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Trasmital

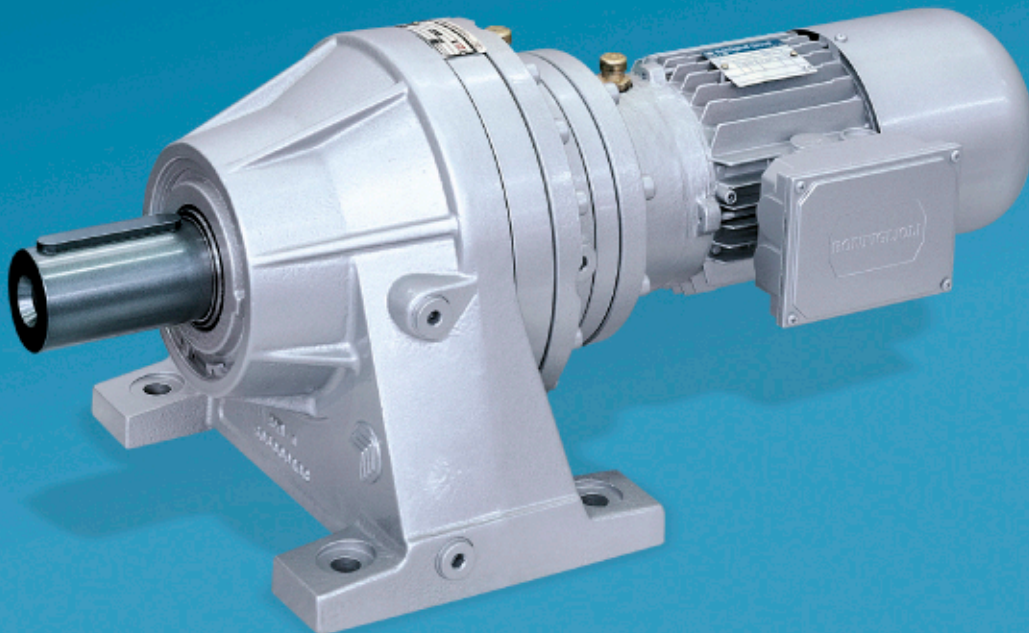
300 Industrial series

Riduttori epicicloidali modulari

Modular planetary gearboxes

Planetengetrieben

Réducteurs épicycloïdaux modulaire



Bonfiglioli

power, control and green solutions



INFORMAZIONI GENERALI
GENERAL INFORMATION
ALLGEMEINE INFORMATIONEN
INFORMATIONS GENERALES

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RIDUTTORI EPICICLOIDALI MODULARI SERIE 300
SERIES 300 MODULAR PLANETARY GEARBOXES
PLANETENGETRIEBEN DER SERIE 300
REDUCTEURS EPICYCLOIDaux MODULAIRE SERIE 300

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MOTORI ELETTRICI
ELECTRIC MOTORS
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Revisioni
L'indice di revisione del catalogo è riportato a pag. 458.
Al sito www.bonfiglioli.com sono disponibili i cataloghi con le revisioni aggiornate.

Revisions
Refer to page 458 for the catalogue revision index.
Visit www.bonfiglioli.com to search for catalogues with up-to-date revisions.

Änderungen
Das Revisionsverzeichnis des Katalogs wird auf Seite 458 wiedergegeben. Auf unserer Website www.bonfiglioli.com werden die Kataloge in ihrer letzten, überarbeiteten Version angeboten.

Révisions
Le sommaire de révision du catalogue est indiqué à la page 458.
Sur le site www.bonfiglioli.com des catalogues avec les dernières révisions sont disponibles.



1.0 - CARATTERISTICHE

La serie 300 è una gamma di riduttori epicicloidali multipiego.

Caratteristiche salienti sono:

- 20 grandezze di costruzione modulare
- configurazione:
 - in linea, da 1 a 4 stadi di riduzione
 - angolare (primo stadio con coppia conica Gleason) da 2 a 4 stadi
- combinazioni con:
 - riduttori a vite senza fine
 - riduttori ad assi ortogonali
- esecuzioni per montaggio con flangia, con piede, pendolare
- alberi lenti: con linguetta, scanalati, scanalati femmina, cavi per montaggio tramite giunto calettatore
- predisposizioni motore per:
 - motori elettrici normalizzati IEC
 - motori compatti per le esecuzioni in linea fino alla grandezza 307
- albero cilindrico in entrata
- motoriduttori
- accessori per albero lento:
 - flangie
 - pignoni
 - barre scanalate
 - giunti ad attrito

1.0 - SPECIFICATIONS

The 300 series consists of a range of multi-purpose planetary gearboxes.

Key features are:

- 20 frame sizes of modular design
- versions:
 - in-line with 1 to 4 reductions
 - right angle (spiral bevel gear set into first stage) with 2 to 4 reductions
- combinations with:
 - worm gear units
 - bevel-helical gear units
- flange, foot and shaft mounting arrangements
- keyed output shaft, splined male shaft, splined hollow shaft, hollow shaft with shrink disc
- input adaptors for:
 - IEC-normalised electric motors
 - integral motor for in-line units up to size 307 and for units combined with bevel helical and worm gears
- parallel input shafts
- gearmotors
- mounting accessories:
 - flanges
 - pinions
 - splined bars
 - shrink discs

1.0 - KONSTRUKTIONSMERKMALE

Die Serie 300 ist eine Reihe an vielseitig einsetzbaren Planetengetrieben.

Ihre Gundmerkmale sind:

- 20 Baugrößen Modularbauweise
- Ausführung:
 - In Reihenanzordnung mit 1 bis 4 Stufen
 - auf Winkel (erste Stufe mit Kegelradpaarung realisiert) In Winkelanzordnung (erste Stufe mit Kegelradpaar) mit 2 bis 4 Stufen
- Kombiniert mit:
 - Schneckengetrieben
 - Kegelradgetrieben
- Abtriebsversionen für Montage mit Flansch, mit Fuß, in Aufsteckversion
- Abtriebswellen: mit Passfeder, Vielkeil, Vielkeilhohlwelle, zylindrischer Hohlwelle für Schrumpfscheibenmontage
- Vorbereitet für:
 - Elektromotoren, gemäß IEC Form B5
 - kompakte Elektromotoren für Reihenanzordnung bis zur Größe 307 und für mit Kegelradgetrieben kombinierte Ausführungen
- Schnelle Wellen am Antrieb
- Getriebemotoren
- Zubehör für Abtriebswellen:
 - Flanschen
 - Ritzel
 - Keilstäbe
 - Schrumpfscheiben

1.0 - CARACTERISTIQUES

La série 300 est une gamme de réducteurs épicycloïdaux polyvalents.

Ses principales caractéristiques sont :





- 20 tailles de construction modulaire
- exécutions:
 - en ligne de 1 à 4 étages de réduction
 - angulaire (premier étage réalisé avec un couple conique Gleason) de 2 à 4 étages de réduction
- Associés à :
 - réducteurs à vis sans fin
 - réducteurs à axes orthogonaux
- versions pour assemblage par bride, à pattes, ou pendulaire
- arbres de sortie clavetés; mâles cannelés; femelles cannelés; creux cylindriques pour assemblage avec frette de serrage
- prédispositions d'entrée pour:
 - moteurs électriques, selon CEI
 - moteurs électriques compacts pour les exécutions en ligne jusqu'à la taille 307
- arbres rapides d'entrée
- motoréducteurs
- accessoires pour arbre de sortie:
 - brides
 - pignons
 - barres cannelées
 - frettes de serrage

ESECUZIONI

CONFIGURATIONS

AUSFÜHRUNGEN

EXECUTIONS

Esecuzione / Configuration Ausführung / Execution	Potenza Power Leistung Puissance	Coppia Torque Drehmomente Couple	Rapporti Ratios Übersetzungen Rapports	Rendimento Efficiency Wirkungsgrad Rendement	Rumorosità Noise level Geräuschpegel Niveau de bruit
 In linea In line Linear Coaxiale	$0.25 \leq P_n \text{ [kW]} \leq 55$	$M_n \leq 1287000 \text{ Nm}$	$3.4 \leq i \leq 2916$	Elevato High Hoch Elevé	Media Medium Mittel Moyen
 Angolare Right-angle Rechtwinklig A renvoi d'angle	$0.25 \leq P_n \text{ [kW]} \leq 55$	$M_n \leq 656000 \text{ Nm}$	$7 \leq i \leq 953$	Elevato High Hoch Elevé	Media Medium Mittel Moyen
 Combinato con riduttore vite senza fine Combined with worm gear unit Kombiniert mit Schneckengetriebe Combinée avec réducteur à vis sans fin	$0.12 \leq P_n \text{ [kW]} \leq 22$	$M_n \leq 656000 \text{ Nm}$	$370 \leq i \leq 5234$	Media Medium Mittel Moyen	Bassa Low Niedrig Faible
 Combinato con riduttore ad assi ortogonali Combined with helical bevel gear unit Kombiniert mit Kegelradgetriebe Combinée avec réducteur à axes orthogonaux	$0.12 \leq P_n \text{ [kW]} \leq 22$	$M_n \leq 15680 \text{ Nm}$	$18.7 \leq i \leq 731$	Elevato High Hoch Elevé	Bassa Low Niedrig Faible



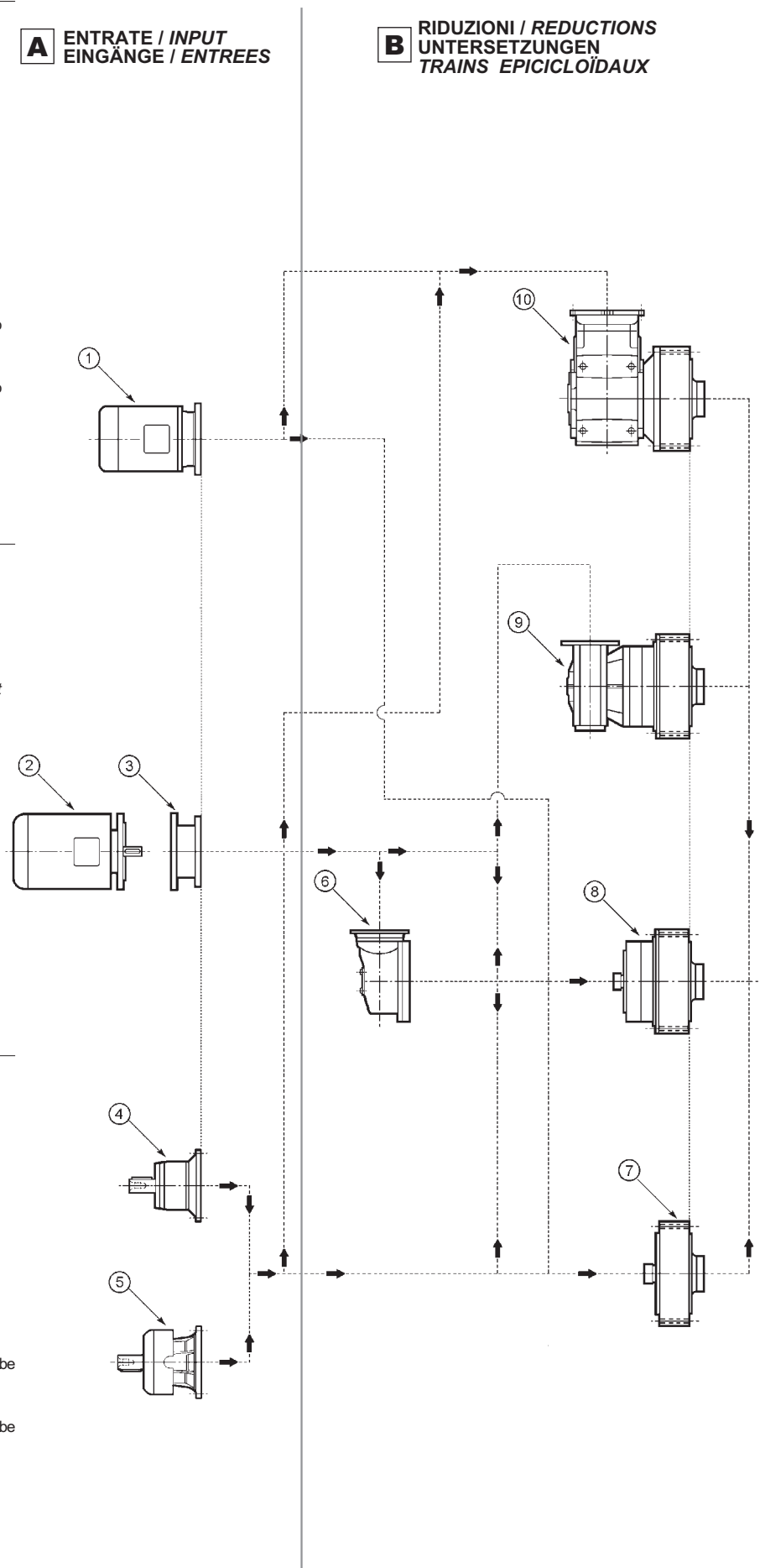
Altre caratteristiche costruttive sono:	<i>More design features:</i>	Andere Konstruktionsmerkmale lassen sich folgendermaßen zusammenfassen:	<i>D'autres caractéristiques de construction sont :</i>
– elevata densità di coppia	– <i>high torque density</i>	– hohes übertragbares Drehmoment/ Verhältnis zu den Aussenmaßen	– <i>apport de couple transmissible/dimensions d'encombrement, élevé</i>
– elevata supportazione radiale e assiale grazie all'utilizzo, sulle versioni H e P, di cuscinetti a rulli conici	– <i>high overhung and axial load capacity due to heavy duty tapered roller bearings featured on H and P versions</i>	– hohe Belastungskapazität für Radial- und Axialkräfte an den Abtriebswellen, dank des Einsatzes von Kegelrollenlager bei den Versionen H und P.	– <i>capacité élevée à supporter les charges radiales et axiales, grâce à l'utilisation, sur les versions H et P, de roulements à rouleaux coniques</i>
– rendimento elevato	– <i>high efficiency</i>	– hohe Wirkungsgrade	– <i>rendement élevé</i>
– collegamenti fra gli organi interni tramite profili scanalati, non tramite linguette	– <i>inner parts are coupled through splined connections rather than keys</i>	– Verbindungen zwischen den inneren Organen mittels Nutprofilen, es werden keine Passfedern verwendet	– <i>raccordements entre les organes intérieurs par le biais de profils cannelés, et non pas de clavettes</i>
– stadi di riduzione con porta-planetari flottanti per la ottimale ripartizione dei carichi fra gli ingranaggi planetari	– <i>planetary gears mounted onto self-centering carriers to ensure the most even load distribution among planetary gears</i>	– Untersetzungsstufen mit schwimmenden Planetenradträgern zur Belastungsverteilung auf die Planetenräder	– <i>étages de réduction avec porte-planétaires flottants pour obtenir une meilleure répartition des charges dans le train d'engrenages épicycloïdaux</i>
– carcasse in ghisa sferoidale.	– <i>housing from ductile cast iron.</i>	– Gehäuse aus Sphäroguss.	– <i>carter en fonte G.S.</i>

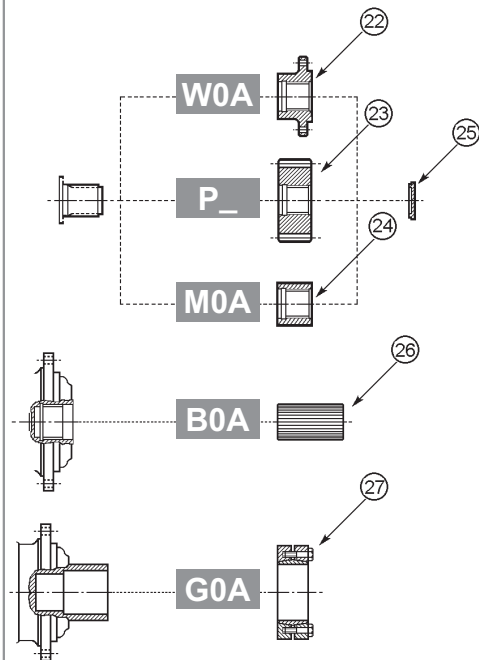
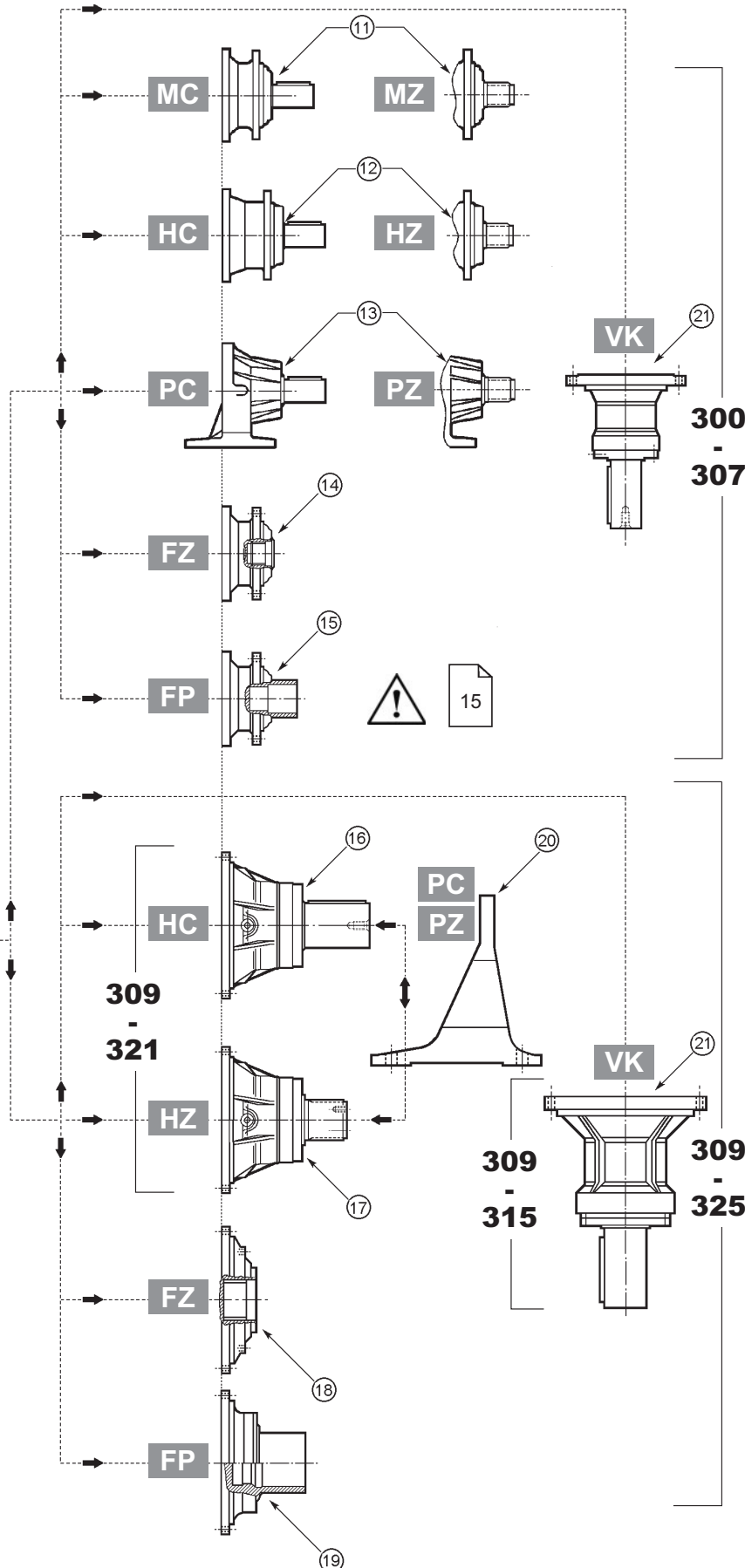
**2.0 - FORME COSTRUTTIVE****2.0 - VERSIONS****2.0 - BAUFORMEN****2.0 - FORMES DE CONSTRUCTION**

- A** 1 Motore elettrico compatto
- 2 Motore elettrico IEC
- 3 Predisposizione motore elettrico
- 4 Albero veloce
- 5 Albero veloce con ventola
- 6 Stadio riduzione angolare
- 7 Uno stadio di riduzione epicicloidale
- 8 Due o più stadi di riduzione epicicloidale
- B** 9 Stadio di riduzione epicicloidale combinato con riduttore a vite senza fine
- 10 Stadio di riduzione epicicloidale combinato con riduttore ad assi ortogonali
- 11 **MC/MZ** - Uscita albero maschio cilindrico o scanalato
- 12 **HC/HZ** - Uscita rinforzata albero maschio cilindrico o scanalato
- 13 **PC/PZ** - Uscita con piede di supporto ed albero maschio cilindrico o scanalato
- C** 14 **FZ** - Uscita albero femmina scanalato
- 15 **FP** - Uscita albero femmina per giunto ad attrito
- 16 **HC** - Uscita albero maschio cilindrico
- 17 **HZ** - Uscita albero maschio scanalato
- 18 **FZ** - Uscita albero femmina scanalato
- 19 **FP** - Uscita albero femmina per giunto ad attrito
- 20 **PC** - Piede di supporto
- 21 **VK** - Uscita rinforzata con albero cilindrico per agitatori / miscelatori
- 22 **W0A** - Flangia
- 23 **P** - Pignone
- D** 24 **M0A** - Manicotto liscio
- 25 Fondello d'arresto
- 26 **B0A** - Barra scanalata
- 27 **G0A** - Giunto ad attrito

- 1 Compact electric motor
- 2 IEC electric motor
- A** 3 Adapter for electric motor
- 4 Solid input shaft
- 5 Solid input shaft with fan
- 6 Right-angle reduction stage
- 7 Single planetary reduction stage
- B** 8 Two or more planetary reduction stages
- 9 Planetary reduction combined with worm gear unit
- 10 Planetary reduction stage combined with helical bevel gear unit
- 11 **MC/MZ** - Keyed or splined solid shaft output
- 12 **HC/HZ** - Keyed or splined heavy duty solid output shaft
- 13 **PC/PZ** - Output with support bracket and keyed or splined solid shaft
- C** 14 **FZ** - Splined hollow output shaft
- 15 **FP** - Hollow output shaft for shrink disc
- 16 **HC** - Parallel solid output shaft
- 17 **HZ** - Splined solid output shaft
- 18 **FZ** - Splined hollow output shaft
- 19 **FP** - Hollow output shaft for shrink disc
- 20 **PC** - Foot mount
- 21 **VK** - Reinforced output with parallel shaft for stirrers and mixers
- 22 **W0A** - Flange
- 23 **P** - Pinion
- D** 24 **M0A** - Sleeve coupling
- 25 End plate
- 26 **B0A** - Splined bar
- 27 **G0A** - Shrink disc

- A** 1 Kompakter Elektromotor
- 2 IEC-Elektromotor
- 3 Vorbereitung für Elektromotor
- 4 Zylindrische Antriebswelle
- 5 Lüftergekühlte Antriebswelle
- 6 Winkelübersetzungsstufe
- 7 Eine Planetenübersetzungsstufe
- B** 8 Zwei oder mehr Planetenübersetzungsstufen
- 9 Planetenübersetzungsstufe kombiniert mit Schneckengetriebe
- 10 Planetenübersetzungsstufe kombiniert mit Kegelradgetriebe
- 11 **MC/MZ** - Abtrieb an Einsteckwelle oder Keilwelle
- 12 **HC/HZ** - Abtrieb an Einsteckwelle oder Verstärkter Abtrieb
- 13 **PC/PZ** - Abtrieb mit Stützfuß und Einsteckwelle oder Keilwelle
- C** 14 **FZ** - Abtrieb mit Keilauflastwelle
- 15 **FP** - Abtrieb mit Auflastwelle für Schrumpfscheibe
- 16 **HC** - Abtrieb mit zylindrischer Einsteckwelle
- 17 **HZ** - Abtrieb mit Keileinsteckwelle
- 18 **FZ** - Abtrieb mit Keilauflastwelle
- 19 **FP** - Abtrieb mit Auflastwelle für Schrumpfscheibe
- 20 **PC** - Stützfuß
- 21 **VK** - Verstärkter Abtrieb mit zylindrischer Welle für Rührwerke und Mischer
- 22 **W0A** - Flansch
- 23 **P** - Ritzel
- D** 24 **M0A** - Nabe
- 25 Bodenklemmscheibe
- 26 **B0A** - Keilvollwelle
- 27 **G0A** - Schrumpfscheibe

**A ENTRATE / INPUT
EINGÄNGE / ENTREES****B RIDUZIONI / REDUCTIONS
UNTERSETZUNGEN
TRAINS EPICICLOÏDAUX**

**C** USCITE / OUTPUT
ABTRIEB / SORTIES**D** ACCESSORI / FITTINGS
ZUBEHÖR / ACCESSOIRES

- A**
- 1 Motore elettrico compact
 - 2 Motore elettrico IEC
 - 3 Preriduzione motore elettrico
 - 4 Arbre rapide
 - 5 Arbre rapide équipé de ventilateur
 - 6 Etage de réduction angulaire
 - 7 Un étage de réduction épicycloïdal
 - 8 Deux ou plusieurs étages de réduction épicycloïdaux
 - 9 Etage de réduction épicycloïdal combiné avec réducteur à vis sans fin
 - 10 Etage de réduction épicycloïdal combiné avec réducteur à axes orthogonaux
- B**
- 11 MC/MZ - Sortie arbre mâle cylindrique ou cannelé
 - 12 HC/HZ - Sortie renforcés arbre mâle cylindrique ou cannelé
 - 13 PC/PZ - Sortie avec pied de support et arbre mâle cylindrique ou cannelé
- C**
- 14 FZ - Sortie arbre femelle cannelé
 - 15 FP - Sortie arbre femelle joint à frottement
 - 16 HC - Sortie arbre mâle cylindrique
 - 17 HZ - Sortie arbre mâle cannelé
 - 18 FZ - Sortie arbre femelle cannelé
 - 19 FP - Sortie arbre femelle joint à frottement
 - 20 PC - Patte de support
 - 21 VK - Sortie renforcée avec arbre cylindrique pour agitateurs et mélangeurs
- D**
- 22 W0A - Bride
 - 23 P - Pignon
 - 24 M0A - Manchon lisse
 - 25 Fond de butée
 - 26 B0A - Barre cannelée
 - 27 G0A - Joint à frottement


**3.0 - SIMBOLOGIA E UNITÀ
DI MISURA**
**3.0 - SYMBOLS AND UNITS
OF MEASURE**
**3.0 - SYMBOLE UND
MAßEINHEITEN**
**3.0 - SYMBOLES ET UNITES
DE MESURE**

Simb. Symb.	Descrizione	Description	Beschreibung	Description
A_{c2}	[N] Carico assiale di calcolo in uscita riduttore	Calculated thrust load at gearbox output shaft	Soll-Axialkraft am Getriebeabtrieb	Charge axiale de calcul à la sortie du réducteur
A_{r2}	[N] Carico assiale in uscita riduttore	Thrust load at gearbox output shaft	Axialkräfte am Getriebeabtrieb	Charge axiale à la sortie du réducteur
A_{n2}	[N] Carico assiale nominale in uscita riduttore	Rated thrust load at gearbox output shaft	Nenn-Axialkraft am Getriebeabtrieb	Charge axiale nominale à la sortie du réducteur
f_L	Fattore di durata	Lifetime factor	Lebensdauerfaktor	Facteur de durée
f_m	Fattore di maggiorazione	Adjusting factor	Überdimensionierungsfaktor	Facteur de majoration
f_{n1}, f_{n2}	Fattore di velocità per carichi su alberi entrata, uscita	Speed factor referred to input and output shaft loading	Drehzahlfaktor für auf Antriebs-/Abtriebswellen einwirkende Kräfte	Facteur de vitesse pour charges sur arbres d'entrée, sortie
f_s	Fattore di servizio	Service factor	Betriebsfaktor	Facteur de service
f_t	Fattore termico	Thermal factor	Wärmefaktor	Facteur thermique
f_{n1}, f_{n2}	Fattore correttivo per carichi sugli alberi	Load corrective factor on shafts	Korrekturfaktor für wellenbelastungen	Facteur de correction pour charges sur les arbres
h	[h] Durata in ore	Lifetime in hours	Dauer in Stunden	Durée en heures
i	Rapporto di riduzione	Gear ratio	Übersetzung	Rapport de réduction
K_a	Fattore di sollecitazione carico assiale	Axial load duty factor	Belastungsfaktor der Axialkraft	Facteur de service de charge axiale
K_r	Fattore di sollecitazione del carico radiale	Radial load factor	Belastungsfaktor der Radialkraft	Facteur de sollicitation de la charge radiale
l	Rapporto di intermittenza	Intermittence factor	Einschaltdauer	Rapport d'intermittence
M_b	[Nm] Coppia nominale del freno	Rated brake torque	Nenn-Drehmoment der Bremse	Couple nominal du frein
M_{c2}	[Nm] Coppia di calcolo in uscita riduttore	Calculated output torque	Soll-Drehmoment am Getriebeabtrieb	Couple de calcul de sortie réducteur
M_2	[Nm] Coppia trasmessa in uscita riduttore	Torque delivered to output shaft	Übertragenes Drehmoment am Getriebeabtrieb	Couple transmis en sortie réducteur
M_{n2}	[Nm] Coppia nominale in uscita riduttore	Gearbox rated output torque	Nenn-Drehmoment am Getriebeabtrieb	Couple nominal de sortie réducteur
M_{2max}	[Nm] Coppia massima in uscita riduttore	Gearbox max. output torque	Max. Drehmoment am Getriebeabtrieb	Couple max. de sortie réducteur
M_{r1}	[Nm] Coppia richiesta in entrata al riduttore	Required torque at input shaft	Erforderliches Drehmoment am Getriebeantrieb	Couple nécessaire à l'entrée du réducteur
M_{r2}	[Nm] Coppia richiesta in uscita al riduttore	Required torque at output shaft	Erforderliches Drehmoment am Getriebeabtrieb	Couple requis à la sortie du réducteur
n_1	[min ⁻¹] Velocità angolare in entrata riduttore	Speed of input shaft	Winkeldrehzahl am Getriebeantrieb	Vitesse angulaire à l'entrée du réducteur
n_2	[min ⁻¹] Velocità angolare in uscita riduttore	Speed of output shaft	Winkeldrehzahl an Getriebeabtrieb	Vitesse angulaire à la sortie du réducteur
P_1	[kW] Potenza max. trasmissibile in entrata riduttore	Max. power that can be applied to input shaft	Max. übertragbare Leistung an Getriebeantrieb	Puissance maximum transmissible à l'entrée du réducteur
P_2	[kW] Potenza trasmessa in uscita riduttore	Power delivered to output shaft	Übertragene Leistung am Getriebeabtrieb	Puissance transmise à la sortie du réducteur
P_n	[kW] Potenza nominale motore	Motor rated power	Nennleistung des Motors	Puissance nominale moteur
P_1	[kW] Potenza richiesta in entrata	Required input power	Erforderliche Leistung am Antrieb	Puissance requise en entrée
P_{r2}	[kW] Potenza in uscita a n_2 max	Output power at n_2 max	Abtriebsleistung bei n_2 max	Puissance en sortie à n_2 max
P_s	[kW] Potenza da smaltire	Power to be dissipated	Überleistung	Puissance à éliminer
P_t	[kW] Potenza termica riduttore	Gearbox thermal capacity	Wärmeleistung des Getriebes	Puissance thermique réducteur
R_{c1}	[N] Carico radiale (di calcolo) in entrata riduttore	Calculated radial load at gearbox input shaft	Radialkraft (Sollwert) am Getriebeantrieb	Charge radiale de calcul à l'entrée du réducteur
R_{c2}	[N] Carico radiale (di calcolo) in uscita riduttore	Calculated radial load at gearbox output shaft	Radialkraft (Sollwert) am Getriebeabtrieb	Charge radiale de calcul à la sortie du réducteur
R_{n1}, R_{n2}	[N] Carico radiale nominale in mezzeria alberi entrata, uscita	Rated radial load at shaft mid-point, input and output	Nenn-Radialkraft auf Mitte der Antriebs-/Abtriebswellen	Charge radiale nominale à la moitié des arbres d'entrée, sortie
R_{x2}	[N] Carico radiale nominale in uscita riduttore ricalcolato rispetto a diversi punti di applicazione del carico	Admissible overhung load for forces applying off the shaft midpoint	Nachberechnete Nenn-Radialkraft am Getriebeabtrieb in bezug auf verschiedene Kraftangriffspunkte	Charge radiale nominale à la sortie du réducteur recalculée par rapport à différents points d'application de la charge
S	Fattore di sicurezza	Safety factor	Sicherheitsfaktor	Facteur de sécurité
t_a	[°C] Temperatura ambiente	Ambient temperature	Umgebungstemperatur	Température ambiante
X	[mm] Distanza di applicazione del carico dallo spallamento albero	Load application distance from shaft shoulder	Abstand des Kraftangriffspunkte vom Wellenansatz	Distance d'application de la charge par rapport à l'épaulement de l'arbre
η_d	Rendimento dinamico	Dynamic efficiency	Dynamischer Wirkungsgrad	Rendement dynamique
Z	Frequenza di avviamento	Starts per hour	Anlaßfrequenz	Frequence de démarrage



Il simbolo identifica il peso.

Icon symbolises the weight.

Symbol für das Gewicht der Getriebe.

Symbole se référant aux poids du réducteur.



Le colonne contrassegnate da questo simbolo indicano i numeri di pagina dove sono riportate le dimensioni.

Columns marked with this symbol indicate the page installation drawings can be sorted from.

In den mit diesem Symbol gekennzeichneten Spalten werden die Seiten mit den entsprechenden Maßangaben aufgeführt.

Les colonnes portant ce symbole indiquent les numéros de page où sont mentionnées les dimensions.

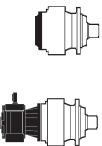


Questo simbolo indica la pagina alla quale è rimandata l'informazione.

This symbol identifies the page the information is available at.

In diesem Symbol wird eine Nummer angegeben, die für die entsprechende Bezugsseite steht.

Cette image comporte un chiffre représentant le numéro de page de référence.



Le parti in nero evidenziano la collocazione delle entrate dei riduttori.

Areas marked in black show the input component parts.

Die schwarz hervorgehobenen Teile stellen die Seite des Getriebeantriebs dar.

Les parties noires montrent l'emplacement des entrées des réducteurs.



Il numero associato al simbolo indica la coppia da applicare per il serraggio delle viti.

The number associated with the wrench indicates the rated tightening torque.

Das an eine Nummer gebundene Schlüssel symbol steht für den Anzugsmoment der Schrupfscheibenschraube.

Le nombre associée a l'image de la clé indique le couple de serrage des vis.



Esecuzione in linea.

In-line unit.

Reihenordnung

Exécution coaxiale.



Esecuzione angolare.

Right-angle unit.

Winkelanordnung

Exécution angulaire.



Esecuzione combinata con vite senza fine.

Worm-planetary combined design.

Mit Schneckengetriebe kombinierte Ausführung.

Exécution combinée avec vis sans fin.



Esecuzione combinata con riduttore ad assi ortogonali.

Bevel helical-planetary combined design.

Mit Kegelradgetriebe kombinierte Ausführung.

Exécution combinée avec réducteur à axes orthogonaux.



4.0 - COPPIA IN USCITA

4.1 Coppia motoriduttore M_2 [Nm]

È la coppia trasmessa in uscita dal motoriduttore con carico continuo uniforme e fattore di sicurezza **S** risultante dalle tabelle dati tecnici per una durata di 10000 h.

4.2 Coppia nominale riduttore M_{n2} [Nm]

È la coppia nominale trasmissibile dal riduttore con:

- carico uniforme e fattore di sicurezza **S=1**
- durata di calcolo di 10000 ore. I valori di M_{n2} sono verificati secondo i seguenti standard:

ISO 6336 per gli ingranaggi (per calcolo secondo AGMA contattare il Servizio Tecnico Bonfiglioli).

ISO 281 per i cuscinetti.

4.3 Coppia massima M_{2max} [Nm]

È il valore di coppia in uscita sopportabile dal riduttore in condizioni statiche o quasi statiche. È inteso come carico istantaneo o come coppia di spunto sotto carico.

I valori riportati nelle tabelle sono validi solo nelle versioni di uscita con albero scanalato.

4.4 Coppia richiesta M_{r2} [Nm]

Rappresenta la coppia richiesta dall'applicazione. Il suo valore dovrà sempre essere uguale, o inferiore, alla coppia nominale M_{n2} del riduttore.

4.5 Coppia di calcolo M_{c2} [Nm]

È il valore di coppia da utilizzare nella selezione del riduttore. L'espressione è fornita dall'equazione seguente, in funzione della coppia richiesta M_{r2} e del fattore di servizio f_s :

4.0 - OUTPUT TORQUE

4.1 Gearmotor delivered torque M_2 [Nm]

This is the net torque delivered to the output shaft, with installed power **P_n**, safety factor **S**, which will yield a theoretical lifetime of 10000 hours. This torque value takes gearbox efficiency into consideration.

4.2 Rated output torque M_{n2} [Nm]

This is the torque output the gearbox can deliver safely, based on:

- uniform loading and safety factor **S=1**
- 10000 hours theoretical lifetime

M_{n2} values are in compliance with following standards:

ISO 6336 for gears (for calculations according to AGMA standards, please contact Bonfiglioli's Technical Service).

ISO 281 for bearings.

4.3 Maximum torque M_{2max} [Nm]

This is the output torque that the gearbox can withstand under static or almost static conditions. It is generally meant as a momentary peak load or starting-up torque under load.

The values in the tables are valid only in versions with output splined shaft.

4.4 Required torque M_{r2} [Nm]

The torque drawn by the application. It must always be equal to or less than rated output torque M_{n2} for the gearbox under study.

4.5 Calculated torque M_{c2} [Nm]

Computational torque value to be used when selecting the gearbox, considering required torque M_{r2} and service factor f_s . It is obtained through the equation:

4.0 - ABTRIEBSMOMENT

4.1 Drehmoment des Getriebemotors M_2 [Nm]

Ist das an der Abtriebswelle des Getriebemotors übertragene Drehmoment bei gleichmäßiger Dauerbelastung und einem, aus den Tabellen der technischen Daten in bezug auf eine Dauer von 10000 Std. resultierenden Sicherheitsfaktor **S**.

4.2 Nenn-Drehmoment des Getriebes M_{n2} [Nm]

Ist das vom Getriebe am Abtrieb übertragene Drehmoment mit gleichmäßiger Dauerbelastung und Sicherheitsfaktor **S=1** für eine Dauer von 10000 Std. Die Werte M_{n2} werden den folgenden Normen gemäß geprüft:

ISO 6336 für die Zahnräder (für die Berechnung nach AGMA den Technischen Kundendienst von Bonfiglioli kontaktieren).

ISO 281 für Lager.

4.3 Maximales Drehmoment M_{2max} [Nm]

Dies ist das Abtriebsdrehmoment, dem das Getriebe unter statischen oder nahezu statischen Bedingungen standhalten kann (Wird als augenblicklicher Spitzendrehmoment oder als Anlaßdrehmoment unter Last verstanden). Die Werte in den Tabellen sind nur gültig in den Versionen mit Ausgang Vielkeilverzahnung.

4.4 Erforderliches Drehmoment M_{r2} [Nm]

Dies ist das von der Anwendung verlangte Drehmoment, das stets kleiner oder gleich dem Nenn- Abtriebsmoment M_{n2} des gewählten Getriebes sein muß.

4.5 Soll-Drehmoment M_{c2} [Nm]

Ist der Wert des Drehmoments, der für die Getriebewahl, unter Berücksichtigung des erforderlichen Drehmoments M_{r2} und des Betriebsfaktors f_s , zu verwenden ist und ergibt sich aus folgender Formel:

4.0 - COUPLE EN SORTIE

4.1 Couple motoréducteur M_2 [Nm]

C'est le couple transmis à la sortie du motoréducteur avec charge continue uniforme et facteur de sécurité **S**, voir tableaux données techniques, pour une durée de 10000 h.

4.2 Couple motoréducteur M_{n2} [Nm]

C'est le couple nominal transmis à la sortie du réducteur avec :

- charge continue uniforme
- facteur de sécurité **S=1** pendant une durée de 10000 h.

Les valeurs de M_{n2} sont vérifiées conformément aux normes suivantes:

ISO 6336 pour les engrenages (pour un calcul selon AGMA contacter le Service Technique Bonfiglioli).

ISO 281 pour les roulements.

4.3 Couple maximal M_{2max} [Nm]

C'est la valeur de couple en sortie pouvant être supportée par le réducteur dans des conditions statiques ou quasi-statiques (considérée en tant que couple de pointe de charge instantanée ou couple de démarrage en charge). Les valeurs figurant dans les tableaux ne sont valables que dans les versions avec arbre cannelé de sortie.

4.4 Couple requis M_{r2} [Nm]

Il représente le couple requis par l'application et devra toujours être inférieur ou égal au couple en sortie nominal M_{n2} du réducteur choisi.

4.5 Couple de calcul M_{c2} [Nm]

C'est la valeur de couple à utiliser pour la sélection du réducteur en considérant le couple requis M_{r2} et le facteur de service f_s (tab. A3); elle résulte de la formule suivante:

$$M_{c2} = M_{r2} \times f_s \leq M_{n2}$$

(1)

5.0 - POTENZA

5.1 Potenza in entrata P_{n1} [kW]

La grandezza P_{n1} rappresenta la potenza massima applicabile al riduttore nelle condizioni di:

- azionamento alla velocità di comando n_1
- fattore di sicurezza **S=1**
- durata teorica di 10000 ore.

5.0 - POWER

5.1 Rated input power P_{n1} [kW]

P_{n1} is the maximum power that can be safely applied to the gearbox when the same is operated:

- at a n_1 drive speed
- under a safety factor **S=1**
- yielding a theoretical lifetime of 10000 hours.

5.0 - LEISTUNG

5.1 Leistung am Antrieb P_{n1} [kW]

In den Auswahltabellen der Getriebegrößen wird die maximal im Antrieb übertragbare Leistung in bezug auf:

- Drehzahl n_1 angegeben
- Sicherheitsfaktor **S=1**
- theoretische Dauer von 10000 Stunden berücksichtigt.

5.0 - PUISSANCE

5.1 Puissance en entrée P_{n1} [kW]

Le tableau de sélection de chaque taille de réducteur indique la puissance maximum transmissible en entrée en fonction de :

- vitesse n_1
- facteur de sécurité **S=1**
- pendant une durée théorique de 10000 heures.



5.2 Potenza in uscita P_2 [kW]

Il parametro rappresenta la potenza netta trasmessa all'albero lento del riduttore. Il suo valore si può calcolare con le seguenti formule:

5.2 Output power P_2 [kW]

This value is the net power delivered to the output shaft. It can be calculated through the following formulas:

5.2 Leistung am Abtrieb P_2 [kW]

Dieser Wert stellt die an den Getriebeabtrieb übertragene Leistung dar. Er ergibt sich aus folgenden Formeln:

5.2 Puissance en sortie P_2 [kW]

Cette valeur représente la puissance transmise à la sortie du réducteur. On peut la calculer avec les formules suivantes :

$$P_2 = P_1 \times \eta_d \quad (2)$$

$$P_2 = \frac{M_{r2} \times n_2}{9550} \quad (3)$$

Per i valori del rendimento η_d vedi tabella (A3).

Efficiency values are listed in table (A3).

In Bezug auf den Wirkungsgrad η_d verweisen wir der tabelle (A3).

En ce qui concerne les valeurs du rendement η_d voir le tableau (A3).

6.0 - POTENZA TERMICA P_t [kW]

È il parametro che indica il limite termico del riduttore. Il valore è reperibile nelle tabelle dati tecnici riduttori e motoriduttori e rappresenta la potenza trasmissibile in servizio continuo in corrispondenza della velocità di azionamento n_1 e alla temperatura ambiente di 20°C senza che la temperatura del lubrificante superi la temperatura di 85-90°C e conseguentemente la superficie del riduttore i 75-80°C, in assenza di un sistema di raffreddamento ausiliario.

Per un tipo di servizio caratterizzato da una breve durata di funzionamento e da un tempo di sosta sufficientemente lungo da consentire il raffreddamento del gruppo, la potenza termica acquisita scarsa rilevanza e si può rivelare trascurabile.

Se la temperatura ambiente è diversa da 20°C e/o il servizio è diverso da quello continuo è opportuno correggere il valore di potenza termica P_t introducendo il fattore correttivo f_t risultante dalla tabella (A1).

Verificare infine che sia sempre soddisfatta la relazione:

6.0 - THERMAL CAPACITY P_t [kW]

This parameter is linked to the gearbox thermal limit.

Values for the thermal capacity are listed within the rating charts of gearboxes and gearmotors and represent the mechanical power that can be transmitted continuously at an input speed n_1 and at an ambient temperature of 20°C, without the lubricant exceeding the temperature of 85-90°C and the gear case the temperature of 75-80°C, without the use a supplementary cooling system.

When the duty cycle is formed by short operating periods and rest time is long enough for the unit to cool down, the thermal capacity is hardly significant and it may be omitted from calculation.

Should the ambient temperature be different from 20°C and/or duty be intermittent, the thermal capacity P_t is to be adjusted through thermal factor f_t as listed in table (A1).

Finally, make sure that the following condition is always satisfied:

6.0 - WÄRMELEISTUNG P_t [kW]

Dieser Wert steht für die Wärmegrenzleistung des Getriebes. Angaben zur thermischen Grenzleistung werden in den Auswahltabellen der Getriebe und Getriebemotoren aufgeführt. Die Werte repräsentieren die mechanische Leistung die bei einer Eingangs-drehzahl n_1 und bei einer Umgebungstemperatur von 20°C dauerhaft übertragen werden kann, ohne dass die Schmiermitteltemperatur 85°C-90°C und die Gehäusetemperatur 75°C-80°C ohne zusätzliche Kühlsysteme überschritten wird. Bei einem Betrieb, der sich durch eine kurzzeitige Betriebsdauer und eine für die Abkühlung der Gruppe ausreichend lang andauernde Aussetzzeit kennzeichnet, ist die Wärmeleistung von geringer Bedeutung und braucht daher nicht unbedingt berücksichtigt zu werden.

Wenn die Umgebungstemperatur von 20°C abweicht und/oder im Aussetzbetrieb gefahren wird, dann muss die Thermische Grenzleistung P_t mit dem Temperaturfaktor f_t gemäß Tabelle (A1) korrigiert werden.

Überprüfen Sie weiterhin ob immer folgenden Gegebenheiten eingehalten werden:

6.0 - PUISSANCE THERMIQUE P_t [kW]

C'est le paramètre qui indique la limite thermique du réducteur. La valeur est indiquée dans les tableaux de données techniques des réducteurs et des motoréducteurs et représente la puissance transmissible en service continu en correspondance de la vitesse d'entrée n_1 et à une température ambiante de 20°C sans que la température du lubrifiant ne dépasse pas la température de 85-90°C et, en conséquence, la surface du réducteur ne dépasse pas la température de 75-80°C sans recourir à un refroidissement auxiliaire.

Pour un type de service caractérisé par une durée de fonctionnement brève et par un temps de pause suffisamment long pour permettre le refroidissement du groupe, la puissance thermique ne revêt qu'une faible importance et peut, par conséquent, ne pas être prise en considération.

Si la température ambiante est différente de 20°C, et/ou le service n'est pas continu, il est opportun de corriger la valeur de puissance thermique P_t avec le facteur de correction f_t du tableau (A1).

Vérifier que l'équation suivante soit toujours satisfaite :

$$P_{r1} \leq P_t \times f_t \quad (4)$$

(A1)

t_a [°C]	Servizio continuo Continuous duty Dauerbetrieb Service continu	f_t			
		Servizio intermittente / Intermittent duty / Aussetzbetrieb / Service intermittent			
		Rapporto di intermittenza / Cyclic duration factor Relative Einschaltdauer / Rapport d'intermittence			
		80%	60%	40%	20%
10	1.2	1.3	1.6	1.8	2.0
20	1.0	1.1	1.3	1.5	1.7
30	0.9	1.0	1.2	1.3	1.5
40	0.7	0.8	0.9	1.0	1.2
50	0.5	0.6	0.7	0.8	0.9



Il rapporto di intermittenza (I)% è dato dal rapporto fra il tempo di funzionamento a carico t_f e il tempo totale ($t_f + t_r$), con t_r = tempo di riposo, espresso in percentuale:

Cyclic duration factor is the relationship of operating time under load t_f to total cycle time ($t_f + t_r$, where t_r stands for time at rest), expressed as a percentage.

Die relative Einschaltdauer (I) % wird von dem Verhältnis zwischen Betriebszeit unter Last t_f und der Gesamtbetriebszeit ($t_f + t_r$) gegeben, wobei t_r = Ruhezeit, in Prozenten ausgedrückt, ist.

Le rapport d'intermittenza (I) % est donné par le rapport entre la durée de fonctionnement en charge t_f et le temps total ($t_f + t_r$) avec t_r = temps de repos, exprimé en pour cent :

$$I = \frac{t_f}{t_f + t_r} \times 100 \quad (5)$$


Se la potenza termica del riduttore in esecuzione convenzionale non soddisfa la condizione espressa dalla relazione (4) è suggerito ricorrere all'esecuzione caratterizzata da albero veloce cilindrico con ventola di raffreddamento, codici FV__, il cui valore di potenza termica è espresso nelle tabelle che seguono.


Should the gear unit in the conventional configuration fall short of thermal capacity and not verify the condition (4) above, it is recommended that the fan cooled input shaft - ordering code FV__ is specified instead. The relevant thermal capacity is listed in the charts here after.

Wenn die Wärmeleistung des Getriebes in der herkömmlichen Konfiguration überschritten wird und die oben genannten Bedingungen (4) nicht zutreffen, dann wird anstatt dessen die lüftergekühlte Eingangswelle, Option FV__, empfohlen. Die zulässige Wärmeleistung wird in der nachfolgenden Tabelle aufgeführt.

Si la puissance thermique du réducteur dans son exécution standard ne satisfait pas la condition exprimée dans la relation (4), il est suggéré d'utiliser la solution caractérisée par l'arbre rapide cylindrique avec ventilateur de refroidissement, codes FV__, dont la valeur de puissance thermique est exprimée dans les tableaux suivants.

(A2)

Potenza termica / Thermal capacity / Wärmeleistung / Puissance thermique							
Pt [kW] @ $n_1 = 1450$ rpm							
							
		FV05B	FV06B	FV07A	FV07B	FV010B	FV011B
303	L1	29	-	-	-	-	-
304	L1	30	-	-	-	-	-
305	L1	31	-	-	-	-	-
306	L1	-	45	-	-	-	-
	L2	31	-	-	-	-	-
307	L1	-	-	49	49	-	-
	L2	36	-	-	-	-	-
309	L1	-	-	52	52	-	-
	L2	36	-	-	-	-	-
310	L1	-	-	-	-	62	-
	L2	-	49	-	-	-	-
	L3	36	-	-	-	-	-
311	L1	-	-	-	-	-	62 (*)
	L2	-	-	53	52	-	-
	L3	36	-	-	-	-	-
313	L1	-	-	-	-	-	-
	L2	-	-	57	57	-	-
	L3	36	-	-	-	-	-
314	L2	-	-	-	-	67	-
	L3	-	52	-	-	-	-
	L4	33	-	-	-	-	-
315	L2	-	-	-	-	-	72 (*)
	L3	-	-	57	57	-	-
316	L2	-	-	-	-	-	72 (*)
	L3	-	-	57	57	-	-
317	L2	-	-	-	-	-	77 (*)
	L3	-	-	62	62	-	-
318	L3	-	-	-	-	-	62 (*)
	L4	-	-	45	45	-	-
319	L3	-	-	-	-	-	77 (*)
	L4	-	-	57	57	-	-
321	L3	-	-	-	-	-	87 (*)
	L4	-	-	62	62	-	-
323	L4	-	-	-	-	-	87 (*)
325	L4	-	-	-	-	-	87 (*)

Potenza termica / Thermal capacity / Wärmeleistung / Puissance thermique			
Pt [kW] @ $n_1 = 1450$ rpm			
			
		FV05B	FV06B
307	R2	52	-
309	R2	52	-
310	R2 (B)	-	82
	R2 (C)	-	82
311	R2 (B)	-	102
	R2 (C)	-	117
	R3	58	-
313	R2 (B)	-	102
	R2 (C)	-	117
	R3	58	-
314	R3 (B)	-	82
	R3 (C)	-	82
	R4	-	-
315	R3 (B)	-	102
	R3 (C)	-	117
	R4	58	-
316	R3 (B)	-	102
	R3 (C)	-	117
	R4	63	-
317	R3 (B)	-	117
	R3 (C)	-	127
	R4	68	-
318	R4 (B)	-	108
	R4 (C)	-	137
319	R4 (B)	-	122
	R4 (C)	-	142
321	R4 (B)	-	132
	R4 (C)	-	152

* @ $n_1 = 1150$ rpm



7.0 - RENDIMENTO

7.0 - EFFICIENCY

7.0 - WIRKUNGSGRAD

7.0 - RENDEMENT

7.1 Rendimento dinamico $[\eta_d]$

È rappresentato dal rapporto fra la potenza misurata all'albero lento P_2 e quella applicata all'albero veloce P_1 :

7.1 Dynamic efficiency $[\eta_d]$

The parameter is defined as the relationship of the net power delivered to the output shaft P_2 to the power applied to the input shaft P_1 :

7.1 Dynamischer Wirkungsgrad $[\eta_d]$

Er ist gegeben durch das Verhältnis der Abtriebsleistung P_2 zur Antriebsleistung P_1 :

7.1 Rendement dynamique $[\eta_d]$

Il est donné par le rapport entre la puissance en sortie P_2 et celle en entrée P_1 :

$$\eta_d = \frac{P_2}{P_1} \quad (6)$$

I valori indicativi di rendimento sono riportati nella tabella seguente.

Indicative values for the efficiency are listed in the chart here after.

Die Werte des indikativen Wirkungsgrads werden in der nachstehenden Tabelle aufgeführt.

Les valeurs indicatif de rendement sont indiquées sur le tableau suivant.

(A3)

N° stadi No. of reductions Anz. Stufen Nombre d'étages de réduction	Esecuzione / Configuration / Ausführung / Exécution		
	Epicycloidale Planetary Planetengetriebe Epicycloïdale	Combinato con riduttore a vite senza fine Combined with worm gear unit Kombiniert mit Schneckengetriebe Combinée avec réducteur à vis sans fin	Combinato con riduttore angolare Combined with right-angle unit Kombiniert mit Kegelradgetriebe Combinée avec réducteur angulaire
1	0.97	—	—
2	0.94	0.73	—
3	0.91	0.70	0.91
4	0.88	—	—

8.0 - RAPPORTO DI RIDUZIONE « i »

8.0 - GEAR RATIO « i »

8.0 - ÜBERSETZUNG « i »

8.0 - RAPPORT DE REDUCTION « i »

È definito come il rapporto fra la velocità di comando dell'albero veloce e la velocità misurata all'albero lento del riduttore.

It is defined as the relationship of the speed the input shaft is driven at and the speed delivered at the output shaft of a gearbox.

Ist das Verhältnis zwischen Antriebs- und Abtriebsdrehzahl des Getriebes.

C'est le rapport entre la vitesse d'entrée et la vitesse de sortie du réducteur.

$$i = \frac{n_1}{n_2} \quad (7)$$

9.0 - VELOCITÀ

9.0 - OPERATING SPEED

9.0 - DREHZAHL

9.0 - VITESSE ANGULAIRE

9.1 Velocità in entrata n_1 [min⁻¹]

È la velocità con la quale è azionato il riduttore. Coincide con la velocità del motore nel caso in cui questo sia collegato direttamente al riduttore. Nel caso di azionamenti tramite trasmissioni esterne, la velocità del motore dovrà essere corretta in funzione del rapporto di trasmissione della trasmissione stessa. In questi casi è consigliabile che la velocità di comando del riduttore sia inferiore a 1400 min⁻¹. La velocità di comando non deve mai superare il valore indicato nelle tabelle dati tecnici dei riduttori.

9.1 Input speed n_1 [min⁻¹]

The speed the gearbox is driven at. The value is coincident with the motor speed if this is directly connected to the gearbox. In case the gearbox is driven through an external transmission, the gearbox input speed is the speed of the motor divided by the reduction of the external transmission. In this case, it is recommended that the input speed be lower than 1400 min⁻¹. Input speed should never exceed the value listed in the gearbox rating chart.

9.1 Drehzahl Antriebswelle n_1 [min⁻¹]

Ist die Geschwindigkeit des Antriebsmotors, wenn dieser direkt auf Achse mit dem Getriebe verbunden ist. Kann aber auch die Geschwindigkeit darstellen, die sich immer aus dem Motor und aus eventuellen Übersetzungsverhältnissen im Fall eines indirekten Antriebs ergibt, z.B. bei einem Riemenantrieb. In diesen Fällen wird am Getriebeantrieb eine unter 1400 min⁻¹ liegende Drehzahl empfohlen. Die Antriebsgeschwindigkeit darf die in den Tabellen der Getriebe angegebenen Werte nie überschreiten.

9.1 Vitesse d'entrée n_1 [min⁻¹]

C'est la vitesse du moteur d'entraînement, au cas où celui-ci serait directement accouplé au réducteur de manière axiale. Ou bien la vitesse débouchant toujours du moteur, et des rapports de transmission éventuels, en cas d'entraînement indirect par exemple par courroies. Dans ces cas, une vitesse d'entrée au réducteur inférieure à 1400 min⁻¹ est conseillée. La vitesse en entrée ne doit jamais dépasser les valeurs indiquées aux tableaux des données techniques des réducteurs.

9.2 Velocità in uscita n_2 [min⁻¹]

È funzione della velocità in comando n_1 e del rapporto di trasmissione i , secondo la relazione:

9.2 Output speed n_2 [min⁻¹]

It is calculated from drive speed n_1 and gear ratio i , as per the following equation:

9.2 Abtriebsdrehzahl n_2 [min⁻¹]

Sie ist abhängig von der Antriebsdrehzahl n_1 und der Übersetzung i nach folgender Gleichung:

9.2 Vitesse en sortie n_2 [min⁻¹]

Elle varie en fonction de la vitesse d'entrée n_1 et du rapport de réduction i selon l'équation :

$$n_2 = \frac{n_1}{i} \quad (8)$$



10.0 - FATTORE DI SERVIZIO [f_s]

È un fattore che associa un valore numerico alla gravosità dell'applicazione. Il parametro tiene conto, con qualche inevitabile approssimazione, della variabilità del carico col quale opera il riduttore, del tipo di servizio e della durata di funzionamento. La tabella (A4) fornisce una indicazione per la determinazione del fattore di servizio.

10.0 - SERVICE FACTOR [f_s]

A parameter representing the severity of the application. This factor takes into account, although approximately, the type of load the gearbox operates with, the specific duty as well as the operating daily hours. The table (A4) is of reference when determining the appropriate service factor.

10.0 - BETRIEBSFAKTOR [f_s]

Stellt einen Faktor dar, der die Applikationsart bestimmt. Er berücksichtigt, mit einer ausreichenden Annäherung, die Belastungsschwankungen, denen das Getriebe bei einer bestimmten Betriebsart und Betriebsdauer unterliegt. Die Tabelle (A4) gibt einen Hinweis für die Auswahl des am besten geeigneten Betriebsfaktors.

10.0 - FACTEUR DE SERVICE [f_s]

C'est un facteur qui définit le type d'application. Il prend en considération, avec une approximation satisfaisante, la variabilité de la charge à laquelle le réducteur est soumis pour un type de service donné ainsi que la durée de fonctionnement. Le tableau (A4) fournit une indication pour le choix du facteur de service le plus adapté.

(A4)

Fattore di servizio / Service factor / Betriebsfaktor / Facteur de service « f _s »						
Natura del carico Type of load Belastungsart Nature de la charge	N° avviamenti /ora Number of starts/hour Schaltungen/Std. N.bre démarrages/heures Z	Durata totale di funzionamento (h) Total operating hours (h) Gesamte Betriebsdauer (h) Durée totale de fonctionnement (h)				
		≤ 5000	10000	15000	25000	50000
		Durata di funzionamento giornaliera (h) Daily operating hours (h) Tägliche Betriebsdauer (h) Durée journalière de fonctionnement (h)				
		h < 4	4 < h < 8	8 < h < 12	12 < h < 16	16 < h < 24
Uniforme Uniform load Gleichmäßig Uniforme	Z < 10	0.90	1.00	1.15	1.30	1.60
	10 < Z < 30	0.95	1.15	1.30	1.50	1.80
	30 < Z < 100	1.00	1.25	1.45	1.60	2.00
Variabile con urti moderati Moderate shock load Variable mit mäßigen Stößen Variable avec chocs modérés	Z < 10	1.00	1.25	1.45	1.60	2.00
	10 < Z < 30	1.10	1.40	1.60	1.80	2.20
	30 < Z < 100	1.20	1.50	1.70	2.00	2.40
Variabile con urti forti Heavy shock load Variable mit starken Stößen Variable avec chocs fort	Z < 10	1.20	1.50	1.70	2.00	2.40
	10 < Z < 30	1.30	1.60	1.80	2.10	2.60
	30 < Z < 100	1.40	1.75	2.00	2.30	2.80

11.0 - FATTORE DI SICUREZZA [S]

È rappresentato dal rapporto fra la potenza trasmissibile dal riduttore in condizioni nominali e la potenza del motore elettrico installato.

11.0 - SAFETY FACTOR [S]

This is the relationship of the gear unit rated power to the power of the electric motor actually driving the unit.

11.0 - SICHERHEITSAKTOR [S]

Ist das Verhältnis zwischen der unter normalen Bedingungen vom Getriebe übertragenen Leistung und der Leistung des eingebauten Elektromotors.

11.0 - FACTEUR DE SECURITE [S]

C'est le rapport entre la puissance transmissible par le réducteur en conditions nominales et la puissance du moteur électrique installé.

$$S = \frac{P_{n1}}{P_1} \quad (9)$$

12.0 - SELEZIONE PRODOTTO

I dati necessari a completare la selezione di un riduttore, o motoriduttore, sono sintetizzati nella tabella (A5). Una copia di questa, debitamente compilata in ogni parte, può essere inviata al nostro Servizio Tecnico per la selezione del riduttore più idoneo per la specifica applicazione.

12.0 - PRODUCT SELECTION

The key parameters that are necessary when selecting a gearbox, or a gearmotor, are listed in table (A5). The form, duly filled in, can be forwarded to our Technical Service which will assist the Customer in selecting the most suitable drive for the specific application.

12.0 - ANTRIEBSAUSWAHL

Um ein Getriebe oder einen Getriebemotor in korrekter Weise auswählen zu können, muß man über einige grundsätzliche Daten verfügen. Daten, die auf der Tabelle (A5) zusammengefaßt werden. Eine Kopie dieser Tabelle kann an unsere Verkaufsorganisation gesendet werden, um in dieser Weise gemeinsam die Wahl des für die jeweilige Applikationsart geeignetsten Getriebes treffen zu können.

12.0 - SELECTION

Pour choisir correctement un réducteur, ou motoréducteur, il est nécessaire de prendre en considération certaines données fondamentales, résumées dans le tableau (A5). Un exemplaire de ce tableau peut être adressé à notre Organisation de vente afin de faciliter le choix du réducteur le plus adapté au type d'application.



(A5)

Tipo di applicazione
Type of application
Anwendung
Type d'application

RIDUTTORE / GEARBOX / GETRIEBE / REDUCTEUR

P_{r2} Potenza richiesta in uscita
Required output power
Am Abtrieb erforderliche Leistung
Puissance nécessaire en sortie kW

M_{r2} Coppia richiesta in uscita
Required output torque
Am Abtrieb erforderliches Drehmoment
Couple nécessaire en sortie Nm

n_2 Velocità in uscita
Output speed
Abtriebsdrehzahl
Vitesse en sortie min^{-1}

n_1 Velocità in entrata
Input speed
Antriebsdrehzahl
Vitesse en entrée min^{-1}

R_2 Carico radiale su albero in uscita
Radial load on output shaft
Radialkraft auf Abtriebswelle
Charge radiale sur l'arbre de sortie N

X_2 Distanza di applicazione del carico
Load application distance
Abstand des Kraftangriffspunktes
Distance d'application de la charge mm (*)

R_1 Carico radiale su albero in entrata
Radial load on input shaft
Radialkraft auf Antriebswelle
Charge radiale sur l'arbre d'entrée N

X_1 Distanza di applicazione del carico
Load application distance
Abstand des Kraftangriffspunktes
Distance d'application de la charge mm (*)

A_2 Carico assiale su albero in uscita
Thrust load on output shaft
Axialkraft auf Abtriebswelle
Charge axiale sur l'arbre de sortie N (+)

A_1 Carico assiale su albero in entrata
Thrust load on input shaft
Axialkraft auf Antriebswelle
Charge axiale sur l'arbre d'entrée N (+)

h Durata di vita
Requested life time
Lebensdauer
Durée de vie h

t_a Temperatura ambiente
Ambient temperature
Umgebungstemperatur
Température ambiante °C

**MOTORE ELETTRICO / ELECTRIC MOTOR
ELEKTROMOTOR / MOTEUR ELECTRIQUE**

Grandezza IEC
IEC size
IEC Baugröße
Taille CEI

P_n Potenza nominale
Rated power
Nennleistung
Puissance nominale kW

Tensione di alimentazione
Motor voltage
Nennspannung des Motors
Tension d'alimentation moteur V

N° poli
Number of poles
Anzahl der Pole
N.bre de pôles

Frequenza
Frequency
Frequenz
Fréquence Hz

Fattore di intermittenza in accordo a CEI
Duty type to IEC norms
Relative Einschaltdauer gemäß CEI
Type de service selon CEI S...../.....%

Z Frequenza di avviamento
Starts per hour
Schaltungshäufigkeit
Fréquence de démarrage 1/h

Grado di protezione motore
Motor protection degree
Schutzart des Motors
Degré de protection moteur IP.....

Classe di isolamento
Insulation class
Isolierstoffklasse
Classe d'isolation

**FRENO SU MOTORE AUTOFRENANTE
MOTOR IN-BUILT BRAKE (IF FITTED)
BREMSE AUF SELBSTBREMSENDEM MOTOR
FREIN SUR MOTEUR AUTOFREINE**

Tensione di alimentazione freno
Brake voltage
Nennspannung der Bremse
Tension d'alimentation du frein V

M_b Coppia frenante
Brake torque
Bremsmoment
Couple de freinage Nm

Esecuzione

Type

Ausführung

Exécution



In linea

In line

In Reihe

Linéaire



Angolare

Right angle

Auf Winkel

Angulaire



Combinato con riduttore a vite senza fine

Combined with worm gearbox

Kombinierte mit Schneckengetriebe

Combiné avec réducteur à vis sans fin

Versione uscita

Output version

Abtriebsversion

Version sortie

Accessori

Accessories

Zubehör

Accessoires

Posizione di montaggio

Mounting position

Montageposition

Position de montage

N.B:

(*) La distanza $X_{1,2}$ è quella compresa fra il punto di applicazione della forza e la battuta dell'albero (se non indicata, si considererà la forza agente sulla mezzeria della sporgenza dell'albero).

(+) + = compressione
- = trazione

N.B:

(*) Dimension $x_{1,2}$ is the distance between the point the force applies and the shaft shoulder (if not specified a force applying at mid-point of the shaft will be assumed).

(+) + = push
- = pull

N.B:

(*) Der Abstand $X_{1,2}$ ist der Abstand vom Kraftangriffspunkt zum Wellenansatz (wenn nicht anders angegeben, wird davon ausgegangen, daß die Kraft auf der Mitte des Wellenendes angreift).

(+) + = Druck
- = Zug

N.B:

(*) La distance $X_{1,2}$ est celle comprise entre le point d'application de la force et l'épaulement de l'arbre (si non précisée l'on considèrera la force agissant au milieu de la saillie de l'arbre).

(+) + = compression
- = traction

**N.B.**

I criteri di scelta e i dati tecnici riportati in questo catalogo non sono validi per tutte le applicazioni, come ad esempio impianti di sollevamento, dove il riduttore funziona come organo di sicurezza verso persone e/o cose. In questi casi la selezione del riduttore deve essere fatta con criteri specifici, ed eventualmente in accordo alle vigenti norme di sicurezza, per cui è necessario interpellare il Servizio Tecnico di BONFIGLIOLI.

NOTE:

The selection criteria and specifications reported in this catalogue are not valid for every and each application, including those where the gearbox operates as a safety device preventing injury to persons or damage to objects, as is the case with hoisting equipment. For these applications, the gearbox should be selected according to specific criteria and in compliance with the applicable safety regulations. Should this be the case we recommend that you seek advice from BONFIGLIOLI Technical Service.

MERKE:

Die Auswahlkriterien und die technischen Daten, die in diesem Katalog aufgeführt werden, sind nicht für alle Applikationsarten gültig, wie z.B. an Hebeanlagen, wo das Getriebe die Funktion eines Sicherheitsorgans im Hinblick auf den Personen- und/oder Sachschutz hat. In diesen Fällen muß die Getriebewahl unter Anwendung spezifischer Kriterien und eventuell in Übereinstimmung mit den Sicherheitsnormen erfolgen. Es ist daher erforderlich, daß Sie sich diesbezüglich mit einer Verkaufsstelle der BONFIGLIOLI in Verbindung setzen.

N.B.

Les critères de sélection et les données techniques indiqués dans ce catalogue ne sont pas valables pour toutes les applications, telles que les équipements de levage, où le réducteur a fonction d'organe de sécurité vis-à-vis du personnel et des matériels. Dans ces cas, la sélection du réducteur doit être faite avec des critères spécifiques, et, s'il y a lieu, en conformité avec les règles de sécurité en vigueur; c'est pourquoi il faut consulter l'organisation de vente BONFIGLIOLI.

12.1 Selezione motoriduttore

In base al tipo di applicazione definire:

- a) il fattore di servizio f_s in funzione del tipo di carico, del n° di avviamenti/ora e della durata richiesta (tab A4);
- b) La potenza necessaria all'azionamento:

12.1 Selecting a gearmotor

Consider the specific application and establish on beforehand:

- a) service factor f_s according to type of load, number of starts per hour and expected lifetime (tab. A4.);
- b) Required drive power:

12.1 Wahl der Getriebemotor

Der Applikationsart gemäß ist folgendes zu definieren:

- a) Betriebsfaktor f_s in Abhängigkeit zur Belastungsart, zu den Schaltungen/Std. und zu geforderter Dauer (Tab. A4);
- b) die für den Antrieb erforderliche Leistung:

12.1 Choix du motoréducteur

En fonction du type d'application, il est nécessaire de définir :

- a) le facteur de service f_s en fonction du type de charge et du nombre de démarrage/heure et de la durée nécessaire (tab. A4);
- b) La puissance nécessaire au mouvement;

$$P_{r1} = \frac{M_{r2} \times n_2}{9550 \times \eta_d} \quad (10)$$

La tabella (A3) riporta i valori indicativi di rendimento η_d per vari tipi di riduttore.

Table (A3) lists the indicative values of efficiency η_d for the different types of gearboxes.

Die Tabelle (A3) führt die indikativen Werte des Wirkungsgrads η_d bezüglich der unterschiedlichen

Le tableau (A3) indique les valeurs indicatives de rendement η_d relatives aux différents types de réducteurs

- c) Disponendo del valore di potenza P_{r1} preventivamente calcolato e della velocità richiesta all'albero n_2 , consultare le tabelle di selezione motoriduttori identificando la tabella relativa alla potenza P_n normalizzata maggiore o uguale a P_{r1} :

- c) After required power P_{r1} and output speed n_2 are known, locate the gearmotor rating charts and select the one relevant to normalized power P_n equal to or greater than P_{r1} :

- c) Unter Bezugnahme auf den berechneten Leistungswert P_{r1} und die erforderliche Drehzahl n_2 , die Tabelle der technischen Daten der Getriebemotoren konsultieren, dabei die Tabelle bezüglich der genormten Leistung P_n , die dem Wert P_{r1} gleich kommt oder größer ist, herausuchen.

- c) Une fois la valeur de puissance P_{r1} calculée et le nombre de tours n_2 demandé, consulter les tableaux des données techniques des motoréducteurs après avoir identifié le tableau correspondant à la puissance P_n normalisée, supérieure ou égale à P_{r1} .

$$P_n \geq P_{r1} \quad (11)$$

Se non diversamente indicato, la potenza P_n dei motori riportata a catalogo si riferisce al servizio continuo S1.

Unless otherwise specified, power P_n listed in the motor rating chart refers to continuous duty S1.

Falls nicht anders angegeben, bezieht sich die im Katalog angegebene Leistung der Motoren P_n auf den Dauerbetrieb S1.

Sauf indication diverse, la puissance P_n des moteurs indiquée dans le catalogue se réfère au service continu S1.

Per i motori utilizzati in condizioni diverse da S1, può essere opportuno identificare il tipo di servizio previsto con riferimento alle Norme CEI 2-3/IEC 60034-1.

For motors operating in conditions other than S1, determine type of duty according to CEI 2-3/IEC 60034-1 standards.

Bei Motoren, die unter von S1 abweichenden Bedingungen verwendet werden, muß unter Bezugnahme auf die Normen CEI 2-3/IEC 60034-1 die entsprechende Betriebsart identifiziert werden.

En cas de moteurs utilisés dans des conditions différentes de S1, il est nécessaire de déterminer le type de service prévu, dans le respect des Normes CEI 2-3 IEC 60034-1.

In particolare, per i servizi da S2 a S8 e per le grandezze motore uguali o inferiori a 132, è possibile ottenere una maggiorazione della potenza rispetto a quella prevista per il servizio continuo.

Note that for duty cycles from S2 to S8 and motor frame sizes up to 132 included, power may be upgraded over that specified for continuous duty. In this event, the condition to be verified is the following:

Insbesondere ist es für Betriebe von S2 bis S8 und für Motorgrößen, die gleich oder größer als 132 sind, möglich, der für den Dauerbetrieb vorgesehenen Leistung gegenüber einen Leistungsausbau zu erhalten. Die zu erfüllende Bedingung ist daher:

Plus particulièrement, en ce qui concerne les services de S2 à S8 et pour des tailles de moteur égales ou inférieures à 132, il est possible d'obtenir une majoration de la puissance par rapport à celle prévue pour le service continu, par conséquent, la condition doit être la suivante :

$$P_n = \frac{P_{r1}}{f_m} \quad (12)$$

Il fattore di maggiorazione f_m è ricavabile dalla tabella (A6).

The adjusting factor f_m can be obtained from table (A6).

Der Überdimensionierungsfaktor f_m kann der Tabelle (A6) entnommen werden.

Le facteur de majoration f_m se trouve dans le tableau (A6).



(A6)

	SERVIZIO / DUTY CYCLE / BETRIEB / SERVICE						
	S2			S3*			S4-S8
	Durata del ciclo / Cycle time Zyklusdauer / Durée du cycle			Rapporto di intermittenza I /Cyclic duration rate I Relative Einschaltdauer I / Rapport d'intermittence I			Interpellarci Contact us Rückfrage Nous contacter
	10	30	60	25%	40%	60%	
f_m	1.35	1.15	1.05	1.25	1.15	1.1	

* La durata del ciclo dovrà comunque essere uguale, o inferiore, a 10 minuti; se superiore interpellare il nostro Servizio Tecnico.

* Cycle time must be equal to or less than 10 minutes. Should this not be the case contact our Technical Service for assistance.

* Die Zyklusdauer muß jedoch kürzer oder gleich 10 Minuten sein; sollte sie darüber liegen, sollten Sie sich mit unserer Verkaufsorganisation in Verbindung setzen.

* Dans tous les cas, la durée du cycle doit être égale ou inférieure à 10 minutes ; en cas de durée supérieure, contacter notre Service Technique.

Rapporto di intermittenza: vedere formula (5).

Cyclic duration rate: see formula (5).

Relative Einschaltdauer siehe Formel (5).

Rapport d'intermittence: voir formule (5).

Selezionare infine, in corrispondenza della velocità all'albero n_2 , il motoriduttore che presenta un fattore di sicurezza **S** che garantisce la seguente condizione:

For the output speed n_2 , or closest to, select the gearbox that yields a safety factor **S** meeting the following condition:

Daraufhin der Abtriebsdrehzahl n_2 gemäß, einen Getriebemotor mit einem Soll-Sicherheitsfaktor **S** auswählen, der folgendes gewährleistet:

Ensuite, en fonction de la vitesse de sortie n_2 , choisir le motoréducteur avec un facteur de sécurité **S** calculé assurant :

$$S \geq f_s \quad (13)$$

L'abbinamento di motori di grossa taglia a riduttori monostadio delle grandezze **300-307** con configurazione di uscita **FP** può comportare la limitazione della durata di vita teorica del riduttore. In questo caso contattare preventivamente il Servizio Tecnico di Bonfiglioli Riduttori.

The combination of large, heavy weight, motors with single reduction units of sizes **300 to 307** in the **FP** configuration, may result into a reduced theoretical lifetime for the gearbox. Should this be your case, kindly contact the local Bonfiglioli Technical Service for directions.

Durch die Kombination von großen, schweren Motoren mit einstufigen Planeten-getrieben der Baugröße **300 bis 307** in **FP** Ausführung, kann die theoretische Lebensdauer des Getriebes reduziert werden. In diesen Fällen kontaktieren Sie den technischen Service von Bonfiglioli.

L'assemblage entre des moteurs de grosse taille et des réducteurs monostage de taille **300-307** en version **FP** peut conduire à une limitation de la durée de vie théorique du réducteur. Dans ce cas nous vous conseillons de contacter préalablement notre Service Technique.

12.2 Selezione del riduttore

In base al tipo di applicazione definire:

- il fattore di servizio f_s in funzione del tipo di carico, del numero di avviamenti/ora e della durata richiesta (tab. A4);
- con il valore di coppia richiesta in uscita M_{r2} , determinare la coppia di calcolo:

12.2 Selecting a gearbox

Examine the application and establish:

- service factor f_s according to type of load, number of starts per hour and required lifetime (tab. A4);
- Determine calculated torque according to required output torque M_{r2} as follows:

$$M_{c2} = M_{r2} \times f_s \quad (14)$$

- In base alla velocità all'albero lento n_2 e a quella di comando n_1 , calcolare il rapporto di trasmissione:

- Determine gear ratio from required output speed n_2 and drive speed n_1 :

$$i = \frac{n_1}{n_2} \quad (15)$$

- disponendo dei valori di M_{c2} e i , consultare la tabella dati tecnici riduttori relativa alla velocità di comando n_1 e selezionare da questa il riduttore con il rapporto di trasmissione più prossimo a quello calcolato e che assicuri contemporaneamente la condizione:

- Once M_{c2} and i are determined, locate the gearbox rating chart for the drive speed n_1 and select a gearbox featuring the ratio i nearest to calculated ratio that also satisfies the condition:

$$M_{n2} \geq M_{c2} \quad (16)$$

12.2 Wahl der Getriebe

Der Applikationsart gemäß folgendes definieren:

- Betriebsfaktor f_s in Abhängigkeit zur Belastungsart, zu den Schaltungen/Std. und zu geforderter Dauer (Tab. A4);
- mit dem am Abtrieb erforderlichen Drehmoment M_{r2} den Soll-Drehmoment bestimmen:

12.2 Choix du réducteur

En fonction du type d'application, il est nécessaire de définir :

- le facteur de service f_s en fonction du type de charge et du nombre de démarrage/heure et de la durée nécessaire (tab. A4) ;
- avec la valeur de couple requise en sortie M_{r2} , déterminer le couple de calcul

- en fonction de la vitesse en sortie n_2 requise et de celle n_1 en entrée, calculer le rapport de réduction :

- avec la valeur de M_{c2} et i , consulter les tableaux des données techniques réducteurs correspondants à la vitesse n_1 puis sélectionner le réducteur ayant le rapport le plus proche de celui calculé et assurant :



Se al riduttore dovrà essere applicato un motore elettrico, verificarne l'applicabilità consultando le tabelle delle predisposizioni possibili.

If a IEC-normalised motor is to be fitted onto the gearbox, check availability of the applica-ble adapter.

Falls am ausgewählten Getriebe ein Elektromotor der Bauform B5 angebracht werden soll, muß die entsprechende Applizierbarkeit unter Bezugnahme auf die Tabellen, in denen die entsprechenden Möglichkeiten aufgeführt sind, geprüft werden.

Si le réducteur choisi doit être appliqué à un moteur électrique de forme B5, vérifier ses possibilités d'application en consultant les tableaux des prédisposi-tions possibles.

13.0 - VERIFICHE

Effettuata la selezione si racco-manda di procedere alle se-guenti verifiche:

a) Potenza termica

Assicurarsi che la potenza termica del riduttore sia uguale, o superiore, alla po-tenza meccanica richiesta dall'applicazione. Vedi rela-zione (4) a pag. 9. In caso contrario provvedere ad applicare un sistema di raffreddamento ausiliario (vedi cap. 29) oppure sele-zionare un riduttore di gran-dezza superiore.

b) Coppia massima

Verificare che nè la coppia istantanea di picco nè la coppia di spunto sotto carico superino il valore di M_{2max} ammesso per il riduttore (vedi grafico).

13.0 - VERIFICATIONS

After the drive unit has been se-lected check the following:

a) Thermal capacity

Make sure that the thermal capacity of the gearbox is equal to or greater than the the mechanical power re-quired by the application, as per equation (4) at page 9. If this is not the case provide a supplementary cooling system (see chap. 29) or se-lect a larger gearbox.

b) Maximum torque

Make sure that neither the momentary peak torque nor the starting torque under load ever exceed the M_{2max} value that the gearbox is rated for (see figure).

13.0 - PRÜFUNGEN

Nach Wahl des Getriebemotors folgende Prüfungen ausführen:

a) Wärmeleistung

Sicherstellen, daß die in den Tabellen mit den technischen Daten angegebene Wärmelei-stung des Getriebes den glei-chen oder einen höheren Wert bezüglich der aus der Glei-chung (4) auf Seite 9 hervor-gehenden Leistung aufweist. Ist dies nicht der Fall, ein grö-ßeres Getriebe auswählen oder ein Hilfskühlsystem applizieren (siehe Kap. 29).

b) Max. Drehmoment

Überprüfen, ob das maximale Drehmoment (als augenblic-klicher Spitzendrehmoment oder als Anlaßdreh- moment unter Last verstanden) den seitens des Getriebes zulässigen Wert M_{2max} auch nicht überschreitet (siehe Grafik).

13.0 - VERIFICATIONS

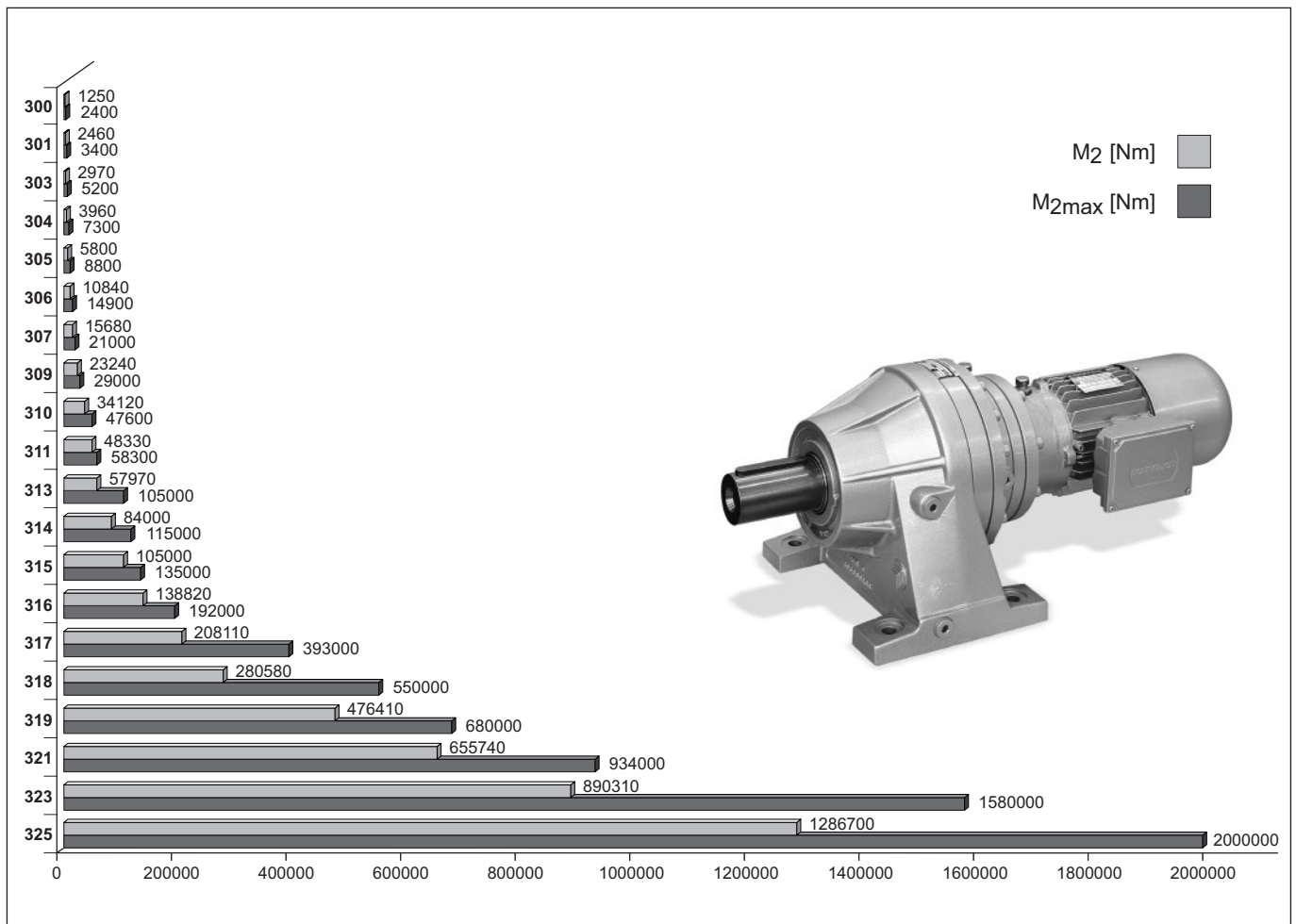
Après avoir effectué une sélec-tion, nous conseillons de procé-der aux vérifications suivantes:

a) Puissance thermique

Vérifier que la puissance thermique du réducteur ait une valeur égale ou supé-rieure à la puissance requise par l'application selon l'équa-tion (4) page 9. Dans le cas contraire, appli-quer un système de refroidis-sement auxiliaire (voir chap. 29) ou sélectionner un réduc-teur de taille supérieure.

b) Couple maximum

Vérifier que la couple maxi-mal (considéré en tant que couple de pointe de charge instantanée ou couple de démarrage en charge) ne dépasse pas la valeur de M_{2max} admise par le réduc-teur (voir graphique).



**c) Carichi radiali**

In base al tipo di applicazione definire:

- la forza radiale risultante sull'albero in entrata o in uscita, secondo la seguente formula:

c) Overhung load

Examine the application and establish:

- overhung load applying to input and/or output shaft through the following formula:

$$R_{c1-2} = \frac{2000 \times M_{r1-2} \times K_r}{d} \quad (17)$$

c) Radialkräfte

Der Applikationsart gemäß, folgendes definieren:

- auf Antriebs- und Abtriebswelle einwirkende Radialkraft, gemäß folgender Formel:

c) Charges radiales

En fonction du type d'application définir :

- la charge radiale sur l'arbre en entrée ou en sortie selon la formule suivante :

R_{c1-2} carico radiale (N)
 $_1 =$ su albero veloce
 $_2 =$ su albero lento
 M_{r1-2} Coppia all'albero (Nm)
 d Diametro primitivo (mm) dell'organo calettato sull'albero (pignone, ingranaggio, puleggia, ecc.)
 $K_r = 1$ pignone per catena
 $K_r = 1,25$ ingranaggio
 $K_r = 1,5-2,5$ puleggia per cinghia trapezoidale

R_{c1-2} overhung load (N)
 $_1 =$ for input shaft
 $_2 =$ for output shaft
 M_{r1-2} Torque at the shaft (Nm)
 d P.C.D (mm) of transmission element (sprocket, gear, pulley, etc.)
 $K_r = 1$ chain transmission
 $K_r = 1.25$ gear transmission
 $K_r = 1.5-2.5$ V-belt transmission

R_{c1-2} Radialkraft (N)
 $_1 =$ auf Antriebswelle
 $_2 =$ auf Abtriebswelle
 M_{r1-2} Drehmoment auf Welle (Nm)
 d Durchmesser (mm) des Kettenrads, des Zahnrads, der Riemenscheibe, usw.
 $K_r = 1$ Kettenrad
 $K_r = 1,25$ Zahnrad
 $K_r = 1,5-2,5$ Riemenscheibe für V Rieme

R_{c1-2} charge radiale (N)
 $_1 =$ sur l'arbre rapide
 $_2 =$ sur l'arbre lent
 M_{r1-2} Couple sur l'arbre (Nm)
 d Diamètre (mm) de la roue pour chaînes, engrenage, poulies, etc.
 $K_r = 1$ roue pour chaîne
 $K_r = 1,25$ engrenage
 $K_r = 1,5-2,5$ poulie pour courroie en V

c1) albero lento

- Definire la posizione assiale X del carico sull'albero, entrare con tale valore nel diagramma indicante il carico sopportabile dal riduttore R_{x2} e verificare sia soddisfatta la seguente relazione:

c1) output shaft

- Define the trust load position X onto shaft. Check this value with the chart indicating the load R_{x2} bearable by the gearbox. Check that the following is satisfied:

c1) Abtriebswelle

- Die Axialposition X der an der Welle anliegenden Last definieren und durch einen Vergleich dieses Werts auf dem Diagramm, welches die vom Getriebe R_{x2} tragbare Last angibt, nachprüfen, ob das folgende Verhältnis gegeben ist:

c1) arbre en sortie

- Définir la position axiale X de la charge sur l'arbre, introduire cette valeur dans le diagramme indiquant la charge supportable par le réducteur R_{x2} et vérifier que le rapport suivant est respecté:

$$R_{c2} \leq R_{x2} \times fh \quad (18)$$

- Esecuzione VK

- Determinare:
- Carico radiale R_{c2}
 - Carico assiale A_{c2}
 - Distanza x del carico R_{c2}

Leggere sul diagramma relativo al riduttore in oggetto, in corrispondenza della distanza x e del rapporto A_{n2}/R_{n2} più prossimo al valore A_{c2}/R_{c2} , il valore del carico radiale ammissibile R_{x2} .
 Deve essere verificato:

- VK output

- Determine:
- Radial load R_{c2}
 - Thrust load A_{c2}
 - Offset x of load R_{c2}

Look up the diagram relevant to the gearbox under study and identify permitted radial load R_{x2} corresponding to distance x and the ratio A_{n2}/R_{n2} nearest to value A_{c2}/R_{c2} .
 Make sure the following equation is verified:

- Ausführung VK

- Folgendes bestimmen:
- Radialkraft R_{c2}
 - Axialkraft A_{c2}
 - Position x der Krafteinwirkung R_{c2}

Am zur gewählten Größe gehörigen Diagramm, beim Wert x und dem Verhältnis A_{n2}/R_{n2} , welches A_{c2}/R_{c2} am nächsten kommt, den Wert der zulässigen Radialkraft R_{x2} ablesen.
 Es muß folgendes gegeben sein:

- Exécution VK

- Définir :
- Charge radiale R_{c2}
 - Charge axiale A_{c2}
 - Position x de la charge R_{c2}

Sur le diagramme relatif à la taille sélectionnée, repérer, en face de la valeur x et du rapport A_{n2}/R_{n2} le plus proche de la valeur A_{c2}/R_{c2} , la valeur de la charge radiale admissible R_{x2} .
 Vérifier l'existence de l'équation :

$$R_{x2} \geq R_{c2} \quad (19)$$

I valori diagrammati sono validi per:

- velocità $n_2 = 10 \text{ min}^{-1}$
- durata teorica 10000 h

Per valori di velocità in uscita n_2 , o per durate diverse, definire:

- fattore di velocità f_{n2} secondo la tabella (A7):

Values in the diagram refer to:

- $n_2 = 10 \text{ rpm}$
- 10000 hrs theoretical lifetime

For different output speed n_2 , or lifetime expectancy, consider:

- a speed factor f_{n2} as per table (A7):

Die im Diagramm dargestellten Werte sind für

- $n_2 = 10 \text{ min}^{-1}$
- 10000 Std. gültig

Für die Werte der Abtriebsdrehzahl n_2 oder abweichenden Belastungsdauern, muß folgendes definiert werden:

- Drehzahlfaktor f_{n2} gemäß

Les valeurs indiquées sur le diagramme sont valables pour:

- $n_2 = 10 \text{ min}^{-1}$
- durée 10000 h

En cas de valeurs de vitesse en sortie n_2 ou de durée différentes, définir :

- facteur de vitesse f_{n2} selon le tableau (A7) suivant :

(A7)

n_2	1	2.5	5	10	15	25	50	100
f_{n2}	2.0	1.51	1.23	1.00	0.88	0.76	0.62	0.50



- fattore di durata f_L secondo la tabella (A8).

- a lifetime factor f_L according to table (A8).

- Dauerfaktor f_L gemäß Tabelle (A8):

- facteur de durée f_L selon le tableau (A8) :

(A8)

Durata / Lifetime Dauer / Durée	2500 h	5000 h	10000 h	15000 h	25000 h	50000 h	100000 h
f_L	0.66	0.81	1.00	1.13	1.32	1.62	2.00

Deve essere verificato:

This condition must be verified:

Folgendes muß gegeben sein:

Vérifier l'existence de l'équation :

$$R_{x2} \times f_{n2} \geq R_{c2} \times f_L \quad (20)$$

c₂)albero veloce

- Definire la posizione assiale X del carico sull'albero, entrare con tale valore nel diagramma indicante il carico sopportabile dal riduttore R_{x1} e verificare sia soddisfatta la seguente relazione:

c₂)input shaft

- Define the thrust load position X onto shaft. Check this value with the chart indicating the load R_{x1} bearable by the gearbox. Check that the following is satisfied:

c₂)Antriebswelle

- Die Axialposition X der an der Welle anliegenden Last definieren und durch einen Vergleich dieses Werts auf dem Diagramm, welches die vom Getriebe R_{x1} tragbare Last angibt, nachprüfen, ob das folgende Verhältnis gegeben ist:

c₂)arbre en entrée

- Définir la position axiale X de la charge sur l'arbre, introduire cette valeur dans le diagramme indiquant la charge supportable par le réducteur R_{x1} et vérifier que le rapport suivant est respecté:

$$R_{c1} \leq R_{x1} \times fh \quad (21)$$

d) Carichi assiali

Provvedere a verificare il carico assiale, quando presente sull'albero di uscita, in maniera analoga alla verifica relativa al carico radiale. Deve essere soddisfatta la seguente relazione:

d) Thrust loads

Check the thrust load, when exerted onto the output shaft, as specified for the radial load. The following should be satisfied:

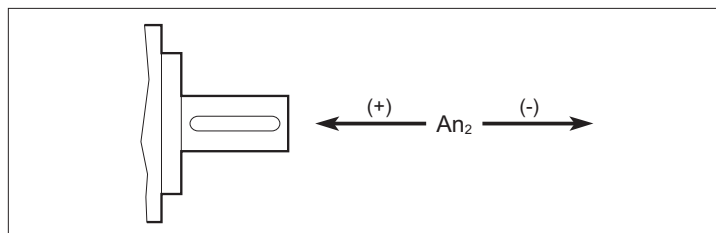
d) Axialkräfte

In einer, der im Hinblick auf die Kontrolle der Radialkräfte analogen Vorgangsweise, die Kontrolle der Axialkraft, falls an der Abtriebswelle anliegend, vornehmen. Das folgende Verhältnis muß gegeben sein:

d) Charges axiales

Vérifier la charge axiale, si existante sur l'arbre lent, parallèlement à la vérification concernant la charge radiale. La condition suivante doit être respectée :

$$\pm A_{c2} \leq \pm A_{n2} \times fh_2 \quad (22)$$



14.0 - SCELTA DEL MOTORE

14.0 - SELECTING THE MOTOR

14.0 - WAHL DES MOTOR

14.0 - CHOIX DU MOTEUR

a) Tramite la formula sotto riportata ricavare la potenza richiesta all'albero veloce del riduttore, dopo aver preventivamente determinato:
- la coppia M_{r2}
- la velocità n_2
- il rendimento η_d

a) Through the formula here after calculate the power required to gearbox input shaft. The following parameters must be determined on beforehand:
- required torque M_{r2}
- output speed n_2
- efficiency η_d

a) Da man n_2 und den dynamischen Wirkungsgrad η_d kennt, kann man aus dem Drehmoment M_{r2} nun die Antriebsleistung errechnen:

a) La formule ci-dessous permet de calculer la puissance requise sur l'arbre rapide du réducteur après avoir déterminé :
- le couple M_{r2}
- la vitesse n_2
- le rendement η_d

$$P_{r1} = \frac{M_{r2} \times n_2}{9550 \times \eta_d} \quad (23)$$

La tabella (A3) fornisce i valori di rendimento η_d indicativi relativi ai vari tipi di riduttore.

Table (A3) lists the efficiency values η_d for the various types of gearboxes.

Die Tabelle (A3) führt die Anhaltswerte des Wirkungsgrads η_d auf, die sich auf die unterschiedlichen Getriebetypen beziehen.

Le tableau (A3) indique les valeurs de rendement η_d indicatives relatives aux différents types de réducteur.



b) Nelle tabelle dati tecnici dei motori selezionare un motore caratterizzato da una potenza nominale P_n che soddisfi la condizione:

b) *In the electric motor section select a motor that is sufficiently rated, as per the following condition:*

b) In den Tabellen mit den technischen Motordaten eine Größe mit einer solchen Nennleistung wählen, welche die folgende Anforderung:

b) *Sélectionner au tableau données techniques des moteurs une taille avec puissance nominale P_n capable de satisfaire à :*

$$P_n \geq P_{r1} \quad (24)$$

Per tipi di servizio diversi da quello continuo S1 la potenza P_n può essere corretta tramite il fattore f_m fornito dalla tabella (A6).
Preferibilmente scegliere motori a 4 poli, o superiori.

For duties other than continuous S1 the motor rating can be upgraded through the factor f_m , listed in table (A6). 4-Pole motors, or lower speed motors, should be preferred.

Für Einsatzbedingungen, die von den Standardbedingungen abweichen, siehe Tabelle (A6). Sollten vorzugsweise Motoren mit 4 oder mehr Polen gewählt werden.

En cas d'utilisations différentes du service continu S1, la puissance P_n peut être corrigée à l'aide du facteur f_m fourni par le tableau (A6). Choisir de préférence des moteurs à 4 pôles, ou supérieurs.

15.0 - INSTALLAZIONE

15.0 - INSTALLATION

15.0 - INSTALLATION

15.0 - INSTALLATION

È molto importante per l'affidabilità e il buon funzionamento del riduttore rispettare alcune norme per la sua corretta installazione.

Le norme qui riportate hanno valore per una prima indicazione per la installazione del riduttore.

Per provvedere ad una effettiva e corretta installazione attenersi al Manuale di installazione uso e manutenzione dei riduttori fornibile dalla nostra Organizzazione di Vendita.

Riportiamo in breve le norme da seguire:

Observing a few rules for correct installation is essential to the reliable and proper operation of the gearbox.

The rules set out here are intended as a preliminary guide to selecting gearbox.

For effective and proper installation, follow the instructions given in the Installation, use and maintenance manual available from our Sales network.

Following is a brief outline of installation rules:

Im Hinblick auf die Zuverlässigkeit und eine gute Betriebsweise des Getriebes ist es besonders wichtig, für deren korrekten Einbau Kenntnis über einige Richtlinien zu haben. Die hier in Folge angeführten Normen sind eine erste Anleitung für die Auswahl des Getriebes.

Um eine effektive und korrekt erfolgte Installation zu erhalten, muß man sich an das Anleitungs- und Instandhaltungshandbuch der Getriebe der Serie 300 halten. Dieses Handbuch ist bei unserer Verkaufsorganisation erhältlich. Wir möchten Ihnen hier nur kurz die zu befolgenden Normen anführen:

Il est très important pour la fiabilité et le bon fonctionnement du réducteur de respecter certaines règles pour une installation correcte. Les règles indiquées n'ont qu'une valeur indicative d'orientation pour le choix du réducteur. Pour effectuer une installation définitive parfaite, respecter les consignes d'installation, utilisation et entretien des réducteurs de la série 300, qui peuvent être livrées par notre Organisation de Vente.

Voici brièvement les règles qu'il faut suivre :

a) Fissaggio:

– Appoggiare il riduttore a una struttura sufficientemente rigida, con superfici di accoppiamento piane e lavorate di macchina utensile.

– Le superfici di accoppiamento, specialmente per riduttori montati con flangia e con alberi in uscita femmina scanalati, devono risultare entro precise tolleranze geometriche (vedi manuale).

– Per alcune grandezze di riduttori, in applicazioni con elevati carichi radiali in uscita, è raccomandato il montaggio a flangia eseguito per utilizzare i doppi diametri di centraggio di cui tali riduttori sono provvisti.

– Verificare che il riduttore sia previsto per la posizione di montaggio richiesta.

– Fissare il riduttore con viti di classe 8.8, o superiore, serstrandole ai valori di coppia indicati nelle relative tabelle. Per coppie massime trasmesse maggiori od uguali al 70% della coppia M_{2max} indicata e con frequenti inversioni del moto, utilizzare

a) Fastening:

– *Place the gearbox on a surface providing adequate rigidity. Mating surfaces should be machined and flat.*

– *This applies especially to flange-mounted gearboxes with splined hollow output shafts.*

– *In applications that involve high radial loads at the output end, flange mounting is recommended for some gearboxes as this mounting pattern benefits from the double pilot diameters provided on these gearboxes.*

– *Make sure the gearbox is suitable for the required mounting position.*

– *Use bolts of grade 8.8 or greater to secure the gearbox. Tighten the bolts to the rated values specified in the relevant charts. With transmitted torque greater than or equal to 70% of the given M_{2max} , and with frequent reversals, use bolts*

a) Befestigung:

– Das Getriebe auf einer ausreichend starken Stuktur mit flachen und mittels Werkzeugmaschinen bearbeiteten Passungsflächen ablegen.

– Die Passungsflächen, besonders für die mit Flansch und Keilabtriebswellen montierten Getriebe, müssen innerhalb bestimmter geometrischer Toleranzen liegen (siehe Handbuch).

– Bei einigen Baugrößen der Getriebe, bei Applikationen mit hoher auf dem Abtrieb einwirkender Radialkraft, wird die Montageweise mit Flansch empfohlen, wodurch die doppelten Zentrierdurchmesser, mit denen die Getriebe ausgestattet sind, verwendet werden können.

– Sicherstellen, dass das Getriebe auch für die betreffende Montageposition vorgesehen ist.

– Das Getriebe mit Schrauben der Widerstandsklasse 8.8 oder einer höheren Klasse befestigen, dabei auf die in den jeweiligen Tabellen angegebenen Anzugsmomente bringen. Für zu übertragene Maximaldrehmomente, die höher als 70% des angegebenen Werts

a) Fixation:

– *Faire en sorte que le réducteur repose sur un bâti suffisamment rigide avec des surfaces d'accouplement planes et usinées à la machine-outil.*

– *Les surfaces d'accouplement, spécialement pour les réducteurs avec bride d'assemblage et arbres de sortie femelle cannelés, doivent respecter des tolérances géométriques bien précises (voir catalogue).*

– *Pour certaines tailles de réducteur, dans des applications avec des charges radiales élevées à la sortie, on préconise un montage avec bride, afin d'utiliser les doubles diamètres de centrage, dont ces réducteurs sont pourvus.*

– *Veiller à ce que le réducteur convienne à la position de montage nécessaire.*

– *Fixer le réducteur avec des vis d'un degré de résistance 8.8 ou supérieur en les serrant aux valeurs de couple de serrage indiquées sur les tableaux correspondants. Pour des couples maximaux transmis plus importants ou équivalents à 70% du couple*



viti in classe minima di resistenza 10.9.

Alcune grandezze di riduttori prevedono oltre il fissaggio con viti, anche spine. Inserire le spine di cui i riduttori sono provvisti, nella struttura sulla quale il riduttore viene installato per una lunghezza almeno pari a 1,5 volte il valore del loro diametro.

with minimum grade 10.9. Some gearboxes can be fastened using both bolts and pins. If a pin is used, the portion of the pin inserted into the structure the gearbox is being installed to should be at least 1.5 times its diameter.

M_{2max} oder diesem Prozentsatz gleich kommen und im Fall von häufigen Schaltungen sind Schrauben aus der Klasse der min. Widerstandsgrads 10.9 zu verwenden. Einige Getriebebaugrößen der Getriebe sehen ausser der Befestigung durch die Schrauben, auch Stifte vor. Dazu die Stifte, mit denen die Getriebe ausgestattet sind, über eine Länge von mindestens gleich 1,5 des Werts ihres Durchmesser, in die Stuktur einstecken, auf die das Getriebe installiert werden soll.

M_{2max} indiqué, et en cas d'inversions fréquentes du mouvement, utiliser des vis dans une classe minimale de résistance 10.9. Certaines tailles de réducteurs prévoient une fixation tant par vis que par goupilles. Introduire les goupilles, livrées avec les réducteurs, dans le bâti sur lequel le réducteur sera installé sur une longueur au moins égale à 1,5 de la valeur de leur diamètre.

b) Collegamenti

– Fissare gli organi di collegamento in entrata ed uscita al riduttore evitando di battere con martello o equivalenti. Utilizzare per l'inserimento degli organi le viti di servizio e i fori filettati presenti negli alberi. Prima di montare gli organi di collegamento avere cura di pulire gli alberi eliminando grassi o protettivi eventualmente presenti.

– Versi di rotazione. Nell'effettuare il cablaggio del motore, tenere presente che i riduttori hanno i versi di rotazione entrata/uscita, come indicato nella tabella seguente:

b) Connections

– When fitting transmission elements onto the gearbox do not tap them with hammers or similar tools. To slide these parts in, use the service screws and taps provided at the shaft ends. Be sure to clean off any grease or rust preventative from the shafts before fitting any parts.

– Direction of rotation Before wiring the motor please note the input/output shaft arrangement, as described in the diagram here after:

b) Anschlüsse

– Die Anschlußteile im An- und Abtrieb des Getriebes befestigen, dabei ist ein Einklopfen dieser unter Anwendung eines Hammers oder anderer gleichartiger Instrumente zu vermeiden. Zum Einführen der Teile die Service-schrauben und die Gewindebohrungen der Wellen verwenden. Vor der Montage der Verbindungsteile, die Wellen sorgfältig von Fett oder eventuell vorhandenen Schutzmitteln reinigen.

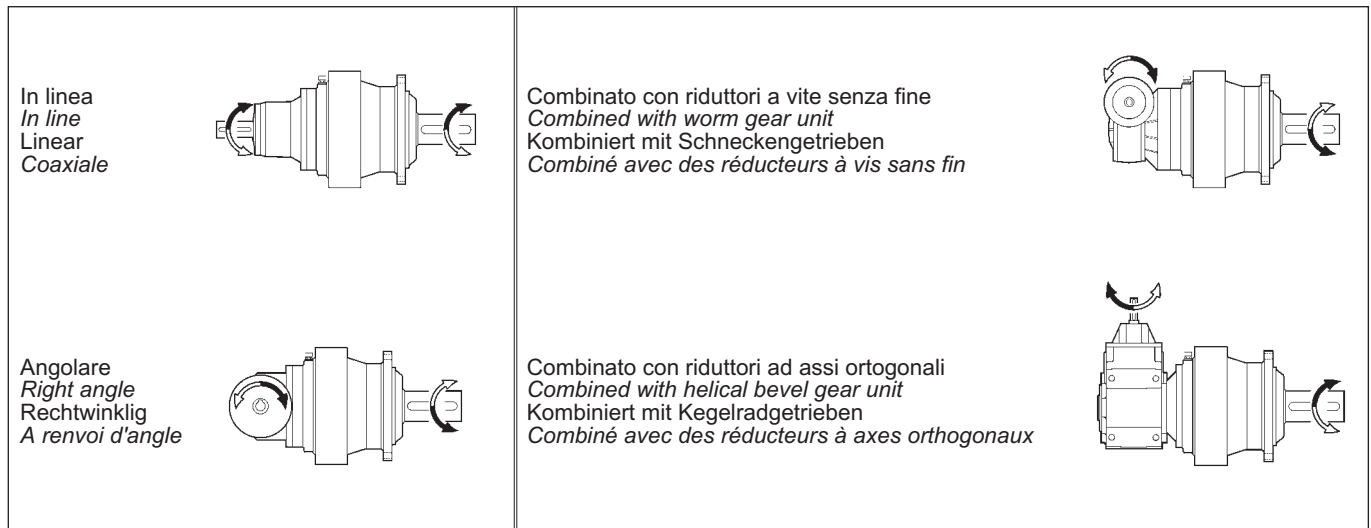
– Drehrichtungen Beim Anschluß der Motoren an den Schaltkreis in Abhängigkeit zu ihren Umdrehungsrichtungen, muß berücksichtigt werden, daß die Getriebe im An-/Abtrieb die folgenden, in der nachstehenden Tabelle aufgeführten Drehrichtungen aufweisen:

b) Raccordements

– Fixer les éléments de raccordement en entrée et en sortie du réducteur en évitant de frapper avec un marteau ou autre. Pour l'introduction des organes, utiliser les vis appropriées et les orifices filetés présents sur les arbres. Avant de monter les éléments de raccordement, nettoyer les arbres en éliminant les graisses ou produits de protection éventuellement présents.

– Sens de rotation. En ce qui concerne le raccordement des moteurs au circuit électrique, en fonction de leur sens de rotation différent, ne pas oublier que les sens de rotation entrée/sortie des réducteurs sont ceux indiqués dans le tableau suivant :

(A9)



c) Verniciatura

– Utilizzare vernici compatibili con la vernice di fondo presente sui riduttori, vedi: Condizioni di fornitura. Durante la verniciatura proteggere gli anelli di tenuta presente sugli alberi.

c) Paint coating

– Use paint compatible with the primer applied to the gearbox, see: Supply conditions. Prior to painting, tape the seal rings installed on the shafts.

c) Lackierung

– Lackarten verwenden, die mit der Grundlackierung der Getriebe kompatibel sind. Siehe Lieferbedingungen auf Seite 21. angeführten Lieferbedingungen. Während des Lackiervorgangs sind die auf der

c) Peinture

– Utiliser des peintures compatibles avec la couche de fond déjà existante sur les réducteurs, voir Conditions de livraison. En cours de peinture, protéger les bagues à lèvres des



La vernice li può fare essiccare causando perdite d'olio.

Contact with the solvent may deteriorate the seals with subsequent oil leakage.

Welle angeordneten Dichtringe in angemessener Weise zu schützen. Der Lack kann zum Austrocknen dieser Ringe führen, was letztendlich zu Ölverlusten führen würde.

arbres.
La peinture peut les sécher et des fuites d'huile peuvent en découler.

d) Lubrificazione

- Prima della messa in servizio riempire il riduttore di lubrificante (vedi: Lubrificazione) fino al raggiungimento del livello riscontrabile dall'apposito tappo di servizio di cui ogni riduttore è provvisto in funzione della posizione di montaggio specificata in fase di ordine.

d) Lubrication

- *Prior to commissioning, fill the gearbox with the recommended type and quantity of oil (see: Lubrication). The level is to be checked through the appropriate plug, or sight glass, each gearbox is provided with, and located according to the mounting position originally specified.*

d) Schmierung

- Vor der Inbetriebnahme muß das Getriebe oder der Getriebemotor solange mit dem empfohlenen Schmieröl (siehe "Schmierung" auf Seite 33) gefüllt werden, bis der vorgesehene Pegel über die Einfüllschraube oder das Schauglas, mit denen die Getriebe je nach Montagelage ausgestattet sind, erkennbar ist.

d) Lubrification

- *Avant la mise en service, remplir le réducteur avec l'huile conseillée (voir Lubrification) jusqu'au niveau prévu, vérifiable à travers le bouchon ou niveau visible équipant chaque réducteur, en fonction de la position de montage établie.*

NOTA: nei riduttori combinati la lubrificazione degli stadi epicycloidali è separata da quella dei riduttori a vite senza fine (serie 3/V), o ortogonali (serie 3/A). I riduttori forniti con lubrificazione permanente ad olio sintetico (vedi tab. A26-A27) non necessitano delle operazioni sopra descritte.

NOTE: Combined gearboxes feature separate lubrication for planetary stages and for worm gears (series 3/V) or bevel helical units (series 3/A). The operations described above are not to be performed with life-lubed gearboxes, that are factory filled with synthetic oil (see tab. A26-A27)

MERKE: Bei den kombinierten Getrieben ist die Schmierung der Planetenstufen von denen der Schneckengetriebe (3/V) oder Kegeldradgetriebe (3/A) getrennt. Bei den mit Dauerschmierung mit Synthetiköl (siehe Tabelle A26-A27) gelieferten Getriebe sind die zuvor genannten Arbeiten nicht erforderlich.

REMARQUE : Sur les réducteurs combinés, la lubrification des étages épicycloïdaux est séparée de celle des réducteurs à vis sans fin (3/V) ou orthogonaux (3/A). Sur les réducteurs fournis avec lubrification permanente avec de l'huile synthétique (voir tab. A26-A27), il n'est pas nécessaire d'effectuer les opérations décrites ci-dessus.

16.0 - MANUTENZIONE

Controllare il serraggio dei bulloni dopo 50 ore di lavoro. Effettuare il primo cambio olio circa dopo 100-150 ore di lavoro; successivamente effettuare il cambio ogni 2000 3000 ore, a seconda degli impieghi, o almeno una volta all'anno. Sono esclusi i riduttori dotati di lubrificazione permanente. È buona norma comunque controllare il livello una volta al mese per funzionamento intermittente, o più frequentemente, per funzionamento in continuo, e aggiungere olio se necessario.

16.0 - MAINTENANCE

Check the tightness of mounting bolts after the initial 50 hours of operation. Change the oil first after 100-150 hours operation. Subsequently, change the oil every 2000 - 3000 hours operation, depending on the application. Alternatively change oil once a year. However, oil level should be checked at regular intervals and topped up as required. Check monthly if unit operates under intermittent duty, more frequently if duty is continuous.

16.0 - WARTUNG

Schrauben nach 50 Betriebsstunden auf festen Sitz prüfen. Ersten Ölwechsel nach zirka 100-150 Betriebsstunden durchführen. Anschließend alle 2000 - 3000 oder mindestens einmal jährlich einen Ölwechsel durchführen (je nach Einsatzbereich). Hiervon ausgeschlossen sind die Getriebe mit Dauerschmierung. Es sollte jedoch bei Aussetzbetrieb einmal monatlich und bei Dauerbetrieb häufiger der Ölstand kontrolliert werden. Falls notwendig, Öl nachfüllen.

16.0 - ENTRETIEN

Contrôler le serrage des vis et boulons, après 50 heures de travail. Effectuer la première vidange du lubrifiant, après 100 à 150 heures de travail. Ultérieurement, effectuer une vidange toutes les 2000 à 3000 heures, selon les applications, ou au minimum une fois par an. Les réducteurs avec lubrification permanente sont exclus. Toutefois, il est conseillé de contrôler le niveau d'huile une fois par mois, en cas de fonctionnement intermittent, plus souvent en cas de service continu, et de faire l'appoint si nécessaire.

17.0 - STOCCAGGIO

Il corretto stoccaggio dei prodotti richiede l'esecuzione delle seguenti attività:

- Escludere aree all'aperto, zone esposte alle intemperie o con eccessiva umidità.
- Interporre sempre tra il pavimento ed i prodotti, pianali lignei o di altra natura, atti ad impedire il diretto contatto col suolo.
- Per periodi di stoccaggio superiori ai 60 giorni, le superfici interessate agli accoppiamenti quali flangie, alberi e giunti, devono essere protette con idoneo prodotto an-

17.0 - STORAGE

Observe the following instructions to ensure correct storage of the products:

- Do not store outdoors, in areas exposed to weather or with excessive humidity.*
- Always place boards, wood, or other material between the products and the floor. The gearbox should not have direct contact with the floor.*
- For storage periods of over 60 days, all machined surfaces such as flanges, shafts and couplings must be protected with a suitable anti-oxidation product (Mobi-*

17.0 - LAGERUNG

Die korrekte Lagerung der Antriebe erfordert folgende Vorkehrungen:

- Die Produkte nicht im Freien lagern und nicht in Räumen, die der Witterung ausgesetzt sind, oder eine hohe Feuchtigkeit aufweisen.
- Die Produkte nie direkt auf dem Boden, sondern auf Unterlagen aus Holz oder einem anderen Material lagern.
- Bei Lagerzeiten von mehr als 60 Tagen die Oberflächen für die Verbindung, wie Flansche, Wellen oder Kupplungen mit einem geeigneten Oxidationsschutz-

17.0 - STOCKAGE

Un stockage correct des produits reçus nécessite de respecter les règles suivantes :

- Exclure les zones à ciel ouvert, les zones exposées aux intempéries ou avec humidité excessive.*
- Interposer dans tous les cas entre le plancher et les produits des planches de bois ou des supports d'autre nature empêchant le contact direct avec le sol.*
- Pour les périodes de stockage supérieures à 60 jours, les surfaces concernées par les liaisons telles que les brides, les arbres et les accouplements doivent être protégés.*



tiossidante (Mobilarma 248 od equivalente).

larma 248 or equivalent product).

mittel behandeln (Mobilarma 248 oder ein äquivalentes Mittel).

gées avec un produit antioxydant spécial (Mobilarma 248 ou équivalent).

d) Per periodi di stoccaggio previsti superiori ai 6 mesi, i prodotti devono essere oggetto delle seguenti attività:

d) *When units are expected to be in storage for more than 6 months, the following extra measures are required:*

d) Bei Lagerzeiten von mehr als 6 Monaten müssen folgende Vorkehrungen getroffen werden:

d) *Pour les périodes de stockage prévues supérieures à 6 mois, les produits doivent faire l'objet des contrôles suivants :*

- Ricoprire tutte le parti lavorate esterne con grasso atto ad evitare ossidazioni.
- Posizionare i riduttori con il tappo di sfiato nella posizione più alta e riempirli di olio, ad eccezione di quelli dotati in fabbrica di lubrificazione permanente. I riduttori, prima del loro utilizzo, dovranno essere ripristinati con la corretta quantità e tipo di lubrificante previsto (vedi tab. A24-A27).

- *Smear all machined parts with grease to prevent oxidation.*
- *Place the gearbox so that the breather plug is uppermost and fill it with oil (this does not apply to life-lubricated gearboxes). Before the gearbox is put into operation, the appropriate type and quantity of oil should be restored (tab. A24-A27).*

- Die bearbeiteten Außenteile und die Passflächen mit Oxidationsschutzfett abdecken.
- Die Getriebe mit der Entlüftungsschraube in der obersten Position ausgerichtet aufstellen und, die mit Dauerschmierung ausgestatteten Getriebe ausgenommen, mit Öl füllen. Die Getriebe müssen vor ihrem Einsatz mit der richtigen Menge des vorgesehenen Schmiermittels aufgefüllt werden (Tab. A24-A27).

- *Recouvrir les parties extérieures usinées avec de la graisse contre l'oxydation.*
- *Positionner les réducteurs avec le bouchon reniflard le plus haut possible et les remplir d'huile, à l'exception de ceux à lubrification permanente. Avant utilisation, les réducteurs doivent être remplis de la quantité et du type de lubrifiant préconisés (tab. A24-A27).*

18.0 - CONDIZIONI DI FORNITURA

18.0 - SUPPLY CONDITIONS

18.0 - LIEFERBEDINGUNGEN

18.0 - CONDITIONS DE LIVRAISON

I riduttori vengono forniti come segue:

Gearboxes are generally supplied as follows:

Die Getriebe werden folgendermaßen geliefert:

Les réducteurs sont livrés comme suit :

a) predisposti per l'installazione nella posizione di montaggio specificata nell'ordinativo;

a) *arranged for installation in the mounting position specified in the purchase order;*

a) bereits für die Installation in der Einbaulage gemäß Auftrag bereit.

a) *déjà adaptés pour l'installation dans la position d'assemblage définie en cours de commande;*

b) senza olio lubrificante ed internamente protetti con un film d'olio usato per il collaudo finale (tipo SHELL ENSIS OIL N);

b) *Unlubricated. Inner parts are protected by a film of the oil used for testing purpose (type SHELL ENSIS OIL N);*

b) ohne Schmieröl und innen mit einem Öl, das für die Endabnahmeprüfung verwendet wurde, überzogen (Typ SHELL ENSIS OIL N).

b) *sans huile et protégés à l'intérieur avec un film d'huile utilisée lors de l'essai final (type SHELL ENSIS OIL N);*

c) verniciati con vernice di fondo antiossidante all'acqua di colore grigio (tipo Idrayon Primer Ral 7042/C441). Le superfici di accoppiamento non sono verniciate. La verniciatura finale è a cura del cliente;

c) *primer coated with grey anti-oxidant water-based primer type Idrayon Primer-Ral 7042/C441. Mounting surfaces are not paint coated. Finish coating is to be applied by the Customer;*

c) mit einer grauen, vor Oxidation durch Wasser schützenden Grundlackierung überzogen (Typ Idrayon Primer Ral 7042/C441). Die Verbindungsflächen sind nicht lackiert. Die Endlackierung geht zu Lasten des Kunden.

c) *peints avec une couche de fond de protection antioxydant à l'eau, de coloris gris (type idrayon Primer-Ral 7042/C441). Les surfaces d'accouplement ne sont pas peintes. La peinture de finition doit être réalisée par le client ;*

d) collaudati secondo specifiche interne;

d) *tested to factory specifications;*

d) gemäß werksinterner Spezifikationen geprüft.

d) *essayés d'après les spécifications internes ;*

e) appositamente imballati;

e) *suitably packed;*

e) in angemessener Weise verpackt.

e) *dûment emballés ;*

f) provvisti di dadi e bulloni per montaggio motori elettrici versione IEC;

f) *complete with mounting hardware for IEC electric motors;*

f) mit Muttern und Schrauben für die Montage an Elektromotoren der Version IEC;

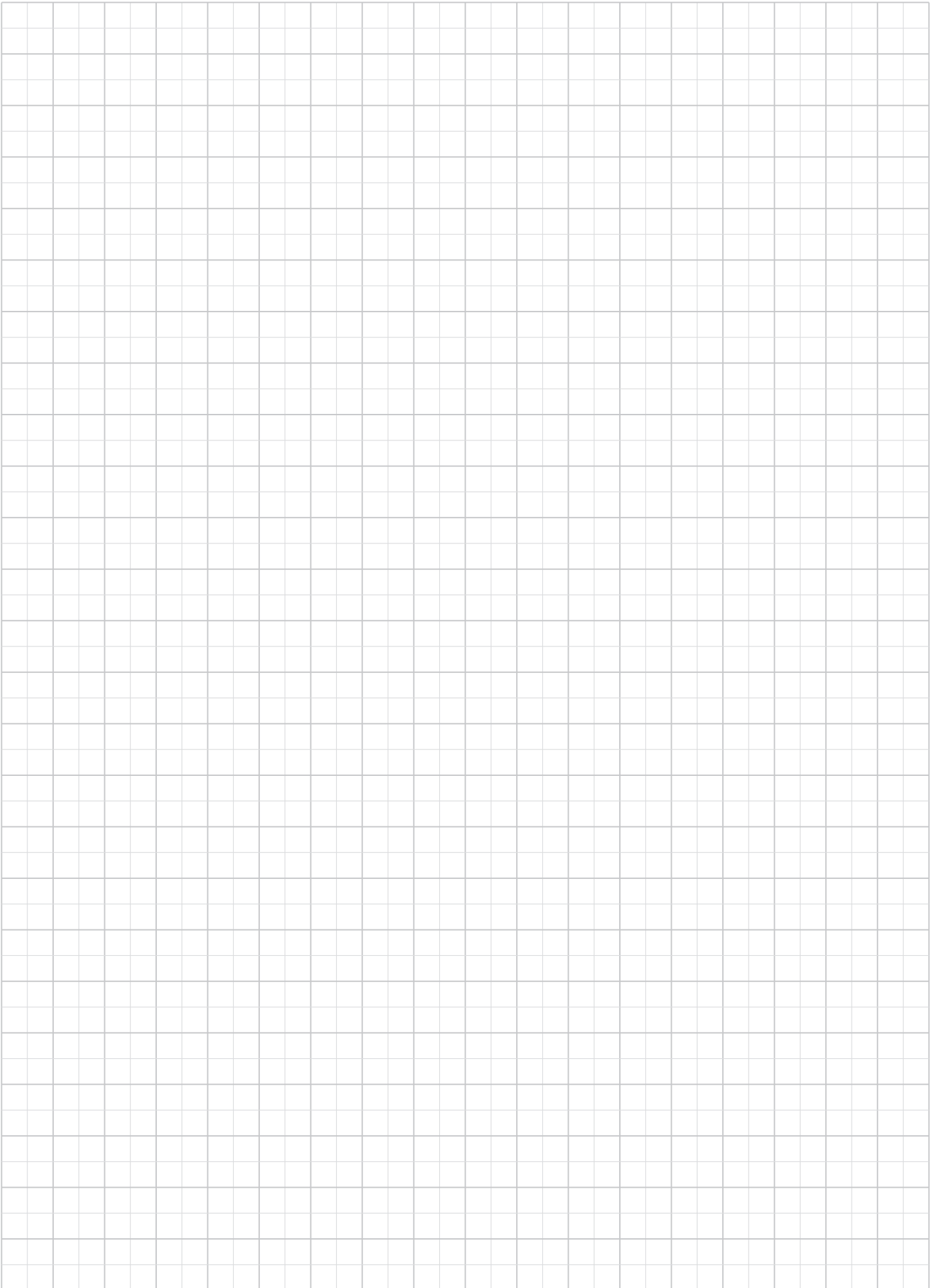
f) *pourvus d'écrous et de boulons pour l'assemblage aux moteurs électriques, version CEI ;*

g) dotati di carica di lubrificante per i tipi a lubrificazione permanente.

g) *gearboxes lubricated "for life" are factory filled with oil.*

g) die mit Dauerschmierung, bereits mit Schmiermittel ausgestattet.

g) *déjà pourvus de lubrifiant pour ceux à lubrification permanente.*





19.0 - DESIGNAZIONE
RIDUTTORE 300

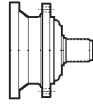
19.0 - 300 GEARBOX
DESIGNATION

19.0 - 300 GETRIEBE-
BEZEICHNUNG

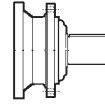
19.0 - DESIGNATION
REDUCTEUR 300

3 11 L 2 16.7 HZ

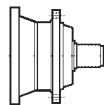
VERSIONE USCITA / OUTPUT VERSION / AUSGANGSVERSION / VERSION EN SORTIE



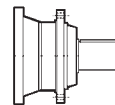
MZ: Albero maschio scanalato
Splined male shaft
Vielkeilwelle
Arbre de sortie cannelé



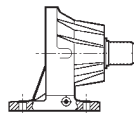
MC: Albero maschio cilindrico
Solid keyed shaft
Zylindrisches Welle
Arbre de sortie cyl. claveté



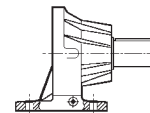
HZ: Albero maschio rinforzato scanalato
Heavy duty splined male shaft
Vielkeilwelle mit Verstärker
Lagerung
Arbres de sortie cannelé, paliers renforcés



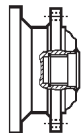
HC: Albero maschio rinforzato cilindrico
Heavy duty solid keyed shaft
Zylindrisches Welle mit Verstärker Lagerung
Arbre de sortie cyl. claveté, paliers renforcés



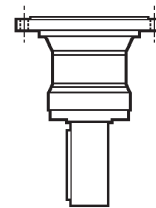
PZ: Uscita con albero scanalato e piedi di supporto
Foot base with splined shaft
Fußausführung mit Keilwelle
Base de support avec arbre mâle cannelé



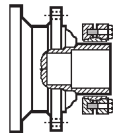
PC: Uscita con albero cilindrico e piedi di supporto
Foot base with solid keyed shaft
Fußausführung mit zylindrischer Welle
Base support à pattes avec arbre cyl. claveté



FZ / FZB:
Albero femmina scanalato
Hollow splined shaft
Vielkeilhohlwelle
Arbre de sortie creux cannelé



VK: Albero cilindrico rinforzato per agitatori e mescolatori
Reinforced output with heavy duty keyed shaft for stirrers and mixer
Verstärkter Abtrieb mit zylindrischer Welle für Rührwerke und Mischer
Sortie renforcée avec arbre cylindrique pour agitateurs et mélangeurs



FP: Albero femmina per giunto d'attrito
Hollow shaft for shrink disc
Zylindrische Hohlwelle für Schumpfscheibe
Arbre de sortie creux pour montage par frette

RAPPORTO DI RIDUZIONE / GEAR RATIO / ÜBERSETZUNG / RAPPORT DE REDUCTION

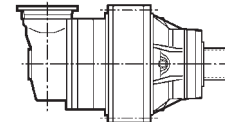
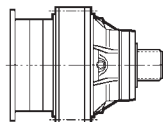
Indicare il valore del rapporto (compresi punto e decimali) riportato su pagine dati tecnici
Fill in the value of the transm. ratio (including point and decimals) reported in the selection charts
Den auf den Seiten der technischen Daten angegebenen Wert des Übersetzungs (einschließlich Punkt und Dezimalen) angeben
Indiquer la valeur du rapport (y inclus les chiffres décimaux) citée aux pages des données techniques
Es. / Ex. / Beispiel / Ex. : 1/5.33 = 5.33 1/44.6 = 44.6 1/131 = 131

NUMERO STADI DI RIDUZIONE / REDUCTIONS
ANZAHL DER GETRIEBESTUFEN / N. ETAGES DE REDUCTION TOTAUX
1, 2, 3, 4

ESECUZIONE / DESIGN / AUSFÜHRUNG / EXECUTION

L = Lineare / *In line* / Linear / *Coaxiale*

R = Angolare / *Right angle* / Rechtwinklig / *A renvoi d'angle*



GRANDEZZA RIDUTTORE / GEARBOX FRAME SIZE / GETRIEBEBAUGRÖSSE / TAILLE REDUCTEUR

00 = 300	214	05 = 305	250	10 = 310	290	15 = 315	330	19 = 319	364
01 = 301	222	06 = 306	260	11 = 311	300	16 = 316	340	21 = 321	372
03 = 303	230	07 = 307	270	13 = 313	310	17 = 317	348	23 = 323	380
04 = 304	240	09 = 309	280	14 = 314	320	18 = 318	356	25 = 325	384

SERIE / SERIES / SERIE / SERIE



P180 A W0A

OPZIONI / OPTIONS / OPTIONEN / OPTIONS

GUARNIZIONI / GASKET / DICHTUNGEN / MATIERE ETANCHE

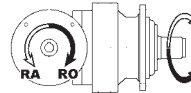
STANDARD = NBR

PV = VITON®

SOLO PER ESECUZIONE ANGOLARE / ONLY FOR RIGHT ANGLE DESIGN
 NUR FÜR WINKELAUSFÜHRUNGEN / UNIQUEMENT EN CASE D'EXECUTION D'ANGLE
 senso di rotazione in ingresso preferenziale / preferential input direction of rotation
 bevorzugte umdrehungsrichtung am antrieb / sense de rotation de preference en entrée

RA = Sinistro / Left / Links / Gauche

RO = Destro / Right / Rechts / Droit



CENTRALINA AUSILIARE DI RAFFREDDAMENTO
 SUPPLEMENTARY COOLING SYSTEM
 HILFSKÜHLSYSTEM
 UNITE DE REFROIDISSEMENT AUXILIAIRE
CR1, CR2, CR3



ACCESSORI IN USCITA / OUTPUT FITTINGS / ZUBEHÖR (ABTRIEB) / ACCESSOIRES COTE SORTIE



P... = Pignoni
 Pinions
 Ritzel
 Pignons



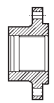
B0A = Barra scanalata
 Splined bar
 Vielkeilvollwelle
 Barre cannelée



M0A = Manicotto liscio
 Sleeve coupling
 Nabe
 Manchon lisse



G0A = Giunto ad attrito
 Shrink disc
 Schrumpfscheibe
 Frette de serrage



W0A = Flangia
 Flange
 Flansch
 Bride

POSIZIONE DI MONTAGGIO / MOUNTING POSITION EINBAULAGEN / POSITION DE MONTAGE



ENTRATA / INPUT / EINGANG / ENTREE



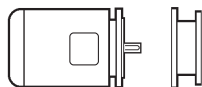
Albero veloce
 Input keyed shaft
 Eingangswelle
 Arbre d'entrée cyl. claveté

	V01A	V01B	V05B	V06B	V07A	V07B	V10B	V11B	V15B
diam.	Ø24	Ø38	Ø48	Ø60	Ø60	Ø80	Ø80	Ø80	Ø120



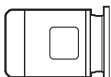
Albero veloce con ventola
 Solid input shaft with fan
 Lüfter gekühlte Eingangswelle
 Arbre rapide équipé de ventilateur

	FV05B	FV06B	FV07A	FV07B	FV10B	FV11B
diam.	Ø48	Ø60	Ø60	Ø80	Ø80	Ø80



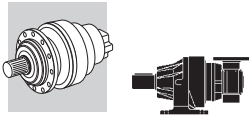
Predisposizione motore elettrico
 Electric motor adapter input
 Motoranbauteile für IEC-Motor
 Adaptation pour moteur électrique

P+IEC (P71...P250)



Motoriduttore integrato completo di motore elettrico compatto
 (disponibile fino alla grandezza 307)
 Integrated gearmotor with in-built compact electric motor
 (available up to size 307)
 Integrierter Getriebemotor komplett mit kompakten Elektromotor
 (bis zur Baugröße 307 verfügbar)
 Motoréducteur intégré avec moteur électrique compact
 (Disponible jusqu'à la taille 307)

S2, S3, S4



19.0 - DESIGNAZIONE
RIDUTTORE 3/V

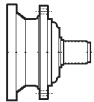
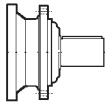
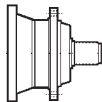
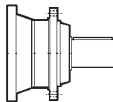
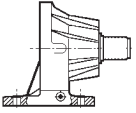
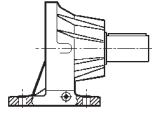
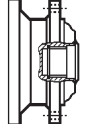
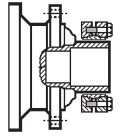
19.0 - 3/V GEARBOX
DESIGNATION

19.0 - 3/V GETRIEBE-
BEZEICHNUNG

19.0 - DESIGNATION
REDUCTEUR 3/V

3/V 05 L 3 623 PC

VERSIONE USCITA / OUTPUT VERSION / AUSGANGSVERSION / VERSION EN SORTIE

	MZ: Albero maschio scanalato <i>Splined male shaft</i> Vielkeilwelle <i>Arbre de sortie cannelé</i>		MC: Albero maschio cilindrico <i>Solid keyed shaft</i> Zylindrisches Welle <i>Arbre de sortie cyl. claveté</i>
	HZ: Albero maschio rinforzato scanalato <i>Heavy duty splined male shaft</i> Vielkeilwelle mit Verstärker Lagerung <i>Arbres de sortie cannelé, paliers renforcés</i>		HC: Albero maschio rinforzato cilindrico <i>Heavy duty solid keyed shaft</i> Zylindrisches Welle mit Verstärker Lagerung <i>Arbre de sortie cyl. claveté, paliers renforcés</i>
	PZ: Uscita con albero scanalato e piedi di supporto <i>Foot base with splined shaft</i> Fußausführung mit Keilwelle <i>Base de support avec arbre mâle cannelé</i>		PC: Uscita con albero cilindrico e piedi di supporto <i>Foot base with solid keyed shaft</i> Fußausführung mit zylindrischer Welle <i>Base support à pattes avec arbre cyl. clavété</i>
	FZ / FZB: Albero femmina scanalato <i>Hollow splined shaft</i> Vielkeilhohlwelle <i>Arbre de sortie creux cannelé</i>		
	FP: Albero femmina per giunto d'attrito <i>Hollow shaft for shrink disc</i> Zylindrische Hohlwelle für Schumpfscheibe <i>Arbre de sortie creux pour montage par frette</i>		

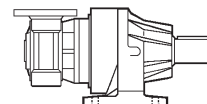
RAPPORTO DI RIDUZIONE / GEAR RATIO / ÜBERSETZUNG / RAPPORT DE REDUCTION

Indicare il valore del rapporto riportato su pagine dati tecnici
Fill in the value of the transm. ratio reported in the selection charts
Den auf den Seiten der technischen Daten angegebenen Wert des Übersetzuns angeben
Indiquer la valeur du rapport citée aux pages des données techniques
Es. / Ex. / Beispiel / Ex. : 1/773 = 773

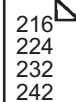
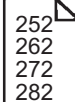
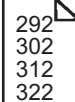
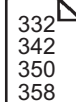

NUMERO STADI DI RIDUZIONE / REDUCTIONS
ANZAHL DER GETRIEBESTUFEN / N. ETAGES DE REDUCTION TOTAUX
3, 4

ESECUZIONE / DESIGN / AUSFÜHRUNG / EXECUTION

L = Combinato serie 300, 2 o 3 stadi epicicloidali + vite senza fine
Combined 300 unit, 2 or 3 planetary stages + worm gear units
Kombinierte Version aus Serie 300, 2 oder 3 Planetenstufen + Schneckengetriebe
Combiné série 300, 2 ou 3 étages épicycloïdaux + réducteur à vis sans fin

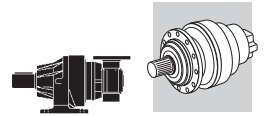


GRANDEZZA RIDUTTORE / GEARBOX FRAME SIZE / GETRIEBEBEAUGRÖSSE / TAILLE REDUCTEUR

00 = 3/V 00	 216	05 = 3/V 05	 252	10 = 3/V 10	 292	15 = 3/V 15	 332	19 = 3/V 19	 366
01 = 3/V 01	224	06 = 3/V 06	262	11 = 3/V 11	302	16 = 3/V 16	342	21 = 3/V 21	374
03 = 3/V 03	232	07 = 3/V 07	272	13 = 3/V 13	312	17 = 3/V 17	350		
04 = 3/V 04	242	09 = 3/V 09	282	14 = 3/V 14	322	18 = 3/V 18	358		

SERIE / SERIES / SERIE / SERIE

Riduttori combinati serie 300 / riduttori a vite senza fine
Combined 300 gearboxes / Worm gear units
Kombinierte Getriebe aus Serie 300 / Schneckengetriebe
Réducteurs combinés série 300 / réducteur à vis sans fin



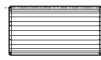
P80 B5 AF W0A ...

OPZIONI / *OPTIONS* / OPTIONEN / *OPTIONS*
 GUARNIZIONI / *GASKET* / DICHTUNGEN / *MATIERE ETANCHE*
 STANDARD = NBR
 PV = VITON®

ACCESSORI IN USCITA / *OUTPUT FITTINGS* ZUBEHÖR (ABTRIEB) / *ACCESSOIRES COTE SORTIE*



P... = Pignoni
Pinions
 Ritzel
Pignons



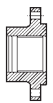
B0A = Barra scanalata
Splined bar
 Vielkeilvollwelle
Barre cannelée



M0A = Manicotto liscio
Sleeve coupling
 Nabe
Manchon lisse



G0A = Giunto ad attrito
Shrink disc
 Schrumpfscheibe
Frette de serrage



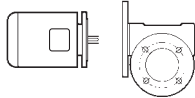
W0A = Flangia
Flange
 Flansch
Bride

POSIZIONE DI MONTAGGIO / *MOUNTING POSITION*
 EINBAULAGEN / *POSITION DE MONTAGE*



FORMA COSTRUTTIVA / *MOTOR EXECUTION* / BAUFORM / *FORM DE CONSTRUCTION*
B5, B14

ENTRATA / *INPUT* / EINGANG / *ENTREE*



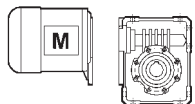
Predisposizione motore elettrico
Electric motor connection
 Motoranbauteile für IEC-Motor
Adaptation pour moteur électrique

P+IEC (P63...P180)

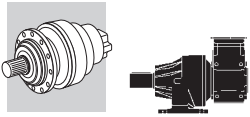


Albero veloce
Input keyed shaft
 Eingangswelle
Arbre d'entrée cyl. claveté

HS



S1, S2, S3



19.0 - DESIGNAZIONE
RIDUTTORE 3/A

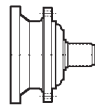
19.0 - 3/A GEARBOX
DESIGNATION

19.0 - 3/A GETRIEBE-
BEZEICHNUNG

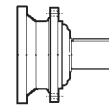
19.0 - DESIGNATION
REDUCTEUR 3/A

3/A 06 L 2 69.9 PC

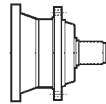
VERSIONE USCITA / OUTPUT VERSION / AUSGANGSVERSION / VERSION EN SORTIE



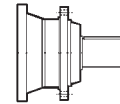
MZ: Albero maschio scanalato
Splined male shaft
Vielkeilwelle
Arbre de sortie cannelé sortant



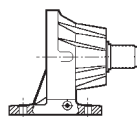
MC: Albero maschio cilindrico
Solid keyed shaft
Zylindrisches Welle
Arbre de sortie cyl. Claveté sortant



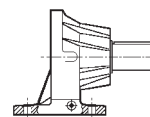
HZ: Albero maschio rinforzato scanalato
Heavy duty splined male shaft
Vielkeilwelle mit Verstärker Lagerung
Arbres de sortie cannelé sortant, paliers renforcés



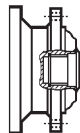
HC: Albero maschio rinforzato cilindrico
Heavy duty solid keyed shaft
Zylindrisches Welle mit Verstärker Lagerung
Arbre de sortie cyl. claveté sortant, paliers renforcés



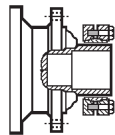
PZ: Base di supporto con albero maschio scanalato
Foot mounted with splined shaft
Fußausführung mit Keilwelle
Base de support avec arbre mâle cannelé



PC: Base di supporto con albero cilindrico
Foot mounted with solid keyed shaft
Fußausführung mit zylindrischer Welle
Base support à pattes avec arbre cyl. clavé



FZ: Albero femmina scanalato
Hollow splined shaft
Vielkeilhohlwelle
Arbre de sortie creux cannelé



FP: Albero femmina per giunto ad attrito
Hollow shaft for shrink disc
Zylindrische Hohlwelle für Schumpfscheibe
Arbre de sortie creux pour montage par frette

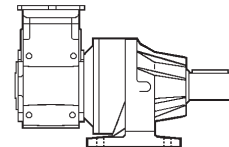
RAPPORTO DI RIDUZIONE / GEAR RATIO / ÜBERSETZUNG / RAPPORT DE REDUCTION

Indicare il valore del rapporto (compresi punto e decimali) riportato su pagine dati tecnici
Fill in the value of the transm. ratio (including point and decimals) reported in the selection charts
Den auf den Seiten der technischen Daten angegebenen Wert des Übersetzungs (einschließlich Punkt und Dezimalen) angeben
Indiquer la valeur du rapport (y inclus les chiffres décimaux) citée aux pages des données techniques
Es. / Ex. / Beispiel / Ex. : 1/19.4 = 19.4 1/175 = 175

NUMERO UNITÀ DI RIDUZIONE / TOTAL REDUCTION UNITS
ÜBERSETZUNGSSTUFEN INSGESAMT / N. ETAGES DE REDUCTION TOTAUX
2

ESECUZIONE / DESIGN / AUSFÜHRUNG / EXECUTION

L = Combinato serie 300, 1 stadio epicicloidale + riduttore ad assi ortogonali serie A
Combined 300 unit, 1 planetary stages + A helical bevel units
Kombinierte Version aus Serie 300, 1 Planetenstufe + Kegelradgetriebe der Serie A
Combiné série 300, 1 étage épicycloïdaux + réducteur à axes orthogonaux série A

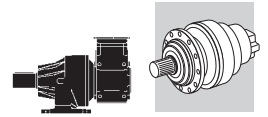


GRANDEZZA RIDUTTORE / GEARBOX SIZE / GETRIEBEBEAUGRÖSSE / TAILLE REDUCTEUR

00 = 3/A 00 (300+A10)	217	05 = 3/A 05 (305+A41)	253
01 = 3/A 01 (301+A20)	225	06 = 3/A 06 (306+A50)	263
03 = 3/A 03 (303+A30)	233	07 = 3/A 07 (307+A60)	273
04 = 3/A 04 (304+A41)	243		

SERIE / SERIES / SERIE / SERIE

Riduttori combinati serie 300 / riduttori ad assi ortogonali serie A
Combined 300 gearboxes / A series helical bevel gear units
Kombinierte Getriebe aus Serie 300 / Kegelradgetriebe der Serie A
Réducteurs combinés série 300 / réducteur à axes orthogonaux série A



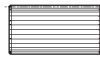
S4 EF WOA ...

OPZIONI / *OPTIONS* / OPTIONEN / *OPTIONS*
 GUARNIZIONI / *GASKET* / DICHTUNGEN / *MATIERE ETANCHE*
 STANDARD = NBR
 PV = VITON®

ACCESSORI IN USCITA / *OUTPUT FITTINGS* / ZUBEHÖR (ABTRIEB) / *ACCESSOIRES COTE SORTIE*



P... = Pignoni
Pinions
 Ritzel
Pignons



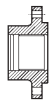
B0A = Barra scanalata
Splined bar
 Vielkeilvollwelle
Barre cannelée



M0A = Manicotto liscio
Sleeve coupling
 Nabe
Manchon lisse



G0A = Giunto ad attrito
Shrink disc
 Schrumpfscheibe
Frette de serrage

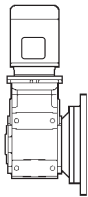


WOA = Flangia
Flange
 Flansch
Bride

POSIZIONE DI MONTAGGIO / *MOUNTING POSITION*
 EINBAULAGEN / *POSITION DE MONTAGE*

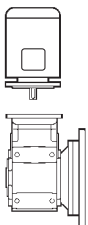
34

ENTRATA / *INPUT* / EINGANG / *ENTREE*



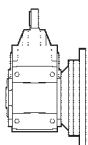
Motoriduttore integrato completo di motore elettrico compatto
Integrated gearmotor with in-built compact electric motor
 Integrierter Getriebemotor komplett mit kompakten Elektromotor
Motoréducteur intégré avec moteur électrique compact

S2, S3, S4



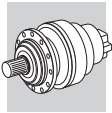
Predisposizione motore elettrico
Electric motor connection
 Motoranbauteile für IEC-Motor
Adaptation pour moteur électrique

P+IEC (P63...P180)



Albero veloce
Input keyed shaft
 Eingangswelle
Arbre d'entrée cyl. claveté

HS



19.1 - Designazione motore

19.1 - Motor designation

19.1 - Motor Bezeichnung

19.1 - Designation moteur

MOTORE / MOTOR / MOTOR / MOTEUR

FRENO / BRAKE / BREMSE / FREIN

M 1LA 4 230/400-50 IP54 CLF ... W

FD 7.5 R SB 220 SA ...

OPZIONI
OPTIONS
OPTIONEN
OPTIONS

ALIMENTAZ. FRENO
BRAKE SUPPLY
BREMSVERSORGUNG
ALIMENTATION FREIN

TIPO ALIMENTATORE
RECTIFIER TYPE
GLEICHRICHTERTYP
TYPE ALIMENTATEUR
NB, SB, NBR, SBR

LEVA DI SBLOCCO FRENO
BRAKE HAND RELEASE
BRESENTHANDLÜFTUNG
LEVIER DE DEBLOCAGE FREIN
R, RM

COPPIA FRENANTE / BRAKE TORQUE
BREMSMOMENT/ COUPLE FREIN

TIPO FRENO / BRAKE TYPE
BRESENTYP / TYPE DE FREIN

FD (freno c.c./ d.c. brake / G.S. Bremse / frein c.c.)
FA, BA (freno c.a./ a.c. brake / W.S. Bremse / frein c.a.)

POSIZIONE MORSETTIERA / TERMINAL BOX POSITION
KLEMMENKASTENLAGE / POSITION BOITE A BORNE
W (default), N, E, S

FORMA COSTRUTTIVA / MOTOR MOUNTING
BAUFORM / FORM DE CONSTRUCTION

— (motore integrato / compact motor / kompaktes Motor / moteur compact)
B5 (motore IEC / IEC -motor / IEC Motor / moteur CEI)

CLASSE ISOLAMENTO / INSULATION CLASS
ISOLIERUNGSKLASSE / CLASSE ISOLATION

CL F standard
CL H option

GRADO DI PROTEZIONE / DEGREE OF PROTECTION
SCHUTZART / DEGRE DE PROTECTION

IP55 standard (IP54 - autofrenante / brake motor / Bremssmotor / moteur frein)

TENSIONE - FREQUENZA / VOLTAGE - FREQUENCY
SPANNUNG - FREQUENZ / TENSION - FREQUENCE

NUMERO DI POLI / POLE NUMBER / POLZAHL / N.bre POLES
4, 6, 2/4, 2/6, 2/8, 2/12

GRANDEZZA MOTORE / MOTOR SIZE / MOTOR-BAUGRÖSSE / TAILLE MOTEUR

1SD - 5LA (motore integrato / compact motor / kompaktes Motor / moteur compact)
63A - 250M (motore IEC / IEC motor / IEC - motor / moteur CEI)

TIPO MOTORE/ MOTOR TYPE / MOTORTYP / TYPE MOTEUR

M = trifase integrato / compact 3-phase / kompaktes Dreiphasen / 3 phasé compact
BN = trifase IEC / IEC 3-phase / IEC Dreiphasen / 3 phasé CEI



20.0 - POSIZIONE DI MONTAGGIO

Per la completa definizione della configurazione del riduttore, è necessario specificare la posizione di montaggio rispetto al suolo. Riferirsi per questo alla tabella (A10) per i riduttori in linea e alla (A11) per i riduttori con riduzione angolare.

20.0 - MOUNTING POSITION

The product designation is only complete when the mounting position is also specified. Please refer to table (A10) for in-line gear units and to (A11) for right angle drives.

20.0 - MONTAGEPOSITION

Für die vollständige Definition der Bauform des Getriebemotors oder des gewählten Getriebes ist die Montagestellung gegenüber dem Boden gemäß der Tabelle (A10) und der Ausrichtung des Winkelstücks festzulegen (A11).

20.0 - POSITION DE MONTAGE

Pour une définition complète de la forme de construction, du réducteur, préciser la position de montage par rapport au sol. D'après les tableaux (A10) et l'orientation de l'angulaire (A11).

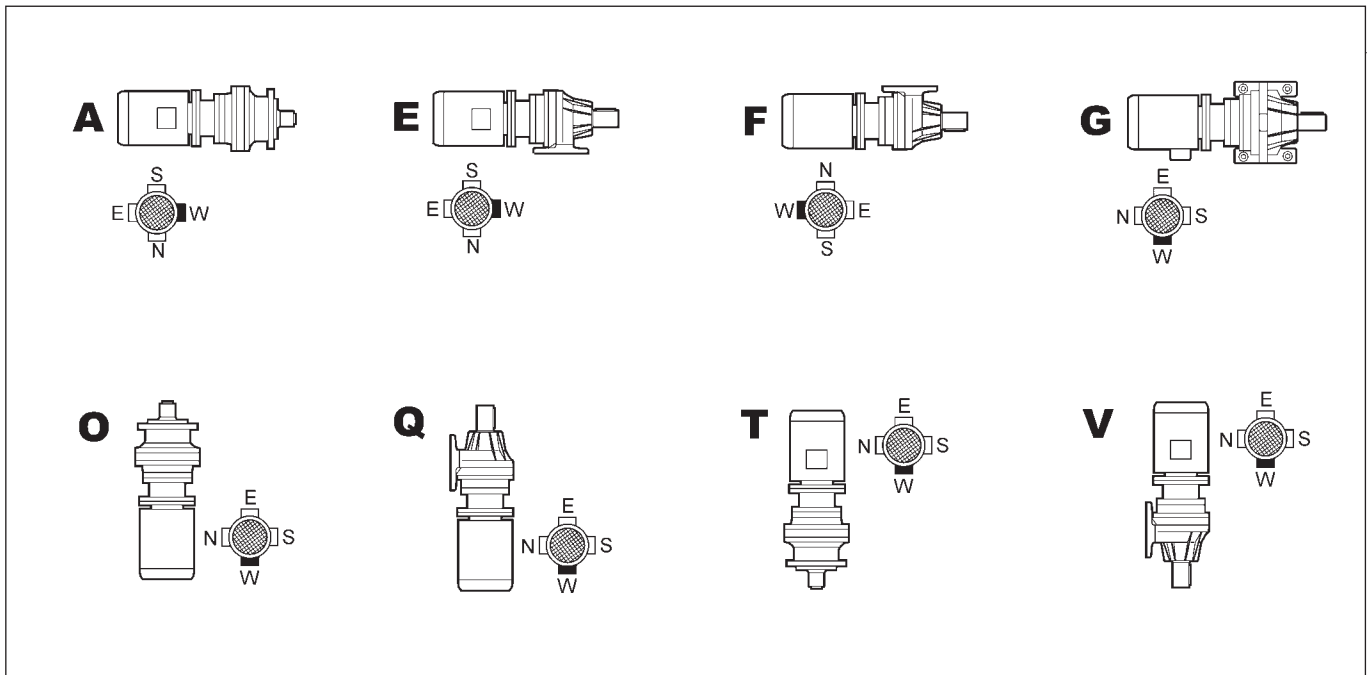
20.1 - Riduttori in linea

20.1 - In-line units

20.1 - Coaxiale Untersetzungsgetriebe

20.1 - Réducteurs coaxiaux

(A10)





20.2 - Riduttori angolari

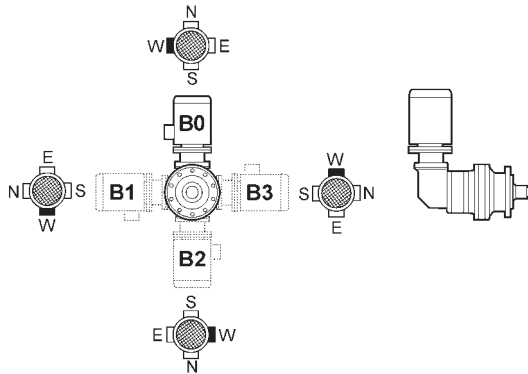
20.2 - Right angle units

20.2 - Rechtwinklige
Untersetzungsgetriebe

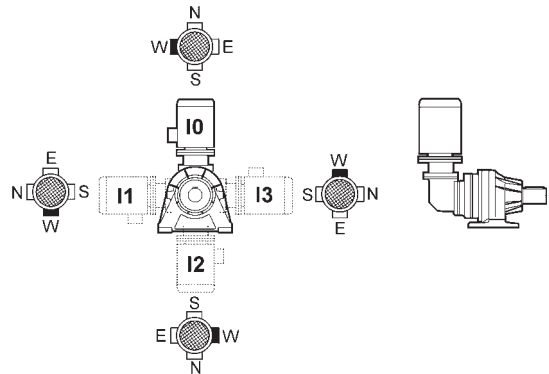
20.2 - Réducteurs a renvoi
d'angle

(A11)

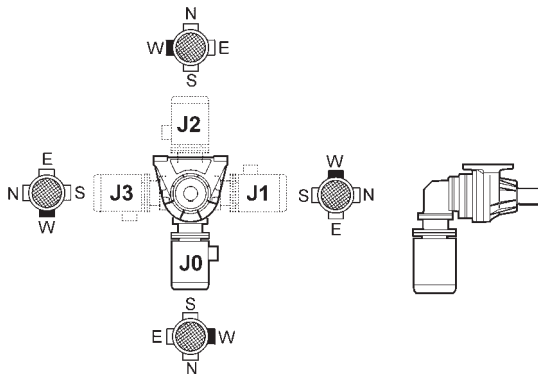
B0 - B1 - B2 - B3



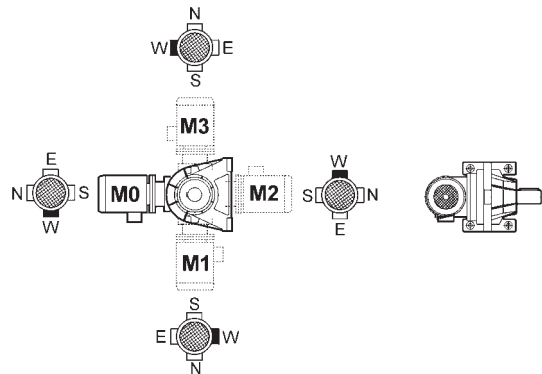
I0 - I1 - I2 - I3



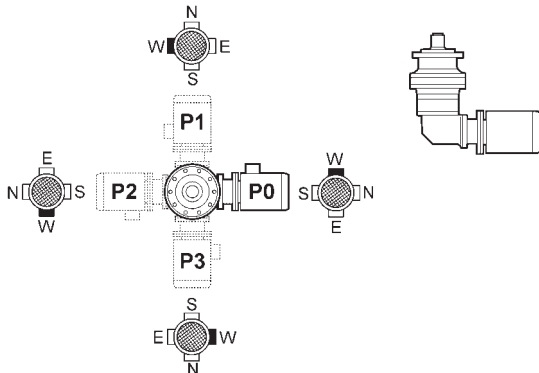
J0 - J1 - J2 - J3



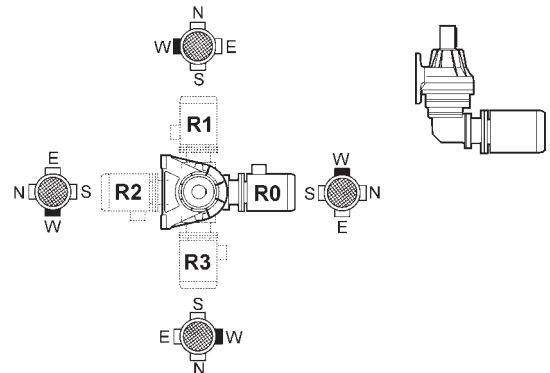
M0 - M1 - M2 - M3



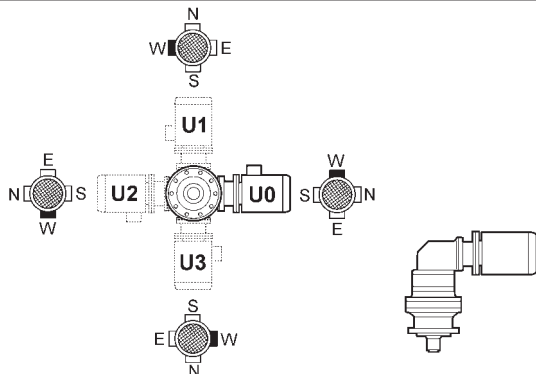
P0 - P1 - P2 - P3



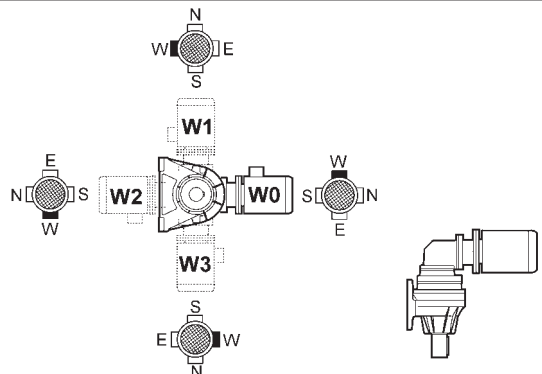
R0 - R1 - R2 - R3

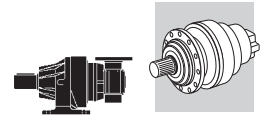


U0 - U1 - U2 - U3



W0 - W1 - W2 - W3





20.3 - Serie 3/V

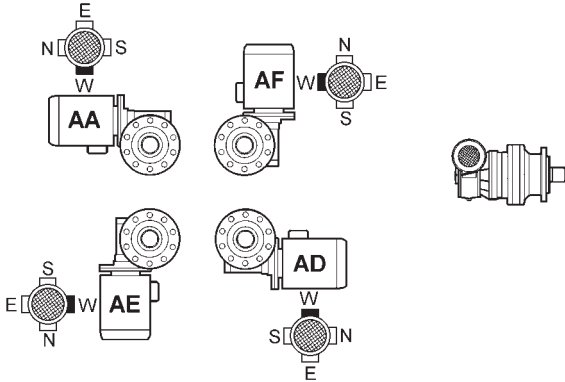
20.3 - 3/V Series

20.3 - Serie 3/V

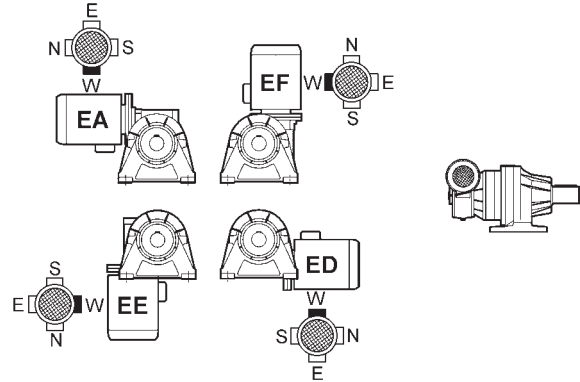
20.3 - Série 3/V

(A12)

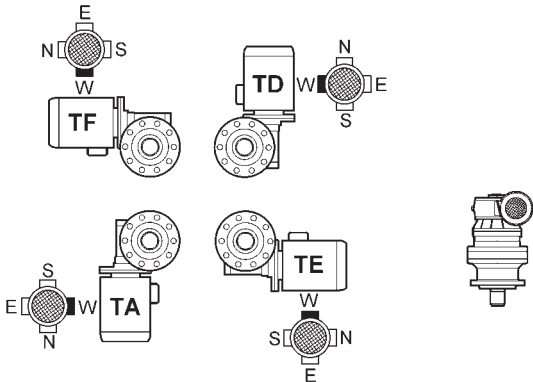
AA - AE - AF - AD



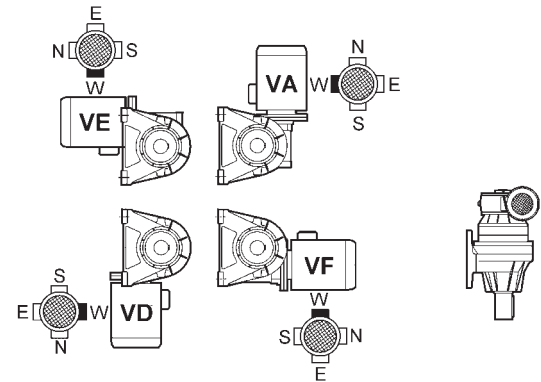
EA - EE - EF - ED



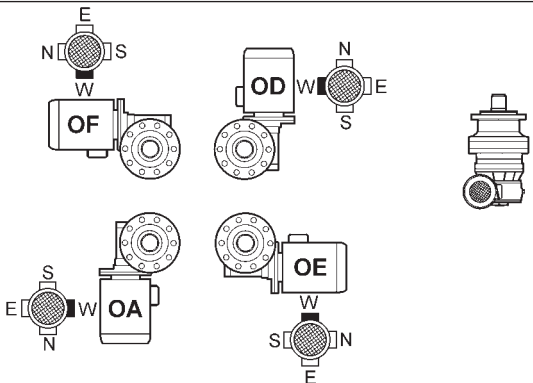
TA - TE - TF - TD



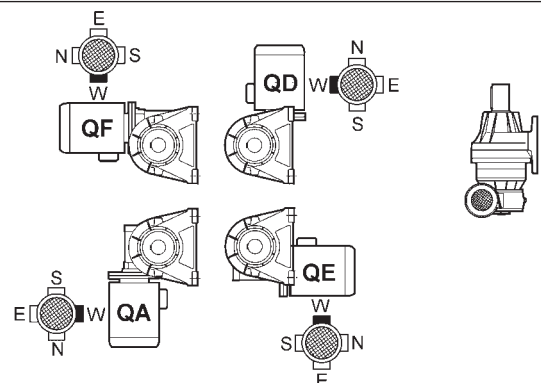
VA - VE - VF - VD



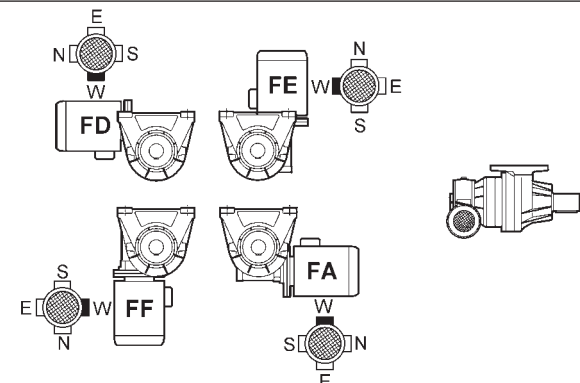
OA - OE - OF - OD

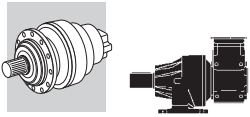


QA - QE - QF - QD



FA - FE - FF - FD





20.4 - Serie 3/A

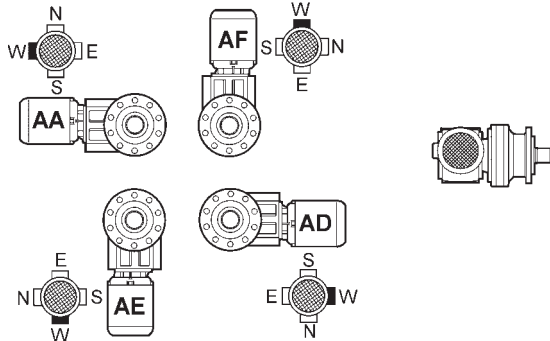
20.4 - 3/A Series

20.4 - Serie 3/A

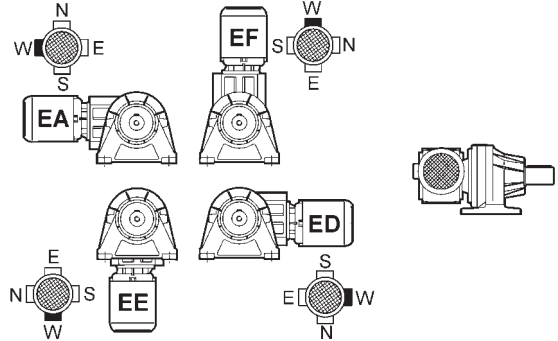
20.4 - Série 3/A

(A13)

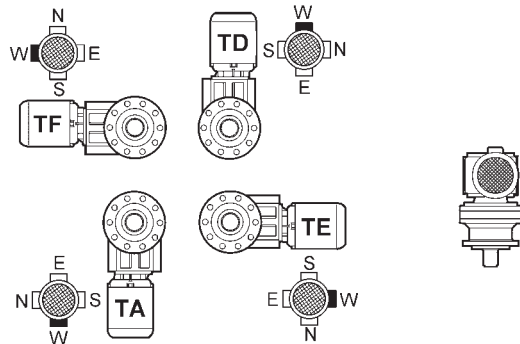
AA - AE - AF - AD



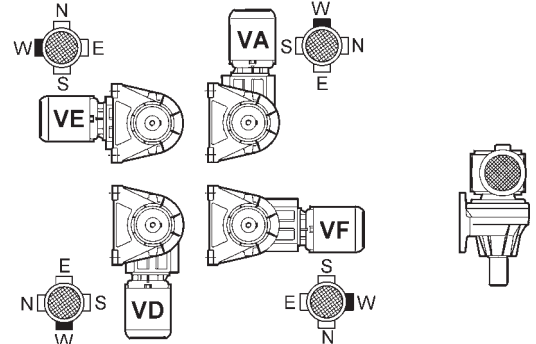
EA - EE - EF - ED



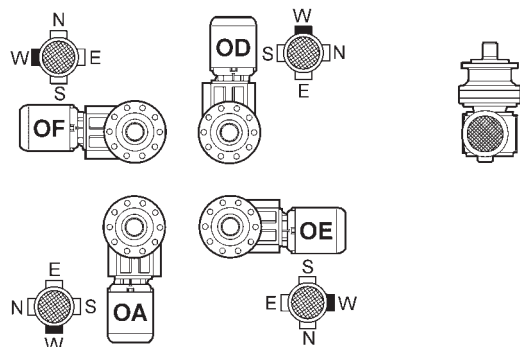
TA - TE - TF - TD



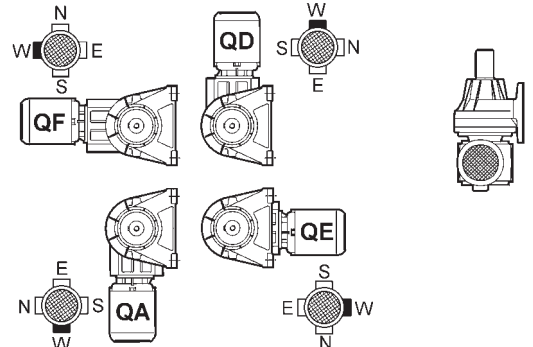
VA - VE - VF - VD



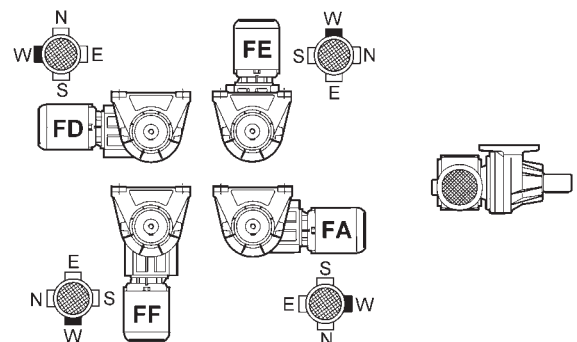
OA - OE - OF - OD

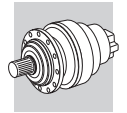


QA - QE - QF - QD



FA - FE - FF - FD





21.0 - LUBRIFICAZIONE (prima della messa in servizio)

Tutti i riduttori prevedono una lubrificazione a bagno d'olio. Nelle posizioni di montaggio che prevedono i riduttori con un asse verticale, dove lo sbattimento dell'olio durante il funzionamento non sarebbe sufficiente a garantire la corretta lubrificazione dei cuscinetti superiori, vengono adottati adeguati sistemi di lubrificazione.

Il funzionamento dei riduttori è ammesso per temperature ambiente comprese fra -20°C e +40°C. Per temperature ambiente comprese fra -20°C e -10°C l'avviamento del riduttore potrà avvenire solo dopo aver effettuato un pre-riscaldamento progressivo ed omogeneo del gruppo, oppure con funzionamento "a vuoto", senza carico collegato.

Il carico potrà poi essere applicato all'albero del riduttore quando la temperatura dello stesso avrà raggiunto la temperatura di -10°C, o superiore.

Prima della messa in opera immettere la giusta quantità di lubrificante del tipo raccomandato in tabella (A14). A tal proposito i riduttori sono muniti dei tappi di carico, livello e scarico olio.

Al fine di predisporre il corretto orientamento dei tappi, per una adeguata lubrificazione, di precisare sempre la posizione di montaggio desiderata.

Nella tabella (A14) sono riportate le marche più diffuse di lubrificazione con i tipi di oli consigliati per applicazioni normali.

- Per funzionamenti particolari dove sono richiesti speciali requisiti, interpellare il nostro Servizio Tecnico.
- La temperatura max. del lubrificante in esercizio continuo non deve superare gli 85-90°C.
- Se non diversamente concordato, i riduttori sono forniti privi di lubrificante. Fanno eccezione i riduttori combinati (3/V e 3/A) nei quali il riduttore a vite, o ad assi ortogonali, può essere fornito con lubrificazione permanente a base di olio sintetico secondo lo schema riportato nelle tabelle di pag. 43 e 44.
- Le quantità d'olio indicate per i vari tipi di riduttori sono indicative, il riempimento deve considerarsi corretto quando il lubrificante raggiunge il tappo di livello, collocato in fabbrica in funzione della posizione di montaggio.
- nel caso in cui la potenza trasmessa superi quella termica, occorrerà provvedere ad una circolazione forzata dell'olio (vedi: Sistemi ausiliari di raffreddamento).

21.0 - LUBRICATION (prior to start-up)

Gear units are oil lubricated. For gearboxes specified for vertical installation, whereas the oil coverage may not be sufficient to ensure proper lubrication of the uppermost bearings, extra lubrication provisions are used.

Operation of gear units is permitted at ambient temperatures between -20°C and +40°C. However, for temperatures between -20°C and -10°C unit may only start up after it has been progressively and evenly pre-heated, or otherwise initially operated unloaded.

Load may then be connected to the output shaft when the gear unit has reached the temperature of -10°C, or higher.

Prior to starting-up, fill the gearbox with the appropriate quantity of oil, selecting the viscosity as per table (A14).

Gearboxes are generally provided with oil fill, level and drain plugs. As such, the mounting position needs always to be specified when ordering the gearbox.

The table (A14) lists the most common brands of lubricant and the types recommended for normal applications.

- *Note: For applications with non-routine operating conditions, consult factory with complete information.*
- *Oil temperature must not exceed 85-90°C in operation.*
- *Unless otherwise specified, gear units are supplied unlubricated. Primary gear units belonging to 3/V and 3/A combinations instead may be supplied factory filled with long-life synthetic lubricant, depending on their frame size, as indicated in the charts at page 43 and 44.*
- *The oil capacities listed for the various types of unit are indicative only. Fill the gearbox up to the level plug, located as per the mounting position specified when ordering to ensure the gearbox is properly filled.*
- *Should transmitted power exceed the thermal capacity of the unit a supplementary cooling unit must be provided (see: Supplementary cooling systems).*

21.0 - SCHMIERUNG (vor der Inbetriebnahme)

Alle Getriebe weisen eine Ölbadschmierung auf. Werden die Getriebe mit vertikaler Achse eingebaut, so daß nicht gewährleistet werden kann, daß das Öl während des Betriebs des Getriebes auch die oberen Lager ordnungsgemäß schmiert, werden entsprechende Dauerschmierungen vorgesehen.

Die Getriebe dürfen bei einer Umgebungstemperatur von -20°C bis +40°C betrieben werden. Allerdings darf ein Start unter Last bei -20°C bis -10°C erst nach stufenweiser und gleichmäßiger Vorwärmung erfolgen. Anderfalls muss das Anfahren ohne Last erfolgen.

Die Last darf erst zugeschaltet werden, wenn die Getriebeeinheit eine Temperatur von mindestens -10° oder höher erreicht hat.

Vor der Inbetriebnahme muß die entsprechende Schmiermittelmenge eingefüllt werden. Die hierzu jeweils erforderlichen Viskositätswerte können der Tabelle (A14) entnommen werden. Für diesen Füllvorgang wurden die Getriebe mit Verschläüssen für das Einfüllen, Nachfüllen und den Ablass des Öls ausgestattet. Um die Verschlässe für eine angemessene Schmierung in korrekter Weise auszurichten zu können, empfehlen wir Ihnen, immer die gewünschte Montageposition anzugeben. In der Tabelle (A14) werden die bekanntesten Schmiermittelmarten mit den für normale Applikationen empfohlenen Öltypen aufgeführt.

- Im Falle von speziellen Einsatzbereichen, bei denen besondere Anforderungen vonnöten sind, wenden Sie sich bitte an unsere technische Abteilung.
- Die maximale Temperatur des Schmiermittels bei Dauerbetrieb darf 85-90°C nicht überschreiten.
- Die Getriebe werden ohne Öl ausgeliefert, es sei denn es ist anders spezifiziert. Die Getriebekombinationen 3/V und 3/A werden in einigen Baugrößen mit synthetischem lebensdauer Öl befüllt. Die Befüllung ist abhängig von der Baugröße, siehe Übersicht Seite 43 und 44.
- Die für die verschiedenen Getriebetypen angegebenen Öl-mengen sind Anhaltswerte, der Füllstand ist dann korrekt, wenn das Schmiermittel den Ölstandverschluss erreicht, der in Abhängigkeit zur Einbaulage in der Herstellerfirma angeordnet wurde.
- Sollte die übertragende Leistung die Wärmeleistung über-

21.0 - LUBRIFICATION (avant mise en route)

Tous les réducteurs prévoient une lubrification en bain d'huile. Dans les positions de montage qui prévoient les réducteurs avec axe vertical, où le barbotage de l'huile pendant le fonctionnement serait insuffisant pour garantir une lubrification correcte des paliers supérieurs, l'on adopte des systèmes appropriés de graissage à vie.

Le fonctionnement des réducteurs est admis pour des températures ambiantes comprises entre -20°C et +40°C. Pour des températures ambiantes comprises entre -20°C et -10°C le démarrage du réducteur est admis seulement après un préchauffage progressif et homogène, ou avec un fonctionnement « à vide », sans charge appliquée.

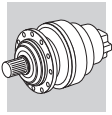
La charge pourra être ensuite appliquée à l'arbre du réducteur quand celui-ci aura atteint une température de -10°C, ou supérieure.

Avant la mise en service, introduire la quantité exacte de lubrifiant en choisissant la viscosité dans le tableau (A14). Les réducteurs sont pourvus de cet effet d'un bouchon de remplissage, jauge de niveau et élément de vidange huile.

Dans le but de réaliser une mise en place exacte des bouchons, pour une lubrification appropriée, il est conseillé de spécifier toujours la position de montage souhaitée.

Sur le tableau (A14), ont été reportées les marques les plus répandues de lubrifiants avec les types conseillés, pour des applications normales.

- *Pour des applications dans des conditions de fonctionnement particulières, consulter nos Services Techniques.*
- *La température maxi du lubrifiant, en fonctionnement continu, ne doit pas dépasser 85-90°C.*
- *Sauf si différemment spécifié, les réducteurs sont livrés sans lubrifiant. Font exception les réducteurs combinés (3/V et 3/A) dans lesquels le réducteur à vis, ou à axes orthogonaux, peut être livré avec lubrification permanente à base d'huile synthétique selon le schéma indiqué dans les tableaux à page 43 et 44.*
- *Les quantités d'huile indiquées pour les différents types de réducteurs sont à titre indicatif ; le remplissage est correct quand le lubrifiant atteint le bouchon de niveau, placé à l'usine selon la position de montage.*
- *Dans le cas où la puissance transmise dépasserait la puissance thermique, il sera nécessaire de prévoir une circulation d'huile (voir Sys-*



NOTA: nei riduttori di tipo combinato la lubrificazione degli stadi epicicloidali è separata da quella dei riduttori a vite senza fine (3/V), o ortogonali (3/A).

NOTE: Combined gearboxes and gearmotors feature separate lubrication for planetary stages and for worm gearboxes (3/V) or helical bevel units (3/A).

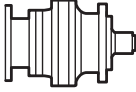
steigen, ist eine Ölumlagerung erforderlich (Siehe Hilfskühl-systeme).

MERKE: Bei den kombinierten Getrieben ist die Schmierung der Planetenstufen von denen der Schneckengetriebe (3/V) oder Kegelaradgetriebe (3/A) getrennt.

temes auxiliaires de refroidissement).

REMARQUE: Sur les réducteurs combinés, la lubrification des étages épicycloïdaux est séparée de celle des réducteurs à vis sans fin (3/V) ou orthogonaux (3/A).

(A14)

 Norme ISO 3448 con caratteristiche EP / ISO standard 3448 EP grade ISO-Normen 3448 EP-Merkmalen / Normes ISO 3448 avec caractéristiques EP			
T _a	-10°C / +30°C	+10°C / +45°C	-20°C / +60°C
	ISO VG 150	ISO VG 220	ISO VG 150-220
SHELL	OMALA S4 WE 150	OMALA S4 WE 220	OMALA S4 WE
AGIP	BLASIA150	BLASIA 220	BLASIA SX220
ARAL	DEGOL BG 150	DEGOL BG 220	DEGOL PAS 150-220
BP	ENERGOL GR XP 150	ENERGOL GR XP 220	EVERSYN EXP 150-220
CASTROL	ALPHA SP 150	ALPHA SP 220	ALPHASYN EP 150-220
CEPSA	ENGRANAJES HP 150	ENGRANAJES HP 220	ENGRANAJES HPX 150-220
CHEVRON	N.L. GEAR COMPOUNDS EP 150	N.L. GEAR COMPOUNDS EP 220	TEGRA SYNTHETIC GEAR EP 150-200
ESSO	SPARTAN EP 150	SPARTAN EP 220	SPARTAN S EP 150-220
FUCHS	RENOLIN CKC 150	RENOLIN CKC 220	RENOLIN UNISYN CKC 150-220
KLUBER	KLUBEROIL GEM1-150	KLUBEROIL GEM1-220	KLUBERSYNT EG 4-150 / 4-220
Q8	GOYA 150	GOYA 220	EL GRECO 220
MOBIL	MOBILGEAR 600 XP 150	MOBILGEAR 600 XP 220	MOBILGEAR SHC XMP 150-220
MOLYCOTE	L-0115	L-0122	L-2115 / L-2122
REPSOL	SUPER TAURO 150	SUPER TAURO 220	SUPER TAURO SINTETICO 150-220
TOTAL	CARTER EP 1500	CARTER EP 2200	CARTER SH 150-220

La temperatura sulla carcassa non deve superare, nel punto più caldo, 80-85°C.

The temperature of the gear case should never exceed 80-85°C at the hottest point.

Gehäusetemperatur, an der Wärmsten Stelle max. 80-85°C.


La température sur la carcasse ne devant pas dépasser les 80-85°C

■ Oli sintetici polialfaolefine (PAO)

■ Polyalphaolefin-based synthetic oil (PAO)

■ Synthetische Poly-Alpha-Olefin-Öle (PAO)

■ Huiles synthétiques polyalphaoléfinées (PAO)

 Viscosità olio ISO VG / Oil viscosity ISO VG / Öl-Viskosität ISO VG / Viscosité de l'huile ISO VG					
	T _a ≤ -20°	-20° < T _a ≤ 10°	0° ≤ T _a ≤ 30°	20° ≤ T _a ≤ 40°	T _a > 40°
Mineral EP	(*)	150	320	460	460 (*)
PAO EP	(*)	150	220	320	460 (*)
PAG	(*)	150	220	320	460 (*)

(*) consultare il Servizio Tecnico Commerciale

(*) consult Bonfiglioli Technical Service.

(*) Bitte wenden Sie sich an die technische Abteilung von Bonfiglioli.

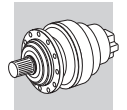
(*) Consulter le service technique Bonfiglioli.

Per i riduttori A 05...A 60 usare sempre e solo olio sintetico tipo PAG (a base poliglicolica) con viscosità ISO VG 320

When filling bevel helical gear units of models A 05 to A 60 use exclusively a PAG (polyglycol-based) synthetic oil with viscosity ISO VG 320.

Zur Befüllung der Kegelarad-getriebe Baugröße A 05 bis A 60 darf ausschließlich PAG (auf Polyglycol basierend) synthetisches Öl mit der Viskosität von ISO VG 320 verwendet werden.

Pour les réducteurs A 05 à A 60, utiliser exclusivement une huile synthétique à base de polyglycol (PAG) d'une viscosité ISO VG 320



21.1 - Posizione tappi olio
Serie 3_L - 3_R

21.1 - Oil plug positions
3_L - 3_R Series

21.1 - Position der Schrauben
Serie 3_L - 3_R

21.1 - Positions des bouchons
Série 3_L - 3_R

(A15)

TUTTI I RIDUTTORI

- 1 Tappo carico e sfiato
- 2 Tappo di livello
- 3 Tappo scarico

RIDUTTORI LINEARI AD UNO STADIO

- 1A Tappo carico e sfiato
- 3A Tappo scarico

RIDUTTORI ANGOLARI A DUE STADI

- 1B Tappo carico e sfiato
- 3B Tappo scarico

ALL UNITS

- 1 Filler/breather oil plug
- 2 Oil level plug
- 3 Oil draining plug

1 STAGE IN-LINE GEAR UNITS

- 1A Filler/breather oil plug
- 3A Oil draining plug

2 STAGE RIGHT ANGLE GEAR UNITS

- 1B Filler/breather oil plug
- 3B Oil draining plug

ALLE GETRIEBE

- 1 Einfüll-und Ablasschraube
- 2 Ölstandschraube
- 3 Ölablasschraube

LINEAR GETRIEBE MIT 1 STUFEN

- 1A Einfüll-und Ablasschraube
- 3A Ölablasschraube

RECHTWINLIG GETRIEBE MIT 2 STUFEN

- 1B Einfüll-und Ablasschraube
- 3B Ölablasschraube

TOUTES REDUCTEURS

- 1 Bouchon de remplissage et reniflard
- 2 Bouchon de niveau
- 3 Bouchon de vidange

REDUCTEURS COAXIALE AVEC 1 TRAIN DE REDUCTION

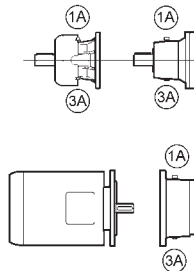
- 1A Bouchon de remplissage et reniflard
- 3A Bouchon de vidange

REDUCTEURS A RENVOI D'ANGLE AVEC 2 TRAINS DE REDUCTION

- 1B Bouchon de remplissage et reniflard
- 3B Bouchon de vidange

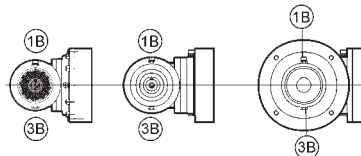
300 - 325

A - E



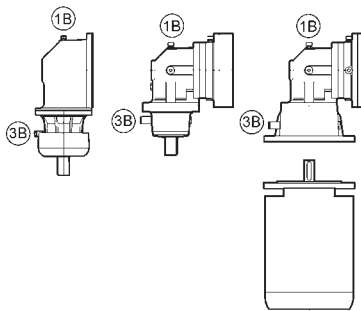
300 - 321

B1 - B3 - I1 - I3



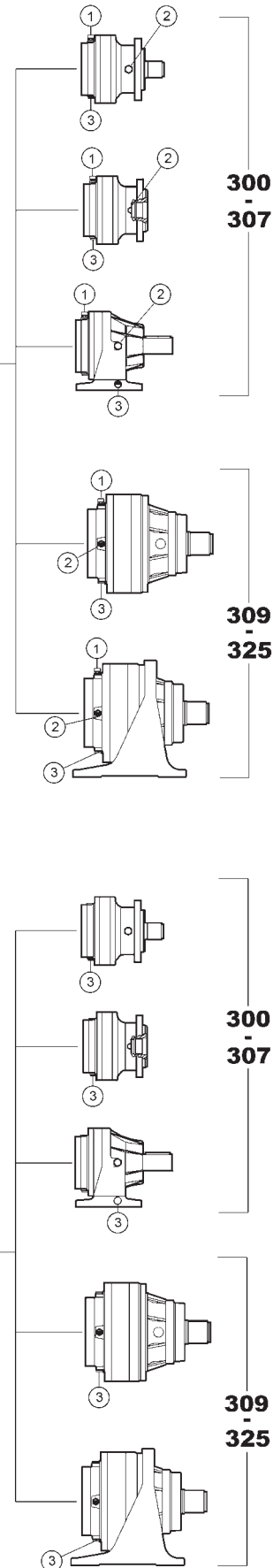
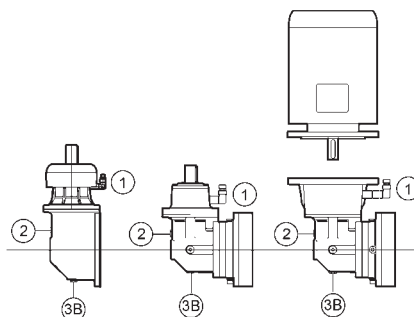
300 - 321

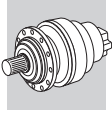
B2 - I2



300 - 321

B0 - I0





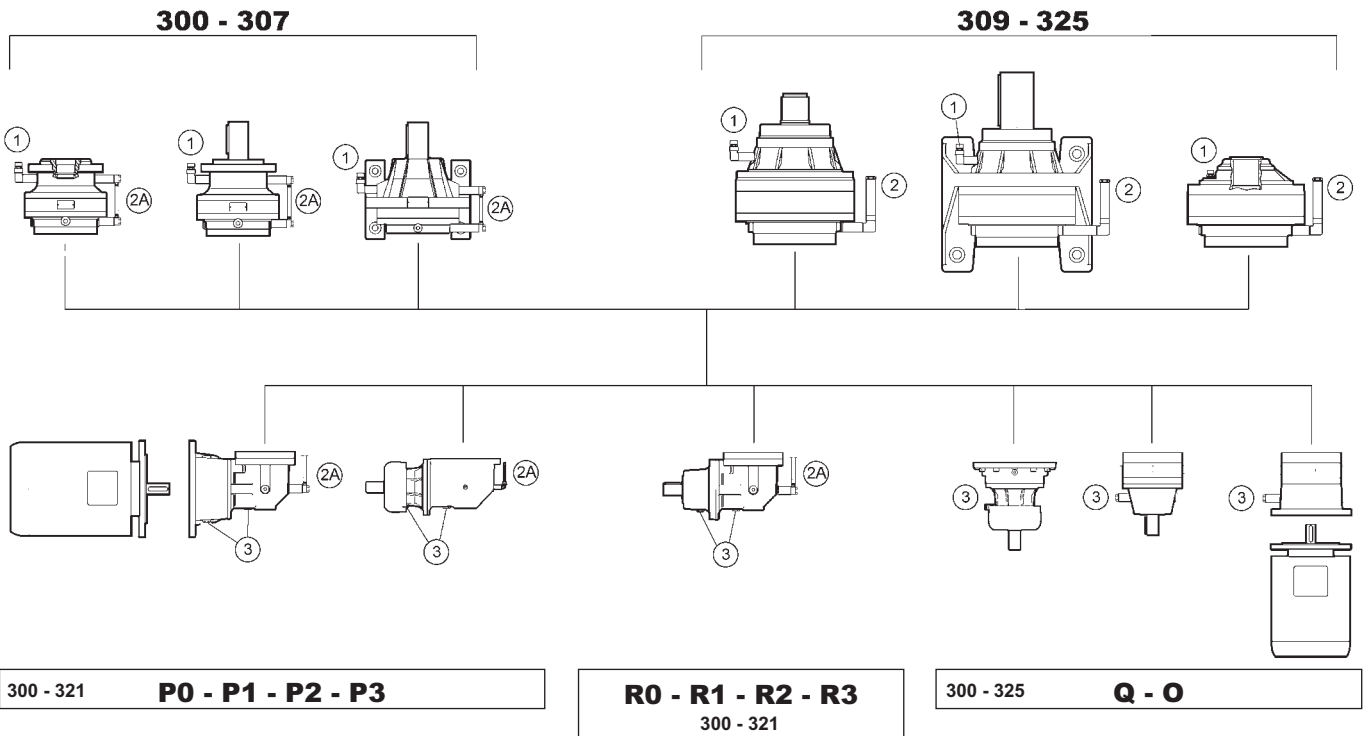
21.1 - Posizione tappi olio
Serie 3_L - 3_R

21.1 - Oil plug positions
3_L - 3_R Series

21.1 - Position der Schrauben
Serie 3_L - 3_R

21.1 - Positions des bouchons
Série 3_L - 3_R

(A16)



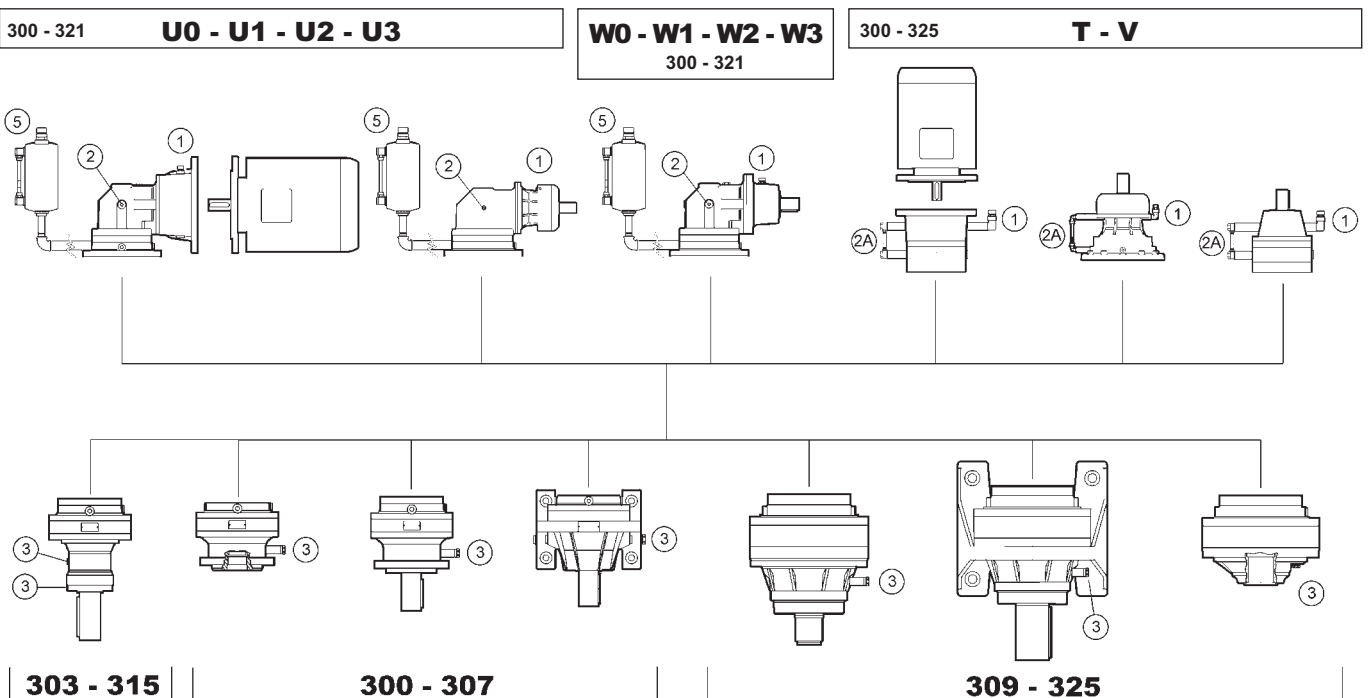
TUTTI I RIDUTTORI
 1 Tappo carico e sfiato
 2 Tappo di livello
 2A Tubo trasparente di livello
 3 Tappo scarico
 5 Vaso d'espansione per servizio continuo

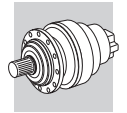
ALL GEARBOXES
 Filler/breather oil plug
 Oil level plug
 Transparent oil level pipe
 Oil draining plug
 Expansion tank for continuous duty

ALLE GETRIEBE
 Einfüll- und Ablassschraube
 Ölstandschrabe
 Ölstandschrabe
 Ölablassschraube
 Ölüberlaufgefäß für Applikationen im Dauerbetriebe

TOUTES REDUCTEURS
 Bouchon de remplissage et reniflard
 Bouchon de niveau
 Bouchon de niveau
 Bouchon de vidange
 Vase d'expansion pour des applications en service continu

(A17)





21.1 - Posizione tappi olio Serie 3/V

21.1 - Oil plug positions 3/V Series

21.1 - Position der Schrauben Serie 3/V

21.1 - Positions des bouchons Série 3/V

(A18)

A - E

TUTTI I RIDUTTORI (stadi epicicloidali)

- 1 Tappo carico e sfiato
- 2 Tappo di livello
- 3 Tappo scarico

(stadio a vite senza fine)

- 1V Tappo carico e sfiato
- 2V Tappo di livello
- 3V Tappo scarico

ALL GEARBOXES (planetary stages)

- 1 Filler/breather oil plug
- 2 Oil level plug
- 3 Oil draining plug

(worm reduction module)

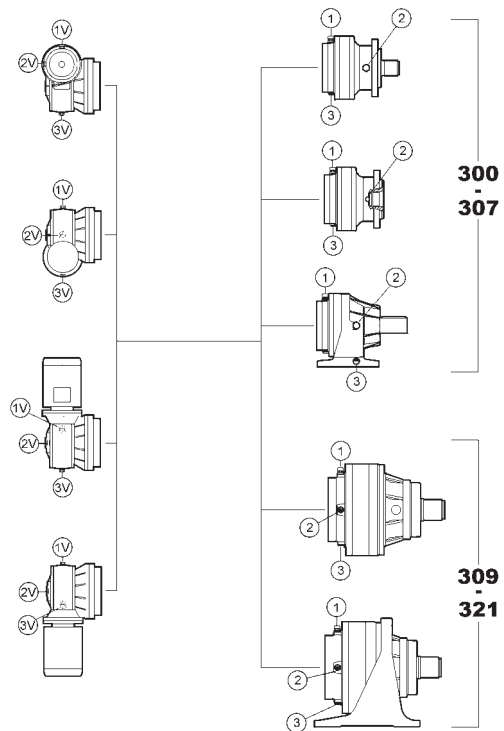
- 1V Filler/breather oil plug
- 2V Oil level plug
- 3V Oil draining plug

ALLE GETRIEBE (Planetenstufen)

- 1 Einfüll-und Ablasschraube
- 2 Ölstandschrabe
- 3 Ölablasschraube

(Schneckenübersetzungsstufe)

- 1V Einfüll-und Ablasschraube
- 2V Ölstandschrabe
- 3V Ölablasschraube



(A19)

O - Q

300 - 307

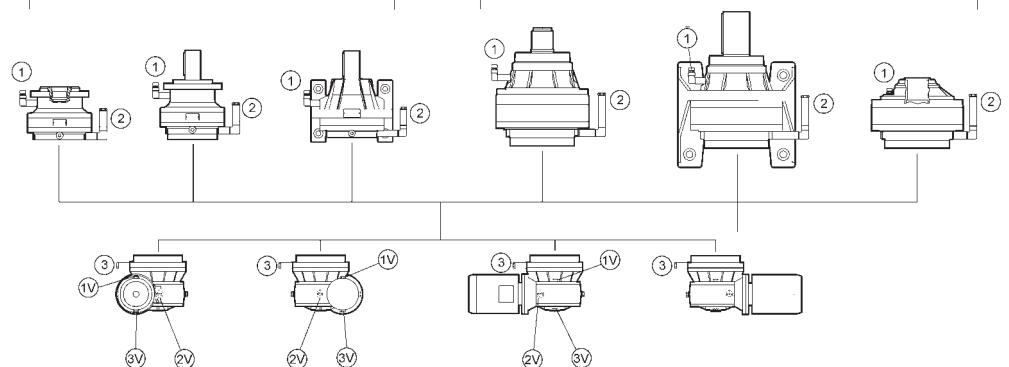
309 - 321

TOUTES REDUCTEURS (étages épicycloïdaux)

- 1 Bouchon de remplissage et reniflard
- 2 Bouchon de niveau
- 3 Bouchon de vidange

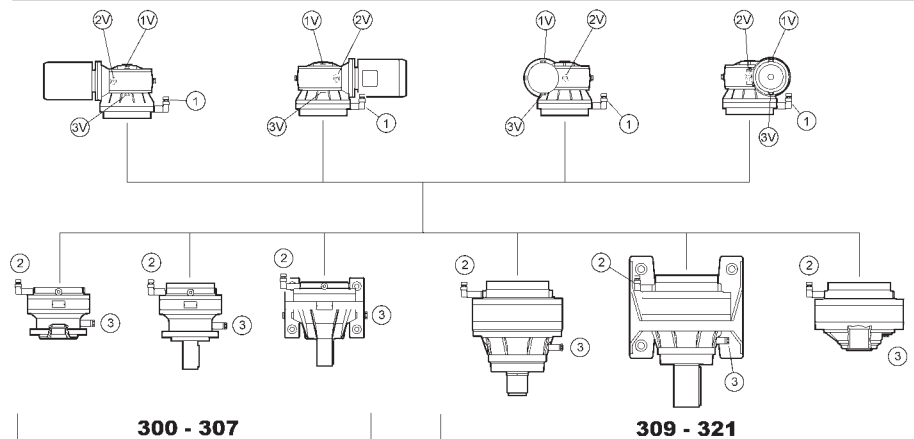
(étage de réduction à vis sans fin)

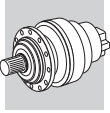
- 1V Bouchon de remplissage et reniflard
- 3V Bouchon de niveau
- 3V Bouchon de vidange



(A20)

T - V





21.1 - Posizione tappi olio Serie 3/A

21.1 - Oil plug position 3/A Series

21.1 - Position der Schrauben Serie 3/A

21.1 - Positions des bouchons Série 3/A

(A21)

A - E

TUTTI I RIDUTTORI (stadi epicicloidali)

- 1 Tappo carico e sfiato
- 2 Tappo di livello
- 3 Tappo scarico

(stadio ad assi ortogonali)

- 1A Tappo carico e sfiato
- 2A Tappo di livello
- 3A Tappo scarico

ALL GEARBOXES (planetary stages)

- 1 Filler/breather oil plug
- 2 Oil level plug
- 3 Oil draining plug

(helical bevel reduction module)

- 1A Filler/breather oil plug
- 2A Oil level plug
- 3A Oil draining plug

ALLE GETRIEBE (Planetenstufen)

- 1 Einfüll- und Ablassschraube
- 2 Ölstandschrabe
- 3 Ölablassschraube

(Kegelradübersetzungsstufe)

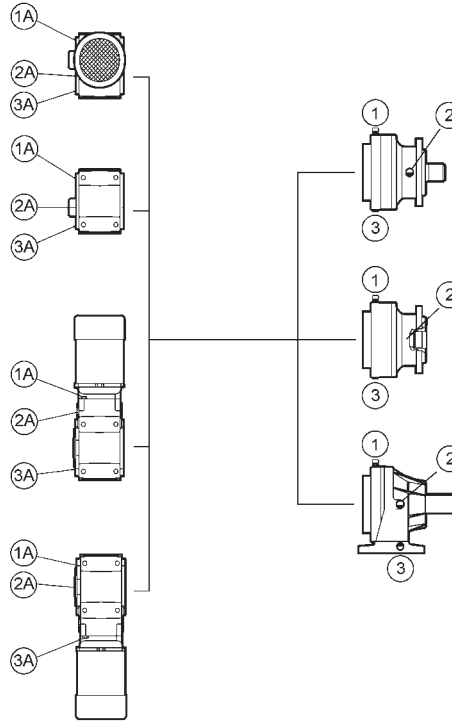
- 1A Einfüll- und Ablassschraube
- 2A Ölstandschrabe
- 3A Ölablassschraube

TOUTES REDUCTEURS (étages épicycloïdaux)

- 1 Bouchon de remplissage et reniflard
- 2 Bouchon de niveau
- 3 Bouchon de vidange

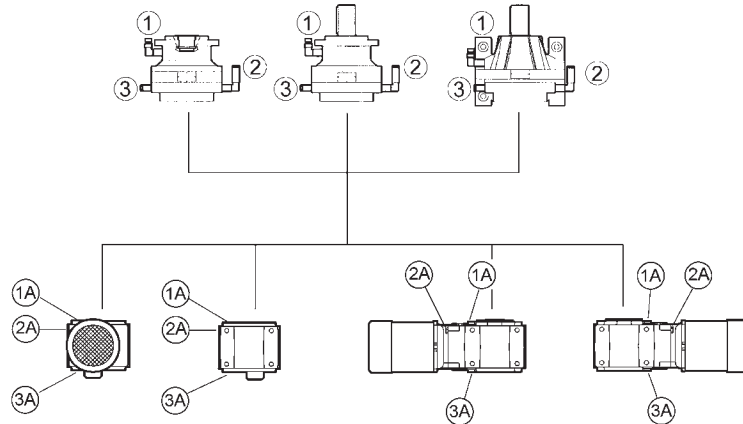
(étage de réduction à axes orthogonaux)

- 1A Bouchon de remplissage et reniflard
- 2A Bouchon de niveau
- 3A Bouchon de vidange



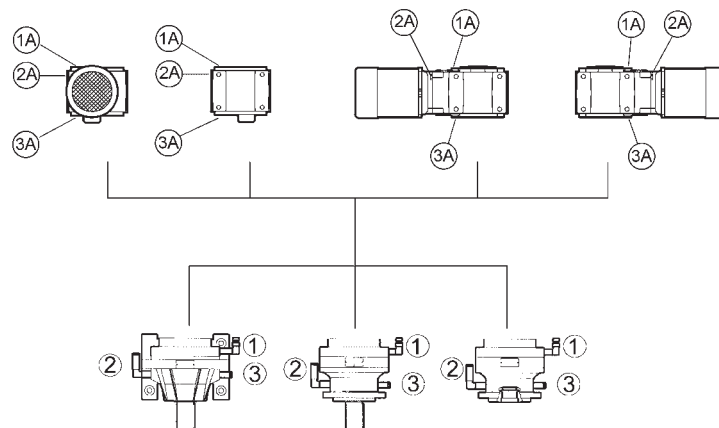
(A22)

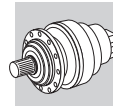
O - Q



(A23)

T - V






21.2 - Quantità olio (l)
Serie 3_L


21.2 - Oil quantity (l)
3_L Series

21.2 - Schmierölmenge (l)
Serie 3_L

21.2 - Quantité d'huile (l)
Série 3_L

(A24)

		Posizione di montaggio Mounting position Einbaulagen Position de montage		
		A	T	O
300	L1	0.6	1.0	0.9
	L2	0.9	1.3	1.2
	L3	1.2	1.6	1.5
	L4	1.5	1.9	1.8
301	L1	0.8	1.2	1.1
	L2	1.1	1.5	1.4
	L3	1.4	1.8	1.7
	L4	1.7	2.1	2.0
303	L1	1.3	2.3	2.0
	L2	1.6	2.6	2.3
	L3	1.9	2.9	2.6
	L4	2.2	3.2	2.9
304	L1	1.4	2.4	2.2
	L2	1.9	2.9	2.7
	L3	2.2	3.2	3.0
	L4	2.5	3.5	3.3
305	L1	1.6	2.6	2.4
	L2	2.1	3.1	2.9
	L3	2.4	3.4	3.2
	L4	2.7	3.7	3.5
306	L1	2.5	3.5	3.2
	L2	3.3	4.3	4.0
	L3	3.6	4.6	4.3
	L4	3.9	4.9	4.6
307	L1	3.5	5.0	4.5
	L2	4.5	6.0	5.5
	L3	5.0	6.5	6.0
	L4	5.3	6.8	6.3
309	L1	4.0	5.5	5.0
	L2	5.0	6.5	6.0
	L3	5.5	7.0	6.5
	L4	5.8	7.3	6.8
310	L1	5.0	6.5	6.0
	L2	6.3	7.8	7.3
	L3	7.1	8.6	8.1
	L4	7.4	8.9	8.4

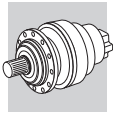
		Posizione di montaggio Mounting position Einbaulagen Position de montage		
		A	T	O
311	L1	7.0	12	10
	L2	9.0	14	12
	L3	10	15	13
	L4	11	16	14
313	L1	9.0	14	12
	L2	12	17	15
	L3	13	18	16
	L4	13	18	16
314	L2	17	25	21
	L3	19	27	23
	L4	20	28	24
	315	L1	15	23
L2		19	27	23
L3		21	29	25
L4		22	30	26
316	L2	22	30	26
	L3	24	32	28
	L4	25	33	29
317	L2	26	41	36
	L3	29	44	39
	L4	30	45	40
318	L2	35	50	45
	L3	40	55	50
	L4	43	58	53
	319	L2	45	65
L3		50	70	60
L4		53	73	63
321	L3	56	76	66
	L4	60	80	70
323	L3	Consultare il Servizio Tecnico Bonfiglioli Riduttori Consult Bonfiglioli's Technical Service Bitte an den technischen Service von Bonfiglioli Riduttori Contacter le Service Technique de Bonfiglioli		
	L4			
325	L3			
	L4			

N.B. Le quantità d'olio sono indicative. Verificare l'esatto livello al momento del riempimento tramite l'apposito tappo.

N.B. Oil quantities are indicative. Check actual level after filling through the appropriate plug.

Achtung! Die Angabe bezüglich Ölmenge sind Richtwerte. Der Ölstand soll während des Einfüllens anhand des Ölstandstopfens überprüft werden.

N.B. Les quantités d'huile sont indicatives. Vérifiez la quantité correcte de lubrifiant selon le niveau d'huile.




21.2 - Quantità olio (l)
Serie 3_R


21.2 - Oil quantity (l)
3_R Series

21.2 - Schmierölmenge (l)
Serie 3_R

21.2 - Quantité d'huile (l)
Série 3_R

(A25)

		Posizione di montaggio Mounting position Einbaulagen Position de montage 32		
		B0	U_	P_
300	R2	1.2	1.7	1.5
	R3	1.5	2.0	1.8
	R4	1.8	2.3	2.1
301	R2	1.6	2.1	1.9
	R3	1.9	2.4	2.2
	R4	2.2	2.7	2.5
303	R2	2.2	2.8	2.6
	R3	2.5	3.1	2.9
	R4	2.8	3.4	3.2
304	R2	2.3	2.9	2.7
	R3	2.8	3.4	3.2
	R4	3.1	3.7	3.5
305	R2	2.5	3.1	2.9
	R3	3.0	3.6	3.4
	R4	3.3	3.9	3.7
306	R2	4.0	5.0	4.8
	R3	4.8	5.8	5.6
	R4	5.1	6.1	5.9
307	R2	6.0	8.0	7.0
	R3	7.0	9.0	8.0
	R4	7.5	9.5	8.5

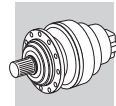
		Posizione di montaggio Mounting position Einbaulagen Position de montage 32		
		B0	U_	P_
309	R2	6.5	8.5	7.5
	R3	7.5	9.5	8.5
	R4	8.0	10	9.0
310	R2	13	15	14
	R3	11	13	12
	R4	12	14	13
311	R2	14	19	17
	R3	16	21	19
	R4	17	22	20
313	R2	16	21	19
	R3	19	24	22
	R4	20	25	23
314	R3	25	33	29
	R4	28	36	32
315	R3	27	35	31
	R4	30	38	34
316	R3	30	38	34
	R4	33	41	37
317	R3	38	52	48
	R4	42	56	52
318	R4	48	63	58

N.B. Le quantità d'olio sono indicative. Verificare l'esatto livello al momento del riempimento tramite l'apposito tappo.

N.B. Oil quantities are indicative. Check actual level after filling through the appropriate plug.

Achtung! Die Angabe bezüglich Ölmenge sind Richtwerte. Der Ölstand soll während des Einfüllens anhand des Ölstandstopfens überprüft werden.

N.B. Les quantités d'huile sont indicatives. Vérifiez la quantité correcte de lubrifiant selon le niveau d'huile.



21.2 - Quantità olio (l)
Serie 3/V

21.2 - Oil quantity (l)
3/V Series

21.2 - Schmierölmenge (l)
Serie 3/V

21.2 - Quantité d'huile (l)
Série 3/V

(A26)

	[1]												
	AA - EA - FD			AF - EF - FE		AE - EE - FF		AD - ED - FA		TA - TE - TF - TD VA - VE - VF - VD		OA - OE - OF - OD QA - QE - QF - QD	
		input			input		input		input		input		input
	P(IEC)	HS	P(IEC)	HS	P(IEC)	HS	P(IEC)	HS	P(IEC)	HS	P(IEC)	HS	
3/V 00 L3	0.9	0.12	0.12	0.9	0.12	0.9	0.12	0.9	0.12	1.3	0.12	1.2	0.12
3/V 01 L3	1.1			1.1		1.1		1.1		1.5		1.4	
3/V 03 L3	1.6	0.25	0.25	1.6	0.31	1.6	0.31	1.6	0.38	2.6	0.31	2.3	0.25
3/V 04 L3	1.9	0.38	0.38	1.9	0.43	1.9	0.43	1.9	0.52	2.9	0.52	2.7	0.38
3/V 05 L3	2.1			2.1		2.1		2.1		3.1		2.9	
3/V 06 L3	3.3	0.64	0.64	3.3	0.76	3.3	0.76	3.3	0.85	4.3	0.76	4	0.76
3/V 10 L4	7.1			7.1		7.1		7.1		8.6		8.1	
3/V 07 L3	4.5			4.5		4.5		4.5		6		5.5	
3/V 11 L4	10	2.4	2.8	10	2.6	10	2.6	10	1.7	15	1.9	13	1.9
3/V 13 L4	13			13		13		13		18		16	
3/V 09 L3	5			5		5.0		5		6.5		6	
3/V 10 L3	6.3			6.3		6.3		6.3		7.8		7.3	
3/V 14 L4	19	4.3	4.5	19	3.9	19	3.9	19	3.0	27	3.5	23	3.5
3/V 15 L4	21			21		21		21		29		25	
3/V 16 L4	24			24		24		24		32		28	
3/V 11 L3	9			9		9		9		14		12	
3/V 13 L3	12	7.8	9.6	12	6.7	12	6.7	12	5.0	17	5.5	15	5.5
3/V 14 L3	17			17		17		17		25		21	
3/V 17 L4	29			29		29		29		44		39	
3/V 15 L3	19			19		19		19		27		23	
3/V 18 L4	40	11	15	40	8.9	40	9.4	40	7.5	55	9.5	50	9.5
3/V 19 L4	50			50		50		50		70		60	
3/V 16 L3	22			22		22		22		30		26	
3/V 17 L3	26	23	28	26	16.8	26	17.5	26	10.7	41	17	36	17
3/V 21 L4	56			56		56		56		76		66	

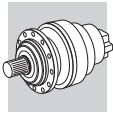
Lubrificazione permanente / Life lubricated / Dauerschmierung / Lubrification permanente

NOTA: nei riduttori combinati la lubrificazione degli stadi epicycloidali è separata da quella dei riduttori a vite senza fine (3/V), o ortogonali (3/A).

NOTE: Combined gearboxes feature separate lubrication for planetary stages and for worm gearboxes (3/V), or helical bevel units (3/A).

MERKE: Bei den kombinierten Getrieben ist die Schmierung der Planetenstufen von denen der Schneckengetriebe (3/V), oder Kegelradgetriebe (3/A) getrennt

REMARQUE: Sur les réducteurs combinés, la lubrification des étages épicycloïdaux est séparée de celle des réducteurs à vis sans fin (3/V), ou orthogonaux (3/A).
















21.2 - Quantità olio (l)
Serie 3/A

21.2 - Oil quantity (l)
3/A Series

21.2 - Schmierölmenge (l)
Serie 3/A

21.2 - Quantité d'huile (l)
Série 3/A

(A27)

	 [1]											
	AA - EA - FD		TA - TE - TF - TD VA - VE - VF - VD		OA - OE - OF - OD QA - QE - QF - QD		AD - ED - FA		AF - EF - FE		AE - EE - FF	
												
3/A 00 L2	0.60	1.4	1.0	1.4	0.9	1.4	0.6	1.4	0.6	1.4	0.6	1.4
3/A 01 L2	0.80	2.3	1.2	2.3	1.1	2.3	0.8	2.3	0.8	2.3	0.8	2.3
3/A 03 L2	1.3	3.2	2.3	3.2	2.0	3.2	1.3	3.2	1.3	3.2	1.3	3.2
3/A 04 L2	1.4	3.8	2.4	3.9	2.2	3.9	1.4	4.5	1.4	5.0	1.4	4.2
3/A 05 L2	1.6	4.0	2.6	4.1	2.4	4.1	1.6	4.7	1.6	5.2	1.6	4.4
3/A 06 L2	2.5	4.9	3.5	8.1	3.2	4.7	2.5	8.4	2.5	11	2.5	9.2
3/A 07 L2	3.5	6.8	5.0	8.1	4.5	12	3.5	15	3.5	18	3.5	15

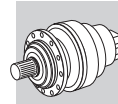
 Lubrificazione permanente / Life lubricated / Dauerschmierung / Lubrification permanente

NOTA: nei riduttori combinati la lubrificazione degli stadi epicicloidali è separata da quella dei riduttori a vite senza fine (3/V), o ortogonali (3/A).

NOTE: Combined gearboxes feature separate lubrication for planetary stages and for worm gearboxes (3/V), or helical bevel units (3/A).

MERKE: Bei den kombinierten Getrieben ist die Schmierung der Planetenstufen von denen der Schneckengetriebe (3/V), oder Kegelradgetriebe (3/A) getrennt

REMARQUE: Sur les réducteurs combinés, la lubrification des étages épicycloïdaux est séparée de celle des réducteurs à vis sans fin (3/V), ou orthogonaux (3/A).



22.0 - DATI TECNICI MOTORI-DUTTORI 300 L - 300 R

22.0 - 300 L - 300 R GEARMOTOR RATING CHARTS

22.0 - 300 L - 300 R TECHNISCHE DATEN DER GETRIEBEMOTOREN

22.0 - DONNEES TECHNIQUES MOTOREDUCTEURS 300 L - 300 R

Guida alla consultazione delle tabelle.

Reading the rating chart.

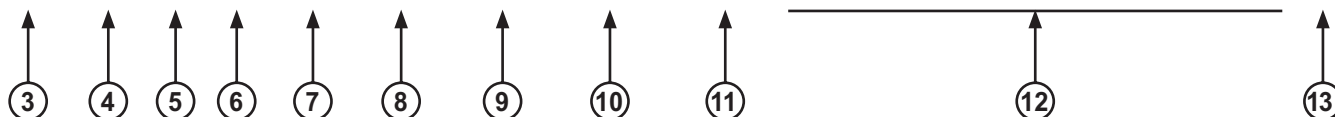
Anleitung für die richtige Konsultation der Tabellen.

Guide pour la consultation des tableaux.



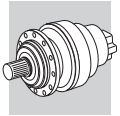
P₁ = 30 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
1.1	239514	1.5	1389	30.0	319 L4	—	BN200L4	—	—	—	636100	700800	199500	364
1.2	206034	1.7	1195	30.0	319 L4	—	BN200L4	—	—	—	608000	669900	189700	364
1.3	193443	2.7	1122	35.0	321 L4	—	BN200L4	—	—	—	731900	867900	1114500	372
1.4	182670	1.5	1059	22.0	318 L4	—	BN200L4	—	—	—	503000	520700	182200	356
1.4	178055	1.0	1032	18.0	317 L4	—	BN200L4	—	—	—	403600	429700	135500	348



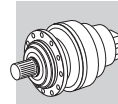
Valori di potenza termica inferiori alla potenza meccanica applicata / Thermal capacity lower than power applied / Wärmeleistung niedriger als die Motorleistung / Les valeurs de puissance thermique sont inférieures à la puissance mécanique appliquée

1	Potenza del motore elettrico abbinato al riduttore	Rating of electric motor connected to the gearbox	Übertragene Leistung am Getriebeantrieb	Puissance transmise à l'entrée du réducteur
2	Velocità albero lento	Gearbox output speed	Drehzahl am Getriebeabtrieb	Vitesse angulaire en sortie réducteur
3	Coppia trasmessa all'albero lento	Torque delivered at output shaft	Übertragenes Drehmoment am Getriebeabtrieb	Couple transmise en sortie réducteur
4	Fattore di sicurezza	Safety factor	Sicherheitsfaktor	Facteur de sécurité
5	Rapporto di riduzione	Gear ratio	Übersetzung	Rapport de réduction
6	Potenza termica riduttore	Gearbox thermal capacity	Wärmeleistung des Getriebes	Puissance thermique réducteur
7	Grandezza riduttore in esecuzione lineare	Frame size of the in-line gear unit	Baugröße des Lineargetriebes	Taille réducteur exécution linéaire
8	Grandezza riduttore in esecuzione angolare NOTA: i suffissi (B) (C) sulla stessa grandezza indicano riduzioni angolari di dimensioni differenti: vedere le pagine dimensionali	Frame size of the right-angled gear unit NOTE: Suffix (B) or (C) alongside the frame size refer to different bevel gear sets. See installation drawings for reference	Baugröße des Winkelgetriebes HINWEIS: Die Kennzeichnungen (B) (C) an der gleichen Baugröße weisen auf die Winkelreduzierung in unterschiedlichen Maßen hin: siehe Seiten mit Maßtabellen	Taille réducteur exécution angulaire REMARQUE: les indications (A) (B) (C) sur la même taille indiquent des réductions angulaires de dimensions différentes. Se reporter aux pages des dimensions
9	Grandezza motore IEC e polarità	IEC motor size and pole number	Baugröße des IEC-Motors und Anzahl der Pole	Taille moteur IEC et n° pôles
10	Grandezza motore compatto e polarità	Integral motor frame size and pole number	Baugröße des Kompaktmotors und Anzahl der Pole	Taille moteur compact et n° pôles
11	Carico radiale applicabile sull'albero lento, calcolato per: - fattore di sicurezza S=1 - durata teorica di 10000 h Per forze non agenti in mezzeria riferirsi ai diagrammi riportati a seguito delle pagine dimensionali del riduttore in oggetto	Permitted overhung loading on output shaft, based on: - safety factor S=1 - 10000 hrs theoretical lifetime For forces not applying at shaft midpoint, see diagrams provided in the pages following dimensions of the specific gearbox	Auf die Mitte der Abtriebswelle für Sicherheitsfaktor S=1 und eine Dauer von 10000 Std. applizierbare Nenn-Radialkräfte. Für andere Kraftangriffspunkte verweisen wir auf die Diagramme, die den Seiten mit den Maßen der gewählten Größe folgen	Charges radiales applicables en milieu d'arbre de sortie pendant: - facteur de sécurité S=1 - durée de 10000 heures Pour d'autres positions de charge, voir diagrammes figurant à la suite des pages dimensions de la taille sélectionnée
12	Pagina delle dimensioni. Le dimensioni dei motoriduttori si riferiscono ad abbinamenti con motori di produzione BONFIGLIOLI	Page dimensions can be sorted from. Gearmotor overall dimensions refer to matches with BONFIGLIOLI motors only	Maßseiten. Die Maße der Getriebemotoren sind nur im Fall einer Montage mit Motoren der BONFIGLIOLI gültig	Page avec les dimensions. Les dimensions des motoréducteurs sont valables seulement avec moteurs BONFIGLIOLI








P₁ = 0.25 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
					MC	MZ	HC/PC	HZ/PZ	FZ					
0.47	4439	1.6	2916	6.0	306 L4	—	BN71A4	—	45000	51000	101000	119000	35000	260
0.57	3688	3.0	2423	7.5	307 L4	—	BN71A4	—	52000	65000	109000	145000	45000	270
0.59	3557	2.0	2337	6.0	306 L4	—	BN71A4	—	45000	51000	101000	119000	35000	260
0.62	3415	1.1	2243	6.0	305 L4	—	BN71A4	—	36000	42000	64000	74000	24000	250
0.67	3157	2.2	2074	6.0	306 L4	—	BN71A4	—	45000	51000	101000	119000	35000	260
0.69	3031	0.9	1991	6.0	303 L4	—	BN71A4	—	36000	42000	64000	74000	24000	230
0.69	3031	1.2	1991	6.0	304 L4	—	BN71A4	—	36000	42000	64000	74000	24000	240
0.69	3031	1.8	1991	6.0	305 L4	—	BN71A4	—	36000	42000	64000	74000	24000	250
0.74	2823	1.7	1854	6.0	305 L4	—	BN71A4	—	36000	42000	64000	74000	24000	250
0.76	2764	1.1	1815	6.0	304 L4	—	BN71A4	—	36000	42000	64000	74000	24000	240
0.87	2415	0.9	1586	6.0	303 L4	—	BN71A4	—	36000	42000	64000	74000	24000	230
0.87	2415	1.6	1586	6.0	304 L4	—	BN71A4	—	36000	42000	64000	74000	24000	240
0.87	2415	2.0	1586	6.0	305 L4	—	BN71A4	—	36000	42000	64000	74000	24000	250
1.0	2086	1.2	1370	6.0	303 L4	—	BN71A4	—	36000	42000	62200	74000	23800	230
1.0	2086	2.2	1370	6.0	305 L4	—	BN71A4	—	36000	42000	62200	74000	23800	250
1.0	2046	1.8	1344	6.0	304 L4	—	BN71A4	—	36000	42000	61900	74000	23700	240
1.1	1946	1.4	1278	6.0	303 L4	—	BN71A4	—	36000	41900	60900	73300	23300	230
1.1	1946	2.8	1278	6.0	305 L4	—	BN71A4	—	36000	41900	60900	73300	23300	250
1.1	1941	1.2	1275	6.0	301 L4	—	BN71A4	—	11800	11800	29800	34000	7750	222
1.1	1935	2.0	1271	6.0	304 L4	—	BN71A4	—	36000	41800	60800	73200	23200	240
1.2	1772	1.6	1164	6.0	304 L4	—	BN71A4	—	35200	40600	59200	71300	22600	240
1.2	1687	1.0	1108	6.0	301 L4	—	BN71A4	—	11300	11300	28600	32900	7400	222
1.3	1671	1.4	1098	6.0	303 L4	—	BN71A4	—	34500	39800	58200	70000	22100	230
1.3	1671	2.7	1098	6.0	305 L4	—	BN71A4	—	34500	39800	58200	70000	22100	250
1.4	1555	1.5	1022	6.0	301 L4	—	BN71A4	—	11000	11000	27900	32100	7200	222
1.4	1551	1.8	1018	6.0	303 L4	—	BN71A4	—	33600	38800	56900	68500	21600	230
1.4	1551	2.5	1018	6.0	304 L4	—	BN71A4	—	33600	38800	56900	68500	21600	240
1.5	1434	1.6	942	6.0	301 L4	—	BN71A4	—	10700	10700	27200	31300	7010	222
1.5	1364	1.6	896	6.0	303 L4	—	BN71A4	—	32200	37200	54800	65900	20700	230
1.7	1254	1.8	824	12.0	—	303 R4	BN71A4	—	31300	36200	53400	64300	20100	231
1.7	1246	0.9	819	6.0	300 L4	—	BN71A4	—	9940	9940	25600	29400	6540	214
1.7	1246	1.8	819	6.0	301 L4	—	BN71A4	—	10200	10200	26100	30000	6690	222
1.7	1242	2.2	816	6.0	303 L4	—	BN71A4	—	31300	36100	53300	64100	20000	230
1.7	1213	1.5	797	12.0	—	303 R4	BN71A4	—	31000	35800	52900	63600	19900	231
1.7	1213	2.8	797	12.0	—	305 R4	BN71A4	—	31000	35800	52900	63600	19900	251
1.8	1167	1.3	766	10.0	—	301 R4	BN71A4	—	9950	9950	25600	29400	6540	223
1.8	1149	1.0	755	6.0	300 L4	—	BN71A4	—	9680	9680	25000	28700	6360	214
1.8	1149	1.9	755	6.0	301 L4	—	BN71A4	—	9900	9900	25500	29300	6510	222
1.9	1093	2.0	718	6.0	303 L4	—	BN71A4	—	29900	34600	51300	61700	19200	230
2.0	1069	2.5	702	6.0	304 L4	—	BN71A4	—	29700	34300	50900	61300	19100	240
2.0	1065	2.5	699	12.0	—	304 R4	BN71A4	—	29700	34300	50900	61200	19000	241
2.1	1003	2.1	659	12.0	—	303 R4	BN71A4	—	29100	33600	50000	60100	18700	231
2.1	989	2.3	649	6.0	303 L4	—	BN71A4	—	29000	33400	49700	59800	18600	230
2.2	938	1.1	616	6.0	300 L4	—	BN71A4	—	9260	9260	24000	27600	6090	214
2.2	938	2.3	616	6.0	301 L4	—	BN71A4	—	9260	9260	24000	27600	6090	222
2.3	933	1.6	613	10.0	—	301 R4	BN71A4	—	9240	9240	23900	27500	6080	223
2.4	863	2.8	567	12.0	—	303 R4	BN71A4	—	27700	32000	47700	57400	17800	231
2.5	852	3.0	560	12.0	—	304 R4	BN71A4	—	27600	31800	47600	57200	17700	241
2.5	849	1.2	558	6.0	300 L4	—	BN71A4	—	8950	8950	23300	26700	5890	214
2.5	849	2.5	558	6.0	301 L4	—	BN71A4	—	8950	8950	23300	26700	5890	222
2.6	804	2.5	528	12.0	—	303 R4	BN71A4	—	27000	31200	46700	56200	17300	231
2.8	752	1.4	494	6.0	300 L4	—	BN71A4	—	8600	8600	22400	25800	5650	214
2.8	752	2.8	494	6.0	301 L4	—	BN71A4	—	8600	8600	22400	25800	5650	222
2.8	748	0.9	491	10.0	—	300 R4	BN71A4	—	8580	8580	22400	25700	5640	215
2.8	748	1.9	491	10.0	—	301 R4	BN71A4	—	8580	8580	22400	25700	5640	223
3.0	690	1.5	453	10.0	—	300 R4	BN71A4	—	8350	8350	21900	25100	5490	215
3.0	690	2.8	453	10.0	—	301 R4	BN71A4	—	8350	8350	21900	25100	5490	223
3.1	681	1.5	447	6.0	300 L4	—	BN71A4	—	8320	8320	21800	25000	5470	214
3.1	681	3.0	447	6.0	301 L4	—	BN71A4	—	8320	8320	21800	25000	5470	222
3.4	614	1.1	403	6.0	300 L4	—	BN71A4	—	8040	8040	21100	24300	5280	214
3.4	614	2.2	403	6.0	301 L4	—	BN71A4	—	8040	8040	21100	24300	5280	222
3.5	599	1.1	394	10.0	—	300 R4	BN71A4	—	7970	7970	21000	24100	5240	215
3.5	599	2.3	394	10.0	—	301 R4	BN71A4	—	7970	7970	21000	24100	5240	223
3.5	612	2.8	389	7.5	303 L3	—	BN71A4	—	24400	28200	42600	51300	15700	230
3.7	589	1.1	374	7.5	300 L3	—	BN71A4	—	7840	7840	20600	23700	5150	214
3.7	589	2.3	374	7.5	301 L3	—	BN71A4	—	7840	7840	20600	23700	5150	222
3.8	553	1.8	363	10.0	—	300 R4	BN71A4	—	7760	7760	20500	23500	5100	215

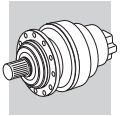


P₁ = 0.25 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]						
									MC	MZ	HC/PC	HZ/PZ	FZ		
4.2	503	1.9	330	6.0	300 L4	—	BN71A4	—	—	7520	7520	19900	22900	4940	214
4.6	471	1.4	299	7.5	300 L3	—	BN71A4	—	—	7270	7270	19300	22200	4780	214
4.6	471	2.8	299	7.5	301 L3	—	BN71A4	—	—	7270	7270	19300	22200	4780	222
4.7	443	2.1	291	10.0	—	300 R4	BN71A4	—	—	7210	7210	19100	22000	4740	215
5.1	408	2.3	268	10.0	—	300 R4	BN71A4	—	—	7020	7020	18700	21500	4610	215
5.8	377	1.7	240	7.5	300 L3	—	BN71A4	—	—	6760	6760	18100	20800	4440	214
5.8	361	1.8	237	10.0	—	300 R4	BN71A4	—	—	6740	6740	18000	20700	4430	215
6.2	348	2.6	221	7.5	300 L3	—	BN71A4	—	—	6580	6580	17600	20300	4320	214
6.4	327	2.8	215	10.0	—	300 R4	BN71A4	—	—	6520	6520	17500	20100	4280	215
7.2	302	2.2	192	7.5	300 L3	—	BN71A4	—	—	6280	6280	16900	19400	4130	214
9.6	218	3.0	143	10.0	—	300 R4	BN71A4	—	—	5690	5690	15500	17800	3740	215
10.4	209	2.6	133	12.0	—	300 R3	BN71A4	—	—	5550	5550	15100	17400	3650	215

P₁ = 0.37 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]						
									MC	MZ	HC/PC	HZ/PZ	FZ		
0.47	6672	1.0	2916	6.0	306 L4	—	BN71B4	M1SD4	—	45000	51000	101000	119000	35000	260
0.57	5543	2.0	2423	7.5	307 L4	—	BN71B4	M1SD4	—	52000	65000	109000	145000	45000	270
0.59	5346	1.3	2337	6.0	306 L4	—	BN71B4	M1SD4	—	45000	51000	101000	119000	35000	260
0.66	4744	1.5	2074	6.0	306 L4	—	BN71B4	M1SD4	—	45000	51000	101000	119000	35000	260
0.69	4555	1.2	1991	6.0	305 L4	—	BN71B4	M1SD4	—	36000	42000	64000	74000	24000	250
0.74	4243	1.1	1854	6.0	305 L4	—	BN71B4	M1SD4	—	36000	42000	64000	74000	24000	250
0.74	4217	2.4	1843	6.0	306 L4	—	BN71B4	M1SD4	—	45000	51000	101000	119000	35000	260
0.86	3653	2.4	1597	6.0	306 L4	—	BN71B4	M1SD4	—	45000	51000	101000	119000	35000	260
0.86	3629	1.1	1586	6.0	304 L4	—	BN71B4	M1SD4	—	36000	42000	64000	74000	24000	240
0.86	3629	1.3	1586	6.0	305 L4	—	BN71B4	M1SD4	—	36000	42000	64000	74000	24000	250
0.93	3374	3.0	1475	6.0	306 L4	—	BN71B4	M1SD4	—	45000	51000	101000	119000	35000	260
1.0	3135	1.5	1370	6.0	305 L4	—	BN71B4	M1SD4	—	36000	42000	62200	74000	23800	250
1.0	3074	1.2	1344	6.0	304 L4	—	BN71B4	M1SD4	—	36000	42000	61900	74000	23700	240
1.1	2927	2.9	1279	6.0	306 L4	—	BN71B4	M1SD4	—	45000	51000	99700	116100	34000	260
1.1	2924	1.0	1278	6.0	303 L4	—	BN71B4	M1SD4	—	36000	41900	60900	73300	23300	230
1.1	2924	1.9	1278	6.0	305 L4	—	BN71B4	M1SD4	—	36000	41900	60900	73300	23300	250
1.1	2908	1.3	1271	6.0	304 L4	—	BN71B4	M1SD4	—	36000	41800	60800	73200	23200	240
1.2	2663	1.1	1164	6.0	304 L4	—	BN71B4	M1SD4	—	35200	40600	59200	71300	22600	240
1.2	2512	0.9	1098	6.0	303 L4	—	BN71B4	M1SD4	—	33700	38900	57000	68600	21600	230
1.2	2512	1.8	1098	6.0	305 L4	—	BN71B4	M1SD4	—	34500	39800	58200	70000	22100	250
1.3	2338	1.0	1022	6.0	301 L4	—	BN71B4	M1SD4	—	10700	10700	27300	31400	7040	222
1.3	2330	1.2	1018	6.0	303 L4	—	BN71B4	M1SD4	—	33600	38800	56900	68500	21600	230
1.3	2330	1.7	1018	6.0	304 L4	—	BN71B4	M1SD4	—	33600	38800	56900	68500	21600	240
1.3	2330	2.3	1018	6.0	305 L4	—	BN71B4	M1SD4	—	33600	38800	56900	68500	21600	250
1.5	2156	1.1	942	6.0	301 L4	—	BN71B4	M1SD4	—	10700	10700	27200	31300	7010	222
1.5	2051	1.1	896	6.0	303 L4	—	BN71B4	M1SD4	—	32200	37200	54800	65900	20700	230
1.5	2051	2.1	896	6.0	305 L4	—	BN71B4	M1SD4	—	32200	37200	54800	65900	20700	250
1.7	1884	1.2	824	12.0	—	303 R4	BN71B4	M1SD4	—	31300	36200	53400	64300	20100	231
1.7	1884	2.2	824	12.0	—	305 R4	BN71B4	M1SD4	—	31300	36200	53400	64300	20100	251
1.7	1873	1.2	819	6.0	301 L4	—	BN71B4	M1SD4	—	10200	10200	26100	30000	6690	222
1.7	1867	1.5	816	6.0	303 L4	—	BN71B4	M1SD4	—	31300	36100	53300	64100	20000	230
1.7	1867	2.0	816	6.0	304 L4	—	BN71B4	M1SD4	—	31300	36100	53300	64100	20000	240
1.7	1867	2.9	816	6.0	305 L4	—	BN71B4	M1SD4	—	31300	36100	53300	64100	20000	250
1.7	1824	1.0	797	12.0	—	303 R4	BN71B4	M1SD4	—	31000	35800	52900	63600	19900	231
1.7	1824	1.9	797	12.0	—	305 R4	BN71B4	M1SD4	—	31000	35800	52900	63600	19900	251
1.8	1727	1.3	755	6.0	301 L4	—	BN71B4	M1SD4	—	9900	9900	25500	29300	6510	222
1.9	1643	1.3	718	6.0	303 L4	—	BN71B4	M1SD4	—	29900	34600	51300	61700	19200	230
1.9	1643	2.5	718	6.0	305 L4	—	BN71B4	M1SD4	—	29900	34600	51300	61700	19200	250
2.0	1606	1.6	702	6.0	304 L4	—	BN71B4	M1SD4	—	29700	34300	50900	61300	19100	240
2.0	1600	1.6	699	12.0	—	304 R4	BN71B4	M1SD4	—	29700	34300	50900	61200	19000	241
2.1	1508	1.4	659	12.0	—	303 R4	BN71B4	M1SD4	—	29100	33600	50000	60100	18700	231
2.1	1508	2.7	659	12.0	—	305 R4	BN71B4	M1SD4	—	29100	33600	50000	60100	18700	251
2.1	1486	1.6	649	6.0	303 L4	—	BN71B4	M1SD4	—	29000	33400	49700	59800	18600	230
2.1	1486	2.4	649	6.0	304 L4	—	BN71B4	M1SD4	—	29000	33400	49700	59800	18600	240
2.2	1410	1.5	616	6.0	301 L4	—	BN71B4	M1SD4	—	9260	9260	24000	27600	6090	222
2.2	1403	1.0	613	10.0	—	301 R4	BN71B4	M1SD4	—	9240	9240	23900	27500	6080	223
2.4	1297	1.9	567	12.0	—	303 R4	BN71B4	M1SD4	—	27700	32000	47700	57400	17800	231

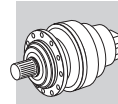


P₁ = 0.37 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
2.4	1280	2.0	560	12.0	—	304 R4	BN71B4	M1SD4	27600	31800	47600	57200	17700	241
2.5	1276	1.7	558	6.0	301 L4	—	BN71B4	M1SD4	8950	8950	23300	26700	5890	222
2.5	1272	2.2	556	6.0	303 L4	—	BN71B4	M1SD4	27500	31700	47500	57100	17600	230
2.5	1272	2.9	556	6.0	304 L4	—	BN71B4	M1SD4	27500	31700	47500	57100	17600	240
2.6	1208	1.7	528	12.0	—	303 R4	BN71B4	M1SD4	27000	31200	46700	56200	17300	231
2.8	1130	0.9	494	6.0	300 L4	—	BN71B4	M1SD4	8400	8400	22000	25300	5520	214
2.8	1130	1.8	494	6.0	301 L4	—	BN71B4	M1SD4	8600	8600	22400	25800	5650	222
2.8	1126	2.4	492	6.0	303 L4	—	BN71B4	M1SD4	26400	30500	45800	55100	16900	230
2.8	1124	1.3	491	10.0	—	301 R4	BN71B4	M1SD4	8580	8580	22400	25700	5640	223
3.0	1037	1.0	453	10.0	—	300 R4	BN71B4	M1SD4	8350	8350	21900	25100	5490	215
3.0	1037	1.9	453	10.0	—	301 R4	BN71B4	M1SD4	8350	8350	21900	25100	5490	223
3.0	1033	2.2	452	12.0	—	303 R4	BN71B4	M1SD4	25700	29600	44600	53700	16500	231
3.1	1023	1.0	447	6.0	300 L4	—	BN71B4	M1SD4	8320	8320	21800	25000	5470	214
3.1	1023	2.0	447	6.0	301 L4	—	BN71B4	M1SD4	8320	8320	21800	25000	5470	222
3.1	1020	2.8	446	6.0	303 L4	—	BN71B4	M1SD4	25500	29500	44400	53400	16400	230
3.2	1008	2.5	426	7.5	304 L3	—	BN71B4	M1SD4	25200	29000	43800	52700	16100	240
3.3	946	2.6	414	12.0	—	304 R4	BN71B4	M1SD4	24900	28800	43400	52300	16000	241
3.3	945	2.5	413	6.0	303 L4	—	BN71B4	M1SD4	24900	28800	43400	52200	16000	230
3.4	922	1.5	403	6.0	301 L4	—	BN71B4	M1SD4	8040	8040	21100	24300	5280	222
3.4	951	2.0	402	7.5	303 L3	—	BN71B4	M1SD4	24700	28500	43100	51800	15800	230
3.5	901	1.5	394	10.0	—	301 R4	BN71B4	M1SD4	7970	7970	21000	24100	5240	223
3.5	893	2.2	390	12.0	—	303 R4	BN71B4	M1SD4	24400	28200	42700	51400	15700	231
3.5	920	1.8	389	7.5	303 L3	—	BN71B4	M1SD4	24400	28200	42600	51300	15700	230
3.7	885	1.5	374	7.5	301 L3	—	BN71B4	M1SD4	7840	7840	20600	23700	5150	222
3.8	833	2.8	364	12.0	—	303 R4	BN71B4	M1SD4	23900	27600	41800	50300	15300	231
3.8	831	1.2	363	10.0	—	300 R4	BN71B4	M1SD4	7760	7760	20500	23500	5100	215
3.8	831	2.4	363	10.0	—	301 R4	BN71B4	M1SD4	7760	7760	20500	23500	5100	223
4.0	807	3.0	341	7.5	304 L3	—	BN71B4	M1SD4	23400	27000	41000	49300	15000	240
4.1	768	3.0	336	12.0	—	303 R4	BN71B4	M1SD4	23200	26800	40800	49100	14900	231
4.1	756	1.3	330	6.0	300 L4	—	BN71B4	M1SD4	7520	7520	19900	22900	4940	214
4.1	756	2.5	330	6.0	301 L4	—	BN71B4	M1SD4	7520	7520	19900	22900	4940	222
4.3	760	2.4	321	7.5	303 L3	—	BN71B4	M1SD4	22900	26400	40300	48500	14700	230
4.4	715	2.6	313	12.0	—	303 R4	BN71B4	M1SD4	22700	26200	39900	48100	14600	231
4.6	708	0.9	299	7.5	300 L3	—	BN71B4	M1SD4	7270	7270	19300	22200	4780	214
4.6	708	1.8	299	7.5	301 L3	—	BN71B4	M1SD4	7270	7270	19300	22200	4780	222
4.7	666	1.4	291	10.0	—	300 R4	BN71B4	M1SD4	7210	7210	19100	22000	4740	215
4.7	666	2.8	291	10.0	—	301 R4	BN71B4	M1SD4	7210	7210	19100	22000	4740	223
5.1	614	1.5	268	10.0	—	300 R4	BN71B4	M1SD4	7020	7020	18700	21500	4610	215
5.7	567	1.1	240	7.5	300 L3	—	BN71B4	M1SD4	6760	6760	18100	20800	4440	214
5.7	567	2.3	240	7.5	301 L3	—	BN71B4	M1SD4	6760	6760	18100	20800	4440	222
5.8	543	1.2	237	10.0	—	300 R4	BN71B4	M1SD4	6740	6740	18000	20700	4430	215
5.8	543	2.4	237	10.0	—	301 R4	BN71B4	M1SD4	6740	6740	18000	20700	4430	223
6.2	523	1.7	221	7.5	300 L3	—	BN71B4	M1SD4	6580	6580	17600	20300	4320	214
6.4	492	1.9	215	10.0	—	300 R4	BN71B4	M1SD4	6520	6520	17500	20100	4280	215
7.1	454	1.4	192	7.5	300 L3	—	BN71B4	M1SD4	6280	6280	16900	19400	4130	214
7.1	454	2.9	192	7.5	301 L3	—	BN71B4	M1SD4	6280	6280	16900	19400	4130	222
7.7	419	2.1	177	7.5	300 L3	—	BN71B4	M1SD4	6110	6110	16500	19000	4020	214
7.8	401	2.2	175	10.0	—	300 R4	BN71B4	M1SD4	6090	6090	16500	18900	4000	215
8.6	363	2.4	159	10.0	—	300 R4	BN71B4	M1SD4	5890	5890	16000	18300	3870	215
9.6	328	2.0	143	10.0	—	300 R4	BN71B4	M1SD4	5690	5690	15500	17800	3740	215
9.7	336	2.6	142	7.5	300 L3	—	BN71B4	M1SD4	5670	5670	15400	17700	3730	214
10.3	314	1.7	133	12.0	—	300 R3	BN71B4	M1SD4	5550	5550	15100	17400	3650	215
10.5	310	2.8	131	7.5	300 L3	—	BN71B4	M1SD4	5520	5520	15100	17300	3630	214
10.6	297	2.9	130	10.0	—	300 R4	BN71B4	M1SD4	5510	5510	15000	17300	3620	215
11.8	274	2.4	116	7.5	300 L3	—	BN71B4	M1SD4	5300	5300	14500	16700	3490	214
12.9	252	2.6	106	12.0	—	300 R3	BN71B4	M1SD4	5160	5160	14200	16300	3390	215

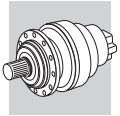
P₁ = 0.55 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
0.57	8101	1.4	2423	7.5	307 L4	—	BN80A4	M1LA4	52000	65000	109000	145000	45000	270
0.57	8101	2.1	2423	7.5	309 L4	—	BN80A4	—	—	—	110000	145000	36000	280
0.67	6934	1.0	2074	6.0	306 L4	—	BN80A4	M1LA4	45000	51000	101000	119000	35000	260








P₁ = 0.55 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
0.68	6826	2.1	2041	7.5	307 L4	—	BN80A4	M1LA4	52000	65000	109000	145000	45000	270
0.69	6697	2.5	2003	7.5	309 L4	—	BN80A4	—	—	—	110000	145000	36000	280
0.75	6164	1.6	1843	6.0	306 L4	—	BN80A4	M1LA4	45000	51000	101000	119000	35000	260
0.79	5910	2.7	1767	7.5	307 L4	—	BN80A4	M1LA4	52000	65000	109000	145000	45000	270
0.81	5761	3.0	1723	7.5	309 L4	—	BN80A4	—	—	—	110000	145000	36000	280
0.87	5339	1.6	1597	6.0	306 L4	—	BN80A4	M1LA4	45000	51000	101000	119000	35000	260
0.87	5319	2.8	1591	7.5	307 L4	—	BN80A4	M1LA4	52000	65000	109000	145000	45000	270
0.94	4931	2.0	1475	6.0	306 L4	—	BN80A4	M1LA4	45000	51000	101000	119000	35000	260
1.0	4582	1.0	1370	6.0	305 L4	—	BN80A4	M1LA4	36000	42000	62200	74000	23800	250
1.1	4278	2.0	1279	6.0	306 L4	—	BN80A4	M1LA4	45000	51000	99700	116100	34000	260
1.1	4274	1.3	1278	6.0	305 L4	—	BN80A4	M1LA4	36000	41900	60900	73300	23300	250
1.1	4262	2.9	1274	7.5	307 L4	—	BN80A4	M1LA4	50200	63000	107100	140400	43600	270
1.1	4250	0.9	1271	6.0	304 L4	—	BN80A4	M1LA4	36000	41800	60800	73200	23200	240
1.3	3671	1.2	1098	6.0	305 L4	—	BN80A4	M1LA4	34500	39800	58200	70000	22100	250
1.3	3660	2.1	1095	6.0	306 L4	—	BN80A4	M1LA4	42900	48600	95200	110800	32200	260
1.4	3406	1.1	1018	6.0	304 L4	—	BN80A4	M1LA4	33600	38800	56900	68500	21600	240
1.4	3406	1.6	1018	6.0	305 L4	—	BN80A4	M1LA4	33600	38800	56900	68500	21600	250
1.4	3394	2.8	1015	6.0	306 L4	—	BN80A4	M1LA4	41900	47400	93000	108300	31400	260
1.6	2997	1.4	896	6.0	305 L4	—	BN80A4	M1LA4	32200	37200	54800	65900	20700	250
1.6	2933	2.6	877	6.0	306 L4	—	BN80A4	M1LA4	39900	45200	89000	103700	29900	260
1.7	2776	2.3	830	12.0	—	306 R4	BN80A4	M1LA4	39100	44300	87600	102000	29400	261
1.7	2754	1.5	824	12.0	—	305 R4	BN80A4	M1LA4	31300	36200	53400	64300	20100	251
1.7	2729	1.0	816	6.0	303 L4	—	BN80A4	M1LA4	31300	36100	53300	64100	20000	230
1.7	2729	1.4	816	6.0	304 L4	—	BN80A4	M1LA4	31300	36100	53300	64100	20000	240
1.7	2729	2.0	816	6.0	305 L4	—	BN80A4	M1LA4	31300	36100	53300	64100	20000	250
1.7	2705	2.8	809	6.0	306 L4	—	BN80A4	M1LA4	38800	44000	86900	101200	29200	260
1.7	2665	1.3	797	12.0	—	305 R4	BN80A4	M1LA4	31000	35800	52900	63600	19900	251
1.9	2401	1.7	718	6.0	305 L4	—	BN80A4	M1LA4	29900	34600	51300	61700	19200	250
2.0	2347	1.1	702	6.0	304 L4	—	BN80A4	M1LA4	29700	34300	50900	61300	19100	240
2.0	2339	1.1	699	12.0	—	304 R4	BN80A4	M1LA4	29700	34300	50900	61200	19000	241
2.1	2225	2.7	665	12.0	—	306 R4	BN80A4	M1LA4	36400	41200	82000	95400	27300	261
2.1	2203	1.0	659	12.0	—	303 R4	BN80A4	M1LA4	29100	33600	50000	60100	18700	231
2.1	2203	1.8	659	12.0	—	305 R4	BN80A4	M1LA4	29100	33600	50000	60100	18700	251
2.1	2172	1.1	649	6.0	303 L4	—	BN80A4	M1LA4	29000	33400	49700	59800	18600	230
2.1	2172	1.6	649	6.0	304 L4	—	BN80A4	M1LA4	29000	33400	49700	59800	18600	240
2.1	2172	2.1	649	6.0	305 L4	—	BN80A4	M1LA4	29000	33400	49700	59800	18600	250
2.3	2061	1.0	616	6.0	301 L4	—	BN80A4	M1LA4	9260	9260	24000	27600	6090	222
2.5	1895	1.3	567	12.0	—	303 R4	BN80A4	M1LA4	27700	32000	47700	57400	17800	231
2.5	1895	2.6	567	12.0	—	305 R4	BN80A4	M1LA4	27700	32000	47700	57400	17800	251
2.5	1871	1.4	560	12.0	—	304 R4	BN80A4	M1LA4	27600	31800	47600	57200	17700	241
2.5	1865	1.1	558	6.0	301 L4	—	BN80A4	M1LA4	8950	8950	23300	26700	5890	222
2.5	1860	1.5	556	6.0	303 L4	—	BN80A4	M1LA4	27500	31700	47500	57100	17600	230
2.5	1860	2.0	556	6.0	304 L4	—	BN80A4	M1LA4	27500	31700	47500	57100	17600	240
2.5	1860	3.0	556	6.0	305 L4	—	BN80A4	M1LA4	27500	31700	47500	57100	17600	250
2.6	1765	1.1	528	12.0	—	303 R4	BN80A4	M1LA4	27000	31200	46700	56200	17300	231
2.6	1765	2.2	528	12.0	—	305 R4	BN80A4	M1LA4	27000	31200	46700	56200	17300	251
2.8	1651	1.3	494	6.0	301 L4	—	BN80A4	M1LA4	8600	8600	22400	25800	5650	222
2.8	1646	1.6	492	6.0	303 L4	—	BN80A4	M1LA4	26400	30500	45800	55100	16900	230
2.8	1646	2.3	492	6.0	304 L4	—	BN80A4	M1LA4	26400	30500	45800	55100	16900	240
3.1	1515	1.3	453	10.0	—	301 R4	BN80A4	M1LA4	8350	8350	21900	25100	5490	223
3.1	1510	1.5	452	12.0	—	303 R4	BN80A4	M1LA4	25700	29600	44600	53700	16500	231
3.1	1510	2.4	452	12.0	—	304 R4	BN80A4	M1LA4	25700	29600	44600	53700	16500	241
3.1	1495	1.4	447	6.0	301 L4	—	BN80A4	M1LA4	8320	8320	21800	25000	5470	222
3.1	1490	1.9	446	6.0	303 L4	—	BN80A4	M1LA4	25500	29500	44400	53400	16400	230
3.1	1490	2.5	446	6.0	304 L4	—	BN80A4	M1LA4	25500	29500	44400	53400	16400	240
3.3	1473	1.7	426	7.5	304 L3	—	BN80A4	M1LA4	25200	29000	43800	52700	16100	240
3.4	1383	1.8	414	12.0	—	304 R4	BN80A4	M1LA4	24900	28800	43400	52300	16000	241
3.4	1382	1.7	413	6.0	303 L4	—	BN80A4	M1LA4	24900	28800	43400	52200	16000	230
3.4	1382	2.2	413	6.0	304 L4	—	BN80A4	M1LA4	24900	28800	43400	52200	16000	240
3.4	1348	1.0	403	6.0	301 L4	—	BN80A4	M1LA4	8040	8040	21100	24300	5280	222
3.5	1389	1.4	402	7.5	303 L3	—	BN80A4	M1LA4	24700	28500	43100	51800	15800	230
3.5	1389	2.7	402	7.5	305 L3	—	BN80A4	M1LA4	24700	28500	43100	51800	15800	250
3.5	1316	1.0	394	10.0	—	301 R4	BN80A4	M1LA4	7970	7970	21000	24100	5240	223
3.6	1305	1.5	390	12.0	—	303 R4	BN80A4	M1LA4	24400	28200	42700	51400	15700	231
3.6	1305	2.9	390	12.0	—	305 R4	BN80A4	M1LA4	24400	28200	42700	51400	15700	251
3.6	1344	1.3	389	7.5	303 L3	—	BN80A4	M1LA4	24400	28200	42600	51300	15700	230
3.6	1344	2.4	389	7.5	305 L3	—	BN80A4	M1LA4	24400	28200	42600	51300	15700	250

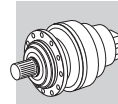


P₁ = 0.55 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
3.7	1293	1.0	374	7.5	301 L3	—	BN80A4	M1LA4	7840	7840	20600	23700	5150	222
3.8	1217	1.9	364	12.0	—	303 R4	BN80A4	M1LA4	23900	27600	41800	50300	15300	231
3.8	1217	2.4	364	12.0	—	304 R4	BN80A4	M1LA4	23900	27600	41800	50300	15300	241
3.8	1214	1.6	363	10.0	—	301 R4	BN80A4	M1LA4	7760	7760	20500	23500	5100	223
4.1	1180	2.1	341	7.5	304 L3	—	BN80A4	M1LA4	23400	27000	41000	49300	15000	240
4.1	1129	2.1	338	12.0	—	304 R4	BN80A4	M1LA4	23300	26900	40900	49200	14900	241
4.1	1122	2.0	336	12.0	—	303 R4	BN80A4	M1LA4	23200	26800	40800	49100	14900	231
4.2	1105	1.7	330	6.0	301 L4	—	BN80A4	M1LA4	7520	7520	19900	22900	4940	222
4.3	1111	1.7	321	7.5	303 L3	—	BN80A4	M1LA4	22900	26400	40300	48500	14700	230
4.4	1045	1.8	313	12.0	—	303 R4	BN80A4	M1LA4	22700	26200	39900	48100	14600	231
4.6	1034	1.3	299	7.5	301 L3	—	BN80A4	M1LA4	7270	7270	19300	22200	4780	222
4.8	973	1.0	291	10.0	—	300 R4	BN80A4	M1LA4	7210	7210	19100	22000	4740	215
4.8	973	1.9	291	10.0	—	301 R4	BN80A4	M1LA4	7210	7210	19100	22000	4740	223
4.8	970	2.7	290	12.0	—	303 R4	BN80A4	M1LA4	22100	25600	39100	47000	14200	231
5.0	956	2.3	276	7.5	303 L3	—	BN80A4	M1LA4	21800	25200	38500	46300	14000	230
5.1	944	2.5	273	7.5	304 L3	—	BN80A4	M1LA4	21700	25000	38300	46100	13900	240
5.2	897	1.0	268	10.0	—	300 R4	BN80A4	M1LA4	7020	7020	18700	21500	4610	215
5.2	897	2.1	268	10.0	—	301 R4	BN80A4	M1LA4	7020	7020	18700	21500	4610	223
5.4	891	2.1	258	7.5	303 L3	—	BN80A4	M1LA4	21300	24600	37700	45300	13600	230
5.4	853	2.2	255	12.0	—	303 R4	BN80A4	M1LA4	21200	24500	37600	45200	13600	231
5.8	829	1.6	240	7.5	301 L3	—	BN80A4	M1LA4	6760	6760	18100	20800	4440	222
5.9	794	1.6	237	10.0	—	301 R4	BN80A4	M1LA4	6740	6740	18000	20700	4430	223
6.0	772	2.4	231	12.0	—	303 R4	BN80A4	M1LA4	20500	23700	36500	43900	13200	231
6.3	764	1.2	221	7.5	300 L3	—	BN80A4	M1LA4	6580	6580	17600	20300	4320	214
6.3	764	2.3	221	7.5	301 L3	—	BN80A4	M1LA4	6580	6580	17600	20300	4320	222
6.3	762	3.0	220	7.5	303 L3	—	BN80A4	M1LA4	20200	23300	36000	43300	13000	230
6.5	719	1.3	215	10.0	—	300 R4	BN80A4	M1LA4	6520	6520	17500	20100	4280	215
6.5	719	2.5	215	10.0	—	301 R4	BN80A4	M1LA4	6520	6520	17500	20100	4280	223
7.2	664	1.0	192	7.5	300 L3	—	BN80A4	M1LA4	6280	6280	16900	19400	4130	214
7.2	664	2.0	192	7.5	301 L3	—	BN80A4	M1LA4	6280	6280	16900	19400	4130	222
7.3	658	2.8	190	7.5	303 L3	—	BN80A4	M1LA4	19200	22200	34400	41400	12300	230
7.8	612	1.4	177	7.5	300 L3	—	BN80A4	M1LA4	6110	6110	16500	19000	4020	214
7.8	612	2.9	177	7.5	301 L3	—	BN80A4	M1LA4	6110	6110	16500	19000	4020	222
7.9	587	1.5	175	10.0	—	300 R4	BN80A4	M1LA4	6090	6090	16500	18900	4000	215
8.8	531	1.6	159	10.0	—	300 R4	BN80A4	M1LA4	5890	5890	16000	18300	3870	215
9.7	479	1.4	143	10.0	—	300 R4	BN80A4	M1LA4	5690	5690	15500	17800	3740	215
9.7	479	2.7	143	10.0	—	301 R4	BN80A4	M1LA4	5690	5690	15500	17800	3740	223
9.8	491	1.8	142	7.5	300 L3	—	BN80A4	M1LA4	5670	5670	15400	17700	3730	214
10.5	459	1.2	133	12.0	—	300 R3	BN80A4	M1LA4	5420	5420	14800	17000	3570	215
10.5	459	2.5	133	12.0	—	301 R3	BN80A4	M1LA4	5550	5550	15100	17400	3650	223
10.6	453	1.9	131	7.5	300 L3	—	BN80A4	M1LA4	5520	5520	15100	17300	3630	214
10.7	434	2.0	130	10.0	—	300 R4	BN80A4	M1LA4	5510	5510	15000	17300	3620	215
12.0	401	1.6	116	7.5	300 L3	—	BN80A4	M1LA4	5300	5300	14500	16700	3490	214
13.1	368	1.8	106	12.0	—	300 R3	BN80A4	M1LA4	5160	5160	14200	16300	3390	215
13.1	354	2.4	106	10.0	—	300 R4	BN80A4	M1LA4	5150	5150	14100	16200	3380	215
13.3	363	2.4	105	7.5	300 L3	—	BN80A4	M1LA4	5130	5130	14100	16200	3370	214
16.2	296	2.9	85.6	7.5	300 L3	—	BN80A4	M1LA4	4790	4790	13300	15200	3150	214
16.3	294	2.2	85.2	12.0	—	300 R3	BN80A4	M1LA4	4790	4790	13200	15200	3150	215
19.9	242	2.7	69.9	7.5	300 L3	—	BN80A4	M1LA4	4480	4480	12500	14300	2950	214
20.4	236	2.8	68.2	12.0	—	300 R3	BN80A4	M1LA4	4440	4440	12400	14200	2920	215
21.5	231	2.4	64.8	7.5	300 L2	—	BN80A4	M1LA4	4370	4370	12200	14000	2870	214

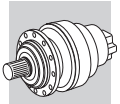
P₁ = 0.75 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
0.55	11325	2.3	2523	11.0	310 L4	—	BN80B4	—	—	—	133000	166000	65000	290
0.58	10872	1.0	2423	7.5	307 L4	—	BN80B4	M2SA4	52000	65000	109000	145000	45000	270
0.58	10872	1.6	2423	7.5	309 L4	—	BN80B4	—	—	—	110000	145000	36000	280
0.69	9161	1.6	2041	7.5	307 L4	—	BN80B4	M2SA4	52000	65000	109000	145000	45000	270
0.69	9075	2.9	2022	11.0	310 L4	—	BN80B4	—	—	—	133000	166000	65000	290
0.70	8988	1.9	2003	7.5	309 L4	—	BN80B4	—	—	—	110000	145000	36000	280
0.76	8272	1.2	1843	6.0	306 L4	—	BN80B4	M2SA4	45000	51000	101000	119000	35000	260
0.79	7932	2.0	1767	7.5	307 L4	—	BN80B4	M2SA4	52000	65000	109000	145000	45000	270








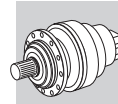
P₁ = 0.75 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
0.81	7731	2.2	1723	7.5	309 L4	—	BN80B4	—	—	—	110000	145000	36000	280
0.87	7202	2.4	1605	7.5	309 L4	—	BN80B4	—	—	—	110000	145000	36000	280
0.88	7166	1.2	1597	6.0	306 L4	—	BN80B4	M2SA4	45000	51000	101000	119000	35000	260
0.88	7138	2.1	1591	7.5	307 L4	—	BN80B4	M2SA4	52000	65000	109000	145000	45000	270
0.95	6618	1.5	1475	6.0	306 L4	—	BN80B4	M2SA4	45000	51000	101000	119000	35000	260
0.99	6320	2.5	1408	7.5	307 L4	—	BN80B4	M2SA4	51900	65000	109000	144700	45000	270
1.0	6195	2.7	1380	7.5	309 L4	—	BN80B4	—	—	—	110000	143800	35800	280
1.1	5771	2.9	1286	7.5	309 L4	—	BN80B4	—	—	—	109200	140800	35000	280
1.1	5742	1.5	1279	6.0	306 L4	—	BN80B4	M2SA4	45000	51000	99700	116100	34000	260
1.1	5736	1.0	1278	6.0	305 L4	—	BN80B4	M2SA4	36000	41900	60900	73300	23300	250
1.1	5720	2.2	1274	7.5	307 L4	—	BN80B4	M2SA4	50200	63000	107100	140400	43600	270
1.2	5191	2.7	1157	7.5	307 L4	—	BN80B4	M2SA4	48600	60900	104100	136400	42200	270
1.3	4927	0.9	1098	6.0	305 L4	—	BN80B4	M2SA4	33700	38900	57000	68600	21600	250
1.3	4912	1.6	1095	6.0	306 L4	—	BN80B4	M2SA4	42900	48600	95200	110800	32200	260
1.4	4571	1.2	1018	6.0	305 L4	—	BN80B4	M2SA4	33600	38800	56900	68500	21600	250
1.4	4555	2.1	1015	6.0	306 L4	—	BN80B4	M2SA4	41900	47400	93000	108300	31400	260
1.6	4022	1.1	896	7.5	305 L4	—	BN80B4	M2SA4	46300	58000	99600	130500	40200	250
1.6	3936	2.0	877	6.0	306 L4	—	BN80B4	M2SA4	39900	45200	89000	103700	29900	260
1.7	3726	1.7	830	12.0	—	306 R4	BN80B4	M2SA4	39100	44300	87600	102000	29400	261
1.7	3696	1.1	824	12.0	—	305 R4	BN80B4	M2SA4	31300	36200	53400	64300	20100	251
1.7	3663	1.0	816	6.0	304 L4	—	BN80B4	M2SA4	31300	36100	53300	64100	20000	240
1.7	3663	1.5	816	6.0	305 L4	—	BN80B4	M2SA4	31300	36100	53300	64100	20000	250
1.7	3630	2.1	809	6.0	306 L4	—	BN80B4	M2SA4	38800	44000	86900	101200	29200	260
1.8	3577	1.0	797	12.0	—	305 R4	BN80B4	M2SA4	31000	35800	52900	63600	19900	251
1.9	3223	1.3	718	6.0	305 L4	—	BN80B4	M2SA4	29900	34600	51300	61700	19200	250
2.1	2986	2.0	665	12.0	—	306 R4	BN80B4	M2SA4	36400	41200	82000	95400	27300	261
2.1	2957	1.4	659	12.0	—	305 R4	BN80B4	M2SA4	29100	33600	50000	60100	18700	251
2.2	2915	1.2	649	6.0	304 L4	—	BN80B4	M2SA4	29000	33400	49700	59800	18600	240
2.2	2915	1.5	649	6.0	305 L4	—	BN80B4	M2SA4	29000	33400	49700	59800	18600	250
2.5	2544	1.0	567	12.0	—	303 R4	BN80B4	M2SA4	27700	32000	47700	57400	17800	231
2.5	2544	1.9	567	12.0	—	305 R4	BN80B4	M2SA4	27700	32000	47700	57400	17800	251
2.5	2511	1.0	560	12.0	—	304 R4	BN80B4	M2SA4	27600	31800	47600	57200	17700	241
2.5	2496	1.1	556	6.0	303 L4	—	BN80B4	M2SA4	27500	31700	47500	57100	17600	230
2.5	2496	1.5	556	6.0	304 L4	—	BN80B4	M2SA4	27500	31700	47500	57100	17600	240
2.5	2496	2.2	556	6.0	305 L4	—	BN80B4	M2SA4	27500	31700	47500	57100	17600	250
2.5	2468	2.9	550	12.0	—	306 R4	BN80B4	M2SA4	34100	38700	77400	90100	25600	261
2.7	2369	1.7	528	12.0	—	305 R4	BN80B4	M2SA4	27000	31200	46700	56200	17300	251
2.8	2216	0.9	494	6.0	301 L4	—	BN80B4	M2SA4	8400	8400	22000	25300	5520	222
2.8	2209	1.2	492	6.0	303 L4	—	BN80B4	M2SA4	26400	30500	45800	55100	16900	230
2.8	2209	1.7	492	6.0	304 L4	—	BN80B4	M2SA4	26400	30500	45800	55100	16900	240
2.8	2209	2.4	492	6.0	305 L4	—	BN80B4	M2SA4	26400	30500	45800	55100	16900	250
3.1	2033	0.9	453	10.0	—	301 R4	BN80B4	M2SA4	8350	8350	21900	25100	5490	223
3.1	2027	1.1	452	12.0	—	303 R4	BN80B4	M2SA4	25700	29600	44600	53700	16500	231
3.1	2027	1.8	452	12.0	—	304 R4	BN80B4	M2SA4	25700	29600	44600	53700	16500	241
3.1	2027	2.3	452	12.0	—	305 R4	BN80B4	M2SA4	25700	29600	44600	53700	16500	251
3.1	2006	1.0	447	6.0	301 L4	—	BN80B4	M2SA4	8320	8320	21800	25000	5470	222
3.1	2000	1.4	446	6.0	303 L4	—	BN80B4	M2SA4	25500	29500	44400	53400	16400	230
3.1	2000	1.9	446	6.0	304 L4	—	BN80B4	M2SA4	25500	29500	44400	53400	16400	240
3.1	2000	2.7	446	6.0	305 L4	—	BN80B4	M2SA4	25500	29500	44400	53400	16400	250
3.3	1976	1.2	426	7.5	304 L3	—	BN80B4	M2SA4	25200	29000	43800	52700	16100	240
3.4	1856	1.3	414	12.0	—	304 R4	BN80B4	M2SA4	24900	28800	43400	52300	16000	241
3.4	1855	1.3	413	6.0	303 L4	—	BN80B4	M2SA4	24900	28800	43400	52200	16000	230
3.4	1855	1.6	413	6.0	304 L4	—	BN80B4	M2SA4	24900	28800	43400	52200	16000	240
3.4	1855	2.5	413	6.0	305 L4	—	BN80B4	M2SA4	24900	28800	43400	52200	16000	250
3.5	1865	1.0	402	7.5	303 L3	—	BN80B4	M2SA4	24700	28500	43100	51800	15800	230
3.5	1865	2.0	402	7.5	305 L3	—	BN80B4	M2SA4	24700	28500	43100	51800	15800	250
3.6	1751	1.1	390	12.0	—	303 R4	BN80B4	M2SA4	24400	28200	42700	51400	15700	231
3.6	1751	2.1	390	12.0	—	305 R4	BN80B4	M2SA4	24400	28200	42700	51400	15700	251
3.6	1804	0.9	389	7.5	303 L3	—	BN80B4	M2SA4	24400	28200	42600	51300	15700	230
3.6	1804	1.8	389	7.5	305 L3	—	BN80B4	M2SA4	24400	28200	42600	51300	15700	250
3.8	1633	1.4	364	12.0	—	303 R4	BN80B4	M2SA4	23900	27600	41800	50300	15300	231
3.8	1633	1.8	364	12.0	—	304 R4	BN80B4	M2SA4	23900	27600	41800	50300	15300	241
3.8	1633	2.8	364	12.0	—	305 R4	BN80B4	M2SA4	23900	27600	41800	50300	15300	251
3.9	1629	1.2	363	10.0	—	301 R4	BN80B4	M2SA4	7760	7760	20500	23500	5100	223
4.1	1584	1.5	341	7.5	304 L3	—	BN80B4	M2SA4	23400	27000	41000	49300	15000	240
4.1	1515	1.6	338	12.0	—	304 R4	BN80B4	M2SA4	23300	26900	40900	49200	14900	241
4.2	1506	1.5	336	12.0	—	303 R4	BN80B4	M2SA4	23200	26800	40800	49100	14900	231








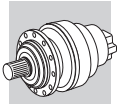
P₁ = 0.75 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
4.2	1482	1.3	330	12.0	301 L4	—	BN80B4	M2SA4	23200	26800	40800	49100	14900	222
4.4	1492	1.2	321	7.5	303 L3	—	BN80B4	M2SA4	22900	26400	40300	48500	14700	230
4.4	1492	2.4	321	7.5	305 L3	—	BN80B4	M2SA4	22900	26400	40300	48500	14700	250
4.5	1403	1.3	313	12.0	—	303 R4	BN80B4	M2SA4	22700	26200	39900	48100	14600	231
4.5	1403	2.6	313	12.0	—	305 R4	BN80B4	M2SA4	22700	26200	39900	48100	14600	251
4.6	1376	2.5	307	12.0	—	304 R4	BN80B4	M2SA4	22500	26000	39700	47800	14500	241
4.7	1388	0.9	299	7.5	301 L3	—	BN80B4	M2SA4	7270	7270	19300	22200	4780	222
4.8	1305	1.4	291	10.0	—	301 R4	BN80B4	M2SA4	7210	7210	19100	22000	4740	223
4.8	1301	2.0	290	12.0	—	303 R4	BN80B4	M2SA4	22100	25600	39100	47000	14200	231
4.8	1301	2.8	290	12.0	—	304 R4	BN80B4	M2SA4	22100	25600	39100	47000	14200	241
5.1	1283	1.7	276	7.5	303 L3	—	BN80B4	M2SA4	21800	25200	38500	46300	14000	230
5.1	1267	1.9	273	7.5	304 L3	—	BN80B4	M2SA4	21700	25000	38300	46100	13900	240
5.2	1204	1.6	268	10.0	—	301 R4	BN80B4	M2SA4	7020	7020	18700	21500	4610	223
5.4	1195	1.5	258	7.5	303 L3	—	BN80B4	M2SA4	21300	24600	37700	45300	13600	230
5.5	1145	1.6	255	12.0	—	303 R4	BN80B4	M2SA4	21200	24500	37600	45200	13600	231
5.8	1112	1.2	240	7.5	301 L3	—	BN80B4	M2SA4	6760	6760	18100	20800	4440	222
5.9	1066	1.2	237	10.0	—	301 R4	BN80B4	M2SA4	6740	6740	18000	20700	4430	223
6.1	1037	1.8	231	12.0	—	303 R4	BN80B4	M2SA4	20500	23700	36500	43900	13200	231
6.3	1026	1.7	221	7.5	301 L3	—	BN80B4	M2SA4	6580	6580	17600	20300	4320	222
6.4	1023	2.2	220	7.5	303 L3	—	BN80B4	M2SA4	20200	23300	36000	43300	13000	230
6.5	965	0.9	215	10.0	—	300 R4	BN80B4	M2SA4	6370	6370	17100	19700	4190	215
6.5	965	1.9	215	10.0	—	301 R4	BN80B4	M2SA4	6520	6520	17500	20100	4280	223
6.5	962	2.8	214	12.0	—	303 R4	BN80B4	M2SA4	20000	23100	35700	42900	12800	231
6.9	936	2.6	202	7.5	304 L3	—	BN80B4	M2SA4	19600	22600	35000	42100	12600	240
7.3	891	1.5	192	7.5	301 L3	—	BN80B4	M2SA4	6280	6280	16900	19400	4130	222
7.4	883	2.1	190	7.5	303 L3	—	BN80B4	M2SA4	19200	22200	34400	41400	12300	230
7.6	830	2.8	185	12.0	—	303 R4	BN80B4	M2SA4	19100	22000	34100	41100	12200	231
7.9	824	2.7	178	7.5	303 L3	—	BN80B4	M2SA4	18800	21700	33700	40600	12100	230
7.9	822	1.1	177	7.5	300 L3	—	BN80B4	M2SA4	6110	6110	16500	19000	4020	214
7.9	822	2.2	177	7.5	301 L3	—	BN80B4	M2SA4	6110	6110	16500	19000	4020	222
8.0	787	1.1	175	10.0	—	300 R4	BN80B4	M2SA4	6090	6090	16500	18900	4000	215
8.0	787	2.2	175	10.0	—	301 R4	BN80B4	M2SA4	6090	6090	16500	18900	4000	223
8.6	760	2.9	164	7.5	303 L3	—	BN80B4	M2SA4	18300	21100	32900	39600	11700	230
8.8	713	1.2	159	10.0	—	300 R4	BN80B4	M2SA4	5890	5890	16000	18300	3870	215
8.8	713	2.4	159	10.0	—	301 R4	BN80B4	M2SA4	5890	5890	16000	18300	3870	223
9.2	708	2.6	152	7.5	303 L3	—	BN80B4	M2SA4	17900	20600	32200	38700	11500	230
9.8	643	1.0	143	10.0	—	300 R4	BN80B4	M2SA4	5690	5690	15500	17800	3740	215
9.8	643	2.0	143	10.0	—	301 R4	BN80B4	M2SA4	5690	5690	15500	17800	3740	223
9.9	659	1.3	142	7.5	300 L3	—	BN80B4	M2SA4	5670	5670	15400	17700	3730	214
9.9	659	2.6	142	7.5	301 L3	—	BN80B4	M2SA4	5670	5670	15400	17700	3730	222
10.5	617	1.9	133	12.0	—	301 R3	BN80B4	M2SA4	5550	5550	15100	17400	3650	223
10.7	607	1.4	131	7.5	300 L3	—	BN80B4	M2SA4	5520	5520	15100	17300	3630	214
10.7	607	2.8	131	7.5	301 L3	—	BN80B4	M2SA4	5520	5520	15100	17300	3630	222
10.8	582	1.5	130	10.0	—	300 R4	BN80B4	M2SA4	5510	5510	15000	17300	3620	215
10.8	582	3.0	130	10.0	—	301 R4	BN80B4	M2SA4	5510	5510	15000	17300	3620	223
12.1	538	1.2	116	7.5	300 L3	—	BN80B4	M2SA4	5300	5300	14500	16700	3490	214
12.1	538	2.4	116	7.5	301 L3	—	BN80B4	M2SA4	5300	5300	14500	16700	3490	222
13.2	494	1.3	106	12.0	—	300 R3	BN80B4	M2SA4	5160	5160	14200	16300	3390	215
13.2	494	2.6	106	12.0	—	301 R3	BN80B4	M2SA4	5160	5160	14200	16300	3390	223
13.2	475	1.8	106	10.0	—	300 R4	BN80B4	M2SA4	5150	5150	14100	16200	3380	215
13.4	487	1.8	105	7.5	300 L3	—	BN80B4	M2SA4	5130	5130	14100	16200	3370	214
16.4	397	2.1	85.6	7.5	300 L3	—	BN80B4	M2SA4	4790	4790	13300	15200	3150	214
16.4	395	1.6	85.2	12.0	—	300 R3	BN80B4	M2SA4	4790	4790	13200	15200	3150	215
17.8	365	2.3	78.7	12.0	—	300 R3	BN80B4	M2SA4	4660	4660	12900	14900	3060	215
18.1	360	2.4	77.5	7.5	300 L3	—	BN80B4	M2SA4	4640	4640	12900	14800	3050	214
20.0	324	2.0	69.9	7.5	300 L3	—	BN80B4	M2SA4	4480	4480	12500	14300	2950	214
20.5	317	2.1	68.2	12.0	—	300 R3	BN80B4	M2SA4	4440	4440	12400	14200	2920	215
21.6	311	1.8	64.8	7.5	300 L2	—	BN80B4	M2SA4	4370	4370	12200	14000	2870	214
22.1	294	2.9	63.2	7.5	300 L3	—	BN80B4	M2SA4	4330	4330	12100	13900	2850	214
22.2	292	2.9	62.9	12.0	—	300 R3	BN80B4	M2SA4	4330	4330	12100	13900	2840	215
27.0	249	2.6	51.9	7.5	300 L2	—	BN80B4	M2SA4	4060	4060	11400	13100	2670	214



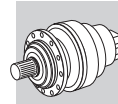
P₁ = 1.1 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
0.55	16877	1.5	2523	11.0	310 L4	—	BN90S4	—	—	—	133000	166000	65000	290
0.57	16202	1.0	2423	7.5	309 L4	—	BN90S4	—	—	—	110000	145000	36000	280
0.66	14021	2.4	2096	11.0	311 L4	—	BN90S4	—	—	—	157000	195000	65000	300
0.68	13652	1.0	2041	7.5	307 L4	—	BN90S4	M2SB4	52000	65000	109000	145000	45000	270
0.69	13523	1.9	2022	11.0	310 L4	—	BN90S4	—	—	—	133000	166000	65000	290
0.69	13394	1.3	2003	7.5	309 L4	—	BN90S4	—	—	—	110000	145000	36000	280
0.77	12001	2.2	1794	11.0	310 L4	—	BN90S4	—	—	—	133000	166000	65000	290
0.79	11820	1.3	1767	7.5	307 L4	—	BN90S4	M2SB4	52000	65000	109000	145000	45000	270
0.81	11521	1.5	1723	7.5	309 L4	—	BN90S4	—	—	—	110000	145000	36000	280
0.83	11179	2.3	1672	11.0	310 L4	—	BN90S4	—	—	—	133000	166000	65000	290
0.87	10732	1.6	1605	7.5	309 L4	—	BN90S4	—	—	—	110000	145000	36000	280
0.87	10638	1.4	1591	7.5	307 L4	—	BN90S4	M2SB4	52000	65000	109000	145000	45000	270
0.94	9862	1.0	1475	6.0	306 L4	—	BN90S4	M2SB4	45000	51000	101000	119000	35000	260
0.97	9616	2.7	1438	11.0	310 L4	—	BN90S4	—	—	—	133000	166000	65000	290
0.99	9419	1.7	1408	7.5	307 L4	—	BN90S4	M2SB4	51900	65000	109000	144700	45000	270
1.0	9232	1.8	1380	7.5	309 L4	—	BN90S4	—	—	—	110000	143800	35800	280
1.1	8599	1.9	1286	7.5	309 L4	—	BN90S4	—	—	—	109200	140800	35000	280
1.1	8557	1.0	1279	6.0	306 L4	—	BN90S4	M2SB4	45000	51000	99700	116100	34000	260
1.1	8524	1.4	1274	7.5	307 L4	—	BN90S4	M2SB4	50200	63000	107100	140400	43600	270
1.2	7736	1.8	1157	7.5	307 L4	—	BN90S4	M2SB4	48600	60900	104100	136400	42200	270
1.2	7687	2.1	1149	7.5	309 L4	—	BN90S4	—	—	—	105500	136100	33700	280
1.3	7320	1.1	1095	6.0	306 L4	—	BN90S4	M2SB4	42900	48600	95200	110800	32200	260
1.4	6788	1.4	1015	6.0	306 L4	—	BN90S4	M2SB4	41900	47400	93000	108300	31400	260
1.4	6682	2.1	999	7.5	307 L4	—	BN90S4	M2SB4	46300	58000	99600	130500	40200	270
1.4	6682	2.7	999	7.5	309 L4	—	BN90S4	—	—	—	101200	130500	32200	280
1.5	6061	2.5	906	7.5	307 L4	—	BN90S4	M2SB4	44800	56200	96700	126800	38900	270
1.5	6061	3.0	906	7.5	309 L4	—	BN90S4	—	—	—	98300	126800	31100	280
1.6	5866	1.3	877	6.0	306 L4	—	BN90S4	M2SB4	39900	45200	89000	103700	29900	260
1.7	5553	1.1	830	12.0	—	306 R4	BN90S4	M2SB4	39100	44300	87600	102000	29400	261
1.7	5458	1.0	816	6.0	305 L4	—	BN90S4	M2SB4	31300	36100	53300	64100	20000	250
1.7	5409	1.4	809	6.0	306 L4	—	BN90S4	M2SB4	38800	44000	86900	101200	29200	260
1.7	5354	2.5	801	7.5	307 L4	—	BN90S4	M2SB4	43000	53900	93200	122100	37400	270
2.0	4679	2.0	700	6.0	306 L4	—	BN90S4	M2SB4	37000	41900	83200	96900	27800	260
2.0	4613	2.1	690	15.0	—	307 R4	BN90S4	M2SB4	40900	51300	89100	116800	35500	271
2.1	4449	1.4	665	12.0	—	306 R4	BN90S4	M2SB4	36400	41200	82000	95400	27300	261
2.1	4407	0.9	659	12.0	—	305 R4	BN90S4	M2SB4	29100	33600	50000	60100	18700	251
2.1	4371	3.0	654	7.5	307 L4	—	BN90S4	M2SB4	40200	50400	87700	114900	34900	270
2.1	4344	1.0	649	6.0	305 L4	—	BN90S4	M2SB4	29000	33400	49700	59800	18600	250
2.2	4250	2.2	636	6.0	306 L4	—	BN90S4	M2SB4	35800	40600	80800	94100	26900	260
2.4	3949	2.1	590	12.0	—	306 R4	BN90S4	M2SB4	34900	39600	79100	92100	26200	261
2.4	3941	2.4	589	6.0	306 L4	—	BN90S4	M2SB4	34900	39600	79000	92000	26200	260
2.5	3791	1.3	567	12.0	—	305 R4	BN90S4	M2SB4	27700	32000	47700	57400	17800	251
2.5	3719	1.0	556	6.0	304 L4	—	BN90S4	M2SB4	27500	31700	47500	57100	17600	240
2.5	3719	1.5	556	6.0	305 L4	—	BN90S4	M2SB4	27500	31700	47500	57100	17600	250
2.5	3678	2.0	550	12.0	—	306 R4	BN90S4	M2SB4	34100	38700	77400	90100	25600	261
2.6	3531	1.1	528	12.0	—	305 R4	BN90S4	M2SB4	27000	31200	46700	56200	17300	251
2.7	3406	2.8	509	6.0	306 L4	—	BN90S4	M2SB4	33300	37700	75600	88100	25000	260
2.8	3292	1.1	492	6.0	304 L4	—	BN90S4	M2SB4	26400	30500	45800	55100	16900	240
2.8	3292	1.6	492	6.0	305 L4	—	BN90S4	M2SB4	26400	30500	45800	55100	16900	250
2.8	3280	2.8	490	15.0	—	307 R4	BN90S4	M2SB4	36500	45800	80500	105400	31700	271
2.8	3264	2.8	488	12.0	—	306 R4	BN90S4	M2SB4	32800	37100	74700	87000	24600	261
3.1	3041	2.3	455	12.0	—	306 R4	BN90S4	M2SB4	32000	36300	73100	85100	24100	261
3.1	3021	1.2	452	12.0	—	304 R4	BN90S4	M2SB4	25700	29600	44600	53700	16500	241
3.1	3021	1.6	452	12.0	—	305 R4	BN90S4	M2SB4	25700	29600	44600	53700	16500	251
3.1	2980	0.9	446	6.0	303 L4	—	BN90S4	M2SB4	25500	29500	44400	53400	16400	230
3.1	2980	1.2	446	6.0	304 L4	—	BN90S4	M2SB4	25500	29500	44400	53400	16400	240
3.1	2980	1.8	446	6.0	305 L4	—	BN90S4	M2SB4	25500	29500	44400	53400	16400	250
3.4	2764	1.1	413	6.0	304 L4	—	BN90S4	M2SB4	24900	28800	43400	52200	16000	240
3.4	2764	1.7	413	6.0	305 L4	—	BN90S4	M2SB4	24900	28800	43400	52200	16000	250
3.4	2801	2.0	405	7.5	306 L3	—	BN90S4	M2SB4	30800	34900	70600	82200	23100	260
3.5	2779	1.4	402	7.5	305 L3	—	BN90S4	M2SB4	24700	28500	43100	51800	15800	250
3.6	2614	2.6	391	6.0	306 L4	—	BN90S4	M2SB4	30400	34500	69900	81400	22900	260
3.6	2609	1.4	390	12.0	—	305 R4	BN90S4	M2SB4	24400	28200	42700	51400	15700	251
3.6	2601	2.9	389	12.0	—	306 R4	BN90S4	M2SB4	30400	34400	69800	81200	22800	261
3.6	2689	1.2	389	7.5	305 L3	—	BN90S4	M2SB4	24400	28200	42600	51300	15700	250
3.8	2434	0.9	364	12.0	—	303 R4	BN90S4	M2SB4	23900	27600	41800	50300	15300	231
3.8	2434	1.2	364	12.0	—	304 R4	BN90S4	M2SB4	23900	27600	41800	50300	15300	241



P₁ = 1.1 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
					MC	MZ	HC/PC	HZ/PZ	FZ					
3.8	2434	1.9	364	12.0	—	305 R4	BN90S4	M2SB4	23900	27600	41800	50300	15300	251
4.1	2360	1.0	341	7.5	304 L3	—	BN90S4	M2SB4	23400	27000	41000	49300	15000	240
4.1	2257	1.1	338	12.0	—	304 R4	BN90S4	M2SB4	23300	26900	40900	49200	14900	241
4.1	2244	1.0	336	12.0	—	303 R4	BN90S4	M2SB4	23200	26800	40800	49100	14900	231
4.1	2244	2.0	336	12.0	—	305 R4	BN90S4	M2SB4	23200	26800	40800	49100	14900	251
4.3	2244	2.5	325	7.5	306 L3	—	BN90S4	M2SB4	28600	32400	66100	76900	21500	260
4.3	2223	1.6	321	7.5	305 L3	—	BN90S4	M2SB4	22900	26400	40300	48500	14700	250
4.4	2091	1.7	313	12.0	—	305 R4	BN90S4	M2SB4	22700	26200	39900	48100	14600	251
4.5	2050	1.7	307	12.0	—	304 R4	BN90S4	M2SB4	22500	26000	39700	47800	14500	241
4.8	1945	1.0	291	10.0	—	301 R4	BN90S4	M2SB4	7210	7210	19100	22000	4740	223
4.8	1939	1.4	290	12.0	—	303 R4	BN90S4	M2SB4	22100	25600	39100	47000	14200	231
4.8	1939	1.9	290	12.0	—	304 R4	BN90S4	M2SB4	22100	25600	39100	47000	14200	241
4.8	1939	2.7	290	12.0	—	305 R4	BN90S4	M2SB4	22100	25600	39100	47000	14200	251
4.8	1992	2.8	288	7.5	306 L3	—	BN90S4	M2SB4	27500	31200	63700	74200	20700	260
5.0	1912	1.2	276	7.5	303 L3	—	BN90S4	M2SB4	21800	25200	38500	46300	14000	230
5.0	1912	2.3	276	7.5	305 L3	—	BN90S4	M2SB4	21800	25200	38500	46300	14000	250
5.1	1888	1.3	273	7.5	304 L3	—	BN90S4	M2SB4	21700	25000	38300	46100	13900	240
5.2	1855	3.0	268	7.5	306 L3	—	BN90S4	M2SB4	26900	30400	62400	72700	20200	260
5.2	1794	1.0	268	10.0	—	301 R4	BN90S4	M2SB4	7020	7020	18700	21500	4610	223
5.2	1789	2.0	267	12.0	—	304 R4	BN90S4	M2SB4	21500	24900	38100	45900	13800	241
5.4	1781	1.0	258	7.5	303 L3	—	BN90S4	M2SB4	21300	24600	37700	45300	13600	230
5.4	1781	2.0	258	7.5	305 L3	—	BN90S4	M2SB4	21300	24600	37700	45300	13600	250
5.4	1707	1.1	255	12.0	—	303 R4	BN90S4	M2SB4	21200	24500	37600	45200	13600	231
5.4	1707	2.1	255	12.0	—	305 R4	BN90S4	M2SB4	21200	24500	37600	45200	13600	251
6.0	1545	1.2	231	12.0	—	303 R4	BN90S4	M2SB4	20500	23700	36500	43900	13200	231
6.0	1545	2.3	231	12.0	—	305 R4	BN90S4	M2SB4	20500	23700	36500	43900	13200	251
6.1	1515	2.3	227	12.0	—	304 R4	BN90S4	M2SB4	20400	23500	36300	43600	13100	241
6.3	1528	1.2	221	7.5	301 L3	—	BN90S4	M2SB4	6580	6580	17600	20300	4320	222
6.3	1524	1.5	220	7.5	303 L3	—	BN90S4	M2SB4	20200	23300	36000	43300	13000	230
6.3	1524	2.4	220	7.5	304 L3	—	BN90S4	M2SB4	20200	23300	36000	43300	13000	240
6.5	1438	1.3	215	10.0	—	301 R4	BN90S4	M2SB4	6520	6520	17500	20100	4280	223
6.5	1433	1.9	214	12.0	—	303 R4	BN90S4	M2SB4	20000	23100	35700	42900	12800	231
6.5	1433	2.5	214	12.0	—	304 R4	BN90S4	M2SB4	20000	23100	35700	42900	12800	241
6.9	1395	1.7	202	7.5	304 L3	—	BN90S4	M2SB4	19600	22600	35000	42100	12600	240
7.2	1328	1.0	192	7.5	301 L3	—	BN90S4	M2SB4	6280	6280	16900	19400	4130	222
7.3	1316	1.4	190	7.5	303 L3	—	BN90S4	M2SB4	19200	22200	34400	41400	12300	230
7.3	1316	2.7	190	7.5	305 L3	—	BN90S4	M2SB4	19200	22200	34400	41400	12300	250
7.5	1237	1.9	185	12.0	—	303 R4	BN90S4	M2SB4	19100	22000	34100	41100	12200	231
7.5	1237	2.8	185	12.0	—	304 R4	BN90S4	M2SB4	19100	22000	34100	41100	12200	241
7.8	1228	1.8	178	7.5	303 L3	—	BN90S4	M2SB4	18800	21700	33700	40600	12100	230
7.8	1228	2.3	178	7.5	304 L3	—	BN90S4	M2SB4	18800	21700	33700	40600	12100	240
7.8	1225	1.4	177	7.5	301 L3	—	BN90S4	M2SB4	6110	6110	16500	19000	4020	222
7.9	1173	1.5	175	10.0	—	301 R4	BN90S4	M2SB4	6090	6090	16500	18900	4000	223
8.4	1139	2.1	165	7.5	304 L3	—	BN90S4	M2SB4	18300	21200	33000	39600	11800	240
8.5	1132	1.9	164	7.5	303 L3	—	BN90S4	M2SB4	18300	21100	32900	39600	11700	230
8.8	1062	1.6	159	10.0	—	301 R4	BN90S4	M2SB4	5890	5890	16000	18300	3870	223
8.8	1059	2.5	158	12.0	—	303 R4	BN90S4	M2SB4	18100	20900	32600	39200	11600	231
9.1	1055	1.7	152	7.5	303 L3	—	BN90S4	M2SB4	17900	20600	32200	38700	11500	230
9.4	991	2.3	148	12.0	—	303 R4	BN90S4	M2SB4	17700	20400	31900	38400	11400	231
9.7	958	1.4	143	10.0	—	301 R4	BN90S4	M2SB4	5690	5690	15500	17800	3740	223
9.8	981	1.8	142	7.5	301 L3	—	BN90S4	M2SB4	5670	5670	15400	17700	3730	222
9.8	978	2.7	141	7.5	303 L3	—	BN90S4	M2SB4	17400	20100	31500	37900	11200	230
10.5	919	1.3	133	12.0	—	301 R3	BN90S4	M2SB4	5550	5550	15100	17400	3650	223
10.6	905	1.0	131	7.5	300 L3	—	BN90S4	M2SB4	5520	5520	15100	17300	3630	214
10.6	905	1.9	131	7.5	301 L3	—	BN90S4	M2SB4	5520	5520	15100	17300	3630	222
10.7	867	1.0	130	10.0	—	300 R4	BN90S4	M2SB4	5510	5510	15000	17300	3620	215
10.7	867	2.0	130	10.0	—	301 R4	BN90S4	M2SB4	5510	5510	15000	17300	3620	223
11.2	861	2.1	124	7.5	303 L3	—	BN90S4	M2SB4	16700	19300	30300	36500	10700	230
11.5	839	2.9	121	14.0	—	304 R3	BN90S4	M2SB4	16600	19100	30100	36200	10600	241
12.0	801	1.6	116	7.5	301 L3	—	BN90S4	M2SB4	5300	5300	14500	16700	3490	222
12.2	791	2.3	114	14.0	—	303 R3	BN90S4	M2SB4	16200	18700	29500	35500	10400	231
12.3	779	2.3	113	7.5	303 L3	—	BN90S4	M2SB4	16200	18600	29400	35400	10400	230
13.1	736	1.8	106	12.0	—	301 R3	BN90S4	M2SB4	5160	5160	14200	16300	3390	223
13.1	708	1.2	106	10.0	—	300 R4	BN90S4	M2SB4	5150	5150	14100	16200	3380	215
13.1	708	2.4	106	10.0	—	301 R4	BN90S4	M2SB4	5150	5150	14100	16200	3380	223
13.3	725	1.2	105	7.5	300 L3	—	BN90S4	M2SB4	5130	5130	14100	16200	3370	214
13.3	725	2.3	105	7.5	301 L3	—	BN90S4	M2SB4	5130	5130	14100	16200	3370	222

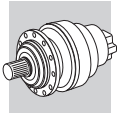


P₁ = 1.1 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
15.2	633	2.9	91.5	14.0	—	303 R3	BN90S4	M2SB4	15100	17400	27600	33200	9670	231
16.2	592	1.4	85.6	7.5	300 L3	—	BN90S4	M2SB4	4790	4790	13300	15200	3150	214
16.2	592	2.8	85.6	7.5	301 L3	—	BN90S4	M2SB4	4790	4790	13300	15200	3150	222
16.3	589	1.1	85.2	12.0	—	300 R3	BN90S4	M2SB4	4790	4790	13200	15200	3150	215
16.3	589	2.2	85.2	12.0	—	301 R3	BN90S4	M2SB4	4790	4790	13200	15200	3150	223
17.7	544	1.6	78.7	12.0	—	300 R3	BN90S4	M2SB4	4660	4660	12900	14900	3060	215
17.7	544	2.9	78.7	12.0	—	301 R3	BN90S4	M2SB4	4660	4660	12900	14900	3060	223
17.9	536	1.6	77.5	7.5	300 L3	—	BN90S4	M2SB4	4640	4640	12900	14800	3050	214
19.9	483	1.3	69.9	7.5	300 L3	—	BN90S4	M2SB4	4480	4480	12500	14300	2950	214
19.9	483	2.7	69.9	7.5	301 L3	—	BN90S4	M2SB4	4480	4480	12500	14300	2950	222
20.4	472	1.4	68.2	12.0	—	300 R3	BN90S4	M2SB4	4440	4440	12400	14200	2920	215
20.4	472	2.8	68.2	12.0	—	301 R3	BN90S4	M2SB4	4440	4440	12400	14200	2920	223
21.5	463	1.2	64.8	7.5	300 L2	—	BN90S4	M2SB4	4370	4370	12200	14000	2870	214
21.5	463	2.5	64.8	7.5	301 L2	—	BN90S4	M2SB4	4370	4370	12200	14000	2870	222
22.0	437	1.9	63.2	7.5	300 L3	—	BN90S4	M2SB4	4330	4330	12100	13900	2850	214
22.1	435	2.0	62.9	12.0	—	300 R3	BN90S4	M2SB4	4330	4330	12100	13900	2840	215
26.8	371	1.8	51.9	7.5	300 L2	—	BN90S4	M2SB4	4060	4060	11400	13100	2670	214
26.9	357	2.4	51.6	7.5	300 L3	—	BN90S4	M2SB4	4050	4050	11400	13100	2660	214
27.6	349	2.4	50.4	12.0	—	300 R3	BN90S4	M2SB4	4020	4020	11300	13000	2640	215
33	297	2.2	41.5	7.5	300 L2	—	BN90S4	M2SB4	3770	3770	10700	12300	2480	214
34	285	2.3	41.2	12.0	—	300 R3	BN90S4	M2SB4	3760	3760	10600	12200	2470	215
42	238	2.7	33.3	7.5	300 L2	—	BN90S4	M2SB4	3500	3500	9990	11500	2300	214
75	132	2.8	18.5	12.0	—	300 R2	BN90S4	M2SB4	2870	2870	8370	9620	1890	215

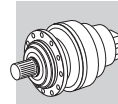
P₁ = 1.5 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
0.56	22651	1.1	2523	11.0	310 L4	—	BN90LA4	—	—	—	133000	166000	65000	290
0.64	19631	2.5	2187	11.0	313 L4	—	BN90LA4	—	—	—	192000	231000	80000	310
0.67	18817	1.8	2096	11.0	311 L4	—	BN90LA4	—	—	—	157000	195000	65000	300
0.70	18150	1.4	2022	11.0	310 L4	—	BN90LA4	—	—	—	133000	166000	65000	290
0.70	17976	0.9	2003	7.5	309 L4	—	BN90LA4	—	—	—	110000	145000	36000	280
0.79	16107	1.6	1794	11.0	310 L4	—	BN90LA4	—	—	—	133000	166000	65000	290
0.80	15863	1.0	1767	7.5	307 L4	—	BN90LA4	M3SA4	52000	65000	109000	145000	45000	270
0.80	15855	2.7	1766	11.0	311 L4	—	BN90LA4	—	—	—	157000	195000	65000	300
0.82	15463	1.1	1723	7.5	309 L4	—	BN90LA4	—	—	—	110000	145000	36000	280
0.84	15078	2.3	1680	11.0	311 L4	—	BN90LA4	—	—	—	157000	195000	65000	300
0.84	15004	1.7	1672	11.0	310 L4	—	BN90LA4	—	—	—	133000	166000	65000	290
0.88	14403	1.2	1605	7.5	309 L4	—	BN90LA4	—	—	—	110000	145000	36000	280
0.89	14277	1.1	1591	7.5	307 L4	—	BN90LA4	M3SA4	52000	65000	109000	145000	45000	270
0.98	12906	2.0	1438	11.0	310 L4	—	BN90LA4	—	—	—	133000	166000	65000	290
1.0	12641	1.2	1408	7.5	307 L4	—	BN90LA4	M3SA4	51900	65000	109000	144700	45000	270
1.0	12390	1.3	1380	7.5	309 L4	—	BN90LA4	—	—	—	110000	143800	35800	280
1.1	11541	1.4	1286	7.5	309 L4	—	BN90LA4	—	—	—	109200	140800	35000	280
1.1	11440	1.1	1274	7.5	307 L4	—	BN90LA4	M3SA4	50200	63000	107100	140400	43600	270
1.1	11300	2.4	1259	11.0	310 L4	—	BN90LA4	—	—	—	128500	161600	62700	290
1.2	10451	2.8	1164	11.0	310 L4	—	BN90LA4	—	—	—	125500	157900	61100	290
1.2	10382	1.4	1157	7.5	307 L4	—	BN90LA4	M3SA4	48600	60900	104100	136400	42200	270
1.2	10317	1.6	1149	7.5	309 L4	—	BN90LA4	—	—	—	105500	136100	33700	280
1.4	9110	1.0	1015	6.0	306 L4	—	BN90LA4	M3SA4	41900	47400	93000	108300	31400	260
1.4	8968	1.5	999	7.5	307 L4	—	BN90LA4	M3SA4	46300	58000	99600	130500	40200	270
1.4	8968	2.0	999	7.5	309 L4	—	BN90LA4	—	—	—	101200	130500	32200	280
1.6	8135	1.9	906	7.5	307 L4	—	BN90LA4	M3SA4	44800	56200	96700	126800	38900	270
1.6	8135	2.2	906	7.5	309 L4	—	BN90LA4	—	—	—	98300	126800	31100	280
1.6	8061	2.9	898	15.0	—	310 R4	BN90LA4	—	—	—	116100	146000	56100	291
1.6	7872	1.0	877	6.0	306 L4	—	BN90LA4	M3SA4	39900	45200	89000	103700	29900	260
1.7	7260	1.1	809	6.0	306 L4	—	BN90LA4	M3SA4	38800	44000	86900	101200	29200	260
1.8	7186	1.9	801	7.5	307 L4	—	BN90LA4	M3SA4	43000	53900	93200	122100	37400	270
1.8	7186	2.5	801	7.5	309 L4	—	BN90LA4	—	—	—	94700	122100	29900	280
2.0	6482	2.3	722	7.5	307 L4	—	BN90LA4	M3SA4	41500	52100	90400	118400	36100	270
2.0	6280	1.5	700	6.0	306 L4	—	BN90LA4	M3SA4	37000	41900	83200	96900	27800	260
2.0	6191	1.6	690	15.0	—	307 R4	BN90LA4	M3SA4	40900	51300	89100	116800	35500	271
2.0	6191	2.4	690	15.0	—	309 R4	BN90LA4	—	—	—	90600	116800	28400	281








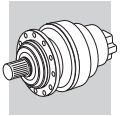
P₁ = 1.5 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
					MC	MZ	HC/PC	HZ/PZ	FZ					
2.1	5971	1.0	665	12.0	—	306 R4	BN90LA4	M3SA4	36400	41200	82000	95400	27300	261
2.2	5866	2.2	654	7.5	307 L4	—	BN90LA4	M3SA4	40200	50400	87700	114900	34900	270
2.2	5705	1.7	636	6.0	306 L4	—	BN90LA4	M3SA4	35800	40600	80800	94100	26900	260
2.4	5299	1.6	590	12.0	—	306 R4	BN90LA4	M3SA4	34900	39600	79100	92100	26200	261
2.4	5290	1.8	589	6.0	306 L4	—	BN90LA4	M3SA4	34900	39600	79000	92000	26200	260
2.4	5217	2.4	581	15.0	—	307 R4	BN90LA4	M3SA4	38600	48500	84700	110900	33600	271
2.4	5194	2.9	579	7.5	307 L4	—	BN90LA4	M3SA4	38600	48400	84500	110800	33500	270
2.5	5087	1.0	567	12.0	—	305 R4	BN90LA4	M3SA4	27700	32000	47700	57400	17800	251
2.5	4992	1.1	556	6.0	305 L4	—	BN90LA4	M3SA4	27500	31700	47500	57100	17600	250
2.6	4936	1.5	550	12.0	—	306 R4	BN90LA4	M3SA4	34100	38700	77400	90100	25600	261
2.8	4571	2.1	509	6.0	306 L4	—	BN90LA4	M3SA4	33300	37700	75600	88100	25000	260
2.9	4419	1.2	492	6.0	305 L4	—	BN90LA4	M3SA4	26400	30500	45800	55100	16900	250
2.9	4403	2.1	490	15.0	—	307 R4	BN90LA4	M3SA4	36500	45800	80500	105400	31700	271
2.9	4381	2.1	488	12.0	—	306 R4	BN90LA4	M3SA4	32800	37100	74700	87000	24600	261
3.0	4172	2.9	465	7.5	307 L4	—	BN90LA4	M3SA4	35800	45000	79200	103700	31200	270
3.1	4081	1.7	455	12.0	—	306 R4	BN90LA4	M3SA4	32000	36300	73100	85100	24100	261
3.1	4054	0.9	452	12.0	—	304 R4	BN90LA4	M3SA4	25700	29600	44600	53700	16500	241
3.1	4054	1.2	452	12.0	—	305 R4	BN90LA4	M3SA4	25700	29600	44600	53700	16500	251
3.2	4000	0.9	446	6.0	304 L4	—	BN90LA4	M3SA4	25500	29500	44400	53400	16400	240
3.2	4000	1.4	446	6.0	305 L4	—	BN90LA4	M3SA4	25500	29500	44400	53400	16400	250
3.2	3988	2.5	444	6.0	306 L4	—	BN90LA4	M3SA4	31800	36000	72600	84500	23900	260
3.4	3768	2.3	420	12.0	—	306 R4	BN90LA4	M3SA4	31200	35300	71400	83100	23400	261
3.4	3709	1.3	413	6.0	305 L4	—	BN90LA4	M3SA4	24900	28800	43400	52200	16000	250
3.5	3759	1.5	405	7.5	306 L3	—	BN90LA4	M3SA4	30800	34900	70600	82200	23100	260
3.5	3729	1.0	402	7.5	305 L3	—	BN90LA4	M3SA4	24700	28500	43100	51800	15800	250
3.6	3509	1.9	391	6.0	306 L4	—	BN90LA4	M3SA4	30400	34500	69900	81400	22900	260
3.6	3502	1.1	390	12.0	—	305 R4	BN90LA4	M3SA4	24400	28200	42700	51400	15700	251
3.6	3491	2.2	389	12.0	—	306 R4	BN90LA4	M3SA4	30400	34400	69800	81200	22800	261
3.9	3266	0.9	364	12.0	—	304 R4	BN90LA4	M3SA4	23300	26900	40900	49300	15000	241
3.9	3266	1.4	364	12.0	—	305 R4	BN90LA4	M3SA4	23900	27600	41800	50300	15300	251
4.2	3123	2.8	336	11.0	307 L3	—	BN90LA4	M3SA4	32200	40400	71900	94200	28000	270
4.2	3012	1.5	336	12.0	—	305 R4	BN90LA4	M3SA4	23200	26800	40800	49100	14900	251
4.3	3012	1.8	325	7.5	306 L3	—	BN90LA4	M3SA4	28600	32400	66100	76900	21500	260
4.4	2983	1.2	321	7.5	305 L3	—	BN90LA4	M3SA4	22900	26400	40300	48500	14700	250
4.5	2806	1.3	313	12.0	—	305 R4	BN90LA4	M3SA4	22700	26200	39900	48100	14600	251
4.5	2797	2.7	312	12.0	—	306 R4	BN90LA4	M3SA4	28200	32000	65300	76000	21200	261
4.6	2752	1.3	307	12.0	—	304 R4	BN90LA4	M3SA4	22500	26000	39700	47800	14500	241
4.9	2603	1.0	290	12.0	—	303 R4	BN90LA4	M3SA4	22100	25600	39100	47000	14200	231
4.9	2603	1.4	290	12.0	—	304 R4	BN90LA4	M3SA4	22100	25600	39100	47000	14200	241
4.9	2603	2.0	290	12.0	—	305 R4	BN90LA4	M3SA4	22100	25600	39100	47000	14200	251
4.9	2673	2.1	288	7.5	306 L3	—	BN90LA4	M3SA4	27500	31200	63700	74200	20700	260
5.1	2566	1.7	276	7.5	305 L3	—	BN90LA4	M3SA4	21800	25200	38500	46300	14000	250
5.2	2534	0.9	273	7.5	304 L3	—	BN90LA4	M3SA4	21700	25000	38300	46100	13900	240
5.3	2490	2.2	268	7.5	306 L3	—	BN90LA4	M3SA4	26900	30400	62400	72700	20200	260
5.3	2400	1.5	267	12.0	—	304 R4	BN90LA4	M3SA4	21500	24900	38100	45900	13800	241
5.5	2390	1.5	258	7.5	305 L3	—	BN90LA4	M3SA4	21300	24600	37700	45300	13600	250
5.5	2290	1.6	255	12.0	—	305 R4	BN90LA4	M3SA4	21200	24500	37600	45200	13600	251
6.1	2073	1.7	231	12.0	—	305 R4	BN90LA4	M3SA4	20500	23700	36500	43900	13200	251
6.2	2033	1.7	227	12.0	—	304 R4	BN90LA4	M3SA4	20400	23500	36300	43600	13100	241
6.4	2045	1.1	220	7.5	303 L3	—	BN90LA4	M3SA4	20200	23300	36000	43300	13000	230
6.4	2045	1.8	220	7.5	304 L3	—	BN90LA4	M3SA4	20200	23300	36000	43300	13000	240
6.4	2045	2.3	220	7.5	305 L3	—	BN90LA4	M3SA4	20200	23300	36000	43300	13000	250
6.6	1929	0.9	215	10.0	—	301 R4	BN90LA4	M3SA4	6520	6520	17500	20100	4280	223
6.6	1923	1.4	214	12.0	—	303 R4	BN90LA4	M3SA4	20000	23100	35700	42900	12800	231
6.6	1923	1.9	214	12.0	—	304 R4	BN90LA4	M3SA4	20000	23100	35700	42900	12800	241
6.6	1923	2.8	214	12.0	—	305 R4	BN90LA4	M3SA4	19600	22600	34900	42000	12500	251
7.0	1872	1.3	202	7.5	304 L3	—	BN90LA4	M3SA4	19600	22600	35000	42100	12600	240
7.4	1766	1.0	190	7.5	303 L3	—	BN90LA4	M3SA4	19200	22200	34400	41400	12300	230
7.4	1766	2.0	190	7.5	305 L3	—	BN90LA4	M3SA4	19200	22200	34400	41400	12300	250
7.6	1660	1.4	185	12.0	—	303 R4	BN90LA4	M3SA4	19100	22000	34100	41100	12200	231
7.6	1660	2.1	185	12.0	—	304 R4	BN90LA4	M3SA4	19100	22000	34100	41100	12200	241
7.6	1660	2.7	185	12.0	—	305 R4	BN90LA4	M3SA4	19100	22000	34100	41100	12200	251
7.9	1648	1.3	178	7.5	303 L3	—	BN90LA4	M3SA4	18800	21700	33700	40600	12100	230
7.9	1648	1.7	178	7.5	304 L3	—	BN90LA4	M3SA4	18800	21700	33700	40600	12100	240
7.9	1648	2.7	178	7.5	305 L3	—	BN90LA4	M3SA4	18800	21700	33700	40600	12100	250
8.0	1644	1.1	177	7.5	301 L3	—	BN90LA4	M3SA4	6110	6110	16500	19000	4020	222
8.0	1575	1.1	175	10.0	—	301 R4	BN90LA4	M3SA4	6090	6090	16500	18900	4000	223



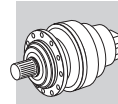
P₁ = 1.5 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
8.6	1528	1.6	165	7.5	304 L3	—	BN90LA4	M3SA4	18300	21200	33000	39600	11800	240
8.6	1520	1.4	164	7.5	303 L3	—	BN90LA4	M3SA4	18300	21100	32900	39600	11700	230
8.6	1520	2.9	164	7.5	305 L3	—	BN90LA4	M3SA4	18300	21100	32900	39600	11700	250
8.9	1426	1.2	159	10.0	—	301 R4	BN90LA4	M3SA4	5890	5890	16000	18300	3870	223
8.9	1421	1.9	158	12.0	—	303 R4	BN90LA4	M3SA4	18100	20900	32600	39200	11600	231
8.9	1421	2.5	158	12.0	—	304 R4	BN90LA4	M3SA4	18100	20900	32600	39200	11600	241
9.2	1415	1.3	152	7.5	303 L3	—	BN90LA4	M3SA4	17900	20600	32200	38700	11500	230
9.2	1415	2.5	152	7.5	305 L3	—	BN90LA4	M3SA4	17900	20600	32200	38700	11500	250
9.4	1388	2.5	150	7.5	304 L3	—	BN90LA4	M3SA4	17800	20500	32000	38500	11400	240
9.5	1330	2.6	148	12.0	—	304 R4	BN90LA4	M3SA4	17700	20400	31900	38400	11400	241
9.5	1330	1.7	148	12.0	—	303 R4	BN90LA4	M3SA4	17700	20400	31900	38400	11400	231
9.8	1286	1.0	143	10.0	—	301 R4	BN90LA4	M3SA4	5690	5690	15500	17800	3740	223
9.9	1317	1.3	142	7.5	301 L3	—	BN90LA4	M3SA4	5670	5670	15400	17700	3730	222
10.0	1313	2.0	141	7.5	303 L3	—	BN90LA4	M3SA4	17400	20100	31500	37900	11200	230
10.0	1313	2.7	141	7.5	304 L3	—	BN90LA4	M3SA4	17400	20100	31500	37900	11200	240
10.6	1233	0.9	133	12.0	—	301 R3	BN90LA4	M3SA4	5550	5550	15100	17400	3650	223
10.8	1215	1.4	131	7.5	301 L3	—	BN90LA4	M3SA4	5520	5520	15100	17300	3630	222
10.8	1211	2.9	130	7.5	304 L3	—	BN90LA4	M3SA4	17000	19600	30700	37000	10900	240
10.9	1164	1.5	130	10.0	—	301 R4	BN90LA4	M3SA4	5510	5510	15000	17300	3620	223
10.9	1160	2.3	129	12.0	—	303 R4	BN90LA4	M3SA4	16900	19500	30600	36900	10800	231
11.3	1155	1.6	124	7.5	303 L3	—	BN90LA4	M3SA4	16700	19300	30300	36500	10700	230
11.6	1125	2.1	121	14.0	—	304 R3	BN90LA4	M3SA4	16600	19100	30100	36200	10600	241
12.2	1075	1.2	116	7.5	301 L3	—	BN90LA4	M3SA4	5300	5300	14500	16700	3490	222
12.3	1062	1.7	114	14.0	—	303 R3	BN90LA4	M3SA4	16200	18700	29500	35500	10400	231
12.5	1046	1.7	113	7.5	303 L3	—	BN90LA4	M3SA4	16200	18600	29400	35400	10400	230
13.2	988	1.3	106	12.0	—	301 R3	BN90LA4	M3SA4	5160	5160	14200	16300	3390	223
13.3	950	0.9	106	10.0	—	300 R4	BN90LA4	M3SA4	5030	5030	13800	15900	3310	215
13.3	950	1.8	106	10.0	—	301 R4	BN90LA4	M3SA4	5150	5150	14100	16200	3380	223
13.4	973	1.7	105	7.5	301 L3	—	BN90LA4	M3SA4	5130	5130	14100	16200	3370	222
13.5	970	2.7	105	7.5	303 L3	—	BN90LA4	M3SA4	15800	18200	28800	34600	10100	230
14.5	900	2.7	97.0	14.0	—	304 R3	BN90LA4	M3SA4	15400	17700	28100	33800	9860	241
15.4	849	2.1	91.5	14.0	—	303 R3	BN90LA4	M3SA4	15100	17400	27600	33200	9670	231
15.6	837	2.7	90.2	7.5	303 L3	—	BN90LA4	M3SA4	15000	17300	27500	33100	9620	230
16.5	794	1.1	85.6	7.5	300 L3	—	BN90LA4	M3SA4	4790	4790	13300	15200	3150	214
16.5	794	2.1	85.6	7.5	301 L3	—	BN90LA4	M3SA4	4790	4790	13300	15200	3150	222
16.6	790	1.6	85.2	12.0	—	301 R3	BN90LA4	M3SA4	4790	4790	13200	15200	3150	223
17.9	731	3.0	78.7	14.0	—	303 R3	BN90LA4	M3SA4	14300	16500	26400	31800	9190	231
17.9	730	1.2	78.7	12.0	—	300 R3	BN90LA4	M3SA4	4660	4660	12900	14900	3060	215
17.9	730	2.2	78.7	12.0	—	301 R3	BN90LA4	M3SA4	4660	4660	12900	14900	3060	223
18.2	719	1.2	77.5	7.5	300 L3	—	BN90LA4	M3SA4	4640	4640	12900	14800	3050	214
18.2	719	2.3	77.5	7.5	301 L3	—	BN90LA4	M3SA4	4640	4640	12900	14800	3050	222
19.2	681	2.7	73.3	14.0	—	303 R3	BN90LA4	M3SA4	14000	16200	25900	31100	8980	231
20.2	649	1.0	69.9	7.5	300 L3	—	BN90LA4	M3SA4	4480	4480	12500	14300	2950	214
20.2	649	2.0	69.9	7.5	301 L3	—	BN90LA4	M3SA4	4480	4480	12500	14300	2950	222
20.7	633	1.0	68.2	12.0	—	300 R3	BN90LA4	M3SA4	4440	4440	12400	14200	2920	215
20.7	633	2.1	68.2	12.0	—	301 R3	BN90LA4	M3SA4	4440	4440	12400	14200	2920	223
21.8	621	1.9	64.8	7.5	301 L2	—	BN90LA4	M3SA4	4370	4370	12200	14000	2870	222
22.3	587	1.4	63.2	7.5	300 L3	—	BN90LA4	M3SA4	4330	4330	12100	13900	2850	214
22.3	587	2.8	63.2	7.5	301 L3	—	BN90LA4	M3SA4	4330	4330	12100	13900	2850	222
22.4	584	1.5	62.9	12.0	—	300 R3	BN90LA4	M3SA4	4330	4330	12100	13900	2840	215
22.4	584	2.8	62.9	12.0	—	301 R3	BN90LA4	M3SA4	4330	4330	12100	13900	2840	223
27.2	498	1.3	51.9	7.5	300 L2	—	BN90LA4	M3SA4	4060	4060	11400	13100	2670	214
27.2	498	2.6	51.9	7.5	301 L2	—	BN90LA4	M3SA4	4060	4060	11400	13100	2670	222
27.3	479	1.8	51.6	7.5	300 L3	—	BN90LA4	M3SA4	4050	4050	11400	13100	2660	214
28.0	468	1.8	50.4	12.0	—	300 R3	BN90LA4	M3SA4	4020	4020	11300	13000	2640	215
34	398	1.6	41.5	7.5	300 L2	—	BN90LA4	M3SA4	3770	3770	10700	12300	2480	214
34	382	1.7	41.2	12.0	—	300 R3	BN90LA4	M3SA4	3760	3760	10600	12200	2470	215
37	368	2.3	38.4	7.5	300 L2	—	BN90LA4	M3SA4	3670	3670	10400	12000	2410	214
38	346	2.4	37.3	12.0	—	300 R3	BN90LA4	M3SA4	3630	3630	10300	11900	2390	215
42	319	2.0	33.3	7.5	300 L2	—	BN90LA4	M3SA4	3500	3500	9990	11500	2300	214
46	294	2.9	30.7	7.5	300 L2	—	BN90LA4	M3SA4	3410	3410	9750	11200	2240	214
46	282	3.0	30.4	12.0	—	300 R3	BN90LA4	M3SA4	3400	3400	9730	11200	2230	215
76	177	2.1	18.5	12.0	—	300 R2	BN90LA4	M3SA4	2870	2870	8370	9620	1890	215



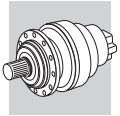
P₁ = 1.85 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
					MC	MZ	HC/PC	HZ/PZ	FZ					
0.55	28202	0.9	2523	11.0	310 L4	—	BN90LB4	—	—	—	133000	166000	65000	290
0.64	24442	2.0	2187	11.0	313 L4	—	BN90LB4	—	—	—	192000	231000	80000	310
0.66	23430	1.5	2096	11.0	311 L4	—	BN90LB4	—	—	—	157000	195000	65000	300
0.69	22598	1.2	2022	11.0	310 L4	—	BN90LB4	—	—	—	133000	166000	65000	290
0.77	20306	2.9	1817	11.0	313 L4	—	BN90LB4	—	—	—	192000	231000	80000	310
0.77	20055	1.3	1794	11.0	310 L4	—	BN90LB4	—	—	—	133000	166000	65000	290
0.79	19742	2.2	1766	11.0	311 L4	—	BN90LB4	—	—	—	157000	195000	65000	300
0.83	18774	1.8	1680	11.0	311 L4	—	BN90LB4	—	—	—	157000	195000	65000	300
0.83	18681	1.4	1672	11.0	310 L4	—	BN90LB4	—	—	—	133000	166000	65000	290
0.87	17934	0.9	1605	7.5	309 L4	—	BN90LB4	—	—	—	110000	145000	36000	280
0.97	16070	1.6	1438	11.0	310 L4	—	BN90LB4	—	—	—	133000	166000	65000	290
0.98	15819	2.7	1415	11.0	311 L4	—	BN90LB4	—	—	—	157000	195000	65000	300
0.99	15739	1.0	1408	7.5	307 L4	—	BN90LB4	—	51900	65000	109000	144700	45000	270
1.0	15427	1.1	1380	7.5	309 L4	—	BN90LB4	—	—	—	110000	143800	35800	280
1.1	14370	1.1	1286	7.5	309 L4	—	BN90LB4	—	—	—	109200	140800	35000	280
1.1	14070	2.0	1259	11.0	310 L4	—	BN90LB4	—	—	—	128500	161600	62700	290
1.2	13012	2.3	1164	11.0	310 L4	—	BN90LB4	—	—	—	125500	157900	61100	290
1.2	12927	1.1	1157	7.5	307 L4	—	BN90LB4	—	48600	60900	104100	136400	42200	270
1.2	12845	1.3	1149	7.5	309 L4	—	BN90LB4	—	—	—	105500	136100	33700	280
1.4	11406	2.5	1021	11.0	310 L4	—	BN90LB4	—	—	—	120700	151800	58500	290
1.4	11166	1.2	999	7.5	307 L4	—	BN90LB4	—	46300	58000	99600	130500	40200	270
1.4	11166	1.6	999	7.5	309 L4	—	BN90LB4	—	—	—	101200	130500	32200	280
1.5	10129	1.5	906	7.5	307 L4	—	BN90LB4	—	44800	56200	96700	126800	38900	270
1.5	10129	1.8	906	7.5	309 L4	—	BN90LB4	—	—	—	98300	126800	31100	280
1.5	10037	2.3	898	15.0	—	310 R4	BN90LB4	—	—	—	116100	146000	56100	291
1.7	8947	1.5	801	7.5	307 L4	—	BN90LB4	—	43000	53900	93200	122100	37400	270
1.7	8947	2.0	801	7.5	309 L4	—	BN90LB4	—	—	—	94700	122100	29900	280
1.9	8071	1.9	722	7.5	307 L4	—	BN90LB4	—	41500	52100	90400	118400	36100	270
1.9	8071	2.6	722	7.5	309 L4	—	BN90LB4	—	—	—	91800	118400	28900	280
2.0	7819	1.2	700	6.0	306 L4	—	BN90LB4	—	37000	41900	83200	96900	27800	260
2.0	7709	1.3	690	15.0	—	307 R4	BN90LB4	—	40900	51300	89100	116800	35500	271
2.0	7709	1.9	690	15.0	—	309 R4	BN90LB4	—	—	—	90600	116800	28400	281
2.1	7304	1.8	654	7.5	307 L4	—	BN90LB4	—	40200	50400	87700	114900	34900	270
2.1	7304	2.5	654	7.5	309 L4	—	BN90LB4	—	—	—	89100	114900	27900	280
2.2	7103	1.3	636	6.0	306 L4	—	BN90LB4	—	35800	40600	80800	94100	26900	260
2.4	6598	1.3	590	12.0	—	306 R4	BN90LB4	—	34900	39600	79100	92100	26200	261
2.4	6586	1.4	589	6.0	306 L4	—	BN90LB4	—	34900	39600	79000	92000	26200	260
2.4	6495	1.9	581	15.0	—	307 R4	BN90LB4	—	38600	48500	84700	110900	33600	271
2.4	6495	2.4	581	15.0	—	309 R4	BN90LB4	—	—	—	86000	110900	26900	281
2.4	6467	2.3	579	7.5	307 L4	—	BN90LB4	—	38600	48400	84500	110800	33500	270
2.5	6146	1.2	550	12.0	—	306 R4	BN90LB4	—	34100	38700	77400	90100	25600	261
2.7	5691	1.7	509	6.0	306 L4	—	BN90LB4	—	33300	37700	75600	88100	25000	260
2.7	5691	2.5	509	7.5	307 L4	—	BN90LB4	—	37000	46400	81400	106600	32100	270
2.7	5691	2.5	509	7.5	309 L4	—	BN90LB4	—	—	—	82700	106600	25700	280
2.8	5502	1.0	492	6.0	305 L4	—	BN90LB4	—	26400	30500	45800	55100	16900	250
2.8	5482	1.7	490	15.0	—	307 R4	BN90LB4	—	36500	45800	80500	105400	31700	271
2.8	5482	2.6	490	15.0	—	309 R4	BN90LB4	—	—	—	81700	105400	25400	281
2.8	5455	1.7	488	12.0	—	306 R4	BN90LB4	—	32800	37100	74700	87000	24600	261
3.0	5195	2.3	465	7.5	307 L4	—	BN90LB4	—	35800	45000	79200	103700	31200	270
3.0	5106	2.7	457	15.0	—	309 R4	BN90LB4	—	—	—	80000	103200	24800	281
3.1	5081	1.4	455	12.0	—	306 R4	BN90LB4	—	32000	36300	73100	85100	24100	261
3.1	5061	2.6	453	15.0	—	307 R4	BN90LB4	—	35500	44600	78600	102900	30900	271
3.1	5048	0.9	452	12.0	—	305 R4	BN90LB4	—	25700	29600	44600	53700	16500	251
3.1	4980	1.1	446	6.0	305 L4	—	BN90LB4	—	25500	29500	44400	53400	16400	250
3.1	4965	2.0	444	6.0	306 L4	—	BN90LB4	—	31800	36000	72600	84500	23900	260
3.3	4692	1.9	420	12.0	—	306 R4	BN90LB4	—	31200	35300	71400	83100	23400	261
3.4	4619	2.6	413	15.0	—	307 R4	BN90LB4	—	34500	43200	76400	100100	30000	271
3.4	4618	1.0	413	6.0	305 L4	—	BN90LB4	—	24900	28800	43400	52200	16000	250
3.4	4532	2.6	406	7.5	307 L4	—	BN90LB4	—	34300	43000	76000	99600	29800	270
3.4	4681	1.2	405	7.5	306 L3	—	BN90LB4	—	30800	34900	70600	82200	23100	260
3.6	4369	1.6	391	6.0	306 L4	—	BN90LB4	—	30400	34500	69900	81400	22900	260
3.6	4347	1.7	389	12.0	—	306 R4	BN90LB4	—	30400	34400	69800	81200	22800	261
3.8	4067	1.1	364	12.0	—	305 R4	BN90LB4	—	23900	27600	41800	50300	15300	251
4.1	3888	2.3	336	11.0	307 L3	—	BN90LB4	—	32200	40400	71900	94200	28000	270
4.1	3751	1.2	336	12.0	—	305 R4	BN90LB4	—	23200	26800	40800	49100	14900	251
4.3	3750	1.5	325	7.5	306 L3	—	BN90LB4	—	28600	32400	66100	76900	21500	260
4.3	3715	1.0	321	7.5	305 L3	—	BN90LB4	—	22900	26400	40300	48500	14700	250



P₁ = 1.85 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
					MC	MZ	HC/PC	HZ/PZ	FZ					
4.4	3494	1.0	313	12.0	—	305 R4	BN90LB4	—	22700	26200	39900	48100	14600	251
4.5	3483	2.2	312	12.0	—	306 R4	BN90LB4	—	28200	32000	65300	76000	21200	261
4.5	3426	1.0	307	12.0	—	304 R4	BN90LB4	—	22500	26000	39700	47800	14500	241
4.8	3241	1.1	290	12.0	—	304 R4	BN90LB4	—	22100	25600	39100	47000	14200	241
4.8	3241	1.6	290	12.0	—	305 R4	BN90LB4	—	22100	25600	39100	47000	14200	251
4.8	3230	2.6	289	12.0	—	306 R4	BN90LB4	—	27500	31200	63800	74300	20700	261
4.8	3328	1.7	288	7.5	306 L3	—	BN90LB4	—	27500	31200	63700	74200	20700	260
5.0	3195	1.4	276	7.5	305 L3	—	BN90LB4	—	21800	25200	38500	46300	14000	250
5.2	3100	1.8	268	7.5	306 L3	—	BN90LB4	—	26900	30400	62400	72700	20200	260
5.2	2989	1.2	267	12.0	—	304 R4	BN90LB4	—	21500	24900	38100	45900	13800	241
5.4	2976	1.2	258	7.5	305 L3	—	BN90LB4	—	21300	24600	37700	45300	13600	250
5.4	2852	1.3	255	12.0	—	305 R4	BN90LB4	—	21200	24500	37600	45200	13600	251
5.6	2778	3.0	249	12.0	—	306 R4	BN90LB4	—	26200	29700	61000	71000	19700	261
5.8	2751	3.0	238	7.5	306 L3	—	BN90LB4	—	25800	29200	60200	70100	19400	260
6.0	2582	1.4	231	12.0	—	305 R4	BN90LB4	—	20500	23700	36500	43900	13200	251
6.0	2574	2.9	230	12.0	—	306 R4	BN90LB4	—	25500	28900	59600	69400	19200	261
6.1	2532	1.4	227	12.0	—	304 R4	BN90LB4	—	20400	23500	36300	43600	13100	241
6.3	2563	2.5	222	7.5	306 L3	—	BN90LB4	—	25200	28600	58900	68600	18900	260
6.3	2546	1.4	220	7.5	304 L3	—	BN90LB4	—	20200	23300	36000	43300	13000	240
6.3	2546	1.9	220	7.5	305 L3	—	BN90LB4	—	20200	23300	36000	43300	13000	250
6.5	2395	1.1	214	12.0	—	303 R4	BN90LB4	—	20000	23100	35700	42900	12800	231
6.5	2395	1.5	214	12.0	—	304 R4	BN90LB4	—	20000	23100	35700	42900	12800	241
6.5	2395	2.3	214	12.0	—	305 R4	BN90LB4	—	20000	23100	35700	42900	12800	251
6.9	2331	1.0	202	7.5	304 L3	—	BN90LB4	—	19600	22600	35000	42100	12600	240
7.3	2199	1.6	190	7.5	305 L3	—	BN90LB4	—	19200	22200	34400	41400	12300	250
7.3	2193	3.0	190	7.5	306 L3	—	BN90LB4	—	23900	27100	56200	65500	18000	260
7.5	2067	1.1	185	12.0	—	303 R4	BN90LB4	—	19100	22000	34100	41100	12200	231
7.5	2067	1.7	185	12.0	—	304 R4	BN90LB4	—	19100	22000	34100	41100	12200	241
7.5	2067	2.2	185	12.0	—	305 R4	BN90LB4	—	19100	22000	34100	41100	12200	251
7.8	2052	1.1	178	7.5	303 L3	—	BN90LB4	—	18800	21700	33700	40600	12100	230
7.8	2052	1.4	178	7.5	304 L3	—	BN90LB4	—	18800	21700	33700	40600	12100	240
7.8	2052	2.2	178	7.5	305 L3	—	BN90LB4	—	18800	21700	33700	40600	12100	250
7.9	1961	0.9	175	10.0	—	301 R4	BN90LB4	—	5950	5950	16100	18500	3910	223
8.4	1903	1.3	165	7.5	304 L3	—	BN90LB4	—	18300	21200	33000	39600	11800	240
8.5	1892	1.2	164	7.5	303 L3	—	BN90LB4	—	18300	21100	32900	39600	11700	230
8.5	1892	2.3	164	7.5	305 L3	—	BN90LB4	—	18300	21100	32900	39600	11700	250
8.8	1775	1.0	159	10.0	—	301 R4	BN90LB4	—	5890	5890	16000	18300	3870	223
8.8	1770	1.5	158	12.0	—	303 R4	BN90LB4	—	18100	20900	32600	39200	11600	231
8.8	1770	2.0	158	12.0	—	304 R4	BN90LB4	—	18100	20900	32600	39200	11600	241
9.1	1762	1.0	152	7.5	303 L3	—	BN90LB4	—	17900	20600	32200	38700	11500	230
9.1	1762	2.0	152	7.5	305 L3	—	BN90LB4	—	17900	20600	32200	38700	11500	250
9.3	1728	2.0	150	7.5	304 L3	—	BN90LB4	—	17800	20500	32000	38500	11400	240
9.4	1656	2.1	148	12.0	—	304 R4	BN90LB4	—	17700	20400	31900	38400	11400	241
9.4	1656	1.4	148	12.0	—	303 R4	BN90LB4	—	17700	20400	31900	38400	11400	231
9.4	1656	2.7	148	12.0	—	305 R4	BN90LB4	—	17700	20400	31900	38400	11400	251
9.8	1640	1.0	142	7.5	301 L3	—	BN90LB4	—	5670	5670	15400	17700	3730	222
9.8	1635	1.6	141	7.5	303 L3	—	BN90LB4	—	17400	20100	31500	37900	11200	230
9.8	1635	2.2	141	7.5	304 L3	—	BN90LB4	—	17400	20100	31500	37900	11200	240
10.6	1512	1.1	131	7.5	301 L3	—	BN90LB4	—	5520	5520	15100	17300	3630	222
10.7	1508	2.3	130	7.5	304 L3	—	BN90LB4	—	17000	19600	30700	37000	10900	240
10.7	1449	1.2	130	10.0	—	301 R4	BN90LB4	—	5510	5510	15000	17300	3620	223
10.8	1445	1.8	129	12.0	—	303 R4	BN90LB4	—	16900	19500	30600	36900	10800	231
10.8	1445	2.4	129	12.0	—	304 R4	BN90LB4	—	16900	19500	30600	36900	10800	241
11.2	1439	1.3	124	7.5	303 L3	—	BN90LB4	—	16700	19300	30300	36500	10700	230
11.2	1439	2.5	124	7.5	305 L3	—	BN90LB4	—	16700	19300	30300	36500	10700	250
11.5	1401	1.7	121	14.0	—	304 R3	BN90LB4	—	16600	19100	30100	36200	10600	241
12.0	1339	1.0	116	7.5	301 L3	—	BN90LB4	—	5300	5300	14500	16700	3490	222
12.2	1322	1.4	114	14.0	—	303 R3	BN90LB4	—	16200	18700	29500	35500	10400	231
12.2	1322	2.7	114	14.0	—	305 R3	BN90LB4	—	16200	18700	29500	35500	10400	251
12.3	1302	1.4	113	7.5	303 L3	—	BN90LB4	—	16200	18600	29400	35400	10400	230
12.3	1302	2.8	113	7.5	305 L3	—	BN90LB4	—	16200	18600	29400	35400	10400	250
12.6	1277	2.6	111	7.5	304 L3	—	BN90LB4	—	16000	18500	29200	35200	10300	240
12.7	1224	2.8	109	12.0	—	304 R4	BN90LB4	—	16000	18500	29200	35100	10300	241
13.1	1230	1.1	106	12.0	—	301 R3	BN90LB4	—	5160	5160	14200	16300	3390	223
13.1	1183	1.4	106	10.0	—	301 R4	BN90LB4	—	5150	5150	14100	16200	3380	223
13.3	1212	1.4	105	7.5	301 L3	—	BN90LB4	—	5130	5130	14100	16200	3370	222
13.3	1208	2.1	105	7.5	303 L3	—	BN90LB4	—	15800	18200	28800	34600	10100	230

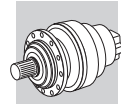


P₁ = 1.85 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
13.3	1208	2.9	105	7.5	304 L3	—	BN90LB4	—	15800	18200	28800	34600	10100	240
14.3	1121	2.1	97.0	14.0	—	304 R3	BN90LB4	—	15400	17700	28100	33800	9860	241
15.2	1058	1.7	91.5	14.0	—	303 R3	BN90LB4	—	15100	17400	27600	33200	9670	231
15.4	1042	2.2	90.2	7.5	303 L3	—	BN90LB4	—	15000	17300	27500	33100	9620	230
16.2	989	1.7	85.6	7.5	301 L3	—	BN90LB4	—	4790	4790	13300	15200	3150	222
16.3	984	1.3	85.2	12.0	—	301 R3	BN90LB4	—	4790	4790	13200	15200	3150	223
17.7	910	2.4	78.7	14.0	—	303 R3	BN90LB4	—	14300	16500	26400	31800	9190	231
17.7	909	0.9	78.7	12.0	—	300 R3	BN90LB4	—	4660	4660	12900	14900	3060	215
17.7	909	1.7	78.7	12.0	—	301 R3	BN90LB4	—	4660	4660	12900	14900	3060	223
17.9	895	0.9	77.5	7.5	300 L3	—	BN90LB4	—	4640	4640	12900	14800	3050	214
17.9	895	1.9	77.5	7.5	301 L3	—	BN90LB4	—	4640	4640	12900	14800	3050	222
18.0	893	2.8	77.2	7.5	303 L3	—	BN90LB4	—	14200	16400	26300	31600	9140	230
19.0	847	2.1	73.3	14.0	—	303 R3	BN90LB4	—	14000	16200	25900	31100	8980	231
19.2	835	2.7	72.3	7.5	303 L3	—	BN90LB4	—	13900	16100	25700	31000	8940	230
19.9	807	1.6	69.9	7.5	301 L3	—	BN90LB4	—	4480	4480	12500	14300	2950	222
20.4	789	1.6	68.2	12.0	—	301 R3	BN90LB4	—	4440	4440	12400	14200	2920	223
21.5	774	1.5	64.8	7.5	301 L2	—	BN90LB4	—	4370	4370	12200	14000	2870	222
22.0	731	1.2	63.2	7.5	300 L3	—	BN90LB4	—	4330	4330	12100	13900	2850	214
22.0	731	2.3	63.2	7.5	301 L3	—	BN90LB4	—	4330	4330	12100	13900	2850	222
22.0	729	3.0	63.1	14.0	—	303 R3	BN90LB4	—	13300	15400	24700	29700	8540	231
22.1	727	1.2	62.9	12.0	—	300 R3	BN90LB4	—	4330	4330	12100	13900	2840	215
22.1	727	2.3	62.9	12.0	—	301 R3	BN90LB4	—	4330	4330	12100	13900	2840	223
24.9	666	2.7	55.8	9.0	303 L2	—	BN90LB4	—	12800	14800	23800	28700	8200	230
25.7	626	2.9	54.2	14.0	—	303 R3	BN90LB4	—	12700	14600	23600	28400	8120	231
26.8	620	1.0	51.9	7.5	300 L2	—	BN90LB4	—	4060	4060	11400	13100	2670	214
26.8	620	2.1	51.9	7.5	301 L2	—	BN90LB4	—	4060	4060	11400	13100	2670	222
26.9	597	1.4	51.6	7.5	300 L3	—	BN90LB4	—	4050	4050	11400	13100	2660	214
26.9	597	2.7	51.6	7.5	301 L3	—	BN90LB4	—	4050	4050	11400	13100	2660	222
27.6	583	1.5	50.4	12.0	—	300 R3	BN90LB4	—	4020	4020	11300	13000	2640	215
27.6	583	2.8	50.4	12.0	—	301 R3	BN90LB4	—	4020	4020	11300	13000	2640	223
33	496	1.3	41.5	7.5	300 L2	—	BN90LB4	—	3770	3770	10700	12300	2480	214
33	496	2.6	41.5	7.5	301 L2	—	BN90LB4	—	3770	3770	10700	12300	2480	222
34	476	1.4	41.2	12.0	—	300 R3	BN90LB4	—	3760	3760	10600	12200	2470	215
34	476	2.7	41.2	12.0	—	301 R3	BN90LB4	—	3760	3760	10600	12200	2470	223
36	458	1.8	38.4	7.5	300 L2	—	BN90LB4	—	3670	3670	10400	12000	2410	214
37	431	2.0	37.3	12.0	—	300 R3	BN90LB4	—	3630	3630	10300	11900	2390	215
42	397	1.6	33.3	7.5	300 L2	—	BN90LB4	—	3500	3500	9990	11500	2300	214
45	366	2.3	30.7	7.5	300 L2	—	BN90LB4	—	3410	3410	9750	11200	2240	214
46	351	2.4	30.4	12.0	—	300 R3	BN90LB4	—	3400	3400	9730	11200	2230	215
56	287	2.5	24.8	12.0	—	300 R3	BN90LB4	—	3170	3170	9150	10500	2090	215
56	296	2.9	24.8	18.0	—	303 R2	BN90LB4	—	9750	11300	18700	22500	6250	231
57	294	2.7	24.6	7.5	300 L2	—	BN90LB4	—	3160	3160	9130	10500	2080	214
69	240	2.7	20.1	7.5	300 L2	—	BN90LB4	—	2960	2960	8590	9870	1940	214
75	220	1.7	18.5	12.0	—	300 R2	BN90LB4	—	2870	2870	8370	9620	1890	215
94	176	2.9	14.8	12.0	—	300 R2	BN90LB4	—	2670	2670	7830	9000	1750	215
154	111	2.9	9.0	7.5	300 L1	—	BN90LB4	—	2260	2260	6750	7750	1490	214

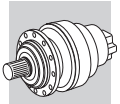
P₁ = 2.2 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
0.64	28676	1.7	2187	11.0	313 L4	—	BN100LA4	—	—	—	192000	231000	80000	310
0.67	27488	1.2	2096	11.0	311 L4	—	BN100LA4	—	—	—	157000	195000	65000	300
0.70	26513	1.0	2022	11.0	310 L4	—	BN100LA4	—	—	—	133000	166000	65000	290
0.78	23823	2.4	1817	11.0	313 L4	—	BN100LA4	—	—	—	192000	231000	80000	310
0.79	23529	1.1	1794	11.0	310 L4	—	BN100LA4	—	—	—	133000	166000	65000	290
0.80	23161	1.9	1766	11.0	311 L4	—	BN100LA4	—	—	—	157000	195000	65000	300
0.84	22026	1.5	1680	11.0	311 L4	—	BN100LA4	—	—	—	157000	195000	65000	300
0.84	21917	1.2	1672	11.0	310 L4	—	BN100LA4	—	—	—	133000	166000	65000	290
0.94	19694	2.9	1502	11.0	313 L4	—	BN100LA4	—	—	—	192000	231000	80000	310
0.98	18853	1.4	1438	11.0	310 L4	—	BN100LA4	—	—	—	133000	166000	65000	290
1.0	18559	2.3	1415	11.0	311 L4	—	BN100LA4	—	—	—	157000	195000	65000	300
1.0	18277	2.9	1394	11.0	313 L4	—	BN100LA4	—	—	—	192000	229000	79900	310
1.0	18099	0.9	1380	7.5	309 L4	—	BN100LA4	—	—	—	110000	143800	35800	280








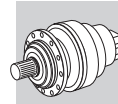
P₁ = 2.2 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
					MC	MZ	HC/PC	HZ/PZ	FZ					
1.1	16859	1.0	1286	7.5	309 L4	—	BN100LA4	—	—	—	109200	140800	35000	280
1.1	16508	1.7	1259	11.0	310 L4	—	BN100LA4	—	—	—	128500	161600	62700	290
1.1	16133	2.7	1230	11.0	311 L4	—	BN100LA4	—	—	—	150800	187900	62300	300
1.2	15266	1.9	1164	11.0	310 L4	—	BN100LA4	—	—	—	125500	157900	61100	290
1.2	15166	0.9	1157	7.5	307 L4	—	BN100LA4	M3LA4	47500	59600	101900	133600	41300	270
1.2	15070	1.1	1149	7.5	309 L4	—	BN100LA4	—	—	—	105500	136100	33700	280
1.4	13382	2.1	1021	11.0	310 L4	—	BN100LA4	—	—	—	120700	151800	58500	290
1.4	13100	1.1	999	7.5	307 L4	—	BN100LA4	M3LA4	46300	58000	99600	130500	40200	270
1.4	13100	1.4	999	7.5	309 L4	—	BN100LA4	—	—	—	101200	130500	32200	280
1.5	12310	2.7	939	11.0	310 L4	—	BN100LA4	—	—	—	117700	148000	56900	290
1.6	11883	1.3	906	7.5	307 L4	—	BN100LA4	M3LA4	44800	56200	96700	126800	38900	270
1.6	11883	1.5	906	7.5	309 L4	—	BN100LA4	—	—	—	98300	126800	31100	280
1.6	11776	2.0	898	15.0	—	310 R4	BN100LA4	—	—	—	116100	146000	56100	291
1.7	10723	2.6	818	11.0	310 L4	—	BN100LA4	—	—	—	112900	142000	54300	290
1.8	10497	1.3	801	7.5	307 L4	—	BN100LA4	M3LA4	43000	53900	93200	122100	37400	270
1.8	10497	1.7	801	7.5	309 L4	—	BN100LA4	—	—	—	94700	122100	29900	280
1.9	9922	2.7	757	15.0	—	310 R4	BN100LA4	—	—	—	110300	138700	52900	291
1.9	9516	2.8	726	11.0	310 L4	—	BN100LA4	—	—	—	108900	137000	52200	290
2.0	9470	1.6	722	7.5	307 L4	—	BN100LA4	M3LA4	41500	52100	90400	118400	36100	270
2.0	9470	2.2	722	7.5	309 L4	—	BN100LA4	—	—	—	91800	118400	28900	280
2.0	9173	1.0	700	6.0	306 L4	—	BN100LA4	M3LA4	37000	41900	83200	96900	27800	260
2.0	9044	1.1	690	15.0	—	307 R4	BN100LA4	M3LA4	40900	51300	89100	116800	35500	271
2.0	9044	1.6	690	15.0	—	309 R4	BN100LA4	—	—	—	90600	116800	28400	281
2.2	8569	1.5	654	7.5	307 L4	—	BN100LA4	M3LA4	40200	50400	87700	114900	34900	270
2.2	8569	2.1	654	7.5	309 L4	—	BN100LA4	—	—	—	89100	114900	27900	280
2.2	8374	2.6	639	15.0	—	310 R4	BN100LA4	—	—	—	104800	131800	50000	291
2.2	8333	1.1	636	6.0	306 L4	—	BN100LA4	M3LA4	35800	40600	80800	94100	26900	260
2.4	7741	1.1	590	12.0	—	306 R4	BN100LA4	M3LA4	34900	39600	79100	92100	26200	261
2.4	7732	2.8	590	15.0	—	310 R4	BN100LA4	—	—	—	102400	128700	48700	291
2.4	7727	1.2	589	6.0	306 L4	—	BN100LA4	M3LA4	34900	39600	79000	92000	26200	260
2.4	7620	1.7	581	15.0	—	307 R4	BN100LA4	M3LA4	38600	48500	84700	110900	33600	271
2.4	7620	2.1	581	15.0	—	309 R4	BN100LA4	—	—	—	86000	110900	26900	281
2.4	7588	2.0	579	7.5	307 L4	—	BN100LA4	M3LA4	38600	48400	84500	110800	33500	270
2.4	7588	2.8	579	7.5	309 L4	—	BN100LA4	—	—	—	85900	110800	26800	280
2.6	7211	1.0	550	12.0	—	306 R4	BN100LA4	M3LA4	34100	38700	77400	90100	25600	261
2.8	6677	1.4	509	6.0	306 L4	—	BN100LA4	M3LA4	33300	37700	75600	88100	25000	260
2.8	6677	2.1	509	7.5	307 L4	—	BN100LA4	M3LA4	37000	46400	81400	106600	32100	270
2.8	6677	2.1	509	7.5	309 L4	—	BN100LA4	—	—	—	82700	106600	25700	280
2.9	6431	1.5	490	15.0	—	307 R4	BN100LA4	M3LA4	36500	45800	80500	105400	31700	271
2.9	6431	2.2	490	15.0	—	309 R4	BN100LA4	—	—	—	81700	105400	25400	281
2.9	6399	1.4	488	12.0	—	306 R4	BN100LA4	M3LA4	32800	37100	74700	87000	24600	261
3.0	6095	2.0	465	7.5	307 L4	—	BN100LA4	M3LA4	35800	45000	79200	103700	31200	270
3.1	5991	2.3	457	15.0	—	309 R4	BN100LA4	—	—	—	80000	103200	24800	281
3.1	5961	1.2	455	12.0	—	306 R4	BN100LA4	M3LA4	32000	36300	73100	85100	24100	261
3.1	5938	2.3	453	15.0	—	307 R4	BN100LA4	M3LA4	35500	44600	78600	102900	30900	271
3.2	5843	0.9	446	6.0	305 L4	—	BN100LA4	M3LA4	25500	29500	44400	53400	16400	250
3.2	5825	1.7	444	6.0	306 L4	—	BN100LA4	M3LA4	31800	36000	72600	84500	23900	260
3.4	5505	1.6	420	12.0	—	306 R4	BN100LA4	M3LA4	31200	35300	71400	83100	23400	261
3.4	5419	2.2	413	15.0	—	307 R4	BN100LA4	M3LA4	34500	43200	76400	100100	30000	271
3.5	5317	2.2	406	7.5	307 L4	—	BN100LA4	M3LA4	34300	43000	76000	99600	29800	270
3.5	5491	1.0	405	7.5	306 L3	—	BN100LA4	M3LA4	30800	34900	70600	82200	23100	260
3.6	5126	1.3	391	6.0	306 L4	—	BN100LA4	M3LA4	30400	34500	69900	81400	22900	260
3.6	5100	1.5	389	12.0	—	306 R4	BN100LA4	M3LA4	30400	34400	69800	81200	22800	261
3.8	4909	2.9	374	15.0	—	309 R4	BN100LA4	—	—	—	75400	97200	23200	281
3.9	4772	1.0	364	12.0	—	305 R4	BN100LA4	M3LA4	23900	27600	41800	50300	15300	251
3.9	4758	2.6	363	15.0	—	307 R4	BN100LA4	M3LA4	33000	41400	73500	96300	28700	271
4.2	4562	1.9	336	11.0	307 L3	—	BN100LA4	M3LA4	32200	40400	71900	94200	28000	270
4.2	4562	2.9	336	11.0	309 L3	—	BN100LA4	—	—	—	73000	94200	22400	280
4.2	4400	1.0	336	12.0	—	305 R4	BN100LA4	M3LA4	23200	26800	40800	49100	14900	251
4.3	4342	2.6	331	15.0	—	307 R4	BN100LA4	M3LA4	32000	40200	71500	93700	27800	271
4.3	4400	1.3	325	7.5	306 L3	—	BN100LA4	M3LA4	28600	32400	66100	76900	21500	260
4.5	4086	1.9	312	12.0	—	306 R4	BN100LA4	M3LA4	28200	32000	65300	76000	21200	261
4.9	3802	1.0	290	12.0	—	304 R4	BN100LA4	M3LA4	22100	25600	39100	47000	14200	241
4.9	3802	1.4	290	12.0	—	305 R4	BN100LA4	M3LA4	22100	25600	39100	47000	14200	251
4.9	3789	2.2	289	12.0	—	306 R4	BN100LA4	M3LA4	27500	31200	63800	74300	20700	261
4.9	3905	1.4	288	7.5	306 L3	—	BN100LA4	M3LA4	27500	31200	63700	74200	20700	260
5.0	3844	2.9	284	11.0	307 L3	—	BN100LA4	M3LA4	30400	38100	68300	89400	26400	270








P₁ = 2.2 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
5.1	3749	1.2	276	7.5	305 L3	—	BN100LA4	M3LA4	21800	25200	38500	46300	14000	250
5.3	3637	1.5	268	7.5	306 L3	—	BN100LA4	M3LA4	26900	30400	62400	72700	20200	260
5.3	3507	1.0	267	12.0	—	304 R4	BN100LA4	M3LA4	21500	24900	38100	45900	13800	241
5.5	3492	1.0	258	7.5	305 L3	—	BN100LA4	M3LA4	21300	24600	37700	45300	13600	250
5.5	3346	1.1	255	12.0	—	305 R4	BN100LA4	M3LA4	21200	24500	37600	45200	13600	251
5.7	3260	2.5	249	12.0	—	306 R4	BN100LA4	M3LA4	26200	29700	61000	71000	19700	261
5.9	3244	2.7	239	11.0	307 L3	—	BN100LA4	M3LA4	28700	36000	64900	85000	25000	270
5.9	3228	2.5	238	7.5	306 L3	—	BN100LA4	M3LA4	25800	29200	60200	70100	19400	260
6.1	3029	1.2	231	12.0	—	305 R4	BN100LA4	M3LA4	20500	23700	36500	43900	13200	251
6.1	3019	2.5	230	12.0	—	306 R4	BN100LA4	M3LA4	25500	28900	59600	69400	19200	261
6.2	2970	1.2	227	12.0	—	304 R4	BN100LA4	M3LA4	20400	23500	36300	43600	13100	241
6.4	3007	2.2	222	7.5	306 L3	—	BN100LA4	M3LA4	25200	28600	58900	68600	18900	260
6.4	2987	1.2	220	7.5	304 L3	—	BN100LA4	M3LA4	20200	23300	36000	43300	13000	240
6.4	2987	1.6	220	7.5	305 L3	—	BN100LA4	M3LA4	20200	23300	36000	43300	13000	250
6.6	2810	1.0	214	12.0	—	303 R4	BN100LA4	M3LA4	20000	23100	35700	42900	12800	231
6.6	2810	1.3	214	12.0	—	304 R4	BN100LA4	M3LA4	20000	23100	35700	42900	12800	241
6.6	2810	1.9	214	12.0	—	305 R4	BN100LA4	M3LA4	20000	23100	35700	42900	12800	251
6.9	2777	2.9	205	7.5	306 L3	—	BN100LA4	M3LA4	24500	27800	57600	67000	18400	260
7.4	2580	1.4	190	7.5	305 L3	—	BN100LA4	M3LA4	19200	22200	34400	41400	12300	250
7.4	2572	2.5	190	7.5	306 L3	—	BN100LA4	M3LA4	23900	27100	56200	65500	18000	260
7.6	2425	1.0	185	12.0	—	303 R4	BN100LA4	M3LA4	18600	21500	33400	40200	11900	231
7.6	2425	1.4	185	12.0	—	304 R4	BN100LA4	M3LA4	19100	22000	34100	41100	12200	241
7.6	2425	1.9	185	12.0	—	305 R4	BN100LA4	M3LA4	19100	22000	34100	41100	12200	251
7.9	2407	0.9	178	7.5	303 L3	—	BN100LA4	M3LA4	18800	21700	33700	40600	12100	230
7.9	2407	1.2	178	7.5	304 L3	—	BN100LA4	M3LA4	18800	21700	33700	40600	12100	240
7.9	2407	1.8	178	7.5	305 L3	—	BN100LA4	M3LA4	18800	21700	33700	40600	12100	250
8.6	2233	1.1	165	7.5	304 L3	—	BN100LA4	M3LA4	18300	21200	33000	39600	11800	240
8.6	2220	1.0	164	7.5	303 L3	—	BN100LA4	M3LA4	18300	21100	32900	39600	11700	230
8.6	2220	2.0	164	7.5	305 L3	—	BN100LA4	M3LA4	18300	21100	32900	39600	11700	250
8.9	2076	1.3	158	12.0	—	303 R4	BN100LA4	M3LA4	18100	20900	32600	39200	11600	231
8.9	2076	1.7	158	12.0	—	304 R4	BN100LA4	M3LA4	18100	20900	32600	39200	11600	241
8.9	2076	2.6	158	12.0	—	305 R4	BN100LA4	M3LA4	18100	20900	32600	39200	11600	251
9.2	2068	1.7	152	7.5	305 L3	—	BN100LA4	M3LA4	17900	20600	32200	38700	11500	250
9.4	2028	1.7	150	7.5	304 L3	—	BN100LA4	M3LA4	17800	20500	32000	38500	11400	240
9.5	1943	1.8	148	12.0	—	304 R4	BN100LA4	M3LA4	17700	20400	31900	38400	11400	241
9.5	1943	1.2	148	12.0	—	303 R4	BN100LA4	M3LA4	17700	20400	31900	38400	11400	231
9.5	1943	2.3	148	12.0	—	305 R4	BN100LA4	M3LA4	17700	20400	31900	38400	11400	251
9.8	1954	2.8	144	14.0	—	306 R3	BN100LA4	M3LA4	21800	24700	51800	60300	16400	261
10.0	1918	1.4	141	7.5	303 L3	—	BN100LA4	M3LA4	17400	20100	31500	37900	11200	230
10.0	1918	1.8	141	7.5	304 L3	—	BN100LA4	M3LA4	17400	20100	31500	37900	11200	240
10.0	1918	2.7	141	7.5	305 L3	—	BN100LA4	M3LA4	17400	20100	31500	37900	11200	250
10.8	1774	1.0	131	7.5	301 L3	—	BN100LA4	M3LA4	5520	5520	15100	17300	3630	222
10.8	1769	2.0	130	7.5	304 L3	—	BN100LA4	M3LA4	17000	19600	30700	37000	10900	240
10.9	1700	1.0	130	10.0	—	301 R4	BN100LA4	M3LA4	5510	5510	15000	17300	3620	223
10.9	1695	1.5	129	12.0	—	303 R4	BN100LA4	M3LA4	16900	19500	30600	36900	10800	231
10.9	1695	2.1	129	12.0	—	304 R4	BN100LA4	M3LA4	16900	19500	30600	36900	10800	241
11.3	1688	1.1	124	7.5	303 L3	—	BN100LA4	M3LA4	16700	19300	30300	36500	10700	230
11.3	1688	2.1	124	7.5	305 L3	—	BN100LA4	M3LA4	16700	19300	30300	36500	10700	250
11.6	1644	1.5	121	14.0	—	304 R3	BN100LA4	M3LA4	16600	19100	30100	36200	10600	241
12.3	1551	1.2	114	14.0	—	303 R3	BN100LA4	M3LA4	16200	18700	29500	35500	10400	231
12.3	1551	2.3	114	14.0	—	305 R3	BN100LA4	M3LA4	16200	18700	29500	35500	10400	251
12.5	1528	1.2	113	7.5	303 L3	—	BN100LA4	M3LA4	16200	18600	29400	35400	10400	230
12.5	1528	2.3	113	7.5	305 L3	—	BN100LA4	M3LA4	16200	18600	29400	35400	10400	250
12.8	1498	2.3	111	7.5	304 L3	—	BN100LA4	M3LA4	16000	18500	29200	35200	10300	240
12.9	1436	2.3	109	12.0	—	304 R4	BN100LA4	M3LA4	16000	18500	29200	35100	10300	241
13.2	1443	0.9	106	12.0	—	301 R3	BN100LA4	M3LA4	5160	5160	14200	16300	3390	223
13.3	1388	1.2	106	10.0	—	301 R4	BN100LA4	M3LA4	5150	5150	14100	16200	3380	223
13.4	1422	1.2	105	7.5	301 L3	—	BN100LA4	M3LA4	5130	5130	14100	16200	3370	222
13.5	1417	1.8	105	7.5	303 L3	—	BN100LA4	M3LA4	15800	18200	28800	34600	10100	230
13.5	1417	2.5	105	7.5	304 L3	—	BN100LA4	M3LA4	15800	18200	28800	34600	10100	240
14.5	1315	1.8	97.0	14.0	—	304 R3	BN100LA4	M3LA4	15400	17700	28100	33800	9860	241
15.4	1241	1.5	91.5	14.0	—	303 R3	BN100LA4	M3LA4	15100	17400	27600	33200	9670	231
15.4	1241	2.9	91.5	14.0	—	305 R3	BN100LA4	M3LA4	15100	17400	27600	33200	9670	251
15.6	1223	1.8	90.2	7.5	303 L3	—	BN100LA4	M3LA4	15000	17300	27500	33100	9620	230
15.6	1223	2.7	90.2	7.5	304 L3	—	BN100LA4	M3LA4	15000	17300	27500	33100	9620	240
15.8	1172	2.8	89.4	12.0	—	304 R4	BN100LA4	M3LA4	15000	17300	27400	33000	9590	241
16.5	1161	1.4	85.6	7.5	301 L3	—	BN100LA4	M3LA4	4790	4790	13300	15200	3150	222

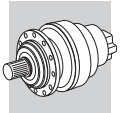


P₁ = 2.2 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
16.6	1155	1.1	85.2	12.0	—	301 R3	BN100LA4	M3LA4	4790	4790	13200	15200	3150	223
17.9	1067	2.0	78.7	14.0	—	303 R3	BN100LA4	M3LA4	14300	16500	26400	31800	9190	231
17.9	1067	2.7	78.7	14.0	—	304 R3	BN100LA4	M3LA4	14300	16500	26400	31800	9190	241
17.9	1066	1.5	78.7	12.0	—	301 R3	BN100LA4	M3LA4	4660	4660	12900	14900	3060	223
18.2	1051	1.6	77.5	7.5	301 L3	—	BN100LA4	M3LA4	4640	4640	12900	14800	3050	222
18.3	1047	2.4	77.2	7.5	303 L3	—	BN100LA4	M3LA4	14200	16400	26300	31600	9140	230
19.2	994	1.8	73.3	14.0	—	303 R3	BN100LA4	M3LA4	14000	16200	25900	31100	8980	231
19.5	980	2.3	72.3	7.5	303 L3	—	BN100LA4	M3LA4	13900	16100	25700	31000	8940	230
20.2	947	1.4	69.9	7.5	301 L3	—	BN100LA4	M3LA4	4480	4480	12500	14300	2950	222
20.7	925	1.4	68.2	12.0	—	301 R3	BN100LA4	M3LA4	4440	4440	12400	14200	2920	223
21.8	908	1.3	64.8	7.5	301 L2	—	BN100LA4	M3LA4	4370	4370	12200	14000	2870	222
22.3	858	1.0	63.2	7.5	300 L3	—	BN100LA4	M3LA4	4330	4330	12100	13900	2850	214
22.3	858	1.9	63.2	7.5	301 L3	—	BN100LA4	M3LA4	4330	4330	12100	13900	2850	222
22.4	855	2.5	63.1	14.0	—	303 R3	BN100LA4	M3LA4	13300	15400	24700	29700	8540	231
22.4	855	2.9	63.1	7.5	303 L3	—	BN100LA4	M3LA4	13300	15400	24700	29700	8540	230
22.4	853	1.0	62.9	12.0	—	300 R3	BN100LA4	M3LA4	4330	4330	12100	13900	2840	215
22.4	853	1.9	62.9	12.0	—	301 R3	BN100LA4	M3LA4	4330	4330	12100	13900	2840	223
23.8	828	2.9	59.1	9.0	304 L2	—	BN100LA4	M3LA4	13000	15000	24200	29200	8360	240
25.3	782	2.3	55.8	9.0	303 L2	—	BN100LA4	M3LA4	12800	14800	23800	28700	8200	230
26.0	735	2.5	54.2	14.0	—	303 R3	BN100LA4	M3LA4	12700	14600	23600	28400	8120	231
26.4	724	3.0	53.4	7.5	303 L3	—	BN100LA4	M3LA4	12600	14500	23500	28300	8080	230
27.2	727	1.8	51.9	7.5	301 L2	—	BN100LA4	M3LA4	4060	4060	11400	13100	2670	222
27.3	700	1.2	51.6	7.5	300 L3	—	BN100LA4	M3LA4	4050	4050	11400	13100	2660	214
27.3	700	2.3	51.6	7.5	301 L3	—	BN100LA4	M3LA4	4050	4050	11400	13100	2660	222
28.0	684	1.2	50.4	12.0	—	300 R3	BN100LA4	M3LA4	4020	4020	11300	13000	2640	215
28.0	684	2.4	50.4	12.0	—	301 R3	BN100LA4	M3LA4	4020	4020	11300	13000	2640	223
32	625	2.9	44.6	9.0	303 L2	—	BN100LA4	M3LA4	11900	13700	22300	26800	7610	230
34	582	1.1	41.5	7.5	300 L2	—	BN100LA4	M3LA4	3770	3770	10700	12300	2480	214
34	582	2.2	41.5	7.5	301 L2	—	BN100LA4	M3LA4	3770	3770	10700	12300	2480	222
34	558	1.2	41.2	12.0	—	300 R3	BN100LA4	M3LA4	3760	3760	10600	12200	2470	215
34	558	2.3	41.2	12.0	—	301 R3	BN100LA4	M3LA4	3760	3760	10600	12200	2470	223
37	537	1.6	38.4	7.5	300 L2	—	BN100LA4	M3LA4	3670	3670	10400	12000	2410	214
37	537	2.9	38.4	7.5	301 L2	—	BN100LA4	M3LA4	3670	3670	10400	12000	2410	222
38	505	1.7	37.3	12.0	—	300 R3	BN100LA4	M3LA4	3630	3630	10300	11900	2390	215
42	466	1.4	33.3	7.5	300 L2	—	BN100LA4	M3LA4	3500	3500	9990	11500	2300	214
42	466	2.8	33.3	7.5	301 L2	—	BN100LA4	M3LA4	3500	3500	9990	11500	2300	222
46	430	2.0	30.7	7.5	300 L2	—	BN100LA4	M3LA4	3410	3410	9750	11200	2240	214
46	412	2.0	30.4	12.0	—	300 R3	BN100LA4	M3LA4	3400	3400	9730	11200	2230	215
57	337	2.2	24.8	12.0	—	300 R3	BN100LA4	M3LA4	3170	3170	9150	10500	2090	215
57	347	2.5	24.8	18.0	—	303 R2	BN100LA4	M3LA4	9750	11300	18700	22500	6250	231
57	344	2.3	24.6	7.5	300 L2	—	BN100LA4	M3LA4	3160	3160	9130	10500	2080	214
70	281	2.3	20.1	7.5	300 L2	—	BN100LA4	M3LA4	2960	2960	8590	9870	1940	214
76	258	1.4	18.5	12.0	—	300 R2	BN100LA4	M3LA4	2870	2870	8370	9620	1890	215
76	258	2.9	18.5	12.0	—	301 R2	BN100LA4	M3LA4	2870	2870	8370	9620	1890	223
78	255	2.9	18.2	7.5	300 L2	—	BN100LA4	M3LA4	2860	2860	8330	9580	1880	214
96	207	2.5	14.8	12.0	—	300 R2	BN100LA4	M3LA4	2670	2670	7830	9000	1750	215
157	130	2.5	9.0	7.5	300 L1	—	BN100LA4	M3LA4	2260	2260	6750	7750	1490	214

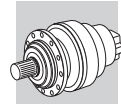
P₁ = 3 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
0.64	38491	1.3	2187	11.0	313 L4	—	BN100LB4	—	—	—	192000	231000	80000	310
0.67	36897	0.9	2096	11.0	311 L4	—	BN100LB4	—	—	—	157000	195000	65000	300
0.78	31977	1.8	1817	11.0	313 L4	—	BN100LB4	—	—	—	192000	231000	80000	310
0.80	31089	1.4	1766	11.0	311 L4	—	BN100LB4	—	—	—	157000	195000	65000	300
0.84	29565	1.2	1680	11.0	311 L4	—	BN100LB4	—	—	—	157000	195000	65000	300
0.94	26435	2.2	1502	11.0	313 L4	—	BN100LB4	—	—	—	192000	231000	80000	310
0.98	25307	1.0	1438	11.0	310 L4	—	BN100LB4	—	—	—	133000	166000	65000	290
1.0	24911	1.7	1415	11.0	311 L4	—	BN100LB4	—	—	—	157000	195000	65000	300
1.0	24533	2.1	1394	11.0	313 L4	—	BN100LB4	—	—	—	192000	229000	79900	310
1.1	22274	2.5	1266	11.0	313 L4	—	BN100LB4	—	—	—	188000	222500	77400	310
1.1	22158	1.2	1259	11.0	310 L4	—	BN100LB4	—	—	—	128500	161600	62700	290
1.1	21655	2.0	1230	11.0	311 L4	—	BN100LB4	—	—	—	150800	187900	62300	300








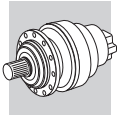
P₁ = 3 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
1.2	20491	1.4	1164	11.0	310 L4	—	BN100LB4	—	—	—	125500	157900	61100	290
1.3	19658	2.7	1117	11.0	313 L4	—	BN100LB4	—	—	—	181100	214300	74200	310
1.3	18628	2.3	1058	11.0	311 L4	—	BN100LB4	—	—	—	144200	179600	59200	300
1.4	17963	1.6	1021	11.0	310 L4	—	BN100LB4	—	—	—	120700	151800	58500	290
1.4	17584	1.0	999	7.5	309 L4	—	BN100LB4	—	—	—	101200	130500	32200	280
1.4	17352	2.4	986	11.0	311 L4	—	BN100LB4	—	—	—	141100	175800	57800	300
1.5	16524	2.0	939	11.0	310 L4	—	BN100LB4	—	—	—	117700	148000	56900	290
1.6	15951	1.0	906	7.5	307 L4	—	BN100LB4	M3LB4	43800	54900	94700	124200	38000	270
1.6	15951	1.1	906	7.5	309 L4	—	BN100LB4	—	—	—	98300	126800	31100	280
1.6	15905	2.9	904	11.0	311 L4	—	BN100LB4	—	—	—	137500	171300	56200	300
1.6	15807	1.5	898	15.0	—	310 R4	BN100LB4	—	—	—	116100	146000	56100	291
1.7	14393	1.9	818	11.0	310 L4	—	BN100LB4	—	—	—	112900	142000	54300	290
1.8	14090	0.9	801	7.5	307 L4	—	BN100LB4	M3LB4	42000	52700	91300	119600	36500	270
1.8	14090	1.3	801	7.5	309 L4	—	BN100LB4	—	—	—	94700	122100	29900	280
1.9	13319	2.0	757	15.0	—	310 R4	BN100LB4	—	—	—	110300	138700	52900	291
1.9	13132	2.3	746	22.0	—	311 R4	BN100LB4	—	—	—	129800	161700	52700	301
1.9	12773	2.1	726	11.0	310 L4	—	BN100LB4	—	—	—	108900	137000	52200	290
2.0	12711	1.2	722	7.5	307 L4	—	BN100LB4	M3LB4	41500	52100	90400	118400	36100	270
2.0	12711	1.7	722	7.5	309 L4	—	BN100LB4	—	—	—	91800	118400	28900	280
2.0	12140	1.2	690	15.0	—	309 R4	BN100LB4	—	—	—	90600	116800	28400	281
2.2	11502	1.1	654	7.5	307 L4	—	BN100LB4	M3LB4	40200	50400	87700	114900	34900	270
2.2	11502	1.6	654	7.5	309 L4	—	BN100LB4	—	—	—	89100	114900	27900	280
2.2	11240	1.9	639	15.0	—	310 R4	BN100LB4	—	—	—	104800	131800	50000	291
2.2	11205	2.4	637	11.0	310 L4	—	BN100LB4	—	—	—	104700	131700	50000	290
2.4	10378	2.1	590	15.0	—	310 R4	BN100LB4	—	—	—	102400	128700	48700	291
2.4	10229	1.2	581	15.0	—	307 R4	BN100LB4	M3LB4	38600	48500	84700	110900	33600	271
2.4	10229	1.5	581	15.0	—	309 R4	BN100LB4	—	—	—	86000	110900	26900	281
2.4	10185	1.5	579	7.5	307 L4	—	BN100LB4	M3LB4	38600	48400	84500	110800	33500	270
2.4	10185	2.1	579	7.5	309 L4	—	BN100LB4	—	—	—	85900	110800	26800	280
2.7	9102	2.8	517	15.0	—	310 R4	BN100LB4	—	—	—	98400	123800	46600	291
2.8	8963	1.1	509	6.0	306 L4	—	BN100LB4	M3LB4	33300	37700	75600	88100	25000	260
2.8	8962	1.6	509	7.5	307 L4	—	BN100LB4	M3LB4	37000	46400	81400	106600	32100	270
2.8	8962	1.6	509	7.5	309 L4	—	BN100LB4	—	—	—	82700	106600	25700	280
2.8	8929	2.9	507	11.0	310 L4	—	BN100LB4	—	—	—	97900	123000	46300	290
2.9	8633	1.1	490	15.0	—	307 R4	BN100LB4	M3LB4	36500	45800	80500	105400	31700	271
2.9	8633	1.6	490	15.0	—	309 R4	BN100LB4	—	—	—	81700	105400	25400	281
2.9	8590	1.1	488	12.0	—	306 R4	BN100LB4	M3LB4	32800	37100	74700	87000	24600	261
3.0	8181	1.5	465	7.5	307 L4	—	BN100LB4	M3LB4	35800	45000	79200	103700	31200	270
3.0	8181	2.2	465	7.5	309 L4	—	BN100LB4	—	—	—	80400	103700	24900	280
3.1	8041	1.7	457	15.0	—	309 R4	BN100LB4	—	—	—	80000	103200	24800	281
3.1	7993	2.5	454	15.0	—	310 R4	BN100LB4	—	—	—	94700	119000	44700	291
3.1	7970	1.7	453	15.0	—	307 R4	BN100LB4	M3LB4	35500	44600	78600	102900	30900	271
3.2	7819	1.3	444	6.0	306 L4	—	BN100LB4	M3LB4	31800	36000	72600	84500	23900	260
3.4	7389	1.2	420	12.0	—	306 R4	BN100LB4	M3LB4	31200	35300	71400	83100	23400	261
3.4	7274	1.6	413	15.0	—	307 R4	BN100LB4	M3LB4	34500	43200	76400	100100	30000	271
3.4	7274	2.5	413	15.0	—	309 R4	BN100LB4	—	—	—	77700	100100	24000	281
3.5	7137	1.7	406	7.5	307 L4	—	BN100LB4	M3LB4	34300	43000	76000	99600	29800	270
3.5	7137	2.5	406	7.5	309 L4	—	BN100LB4	—	—	—	77200	99600	23800	280
3.6	6893	2.8	392	11.0	310 L4	—	BN100LB4	—	—	—	90500	113900	42500	290
3.6	6880	1.0	391	6.0	306 L4	—	BN100LB4	M3LB4	30400	34500	69900	81400	22900	260
3.6	6845	1.1	389	12.0	—	306 R4	BN100LB4	M3LB4	30400	34400	69800	81200	22800	261
3.8	6589	2.2	374	15.0	—	309 R4	BN100LB4	—	—	—	75400	97200	23200	281
3.9	6387	1.9	363	15.0	—	307 R4	BN100LB4	M3LB4	33000	41400	73500	96300	28700	271
4.0	6144	2.4	349	7.5	307 L4	—	BN100LB4	M3LB4	32600	40900	72700	95200	28300	270
4.2	6124	1.4	336	11.0	307 L3	—	BN100LB4	M3LB4	32200	40400	71900	94200	28000	270
4.2	6124	2.2	336	11.0	309 L3	—	BN100LB4	—	—	—	73000	94200	22400	280
4.3	5828	2.0	331	15.0	—	307 R4	BN100LB4	M3LB4	32000	40200	71500	93700	27800	271
4.3	5828	3.0	331	15.0	—	309 R4	BN100LB4	—	—	—	72700	93700	22300	281
4.3	5906	0.9	325	7.5	306 L3	—	BN100LB4	M3LB4	28600	32400	66100	76900	21500	260
4.5	5485	1.4	312	12.0	—	306 R4	BN100LB4	M3LB4	28200	32000	65300	76000	21200	261
4.7	5280	2.7	300	15.0	—	307 R4	BN100LB4	M3LB4	31000	38900	69400	91000	26900	271
4.9	5104	1.0	290	12.0	—	305 R4	BN100LB4	M3LB4	22100	25600	39100	47000	14200	251
4.9	5086	1.6	289	12.0	—	306 R4	BN100LB4	M3LB4	27500	31200	63800	74300	20700	261
4.9	5242	1.0	288	7.5	306 L3	—	BN100LB4	M3LB4	27500	31200	63700	74200	20700	260
5.0	5007	2.3	284	15.0	—	307 R4	BN100LB4	M3LB4	30400	38200	68300	89500	26500	271
5.0	5160	2.2	284	11.0	307 L3	—	BN100LB4	M3LB4	30400	38100	68300	89400	26400	270
5.3	4883	1.1	268	7.5	306 L3	—	BN100LB4	M3LB4	26900	30400	62400	72700	20200	260



P₁ = 3 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]						
									MC	MZ	HC/PC	HZ/PZ	FZ		
5.7	4375	1.9	249	12.0	—	306 R4	BN100LB4	M3LB4	—	26200	29700	61000	71000	19700	261
5.9	4355	2.0	239	11.0	307 L3	—	BN100LB4	M3LB4	—	28700	36000	64900	85000	25000	270
5.9	4355	3.0	239	11.0	309 L3	—	BN100LB4	—	—	—	—	65900	85000	20000	280
5.9	4333	1.9	238	7.5	306 L3	—	BN100LB4	M3LB4	—	25800	29200	60200	70100	19400	260
6.1	4087	2.7	232	15.0	—	307 R4	BN100LB4	M3LB4	—	28400	35700	64300	84200	24700	271
6.1	4053	1.9	230	12.0	—	306 R4	BN100LB4	M3LB4	—	25500	28900	59600	69400	19200	261
6.4	4036	1.6	222	7.5	306 L3	—	BN100LB4	M3LB4	—	25200	28600	58900	68600	18900	260
6.4	4010	0.9	220	7.5	304 L3	—	BN100LB4	M3LB4	—	19700	22800	35200	42400	12700	240
6.4	4010	1.2	220	7.5	305 L3	—	BN100LB4	M3LB4	—	20200	23300	36000	43300	13000	250
6.6	3771	1.0	214	12.0	—	304 R4	BN100LB4	M3LB4	—	20000	23100	35700	42900	12800	241
6.6	3771	1.4	214	12.0	—	305 R4	BN100LB4	M3LB4	—	20000	23100	35700	42900	12800	251
6.6	3760	2.6	214	12.0	—	306 R4	BN100LB4	M3LB4	—	24900	28200	58300	67900	18700	261
6.9	3727	2.2	205	7.5	306 L3	—	BN100LB4	M3LB4	—	24500	27800	57600	67000	18400	260
7.0	3669	3.0	202	11.0	307 L3	—	BN100LB4	M3LB4	—	27100	34000	61600	80700	23600	270
7.4	3464	1.0	190	7.5	305 L3	—	BN100LB4	M3LB4	—	19200	22200	34400	41400	12300	250
7.4	3453	1.9	190	7.5	306 L3	—	BN100LB4	M3LB4	—	23900	27100	56200	65500	18000	260
7.6	3254	1.1	185	12.0	—	304 R4	BN100LB4	M3LB4	—	19100	22000	34100	41100	12200	241
7.6	3254	1.4	185	12.0	—	305 R4	BN100LB4	M3LB4	—	19100	22000	34100	41100	12200	251
7.8	3185	3.0	181	12.0	—	306 R4	BN100LB4	M3LB4	—	23600	26700	55500	64600	17700	261
7.9	3231	1.4	178	7.5	305 L3	—	BN100LB4	M3LB4	—	18800	21700	33700	40600	12100	250
8.4	2953	2.6	168	12.0	—	306 R4	BN100LB4	M3LB4	—	23000	26000	54200	63100	17300	261
8.6	2979	1.5	164	7.5	305 L3	—	BN100LB4	M3LB4	—	18300	21100	32900	39600	11700	250
8.9	2787	1.0	158	12.0	—	303 R4	BN100LB4	M3LB4	—	18100	20900	32600	39200	11600	231
8.9	2787	1.3	158	12.0	—	304 R4	BN100LB4	M3LB4	—	18100	20900	32600	39200	11600	241
8.9	2787	1.9	158	12.0	—	305 R4	BN100LB4	M3LB4	—	18100	20900	32600	39200	11600	251
9.2	2775	1.3	152	7.5	305 L3	—	BN100LB4	M3LB4	—	17900	20600	32200	38700	11500	250
9.3	2767	2.7	152	7.5	306 L3	—	BN100LB4	M3LB4	—	22200	25200	52600	61300	16700	260
9.4	2722	1.3	150	7.5	304 L3	—	BN100LB4	M3LB4	—	17800	20500	32000	38500	11400	240
9.5	2608	1.3	148	12.0	—	304 R4	BN100LB4	M3LB4	—	17700	20400	31900	38400	11400	241
9.5	2608	1.7	148	12.0	—	305 R4	BN100LB4	M3LB4	—	17700	20400	31900	38400	11400	251
9.8	2623	2.1	144	14.0	—	306 R3	BN100LB4	M3LB4	—	21800	24700	51800	60300	16400	261
10.0	2575	1.0	141	7.5	303 L3	—	BN100LB4	M3LB4	—	17400	20100	31500	37900	11200	230
10.0	2575	1.4	141	7.5	304 L3	—	BN100LB4	M3LB4	—	17400	20100	31500	37900	11200	240
10.0	2575	2.0	141	7.5	305 L3	—	BN100LB4	M3LB4	—	17400	20100	31500	37900	11200	250
10.8	2374	1.5	130	7.5	304 L3	—	BN100LB4	M3LB4	—	17000	19600	30700	37000	10900	240
10.9	2275	1.2	129	12.0	—	303 R4	BN100LB4	M3LB4	—	16900	19500	30600	36900	10800	231
10.9	2275	1.6	129	12.0	—	304 R4	BN100LB4	M3LB4	—	16900	19500	30600	36900	10800	241
10.9	2275	2.3	129	12.0	—	305 R4	BN100LB4	M3LB4	—	16900	19500	30600	36900	10800	251
11.3	2265	1.6	124	7.5	305 L3	—	BN100LB4	M3LB4	—	16700	19300	30300	36500	10700	250
11.6	2207	1.1	121	14.0	—	304 R3	BN100LB4	M3LB4	—	16600	19100	30100	36200	10600	241
11.8	2169	3.0	119	14.0	—	306 R3	BN100LB4	M3LB4	—	20500	23200	48900	57000	15400	261
12.3	2082	1.7	114	14.0	—	305 R3	BN100LB4	M3LB4	—	16200	18700	29500	35500	10400	251
12.5	2051	1.8	113	7.5	305 L3	—	BN100LB4	M3LB4	—	16200	18600	29400	35400	10400	250
12.8	2011	1.7	111	7.5	304 L3	—	BN100LB4	M3LB4	—	16000	18500	29200	35200	10300	240
12.9	1927	1.7	109	12.0	—	304 R4	BN100LB4	M3LB4	—	16000	18500	29200	35100	10300	241
13.3	1863	0.9	106	10.0	—	301 R4	BN100LB4	M3LB4	—	5030	5030	13800	15900	3310	223
13.5	1902	1.4	105	7.5	303 L3	—	BN100LB4	M3LB4	—	15800	18200	28800	34600	10100	230
13.5	1902	1.9	105	7.5	304 L3	—	BN100LB4	M3LB4	—	15800	18200	28800	34600	10100	240
13.5	1902	2.6	105	7.5	305 L3	—	BN100LB4	M3LB4	—	15800	18200	28800	34600	10100	250
14.5	1765	1.4	97.0	14.0	—	304 R3	BN100LB4	M3LB4	—	15400	17700	28100	33800	9860	241
15.4	1666	1.1	91.5	14.0	—	303 R3	BN100LB4	M3LB4	—	15100	17400	27600	33200	9670	231
15.4	1666	2.1	91.5	14.0	—	305 R3	BN100LB4	M3LB4	—	15100	17400	27600	33200	9670	251
15.6	1642	1.4	90.2	7.5	303 L3	—	BN100LB4	M3LB4	—	15000	17300	27500	33100	9620	230
15.6	1642	2.0	90.2	7.5	304 L3	—	BN100LB4	M3LB4	—	15000	17300	27500	33100	9620	240
15.6	1642	2.6	90.2	7.5	305 L3	—	BN100LB4	M3LB4	—	15000	17300	27500	33100	9620	250
15.8	1573	2.1	89.4	12.0	—	304 R4	BN100LB4	M3LB4	—	15000	17300	27400	33000	9590	241
16.5	1558	1.1	85.6	7.5	301 L3	—	BN100LB4	M3LB4	—	4790	4790	13300	15200	3150	222
17.9	1433	1.5	78.7	14.0	—	303 R3	BN100LB4	M3LB4	—	14300	16500	26400	31800	9190	231
17.9	1433	2.0	78.7	14.0	—	304 R3	BN100LB4	M3LB4	—	14300	16500	26400	31800	9190	241
17.9	1432	1.1	78.7	12.0	—	301 R3	BN100LB4	M3LB4	—	4660	4660	12900	14900	3060	223
18.2	1410	1.2	77.5	7.5	301 L3	—	BN100LB4	M3LB4	—	4640	4640	12900	14800	3050	222
18.3	1406	1.8	77.2	7.5	303 L3	—	BN100LB4	M3LB4	—	14200	16400	26300	31600	9140	230
18.3	1406	2.5	77.2	7.5	304 L3	—	BN100LB4	M3LB4	—	14200	16400	26300	31600	9140	240
19.2	1335	1.4	73.3	14.0	—	303 R3	BN100LB4	M3LB4	—	14000	16200	25900	31100	8980	231
19.2	1335	2.7	73.3	14.0	—	305 R3	BN100LB4	M3LB4	—	14000	16200	25900	31100	8980	251
19.5	1315	2.5	72.3	7.5	304 L3	—	BN100LB4	M3LB4	—	13900	16100	25700	31000	8940	240
19.5	1315	1.7	72.3	7.5	303 L3	—	BN100LB4	M3LB4	—	13900	16100	25700	31000	8940	230

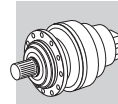


P₁ = 3 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
20.2	1272	1.0	69.9	7.5	301 L3	—	BN100LB4	M3LB4	4480	4480	12500	14300	2950	222
20.7	1242	1.0	68.2	12.0	—	301 R3	BN100LB4	M3LB4	4440	4440	12400	14200	2920	223
21.8	1218	0.9	64.8	7.5	301 L2	—	BN100LB4	M3LB4	4370	4370	12200	14000	2870	222
22.3	1151	1.4	63.2	7.5	301 L3	—	BN100LB4	M3LB4	4330	4330	12100	13900	2850	222
22.4	1148	1.9	63.1	14.0	—	303 R3	BN100LB4	M3LB4	13300	15400	24700	29700	8540	231
22.4	1148	2.5	63.1	14.0	—	304 R3	BN100LB4	M3LB4	13300	15400	24700	29700	8540	241
22.4	1148	2.2	63.1	7.5	303 L3	—	BN100LB4	M3LB4	13300	15400	24700	29700	8540	230
22.4	1145	1.4	62.9	12.0	—	301 R3	BN100LB4	M3LB4	4330	4330	12100	13900	2840	223
23.8	1112	2.1	59.1	9.0	304 L2	—	BN100LB4	M3LB4	13000	15000	24200	29200	8360	240
25.3	1049	1.7	55.8	9.0	303 L2	—	BN100LB4	M3LB4	12800	14800	23800	28700	8200	230
26.0	986	1.8	54.2	14.0	—	303 R3	BN100LB4	M3LB4	12700	14600	23600	28400	8120	231
26.4	972	2.2	53.4	7.5	303 L3	—	BN100LB4	M3LB4	12600	14500	23500	28300	8080	230
27.2	976	1.3	51.9	7.5	301 L2	—	BN100LB4	M3LB4	4060	4060	11400	13100	2670	222
27.3	940	0.9	51.6	7.5	300 L3	—	BN100LB4	M3LB4	3960	3960	11200	12800	2600	214
27.3	940	1.7	51.6	7.5	301 L3	—	BN100LB4	M3LB4	4050	4050	11400	13100	2660	222
28.0	918	0.9	50.4	12.0	—	300 R3	BN100LB4	M3LB4	3930	3930	11100	12700	2580	215
28.0	918	1.8	50.4	12.0	—	301 R3	BN100LB4	M3LB4	4020	4020	11300	13000	2640	223
28.1	915	2.6	50.3	14.0	—	303 R3	BN100LB4	M3LB4	12300	14200	23100	27800	7920	231
29.8	890	2.7	47.3	9.0	304 L2	—	BN100LB4	M3LB4	12100	14000	22700	27300	7760	240
30	848	2.5	46.6	14.0	—	303 R3	BN100LB4	M3LB4	12000	13900	22600	27200	7720	231
32	839	2.2	44.6	9.0	303 L2	—	BN100LB4	M3LB4	11900	13700	22300	26800	7610	230
33	775	2.7	42.6	14.0	—	303 R3	BN100LB4	M3LB4	11700	13500	22000	26400	7490	231
34	781	1.7	41.5	7.5	301 L2	—	BN100LB4	M3LB4	3770	3770	10700	12300	2480	222
34	749	1.7	41.2	12.0	—	301 R3	BN100LB4	M3LB4	3760	3760	10600	12200	2470	223
37	722	3.0	38.4	9.0	303 L2	—	BN100LB4	M3LB4	11300	13000	21300	25600	7240	230
37	721	1.2	38.4	7.5	300 L2	—	BN100LB4	M3LB4	3670	3670	10400	12000	2410	214
37	721	2.1	38.4	7.5	301 L2	—	BN100LB4	M3LB4	3670	3670	10400	12000	2410	222
38	678	1.2	37.3	12.0	—	300 R3	BN100LB4	M3LB4	3630	3630	10300	11900	2390	215
38	678	2.4	37.3	12.0	—	301 R3	BN100LB4	M3LB4	3630	3630	10300	11900	2390	223
39	672	2.7	35.8	9.0	303 L2	—	BN100LB4	M3LB4	10800	12400	20400	24600	6910	230
42	626	1.0	33.3	7.5	300 L2	—	BN100LB4	M3LB4	3420	3420	9790	11200	2250	214
42	626	2.1	33.3	7.5	301 L2	—	BN100LB4	M3LB4	3420	3420	9790	11200	2250	222
46	577	1.5	30.7	7.5	300 L2	—	BN100LB4	M3LB4	3330	3330	9550	11000	2190	214
46	577	2.7	30.7	7.5	301 L2	—	BN100LB4	M3LB4	3410	3410	9750	11200	2240	222
46	554	1.5	30.4	12.0	—	300 R3	BN100LB4	M3LB4	3400	3400	9730	11200	2230	215
46	554	2.9	30.4	12.0	—	301 R3	BN100LB4	M3LB4	3400	3400	9730	11200	2230	223
57	452	1.6	24.8	12.0	—	300 R3	BN100LB4	M3LB4	3170	3170	9150	10500	2090	215
57	466	1.8	24.8	18.0	—	303 R2	BN100LB4	M3LB4	9750	11300	18700	22500	6250	231
57	462	1.7	24.6	7.5	300 L2	—	BN100LB4	M3LB4	3160	3160	9130	10500	2080	214
70	377	1.7	20.1	7.5	300 L2	—	BN100LB4	M3LB4	2960	2960	8590	9870	1940	214
76	347	1.1	18.5	12.0	—	300 R2	BN100LB4	M3LB4	2870	2870	8370	9620	1890	215
76	347	2.1	18.5	12.0	—	301 R2	BN100LB4	M3LB4	2870	2870	8370	9620	1890	223
78	342	2.2	18.2	7.5	300 L2	—	BN100LB4	M3LB4	2860	2860	8330	9580	1880	214
95	279	2.6	14.8	7.5	300 L2	—	BN100LB4	M3LB4	2670	2670	7840	9010	1760	214
96	277	1.8	14.8	12.0	—	300 R2	BN100LB4	M3LB4	2670	2670	7830	9000	1750	215
116	228	3.0	12.1	7.5	300 L2	—	BN100LB4	M3LB4	2500	2500	7380	8480	1640	214
119	222	2.7	11.8	12.0	—	300 R2	BN100LB4	M3LB4	2480	2480	7330	8420	1630	215
157	175	1.8	9.0	7.5	300 L1	—	BN100LB4	M3LB4	2260	2260	6750	7750	1490	214
196	140	2.9	7.2	7.5	300 L1	—	BN100LB4	M3LB4	2100	2100	6310	7250	1380	214

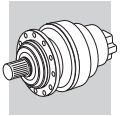
P₁ = 4 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
0.65	51963	0.9	2187	11.0	313 L4	—	BN112M4	—	—	—	192000	231000	80000	310
0.79	43169	1.3	1817	11.0	313 L4	—	BN112M4	—	—	—	192000	231000	80000	310
0.81	41970	1.0	1766	11.0	311 L4	—	BN112M4	—	—	—	157000	195000	65000	300
0.95	35687	1.6	1502	11.0	313 L4	—	BN112M4	—	—	—	192000	231000	80000	310
1.0	33630	1.3	1415	11.0	311 L4	—	BN112M4	—	—	—	157000	195000	65000	300
1.0	33119	1.6	1394	11.0	313 L4	—	BN112M4	—	—	—	192000	229000	79900	310
1.1	30069	1.9	1266	11.0	313 L4	—	BN112M4	—	—	—	188000	222500	77400	310
1.1	29913	0.9	1259	11.0	310 L4	—	BN112M4	—	—	—	128500	161600	62700	290
1.2	29234	1.5	1230	11.0	311 L4	—	BN112M4	—	—	—	150800	187900	62300	300
1.2	27663	1.1	1164	11.0	310 L4	—	BN112M4	—	—	—	125500	157900	61100	290



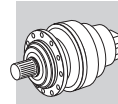
P₁ = 4 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
1.3	26538	2.0	1117	11.0	313 L4	—	BN112M4	—	—	—	181100	214300	74200	310
1.4	25148	1.7	1058	11.0	311 L4	—	BN112M4	—	—	—	144200	179600	59200	300
1.4	24249	1.2	1021	11.0	310 L4	—	BN112M4	—	—	—	120700	151800	58500	290
1.4	24094	2.3	1014	11.0	313 L4	—	BN112M4	—	—	—	175900	208200	71800	310
1.5	23425	1.8	986	11.0	311 L4	—	BN112M4	—	—	—	141100	175800	57800	300
1.5	22307	1.5	939	11.0	310 L4	—	BN112M4	—	—	—	117700	148000	56900	290
1.6	21472	2.2	904	11.0	311 L4	—	BN112M4	—	—	—	137500	171300	56200	300
1.6	21339	1.1	898	15.0	—	310 R4	BN112M4	—	—	—	116100	146000	56100	291
1.6	21130	2.5	889	11.0	313 L4	—	BN112M4	—	—	—	169100	200100	68800	310
1.7	19596	2.3	825	11.0	311 L4	—	BN112M4	—	—	—	133800	166600	54500	300
1.7	19431	1.4	818	11.0	310 L4	—	BN112M4	—	—	—	112900	142000	54300	290
1.8	19022	1.0	801	7.5	309 L4	—	BN112M4	—	—	—	94700	122100	29900	280
1.8	18768	2.8	790	11.0	313 L4	—	BN112M4	—	—	—	163200	193100	66100	310
1.8	18494	2.4	778	22.0	—	313 R4	BN112M4	—	—	—	162500	192300	65800	311
1.9	17980	1.5	757	15.0	—	310 R4	BN112M4	—	—	—	110300	138700	52900	291
1.9	17728	1.7	746	22.0	—	311 R4	BN112M4	—	—	—	129800	161700	52700	301
2.0	17244	1.6	726	11.0	310 L4	—	BN112M4	—	—	—	108900	137000	52200	290
2.0	17205	2.7	724	11.0	311 L4	—	BN112M4	—	—	—	128700	160300	52200	300
2.0	17160	1.2	722	7.5	309 L4	—	BN112M4	—	—	—	91800	118400	28900	280
2.1	16388	0.9	690	15.0	—	309 R4	BN112M4	—	—	—	90600	116800	28400	281
2.2	15527	1.2	654	7.5	309 L4	—	BN112M4	—	—	—	89100	114900	27900	280
2.2	15174	1.4	639	15.0	—	310 R4	BN112M4	—	—	—	104800	131800	50000	291
2.2	15126	1.8	637	11.0	310 L4	—	BN112M4	—	—	—	104700	131700	50000	290
2.3	14937	2.7	629	22.0	—	311 R4	BN112M4	—	—	—	123300	153600	49800	301
2.3	14890	2.7	627	11.0	311 L4	—	BN112M4	—	—	—	123200	153500	49700	300
2.4	14010	1.6	590	15.0	—	310 R4	BN112M4	—	—	—	102400	128700	48700	291
2.5	13809	0.9	581	15.0	—	307 R4	BN112M4	M3LC4	37700	47400	82900	108700	32800	271
2.5	13809	1.1	581	15.0	—	309 R4	BN112M4	—	—	—	86000	110900	26900	281
2.5	13750	1.1	579	7.5	307 L4	—	BN112M4	M3LC4	37700	47300	82800	108500	32800	270
2.5	13750	1.5	579	7.5	309 L4	—	BN112M4	—	—	—	85900	110800	26800	280
2.6	13208	2.4	556	11.0	310 L4	—	BN112M4	—	—	—	100600	126500	47800	290
2.8	12287	2.1	517	15.0	—	310 R4	BN112M4	—	—	—	98400	123800	46600	291
2.8	12099	1.2	509	7.5	307 L4	—	BN112M4	M3LC4	36100	45300	79700	104400	31400	270
2.8	12099	1.2	509	7.5	309 L4	—	BN112M4	—	—	—	82700	106600	25700	280
2.8	12054	2.1	507	11.0	310 L4	—	BN112M4	—	—	—	97900	123000	46300	290
2.9	11654	1.2	490	15.0	—	309 R4	BN112M4	—	—	—	81700	105400	25400	281
2.9	11639	3.0	490	22.0	—	311 R4	BN112M4	—	—	—	114400	142500	45800	301
3.1	11045	1.1	465	7.5	307 L4	—	BN112M4	M3LC4	35800	45000	79200	103700	31200	270
3.1	11045	1.7	465	7.5	309 L4	—	BN112M4	—	—	—	80400	103700	24900	280
3.1	10856	1.3	457	15.0	—	309 R4	BN112M4	—	—	—	80000	103200	24800	281
3.1	10791	1.9	454	15.0	—	310 R4	BN112M4	—	—	—	94700	119000	44700	291
3.2	10760	1.2	453	15.0	—	307 R4	BN112M4	M3LC4	34700	43600	76900	100800	30200	271
3.2	10708	2.8	451	11.0	310 L4	—	BN112M4	—	—	—	94400	118700	44500	290
3.2	10555	0.9	444	6.0	306 L4	—	BN112M4	M3LC4	31100	35200	71100	82800	23300	260
3.4	9963	2.9	419	15.0	—	310 R4	BN112M4	—	—	—	92400	116200	43500	291
3.5	9820	1.2	413	15.0	—	307 R4	BN112M4	M3LC4	34500	43200	76400	100100	30000	271
3.5	9820	1.8	413	15.0	—	309 R4	BN112M4	—	—	—	77700	100100	24000	281
3.5	9635	1.2	406	7.5	307 L4	—	BN112M4	M3LC4	34300	43000	76000	99600	29800	270
3.5	9635	1.8	406	7.5	309 L4	—	BN112M4	—	—	—	77200	99600	23800	280
3.7	9306	2.1	392	11.0	310 L4	—	BN112M4	—	—	—	90500	113900	42500	290
3.8	8895	1.6	374	15.0	—	309 R4	BN112M4	—	—	—	75400	97200	23200	281
3.9	8630	2.8	363	15.0	—	310 R4	BN112M4	—	—	—	88500	111300	41500	291
3.9	8622	1.4	363	15.0	—	307 R4	BN112M4	M3LC4	33000	41400	73500	96300	28700	271
4.1	8294	1.8	349	7.5	307 L4	—	BN112M4	M3LC4	32600	40900	72700	95200	28300	270
4.1	8294	2.6	349	7.5	309 L4	—	BN112M4	—	—	—	73800	95200	22700	280
4.3	8267	1.1	336	11.0	307 L3	—	BN112M4	M3LC4	32200	40400	71900	94200	28000	270
4.3	8267	1.6	336	11.0	309 L3	—	BN112M4	—	—	—	73000	94200	22400	280
4.3	7868	1.5	331	15.0	—	307 R4	BN112M4	M3LC4	32000	40200	71500	93700	27800	271
4.3	7868	2.2	331	15.0	—	309 R4	BN112M4	—	—	—	72700	93700	22300	281
4.6	7405	1.0	312	12.0	—	306 R4	BN112M4	M3LC4	28200	32000	65300	76000	21200	261
4.8	7127	2.0	300	15.0	—	307 R4	BN112M4	M3LC4	31000	38900	69400	91000	26900	271
4.9	6866	1.2	289	12.0	—	306 R4	BN112M4	M3LC4	27500	31200	63800	74300	20700	261
5.0	6759	1.7	284	15.0	—	307 R4	BN112M4	M3LC4	30400	38200	68300	89500	26500	271
5.0	6759	2.5	284	15.0	—	309 R4	BN112M4	—	—	—	69400	89500	21200	281
5.0	6966	1.6	284	11.0	307 L3	—	BN112M4	M3LC4	30400	38100	68300	89400	26400	270
5.0	6966	2.3	284	11.0	309 L3	—	BN112M4	—	—	—	69400	89400	21100	280
5.5	6131	2.4	258	15.0	—	307 R4	BN112M4	M3LC4	29500	37000	66400	87000	25600	271








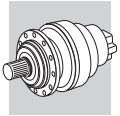
P₁ = 4 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
5.5	6131	2.8	258	15.0	—	309 R4	BN112M4	—	—	—	67400	87000	20500	281
5.8	5906	1.4	249	12.0	—	306 R4	BN112M4	M3LC4	26200	29700	61000	71000	19700	261
6.0	5879	1.5	239	11.0	307 L3	—	BN112M4	M3LC4	28700	36000	64900	85000	25000	270
6.0	5879	2.2	239	11.0	309 L3	—	BN112M4	—	—	—	65900	85000	20000	280
6.0	5850	1.4	238	7.5	306 L3	—	BN112M4	M3LC4	25800	29200	60200	70100	19400	260
6.2	5517	2.0	232	15.0	—	307 R4	BN112M4	M3LC4	28400	35700	64300	84200	24700	271
6.2	5472	1.4	230	12.0	—	306 R4	BN112M4	M3LC4	25500	28900	59600	69400	19200	261
6.4	5476	2.4	223	11.0	309 L3	—	BN112M4	—	—	—	64500	83200	19500	280
6.4	5449	1.2	222	7.5	306 L3	—	BN112M4	M3LC4	25200	28600	58900	68600	18900	260
6.5	5428	2.3	221	11.0	307 L3	—	BN112M4	M3LC4	28000	35100	63300	83000	24300	270
6.7	5091	1.1	214	12.0	—	305 R4	BN112M4	M3LC4	20000	23100	35700	42900	12800	251
6.7	5076	1.9	214	12.0	—	306 R4	BN112M4	M3LC4	24900	28200	58300	67900	18700	261
7.0	4886	2.9	206	15.0	—	307 R4	BN112M4	M3LC4	27300	34300	62000	81200	23700	271
7.0	5032	1.6	205	7.5	306 L3	—	BN112M4	M3LC4	24500	27800	57600	67000	18400	260
7.1	4953	2.2	202	11.0	307 L3	—	BN112M4	M3LC4	27100	34000	61600	80700	23600	270
7.5	4661	1.4	190	7.5	306 L3	—	BN112M4	M3LC4	23900	27100	56200	65500	18000	260
7.7	4394	1.0	185	12.0	—	305 R4	BN112M4	M3LC4	19100	22000	34100	41100	12200	251
7.9	4299	2.2	181	12.0	—	306 R4	BN112M4	M3LC4	23600	26700	55500	64600	17700	261
8.1	4362	1.0	178	7.5	305 L3	—	BN112M4	M3LC4	18800	21700	33700	40600	12100	250
8.1	4349	2.8	177	11.0	307 L3	—	BN112M4	M3LC4	26000	32600	59300	77700	22600	270
8.5	3987	1.9	168	12.0	—	306 R4	BN112M4	M3LC4	23000	26000	54200	63100	17300	261
8.7	4022	1.1	164	7.5	305 L3	—	BN112M4	M3LC4	18300	21100	32900	39600	11700	250
8.9	3969	2.7	162	11.0	307 L3	—	BN112M4	M3LC4	25200	31600	57700	75600	21900	270
9.0	3762	0.9	158	12.0	—	304 R4	BN112M4	M3LC4	18100	20900	32600	39200	11600	241
9.0	3762	1.4	158	12.0	—	305 R4	BN112M4	M3LC4	18100	20900	32600	39200	11600	251
9.1	3751	2.6	158	12.0	—	306 R4	BN112M4	M3LC4	22500	25500	53200	62000	16900	261
9.4	3747	1.0	152	7.5	305 L3	—	BN112M4	M3LC4	17900	20600	32200	38700	11500	250
9.4	3735	2.0	152	7.5	306 L3	—	BN112M4	M3LC4	22200	25200	52600	61300	16700	260
9.6	3674	0.9	150	7.5	304 L3	—	BN112M4	M3LC4	17800	20500	32000	38500	11400	240
9.7	3520	1.0	148	12.0	—	304 R4	BN112M4	M3LC4	17700	20400	31900	38400	11400	241
9.7	3520	1.3	148	12.0	—	305 R4	BN112M4	M3LC4	17700	20400	31900	38400	11400	251
9.9	3542	1.6	144	14.0	—	306 R3	BN112M4	M3LC4	21800	24700	51800	60300	16400	261
10.1	3476	1.0	141	7.5	304 L3	—	BN112M4	M3LC4	17400	20100	31500	37900	11200	240
10.1	3476	1.5	141	7.5	305 L3	—	BN112M4	M3LC4	17400	20100	31500	37900	11200	250
10.1	3464	2.3	141	7.5	306 L3	—	BN112M4	M3LC4	21700	24600	51500	59900	16300	260
11.0	3205	1.1	130	7.5	304 L3	—	BN112M4	M3LC4	17000	19600	30700	37000	10900	240
11.1	3071	1.1	129	12.0	—	304 R4	BN112M4	M3LC4	16900	19500	30600	36900	10800	241
11.1	3071	1.7	129	12.0	—	305 R4	BN112M4	M3LC4	16900	19500	30600	36900	10800	251
11.5	3058	1.2	124	7.5	305 L3	—	BN112M4	M3LC4	16700	19300	30300	36500	10700	250
11.8	2979	2.6	121	7.5	306 L3	—	BN112M4	M3LC4	20600	23400	49200	57300	15500	260
11.9	2942	2.9	120	22.0	—	307 R3	BN112M4	M3LC4	22800	28600	52700	69100	19800	271
12.0	2928	2.2	119	14.0	—	306 R3	BN112M4	M3LC4	20500	23200	48900	57000	15400	261
12.5	2811	1.3	114	14.0	—	305 R3	BN112M4	M3LC4	16200	18700	29500	35500	10400	251
12.7	2769	1.3	113	7.5	305 L3	—	BN112M4	M3LC4	16200	18600	29400	35400	10400	250
12.7	2760	2.7	112	7.5	306 L3	—	BN112M4	M3LC4	20100	22800	48100	56000	15100	260
12.9	2715	1.2	111	7.5	304 L3	—	BN112M4	M3LC4	16000	18500	29200	35200	10300	240
13.1	2601	1.3	109	12.0	—	304 R4	BN112M4	M3LC4	16000	18500	29200	35100	10300	241
13.7	2568	1.0	105	7.5	303 L3	—	BN112M4	M3LC4	15800	18200	28800	34600	10100	230
13.7	2568	1.4	105	7.5	304 L3	—	BN112M4	M3LC4	15800	18200	28800	34600	10100	240
13.7	2568	2.0	105	7.5	305 L3	—	BN112M4	M3LC4	15800	18200	28800	34600	10100	250
14.5	2420	2.7	98.5	14.0	—	306 R3	BN112M4	M3LC4	19200	21800	46200	53800	14400	261
14.7	2383	1.0	97.0	14.0	—	304 R3	BN112M4	M3LC4	15400	17700	28100	33800	9860	241
15.6	2248	1.6	91.5	14.0	—	305 R3	BN112M4	M3LC4	15100	17400	27600	33200	9670	251
15.9	2216	1.0	90.2	7.5	303 L3	—	BN112M4	M3LC4	15000	17300	27500	33100	9620	230
15.9	2216	1.5	90.2	7.5	304 L3	—	BN112M4	M3LC4	15000	17300	27500	33100	9620	240
15.9	2216	1.9	90.2	7.5	305 L3	—	BN112M4	M3LC4	15000	17300	27500	33100	9620	250
16.0	2124	1.6	89.4	12.0	—	304 R4	BN112M4	M3LC4	15000	17300	27400	33000	9590	241
18.2	1934	1.1	78.7	14.0	—	303 R3	BN112M4	M3LC4	14300	16500	26400	31800	9190	231
18.2	1934	1.5	78.7	14.0	—	304 R3	BN112M4	M3LC4	14300	16500	26400	31800	9190	241
18.2	1934	2.2	78.7	14.0	—	305 R3	BN112M4	M3LC4	14300	16500	26400	31800	9190	251
18.5	1898	1.3	77.2	7.5	303 L3	—	BN112M4	M3LC4	14200	16400	26300	31600	9140	230
18.5	1898	1.8	77.2	7.5	304 L3	—	BN112M4	M3LC4	14200	16400	26300	31600	9140	240
18.5	1898	2.5	77.2	7.5	305 L3	—	BN112M4	M3LC4	14200	16400	26300	31600	9140	250
19.5	1802	1.0	73.3	14.0	—	303 R3	BN112M4	M3LC4	14000	16200	25900	31100	8980	231
19.5	1802	2.0	73.3	14.0	—	305 R3	BN112M4	M3LC4	14000	16200	25900	31100	8980	251
19.8	1776	1.9	72.3	7.5	304 L3	—	BN112M4	M3LC4	13900	16100	25700	31000	8940	240
19.8	1776	1.3	72.3	7.5	303 L3	—	BN112M4	M3LC4	13900	16100	25700	31000	8940	230



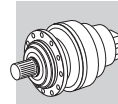
P₁ = 4 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
19.8	1776	2.3	72.3	7.5	305 L3	—	BN112M4	M3LC4	13900	16100	25700	31000	8940	250
22.6	1554	1.1	63.2	7.5	301 L3	—	BN112M4	M3LC4	4330	4330	12100	13900	2850	222
22.7	1550	1.4	63.1	14.0	—	303 R3	BN112M4	M3LC4	13300	15400	24700	29700	8540	231
22.7	1550	1.8	63.1	14.0	—	304 R3	BN112M4	M3LC4	13300	15400	24700	29700	8540	241
22.7	1550	2.8	63.1	14.0	—	305 R3	BN112M4	M3LC4	13300	15400	24700	29700	8540	251
22.7	1549	1.6	63.1	7.5	303 L3	—	BN112M4	M3LC4	13300	15400	24700	29700	8540	230
22.7	1549	2.2	63.1	7.5	304 L3	—	BN112M4	M3LC4	13300	15400	24700	29700	8540	240
22.7	1546	1.1	62.9	12.0	—	301 R3	BN112M4	M3LC4	4330	4330	12100	13900	2840	223
24.2	1501	1.6	59.1	9.0	304 L2	—	BN112M4	M3LC4	13000	15000	24200	29200	8360	240
25.6	1416	1.3	55.8	9.0	303 L2	—	BN112M4	M3LC4	12800	14800	23800	28700	8200	230
25.6	1416	2.5	55.8	9.0	305 L2	—	BN112M4	M3LC4	12800	14800	23800	28700	8200	250
26.4	1331	1.4	54.2	14.0	—	303 R3	BN112M4	M3LC4	12700	14600	23600	28400	8120	231
26.4	1331	2.7	54.2	14.0	—	305 R3	BN112M4	M3LC4	12700	14600	23600	28400	8120	251
26.8	1312	1.7	53.4	7.5	303 L3	—	BN112M4	M3LC4	12600	14500	23500	28300	8080	230
26.8	1312	2.5	53.4	7.5	304 L3	—	BN112M4	M3LC4	12600	14500	23500	28300	8080	240
27.5	1318	1.0	51.9	7.5	301 L2	—	BN112M4	M3LC4	4060	4060	11400	13100	2670	222
27.7	1269	1.3	51.6	7.5	301 L3	—	BN112M4	M3LC4	4050	4050	11400	13100	2660	222
28.4	1239	1.3	50.4	12.0	—	301 R3	BN112M4	M3LC4	4020	4020	11300	13000	2640	223
28.4	1235	1.9	50.3	14.0	—	303 R3	BN112M4	M3LC4	12300	14200	23100	27800	7920	231
28.4	1235	2.8	50.3	14.0	—	304 R3	BN112M4	M3LC4	12300	14200	23100	27800	7920	241
30	1201	2.0	47.3	9.0	304 L2	—	BN112M4	M3LC4	12100	14000	22700	27300	7760	240
31	1145	1.9	46.6	14.0	—	303 R3	BN112M4	M3LC4	12000	13900	22600	27200	7720	231
31	1145	2.5	46.6	14.0	—	304 R3	BN112M4	M3LC4	12000	13900	22600	27200	7720	241
32	1133	1.6	44.6	9.0	303 L2	—	BN112M4	M3LC4	11900	13700	22300	26800	7610	230
33	1071	3.0	43.6	7.5	304 L3	—	BN112M4	M3LC4	11800	13600	22100	26600	7550	240
34	1046	2.0	42.6	14.0	—	303 R3	BN112M4	M3LC4	11700	13500	22000	26400	7490	231
34	1054	1.2	41.5	7.5	301 L2	—	BN112M4	M3LC4	3770	3770	10700	12300	2480	222
35	1011	1.3	41.2	12.0	—	301 R3	BN112M4	M3LC4	3760	3760	10600	12200	2470	223
37	975	2.2	38.4	9.0	303 L2	—	BN112M4	M3LC4	11300	13000	21300	25600	7240	230
37	975	2.9	38.4	9.0	304 L2	—	BN112M4	M3LC4	11300	13000	21300	25600	7240	240
37	974	1.6	38.4	7.5	301 L2	—	BN112M4	M3LC4	3670	3670	10400	12000	2410	222
38	915	0.9	37.3	12.0	—	300 R3	BN112M4	M3LC4	3550	3550	10100	11600	2330	215
38	915	1.7	37.3	12.0	—	301 R3	BN112M4	M3LC4	3630	3630	10300	11900	2390	223
39	913	2.6	37.1	14.0	—	303 R3	BN112M4	M3LC4	11200	12900	21100	25400	7160	231
40	908	2.0	35.8	9.0	303 L2	—	BN112M4	M3LC4	11000	12700	20800	25100	7070	230
43	845	1.5	33.3	7.5	301 L2	—	BN112M4	M3LC4	3500	3500	9990	11500	2300	222
45	773	2.7	31.5	14.0	—	303 R3	BN112M4	M3LC4	10600	12200	20100	24100	6770	231
46	781	2.7	30.8	9.0	303 L2	—	BN112M4	M3LC4	10500	12100	19900	24000	6720	230
47	779	1.1	30.7	7.5	300 L2	—	BN112M4	M3LC4	3410	3410	9750	11200	2240	214
47	779	2.0	30.7	7.5	301 L2	—	BN112M4	M3LC4	3410	3410	9750	11200	2240	222
47	747	1.1	30.4	12.0	—	300 R3	BN112M4	M3LC4	3400	3400	9730	11200	2230	215
47	747	2.1	30.4	12.0	—	301 R3	BN112M4	M3LC4	3400	3400	9730	11200	2230	223
54	671	2.7	26.4	9.0	303 L2	—	BN112M4	M3LC4	9960	11500	19000	22900	6390	230
58	610	1.2	24.8	12.0	—	300 R3	BN112M4	M3LC4	3170	3170	9150	10500	2090	215
58	610	2.3	24.8	12.0	—	301 R3	BN112M4	M3LC4	3170	3170	9150	10500	2090	223
58	629	1.4	24.8	18.0	—	303 R2	BN112M4	M3LC4	9750	11300	18700	22500	6250	231
58	624	1.3	24.6	7.5	300 L2	—	BN112M4	M3LC4	3160	3160	9130	10500	2080	214
58	624	2.4	24.6	7.5	301 L2	—	BN112M4	M3LC4	3160	3160	9130	10500	2080	222
71	510	1.3	20.1	7.5	300 L2	—	BN112M4	M3LC4	2960	2960	8590	9870	1940	214
71	510	2.5	20.1	7.5	301 L2	—	BN112M4	M3LC4	2960	2960	8590	9870	1940	222
78	468	1.6	18.5	12.0	—	301 R2	BN112M4	M3LC4	2870	2870	8370	9620	1890	223
79	461	1.6	18.2	7.5	300 L2	—	BN112M4	M3LC4	2860	2860	8330	9580	1880	214
79	461	2.9	18.2	7.5	301 L2	—	BN112M4	M3LC4	2860	2860	8330	9580	1880	222
96	377	1.9	14.8	7.5	300 L2	—	BN112M4	M3LC4	2670	2670	7840	9010	1760	214
97	375	1.4	14.8	12.0	—	300 R2	BN112M4	M3LC4	2670	2670	7830	9000	1750	215
97	375	2.5	14.8	12.0	—	301 R2	BN112M4	M3LC4	2670	2670	7830	9000	1750	223
118	307	2.2	12.1	7.5	300 L2	—	BN112M4	M3LC4	2500	2500	7380	8480	1640	214
121	300	2.0	11.8	12.0	—	300 R2	BN112M4	M3LC4	2480	2480	7330	8420	1630	215
159	236	1.4	9.00	7.5	300 L1	—	BN112M4	M3LC4	2260	2260	6750	7750	1490	214
159	236	2.7	9.00	7.5	301 L1	—	BN112M4	M3LC4	2260	2260	6750	7750	1490	222
164	222	2.8	8.74	12.0	—	300 R2	BN112M4	M3LC4	2240	2240	6690	7690	1470	215
199	189	2.2	7.20	7.5	300 L1	—	BN112M4	M3LC4	2100	2100	6310	7250	1380	214








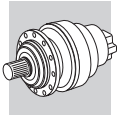
P₁ = 5.5 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
0.76	59957	2.6	1893	18.0	317 L4	—	BN132S4	—	—	—	442000	470000	150000	348
0.79	57559	1.0	1817	11.0	313 L4	—	BN132S4	—	—	—	192000	231000	80000	310
0.80	57190	1.5	1805	18.0	315 L4	—	BN132S4	—	—	—	206000	243000	90000	330
0.80	56908	1.2	1796	15.0	314 L4	—	BN132S4	—	—	—	206000	243000	90000	320
0.96	47582	1.2	1502	11.0	313 L4	—	BN132S4	—	—	—	192000	231000	80000	310
0.96	47277	1.8	1492	18.0	315 L4	—	BN132S4	—	—	—	206000	243000	90000	330
0.97	47044	1.4	1485	15.0	314 L4	—	BN132S4	—	—	—	206000	243000	90000	320
1.0	44840	1.0	1415	11.0	311 L4	—	BN132S4	—	—	—	157000	195000	65000	300
1.0	44159	1.2	1394	11.0	313 L4	—	BN132S4	—	—	—	192000	229000	79900	310
1.1	40669	2.4	1284	18.0	315 L4	—	BN132S4	—	—	—	201500	236600	87400	330
1.1	40468	1.9	1277	15.0	314 L4	—	BN132S4	—	—	—	201200	236300	87300	320
1.1	40092	1.4	1266	11.0	313 L4	—	BN132S4	—	—	—	188000	222500	77400	310
1.2	38979	1.1	1230	11.0	311 L4	—	BN132S4	—	—	—	150800	187900	62300	300
1.3	35384	1.5	1117	11.0	313 L4	—	BN132S4	—	—	—	181100	214300	74200	310
1.3	34984	2.7	1104	18.0	315 L4	—	BN132S4	—	—	—	192600	226200	83200	330
1.3	34811	2.2	1099	15.0	314 L4	—	BN132S4	—	—	—	192400	225800	83000	320
1.4	33530	1.3	1058	11.0	311 L4	—	BN132S4	—	—	—	144200	179600	59200	300
1.4	32869	2.5	1038	15.0	314 L4	—	BN132S4	—	—	—	189100	222000	81400	320
1.4	32125	1.7	1014	11.0	313 L4	—	BN132S4	—	—	—	175900	208200	71800	310
1.5	31233	1.4	986	11.0	311 L4	—	BN132S4	—	—	—	141100	175800	57800	300
1.5	29743	1.1	939	11.0	310 L4	—	BN132S4	—	—	—	115300	145000	55600	290
1.6	29331	2.5	926	15.0	314 L4	—	BN132S4	—	—	—	182700	214500	78400	320
1.6	28807	2.7	909	40.0	—	315 R4	BN132S4	—	—	—	181700	213400	77900	331
1.6	28630	1.6	904	11.0	311 L4	—	BN132S4	—	—	—	137500	171300	56200	300
1.6	28174	1.9	889	11.0	313 L4	—	BN132S4	—	—	—	169100	200100	68800	310
1.7	27172	3.0	858	15.0	314 L4	—	BN132S4	—	—	—	178600	209700	76400	320
1.7	26127	1.7	825	11.0	311 L4	—	BN132S4	—	—	—	133800	166600	54500	300
1.8	25908	1.1	818	11.0	310 L4	—	BN132S4	—	—	—	112900	142000	54300	290
1.8	25024	2.1	790	11.0	313 L4	—	BN132S4	—	—	—	163200	193100	66100	310
1.9	24658	1.8	778	22.0	—	313 R4	BN132S4	—	—	—	162500	192300	65800	311
1.9	23973	1.1	757	15.0	—	310 R4	BN132S4	—	—	—	110300	138700	52900	291
1.9	23637	1.3	746	22.0	—	311 R4	BN132S4	—	—	—	129800	161700	52700	301
2.0	22992	1.2	726	11.0	310 L4	—	BN132S4	—	—	—	108900	137000	52200	290
2.0	22941	2.0	724	11.0	311 L4	—	BN132S4	—	—	—	128700	160300	52200	300
2.0	22879	0.9	722	7.5	309 L4	—	BN132S4	—	—	—	89900	116000	28200	280
2.1	22021	2.3	695	11.0	313 L4	—	BN132S4	—	—	—	157000	185900	63300	310
2.2	20485	2.5	647	22.0	—	313 R4	BN132S4	—	—	—	153700	181900	61800	311
2.3	20233	1.1	639	15.0	—	310 R4	BN132S4	—	—	—	104800	131800	50000	291
2.3	20168	1.3	637	11.0	310 L4	—	BN132S4	—	—	—	104700	131700	50000	290
2.3	20051	2.6	633	11.0	313 L4	—	BN132S4	—	—	—	152700	180700	61400	310
2.3	19916	2.0	629	22.0	—	311 R4	BN132S4	—	—	—	123300	153600	49800	301
2.3	19853	2.0	627	11.0	311 L4	—	BN132S4	—	—	—	123200	153500	49700	300
2.3	19443	3.0	614	22.0	—	314 R4	BN132S4	—	—	—	161500	189600	68400	321
2.4	18681	1.2	590	15.0	—	310 R4	BN132S4	—	—	—	102400	128700	48700	291
2.5	18333	1.2	579	7.5	309 L4	—	BN132S4	—	—	—	85900	110800	26800	280
2.5	17984	2.4	568	11.0	311 L4	—	BN132S4	—	—	—	119600	149000	48100	300
2.6	17611	1.8	556	11.0	310 L4	—	BN132S4	—	—	—	100600	126500	47800	290
2.7	16935	2.9	535	22.0	—	313 R4	BN132S4	—	—	—	145100	171800	58000	311
2.8	16464	2.3	520	22.0	—	311 R4	BN132S4	—	—	—	116500	145100	46700	301
2.8	16383	1.6	517	15.0	—	310 R4	BN132S4	—	—	—	98400	123800	46600	291
2.8	16273	3.0	514	11.0	313 L4	—	BN132S4	—	—	—	143400	169700	57300	310
2.8	16224	2.7	512	11.0	311 L4	—	BN132S4	—	—	—	116000	144500	46500	300
2.8	16072	1.6	507	11.0	310 L4	—	BN132S4	—	—	—	97900	123000	46300	290
2.9	15539	0.9	490	15.0	—	309 R4	BN132S4	—	—	—	80100	103300	24800	281
2.9	15519	2.2	490	22.0	—	311 R4	BN132S4	—	—	—	114400	142500	45800	301
3.1	14726	1.2	465	7.5	309 L4	—	BN132S4	—	—	—	80400	103700	24900	280
3.2	14474	1.0	457	15.0	—	309 R4	BN132S4	—	—	—	80000	103200	24800	281
3.2	14388	1.4	454	15.0	—	310 R4	BN132S4	—	—	—	94700	119000	44700	291
3.2	14347	0.9	453	15.0	—	307 R4	BN132S4	M4SA4	35500	44600	78600	102900	30900	271
3.2	14277	2.1	451	11.0	310 L4	—	BN132S4	—	—	—	94400	118700	44500	290
3.3	13873	2.7	438	22.0	—	311 R4	BN132S4	—	—	—	110600	137800	44100	301
3.4	13284	2.2	419	15.0	—	310 R4	BN132S4	—	—	—	92400	116200	43500	291
3.5	13093	0.9	413	15.0	—	307 R4	BN132S4	M4SA4	33700	42300	74900	98100	29300	271
3.5	13093	1.4	413	15.0	—	309 R4	BN132S4	—	—	—	77700	100100	24000	281
3.6	12847	0.9	406	7.5	307 L4	—	BN132S4	M4SA4	33500	42000	74400	97500	29100	270
3.6	12847	1.4	406	7.5	309 L4	—	BN132S4	—	—	—	77200	99600	23800	280
3.7	12407	1.6	392	11.0	310 L4	—	BN132S4	—	—	—	90500	113900	42500	290








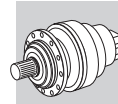
P₁ = 5.5 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
3.8	11860	1.2	374	15.0	—	309 R4	BN132S4	—	—	—	75400	97200	23200	281
4.0	11507	2.1	363	15.0	—	310 R4	BN132S4	—	—	—	88500	111300	41500	291
4.0	11496	1.1	363	15.0	—	307 R4	BN132S4	M4SA4	33000	41400	73500	96300	28700	271
4.1	11482	1.7	350	18.0	310 L3	—	BN132S4	—	—	—	87600	110100	41000	290
4.1	11058	1.3	349	7.5	307 L4	—	BN132S4	M4SA4	32600	40900	72700	95200	28300	270
4.1	11058	1.9	349	7.5	309 L4	—	BN132S4	—	—	—	73800	95200	22700	280
4.3	11022	1.2	336	11.0	309 L3	—	BN132S4	—	—	—	73000	94200	22400	280
4.3	10586	2.6	334	15.0	—	310 R4	BN132S4	—	—	—	86300	108600	40300	291
4.3	10491	1.1	331	15.0	—	307 R4	BN132S4	M4SA4	32000	40200	71500	93700	27800	271
4.3	10491	1.6	331	15.0	—	309 R4	BN132S4	—	—	—	72700	93700	22300	281
4.7	9660	2.4	305	15.0	—	310 R4	BN132S4	—	—	—	84000	105600	39100	291
4.8	9503	1.5	300	15.0	—	307 R4	BN132S4	M4SA4	31000	38900	69400	91000	26900	271
4.9	9674	2.4	295	18.0	310 L3	—	BN132S4	—	—	—	83200	104600	38700	290
4.9	9539	2.8	291	18.0	311 L3	—	BN132S4	—	—	—	97900	121900	38500	300
5.0	9155	0.9	289	12.0	—	306 R4	BN132S4	M4SA4	26900	30500	62500	72800	20200	261
5.1	9012	1.3	284	15.0	—	307 R4	BN132S4	M4SA4	30400	38200	68300	89500	26500	271
5.1	9012	1.9	284	15.0	—	309 R4	BN132S4	—	—	—	69400	89500	21200	281
5.1	9287	1.2	284	11.0	307 L3	—	BN132S4	M4SA4	30400	38100	68300	89400	26400	270
5.1	9287	1.7	284	11.0	309 L3	—	BN132S4	—	—	—	69400	89400	21100	280
5.1	8967	2.9	283	15.0	—	310 R4	BN132S4	—	—	—	82100	103300	38100	291
5.6	8183	2.8	258	15.0	—	310 R4	BN132S4	—	—	—	79900	100500	37000	291
5.6	8175	1.8	258	15.0	—	307 R4	BN132S4	M4SA4	29500	37000	66400	87000	25600	271
5.6	8175	2.1	258	15.0	—	309 R4	BN132S4	—	—	—	67400	87000	20500	281
5.8	8165	2.3	249	18.0	310 L3	—	BN132S4	—	—	—	79100	99400	36600	290
5.8	7875	1.0	249	12.0	—	306 R4	BN132S4	M4SA4	26200	29700	61000	71000	19700	261
6.0	7838	1.1	239	11.0	307 L3	—	BN132S4	M4SA4	28700	36000	64900	85000	25000	270
6.0	7838	1.7	239	11.0	309 L3	—	BN132S4	—	—	—	65900	85000	20000	280
6.0	7800	1.0	238	7.5	306 L3	—	BN132S4	M4SA4	25800	29200	60200	70100	19400	260
6.2	7356	1.5	232	15.0	—	307 R4	BN132S4	M4SA4	28400	35700	64300	84200	24700	271
6.2	7356	2.3	232	15.0	—	309 R4	BN132S4	—	—	—	65300	84200	19800	281
6.3	7295	1.0	230	12.0	—	306 R4	BN132S4	M4SA4	25500	28900	59600	69400	19200	261
6.3	7539	2.8	230	18.0	310 L3	—	BN132S4	—	—	—	77200	97100	35600	290
6.5	7301	1.8	223	11.0	309 L3	—	BN132S4	—	—	—	64500	83200	19500	280
6.5	7237	1.8	221	11.0	307 L3	—	BN132S4	M4SA4	28000	35100	63300	83000	24300	270
6.7	6768	1.4	214	12.0	—	306 R4	BN132S4	M4SA4	24900	28200	58300	67900	18700	261
7.0	6514	2.2	206	15.0	—	307 R4	BN132S4	M4SA4	27300	34300	62000	81200	23700	271
7.0	6709	1.2	205	7.5	306 L3	—	BN132S4	M4SA4	24500	27800	57600	67000	18400	260
7.1	6604	1.7	202	11.0	307 L3	—	BN132S4	M4SA4	27100	34000	61600	80700	23600	270
7.1	6604	2.5	202	11.0	309 L3	—	BN132S4	—	—	—	62600	80700	18900	280
7.6	6041	2.3	191	15.0	—	307 R4	BN132S4	M4SA4	26600	33400	60600	79400	23200	271
7.6	6041	2.9	191	15.0	—	309 R4	BN132S4	—	—	—	61600	79400	18500	281
7.6	6215	1.0	190	7.5	306 L3	—	BN132S4	M4SA4	23900	27100	56200	65500	18000	260
7.9	5983	2.4	183	11.0	309 L3	—	BN132S4	—	—	—	60800	78400	18300	280
8.0	5733	1.6	181	12.0	—	306 R4	BN132S4	M4SA4	23600	26700	55500	64600	17700	261
8.1	5799	2.1	177	11.0	307 L3	—	BN132S4	M4SA4	26000	32600	59300	77700	22600	270
8.6	5316	1.4	168	12.0	—	306 R4	BN132S4	M4SA4	23000	26000	54200	63100	17300	261
8.9	5292	2.0	162	11.0	307 L3	—	BN132S4	M4SA4	25200	31600	57700	75600	21900	270
9.1	5016	1.1	158	12.0	—	305 R4	BN132S4	M4SA4	18100	20900	32600	39200	11600	251
9.1	5001	1.9	158	12.0	—	306 R4	BN132S4	M4SA4	22500	25500	53200	62000	16900	261
9.5	4980	1.5	152	7.5	306 L3	—	BN132S4	M4SA4	22200	25200	52600	61300	16700	260
9.7	4694	1.0	148	12.0	—	305 R4	BN132S4	M4SA4	17300	20000	31300	37600	11100	251
9.8	4794	2.8	146	11.0	307 L3	—	BN132S4	M4SA4	24400	30600	56000	73300	21200	270
10.0	4722	1.2	144	14.0	—	306 R3	BN132S4	M4SA4	21800	24700	51800	60300	16400	261
10.2	4634	1.1	141	7.5	305 L3	—	BN132S4	M4SA4	17400	20100	31500	37900	11200	250
10.2	4618	1.7	141	7.5	306 L3	—	BN132S4	M4SA4	21700	24600	51500	59900	16300	260
10.4	4546	2.4	139	11.0	307 L3	—	BN132S4	M4SA4	24000	30100	55100	72200	20800	270
11.1	4095	1.3	129	12.0	—	305 R4	BN132S4	M4SA4	16900	19500	30600	36900	10800	251
11.6	3929	2.8	124	15.0	—	307 R4	BN132S4	M4SA4	24800	31100	56900	74500	21600	271
11.9	3973	2.0	121	7.5	306 L3	—	BN132S4	M4SA4	20600	23400	49200	57300	15500	260
12.0	3923	2.2	120	22.0	—	307 R3	BN132S4	M4SA4	22800	28600	52700	69100	19800	271
12.1	3904	1.7	119	14.0	—	306 R3	BN132S4	M4SA4	20500	23200	48900	57000	15400	261
12.6	3747	1.0	114	14.0	—	305 R3	BN132S4	M4SA4	16200	18700	29500	35500	10400	251
12.7	3711	2.8	113	11.0	307 L3	—	BN132S4	M4SA4	22400	28100	51800	67900	19500	270
12.8	3691	1.0	113	7.5	305 L3	—	BN132S4	M4SA4	16200	18600	29400	35400	10400	250
12.8	3680	2.0	112	7.5	306 L3	—	BN132S4	M4SA4	20100	22800	48100	56000	15100	260
13.0	3620	0.9	111	7.5	304 L3	—	BN132S4	M4SA4	16000	18500	29200	35200	10300	240
13.2	3469	1.0	109	12.0	—	304 R4	BN132S4	—	16000	18500	29200	35100	10300	241








P₁ = 5.5 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
13.8	3424	1.0	105	7.5	304 L3	—	BN132S4	M4SA4	15800	18200	28800	34600	10100	240
13.8	3424	1.5	105	7.5	305 L3	—	BN132S4	M4SA4	15800	18200	28800	34600	10100	250
13.8	3414	2.6	104	7.5	306 L3	—	BN132S4	M4SA4	19600	22200	47000	54700	14700	260
14.5	3243	2.6	99.0	22.0	—	307 R3	BN132S4	M4SA4	21400	26900	49800	65200	18600	271
14.6	3227	2.0	98.5	14.0	—	306 R3	BN132S4	M4SA4	19200	21800	46200	53800	14400	261
15.7	2998	1.2	91.5	14.0	—	305 R3	BN132S4	M4SA4	15100	17400	27600	33200	9670	251
16.0	2955	1.1	90.2	7.5	304 L3	—	BN132S4	M4SA4	15000	17300	27500	33100	9620	240
16.0	2955	1.4	90.2	7.5	305 L3	—	BN132S4	M4SA4	15000	17300	27500	33100	9620	250
16.1	2831	1.2	89.4	12.0	—	304 R4	BN132S4	—	15000	17300	27400	33000	9590	241
16.3	2892	3.0	88.3	7.5	306 L3	—	BN132S4	M4SA4	18500	21000	44700	52100	13900	260
17.0	2776	2.7	84.7	14.0	—	306 R3	BN132S4	M4SA4	18300	20700	44200	51400	13700	261
17.6	2681	2.6	81.9	7.5	306 L3	—	BN132S4	M4SA4	18100	20500	43700	50900	13600	260
18.3	2579	1.1	78.7	14.0	—	304 R3	BN132S4	—	14300	16500	26400	31800	9190	241
18.3	2579	1.7	78.7	14.0	—	305 R3	BN132S4	M4SA4	14300	16500	26400	31800	9190	251
18.6	2530	1.0	77.2	7.5	303 L3	—	BN132S4	M4SA4	14200	16400	26300	31600	9140	230
18.6	2530	1.4	77.2	7.5	304 L3	—	BN132S4	M4SA4	14200	16400	26300	31600	9140	240
18.6	2530	1.9	77.2	7.5	305 L3	—	BN132S4	M4SA4	14200	16400	26300	31600	9140	250
19.6	2402	1.5	73.3	14.0	—	305 R3	BN132S4	M4SA4	14000	16200	25900	31100	8980	251
19.9	2453	2.2	72.5	13.0	306 L2	—	BN132S4	M4SA4	17400	19700	42100	49100	13000	260
19.9	2368	1.4	72.3	7.5	304 L3	—	BN132S4	M4SA4	13900	16100	25700	31000	8940	240
19.9	2368	0.9	72.3	7.5	303 L3	—	BN132S4	M4SA4	13600	15700	25200	30300	8730	230
19.9	2368	1.8	72.3	7.5	305 L3	—	BN132S4	M4SA4	13600	15700	25200	30300	8730	250
22.8	2066	1.1	63.1	14.0	—	303 R3	BN132S4	—	13300	15400	24700	29700	8540	231
22.8	2066	1.4	63.1	14.0	—	304 R3	BN132S4	—	13300	15400	24700	29700	8540	241
22.8	2066	2.1	63.1	14.0	—	305 R3	BN132S4	M4SA4	13300	15400	24700	29700	8540	251
22.8	2066	1.2	63.1	7.5	303 L3	—	BN132S4	M4SA4	13300	15400	24700	29700	8540	230
22.8	2066	1.7	63.1	7.5	304 L3	—	BN132S4	M4SA4	13300	15400	24700	29700	8540	240
22.8	2066	2.3	63.1	7.5	305 L3	—	BN132S4	M4SA4	13300	15400	24700	29700	8540	250
24.3	2001	1.2	59.1	9.0	304 L2	—	BN132S4	M4SA4	13000	15000	24200	29200	8360	240
25.6	1903	2.7	56.3	13.0	306 L2	—	BN132S4	M4SA4	16000	18100	39100	45500	12000	260
25.8	1888	1.0	55.8	9.0	303 L2	—	BN132S4	M4SA4	12800	14800	23800	28700	8200	230
25.8	1888	1.9	55.8	9.0	305 L2	—	BN132S4	M4SA4	12800	14800	23800	28700	8200	250
26.6	1775	1.0	54.2	14.0	—	303 R3	BN132S4	—	12700	14600	23600	28400	8120	231
26.6	1775	2.0	54.2	14.0	—	305 R3	BN132S4	M4SA4	12700	14600	23600	28400	8120	251
27.0	1750	1.2	53.4	7.5	303 L3	—	BN132S4	M4SA4	12600	14500	23500	28300	8080	230
27.0	1750	1.8	53.4	7.5	304 L3	—	BN132S4	M4SA4	12600	14500	23500	28300	8080	240
27.0	1750	2.3	53.4	7.5	305 L3	—	BN132S4	M4SA4	12600	14500	23500	28300	8080	250
27.9	1691	1.0	51.6	7.5	301 L3	—	BN132S4	M4SA4	3960	3960	11200	12800	2600	222
28.6	1652	1.0	50.4	12.0	—	301 R3	BN132S4	—	3930	3930	11100	12700	2580	223
28.6	1647	1.4	50.3	14.0	—	303 R3	BN132S4	—	12300	14200	23100	27800	7920	231
28.6	1647	2.1	50.3	14.0	—	304 R3	BN132S4	—	12300	14200	23100	27800	7920	241
28.6	1647	2.7	50.3	14.0	—	305 R3	BN132S4	M4SA4	12300	14200	23100	27800	7920	251
30	1601	1.5	47.3	9.0	304 L2	—	BN132S4	M4SA4	12100	14000	22700	27300	7760	240
31	1527	1.4	46.6	14.0	—	303 R3	BN132S4	—	12000	13900	22600	27200	7720	231
31	1527	1.9	46.6	14.0	—	304 R3	BN132S4	—	12000	13900	22600	27200	7720	241
31	1527	2.8	46.6	14.0	—	305 R3	BN132S4	M4SA4	12000	13900	22600	27200	7720	251
32	1511	1.2	44.6	9.0	303 L2	—	BN132S4	M4SA4	11900	13700	22300	26800	7610	230
32	1511	2.4	44.6	9.0	305 L2	—	BN132S4	M4SA4	11900	13700	22300	26800	7610	250
33	1428	2.2	43.6	7.5	304 L3	—	BN132S4	M4SA4	11800	13600	22100	26600	7550	240
34	1395	1.5	42.6	14.0	—	303 R3	BN132S4	—	11700	13500	22000	26400	7490	231
34	1395	2.3	42.6	14.0	—	304 R3	BN132S4	—	11700	13500	22000	26400	7490	241
34	1395	2.7	42.6	14.0	—	305 R3	BN132S4	M4SA4	11700	13500	22000	26400	7490	251
35	1406	0.9	41.5	7.5	301 L2	—	BN132S4	M4SA4	3770	3770	10700	12300	2480	222
35	1348	1.0	41.2	12.0	—	301 R3	BN132S4	—	3760	3760	10600	12200	2470	223
38	1299	1.7	38.4	9.0	303 L2	—	BN132S4	M4SA4	11300	13000	21300	25600	7240	230
38	1299	2.2	38.4	9.0	304 L2	—	BN132S4	M4SA4	11300	13000	21300	25600	7240	240
38	1298	1.2	38.4	7.5	301 L2	—	BN132S4	M4SA4	3670	3670	10400	12000	2410	222
39	1221	1.3	37.3	12.0	—	301 R3	BN132S4	—	3630	3630	10300	11900	2390	223
39	1217	2.0	37.1	14.0	—	303 R3	BN132S4	—	11200	12900	21100	25400	7160	231
39	1217	2.8	37.1	14.0	—	304 R3	BN132S4	—	11200	12900	21100	25400	7160	241
40	1210	1.5	35.8	9.0	303 L2	—	BN132S4	M4SA4	11000	12700	20800	25100	7070	230
40	1210	2.9	35.8	9.0	305 L2	—	BN132S4	M4SA4	11000	12700	20800	25100	7070	250
43	1126	1.2	33.3	7.5	301 L2	—	BN132S4	M4SA4	3500	3500	9990	11500	2300	222
46	1031	2.0	31.5	14.0	—	303 R3	BN132S4	—	10600	12200	20100	24100	6770	231
46	1031	3.0	31.5	14.0	—	304 R3	BN132S4	—	10600	12200	20100	24100	6770	241
47	1041	2.1	30.8	9.0	303 L2	—	BN132S4	M4SA4	10500	12100	19900	24000	6720	230
47	1041	2.7	30.8	9.0	304 L2	—	BN132S4	M4SA4	10500	12100	19900	24000	6720	240

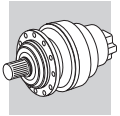


P₁ = 5.5 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]						
									MC	MZ	HC/PC	HZ/PZ	FZ		
47	1039	1.5	30.7	7.5	301 L2	—	BN132S4	M4SA4	—	3410	3410	9750	11200	2240	222
47	996	1.6	30.4	12.0	—	301 R3	BN132S4	—	—	3400	3400	9730	11200	2230	223
54	894	2.0	26.4	9.0	303 L2	—	BN132S4	M4SA4	—	9960	11500	19000	22900	6390	230
56	841	2.4	25.7	14.0	—	303 R3	BN132S4	—	—	9870	11400	18900	22700	6330	231
58	813	1.7	24.8	12.0	—	301 R3	BN132S4	—	—	3170	3170	9150	10500	2090	223
58	838	1.0	24.8	18.0	—	303 R2	BN132S4	M4SA4	—	9750	11300	18700	22500	6250	231
59	832	1.0	24.6	7.5	300 L2	—	BN132S4	M4SA4	—	3090	3090	8940	10300	2030	214
59	832	1.8	24.6	7.5	301 L2	—	BN132S4	M4SA4	—	3160	3160	9130	10500	2080	222
59	830	2.6	24.5	9.0	303 L2	—	BN132S4	M4SA4	—	9720	11200	18600	22400	6230	230
63	769	2.7	22.7	9.0	303 L2	—	BN132S4	M4SA4	—	9470	10900	18200	21900	6080	230
69	703	2.6	20.8	9.0	303 L2	—	BN132S4	M4SA4	—	9190	10600	17700	21300	5900	230
72	679	0.9	20.1	7.5	300 L2	—	BN132S4	M4SA4	—	2960	2960	8590	9870	1940	214
72	679	1.9	20.1	7.5	301 L2	—	BN132S4	M4SA4	—	2960	2960	8590	9870	1940	222
75	650	2.4	19.2	18.0	—	303 R2	BN132S4	M4SA4	—	8960	10300	17300	20800	5750	231
78	624	1.2	18.5	12.0	—	301 R2	BN132S4	M4SA4	—	2870	2870	8370	9620	1890	223
79	615	1.2	18.2	7.5	300 L2	—	BN132S4	M4SA4	—	2860	2860	8330	9580	1880	214
79	615	2.2	18.2	7.5	301 L2	—	BN132S4	M4SA4	—	2860	2860	8330	9580	1880	222
97	502	1.4	14.8	7.5	300 L2	—	BN132S4	M4SA4	—	2670	2670	7840	9010	1760	214
97	502	2.5	14.8	7.5	301 L2	—	BN132S4	M4SA4	—	2670	2670	7840	9010	1760	222
98	499	1.0	14.8	12.0	—	300 R2	BN132S4	M4SA4	—	2670	2670	7830	9000	1750	215
98	499	1.9	14.8	12.0	—	301 R2	BN132S4	M4SA4	—	2670	2670	7830	9000	1750	223
119	410	1.7	12.1	7.5	300 L2	—	BN132S4	M4SA4	—	2500	2500	7380	8480	1640	214
119	410	3.0	12.1	7.5	301 L2	—	BN132S4	M4SA4	—	2500	2500	7380	8480	1640	222
122	400	1.5	11.8	12.0	—	300 R2	BN132S4	M4SA4	—	2480	2480	7330	8420	1630	215
122	400	2.9	11.8	12.0	—	301 R2	BN132S4	M4SA4	—	2480	2480	7330	8420	1630	223
149	338	2.2	9.67	11.0	303 L1	—	BN132S4	M4SA4	—	7120	8220	14100	16900	4570	230
160	314	1.0	9.00	7.5	300 L1	—	BN132S4	M4SA4	—	2260	2260	6750	7750	1490	214
160	314	2.0	9.00	7.5	301 L1	—	BN132S4	M4SA4	—	2260	2260	6750	7750	1490	222
165	296	2.1	8.74	12.0	—	300 R2	BN132S4	M4SA4	—	2240	2240	6690	7690	1470	215
200	251	1.6	7.20	7.5	300 L1	—	BN132S4	M4SA4	—	2100	2100	6310	7250	1380	214
200	251	3.0	7.20	7.5	301 L1	—	BN132S4	M4SA4	—	2100	2100	6310	7250	1380	222
202	241	2.4	7.13	12.0	—	300 R2	BN132S4	M4SA4	—	2090	2090	6300	7230	1380	215
250	201	2.3	5.77	7.5	300 L1	—	BN132S4	M4SA4	—	1950	1950	5910	6790	1280	214

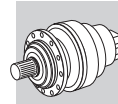
P₁ = 7.5 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
0.76	83274	1.9	1893	18.0	317 L4	—	BN132MA4	—	—	—	442000	470000	150000	348
0.80	79431	1.1	1805	18.0	315 L4	—	BN132MA4	—	—	—	206000	243000	90000	330
0.90	70166	2.4	1595	18.0	317 L4	—	BN132MA4	—	—	—	442000	470000	150000	348
0.96	65663	1.3	1492	18.0	315 L4	—	BN132MA4	—	—	—	206000	243000	90000	330
0.97	65339	1.0	1485	15.0	314 L4	—	BN132MA4	—	—	—	206000	243000	90000	320
1.1	58004	2.9	1318	18.0	317 L4	—	BN132MA4	—	—	—	434300	462400	147000	348
1.1	56484	1.7	1284	18.0	315 L4	—	BN132MA4	—	—	—	201500	236600	87400	330
1.1	56205	1.4	1277	15.0	314 L4	—	BN132MA4	—	—	—	201200	236300	87300	320
1.1	55684	1.0	1266	11.0	313 L4	—	BN132MA4	—	—	—	188000	222500	77400	310
1.2	54449	2.2	1237	18.0	316 L4	—	BN132MA4	—	—	—	331400	368600	144000	340
1.3	49144	1.1	1117	11.0	313 L4	—	BN132MA4	—	—	—	181100	214300	74200	310
1.3	48588	2.0	1104	18.0	315 L4	—	BN132MA4	—	—	—	192600	226200	83200	330
1.3	48349	1.6	1099	15.0	314 L4	—	BN132MA4	—	—	—	192400	225800	83000	320
1.4	46570	0.9	1058	11.0	311 L4	—	BN132MA4	—	—	—	141200	175900	57900	300
1.4	45878	2.2	1043	18.0	315 L4	—	BN132MA4	—	—	—	189400	222300	81600	330
1.4	45878	2.9	1043	18.0	316 L4	—	BN132MA4	—	—	—	314800	350100	136000	340
1.4	45651	1.8	1038	15.0	314 L4	—	BN132MA4	—	—	—	189100	222000	81400	320
1.4	44619	1.2	1014	11.0	313 L4	—	BN132MA4	—	—	—	175900	208200	71800	310
1.5	43379	1.0	986	11.0	311 L4	—	BN132MA4	—	—	—	141100	175800	57800	300
1.5	40915	2.3	930	18.0	315 L4	—	BN132MA4	—	—	—	183000	214800	78500	330
1.6	40738	1.8	926	15.0	314 L4	—	BN132MA4	—	—	—	182700	214500	78400	320
1.6	40010	1.9	909	40.0	—	315 R4	BN132MA4	—	—	—	181700	213400	77900	331
1.6	39764	1.2	904	11.0	311 L4	—	BN132MA4	—	—	—	137500	171300	56200	300
1.6	39130	1.4	889	11.0	313 L4	—	BN132MA4	—	—	—	169100	200100	68800	310
1.7	37926	2.7	862	18.0	315 L4	—	BN132MA4	—	—	—	178800	210000	76600	330
1.7	37738	2.2	858	15.0	314 L4	—	BN132MA4	—	—	—	178600	209700	76400	320








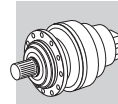
P₁ = 7.5 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
1.7	36288	1.2	825	11.0	311 L4	—	BN132MA4	—	—	—	133800	166600	54500	300
1.8	34755	1.5	790	11.0	313 L4	—	BN132MA4	—	—	—	163200	193100	66100	310
1.8	34417	2.6	782	40.0	—	315 R4	BN132MA4	—	—	—	173700	203900	74100	331
1.9	34248	1.3	778	22.0	—	313 R4	BN132MA4	—	—	—	162500	192300	65800	311
1.9	32829	0.9	746	22.0	—	311 R4	BN132MA4	—	—	—	129800	161700	52700	301
2.0	32463	2.5	738	15.0	314 L4	—	BN132MA4	—	—	—	170700	200400	72700	320
2.0	31862	1.5	724	11.0	311 L4	—	BN132MA4	—	—	—	128700	160300	52200	300
2.1	30585	1.7	695	11.0	313 L4	—	BN132MA4	—	—	—	157000	185900	63300	310
2.2	29407	2.7	668	15.0	314 L4	—	BN132MA4	—	—	—	165700	194500	70300	320
2.2	28452	1.8	647	22.0	—	313 R4	BN132MA4	—	—	—	153700	181900	61800	311
2.3	28012	0.9	637	11.0	310 L4	—	BN132MA4	—	—	—	104700	131700	50000	290
2.3	27848	1.9	633	11.0	313 L4	—	BN132MA4	—	—	—	152700	180700	61400	310
2.3	27662	1.4	629	22.0	—	311 R4	BN132MA4	—	—	—	123300	153600	49800	301
2.3	27574	1.4	627	11.0	311 L4	—	BN132MA4	—	—	—	123200	153500	49700	300
2.3	27005	2.1	614	22.0	—	314 R4	BN132MA4	—	—	—	161500	189600	68400	321
2.5	24978	1.7	568	11.0	311 L4	—	BN132MA4	—	—	—	119600	149000	48100	300
2.6	24805	2.2	564	11.0	313 L4	—	BN132MA4	—	—	—	147500	174500	59100	310
2.6	24460	1.3	556	11.0	310 L4	—	BN132MA4	—	—	—	100600	126500	47800	290
2.7	23520	2.1	535	22.0	—	313 R4	BN132MA4	—	—	—	145100	171800	58000	311
2.7	23230	3.0	528	22.0	—	314 R4	BN132MA4	—	—	—	154400	181300	65000	321
2.8	22867	1.7	520	22.0	—	311 R4	BN132MA4	—	—	—	116500	145100	46700	301
2.8	22754	1.1	517	15.0	—	310 R4	BN132MA4	—	—	—	98400	123800	46600	291
2.8	22601	2.2	514	11.0	313 L4	—	BN132MA4	—	—	—	143400	169700	57300	310
2.8	22533	2.0	512	11.0	311 L4	—	BN132MA4	—	—	—	116000	144500	46500	300
2.8	22322	1.1	507	11.0	310 L4	—	BN132MA4	—	—	—	97900	123000	46300	290
2.9	21828	2.4	496	22.0	—	313 R4	BN132MA4	—	—	—	141900	168000	56600	311
2.9	21555	1.6	490	22.0	—	311 R4	BN132MA4	—	—	—	114400	142500	45800	301
3.2	19983	1.0	454	15.0	—	310 R4	BN132MA4	—	—	—	94700	119000	44700	291
3.2	19876	2.7	452	11.0	313 L4	—	BN132MA4	—	—	—	138000	163300	54900	310
3.2	19829	1.5	451	11.0	310 L4	—	BN132MA4	—	—	—	94400	118700	44500	290
3.2	19818	2.4	450	22.0	—	313 R4	BN132MA4	—	—	—	137900	163200	54800	311
3.3	19268	1.9	438	22.0	—	311 R4	BN132MA4	—	—	—	110600	137800	44100	301
3.4	18450	1.6	419	15.0	—	310 R4	BN132MA4	—	—	—	92400	116200	43500	291
3.5	18184	1.0	413	15.0	—	309 R4	BN132MA4	—	—	—	77700	100100	24000	281
3.5	18162	2.2	413	22.0	—	311 R4	BN132MA4	—	—	—	108700	135400	43300	301
3.5	18055	2.3	410	11.0	311 L4	—	BN132MA4	—	—	—	108500	135200	43200	300
3.6	17843	1.0	406	7.5	309 L4	—	BN132MA4	—	—	—	77200	99600	23800	280
3.7	17233	1.1	392	11.0	310 L4	—	BN132MA4	—	—	—	90500	113900	42500	290
3.7	17048	2.7	387	22.0	—	313 R4	BN132MA4	—	—	—	131800	156000	52100	311
4.0	15982	1.5	363	15.0	—	310 R4	BN132MA4	—	—	—	88500	111300	41500	291
4.1	15947	1.2	350	18.0	310 L3	—	BN132MA4	—	—	—	87600	110100	41000	290
4.1	15359	1.0	349	7.5	307 L4	—	BN132MA4	M4LA4	31800	40000	71200	93300	27700	270
4.1	15359	1.4	349	7.5	309 L4	—	BN132MA4	—	—	—	73800	95200	22700	280
4.1	15294	2.6	348	11.0	311 L4	—	BN132MA4	—	—	—	103200	128600	40900	300
4.2	15014	2.6	341	22.0	—	311 R4	BN132MA4	—	—	—	102700	127900	40600	301
4.3	14702	1.9	334	15.0	—	310 R4	BN132MA4	—	—	—	86300	108600	40300	291
4.3	14571	1.2	331	15.0	—	309 R4	BN132MA4	—	—	—	72700	93700	22300	281
4.5	14152	2.8	322	22.0	—	311 R4	BN132MA4	—	—	—	100900	125600	39800	301
4.7	13417	1.7	305	15.0	—	310 R4	BN132MA4	—	—	—	84000	105600	39100	291
4.7	13821	2.8	304	18.0	313 L3	—	BN132MA4	—	—	—	122500	145000	48100	310
4.8	13199	1.1	300	15.0	—	307 R4	BN132MA4	M4LA4	31000	38900	69400	91000	26900	271
4.9	13437	1.7	295	18.0	310 L3	—	BN132MA4	—	—	—	83200	104600	38700	290
4.9	12915	2.9	294	22.0	—	311 R4	BN132MA4	—	—	—	98100	122200	38600	301
4.9	13248	2.0	291	18.0	311 L3	—	BN132MA4	—	—	—	97900	121900	38500	300
5.1	12517	0.9	284	15.0	—	307 R4	BN132MA4	M4LA4	29700	37300	66900	87700	25900	271
5.1	12517	1.4	284	15.0	—	309 R4	BN132MA4	—	—	—	69400	89500	21200	281
5.1	12899	1.2	284	11.0	309 L3	—	BN132MA4	—	—	—	69400	89400	21100	280
5.1	12454	2.1	283	15.0	—	310 R4	BN132MA4	—	—	—	82100	103300	38100	291
5.6	11365	2.0	258	15.0	—	310 R4	BN132MA4	—	—	—	79900	100500	37000	291
5.6	11354	1.3	258	15.0	—	307 R4	BN132MA4	M4LA4	29500	37000	66400	87000	25600	271
5.6	11354	1.5	258	15.0	—	309 R4	BN132MA4	—	—	—	67400	87000	20500	281
5.8	11340	1.6	249	18.0	310 L3	—	BN132MA4	—	—	—	79100	99400	36600	290
6.0	10886	1.2	239	11.0	309 L3	—	BN132MA4	—	—	—	65900	85000	20000	280
6.2	10295	2.4	234	15.0	—	310 R4	BN132MA4	—	—	—	77600	97600	35800	291
6.2	10217	1.1	232	15.0	—	307 R4	BN132MA4	M4LA4	28400	35700	64300	84200	24700	271
6.2	10217	1.6	232	15.0	—	309 R4	BN132MA4	—	—	—	65300	84200	19800	281
6.3	10470	2.0	230	18.0	310 L3	—	BN132MA4	—	—	—	77200	97100	35600	290








P₁ = 7.5 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
6.5	10141	1.3	223	11.0	309 L3	—	BN132MA4	—	—	—	64500	83200	19500	280
6.5	10051	1.3	221	11.0	307 L3	—	BN132MA4	M4LA4	28000	35100	63300	83000	24300	270
6.7	9399	1.0	214	12.0	—	306 R4	BN132MA4	M4LA4	24900	28200	58300	67900	18700	261
7.0	9057	2.4	206	15.0	—	310 R4	BN132MA4	—	—	—	74700	93900	34300	291
7.0	9048	1.6	206	15.0	—	307 R4	BN132MA4	M4LA4	27300	34300	62000	81200	23700	271
7.0	9048	2.2	206	15.0	—	309 R4	BN132MA4	—	—	—	63000	81200	19000	281
7.1	9182	2.4	202	18.0	310 L3	—	BN132MA4	—	—	—	74200	93300	34100	290
7.1	9173	1.2	202	11.0	307 L3	—	BN132MA4	M4LA4	27100	34000	61600	80700	23600	270
7.1	9173	1.8	202	11.0	309 L3	—	BN132MA4	—	—	—	62600	80700	18900	280
7.6	8390	1.7	191	15.0	—	307 R4	BN132MA4	M4LA4	26600	33400	60600	79400	23200	271
7.6	8390	2.1	191	15.0	—	309 R4	BN132MA4	—	—	—	61600	79400	18500	281
7.6	8331	2.8	189	15.0	—	310 R4	BN132MA4	—	—	—	72800	91500	33400	291
7.9	8309	1.7	183	11.0	309 L3	—	BN132MA4	—	—	—	60800	78400	18300	280
8.0	7962	1.2	181	12.0	—	306 R4	BN132MA4	M4LA4	23600	26700	55500	64600	17700	261
8.1	8064	2.3	177	18.0	310 L3	—	BN132MA4	—	—	—	71400	89800	32600	290
8.1	8054	1.5	177	11.0	307 L3	—	BN132MA4	M4LA4	26000	32600	59300	77700	22600	270
8.6	7383	1.0	168	12.0	—	306 R4	BN132MA4	M4LA4	23000	26000	54200	63100	17300	261
8.7	7268	2.2	165	15.0	—	309 R4	BN132MA4	—	—	—	59000	76100	17700	281
8.8	7445	3.0	164	18.0	310 L3	—	BN132MA4	—	—	—	69700	87600	31800	290
8.9	7350	1.5	162	11.0	307 L3	—	BN132MA4	M4LA4	25200	31600	57700	75600	21900	270
8.9	7350	2.2	162	11.0	309 L3	—	BN132MA4	—	—	—	58600	75600	17500	280
9.1	6946	1.4	158	12.0	—	306 R4	BN132MA4	M4LA4	22500	25500	53200	62000	16900	261
9.5	6917	1.1	152	7.5	306 L3	—	BN132MA4	M4LA4	22200	25200	52600	61300	16700	260
9.5	6686	2.8	152	15.0	—	309 R4	BN132MA4	—	—	—	57500	74200	17200	281
9.8	6658	2.0	146	11.0	307 L3	—	BN132MA4	M4LA4	24400	30600	56000	73300	21200	270
10.2	6414	1.2	141	7.5	306 L3	—	BN132MA4	M4LA4	21700	24600	51500	59900	16300	260
10.4	6314	1.7	139	11.0	307 L3	—	BN132MA4	M4LA4	24000	30100	55100	72200	20800	270
10.4	6314	2.5	139	11.0	309 L3	—	BN132MA4	—	—	—	56000	72200	16700	280
11.1	5687	0.9	129	12.0	—	305 R4	BN132MA4	M4LA4	16900	19500	30600	36900	10800	251
11.4	5727	2.3	126	11.0	307 L3	—	BN132MA4	M4LA4	23200	29100	53500	70100	20200	270
11.4	5727	2.9	126	11.0	309 L3	—	BN132MA4	—	—	—	54400	70100	16100	280
11.6	5458	2.0	124	15.0	—	307 R4	BN132MA4	M4LA4	24800	31100	56900	74500	21600	271
11.9	5517	1.4	121	7.5	306 L3	—	BN132MA4	M4LA4	20600	23400	49200	57300	15500	260
12.0	5449	1.6	120	22.0	—	307 R3	BN132MA4	M4LA4	22800	28600	52700	69100	19800	271
12.0	5449	2.4	120	22.0	—	309 R3	BN132MA4	—	—	—	53600	69100	15900	281
12.1	5422	1.2	119	14.0	—	306 R3	BN132MA4	M4LA4	20500	23200	48900	57000	15400	261
12.7	5154	2.0	113	11.0	307 L3	—	BN132MA4	M4LA4	22400	28100	51800	67900	19500	270
12.8	5111	1.4	112	7.5	306 L3	—	BN132MA4	M4LA4	20100	22800	48100	56000	15100	260
13.7	4623	2.9	105	15.0	—	307 R4	BN132MA4	M4LA4	24100	30300	55400	72700	21000	271
13.8	4756	1.1	105	7.5	305 L3	—	BN132MA4	M4LA4	15800	18200	28800	34600	10100	250
13.8	4741	1.9	104	7.5	306 L3	—	BN132MA4	M4LA4	19600	22200	47000	54700	14700	260
14.4	4564	2.7	100	11.0	307 L3	—	BN132MA4	M4LA4	21500	27000	50000	65500	18700	270
14.5	4504	1.9	99.0	22.0	—	307 R3	BN132MA4	M4LA4	21400	26900	49800	65200	18600	271
14.5	4504	2.8	99.0	22.0	—	309 R3	BN132MA4	—	—	—	50600	65200	14900	281
14.6	4482	1.4	98.5	14.0	—	306 R3	BN132MA4	M4LA4	19200	21800	46200	53800	14400	261
15.5	4232	2.9	93.0	11.0	307 L3	—	BN132MA4	M4LA4	21000	26300	48900	64000	18200	270
16.0	4104	1.0	90.2	7.5	305 L3	—	BN132MA4	M4LA4	15000	17300	27500	33100	9620	250
16.3	4016	2.1	88.3	7.5	306 L3	—	BN132MA4	M4LA4	18500	21000	44700	52100	13900	260
17.0	3856	2.0	84.7	14.0	—	306 R3	BN132MA4	M4LA4	18300	20700	44200	51400	13700	261
17.3	3795	2.7	83.4	22.0	—	307 R3	BN132MA4	M4LA4	20200	25400	47300	62000	17600	271
17.6	3724	1.9	81.9	7.5	306 L3	—	BN132MA4	M4LA4	18100	20500	43700	50900	13600	260
17.9	3666	2.8	80.6	11.0	307 L3	—	BN132MA4	M4LA4	20000	25100	46800	61300	17400	270
18.3	3582	1.2	78.7	14.0	—	305 R3	BN132MA4	M4LA4	14300	16500	26400	31800	9190	251
18.6	3514	1.0	77.2	7.5	304 L3	—	BN132MA4	M4LA4	14200	16400	26300	31600	9140	240
18.6	3514	1.4	77.2	7.5	305 L3	—	BN132MA4	M4LA4	14200	16400	26300	31600	9140	250
18.7	3504	2.4	77.0	7.5	306 L3	—	BN132MA4	M4LA4	17700	20100	42900	50000	13300	260
19.6	3336	1.1	73.3	14.0	—	305 R3	BN132MA4	M4LA4	14000	16200	25900	31100	8980	251
19.8	3317	2.2	72.9	14.0	—	306 R3	BN132MA4	M4LA4	17400	19700	42200	49200	13100	261
19.9	3407	1.6	72.5	13.0	306 L2	—	BN132MA4	M4LA4	17400	19700	42100	49100	13000	260
19.9	3289	1.0	72.3	7.5	304 L3	—	BN132MA4	M4LA4	13900	16100	25700	31000	8940	240
19.9	3289	1.3	72.3	7.5	305 L3	—	BN132MA4	M4LA4	13900	16100	25700	31000	8940	250
21.3	3072	2.3	67.5	14.0	—	306 R3	BN132MA4	M4LA4	17000	19200	41300	48000	12700	261
22.1	2968	2.5	65.2	7.5	306 L3	—	BN132MA4	M4LA4	16800	19000	40800	47500	12600	260
22.8	2870	1.0	63.1	14.0	—	304 R3	BN132MA4	—	13300	15400	24700	29700	8540	241
22.8	2870	1.5	63.1	14.0	—	305 R3	BN132MA4	M4LA4	13300	15400	24700	29700	8540	251
22.8	2869	1.2	63.1	7.5	304 L3	—	BN132MA4	M4LA4	13300	15400	24700	29700	8540	240
22.8	2869	1.6	63.1	7.5	305 L3	—	BN132MA4	M4LA4	13300	15400	24700	29700	8540	250

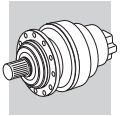


P₁ = 7.5 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
200	349	2.1	7.20	7.5	301 L1	—	BN132MA4	M4LA4	2100	2100	6310	7250	1380	222
202	335	1.7	7.13	12.0	—	300 R2	BN132MA4	M4LA4	2090	2090	6300	7230	1380	215
250	280	1.7	5.77	7.5	300 L1	—	BN132MA4	M4LA4	1950	1950	5910	6790	1280	214
338	207	2.4	4.26	7.5	300 L1	—	BN132MA4	M4LA4	1760	1760	5390	6200	1160	214
414	169	2.8	3.48	7.5	300 L1	—	BN132MA4	M4LA4	1610	1610	4970	5710	1060	214

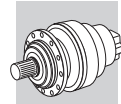
P₁ = 9.2 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
0.76	101595	1.5	1893	18.0	317 L4	—	BN132MB4	—	—	—	442000	470000	150000	348
0.90	85603	2.0	1595	18.0	317 L4	—	BN132MB4	—	—	—	442000	470000	150000	348
0.96	80109	1.0	1492	18.0	315 L4	—	BN132MB4	—	—	—	206000	243000	90000	330
1.1	70765	2.4	1318	18.0	317 L4	—	BN132MB4	—	—	—	434300	462400	147000	348
1.1	68911	1.4	1284	18.0	315 L4	—	BN132MB4	—	—	—	201500	236600	87400	330
1.1	68570	1.1	1277	15.0	314 L4	—	BN132MB4	—	—	—	201200	236300	87300	320
1.2	66427	1.8	1237	18.0	316 L4	—	BN132MB4	—	—	—	331400	368600	144000	340
1.3	60873	2.8	1134	18.0	317 L4	—	BN132MB4	—	—	—	415100	442000	139800	348
1.3	59278	1.6	1104	18.0	315 L4	—	BN132MB4	—	—	—	192600	226200	83200	330
1.3	58985	1.3	1099	15.0	314 L4	—	BN132MB4	—	—	—	192400	225800	83000	320
1.4	55971	1.8	1043	18.0	315 L4	—	BN132MB4	—	—	—	189400	222300	81600	330
1.4	55971	2.4	1043	18.0	316 L4	—	BN132MB4	—	—	—	314800	350100	136000	340
1.4	55695	1.5	1038	15.0	314 L4	—	BN132MB4	—	—	—	189100	222000	81400	320
1.4	54435	1.0	1014	11.0	313 L4	—	BN132MB4	—	—	—	175900	208200	71800	310
1.5	51174	2.8	953	50.0	—	317 R4	BN132MB4	—	—	—	394100	419600	132000	349
1.5	49916	1.9	930	18.0	315 L4	—	BN132MB4	—	—	—	183000	214800	78500	330
1.6	49701	1.5	926	15.0	314 L4	—	BN132MB4	—	—	—	182700	214500	78400	320
1.6	48812	1.6	909	40.0	—	315 R4	BN132MB4	—	—	—	181700	213400	77900	331
1.6	48512	1.0	904	11.0	311 L4	—	BN132MB4	—	—	—	137500	171300	56200	300
1.6	47739	1.1	889	11.0	313 L4	—	BN132MB4	—	—	—	169100	200100	68800	310
1.7	46269	2.2	862	18.0	315 L4	—	BN132MB4	—	—	—	178800	210000	76600	330
1.7	46269	2.8	862	18.0	316 L4	—	BN132MB4	—	—	—	297400	330700	127600	340
1.7	46041	1.8	858	15.0	314 L4	—	BN132MB4	—	—	—	178600	209700	76400	320
1.7	44271	1.0	825	11.0	311 L4	—	BN132MB4	—	—	—	133800	166600	54500	300
1.8	43614	3.0	812	18.0	316 L4	—	BN132MB4	—	—	—	292100	324900	125100	340
1.8	42401	1.2	790	11.0	313 L4	—	BN132MB4	—	—	—	163200	193100	66100	310
1.8	41989	2.2	782	40.0	—	315 R4	BN132MB4	—	—	—	173700	203900	74100	331
1.9	41782	1.1	778	22.0	—	313 R4	BN132MB4	—	—	—	162500	192300	65800	311
1.9	39777	2.5	741	18.0	315 L4	—	BN132MB4	—	—	—	170900	200700	72800	330
2.0	39605	2.0	738	15.0	314 L4	—	BN132MB4	—	—	—	170700	200400	72700	320
2.0	38872	1.2	724	11.0	311 L4	—	BN132MB4	—	—	—	128700	160300	52200	300
2.1	37314	1.4	695	11.0	313 L4	—	BN132MB4	—	—	—	157000	185900	63300	310
2.1	36054	2.8	672	18.0	315 L4	—	BN132MB4	—	—	—	165900	194800	70500	330
2.2	35876	2.2	668	15.0	314 L4	—	BN132MB4	—	—	—	165700	194500	70300	320
2.2	35379	2.5	659	40.0	—	315 R4	BN132MB4	—	—	—	165000	193700	70000	331
2.2	34711	1.5	647	22.0	—	313 R4	BN132MB4	—	—	—	153700	181900	61800	311
2.3	33975	1.5	633	11.0	313 L4	—	BN132MB4	—	—	—	152700	180700	61400	310
2.3	33747	1.2	629	22.0	—	311 R4	BN132MB4	—	—	—	123300	153600	49800	301
2.3	33640	1.2	627	11.0	311 L4	—	BN132MB4	—	—	—	123200	153500	49700	300
2.3	33460	3.0	623	40.0	—	315 R4	BN132MB4	—	—	—	162300	190500	68700	331
2.3	32946	1.7	614	22.0	—	314 R4	BN132MB4	—	—	—	161500	189600	68400	321
2.4	31560	2.5	588	15.0	314 L4	—	BN132MB4	—	—	—	159500	187200	67400	320
2.5	30473	1.4	568	11.0	311 L4	—	BN132MB4	—	—	—	119600	149000	48100	300
2.6	30263	1.8	564	11.0	313 L4	—	BN132MB4	—	—	—	147500	174500	59100	310
2.6	29841	1.1	556	11.0	310 L4	—	BN132MB4	—	—	—	100600	126500	47800	290
2.6	29749	2.7	554	15.0	314 L4	—	BN132MB4	—	—	—	156600	183900	66100	320
2.7	28695	1.7	535	22.0	—	313 R4	BN132MB4	—	—	—	145100	171800	58000	311
2.7	28341	2.4	528	22.0	—	314 R4	BN132MB4	—	—	—	154400	181300	65000	321
2.8	27898	1.4	520	22.0	—	311 R4	BN132MB4	—	—	—	116500	145100	46700	301
2.8	27760	0.9	517	15.0	—	310 R4	BN132MB4	—	—	—	98400	123800	46600	291
2.8	27573	1.8	514	11.0	313 L4	—	BN132MB4	—	—	—	143400	169700	57300	310
2.8	27490	1.6	512	11.0	311 L4	—	BN132MB4	—	—	—	116000	144500	46500	300
2.8	27233	0.9	507	11.0	310 L4	—	BN132MB4	—	—	—	97900	123000	46300	290
2.9	26630	2.0	496	22.0	—	313 R4	BN132MB4	—	—	—	141900	168000	56600	311








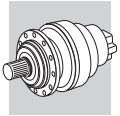
P₁ = 9.2 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
2.9	26547	3.0	495	15.0	314 L4	—	BN132MB4	—	—	—	151400	177700	63600	320
2.9	26297	1.3	490	22.0	—	311 R4	BN132MB4	—	—	—	114400	142500	45800	301
3.2	24249	2.2	452	11.0	313 L4	—	BN132MB4	—	—	—	138000	163300	54900	310
3.2	24191	1.2	451	11.0	310 L4	—	BN132MB4	—	—	—	94400	118700	44500	290
3.2	24178	2.0	450	22.0	—	313 R4	BN132MB4	—	—	—	137900	163200	54800	311
3.2	23880	2.8	445	22.0	—	314 R4	BN132MB4	—	—	—	146700	172200	61400	321
3.3	23506	1.6	438	22.0	—	311 R4	BN132MB4	—	—	—	110600	137800	44100	301
3.4	22509	1.3	419	15.0	—	310 R4	BN132MB4	—	—	—	92400	116200	43500	291
3.5	22157	1.8	413	22.0	—	311 R4	BN132MB4	—	—	—	108700	135400	43300	301
3.5	22027	1.9	410	11.0	311 L4	—	BN132MB4	—	—	—	108500	135200	43200	300
3.7	21154	2.6	394	11.0	313 L4	—	BN132MB4	—	—	—	132500	156800	52400	310
3.7	21024	0.9	392	11.0	310 L4	—	BN132MB4	—	—	—	90500	113900	42500	290
3.7	20798	2.2	387	22.0	—	313 R4	BN132MB4	—	—	—	131800	156000	52100	311
4.0	19498	1.2	363	15.0	—	310 R4	BN132MB4	—	—	—	88500	111300	41500	291
4.1	18895	2.8	352	11.0	313 L4	—	BN132MB4	—	—	—	128000	151500	50500	310
4.1	19455	1.0	350	18.0	310 L3	—	BN132MB4	—	—	—	87600	110100	41000	290
4.1	18738	1.1	349	7.5	309 L4	—	BN132MB4	—	—	—	73800	95200	22700	280
4.1	18658	2.1	348	11.0	311 L4	—	BN132MB4	—	—	—	103200	128600	40900	300
4.2	18549	2.9	346	22.0	—	313 R4	BN132MB4	—	—	—	127300	150700	50200	311
4.2	18317	2.1	341	22.0	—	311 R4	BN132MB4	—	—	—	102700	127900	40600	301
4.3	17937	1.5	334	15.0	—	310 R4	BN132MB4	—	—	—	86300	108600	40300	291
4.3	17776	1.0	331	15.0	—	309 R4	BN132MB4	—	—	—	72700	93700	22300	281
4.5	17265	2.3	322	22.0	—	311 R4	BN132MB4	—	—	—	100900	125600	39800	301
4.7	16574	2.7	309	22.0	—	313 R4	BN132MB4	—	—	—	123100	145700	48300	311
4.7	16369	1.4	305	15.0	—	310 R4	BN132MB4	—	—	—	84000	105600	39100	291
4.7	16861	2.3	304	18.0	313 L3	—	BN132MB4	—	—	—	122500	145000	48100	310
4.9	16393	1.4	295	18.0	310 L3	—	BN132MB4	—	—	—	83200	104600	38700	290
4.9	15756	2.4	294	22.0	—	311 R4	BN132MB4	—	—	—	98100	122200	38600	301
4.9	16163	1.7	291	18.0	311 L3	—	BN132MB4	—	—	—	97900	121900	38500	300
5.1	15270	1.1	284	15.0	—	309 R4	BN132MB4	—	—	—	69400	89500	21200	281
5.1	15737	1.0	284	11.0	309 L3	—	BN132MB4	—	—	—	69400	89400	21100	280
5.1	15194	1.7	283	15.0	—	310 R4	BN132MB4	—	—	—	82100	103300	38100	291
5.4	14273	2.6	266	22.0	—	311 R4	BN132MB4	—	—	—	95300	118700	37400	301
5.6	13866	1.6	258	15.0	—	310 R4	BN132MB4	—	—	—	79900	100500	37000	291
5.6	13852	1.1	258	15.0	—	307 R4	BN132MB4	M4LB4	29500	37000	66400	87000	25600	271
5.6	13852	1.3	258	15.0	—	309 R4	BN132MB4	—	—	—	67400	87000	20500	281
5.8	13835	1.3	249	18.0	310 L3	—	BN132MB4	—	—	—	79100	99400	36600	290
5.9	13619	2.5	245	18.0	311 L3	—	BN132MB4	—	—	—	93000	115800	36400	300
6.0	13281	1.0	239	11.0	309 L3	—	BN132MB4	—	—	—	65900	85000	20000	280
6.2	12560	2.0	234	15.0	—	310 R4	BN132MB4	—	—	—	77600	97600	35800	291
6.2	12465	1.3	232	15.0	—	309 R4	BN132MB4	—	—	—	65300	84200	19800	281
6.3	12774	1.7	230	18.0	310 L3	—	BN132MB4	—	—	—	77200	97100	35600	290
6.3	12278	2.9	229	22.0	—	311 R4	BN132MB4	—	—	—	91100	113400	35500	301
6.5	12372	1.1	223	11.0	309 L3	—	BN132MB4	—	—	—	64500	83200	19500	280
6.5	12263	1.0	221	11.0	307 L3	—	BN132MB4	M4LB4	28000	35100	63300	83000	24300	270
7.0	11049	2.0	206	15.0	—	310 R4	BN132MB4	—	—	—	74700	93900	34300	291
7.0	11038	1.3	206	15.0	—	307 R4	BN132MB4	M4LB4	27300	34300	62000	81200	23700	271
7.0	11038	1.8	206	15.0	—	309 R4	BN132MB4	—	—	—	63000	81200	19000	281
7.1	11258	3.0	203	18.0	311 L3	—	BN132MB4	—	—	—	87800	109400	34100	300
7.1	11202	2.0	202	18.0	310 L3	—	BN132MB4	—	—	—	74200	93300	34100	290
7.1	11191	1.0	202	11.0	307 L3	—	BN132MB4	M4LB4	27100	34000	61600	80700	23600	270
7.1	11191	1.5	202	11.0	309 L3	—	BN132MB4	—	—	—	62600	80700	18900	280
7.6	10236	1.4	191	15.0	—	307 R4	BN132MB4	M4LB4	26600	33400	60600	79400	23200	271
7.6	10236	1.7	191	15.0	—	309 R4	BN132MB4	—	—	—	61600	79400	18500	281
7.6	10164	2.3	189	15.0	—	310 R4	BN132MB4	—	—	—	72800	91500	33400	291
7.9	10137	1.4	183	11.0	309 L3	—	BN132MB4	—	—	—	60800	78400	18300	280
8.0	9713	1.0	181	12.0	—	306 R4	BN132MB4	M4LB4	23000	26100	54300	63200	17300	261
8.1	9838	1.9	177	18.0	310 L3	—	BN132MB4	—	—	—	71400	89800	32600	290
8.1	9826	1.3	177	11.0	307 L3	—	BN132MB4	M4LB4	26000	32600	59300	77700	22600	270
8.7	8867	1.8	165	15.0	—	309 R4	BN132MB4	—	—	—	59000	76100	17700	281
8.8	9083	2.4	164	18.0	310 L3	—	BN132MB4	—	—	—	69700	87600	31800	290
8.9	8967	1.2	162	11.0	307 L3	—	BN132MB4	M4LB4	25200	31600	57700	75600	21900	270
8.9	8967	1.8	162	11.0	309 L3	—	BN132MB4	—	—	—	58600	75600	17500	280
9.0	8610	2.6	160	15.0	—	310 R4	BN132MB4	—	—	—	69300	87100	31600	291
9.1	8474	1.1	158	12.0	—	306 R4	BN132MB4	M4LB4	22500	25500	53200	62000	16900	261
9.5	8157	2.3	152	15.0	—	309 R4	BN132MB4	—	—	—	57500	74200	17200	281
9.8	8123	1.6	146	11.0	307 L3	—	BN132MB4	M4LB4	24400	30600	56000	73300	21200	270



P₁ = 9.2 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
10.2	7869	2.6	142	18.0	310 L3	—	BN132MB4	—	—	—	66700	83900	30300	290
10.2	7825	1.0	141	7.5	306 L3	—	BN132MB4	M4LB4	21700	24600	51500	59900	16300	260
10.4	7703	1.4	139	11.0	307 L3	—	BN132MB4	M4LB4	24000	30100	55100	72200	20800	270
10.4	7703	2.1	139	11.0	309 L3	—	BN132MB4	—	—	—	56000	72200	16700	280
10.6	7293	2.9	136	15.0	—	310 R4	BN132MB4	—	—	—	65900	82900	29900	291
11.0	7238	2.9	130	18.0	310 L3	—	BN132MB4	—	—	—	65100	81900	29500	290
11.4	6987	1.9	126	11.0	307 L3	—	BN132MB4	M4LB4	23200	29100	53500	70100	20200	270
11.4	6987	2.3	126	11.0	309 L3	—	BN132MB4	—	—	—	54400	70100	16100	280
11.6	6658	1.6	124	15.0	—	307 R4	BN132MB4	M4LB4	24800	31100	56900	74500	21600	271
11.9	6731	1.2	121	7.5	306 L3	—	BN132MB4	M4LB4	20600	23400	49200	57300	15500	260
12.0	6647	1.3	120	22.0	—	307 R3	BN132MB4	M4LB4	22800	28600	52700	69100	19800	271
12.0	6647	1.9	120	22.0	—	309 R3	BN132MB4	—	—	—	53600	69100	15900	281
12.0	6647	2.6	120	22.0	—	310 R3	BN132MB4	—	—	—	63500	79800	28600	291
12.1	6615	1.0	119	14.0	—	306 R3	BN132MB4	M4LB4	20500	23200	48900	57000	15400	261
12.1	6606	3.0	119	18.0	310 L3	—	BN132MB4	—	—	—	63300	79600	28600	290
12.7	6288	1.7	113	11.0	307 L3	—	BN132MB4	M4LB4	22400	28100	51800	67900	19500	270
12.7	6288	2.5	113	11.0	309 L3	—	BN132MB4	—	—	—	52700	67900	15600	280
12.8	6236	1.2	112	7.5	306 L3	—	BN132MB4	M4LB4	20100	22800	48100	56000	15100	260
13.7	5640	2.4	105	15.0	—	307 R4	BN132MB4	M4LB4	24100	30300	55400	72700	21000	271
13.8	5785	1.5	104	7.5	306 L3	—	BN132MB4	M4LB4	19600	22200	47000	54700	14700	260
14.4	5568	2.2	100	11.0	307 L3	—	BN132MB4	M4LB4	21500	27000	50000	65500	18700	270
14.4	5568	3.0	100	11.0	309 L3	—	BN132MB4	—	—	—	50800	65500	15000	280
14.5	5495	1.6	99.0	22.0	—	307 R3	BN132MB4	M4LB4	21400	26900	49800	65200	18600	271
14.5	5495	2.3	99.0	22.0	—	309 R3	BN132MB4	—	—	—	50600	65200	14900	281
14.5	5495	3.0	99.0	22.0	—	310 R3	BN132MB4	—	—	—	59900	75400	26900	291
14.6	5468	1.2	98.5	14.0	—	306 R3	BN132MB4	M4LB4	19200	21800	46200	53800	14400	261
15.5	5163	2.4	93.0	11.0	307 L3	—	BN132MB4	M4LB4	21000	26300	48900	64000	18200	270
15.5	5163	2.9	93.0	11.0	309 L3	—	BN132MB4	—	—	—	49600	64000	14600	280
16.3	4900	1.7	88.3	7.5	306 L3	—	BN132MB4	M4LB4	18500	21000	44700	52100	13900	260
17.0	4704	1.6	84.7	14.0	—	306 R3	BN132MB4	M4LB4	18300	20700	44200	51400	13700	261
17.3	4630	2.2	83.4	22.0	—	307 R3	BN132MB4	M4LB4	20200	25400	47300	62000	17600	271
17.6	4544	1.5	81.9	7.5	306 L3	—	BN132MB4	M4LB4	18100	20500	43700	50900	13600	260
17.9	4473	2.3	80.6	11.0	307 L3	—	BN132MB4	M4LB4	20000	25100	46800	61300	17400	270
18.3	4370	1.0	78.7	14.0	—	305 R3	BN132MB4	M4LB4	14300	16500	26400	31800	9190	251
18.3	4364	2.5	78.6	22.0	—	307 R3	BN132MB4	M4LB4	19800	24900	46500	60900	17200	271
18.6	4288	1.1	77.2	7.5	305 L3	—	BN132MB4	M4LB4	14200	16400	26300	31600	9140	250
18.7	4274	2.0	77.0	7.5	306 L3	—	BN132MB4	M4LB4	17700	20100	42900	50000	13300	260
19.4	4114	2.8	74.1	11.0	307 L3	—	BN132MB4	M4LB4	19400	24400	45600	59800	16900	270
19.8	4046	1.8	72.9	14.0	—	306 R3	BN132MB4	M4LB4	17400	19700	42200	49200	13100	261
19.9	4157	1.3	72.5	13.0	306 L2	—	BN132MB4	M4LB4	17400	19700	42100	49100	13000	260
19.9	4012	1.0	72.3	7.5	305 L3	—	BN132MB4	M4LB4	13900	16100	25700	31000	8940	250
20.1	3983	2.5	71.8	22.0	—	307 R3	BN132MB4	M4LB4	19200	24100	45200	59200	16700	271
21.3	3748	1.9	67.5	14.0	—	306 R3	BN132MB4	M4LB4	17000	19200	41300	48000	12700	261
22.1	3621	2.1	65.2	7.5	306 L3	—	BN132MB4	M4LB4	16800	19000	40800	47500	12600	260
22.8	3501	1.2	63.1	14.0	—	305 R3	BN132MB4	M4LB4	13300	15400	24700	29700	8540	251
22.8	3500	1.0	63.1	7.5	304 L3	—	BN132MB4	M4LB4	13300	15400	24700	29700	8540	240
22.8	3500	1.3	63.1	7.5	305 L3	—	BN132MB4	M4LB4	13300	15400	24700	29700	8540	250
24.8	3224	2.4	58.1	14.0	—	306 R3	BN132MB4	M4LB4	16100	18300	39400	45900	12100	261
25.6	3225	1.6	56.3	13.0	306 L2	—	BN132MB4	M4LB4	16000	18100	39100	45500	12000	260
25.8	3200	1.1	55.8	9.0	305 L2	—	BN132MB4	M4LB4	12800	14800	23800	28700	8200	250
26.6	3008	1.2	54.2	14.0	—	305 R3	BN132MB4	M4LB4	12700	14600	23600	28400	8120	251
27.0	2965	1.1	53.4	7.5	304 L3	—	BN132MB4	M4LB4	12600	14500	23500	28300	8080	240
27.0	2965	1.3	53.4	7.5	305 L3	—	BN132MB4	M4LB4	12600	14500	23500	28300	8080	250
27.0	2956	2.4	53.2	7.5	306 L3	—	BN132MB4	M4LB4	15700	17800	38400	44700	11800	260
28.6	2790	1.2	50.3	14.0	—	304 R3	BN132MB4	—	12300	14200	23100	27800	7920	241
28.6	2790	1.6	50.3	14.0	—	305 R3	BN132MB4	M4LB4	12300	14200	23100	27800	7920	251
31	2587	1.1	46.6	14.0	—	304 R3	BN132MB4	—	12000	13900	22600	27200	7720	241
31	2587	1.7	46.6	14.0	—	305 R3	BN132MB4	M4LB4	12000	13900	22600	27200	7720	251
31	2666	2.4	46.5	13.0	306 L2	—	BN132MB4	M4LB4	15000	17000	36900	43000	11300	260
31	2569	2.9	46.3	14.0	—	306 R3	BN132MB4	M4LB4	15000	16900	36800	42900	11200	261
32	2560	1.4	44.6	9.0	305 L2	—	BN132MB4	M4LB4	11900	13700	22300	26800	7610	250
33	2420	1.3	43.6	7.5	304 L3	—	BN132MB4	M4LB4	11800	13600	22100	26600	7550	240
34	2363	1.3	42.6	14.0	—	304 R3	BN132MB4	—	11700	13500	22000	26400	7490	241
34	2363	1.6	42.6	14.0	—	305 R3	BN132MB4	M4LB4	11700	13500	22000	26400	7490	251
37	2204	2.9	38.4	13.0	306 L2	—	BN132MB4	M4LB4	14100	15900	34800	40600	10600	260
38	2202	1.0	38.4	9.0	303 L2	—	BN132MB4	M4LB4	11300	13000	21300	25600	7240	230
38	2202	1.3	38.4	9.0	304 L2	—	BN132MB4	M4LB4	11300	13000	21300	25600	7240	240

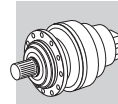


P₁ = 9.2 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
38	2202	2.0	38.4	9.0	305 L2	—	BN132MB4	M4LB4	11300	13000	21300	25600	7240	250
39	2062	1.2	37.1	14.0	—	303 R3	BN132MB4	—	11200	12900	21100	25400	7160	231
39	2062	1.7	37.1	14.0	—	304 R3	BN132MB4	—	11200	12900	21100	25400	7160	241
39	2062	2.1	37.1	14.0	—	305 R3	BN132MB4	M4LB4	11200	12900	21100	25400	7160	251
40	2051	1.7	35.8	9.0	305 L2	—	BN132MB4	M4LB4	11000	12700	20800	25100	7070	250
46	1746	1.2	31.5	14.0	—	303 R3	BN132MB4	—	10600	12200	20100	24100	6770	231
46	1746	1.8	31.5	14.0	—	304 R3	BN132MB4	—	10600	12200	20100	24100	6770	241
46	1746	2.2	31.5	14.0	—	305 R3	BN132MB4	M4LB4	10600	12200	20100	24100	6770	251
47	1764	1.2	30.8	9.0	303 L2	—	BN132MB4	M4LB4	10500	12100	19900	24000	6720	230
47	1764	1.6	30.8	9.0	304 L2	—	BN132MB4	M4LB4	10500	12100	19900	24000	6720	240
47	1764	2.4	30.8	9.0	305 L2	—	BN132MB4	M4LB4	10500	12100	19900	24000	6720	250
47	1688	0.9	30.4	10.0	—	301 R3	BN132MB4	—	3320	3320	9530	10900	2180	223
54	1516	1.2	26.4	9.0	303 L2	—	BN132MB4	M4LB4	9960	11500	19000	22900	6390	230
54	1516	2.3	26.4	9.0	305 L2	—	BN132MB4	M4LB4	9960	11500	19000	22900	6390	250
56	1426	1.4	25.7	14.0	—	303 R3	BN132MB4	—	9870	11400	18900	22700	6330	231
56	1426	2.1	25.7	14.0	—	304 R3	BN132MB4	—	9870	11400	18900	22700	6330	241
56	1426	2.5	25.7	14.0	—	305 R3	BN132MB4	M4LB4	9870	11400	18900	22700	6330	251
58	1378	1.0	24.8	12.0	—	301 R3	BN132MB4	—	3170	3170	9150	10500	2090	223
59	1410	1.1	24.6	7.5	301 L2	—	BN132MB4	M4LB4	3160	3160	9130	10500	2080	222
59	1406	1.5	24.5	9.0	303 L2	—	BN132MB4	M4LB4	9720	11200	18600	22400	6230	230
59	1406	2.3	24.5	9.0	304 L2	—	BN132MB4	M4LB4	9720	11200	18600	22400	6230	240
59	1406	2.7	24.5	9.0	305 L2	—	BN132MB4	M4LB4	9720	11200	18600	22400	6230	250
63	1304	1.6	22.7	9.0	303 L2	—	BN132MB4	M4LB4	9470	10900	18200	21900	6080	230
63	1304	2.1	22.7	9.0	304 L2	—	BN132MB4	M4LB4	9470	10900	18200	21900	6080	240
69	1191	1.5	20.8	9.0	303 L2	—	BN132MB4	M4LB4	9470	10900	18200	21900	6080	230
69	1191	2.5	20.8	9.0	304 L2	—	BN132MB4	M4LB4	9190	10600	17700	21300	5900	240
69	1191	2.7	20.8	9.0	305 L2	—	BN132MB4	M4LB4	9190	10600	17700	21300	5900	250
72	1151	1.1	20.1	7.5	301 L2	—	BN132MB4	M4LB4	2960	2960	8590	9870	1940	222
75	1102	1.4	19.2	18.0	—	303 R2	BN132MB4	M4LB4	8960	10300	17300	20800	5750	231
75	1102	2.6	19.2	18.0	—	305 R2	BN132MB4	M4LB4	8960	10300	17300	20800	5750	251
79	1042	1.3	18.2	7.5	301 L2	—	BN132MB4	M4LB4	2860	2860	8330	9580	1880	222
79	1039	1.9	18.1	9.0	303 L2	—	BN132MB4	M4LB4	8780	10100	17000	20400	5630	230
79	1039	2.8	18.1	9.0	304 L2	—	BN132MB4	M4LB4	8780	10100	17000	20400	5630	240
86	966	2.5	16.8	18.0	—	304 R2	BN132MB4	M4LB4	8570	9900	16600	20000	5500	241
91	911	2.0	15.9	18.0	—	303 R2	BN132MB4	M4LB4	8410	9710	16300	19700	5390	231
94	880	1.9	15.3	9.0	303 L2	—	BN132MB4	M4LB4	8310	9590	16200	19500	5330	230
97	851	1.5	14.8	7.5	301 L2	—	BN132MB4	M4LB4	2670	2670	7840	9010	1760	222
98	846	1.1	14.8	12.0	—	301 R2	BN132MB4	M4LB4	2670	2670	7830	9000	1750	223
105	784	2.5	13.7	18.0	—	303 R2	BN132MB4	M4LB4	8000	9230	15600	18800	5130	231
115	718	2.3	12.5	9.0	303 L2	—	BN132MB4	M4LB4	7770	8970	15200	18300	4980	230
119	694	1.0	12.1	7.5	300 L2	—	BN132MB4	M4LB4	2440	2440	7230	8300	1600	214
119	694	1.8	12.1	7.5	301 L2	—	BN132MB4	M4LB4	2500	2500	7380	8480	1640	222
122	678	1.7	11.8	12.0	—	301 R2	BN132MB4	M4LB4	2480	2480	7330	8420	1630	223
149	572	1.3	9.67	11.0	303 L1	—	BN132MB4	M4LB4	7120	8220	14100	16900	4570	230
160	533	1.2	9.00	7.5	301 L1	—	BN132MB4	M4LB4	2260	2260	6750	7750	1490	222
165	501	1.2	8.74	12.0	—	300 R2	BN132MB4	M4LB4	2240	2240	6690	7690	1470	215
165	501	2.2	8.74	12.0	—	301 R2	BN132MB4	M4LB4	2240	2240	6690	7690	1470	223
192	444	2.7	7.50	11.0	303 L1	—	BN132MB4	M4LB4	6550	7560	13000	15700	4200	230
200	426	1.0	7.20	7.5	300 L1	—	BN132MB4	M4LB4	2100	2100	6310	7250	1380	214
200	426	1.8	7.20	7.5	301 L1	—	BN132MB4	M4LB4	2100	2100	6310	7250	1380	222
202	409	1.4	7.13	12.0	—	300 R2	BN132MB4	M4LB4	2090	2090	6300	7230	1380	215
202	409	2.5	7.13	12.0	—	301 R2	BN132MB4	M4LB4	2090	2090	6300	7230	1380	223
250	341	1.4	5.77	7.5	300 L1	—	BN132MB4	M4LB4	1950	1950	5910	6790	1280	214
250	341	2.7	5.77	7.5	301 L1	—	BN132MB4	M4LB4	1950	1950	5910	6790	1280	222
338	252	1.9	4.26	7.5	300 L1	—	BN132MB4	M4LB4	1760	1760	5390	6200	1160	214
414	206	2.3	3.48	7.5	300 L1	—	BN132MB4	M4LB4	1610	1610	4970	5710	1060	214

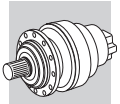
P₁ = 11 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
0.76	121580	1.3	1893	18.0	317 L4	—	BN160MR4	—	—	—	442000	470000	150000	348
0.90	102443	1.7	1595	18.0	317 L4	—	BN160MR4	—	—	—	442000	470000	150000	348
1.1	84686	2.0	1318	18.0	317 L4	—	BN160MR4	—	—	—	434300	462400	147000	348








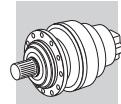
P₁ = 11 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
					MC	MZ	HC/PC	HZ/PZ	FZ					
1.1	82467	1.2	1284	18.0	315 L4	—	BN160MR4	—	—	—	201500	236600	87400	330
1.1	82060	0.9	1277	15.0	314 L4	—	BN160MR4	—	—	—	201200	236300	87300	320
1.2	79495	1.5	1237	18.0	316 L4	—	BN160MR4	—	—	—	331400	368600	144000	340
1.3	72848	2.3	1134	18.0	317 L4	—	BN160MR4	—	—	—	415100	442000	139800	348
1.3	70939	1.3	1104	18.0	315 L4	—	BN160MR4	—	—	—	192600	226200	83200	330
1.3	70589	1.1	1099	15.0	314 L4	—	BN160MR4	—	—	—	192400	225800	83000	320
1.4	66982	1.5	1043	18.0	315 L4	—	BN160MR4	—	—	—	189400	222300	81600	330
1.4	66982	2.0	1043	18.0	316 L4	—	BN160MR4	—	—	—	314800	350100	136000	340
1.4	66651	1.2	1038	15.0	314 L4	—	BN160MR4	—	—	—	189100	222000	81400	320
1.4	66317	2.7	1032	18.0	317 L4	—	BN160MR4	—	—	—	403600	429700	135500	348
1.5	61240	2.4	953	50.0	—	317 R4	BN160MR4	—	—	—	394100	419600	132000	349
1.5	59735	1.6	930	18.0	315 L4	—	BN160MR4	—	—	—	183000	214800	78500	330
1.6	59478	1.2	926	15.0	314 L4	—	BN160MR4	—	—	—	182700	214500	78400	320
1.6	58414	1.3	909	40.0	—	315 R4	BN160MR4	—	—	—	181700	213400	77900	331
1.6	58051	2.9	904	18.0	317 L4	—	BN160MR4	—	—	—	387800	412900	129600	348
1.6	57130	0.9	889	11.0	313 L4	—	BN160MR4	—	—	—	169100	200100	68800	310
1.7	55372	1.8	862	18.0	315 L4	—	BN160MR4	—	—	—	178800	210000	76600	330
1.7	55372	2.3	862	18.0	316 L4	—	BN160MR4	—	—	—	297400	330700	127600	340
1.7	55098	1.5	858	15.0	314 L4	—	BN160MR4	—	—	—	178600	209700	76400	320
1.8	52194	2.5	812	18.0	316 L4	—	BN160MR4	—	—	—	292100	324900	125100	340
1.8	50742	1.0	790	11.0	313 L4	—	BN160MR4	—	—	—	163200	193100	66100	310
1.8	50249	1.8	782	40.0	—	315 R4	BN160MR4	—	—	—	173700	203900	74100	331
1.9	47602	2.1	741	18.0	315 L4	—	BN160MR4	—	—	—	170900	200700	72800	330
1.9	47602	2.7	741	18.0	316 L4	—	BN160MR4	—	—	—	284200	316100	121400	340
2.0	47396	1.7	738	15.0	314 L4	—	BN160MR4	—	—	—	170700	200400	72700	320
2.0	46656	2.8	726	18.0	316 L4	—	BN160MR4	—	—	—	282500	314100	120500	340
2.0	46518	1.0	724	11.0	311 L4	—	BN160MR4	—	—	—	128700	160300	52200	300
2.1	44655	1.1	695	11.0	313 L4	—	BN160MR4	—	—	—	157000	185900	63300	310
2.1	43978	2.9	685	18.0	316 L4	—	BN160MR4	—	—	—	277500	308600	118200	340
2.1	43147	2.3	672	18.0	315 L4	—	BN160MR4	—	—	—	165900	194800	70500	330
2.2	42934	1.9	668	15.0	314 L4	—	BN160MR4	—	—	—	165700	194500	70300	320
2.2	42339	2.1	659	40.0	—	315 R4	BN160MR4	—	—	—	165000	193700	70000	331
2.2	41540	1.2	647	22.0	—	313 R4	BN160MR4	—	—	—	153700	181900	61800	311
2.3	40659	1.3	633	11.0	313 L4	—	BN160MR4	—	—	—	152700	180700	61400	310
2.3	40386	1.0	629	22.0	—	311 R4	BN160MR4	—	—	—	123300	153600	49800	301
2.3	40258	1.0	627	11.0	311 L4	—	BN160MR4	—	—	—	123200	153500	49700	300
2.3	40042	2.5	623	40.0	—	315 R4	BN160MR4	—	—	—	162300	190500	68700	331
2.3	40042	2.9	623	45.0	—	316 R4	BN160MR4	—	—	—	269800	300100	114500	341
2.3	39427	1.5	614	22.0	—	314 R4	BN160MR4	—	—	—	161500	189600	68400	321
2.4	37956	2.6	591	18.0	315 L4	—	BN160MR4	—	—	—	159700	187500	67500	330
2.4	37769	2.1	588	15.0	314 L4	—	BN160MR4	—	—	—	159500	187200	67400	320
2.5	36468	1.2	568	11.0	311 L4	—	BN160MR4	—	—	—	119600	149000	48100	300
2.6	36216	1.5	564	11.0	313 L4	—	BN160MR4	—	—	—	147500	174500	59100	310
2.6	35601	2.2	554	15.0	314 L4	—	BN160MR4	—	—	—	156600	183900	66100	320
2.7	34340	1.4	535	22.0	—	313 R4	BN160MR4	—	—	—	145100	171800	58000	311
2.7	34269	2.9	533	18.0	315 L4	—	BN160MR4	—	—	—	154900	181800	65200	330
2.7	33916	2.0	528	22.0	—	314 R4	BN160MR4	—	—	—	154400	181300	65000	321
2.7	33739	2.9	525	40.0	—	315 R4	BN160MR4	—	—	—	154100	181000	64900	331
2.8	33386	1.2	520	22.0	—	311 R4	BN160MR4	—	—	—	116500	145100	46700	301
2.8	32997	1.5	514	11.0	313 L4	—	BN160MR4	—	—	—	143400	169700	57300	310
2.8	32898	1.3	512	11.0	311 L4	—	BN160MR4	—	—	—	116000	144500	46500	300
2.9	31869	1.6	496	22.0	—	313 R4	BN160MR4	—	—	—	141900	168000	56600	311
2.9	31770	2.5	495	15.0	314 L4	—	BN160MR4	—	—	—	151400	177700	63600	320
2.9	31470	1.1	490	22.0	—	311 R4	BN160MR4	—	—	—	114400	142500	45800	301
3.1	29430	2.7	458	15.0	314 L4	—	BN160MR4	—	—	—	148000	173700	62000	320
3.2	29019	1.9	452	11.0	313 L4	—	BN160MR4	—	—	—	138000	163300	54900	310
3.2	28950	1.0	451	11.0	310 L4	—	BN160MR4	—	—	—	92500	116300	43500	290
3.2	28934	1.6	450	22.0	—	313 R4	BN160MR4	—	—	—	137900	163200	54800	311
3.2	28577	2.4	445	22.0	—	314 R4	BN160MR4	—	—	—	146700	172200	61400	321
3.3	28131	1.3	438	22.0	—	311 R4	BN160MR4	—	—	—	110600	137800	44100	301
3.4	27027	2.9	421	22.0	—	314 R4	BN160MR4	—	—	—	144200	169300	60300	321
3.4	26937	1.1	419	15.0	—	310 R4	BN160MR4	—	—	—	92400	116200	43500	291
3.5	26516	1.5	413	22.0	—	311 R4	BN160MR4	—	—	—	108700	135400	43300	301
3.5	26360	1.6	410	11.0	311 L4	—	BN160MR4	—	—	—	108500	135200	43200	300
3.7	25315	2.2	394	11.0	313 L4	—	BN160MR4	—	—	—	132500	156800	52400	310
3.7	24890	1.9	387	22.0	—	313 R4	BN160MR4	—	—	—	131800	156000	52100	311
4.0	23334	1.0	363	15.0	—	310 R4	BN160MR4	—	—	—	88500	111300	41500	291








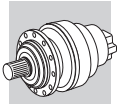
P₁ = 11 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
4.1	22612	2.3	352	11.0	313 L4	—	BN160MR4	—	—	—	128000	151500	50500	310
4.1	22424	0.9	349	7.5	309 L4	—	BN160MR4	—	—	—	72300	93300	22100	280
4.1	22329	1.8	348	11.0	311 L4	—	BN160MR4	—	—	—	103200	128600	40900	300
4.2	22198	2.4	346	22.0	—	313 R4	BN160MR4	—	—	—	127300	150700	50200	311
4.2	21920	1.8	341	22.0	—	311 R4	BN160MR4	—	—	—	102700	127900	40600	301
4.3	21465	1.3	334	15.0	—	310 R4	BN160MR4	—	—	—	86300	108600	40300	291
4.5	20662	1.9	322	22.0	—	311 R4	BN160MR4	—	—	—	100900	125600	39800	301
4.7	19834	2.2	309	22.0	—	313 R4	BN160MR4	—	—	—	123100	145700	48300	311
4.7	19589	1.2	305	15.0	—	310 R4	BN160MR4	—	—	—	84000	105600	39100	291
4.7	20178	1.9	304	18.0	313 L3	—	BN160MR4	—	—	—	122500	145000	48100	310
4.9	19618	1.2	295	18.0	310 L3	—	BN160MR4	—	—	—	83200	104600	38700	290
4.9	18856	2.0	294	22.0	—	311 R4	BN160MR4	—	—	—	98100	122200	38600	301
4.9	19342	1.4	291	18.0	311 L3	—	BN160MR4	—	—	—	97900	121900	38500	300
5.1	18274	0.9	284	15.0	—	309 R4	BN160MR4	—	—	—	68000	87700	20700	281
5.1	18182	1.4	283	15.0	—	310 R4	BN160MR4	—	—	—	82100	103300	38100	291
5.1	18059	2.7	281	22.0	—	313 R4	BN160MR4	—	—	—	119700	141700	46800	311
5.4	17081	2.2	266	22.0	—	311 R4	BN160MR4	—	—	—	95300	118700	37400	301
5.6	16593	1.4	258	15.0	—	310 R4	BN160MR4	—	—	—	79900	100500	37000	291
5.6	16577	1.0	258	15.0	—	309 R4	BN160MR4	—	—	—	67400	87000	20500	281
5.7	16763	2.7	252	18.0	313 L3	—	BN160MR4	—	—	—	115900	137100	45200	310
5.8	16556	1.1	249	18.0	310 L3	—	BN160MR4	—	—	—	79100	99400	36600	290
5.9	16298	2.1	245	18.0	311 L3	—	BN160MR4	—	—	—	93000	115800	36400	300
6.1	15217	2.7	237	22.0	—	313 R4	BN160MR4	—	—	—	113700	134600	44200	311
6.2	15031	1.6	234	15.0	—	310 R4	BN160MR4	—	—	—	77600	97600	35800	291
6.2	14917	1.1	232	15.0	—	309 R4	BN160MR4	—	—	—	65300	84200	19800	281
6.3	15286	1.4	230	18.0	310 L3	—	BN160MR4	—	—	—	77200	97100	35600	290
6.3	14693	2.4	229	22.0	—	311 R4	BN160MR4	—	—	—	91100	113400	35500	301
7.0	13223	1.7	206	15.0	—	310 R4	BN160MR4	—	—	—	74700	93900	34300	291
7.0	13209	1.1	206	15.0	—	307 R4	BN160MR4	M4LC4	27300	34300	62000	81200	23700	271
7.0	13209	1.5	206	15.0	—	309 R4	BN160MR4	—	—	—	63000	81200	19000	281
7.1	13473	2.5	203	18.0	311 L3	—	BN160MR4	—	—	—	87800	109400	34100	300
7.1	13406	1.6	202	18.0	310 L3	—	BN160MR4	—	—	—	74200	93300	34100	290
7.1	13392	1.2	202	11.0	309 L3	—	BN160MR4	—	—	—	62600	80700	18900	280
7.2	12889	2.7	201	22.0	—	313 R4	BN160MR4	—	—	—	108200	128000	41900	311
7.3	12728	2.7	198	22.0	—	311 R4	BN160MR4	—	—	—	87200	108600	33900	301
7.5	12700	2.5	191	18.0	311 L3	—	BN160MR4	—	—	—	86300	107500	33500	300
7.6	12249	1.1	191	15.0	—	307 R4	BN160MR4	M4LC4	26600	33400	60600	79400	23200	271
7.6	12249	1.4	191	15.0	—	309 R4	BN160MR4	—	—	—	61600	79400	18500	281
7.6	12164	1.9	189	15.0	—	310 R4	BN160MR4	—	—	—	72800	91500	33400	291
7.8	11857	2.7	185	22.0	—	313 R4	BN160MR4	—	—	—	105500	124900	40700	311
7.9	12131	1.2	183	11.0	309 L3	—	BN160MR4	—	—	—	60800	78400	18300	280
7.9	11708	2.7	182	22.0	—	311 R4	BN160MR4	—	—	—	85100	106000	32900	301
8.1	11773	1.6	177	18.0	310 L3	—	BN160MR4	—	—	—	71400	89800	32600	290
8.1	11759	1.0	177	11.0	307 L3	—	BN160MR4	M4LC4	26000	32600	59300	77700	22600	270
8.4	11352	2.9	171	18.0	311 L3	—	BN160MR4	—	—	—	83400	103900	32200	300
8.7	10611	1.5	165	15.0	—	309 R4	BN160MR4	—	—	—	59000	76100	17700	281
8.8	10870	2.0	164	18.0	310 L3	—	BN160MR4	—	—	—	69700	87600	31800	290
8.9	10731	1.0	162	11.0	307 L3	—	BN160MR4	M4LC4	25200	31600	57700	75600	21900	270
8.9	10731	1.5	162	11.0	309 L3	—	BN160MR4	—	—	—	58600	75600	17500	280
8.9	10701	3.0	161	18.0	311 L3	—	BN160MR4	—	—	—	82000	102100	31600	300
9.0	10303	2.1	160	15.0	—	310 R4	BN160MR4	—	—	—	69300	87100	31600	291
9.1	10141	0.9	158	12.0	—	306 R4	BN160MR4	M4LC4	22000	24900	52100	60700	16500	261
9.3	9918	2.7	154	22.0	—	311 R4	BN160MR4	—	—	—	80900	100800	31200	301
9.5	9761	1.9	152	15.0	—	309 R4	BN160MR4	—	—	—	57500	74200	17200	281
9.8	9743	2.8	147	40.0	—	311 R3	BN160MR4	—	—	—	79700	99300	30600	301
9.8	9721	1.4	146	11.0	307 L3	—	BN160MR4	M4LC4	24400	30600	56000	73300	21200	270
10.2	9416	2.2	142	18.0	310 L3	—	BN160MR4	—	—	—	66700	83900	30300	290
10.4	9218	1.2	139	11.0	307 L3	—	BN160MR4	M4LC4	24000	30100	55100	72200	20800	270
10.4	9218	1.7	139	11.0	309 L3	—	BN160MR4	—	—	—	56000	72200	16700	280
10.6	8728	2.4	136	15.0	—	310 R4	BN160MR4	—	—	—	65900	82900	29900	291
11.0	8662	2.4	130	18.0	310 L3	—	BN160MR4	—	—	—	65100	81900	29500	290
11.4	8362	1.6	126	11.0	307 L3	—	BN160MR4	M4LC4	23200	29100	53500	70100	20200	270
11.4	8362	2.0	126	11.0	309 L3	—	BN160MR4	—	—	—	54400	70100	16100	280
11.6	7968	1.4	124	15.0	—	307 R4	BN160MR4	M4LC4	24800	31100	56900	74500	21600	271
11.9	8056	1.0	121	7.5	306 L3	—	BN160MR4	M4LC4	20600	23400	49200	57300	15500	260
12.0	7955	1.1	120	22.0	—	307 R3	BN160MR4	M4LC4	22800	28600	52700	69100	19800	271
12.0	7955	1.6	120	22.0	—	309 R3	BN160MR4	—	—	—	53600	69100	15900	281








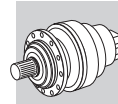
P₁ = 11 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
12.0	7955	2.2	120	22.0	—	310 R3	BN160MR4	—	—	—	63500	79800	28600	291
12.1	7905	2.5	119	18.0	310 L3	—	BN160MR4	—	—	—	63300	79600	28600	290
12.7	7525	1.4	113	11.0	307 L3	—	BN160MR4	M4LC4	22400	28100	51800	67900	19500	270
12.7	7525	2.1	113	11.0	309 L3	—	BN160MR4	—	—	—	52700	67900	15600	280
12.8	7462	1.0	112	7.5	306 L3	—	BN160MR4	M4LC4	20100	22800	48100	56000	15100	260
13.0	7337	2.7	110	18.0	310 L3	—	BN160MR4	—	—	—	61900	77900	27900	290
13.7	6749	2.0	105	15.0	—	307 R4	BN160MR4	M4LC4	24100	30300	55400	72700	21000	271
13.8	6922	1.3	104	7.5	306 L3	—	BN160MR4	M4LC4	19600	22200	47000	54700	14700	260
14.3	6696	2.8	101	18.0	310 L3	—	BN160MR4	—	—	—	60300	75800	27000	290
14.4	6663	1.9	100	11.0	307 L3	—	BN160MR4	M4LC4	21500	27000	50000	65500	18700	270
14.4	6663	2.5	100	11.0	309 L3	—	BN160MR4	—	—	—	50800	65500	15000	280
14.5	6576	1.3	99.0	22.0	—	307 R3	BN160MR4	M4LC4	21400	26900	49800	65200	18600	271
14.5	6576	1.9	99.0	22.0	—	309 R3	BN160MR4	—	—	—	50600	65200	14900	281
14.5	6576	2.5	99.0	22.0	—	310 R3	BN160MR4	—	—	—	59900	75400	26900	291
14.6	6544	1.0	98.5	14.0	—	306 R3	BN160MR4	M4LC4	19200	21800	46200	53800	14400	261
15.5	6179	2.0	93.0	11.0	307 L3	—	BN160MR4	M4LC4	21000	26300	48900	64000	18200	270
15.5	6179	2.4	93.0	11.0	309 L3	—	BN160MR4	—	—	—	49600	64000	14600	280
16.3	5864	1.5	88.3	7.5	306 L3	—	BN160MR4	M4LC4	18500	21000	44700	52100	13900	260
17.0	5629	1.3	84.7	14.0	—	306 R3	BN160MR4	M4LC4	18300	20700	44200	51400	13700	261
17.3	5541	1.8	83.4	22.0	—	307 R3	BN160MR4	M4LC4	20200	25400	47300	62000	17600	271
17.3	5541	2.5	83.4	22.0	—	309 R3	BN160MR4	—	—	—	48000	62000	14100	281
17.3	5541	2.7	83.4	22.0	—	310 R3	BN160MR4	—	—	—	56900	71600	25400	291
17.6	5437	1.3	81.9	7.5	306 L3	—	BN160MR4	M4LC4	18100	20500	43700	50900	13600	260
17.9	5353	1.9	80.6	11.0	307 L3	—	BN160MR4	M4LC4	20000	25100	46800	61300	17400	270
17.9	5353	2.8	80.6	11.0	309 L3	—	BN160MR4	—	—	—	47600	61300	13900	280
18.3	5223	2.7	78.6	22.0	—	310 R3	BN160MR4	—	—	—	55900	70300	24900	291
18.3	5223	2.1	78.6	22.0	—	307 R3	BN160MR4	M4LC4	19800	24900	46500	60900	17200	271
18.6	5131	0.9	77.2	7.5	305 L3	—	BN160MR4	M4LC4	13900	16100	25700	30900	8930	250
18.7	5115	1.6	77.0	7.5	306 L3	—	BN160MR4	M4LC4	17700	20100	42900	50000	13300	260
19.4	4924	2.4	74.1	11.0	307 L3	—	BN160MR4	M4LC4	19400	24400	45600	59800	16900	270
19.8	4842	1.5	72.9	14.0	—	306 R3	BN160MR4	M4LC4	17400	19700	42200	49200	13100	261
19.9	4975	1.1	72.5	13.0	306 L2	—	BN160MR4	M4LC4	17400	19700	42100	49100	13000	260
20.1	4766	2.1	71.8	22.0	—	307 R3	BN160MR4	M4LC4	19200	24100	45200	59200	16700	271
20.1	4766	2.7	71.8	22.0	—	309 R3	BN160MR4	—	—	—	45900	59200	13400	281
20.1	4766	2.7	71.8	22.0	—	310 R3	BN160MR4	—	—	—	54400	68400	24100	291
21.3	4486	1.6	67.5	14.0	—	306 R3	BN160MR4	M4LC4	17000	19200	41300	48000	12700	261
22.1	4333	1.7	65.2	7.5	306 L3	—	BN160MR4	M4LC4	16800	19000	40800	47500	12600	260
22.2	4318	2.7	65.0	22.0	—	310 R3	BN160MR4	—	—	—	52800	66400	23400	291
22.2	4318	2.5	65.0	22.0	—	307 R3	BN160MR4	M4LC4	18600	23300	43900	57500	16200	271
22.2	4318	2.6	65.0	22.0	—	309 R3	BN160MR4	—	—	—	44600	57500	12900	281
22.8	4190	1.0	63.1	14.0	—	305 R3	—	M4LC4	13300	15400	24700	29700	8540	251
22.8	4189	1.1	63.1	7.5	305 L3	—	BN160MR4	M4LC4	13300	15400	24700	29700	8540	250
23.8	4019	2.8	60.5	11.0	307 L3	—	BN160MR4	M4LC4	18200	22800	42900	56300	15800	270
24.8	3859	2.0	58.1	14.0	—	306 R3	BN160MR4	M4LC4	16100	18300	39400	45900	12100	261
25.6	3860	1.3	56.3	13.0	306 L2	—	BN160MR4	M4LC4	16000	18100	39100	45500	12000	260
25.8	3714	2.7	55.9	22.0	—	310 R3	BN160MR4	—	—	—	50500	63500	22200	291
25.8	3714	2.7	55.9	22.0	—	307 R3	BN160MR4	M4LC4	17700	22200	41900	55000	15400	271
25.8	3714	2.7	55.9	22.0	—	309 R3	BN160MR4	—	—	—	42600	55000	12300	281
25.8	3829	0.9	55.8	9.0	305 L2	—	BN160MR4	M4LC4	12500	14400	23300	28100	8010	250
26.6	3599	1.0	54.2	14.0	—	305 R3	—	M4LC4	12700	14600	23600	28400	8120	251
27.0	3548	0.9	53.4	7.5	304 L3	—	BN160MR4	M4LC4	12600	14500	23500	28300	8080	240
27.0	3548	1.1	53.4	7.5	305 L3	—	BN160MR4	M4LC4	12600	14500	23500	28300	8080	250
27.0	3537	2.0	53.2	7.5	306 L3	—	BN160MR4	M4LC4	15700	17800	38400	44700	11800	260
28.6	3339	1.3	50.3	14.0	—	305 R3	—	M4LC4	12300	14200	23100	27800	7920	251
31	3207	2.6	46.7	18.0	307 L2	—	BN160MR4	M4LC4	16700	20900	39700	52100	14500	270
31	3096	1.4	46.6	14.0	—	305 R3	—	M4LC4	12000	13900	22600	27200	7720	251
31	3191	2.0	46.5	13.0	306 L2	—	BN160MR4	M4LC4	15000	17000	36900	43000	11300	260
31	3075	2.4	46.3	14.0	—	306 R3	BN160MR4	M4LC4	15000	16900	36800	42900	11200	261
32	3063	1.2	44.6	9.0	305 L2	—	BN160MR4	M4LC4	11900	13700	22300	26800	7610	250
32	2960	2.7	44.6	22.0	—	310 R3	BN160MR4	—	—	—	47200	59300	20600	291
32	2960	2.7	44.6	22.0	—	307 R3	BN160MR4	M4LC4	16400	20600	39200	51300	14300	271
32	2960	2.7	44.6	22.0	—	309 R3	BN160MR4	—	—	—	39800	51300	11400	281
33	2896	1.1	43.6	7.5	304 L3	—	BN160MR4	M4LC4	11800	13600	22100	26600	7550	240
34	2828	1.3	42.6	14.0	—	305 R3	—	M4LC4	11700	13500	22000	26400	7490	251
37	2605	2.5	39.2	14.0	—	306 R3	BN160MR4	M4LC4	14100	16000	35000	40800	10600	261
37	2638	2.5	38.4	13.0	306 L2	—	BN160MR4	M4LC4	14100	15900	34800	40600	10600	260
38	2635	1.1	38.4	9.0	304 L2	—	BN160MR4	M4LC4	11300	13000	21300	25600	7240	240








P₁ = 11 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
38	2635	1.6	38.4	9.0	305 L2	—	BN160MR4	M4LC4	11300	13000	21300	25600	7240	250
38	2507	2.7	37.7	22.0	—	310 R3	BN160MR4	—	—	—	44900	56400	19500	291
38	2507	2.7	37.7	22.0	—	307 R3	BN160MR4	M4LC4	15500	19500	37300	48800	13500	271
38	2507	2.7	37.7	22.0	—	309 R3	BN160MR4	—	—	—	37900	48800	10800	281
39	2467	1.8	37.1	14.0	—	305 R3	—	M4LC4	11200	12900	21100	25400	7160	251
40	2454	1.5	35.8	9.0	305 L2	—	BN160MR4	M4LC4	11000	12700	20800	25100	7070	250
43	2206	2.6	33.2	14.0	—	306 R3	BN160MR4	M4LC4	13400	15200	33300	38800	10100	261
46	2101	2.7	31.6	22.0	—	307 R3	BN160MR4	M4LC4	14600	18400	35400	46300	12700	271
46	2101	2.7	31.6	22.0	—	309 R3	BN160MR4	—	—	—	35900	46300	10200	281
46	2090	1.8	31.5	14.0	—	305 R3	—	M4LC4	10600	12200	20100	24100	6770	251
47	2111	1.0	30.8	9.0	303 L2	—	BN160MR4	M4LC4	10500	12100	19900	24000	6720	230
47	2111	1.3	30.8	9.0	304 L2	—	BN160MR4	M4LC4	10500	12100	19900	24000	6720	240
47	2111	2.0	30.8	9.0	305 L2	—	BN160MR4	M4LC4	10500	12100	19900	24000	6720	250
54	1814	1.0	26.4	9.0	303 L2	—	BN160MR4	M4LC4	9960	11500	19000	22900	6390	230
54	1814	1.9	26.4	9.0	305 L2	—	BN160MR4	M4LC4	9960	11500	19000	22900	6390	250
56	1706	2.1	25.7	14.0	—	305 R3	—	M4LC4	9870	11400	18900	22700	6330	251
59	1683	1.3	24.5	9.0	303 L2	—	BN160MR4	M4LC4	9720	11200	18600	22400	6230	230
59	1683	1.9	24.5	9.0	304 L2	—	BN160MR4	M4LC4	9720	11200	18600	22400	6230	240
59	1683	2.3	24.5	9.0	305 L2	—	BN160MR4	M4LC4	9720	11200	18600	22400	6230	250
63	1560	1.3	22.7	9.0	303 L2	—	BN160MR4	M4LC4	9470	10900	18200	21900	6080	230
63	1560	1.8	22.7	9.0	304 L2	—	BN160MR4	M4LC4	9470	10900	18200	21900	6080	240
63	1560	2.5	22.7	9.0	305 L2	—	BN160MR4	M4LC4	9470	10900	18200	21900	6080	250
69	1425	1.3	20.8	9.0	303 L2	—	BN160MR4	M4LC4	9190	10600	17700	21300	5900	230
69	1425	2.1	20.8	9.0	304 L2	—	BN160MR4	M4LC4	9190	10600	17700	21300	5900	240
69	1425	2.3	20.8	9.0	305 L2	—	BN160MR4	M4LC4	9190	10600	17700	21300	5900	250
72	1378	0.9	20.1	7.5	301 L2	—	—	M4LC4	2890	2890	8410	9660	1900	222
75	1319	2.6	19.2	18.0	—	306 R2	BN160MR4	M4LC4	11200	12600	28300	33000	8380	261
75	1319	1.2	19.2	18.0	—	303 R2	—	M4LC4	8960	10300	17300	20800	5750	231
75	1319	2.2	19.2	18.0	—	305 R2	—	M4LC4	8960	10300	17300	20800	5750	251
79	1247	1.1	18.2	7.5	301 L2	—	—	M4LC4	2860	2860	8330	9580	1880	222
79	1243	1.6	18.1	9.0	303 L2	—	BN160MR4	M4LC4	8780	10100	17000	20400	5630	230
79	1243	2.4	18.1	9.0	304 L2	—	BN160MR4	M4LC4	8780	10100	17000	20400	5630	240
79	1243	2.9	18.1	9.0	305 L2	—	BN160MR4	M4LC4	8780	10100	17000	20400	5630	250
86	1156	2.1	16.8	18.0	—	304 R2	—	M4LC4	8570	9900	16600	20000	5500	241
91	1090	2.7	15.9	18.0	—	306 R2	BN160MR4	M4LC4	10500	11900	26700	31100	7870	261
91	1090	1.7	15.9	18.0	—	303 R2	—	M4LC4	8410	9710	16300	19700	5390	231
91	1090	2.7	15.9	18.0	—	305 R2	—	M4LC4	8410	9710	16300	19700	5390	251
94	1053	1.6	15.3	9.0	303 L2	—	BN160MR4	M4LC4	8310	9590	16200	19500	5330	230
94	1053	2.7	15.3	9.0	304 L2	—	BN160MR4	M4LC4	8310	9590	16200	19500	5330	240
94	1053	2.9	15.3	9.0	305 L2	—	BN160MR4	M4LC4	8310	9590	16200	19500	5330	250
97	1018	1.3	14.8	7.5	301 L2	—	—	M4LC4	2670	2670	7840	9010	1760	222
98	1013	0.9	14.8	12.0	—	301 R2	—	M4LC4	2610	2610	7670	8810	1710	223
105	938	2.7	13.7	18.0	—	306 R2	BN160MR4	M4LC4	9960	11300	25500	29700	7480	261
105	938	2.1	13.7	18.0	—	303 R2	—	M4LC4	8000	9230	15600	18800	5130	231
105	938	2.7	13.7	18.0	—	304 R2	—	M4LC4	8000	9230	15600	18800	5130	241
105	938	2.7	13.7	18.0	—	305 R2	—	M4LC4	8000	9230	15600	18800	5130	251
115	860	1.9	12.5	9.0	303 L2	—	BN160MR4	M4LC4	7770	8970	15200	18300	4980	230
119	831	1.5	12.1	7.5	301 L2	—	—	M4LC4	2500	2500	7380	8480	1640	222
122	812	1.4	11.8	12.0	—	301 R2	—	M4LC4	2420	2420	7180	8240	1590	223
132	747	2.6	10.9	18.0	—	306 R2	BN160MR4	M4LC4	9230	10500	23900	27800	6930	261
132	747	2.5	10.9	18.0	—	303 R2	—	M4LC4	7410	8560	14600	17600	4760	231
132	747	2.6	10.9	18.0	—	304 R2	—	M4LC4	7410	8560	14600	17600	4760	241
132	747	2.6	10.9	18.0	—	305 R2	—	M4LC4	7410	8560	14600	17600	4760	251
149	684	1.1	9.67	11.0	303 L1	—	BN160MR4	M4LC4	7120	8220	14100	16900	4570	230
156	633	2.7	9.23	18.0	—	306 R2	BN160MR4	M4LC4	8730	9900	22700	26400	6560	261
156	633	2.7	9.23	18.0	—	303 R2	—	M4LC4	7010	8100	13900	16700	4500	231
156	633	2.7	9.23	18.0	—	304 R2	—	M4LC4	7010	8100	13900	16700	4500	241
156	633	2.7	9.23	18.0	—	305 R2	—	M4LC4	7010	8100	13900	16700	4500	251
160	637	1.0	9.00	7.5	301 L1	—	—	M4LC4	2260	2260	6750	7750	1490	222
165	600	1.0	8.74	11.0	—	300 R2	—	M4LC4	6550	7560	13000	15700	4200	215
165	600	1.8	8.74	7.5	—	301 R2	—	M4LC4	2100	2100	6310	7250	1380	223
192	531	2.3	7.50	11.0	303 L1	—	BN160MR4	M4LC4	6400	7390	12800	15400	4100	230
200	510	1.5	7.20	7.5	301 L1	—	—	M4LC4	2050	2050	6180	7100	1350	222
202	490	1.2	7.13	12.0	—	300 R2	—	M4LC4	2090	2090	6300	7230	1380	215
202	490	2.1	7.13	12.0	—	301 R2	—	M4LC4	2050	2050	6170	7080	1350	223
250	409	1.2	5.77	7.5	300 L1	—	—	M4LC4	1950	1950	5910	6790	1280	214
250	409	2.3	5.77	7.5	301 L1	—	—	M4LC4	1950	1950	5910	6790	1280	222

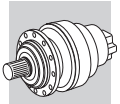


P₁ = 11 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
338	302	1.6	4.26	7.5	300 L1	—	—	M4LC4	1760	1760	5390	6200	1160	214
338	302	2.9	4.26	7.5	301 L1	—	—	M4LC4	1760	1760	5390	6200	1160	222
414	246	1.9	3.48	7.5	300 L1	—	—	M4LC4	1610	1610	4970	5710	1060	214

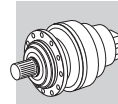
P₁ = 15 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
0.77	163217	1.0	1893	18.0	317 L4	—	BN160L4	—	—	—	442000	470000	150000	348
0.92	137526	1.2	1595	18.0	317 L4	—	BN160L4	—	—	—	442000	470000	150000	348
1.1	113688	1.5	1318	18.0	317 L4	—	BN160L4	—	—	—	434300	462400	147000	348
1.2	106719	1.1	1237	18.0	316 L4	—	BN160L4	—	—	—	331400	368600	144000	340
1.3	97796	1.7	1134	18.0	317 L4	—	BN160L4	—	—	—	415100	442000	139800	348
1.3	95233	1.0	1104	18.0	315 L4	—	BN160L4	—	—	—	192600	226200	83200	330
1.4	89921	1.1	1043	18.0	315 L4	—	BN160L4	—	—	—	189400	222300	81600	330
1.4	89921	1.5	1043	18.0	316 L4	—	BN160L4	—	—	—	314800	350100	136000	340
1.4	89477	0.9	1038	15.0	314 L4	—	BN160L4	—	—	—	189100	222000	81400	320
1.4	89028	2.0	1032	18.0	317 L4	—	BN160L4	—	—	—	403600	429700	135500	348
1.5	82213	1.8	953	50.0	—	317 R4	BN160L4	—	—	—	394100	419600	132000	349
1.6	80193	1.2	930	18.0	315 L4	—	BN160L4	—	—	—	183000	214800	78500	330
1.6	79847	0.9	926	15.0	314 L4	—	BN160L4	—	—	—	182700	214500	78400	320
1.6	78419	1.0	909	40.0	—	315 R4	BN160L4	—	—	—	181700	213400	77900	331
1.6	77931	2.1	904	18.0	317 L4	—	BN160L4	—	—	—	387800	412900	129600	348
1.7	74334	1.4	862	18.0	315 L4	—	BN160L4	—	—	—	178800	210000	76600	330
1.7	74334	1.7	862	18.0	316 L4	—	BN160L4	—	—	—	297400	330700	127600	340
1.7	73967	1.1	858	15.0	314 L4	—	BN160L4	—	—	—	178600	209700	76400	320
1.8	70068	1.9	812	18.0	316 L4	—	BN160L4	—	—	—	292100	324900	125100	340
1.8	69272	2.4	803	50.0	—	317 R4	BN160L4	—	—	—	374300	398500	124600	349
1.8	68302	2.7	792	18.0	317 L4	—	BN160L4	—	—	—	372700	396900	124100	348
1.9	67457	1.3	782	40.0	—	315 R4	BN160L4	—	—	—	173700	203900	74100	331
2.0	63904	1.6	741	18.0	315 L4	—	BN160L4	—	—	—	170900	200700	72800	330
2.0	63904	2.0	741	18.0	316 L4	—	BN160L4	—	—	—	284200	316100	121400	340
2.0	63628	1.3	738	15.0	314 L4	—	BN160L4	—	—	—	170700	200400	72700	320
2.0	62634	2.1	726	18.0	316 L4	—	BN160L4	—	—	—	282500	314100	120500	340
2.0	62012	2.9	719	18.0	317 L4	—	BN160L4	—	—	—	362100	385500	120100	348
2.1	59039	2.2	685	18.0	316 L4	—	BN160L4	—	—	—	277500	308600	118200	340
2.2	58368	2.8	677	50.0	—	317 R4	BN160L4	—	—	—	355600	378600	117700	349
2.2	57923	1.7	672	18.0	315 L4	—	BN160L4	—	—	—	165900	194800	70500	330
2.2	57637	1.4	668	15.0	314 L4	—	BN160L4	—	—	—	165700	194500	70300	320
2.2	56839	1.6	659	40.0	—	315 R4	BN160L4	—	—	—	165000	193700	70000	331
2.3	55766	0.9	647	22.0	—	313 R4	BN160L4	—	—	—	150500	178100	60400	311
2.3	54583	1.0	633	11.0	313 L4	—	BN160L4	—	—	—	152700	180700	61400	310
2.3	53978	2.9	626	50.0	—	317 R4	BN160L4	—	—	—	347300	369800	114700	349
2.3	53845	2.3	624	18.0	316 L4	—	BN160L4	—	—	—	270000	300300	114600	340
2.3	53755	1.9	623	40.0	—	315 R4	BN160L4	—	—	—	162300	190500	68700	331
2.3	53755	2.1	623	45.0	—	316 R4	BN160L4	—	—	—	269800	300100	114500	341
2.4	52929	1.1	614	22.0	—	314 R4	BN160L4	—	—	—	161500	189600	68400	321
2.5	50955	2.0	591	18.0	315 L4	—	BN160L4	—	—	—	159700	187500	67500	330
2.5	50955	2.4	591	18.0	316 L4	—	BN160L4	—	—	—	265500	295300	112500	340
2.5	50703	1.6	588	15.0	314 L4	—	BN160L4	—	—	—	159500	187200	67400	320
2.6	48805	2.5	566	18.0	316 L4	—	BN160L4	—	—	—	262100	291500	110900	340
2.6	48619	1.1	564	11.0	313 L4	—	BN160L4	—	—	—	147500	174500	59100	310
2.6	47793	1.7	554	15.0	314 L4	—	BN160L4	—	—	—	156600	183900	66100	320
2.7	46100	1.1	535	22.0	—	313 R4	BN160L4	—	—	—	145100	171800	58000	311
2.7	46004	2.2	533	18.0	315 L4	—	BN160L4	—	—	—	154900	181800	65200	330
2.7	46004	2.6	533	18.0	316 L4	—	BN160L4	—	—	—	257500	286400	108700	340
2.8	45531	1.5	528	22.0	—	314 R4	BN160L4	—	—	—	154400	181300	65000	321
2.8	45293	2.2	525	40.0	—	315 R4	BN160L4	—	—	—	154100	181000	64900	331
2.8	45293	2.6	525	45.0	—	316 R4	BN160L4	—	—	—	256300	285000	108200	341
2.8	44298	1.1	514	11.0	313 L4	—	BN160L4	—	—	—	143400	169700	57300	310
2.9	44164	1.0	512	11.0	311 L4	—	BN160L4	—	—	—	116000	144500	46500	300
2.9	42783	1.2	496	22.0	—	313 R4	BN160L4	—	—	—	141900	168000	56600	311
3.0	42650	1.9	495	15.0	314 L4	—	BN160L4	—	—	—	151400	177700	63600	320
3.0	41983	2.4	487	18.0	315 L4	—	BN160L4	—	—	—	150700	176900	63300	330








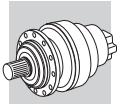
P₁ = 15 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
3.0	41983	2.8	487	18.0	316 L4	—	BN160L4	—	—	—	250500	278600	105500	340
3.2	39509	2.0	458	15.0	314 L4	—	BN160L4	—	—	—	148000	173700	62000	320
3.2	38957	1.4	452	11.0	313 L4	—	BN160L4	—	—	—	138000	163300	54900	310
3.2	38843	1.2	450	22.0	—	313 R4	BN160L4	—	—	—	137900	163200	54800	311
3.3	38364	1.8	445	22.0	—	314 R4	BN160L4	—	—	—	146700	172200	61400	321
3.3	38030	2.6	441	18.0	315 L4	—	BN160L4	—	—	—	146300	171700	61200	330
3.3	37764	1.0	438	22.0	—	311 R4	BN160L4	—	—	—	110600	137800	44100	301
3.5	36282	2.2	421	22.0	—	314 R4	BN160L4	—	—	—	144200	169300	60300	321
3.5	35597	1.1	413	22.0	—	311 R4	BN160L4	—	—	—	108700	135400	43300	301
3.6	35388	1.2	410	11.0	311 L4	—	BN160L4	—	—	—	108500	135200	43200	300
3.6	35294	2.8	409	40.0	—	315 R4	BN160L4	—	—	—	143000	167900	59700	331
3.7	33985	1.6	394	11.0	313 L4	—	BN160L4	—	—	—	132500	156800	52400	310
3.8	33467	2.3	388	15.0	314 L4	—	BN160L4	—	—	—	140800	165300	58700	320
3.8	33414	1.4	387	22.0	—	313 R4	BN160L4	—	—	—	131800	156000	52100	311
4.1	30571	2.6	354	22.0	—	314 R4	BN160L4	—	—	—	137000	160800	56900	321
4.1	30356	1.7	352	11.0	313 L4	—	BN160L4	—	—	—	128000	151500	50500	310
4.2	29976	1.3	348	11.0	311 L4	—	BN160L4	—	—	—	103200	128600	40900	300
4.2	29801	1.8	346	22.0	—	313 R4	BN160L4	—	—	—	127300	150700	50200	311
4.3	29427	1.3	341	22.0	—	311 R4	BN160L4	—	—	—	102700	127900	40600	301
4.4	28817	1.0	334	15.0	—	310 R4	BN160L4	—	—	—	84600	106300	39400	291
4.5	27738	1.4	322	22.0	—	311 R4	BN160L4	—	—	—	100900	125600	39800	301
4.6	27083	2.9	314	15.0	314 L4	—	BN160L4	—	—	—	132100	155100	54700	320
4.7	26627	1.7	309	22.0	—	313 R4	BN160L4	—	—	—	123100	145700	48300	311
4.8	27088	1.4	304	18.0	313 L3	—	BN160L4	—	—	—	122500	145000	48100	310
5.0	25313	1.5	294	22.0	—	311 R4	BN160L4	—	—	—	98100	122200	38600	301
5.0	25966	1.0	291	18.0	311 L3	—	BN160L4	—	—	—	97900	121900	38500	300
5.2	24409	1.1	283	15.0	—	310 R4	BN160L4	—	—	—	82100	103300	38100	291
5.2	24244	2.0	281	22.0	—	313 R4	BN160L4	—	—	—	119700	141700	46800	311
5.5	22930	1.6	266	22.0	—	311 R4	BN160L4	—	—	—	95300	118700	37400	301
5.7	22276	1.0	258	15.0	—	310 R4	BN160L4	—	—	—	79900	100500	37000	291
5.8	22504	2.0	252	18.0	313 L3	—	BN160L4	—	—	—	115900	137100	45200	310
6.0	21879	1.6	245	18.0	311 L3	—	BN160L4	—	—	—	93000	115800	36400	300
6.1	21360	2.4	240	25.0	314 L3	—	BN160L4	—	—	—	119300	140100	48800	320
6.2	20428	2.0	237	22.0	—	313 R4	BN160L4	—	—	—	113700	134600	44200	311
6.2	20178	1.2	234	15.0	—	310 R4	BN160L4	—	—	—	77600	97600	35800	291
6.3	20522	1.0	230	18.0	310 L3	—	BN160L4	—	—	—	77200	97100	35600	290
6.4	19725	1.8	229	22.0	—	311 R4	BN160L4	—	—	—	91100	113400	35500	301
7.0	18603	2.4	209	18.0	313 L3	—	BN160L4	—	—	—	109400	129500	42400	310
7.1	17751	1.2	206	15.0	—	310 R4	BN160L4	—	—	—	74700	93900	34300	291
7.1	17733	1.1	206	15.0	—	309 R4	BN160L4	—	—	—	63000	81200	19000	281
7.2	18087	1.8	203	18.0	311 L3	—	BN160L4	—	—	—	87800	109400	34100	300
7.2	17997	1.2	202	18.0	310 L3	—	BN160L4	—	—	—	74200	93300	34100	290
7.2	17979	0.9	202	11.0	309 L3	—	BN160L4	—	—	—	61300	79100	18400	280
7.3	17304	2.0	201	22.0	—	313 R4	BN160L4	—	—	—	108200	128000	41900	311
7.4	17087	2.0	198	22.0	—	311 R4	BN160L4	—	—	—	87200	108600	33900	301
7.5	17265	2.8	194	18.0	313 L3	—	BN160L4	—	—	—	107000	126700	41400	310
7.6	17049	1.9	191	18.0	311 L3	—	BN160L4	—	—	—	86300	107500	33500	300
7.7	16444	1.1	191	15.0	—	309 R4	BN160L4	—	—	—	61600	79400	18500	281
7.7	16329	1.4	189	15.0	—	310 R4	BN160L4	—	—	—	72800	91500	33400	291
7.9	15918	2.0	185	22.0	—	313 R4	BN160L4	—	—	—	105500	124900	40700	311
8.0	15718	2.0	182	22.0	—	311 R4	BN160L4	—	—	—	85100	106000	32900	301
8.0	16231	2.4	182	18.0	313 L3	—	BN160L4	—	—	—	105100	124300	40500	310
8.2	15805	1.2	177	18.0	310 L3	—	BN160L4	—	—	—	71400	89800	32600	290
8.3	15675	2.9	176	18.0	313 L3	—	BN160L4	—	—	—	104000	123000	40100	310
8.5	15240	2.1	171	18.0	311 L3	—	BN160L4	—	—	—	83400	103900	32200	300
8.8	14245	1.1	165	15.0	—	309 R4	BN160L4	—	—	—	59000	76100	17700	281
8.9	14593	1.5	164	18.0	310 L3	—	BN160L4	—	—	—	69700	87600	31800	290
9.0	14406	1.1	162	11.0	309 L3	—	BN160L4	—	—	—	58600	75600	17500	280
9.1	14365	2.2	161	18.0	311 L3	—	BN160L4	—	—	—	82000	102100	31600	300
9.1	13832	1.6	160	15.0	—	310 R4	BN160L4	—	—	—	69300	87100	31600	291
9.5	13314	2.0	154	22.0	—	311 R4	BN160L4	—	—	—	80900	100800	31200	301
9.5	13645	2.9	153	40.0	—	313 R3	BN160L4	—	—	—	99700	118000	38200	311
9.6	13104	1.4	152	15.0	—	309 R4	BN160L4	—	—	—	57500	74200	17200	281
9.9	13109	2.4	147	18.0	311 L3	—	BN160L4	—	—	—	79700	99300	30700	300
10.0	13079	2.1	147	40.0	—	311 R3	BN160L4	—	—	—	79700	99300	30600	301
10.0	13050	1.0	146	11.0	307 L3	—	BN160L4	—	24400	30600	56000	73300	21200	270
10.3	12641	1.6	142	18.0	310 L3	—	BN160L4	—	—	—	66700	83900	30300	290








P₁ = 15 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
10.5	12375	1.3	139	11.0	309 L3	—	BN160L4	—	—	—	56000	72200	16700	280
10.7	11716	1.8	136	15.0	—	310 R4	BN160L4	—	—	—	65900	82900	29900	291
11.0	11875	2.5	133	18.0	311 L3	—	BN160L4	—	—	—	77400	96400	29700	300
11.2	11629	1.8	130	18.0	310 L3	—	BN160L4	—	—	—	65100	81900	29500	290
11.6	11225	1.2	126	11.0	307 L3	—	BN160L4	—	23200	29100	53500	70100	20200	270
11.6	11225	1.5	126	11.0	309 L3	—	BN160L4	—	—	—	54400	70100	16100	280
11.6	11194	2.6	126	18.0	311 L3	—	BN160L4	—	—	—	76100	94700	29100	300
11.8	10697	1.0	124	15.0	—	307 R4	BN160L4	—	24800	31100	56900	74500	21600	271
11.8	11021	2.7	124	40.0	—	311 R3	BN160L4	—	—	—	75700	94300	28900	301
12.2	10679	1.2	120	22.0	—	309 R3	BN160L4	—	—	—	53600	69100	15900	281
12.2	10679	1.6	120	22.0	—	310 R3	BN160L4	—	—	—	63500	79800	28600	291
12.3	10612	1.9	119	18.0	310 L3	—	BN160L4	—	—	—	63300	79600	28600	290
12.7	10215	2.8	115	18.0	311 L3	—	BN160L4	—	—	—	74000	92200	28200	300
12.9	10102	1.0	113	11.0	307 L3	—	BN160L4	—	22400	28100	51800	67900	19500	270
12.9	10102	1.5	113	11.0	309 L3	—	BN160L4	—	—	—	52700	67900	15600	280
13.2	9850	2.0	110	18.0	310 L3	—	BN160L4	—	—	—	61900	77900	27900	290
13.9	9061	1.5	105	15.0	—	307 R4	BN160L4	—	24100	30300	55400	72700	21000	271
14.0	9293	1.0	104	7.5	306 L3	—	BN160L4	—	19200	21700	46000	53600	14400	260
14.5	8989	2.1	101	18.0	310 L3	—	BN160L4	—	—	—	60300	75800	27000	290
14.6	8945	1.4	100	11.0	307 L3	—	BN160L4	—	21500	27000	50000	65500	18700	270
14.6	8945	1.8	100	11.0	309 L3	—	BN160L4	—	—	—	50800	65500	15000	280
14.7	8828	1.0	99.0	22.0	—	307 R3	BN160L4	—	21400	26900	49800	65200	18600	271
14.7	8828	1.4	99.0	22.0	—	309 R3	BN160L4	—	—	—	50600	65200	14900	281
14.7	8828	1.9	99.0	22.0	—	310 R3	BN160L4	—	—	—	59900	75400	26900	291
15.7	8295	1.5	93.0	11.0	307 L3	—	BN160L4	—	21000	26300	48900	64000	18200	270
15.7	8295	1.8	93.0	11.0	309 L3	—	BN160L4	—	—	—	49600	64000	14600	280
16.0	8143	2.3	91.3	18.0	310 L3	—	BN160L4	—	—	—	58500	73600	26200	290
16.5	7872	1.1	88.3	7.5	306 L3	—	BN160L4	—	18100	20500	43800	51000	13600	260
17.2	7557	1.0	84.7	14.0	—	306 R3	BN160L4	—	18300	20700	44200	51400	13700	261
17.5	7438	1.4	83.4	22.0	—	307 R3	BN160L4	—	20200	25400	47300	62000	17600	271
17.5	7438	1.9	83.4	22.0	—	309 R3	BN160L4	—	—	—	48000	62000	14100	281
17.5	7438	2.0	83.4	22.0	—	310 R3	BN160L4	—	—	—	56900	71600	25400	291
17.8	7300	0.9	81.9	7.5	306 L3	—	BN160L4	—	17700	20000	42800	49900	13300	260
18.1	7186	1.4	80.6	11.0	307 L3	—	BN160L4	—	20000	25100	46800	61300	17400	270
18.1	7186	2.1	80.6	11.0	309 L3	—	BN160L4	—	—	—	47600	61300	13900	280
18.2	7163	2.4	80.3	18.0	310 L3	—	BN160L4	—	—	—	56300	70800	25100	290
18.6	7012	2.0	78.6	22.0	—	310 R3	BN160L4	—	—	—	55900	70300	24900	291
18.6	7012	1.6	78.6	22.0	—	307 R3	BN160L4	—	19800	24900	46500	60900	17200	271
19.0	6867	1.2	77.0	7.5	306 L3	—	BN160L4	—	17700	20100	42900	50000	13300	260
19.7	6610	1.8	74.1	11.0	307 L3	—	BN160L4	—	19400	24400	45600	59800	16900	270
19.7	6610	2.3	74.1	11.0	309 L3	—	BN160L4	—	—	—	46400	59800	13500	280
19.8	6590	2.7	73.9	18.0	310 L3	—	BN160L4	—	—	—	54900	69000	24400	290
20.0	6500	1.1	72.9	14.0	—	306 R3	BN160L4	—	17400	19700	42200	49200	13100	261
20.3	6399	1.6	71.8	22.0	—	307 R3	BN160L4	—	19200	24100	45200	59200	16700	271
20.3	6399	2.0	71.8	22.0	—	309 R3	BN160L4	—	—	—	45900	59200	13400	281
20.3	6399	2.0	71.8	22.0	—	310 R3	BN160L4	—	—	—	54400	68400	24100	291
21.6	6022	1.2	67.5	14.0	—	306 R3	BN160L4	—	17000	19200	41300	48000	12700	261
22.4	5817	1.3	65.2	7.5	306 L3	—	BN160L4	—	16800	19000	40800	47500	12600	260
22.5	5796	2.0	65.0	22.0	—	310 R3	BN160L4	—	—	—	52800	66400	23400	291
22.5	5796	1.9	65.0	22.0	—	307 R3	BN160L4	—	18600	23300	43900	57500	16200	271
22.5	5796	1.9	65.0	22.0	—	309 R3	BN160L4	—	—	—	44600	57500	12900	281
23.3	5582	3.0	62.6	18.0	310 L3	—	BN160L4	—	—	—	52200	65700	23100	290
24.1	5396	2.1	60.5	11.0	307 L3	—	BN160L4	—	18200	22800	42900	56300	15800	270
24.1	5396	2.6	60.5	11.0	309 L3	—	BN160L4	—	—	—	43600	56300	12600	280
25.1	5180	1.5	58.1	14.0	—	306 R3	BN160L4	—	16100	18300	39400	45900	12100	261
26.0	5182	1.0	56.3	13.0	306 L2	—	BN160L4	M5SB4	16000	18100	39100	45500	12000	260
26.1	4986	2.0	55.9	22.0	—	310 R3	BN160L4	—	—	—	50500	63500	22200	291
26.1	4986	2.0	55.9	22.0	—	307 R3	BN160L4	—	17700	22200	41900	55000	15400	271
26.1	4986	2.0	55.9	22.0	—	309 R3	BN160L4	—	—	—	42600	55000	12300	281
27.4	4748	1.5	53.2	7.5	306 L3	—	BN160L4	—	15700	17800	38400	44700	11800	260
28.5	4571	2.3	51.3	11.0	307 L3	—	BN160L4	—	17200	21600	40900	53500	14900	270
28.5	4571	2.9	51.3	11.0	309 L3	—	BN160L4	—	—	—	41500	53500	12000	280
31	4305	1.9	46.7	18.0	307 L2	—	BN160L4	M5SB4	16700	20900	39700	52100	14500	270
31	4305	2.9	46.7	18.0	309 L2	—	BN160L4	—	—	—	40400	52100	11600	280
31	4284	1.5	46.5	13.0	306 L2	—	BN160L4	M5SB4	15000	17000	36900	43000	11300	260
32	4128	1.8	46.3	14.0	—	306 R3	BN160L4	—	15000	16900	36800	42900	11200	261
33	3973	2.0	44.6	22.0	—	310 R3	BN160L4	—	—	—	47200	59300	20600	291

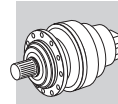


P₁ = 15 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]						
									MC	MZ	HC/PC	HZ/PZ	FZ		
33	3973	2.0	44.6	22.0	—	307 R3	BN160L4	—	—	16400	20600	39200	51300	14300	271
33	3973	2.0	44.6	22.0	—	309 R3	BN160L4	—	—	—	—	39800	51300	11400	281
37	3497	1.9	39.2	14.0	—	306 R3	BN160L4	—	—	14100	16000	35000	40800	10600	261
38	3559	2.3	38.6	18.0	307 L2	—	BN160L4	M5SB4	—	15600	19600	37500	49200	13600	270
38	3541	1.8	38.4	13.0	306 L2	—	BN160L4	M5SB4	—	14100	15900	34800	40600	10600	260
38	3537	1.2	38.4	9.0	305 L2	—	BN160L4	—	—	11300	13000	21300	25600	7240	250
39	3366	2.0	37.7	22.0	—	310 R3	BN160L4	—	—	—	—	44900	56400	19500	291
39	3366	2.0	37.7	22.0	—	307 R3	BN160L4	—	—	—	—	37900	48800	10800	271
39	3366	2.0	37.7	22.0	—	309 R3	BN160L4	—	—	15500	19500	37300	48800	13500	281
41	3295	1.1	35.8	9.0	305 L2	—	BN160L4	—	—	11000	12700	20800	25100	7070	250
44	2962	2.0	33.2	14.0	—	306 R3	BN160L4	—	—	13400	15200	33300	38800	10100	261
44	3046	2.3	33.1	13.0	306 L2	—	BN160L4	M5SB4	—	13400	15100	33300	38800	10000	260
46	2821	2.0	31.6	22.0	—	307 R3	BN160L4	—	—	14600	18400	35400	46300	12700	271
46	2821	2.0	31.6	22.0	—	309 R3	BN160L4	—	—	—	—	35900	46300	10200	281
47	2834	1.0	30.8	9.0	304 L2	—	BN160L4	—	—	10500	12100	19900	24000	6720	240
47	2834	1.5	30.8	9.0	305 L2	—	BN160L4	—	—	10500	12100	19900	24000	6720	250
51	2620	2.6	28.4	13.0	306 L2	—	BN160L4	M5SB4	—	12700	14400	31800	37100	9550	260
55	2435	1.4	26.4	9.0	305 L2	—	BN160L4	—	—	9960	11500	19000	22900	6390	250
55	2427	2.6	26.4	13.0	306 L2	—	BN160L4	M5SB4	—	12400	14000	31100	36200	9310	260
60	2259	1.0	24.5	9.0	303 L2	—	BN160L4	—	—	9490	11000	18200	21900	6090	230
60	2259	1.4	24.5	9.0	304 L2	—	BN160L4	—	—	9720	11200	18600	22400	6230	240
60	2259	1.7	24.5	9.0	305 L2	—	BN160L4	—	—	9720	11200	18600	22400	6230	250
64	2095	1.0	22.7	9.0	303 L2	—	BN160L4	—	—	9470	10900	18200	21900	6080	230
64	2095	1.3	22.7	9.0	304 L2	—	BN160L4	—	—	9470	10900	18200	21900	6080	240
64	2095	1.9	22.7	9.0	305 L2	—	BN160L4	—	—	9470	10900	18200	21900	6080	250
64	2088	2.9	22.7	13.0	306 L2	—	BN160L4	M5SB4	—	11800	13400	29700	34600	8850	260
70	1913	1.0	20.8	9.0	303 L2	—	BN160L4	—	—	8980	10400	17300	20900	5760	230
70	1913	1.5	20.8	9.0	304 L2	—	BN160L4	—	—	9190	10600	17700	21300	5900	240
70	1913	1.7	20.8	9.0	305 L2	—	BN160L4	—	—	9190	10600	17700	21300	5900	250
76	1771	2.0	19.2	18.0	—	306 R2	BN160L4	—	—	11200	12600	28300	33000	8380	261
81	1669	1.2	18.1	9.0	303 L2	—	BN160L4	—	—	8780	10100	17000	20400	5630	230
81	1669	1.8	18.1	9.0	304 L2	—	BN160L4	—	—	8780	10100	17000	20400	5630	240
81	1669	2.2	18.1	9.0	305 L2	—	BN160L4	—	—	8780	10100	17000	20400	5630	250
92	1464	2.0	15.9	18.0	—	306 R2	BN160L4	—	—	10500	11900	26700	31100	7870	261
95	1414	1.2	15.3	9.0	303 L2	—	BN160L4	—	—	8310	9590	16200	19500	5330	230
95	1414	2.0	15.3	9.0	304 L2	—	BN160L4	—	—	8310	9590	16200	19500	5330	240
95	1414	2.2	15.3	9.0	305 L2	—	BN160L4	—	—	8310	9590	16200	19500	5330	250
107	1259	2.0	13.7	18.0	—	306 R2	BN160L4	—	—	9960	11300	25500	29700	7480	261
117	1154	1.4	12.5	9.0	303 L2	—	BN160L4	—	—	7770	8970	15200	18300	4980	230
117	1154	2.3	12.5	9.0	304 L2	—	BN160L4	—	—	7770	8970	15200	18300	4980	240
117	1154	2.5	12.5	9.0	305 L2	—	BN160L4	—	—	7770	8970	15200	18300	4980	250
134	1003	2.0	10.9	18.0	—	306 R2	BN160L4	—	—	9230	10500	23900	27800	6930	261
158	850	2.0	9.23	18.0	—	306 R2	BN160L4	—	—	8730	9900	22700	26400	6560	261
195	713	1.7	7.50	11.0	303 L1	—	BN160L4	M5SB4	—	6550	7560	13000	15700	4200	230
222	625	3.0	6.57	12.0	304 L1	—	BN160L4	M5SB4	—	6260	7230	12500	15100	4020	240
235	589	2.4	6.20	11.0	303 L1	—	BN160L4	M5SB4	—	6140	7090	12300	14800	3940	230
274	507	2.9	5.33	11.0	303 L1	—	BN160L4	M5SB4	—	5840	6750	11800	14200	3750	230

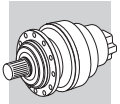
P₁ = 18.5 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]						
									MC	MZ	HC/PC	HZ/PZ	FZ		
0.92	169802	1.0	1595	18.0	317 L4	—	BN180M4	—	—	—	—	442000	470000	150000	348
1.1	147863	2.4	1389	30.0	319 L4	—	BN180M4	—	—	—	—	636100	700800	199500	364
1.1	140370	1.2	1318	18.0	317 L4	—	BN180M4	—	—	—	—	434300	462400	147000	348
1.2	131765	0.9	1237	18.0	316 L4	—	BN180M4	—	—	—	—	331400	368600	144000	340
1.2	127194	2.8	1195	30.0	319 L4	—	BN180M4	—	—	—	—	608000	669900	189700	364
1.3	120748	1.4	1134	18.0	317 L4	—	BN180M4	—	—	—	—	415100	442000	139800	348
1.4	112771	2.4	1059	22.0	318 L4	—	BN180M4	—	—	—	—	503000	520700	182200	356
1.4	111025	0.9	1043	18.0	315 L4	—	BN180M4	—	—	—	—	189400	222300	81600	330
1.4	111025	1.2	1043	18.0	316 L4	—	BN180M4	—	—	—	—	314800	350100	136000	340
1.4	109922	1.6	1032	18.0	317 L4	—	BN180M4	—	—	—	—	403600	429700	135500	348
1.5	101508	1.4	953	50.0	—	317 R4	BN180M4	—	—	—	—	394100	419600	132000	349
1.6	99014	0.9	930	18.0	315 L4	—	BN180M4	—	—	—	—	183000	214800	78500	330








P₁ = 18.5 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
1.6	97007	2.8	911	22.0	318 L4	—	BN180M4	—	—	—	487700	497700	173300	356
1.6	96221	1.7	904	18.0	317 L4	—	BN180M4	—	—	—	387800	412900	129600	348
1.7	91780	1.1	862	18.0	315 L4	—	BN180M4	—	—	—	178800	210000	76600	330
1.7	91780	1.4	862	18.0	316 L4	—	BN180M4	—	—	—	297400	330700	127600	340
1.8	86513	1.5	812	18.0	316 L4	—	BN180M4	—	—	—	292100	324900	125100	340
1.8	85530	1.9	803	50.0	—	317 R4	BN180M4	—	—	—	374300	398500	124600	349
1.8	84332	2.2	792	18.0	317 L4	—	BN180M4	—	—	—	372700	396900	124100	348
1.9	83289	1.1	782	40.0	—	315 R4	BN180M4	—	—	—	173700	203900	74100	331
2.0	78901	1.3	741	18.0	315 L4	—	BN180M4	—	—	—	170900	200700	72800	330
2.0	78901	1.6	741	18.0	316 L4	—	BN180M4	—	—	—	284200	316100	121400	340
2.0	78561	1.0	738	15.0	314 L4	—	BN180M4	—	—	—	170700	200400	72700	320
2.0	77333	1.7	726	18.0	316 L4	—	BN180M4	—	—	—	282500	314100	120500	340
2.0	76565	2.3	719	18.0	317 L4	—	BN180M4	—	—	—	362100	385500	120100	348
2.1	72895	1.8	685	18.0	316 L4	—	BN180M4	—	—	—	277500	308600	118200	340
2.2	72067	2.3	677	50.0	—	317 R4	BN180M4	—	—	—	355600	378600	117700	349
2.2	71517	1.4	672	18.0	315 L4	—	BN180M4	—	—	—	165900	194800	70500	330
2.2	71164	1.1	668	15.0	314 L4	—	BN180M4	—	—	—	165700	194500	70300	320
2.2	70179	1.3	659	40.0	—	315 R4	BN180M4	—	—	—	165000	193700	70000	331
2.3	66647	2.3	626	50.0	—	317 R4	BN180M4	—	—	—	347300	369800	114700	349
2.3	66482	1.9	624	18.0	316 L4	—	BN180M4	—	—	—	270000	300300	114600	340
2.3	66371	1.5	623	40.0	—	315 R4	BN180M4	—	—	—	162300	190500	68700	331
2.3	66371	1.7	623	45.0	—	316 R4	BN180M4	—	—	—	269800	300100	114500	341
2.4	65863	2.7	619	18.0	317 L4	—	BN180M4	—	—	—	346100	368500	114200	348
2.5	62914	1.6	591	18.0	315 L4	—	BN180M4	—	—	—	159700	187500	67500	330
2.5	62914	1.9	591	18.0	316 L4	—	BN180M4	—	—	—	265500	295300	112500	340
2.5	62603	1.3	588	15.0	314 L4	—	BN180M4	—	—	—	159500	187200	67400	320
2.6	60260	2.1	566	18.0	316 L4	—	BN180M4	—	—	—	262100	291500	110900	340
2.6	59010	1.4	554	15.0	314 L4	—	BN180M4	—	—	—	156600	183900	66100	320
2.6	58741	3.0	552	18.0	317 L4	—	BN180M4	—	—	—	334400	356100	110000	348
2.7	56801	1.8	533	18.0	315 L4	—	BN180M4	—	—	—	154900	181800	65200	330
2.7	56801	2.1	533	18.0	316 L4	—	BN180M4	—	—	—	257500	286400	108700	340
2.8	55924	1.8	525	40.0	—	315 R4	BN180M4	—	—	—	154100	181000	64900	331
2.8	55924	2.1	525	45.0	—	316 R4	BN180M4	—	—	—	256300	285000	108200	341
2.8	55368	3.0	520	50.0	—	317 R4	BN180M4	—	—	—	328500	349800	107800	349
3.0	52659	1.5	495	15.0	314 L4	—	BN180M4	—	—	—	151400	177700	63600	320
3.0	51836	1.9	487	18.0	315 L4	—	BN180M4	—	—	—	150700	176900	63300	330
3.0	51836	2.3	487	18.0	316 L4	—	BN180M4	—	—	—	250500	278600	105500	340
3.2	48782	1.6	458	15.0	314 L4	—	BN180M4	—	—	—	148000	173700	62000	320
3.3	47121	2.5	443	45.0	—	316 R4	BN180M4	—	—	—	243500	270800	102200	341
3.3	46956	2.1	441	18.0	315 L4	—	BN180M4	—	—	—	146300	171700	61200	330
3.3	46956	2.5	441	18.0	316 L4	—	BN180M4	—	—	—	243200	270500	102100	340
3.6	43577	2.3	409	40.0	—	315 R4	BN180M4	—	—	—	143000	167900	59700	331
3.6	43577	2.6	409	45.0	—	316 R4	BN180M4	—	—	—	237800	264500	99600	341
3.8	41321	1.9	388	15.0	314 L4	—	BN180M4	—	—	—	140800	165300	58700	320
4.0	39353	2.5	370	18.0	315 L4	—	BN180M4	—	—	—	138700	162900	57700	330
4.0	39353	2.8	370	18.0	316 L4	—	BN180M4	—	—	—	230600	256500	96200	340
4.2	36717	2.6	345	40.0	—	315 R4	BN180M4	—	—	—	135900	159500	56400	331
4.2	36717	2.9	345	45.0	—	316 R4	BN180M4	—	—	—	225900	251200	94000	341
4.6	33439	2.3	314	15.0	314 L4	—	BN180M4	—	—	—	132100	155100	54700	320
4.8	33446	1.2	304	18.0	313 L3	—	BN180M4	—	—	—	122500	145000	48100	310
5.4	28611	2.9	269	40.0	—	315 R4	BN180M4	—	—	—	126100	148000	51900	331
5.8	27786	1.6	252	50.0	313 L3	—	BN180M4	—	—	—	267500	284800	85800	310
6.0	27014	1.3	245	18.0	311 L3	—	BN180M4	—	—	—	93000	115800	36400	300
6.1	26503	2.5	241	30.0	315 L3	—	BN180M4	—	—	—	122000	143200	50000	330
6.1	26373	2.0	240	25.0	314 L3	—	BN180M4	—	—	—	121800	143000	50000	320
7.0	22970	2.0	209	18.0	313 L3	—	BN180M4	—	—	—	109400	129500	42400	310
7.1	22686	2.8	206	25.0	314 L3	—	BN180M4	—	—	—	116400	136700	47500	320
7.2	22332	1.5	203	18.0	311 L3	—	BN180M4	—	—	—	87800	109400	34100	300
7.2	22221	1.0	202	18.0	310 L3	—	BN180M4	—	—	—	74200	93300	34100	290
7.5	21317	2.2	194	18.0	313 L3	—	BN180M4	—	—	—	107000	126700	41400	310
7.6	21050	1.5	191	18.0	311 L3	—	BN180M4	—	—	—	86300	107500	33500	300
8.0	20040	1.9	182	18.0	313 L3	—	BN180M4	—	—	—	105100	124300	40500	310
8.2	19515	0.9	177	18.0	310 L3	—	BN180M4	—	—	—	71400	89800	32600	290
8.3	19354	2.3	176	18.0	313 L3	—	BN180M4	—	—	—	104000	123000	40100	310
8.5	18816	1.7	171	18.0	311 L3	—	BN180M4	—	—	—	83400	103900	32200	300
8.9	18018	1.2	164	18.0	310 L3	—	BN180M4	—	—	—	69700	87600	31800	290
9.0	17962	2.6	163	18.0	313 L3	—	BN180M4	—	—	—	101700	120300	39100	310

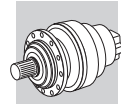


P₁ = 18.5 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
9.1	17736	1.8	161	18.0	311 L3	—	BN180M4	—	—	—	82000	102100	31600	300
9.5	16847	2.3	153	40.0	—	313 R3	BN180M4	—	—	—	99700	118000	38200	311
9.7	16649	2.7	151	18.0	313 L3	—	BN180M4	—	—	—	99400	117600	38100	310
9.9	16186	2.0	147	18.0	311 L3	—	BN180M4	—	—	—	79700	99300	30700	300
10.0	16149	1.7	147	40.0	—	311 R3	BN180M4	—	—	—	79700	99300	30600	301
10.2	15745	2.8	143	18.0	313 L3	—	BN180M4	—	—	—	97700	115700	37400	310
10.3	15608	1.3	142	18.0	310 L3	—	BN180M4	—	—	—	66700	83900	30300	290
10.8	14848	3.0	135	18.0	313 L3	—	BN180M4	—	—	—	96000	113600	36700	310
11.0	14662	2.0	133	18.0	311 L3	—	BN180M4	—	—	—	77400	96400	29700	300
11.2	14358	1.4	130	18.0	310 L3	—	BN180M4	—	—	—	65100	81900	29500	290
11.5	13996	2.9	127	40.0	—	313 R3	BN180M4	—	—	—	94300	111600	36000	311
11.6	13821	2.1	126	18.0	311 L3	—	BN180M4	—	—	—	76100	94700	29100	300
11.8	13607	2.2	124	40.0	—	311 R3	BN180M4	—	—	—	75700	94300	28900	301
12.3	13103	1.5	119	18.0	310 L3	—	BN180M4	—	—	—	63300	79600	28600	290
12.7	12613	2.3	115	18.0	311 L3	—	BN180M4	—	—	—	74000	92200	28200	300
13.2	12162	1.6	110	18.0	310 L3	—	BN180M4	—	—	—	61900	77900	27900	290
14.0	11465	2.5	104	40.0	—	311 R3	BN180M4	—	—	—	71900	89600	27300	301
14.1	11425	2.4	104	18.0	311 L3	—	BN180M4	—	—	—	71800	89500	27300	300
14.5	11099	1.7	101	18.0	310 L3	—	BN180M4	—	—	—	60300	75800	27000	290
15.2	10603	2.6	96.3	40.0	—	311 R3	BN180M4	—	—	—	70200	87500	26600	301
16.0	10054	1.9	91.3	18.0	310 L3	—	BN180M4	—	—	—	58500	73600	26200	290
16.4	9828	2.7	89.3	18.0	311 L3	—	BN180M4	—	—	—	68100	84900	25700	300
18.0	8934	2.9	81.1	40.0	—	311 R3	BN180M4	—	—	—	66700	83100	25200	301
18.2	8845	2.0	80.3	18.0	310 L3	—	BN180M4	—	—	—	56300	70800	25100	290
18.9	8514	3.0	77.3	18.0	311 L3	—	BN180M4	—	—	—	65800	81900	24800	300
19.8	8136	2.2	73.9	18.0	310 L3	—	BN180M4	—	—	—	54900	69000	24400	290
23.3	6892	2.4	62.6	18.0	310 L3	—	BN180M4	—	—	—	52200	65700	23100	290
27.5	5838	2.7	53.0	18.0	310 L3	—	BN180M4	—	—	—	49700	62500	21800	290
31	5315	1.6	46.7	18.0	307 L2	—	BN180M4	M5LA4	16700	20900	39700	52100	14500	270
31	5315	2.4	46.7	18.0	309 L2	—	BN180M4	—	—	—	40400	52100	11600	280
31	5315	2.7	46.7	22.0	310 L2	—	BN180M4	—	—	—	47800	60200	20900	290
31	5289	1.2	46.5	13.0	306 L2	—	BN180M4	M5LA4	15000	17000	36900	43000	11300	260
38	4394	1.9	38.6	18.0	307 L2	—	BN180M4	M5LA4	15600	19600	37500	49200	13600	270
38	4394	2.8	38.6	18.0	309 L2	—	BN180M4	—	—	—	38100	49200	10900	280
38	4372	1.5	38.4	13.0	306 L2	—	BN180M4	M5LA4	14100	15900	34800	40600	10600	260
44	3761	1.8	33.1	13.0	306 L2	—	BN180M4	M5LA4	13400	15100	33300	38800	10000	260
45	3702	2.5	32.6	18.0	307 L2	—	BN180M4	M5LA4	14800	18500	35700	46700	12800	270
48	3490	2.7	30.7	18.0	307 L2	—	BN180M4	M5LA4	14500	18200	35000	45900	12600	270
51	3235	2.1	28.4	13.0	306 L2	—	BN180M4	M5LA4	12700	14400	31800	37100	9550	260
52	3185	2.9	28.0	18.0	307 L2	—	BN180M4	M5LA4	14100	17600	34100	44700	12200	270
55	2997	2.1	26.4	13.0	306 L2	—	BN180M4	M5LA4	12400	14000	31100	36200	9310	260
62	2677	3.0	23.5	35.0	—	307 R2	BN180M4	M5LA4	13300	16600	32400	42400	11500	271
64	2578	2.4	22.7	13.0	306 L2	—	BN180M4	M5LA4	11800	13400	29700	34600	8850	260
81	2054	2.9	18.1	13.0	306 L2	—	BN180M4	M5LA4	10700	12100	27200	31700	8020	260
95	1740	2.9	15.3	13.0	306 L2	—	BN180M4	M5LA4	10300	11700	26400	30800	7770	260
195	880	1.4	7.50	11.0	303 L1	—	BN180M4	M5LA4	6550	7560	13000	15700	4200	230
195	880	2.6	7.50	13.0	305 L1	—	BN180M4	M5LA4	6550	7560	13000	15700	4200	250
222	771	2.4	6.57	12.0	304 L1	—	BN180M4	M5LA4	6260	7230	12500	15100	4020	240
235	728	1.9	6.20	11.0	303 L1	—	BN180M4	M5LA4	6140	7090	12300	14800	3940	230
274	626	2.4	5.33	11.0	303 L1	—	BN180M4	M5LA4	5840	6750	11800	14200	3750	230
344	499	2.9	4.25	11.0	303 L1	—	BN180M4	M5LA4	5420	6250	11000	13200	3480	230

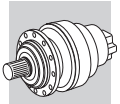
P₁ = 22 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
1.1	175970	2.0	1389	30.0	319 L4	—	BN180L4	—	—	—	636100	700800	199500	364
1.1	167052	1.0	1318	18.0	317 L4	—	BN180L4	—	—	—	425400	452900	143700	348
1.2	151372	2.3	1195	30.0	319 L4	—	BN180L4	—	—	—	608000	669900	189700	364
1.3	143700	1.2	1134	18.0	317 L4	—	BN180L4	—	—	—	415100	442000	139800	348
1.4	134206	2.0	1059	22.0	318 L4	—	BN180L4	—	—	—	503000	520700	182200	356
1.4	132128	1.0	1043	18.0	316 L4	—	BN180L4	—	—	—	314800	350100	136000	340
1.4	130816	1.4	1032	18.0	317 L4	—	BN180L4	—	—	—	403600	429700	135500	348
1.5	127545	2.7	1007	30.0	319 L4	—	BN180L4	—	—	—	577600	636300	179200	364








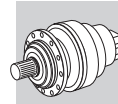
P₁ = 22 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
					MC	MZ	HC/PC	HZ/PZ	FZ					
1.5	120803	1.2	953	50.0	—	317 R4	BN180L4	—	—	—	394100	419600	132000	349
1.6	115536	2.9	912	30.0	319 L4	—	BN180L4	—	—	—	560700	617700	173400	364
1.6	115446	2.3	911	22.0	318 L4	—	BN180L4	—	—	—	487700	497700	173300	356
1.6	114851	2.9	906	115.0	—	319 R4 (C)	BN180L4	—	—	—	559700	616600	173000	365
1.6	114511	1.5	904	18.0	317 L4	—	BN180L4	—	—	—	387800	412900	129600	348
1.7	109226	0.9	862	18.0	315 L4	—	BN180L4	—	—	—	178800	210000	76600	330
1.7	109226	1.2	862	18.0	316 L4	—	BN180L4	—	—	—	297400	330700	127600	340
1.8	102957	1.3	812	18.0	316 L4	—	BN180L4	—	—	—	292100	324900	125100	340
1.8	101788	1.6	803	50.0	—	317 R4	BN180L4	—	—	—	374300	398500	124600	349
1.8	100362	1.9	792	18.0	317 L4	—	BN180L4	—	—	—	372700	396900	124100	348
1.9	99121	0.9	782	40.0	—	315 R4	BN180L4	—	—	—	173700	203900	74100	331
1.9	97274	2.8	768	22.0	318 L4	—	BN180L4	—	—	—	463300	472800	163700	356
2.0	93899	1.1	741	18.0	315 L4	—	BN180L4	—	—	—	170900	200700	72800	330
2.0	93899	1.3	741	18.0	316 L4	—	BN180L4	—	—	—	284200	316100	121400	340
2.0	92033	1.4	726	18.0	316 L4	—	BN180L4	—	—	—	282500	314100	120500	340
2.0	91996	2.9	726	22.0	318 L4	—	BN180L4	—	—	—	455600	464900	160700	356
2.0	91119	2.0	719	18.0	317 L4	—	BN180L4	—	—	—	362100	385500	120100	348
2.1	86751	1.5	685	18.0	316 L4	—	BN180L4	—	—	—	277500	308600	118200	340
2.2	85766	1.9	677	50.0	—	317 R4	BN180L4	—	—	—	355600	378600	117700	349
2.2	85111	1.2	672	18.0	315 L4	—	BN180L4	—	—	—	165900	194800	70500	330
2.2	84691	1.0	668	15.0	314 L4	—	BN180L4	—	—	—	165700	194500	70300	320
2.2	83518	1.1	659	40.0	—	315 R4	BN180L4	—	—	—	165000	193700	70000	331
2.3	79315	2.0	626	50.0	—	317 R4	BN180L4	—	—	—	347300	369800	114700	349
2.3	79119	1.6	624	18.0	316 L4	—	BN180L4	—	—	—	270000	300300	114600	340
2.3	78987	1.3	623	40.0	—	315 R4	BN180L4	—	—	—	162300	190500	68700	331
2.3	78987	1.5	623	45.0	—	316 R4	BN180L4	—	—	—	269800	300100	114500	341
2.4	78382	2.3	619	18.0	317 L4	—	BN180L4	—	—	—	346100	368500	114200	348
2.5	74873	1.3	591	18.0	315 L4	—	BN180L4	—	—	—	159700	187500	67500	330
2.5	74873	1.6	591	18.0	316 L4	—	BN180L4	—	—	—	265500	295300	112500	340
2.5	74503	1.1	588	15.0	314 L4	—	BN180L4	—	—	—	159500	187200	67400	320
2.6	71714	1.7	566	18.0	316 L4	—	BN180L4	—	—	—	262100	291500	110900	340
2.6	70227	1.1	554	15.0	314 L4	—	BN180L4	—	—	—	156600	183900	66100	320
2.6	69906	2.5	552	18.0	317 L4	—	BN180L4	—	—	—	334400	356100	110000	348
2.7	67598	1.5	533	18.0	315 L4	—	BN180L4	—	—	—	154900	181800	65200	330
2.7	67598	1.8	533	18.0	316 L4	—	BN180L4	—	—	—	257500	286400	108700	340
2.8	66554	1.5	525	40.0	—	315 R4	BN180L4	—	—	—	154100	181000	64900	331
2.8	66554	1.8	525	45.0	—	316 R4	BN180L4	—	—	—	256300	285000	108200	341
2.8	65893	2.5	520	50.0	—	317 R4	BN180L4	—	—	—	328500	349800	107800	349
3.0	62669	1.3	495	15.0	314 L4	—	BN180L4	—	—	—	151400	177700	63600	320
3.0	62461	2.7	493	18.0	317 L4	—	BN180L4	—	—	—	323300	344200	105900	348
3.0	61690	1.6	487	18.0	315 L4	—	BN180L4	—	—	—	150700	176900	63300	330
3.0	61690	1.9	487	18.0	316 L4	—	BN180L4	—	—	—	250500	278600	105500	340
3.2	58054	1.4	458	15.0	314 L4	—	BN180L4	—	—	—	148000	173700	62000	320
3.3	56872	2.9	449	18.0	317 L4	—	BN180L4	—	—	—	314300	334700	102700	348
3.3	56078	2.1	443	45.0	—	316 R4	BN180L4	—	—	—	243500	270800	102200	341
3.3	55881	1.8	441	18.0	315 L4	—	BN180L4	—	—	—	146300	171700	61200	330
3.3	55881	2.1	441	18.0	316 L4	—	BN180L4	—	—	—	243200	270500	102100	340
3.3	55521	2.8	438	50.0	—	317 R4	BN180L4	—	—	—	312100	332300	101800	349
3.6	51860	1.9	409	40.0	—	315 R4	BN180L4	—	—	—	143000	167900	59700	331
3.6	51860	2.2	409	45.0	—	316 R4	BN180L4	—	—	—	237800	264500	99600	341
3.7	50553	2.9	399	50.0	—	317 R4	BN180L4	—	—	—	303400	323100	98700	349
3.8	49175	1.6	388	15.0	314 L4	—	BN180L4	—	—	—	140800	165300	58700	320
4.0	46834	2.1	370	18.0	315 L4	—	BN180L4	—	—	—	138700	162900	57700	330
4.0	46834	2.3	370	18.0	316 L4	—	BN180L4	—	—	—	230600	256500	96200	340
4.2	43697	2.2	345	40.0	—	315 R4	BN180L4	—	—	—	135900	159500	56400	331
4.2	43697	2.5	345	45.0	—	316 R4	BN180L4	—	—	—	225900	251200	94000	341
4.3	42595	2.9	336	50.0	—	317 R4	BN180L4	—	—	—	288200	306900	93200	349
4.4	41640	2.5	329	18.0	316 L4	—	BN180L4	—	—	—	222700	247600	92500	340
4.6	39795	2.0	314	15.0	314 L4	—	BN180L4	—	—	—	132100	155100	54700	320
4.8	39803	1.0	304	18.0	313 L3	—	BN180L4	—	—	—	122500	145000	48100	310
4.8	38306	2.5	302	18.0	315 L4	—	BN180L4	—	—	—	130600	153300	54000	330
4.8	38306	2.7	302	18.0	316 L4	—	BN180L4	—	—	—	217100	241500	90000	340
5.1	36622	2.9	289	45.0	—	316 R4	BN180L4	—	—	—	214200	238300	88700	341
5.4	34049	2.4	269	40.0	—	315 R4	BN180L4	—	—	—	126100	148000	51900	331
5.4	34049	2.9	269	45.0	—	316 R4	BN180L4	—	—	—	209600	233100	86500	341
5.6	33191	2.9	262	50.0	—	317 R4	BN180L4	—	—	—	267500	284800	85800	349
5.8	33067	1.4	252	18.0	313 L3	—	BN180L4	—	—	—	115900	137100	45200	310








P₁ = 22 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
6.0	32149	1.1	245	18.0	311 L3	—	BN180L4	—	—	—	93000	115800	36400	300
6.1	31541	2.1	241	30.0	315 L3	—	BN180L4	—	—	—	122000	143200	50000	330
6.1	31385	1.7	240	25.0	314 L3	—	BN180L4	—	—	—	121800	143000	50000	320
6.5	28537	2.7	225	40.0	—	315 R4	BN180L4	—	—	—	119600	140400	48900	331
6.7	27817	2.9	220	50.0	—	317 R4	BN180L4	—	—	—	253600	270100	80900	349
7.0	27336	1.6	209	18.0	313 L3	—	BN180L4	—	—	—	109400	129500	42400	310
7.1	27132	2.9	207	30.0	315 L3	—	BN180L4	—	—	—	116600	136900	47600	330
7.1	26998	2.4	206	25.0	314 L3	—	BN180L4	—	—	—	116400	136700	47500	320
7.2	26576	1.3	203	18.0	311 L3	—	BN180L4	—	—	—	87800	109400	34100	300
7.5	25369	1.9	194	18.0	313 L3	—	BN180L4	—	—	—	107000	126700	41400	310
7.6	25051	1.3	191	18.0	311 L3	—	BN180L4	—	—	—	86300	107500	33500	300
8.0	23849	1.6	182	18.0	313 L3	—	BN180L4	—	—	—	105100	124300	40500	310
8.3	23033	2.0	176	18.0	313 L3	—	BN180L4	—	—	—	104000	123000	40100	310
8.4	22749	2.8	174	25.0	314 L3	—	BN180L4	—	—	—	110600	129800	44900	320
8.5	22393	1.5	171	18.0	311 L3	—	BN180L4	—	—	—	83400	103900	32200	300
8.9	21514	3.0	164	25.0	314 L3	—	BN180L4	—	—	—	108700	127700	44100	320
8.9	21443	1.0	164	18.0	310 L3	—	BN180L4	—	—	—	69700	87600	31800	290
9.0	21376	2.2	163	18.0	313 L3	—	BN180L4	—	—	—	101700	120300	39100	310
9.1	21108	1.5	161	18.0	311 L3	—	BN180L4	—	—	—	82000	102100	31600	300
9.3	20586	2.5	157	55.0	—	314 R3 (C)	BN180L4	—	—	—	107300	126000	43400	321
9.5	20049	1.9	153	40.0	—	313 R3	BN180L4	—	—	—	99700	118000	38200	311
9.7	19813	2.3	151	18.0	313 L3	—	BN180L4	—	—	—	99400	117600	38100	310
9.9	19263	1.7	147	18.0	311 L3	—	BN180L4	—	—	—	79700	99300	30700	300
10.0	19219	1.4	147	40.0	—	311 R3	BN180L4	—	—	—	79700	99300	30600	301
10.2	18738	2.4	143	18.0	313 L3	—	BN180L4	—	—	—	97700	115700	37400	310
10.3	18575	1.1	142	18.0	310 L3	—	BN180L4	—	—	—	66700	83900	30300	290
10.8	17671	2.5	135	18.0	313 L3	—	BN180L4	—	—	—	96000	113600	36700	310
11.0	17449	1.7	133	18.0	311 L3	—	BN180L4	—	—	—	77400	96400	29700	300
11.2	17087	1.2	130	18.0	310 L3	—	BN180L4	—	—	—	65100	81900	29500	290
11.5	16656	2.4	127	40.0	—	313 R3	BN180L4	—	—	—	94300	111600	36000	311
11.6	16448	1.8	126	18.0	311 L3	—	BN180L4	—	—	—	76100	94700	29100	300
11.8	16194	1.9	124	40.0	—	311 R3	BN180L4	—	—	—	75700	94300	28900	301
12.1	15789	2.7	120	18.0	313 L3	—	BN180L4	—	—	—	92800	109900	35300	310
12.3	15594	1.3	119	18.0	310 L3	—	BN180L4	—	—	—	63300	79600	28600	290
12.7	15010	1.9	115	18.0	311 L3	—	BN180L4	—	—	—	74000	92200	28200	300
13.2	14474	1.4	110	18.0	310 L3	—	BN180L4	—	—	—	61900	77900	27900	290
13.3	14376	2.9	110	18.0	313 L3	—	BN180L4	—	—	—	90300	106800	34200	310
13.6	14034	2.8	107	40.0	—	313 R3	BN180L4	—	—	—	89600	106000	34000	311
14.0	13645	2.1	104	40.0	—	311 R3	BN180L4	—	—	—	71900	89600	27300	301
14.1	13597	2.0	104	18.0	311 L3	—	BN180L4	—	—	—	71800	89500	27300	300
14.5	13209	1.4	101	18.0	310 L3	—	BN180L4	—	—	—	60300	75800	27000	290
15.0	12779	2.9	97.5	40.0	—	313 R3	BN180L4	—	—	—	87100	103100	32900	311
15.2	12618	2.2	96.3	40.0	—	311 R3	BN180L4	—	—	—	70200	87500	26600	301
16.0	11965	1.6	91.3	18.0	310 L3	—	BN180L4	—	—	—	58500	73600	26200	290
16.4	11696	2.3	89.3	18.0	311 L3	—	BN180L4	—	—	—	68100	84900	25700	300
17.8	10767	2.9	82.2	40.0	—	313 R3	BN180L4	—	—	—	82800	97900	31100	311
18.0	10632	2.4	81.1	40.0	—	311 R3	BN180L4	—	—	—	66700	83100	25200	301
18.2	10526	1.7	80.3	18.0	310 L3	—	BN180L4	—	—	—	56300	70800	25100	290
18.9	10132	2.5	77.3	18.0	311 L3	—	BN180L4	—	—	—	65800	81900	24800	300
19.8	9683	1.8	73.9	18.0	310 L3	—	BN180L4	—	—	—	54900	69000	24400	290
20.5	9320	2.7	71.1	18.0	311 L3	—	BN180L4	—	—	—	64100	79900	24100	300
20.9	9165	2.9	69.9	40.0	—	313 R3	BN180L4	—	—	—	78900	93300	29500	311
21.5	8911	2.7	68.0	40.0	—	311 R3	BN180L4	—	—	—	63300	78800	23700	301
22.8	8390	2.9	64.0	40.0	—	313 R3	BN180L4	—	—	—	76800	90900	28600	311
23.1	8285	2.9	63.2	40.0	—	311 R3	BN180L4	—	—	—	61900	77100	23100	301
23.3	8202	2.0	62.6	18.0	310 L3	—	BN180L4	—	—	—	52200	65700	23100	290
27.2	7032	2.9	53.7	40.0	—	313 R3	BN180L4	—	—	—	72800	86200	27000	311
27.4	6977	1.0	53.2	7.5	306 L3	—	BN180L4	—	15300	17300	37600	43800	11500	260
27.5	6948	2.3	53.0	18.0	310 L3	—	BN180L4	—	—	—	49700	62500	21800	290
27.6	6943	2.9	53.0	40.0	—	311 R3	BN180L4	—	—	—	58700	73100	21800	301
31	6325	1.3	46.7	18.0	307 L2	—	BN180L4	—	16700	20900	39700	52100	14500	270
31	6325	2.0	46.7	18.0	309 L2	—	BN180L4	—	—	—	40400	52100	11600	280
31	6325	2.2	46.7	22.0	310 L2	—	BN180L4	—	—	—	47800	60200	20900	290
31	6294	1.0	46.5	13.0	306 L2	—	BN180L4	—	15000	17000	36900	43000	11300	260
38	5229	1.6	38.6	18.0	307 L2	—	BN180L4	—	15600	19600	37500	49200	13600	270
38	5229	2.4	38.6	18.0	309 L2	—	BN180L4	—	—	—	38100	49200	10900	280
38	5229	2.6	38.6	22.0	310 L2	—	BN180L4	—	—	—	45200	56800	19600	290

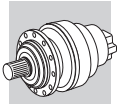


P₁ = 22 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]						
									MC	MZ	HC/PC	HZ/PZ	FZ		
38	5203	1.2	38.4	13.0	306 L2	—	BN180L4	—	—	14100	15900	34800	40600	10600	260
44	4476	1.5	33.1	13.0	306 L2	—	BN180L4	—	—	13400	15100	33300	38800	10000	260
45	4406	2.1	32.6	18.0	307 L2	—	BN180L4	—	—	14800	18500	35700	46700	12800	270
45	4406	3.0	32.6	18.0	309 L2	—	BN180L4	—	—	—	—	36200	46700	10300	280
48	4153	2.3	30.7	18.0	307 L2	—	BN180L4	—	—	14500	18200	35000	45900	12600	270
51	3850	1.7	28.4	22.0	306 L2	—	BN180L4	—	—	—	—	42200	53000	18200	260
52	3790	2.4	28.0	13.0	307 L2	—	BN180L4	—	—	12700	14400	31800	37100	9550	270
55	3567	1.8	26.4	13.0	306 L2	—	BN180L4	—	—	12400	14000	31100	36200	9310	260
58	3433	2.6	25.4	18.0	307 L2	—	BN180L4	—	—	13600	17100	33100	43400	11800	270
62	3186	2.9	23.5	35.0	—	309 R2	BN180L4	—	—	—	—	32900	42400	9220	281
62	3186	2.5	23.5	35.0	—	307 R2	BN180L4	—	—	13300	16600	32400	42400	11500	271
64	3068	2.0	22.7	13.0	306 L2	—	BN180L4	—	—	11800	13400	29700	34600	8850	260
67	2953	2.9	21.8	18.0	307 L2	—	BN180L4	—	—	12900	16200	31600	41400	11200	270
74	2685	2.9	19.8	35.0	—	309 R2	BN180L4	—	—	—	—	31200	40300	8710	281
74	2685	2.9	19.8	35.0	—	307 R2	BN180L4	—	—	12500	15700	30700	40300	10900	271
81	2445	2.4	18.1	13.0	306 L2	—	BN180L4	—	—	10900	12400	27800	32300	8210	260
94	2092	2.9	15.5	35.0	—	309 R2	BN180L4	—	—	—	—	29000	37400	8020	281
94	2092	2.9	15.5	35.0	—	307 R2	BN180L4	—	—	11500	14500	28500	37400	10000	271
95	2071	2.4	15.3	13.0	306 L2	—	BN180L4	—	—	10300	11700	26400	30800	7770	260
113	1754	2.7	13.0	13.0	306 L2	—	BN180L4	—	—	9780	11100	25100	29300	7350	260
113	1753	2.9	13.0	35.0	—	309 R2	BN180L4	—	—	—	—	27500	35400	7560	281
113	1753	2.9	13.0	35.0	—	307 R2	BN180L4	—	—	10900	13600	27000	35400	9450	271
195	1048	1.2	7.50	11.0	303 L1	—	BN180L4	—	—	6550	7560	13000	15700	4200	230
195	1048	2.2	7.50	13.0	305 L1	—	BN180L4	—	—	6550	7560	13000	15700	4200	250
222	918	2.0	6.57	12.0	304 L1	—	BN180L4	—	—	6260	7230	12500	15100	4020	240
235	866	1.6	6.20	11.0	303 L1	—	BN180L4	—	—	6140	7090	12300	14800	3940	230
274	745	2.0	5.33	11.0	303 L1	—	BN180L4	—	—	5840	6750	11800	14200	3750	230
274	745	2.7	5.33	12.0	304 L1	—	BN180L4	—	—	5840	6750	11800	14200	3750	240
344	594	2.4	4.25	11.0	303 L1	—	BN180L4	—	—	5420	6250	11000	13200	3480	230
406	503	2.7	3.60	11.0	303 L1	—	BN180L4	—	—	5010	5780	10300	12300	3210	230

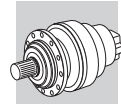
P₁ = 30 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]						
									MC	MZ	HC/PC	HZ/PZ	FZ		
1.1	239514	1.5	1389	30.0	319 L4	—	BN200L4	—	—	—	—	636100	700800	199500	364
1.2	206034	1.7	1195	30.0	319 L4	—	BN200L4	—	—	—	—	608000	669900	189700	364
1.3	193443	2.7	1122	35.0	321 L4	—	BN200L4	—	—	—	—	731900	867900	1114500	372
1.4	182670	1.5	1059	22.0	318 L4	—	BN200L4	—	—	—	—	503000	520700	182200	356
1.4	178055	1.0	1032	18.0	317 L4	—	BN200L4	—	—	—	—	403600	429700	135500	348
1.5	173603	2.0	1007	30.0	319 L4	—	BN200L4	—	—	—	—	577600	636300	179200	364
1.6	157257	2.1	912	30.0	319 L4	—	BN200L4	—	—	—	—	560700	617700	173400	364
1.6	157135	1.7	911	22.0	318 L4	—	BN200L4	—	—	—	—	487700	497700	173300	356
1.6	156325	2.1	906	115.0	—	319 R4 (C)	BN200L4	—	—	—	—	559700	616600	173000	365
1.6	155863	1.1	904	18.0	317 L4	—	BN200L4	—	—	—	—	387800	412900	129600	348
1.7	146694	2.5	850	30.0	319 L4	—	BN200L4	—	—	—	—	549100	605000	169400	364
1.8	140136	0.9	812	18.0	316 L4	—	BN200L4	—	—	—	—	286100	318200	122300	340
1.8	138545	1.2	803	50.0	—	317 R4	BN200L4	—	—	—	—	374300	398500	124600	349
1.8	136603	1.4	792	18.0	317 L4	—	BN200L4	—	—	—	—	372700	396900	124100	348
1.9	134473	2.5	780	115.0	—	319 R4 (C)	BN200L4	—	—	—	—	535000	589400	164500	365
1.9	132401	2.0	768	22.0	318 L4	—	BN200L4	—	—	—	—	463300	472800	163700	356
2.0	127807	1.0	741	18.0	316 L4	—	BN200L4	—	—	—	—	284200	316100	121400	340
2.0	125267	1.0	726	18.0	316 L4	—	BN200L4	—	—	—	—	282500	314100	120500	340
2.0	125217	2.1	726	22.0	318 L4	—	BN200L4	—	—	—	—	455600	464900	160700	356
2.0	124023	1.4	719	18.0	317 L4	—	BN200L4	—	—	—	—	362100	385500	120100	348
2.0	123603	2.9	717	30.0	319 L4	—	BN200L4	—	—	—	—	521600	574700	160000	364
2.1	119224	2.2	691	110.0	—	318 R4 (C)	BN200L4	—	—	—	—	448900	458100	158100	357
2.1	118078	1.1	685	18.0	316 L4	—	BN200L4	—	—	—	—	277500	308600	118200	340
2.2	116737	1.4	677	50.0	—	317 R4	BN200L4	—	—	—	—	355600	378600	117700	349
2.2	113306	2.8	657	115.0	—	319 R4 (C)	BN200L4	—	—	—	—	508200	559900	155400	365
2.2	112919	2.8	655	95.0	—	319 R4 (B)	BN200L4	—	—	—	—	507700	559300	155200	365
2.3	111560	2.4	647	22.0	318 L4	—	BN200L4	—	—	—	—	440100	449100	154600	356
2.3	107957	1.4	626	50.0	—	317 R4	BN200L4	—	—	—	—	347300	369800	114700	349
2.3	107690	1.2	624	18.0	316 L4	—	BN200L4	—	—	—	—	270000	300300	114600	340



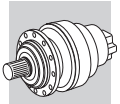
P₁ = 30 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
2.3	107510	0.9	623	40.0	—	315 R4	BN200L4	—	—	—	162300	190500	68700	331
2.3	107510	1.1	623	45.0	—	316 R4	BN200L4	—	—	—	269800	300100	114500	341
2.4	106687	1.7	619	18.0	317 L4	—	BN200L4	—	—	—	346100	368500	114200	348
2.4	105507	2.5	612	22.0	318 L4	—	BN200L4	—	—	—	432800	441700	151800	356
2.5	102558	2.6	595	110.0	—	318 R4 (C)	BN200L4	—	—	—	429100	437900	150300	357
2.5	101910	1.0	591	18.0	315 L4	—	BN200L4	—	—	—	159700	187500	67500	330
2.5	101910	1.2	591	18.0	316 L4	—	BN200L4	—	—	—	265500	295300	112500	340
2.6	97611	1.3	566	18.0	316 L4	—	BN200L4	—	—	—	262100	291500	110900	340
2.6	95150	1.8	552	18.0	317 L4	—	BN200L4	—	—	—	334400	356100	110000	348
2.7	92009	1.1	533	18.0	315 L4	—	BN200L4	—	—	—	154900	181800	65200	330
2.7	92009	1.3	533	18.0	316 L4	—	BN200L4	—	—	—	257500	286400	108700	340
2.8	90587	1.1	525	40.0	—	315 R4	BN200L4	—	—	—	154100	181000	64900	331
2.8	90587	1.3	525	45.0	—	316 R4	BN200L4	—	—	—	256300	285000	108200	341
2.8	89687	1.8	520	50.0	—	317 R4	BN200L4	—	—	—	328500	349800	107800	349
2.8	88899	2.8	515	22.0	318 L4	—	BN200L4	—	—	—	411100	419500	143300	356
2.9	86415	2.9	501	110.0	—	318 R4 (C)	BN200L4	—	—	—	407600	416000	142000	357
2.9	86120	2.9	499	90.0	—	318 R4 (B)	BN200L4	—	—	—	407200	415600	141800	357
3.0	85299	0.9	495	15.0	314 L4	—	BN200L4	—	—	—	151400	177700	63600	320
3.0	85016	2.0	493	18.0	317 L4	—	BN200L4	—	—	—	323300	344200	105900	348
3.0	83966	1.2	487	18.0	315 L4	—	BN200L4	—	—	—	150700	176900	63300	330
3.0	83966	1.4	487	18.0	316 L4	—	BN200L4	—	—	—	250500	278600	105500	340
3.2	79018	1.0	458	15.0	314 L4	—	BN200L4	—	—	—	148000	173700	62000	320
3.3	77409	2.1	449	18.0	317 L4	—	BN200L4	—	—	—	314300	334700	102700	348
3.3	76328	1.5	443	45.0	—	316 R4	BN200L4	—	—	—	243500	270800	102200	341
3.3	76060	1.3	441	18.0	315 L4	—	BN200L4	—	—	—	146300	171700	61200	330
3.3	76060	1.5	441	18.0	316 L4	—	BN200L4	—	—	—	243200	270500	102100	340
3.3	75570	2.1	438	50.0	—	317 R4	BN200L4	—	—	—	312100	332300	101800	349
3.6	70587	1.4	409	40.0	—	315 R4	BN200L4	—	—	—	143000	167900	59700	331
3.6	70587	1.6	409	45.0	—	316 R4	BN200L4	—	—	—	237800	264500	99600	341
3.7	68808	2.2	399	50.0	—	317 R4	BN200L4	—	—	—	303400	323100	98700	349
3.8	66933	1.2	388	15.0	314 L4	—	BN200L4	—	—	—	140800	165300	58700	320
4.0	63746	1.5	370	18.0	315 L4	—	BN200L4	—	—	—	138700	162900	57700	330
4.0	63746	1.7	370	18.0	316 L4	—	BN200L4	—	—	—	230600	256500	96200	340
4.1	62139	2.5	360	18.0	317 L4	—	BN200L4	—	—	—	294300	313300	95400	348
4.2	59476	1.6	345	40.0	—	315 R4	BN200L4	—	—	—	135900	159500	56400	331
4.2	59476	1.8	345	45.0	—	316 R4	BN200L4	—	—	—	225900	251200	94000	341
4.3	57977	2.2	336	50.0	—	317 R4	BN200L4	—	—	—	288200	306900	93200	349
4.4	56677	1.9	329	18.0	316 L4	—	BN200L4	—	—	—	222700	247600	92500	340
4.6	54166	1.4	314	15.0	314 L4	—	BN200L4	—	—	—	132100	155100	54700	320
4.7	53453	2.7	310	18.0	317 L4	—	BN200L4	—	—	—	281300	299500	90700	348
4.8	52138	1.9	302	18.0	315 L4	—	BN200L4	—	—	—	130600	153300	54000	330
4.8	52138	2.0	302	18.0	316 L4	—	BN200L4	—	—	—	217100	241500	90000	340
5.1	49847	2.1	289	45.0	—	316 R4	BN200L4	—	—	—	214200	238300	88700	341
5.4	46345	1.8	269	40.0	—	315 R4	BN200L4	—	—	—	126100	148000	51900	331
5.4	46345	2.2	269	45.0	—	316 R4	BN200L4	—	—	—	209600	233100	86500	341
5.6	45177	2.2	262	50.0	—	317 R4	BN200L4	—	—	—	267500	284800	85800	349
5.7	44164	2.2	256	18.0	316 L4	—	BN200L4	—	—	—	206600	229800	85100	340
5.8	45008	1.0	252	18.0	317 L3	—	BN200L4	—	—	—	115900	137100	45200	348
5.8	45008	2.7	252	35.0	313 L3	—	BN200L4	—	—	—	264500	281600	84700	310
6.1	42931	1.5	241	30.0	315 L3	—	BN200L4	—	—	—	122000	143200	50000	330
6.1	42719	1.2	240	25.0	314 L3	—	BN200L4	—	—	—	121800	143000	50000	320
6.5	38842	2.0	225	40.0	—	315 R4	BN200L4	—	—	—	119600	140400	48900	331
6.5	38842	2.4	225	45.0	—	316 R4	BN200L4	—	—	—	198800	221100	81600	341
6.7	37862	2.1	220	50.0	—	317 R4	BN200L4	—	—	—	253600	270100	80900	349
6.8	37014	2.5	215	18.0	316 L4	—	BN200L4	—	—	—	195900	217900	80300	340
7.0	37207	1.2	209	18.0	313 L3	—	BN200L4	—	—	—	109400	129500	42400	310
7.1	36930	2.2	207	30.0	315 L3	—	BN200L4	—	—	—	116600	136900	47600	330
7.1	36748	1.7	206	25.0	314 L3	—	BN200L4	—	—	—	116400	136700	47500	320
7.2	36173	0.9	203	18.0	311 L3	—	BN200L4	—	—	—	86000	107200	33400	300
7.5	34530	1.4	194	18.0	313 L3	—	BN200L4	—	—	—	107000	126700	41400	310
7.6	34097	0.9	191	18.0	311 L3	—	BN200L4	—	—	—	86300	107500	33500	300
8.0	32462	1.2	182	18.0	313 L3	—	BN200L4	—	—	—	105100	124300	40500	310
8.3	31350	1.4	176	18.0	313 L3	—	BN200L4	—	—	—	104000	123000	40100	310
8.4	31117	2.5	174	30.0	315 L3	—	BN200L4	—	—	—	110700	130000	45000	330
8.4	30963	2.0	174	25.0	314 L3	—	BN200L4	—	—	—	110600	129800	44900	320
8.5	30479	1.1	171	18.0	311 L3	—	BN200L4	—	—	—	83400	103900	32200	300
8.8	29429	2.7	165	30.0	315 L3	—	BN200L4	—	—	—	108900	127900	44100	330








P₁ = 30 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
					MC	MZ	HC/PC	HZ/PZ	FZ					
8.8	29429	2.8	165	35.0	316 L3	—	BN200L4	—	—	—	181100	201400	73500	340
8.9	29283	2.2	164	25.0	314 L3	—	BN200L4	—	—	—	108700	127700	44100	320
9.0	29095	1.6	163	18.0	313 L3	—	BN200L4	—	—	—	101700	120300	39100	310
9.1	28730	1.1	161	18.0	311 L3	—	BN200L4	—	—	—	82000	102100	31600	300
9.3	28020	1.9	157	55.0	—	314 R3 (C)	BN200L4	—	—	—	107300	126000	43400	321
9.3	28020	2.3	157	90.0	—	315 R3 (C)	BN200L4	—	—	—	107300	126000	43400	331
9.5	27289	1.4	153	40.0	—	313 R3	BN200L4	—	—	—	99700	118000	38200	311
9.7	26968	1.7	151	18.0	313 L3	—	BN200L4	—	—	—	99400	117600	38100	310
9.9	26219	1.2	147	18.0	311 L3	—	BN200L4	—	—	—	79700	99300	30700	300
10.0	26159	1.0	147	40.0	—	311 R3	BN200L4	—	—	—	79700	99300	30600	301
10.2	25505	1.7	143	18.0	313 L3	—	BN200L4	—	—	—	97700	115700	37400	310
10.6	24674	2.6	138	25.0	314 L3	—	BN200L4	—	—	—	103300	121300	41600	320
10.8	24103	2.5	135	55.0	—	314 R3 (C)	BN200L4	—	—	—	102600	120400	41300	321
10.8	24052	1.8	135	18.0	313 L3	—	BN200L4	—	—	—	96000	113600	36700	310
11.0	23750	1.3	133	18.0	311 L3	—	BN200L4	—	—	—	77400	96400	29700	300
11.5	22671	1.8	127	40.0	—	313 R3	BN200L4	—	—	—	94300	111600	36000	311
11.6	22387	1.3	126	18.0	311 L3	—	BN200L4	—	—	—	76100	94700	29100	300
11.8	22041	1.4	124	40.0	—	311 R3	BN200L4	—	—	—	75700	94300	28900	301
12.1	21490	2.0	120	18.0	313 L3	—	BN200L4	—	—	—	92800	109900	35300	310
12.3	21225	0.9	119	18.0	310 L3	—	BN200L4	—	—	—	63300	79600	28600	290
12.7	20430	1.4	115	18.0	311 L3	—	BN200L4	—	—	—	74000	92200	28200	300
12.8	20309	2.5	114	55.0	—	314 R3 (C)	BN200L4	—	—	—	97400	114400	39000	321
12.9	20240	2.4	113	55.0	—	314 R3 (B)	BN200L4	—	—	—	97300	114300	38900	321
12.9	20240	3.0	113	75.0	—	315 R3 (B)	BN200L4	—	—	—	97300	114300	38900	331
13.2	19701	1.0	110	18.0	310 L3	—	BN200L4	—	—	—	60700	76300	27200	290
13.3	19567	2.1	110	18.0	313 L3	—	BN200L4	—	—	—	90300	106800	34200	310
13.5	19226	3.0	108	25.0	314 L3	—	BN200L4	—	—	—	95900	112500	38300	320
13.6	19207	2.6	108	55.0	—	314 R3 (C)	BN200L4	—	—	—	95800	112500	38300	321
13.6	19102	2.0	107	40.0	—	313 R3	BN200L4	—	—	—	89600	106000	34000	311
14.0	18572	1.5	104	40.0	—	311 R3	BN200L4	—	—	—	71900	89600	27300	301
14.1	18507	1.5	104	18.0	311 L3	—	BN200L4	—	—	—	71800	89500	27300	300
14.5	17979	1.0	101	18.0	310 L3	—	BN200L4	—	—	—	60300	75800	27000	290
15.0	17393	2.1	97.5	40.0	—	313 R3	BN200L4	—	—	—	87100	103100	32900	311
15.2	17175	1.6	96.3	40.0	—	311 R3	BN200L4	—	—	—	70200	87500	26600	301
15.8	16487	2.4	92.4	18.0	313 L3	—	BN200L4	—	—	—	85700	101500	32300	310
16.0	16286	1.1	91.3	18.0	310 L3	—	BN200L4	—	—	—	58500	73600	26200	290
16.1	16184	2.9	90.7	55.0	—	314 R3 (C)	BN200L4	—	—	—	91000	106900	36200	321
16.4	15920	1.7	89.3	18.0	311 L3	—	BN200L4	—	—	—	68100	84900	25700	300
17.8	14655	2.1	82.2	40.0	—	313 R3	BN200L4	—	—	—	82800	97900	31100	311
18.0	14471	1.8	81.1	40.0	—	311 R3	BN200L4	—	—	—	66700	83100	25200	301
18.2	14327	1.2	80.3	18.0	310 L3	—	BN200L4	—	—	—	56300	70800	25100	290
18.6	13966	2.7	78.3	18.0	313 L3	—	BN200L4	—	—	—	81600	96500	30600	310
18.9	13790	1.8	77.3	18.0	311 L3	—	BN200L4	—	—	—	65800	81900	24800	300
19.8	13179	1.3	73.9	18.0	310 L3	—	BN200L4	—	—	—	54900	69000	24400	290
20.3	12847	2.8	72.0	18.0	313 L3	—	BN200L4	—	—	—	79600	94100	29800	310
20.5	12686	2.0	71.1	18.0	311 L3	—	BN200L4	—	—	—	64100	79900	24100	300
20.9	12475	2.1	69.9	40.0	—	313 R3	BN200L4	—	—	—	78900	93300	29500	311
21.5	12128	2.0	68.0	40.0	—	311 R3	BN200L4	—	—	—	63300	78800	23700	301
22.8	11420	2.1	64.0	40.0	—	313 R3	BN200L4	—	—	—	76800	90900	28600	311
23.1	11276	2.1	63.2	40.0	—	311 R3	BN200L4	—	—	—	61900	77100	23100	301
23.3	11164	1.5	62.6	18.0	310 L3	—	BN200L4	—	—	—	52200	65700	23100	290
24.2	10746	2.2	60.2	18.0	311 L3	—	BN200L4	—	—	—	61000	76000	22800	300
27.2	9571	2.1	53.7	40.0	—	313 R3	BN200L4	—	—	—	72800	86200	27000	311
27.5	9456	1.7	53.0	18.0	310 L3	—	BN200L4	—	—	—	49700	62500	21800	290
27.6	9451	2.1	53.0	40.0	—	311 R3	BN200L4	—	—	—	58700	73100	21800	301
28.9	9006	2.5	50.5	18.0	311 L3	—	BN200L4	—	—	—	57900	72100	21500	300
31	8610	1.0	46.7	18.0	307 L2	—	BN200L4	—	16700	20900	39700	52100	14500	270
31	8610	1.5	46.7	18.0	309 L2	—	BN200L4	—	—	—	40400	52100	11600	280
31	8610	1.6	46.7	22.0	310 L2	—	BN200L4	—	—	—	47800	60200	20900	290
38	7153	2.8	38.8	26.0	311 L2	—	BN200L4	—	—	—	53500	66600	19700	300
38	7117	1.2	38.6	18.0	307 L2	—	BN200L4	—	15600	19600	37500	49200	13600	270
38	7117	1.8	38.6	18.0	309 L2	—	BN200L4	—	—	—	38100	49200	10900	280
38	7117	1.9	38.6	22.0	310 L2	—	BN200L4	—	—	—	45200	56800	19600	290
38	7082	0.9	38.4	13.0	306 L2	—	BN200L4	—	13700	15600	34100	39700	10300	260
44	6092	1.1	33.1	13.0	306 L2	—	BN200L4	—	13400	15100	33300	38800	10000	260
45	5997	1.6	32.6	18.0	307 L2	—	BN200L4	—	14800	18500	35700	46700	12800	270
45	5997	2.2	32.6	18.0	309 L2	—	BN200L4	—	—	—	36200	46700	10300	280

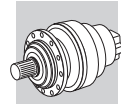


P₁ = 30 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
45	5997	2.2	32.6	22.0	310 L2	—	BN200L4	—	—	—	42900	54000	18600	290
48	5653	2.4	30.7	22.0	310 L2	—	BN200L4	—	—	—	42200	53000	18200	290
48	5653	1.7	30.7	18.0	307 L2	—	BN200L4	—	14500	18200	35000	45900	12600	270
51	5241	1.3	28.4	13.0	306 L2	—	BN200L4	—	12700	14400	31800	37100	9550	260
52	5159	1.8	28.0	18.0	307 L2	—	BN200L4	—	14100	17600	34100	44700	12200	270
52	5159	2.4	28.0	18.0	309 L2	—	BN200L4	—	—	—	34600	44700	9770	280
52	5159	2.5	28.0	22.0	310 L2	—	BN200L4	—	—	—	41000	51600	17600	290
55	4855	1.3	26.4	13.0	306 L2	—	BN200L4	—	12400	14000	31100	36200	9310	260
58	4673	2.7	25.4	22.0	310 L2	—	BN200L4	—	—	—	39800	50100	17100	290
58	4673	1.9	25.4	18.0	307 L2	—	BN200L4	—	13600	17100	33100	43400	11800	270
58	4673	2.2	25.4	18.0	309 L2	—	BN200L4	—	—	—	33600	43400	9460	280
58	4668	2.6	25.3	55.0	—	310 R2 (C)	BN200L4	—	—	—	39800	50100	17100	291
62	4337	2.1	23.5	35.0	—	309 R2	BN200L4	—	—	—	32900	42400	9220	281
62	4337	1.8	23.5	35.0	—	307 R2	BN200L4	—	13300	16600	32400	42400	11500	271
64	4176	1.5	22.7	13.0	306 L2	—	BN200L4	—	11800	13400	29700	34600	8850	260
67	4020	2.2	21.8	18.0	307 L2	—	BN200L4	—	12900	16200	31600	41400	11200	270
67	4020	2.5	21.8	18.0	309 L2	—	BN200L4	—	—	—	32100	41400	8990	280
68	3934	3.0	21.3	55.0	—	310 R2 (C)	BN200L4	—	—	—	37800	47600	16100	291
74	3654	2.1	19.8	35.0	—	309 R2	BN200L4	—	—	—	31200	40300	8710	281
74	3654	2.1	19.8	35.0	—	307 R2	BN200L4	—	12500	15700	30700	40300	10900	271
81	3328	1.8	18.1	13.0	306 L2	—	BN200L4	—	10900	12400	27800	32300	8210	260
84	3203	2.5	17.4	18.0	307 L2	—	BN200L4	—	12000	15000	29500	38700	10400	270
94	2847	2.1	15.5	35.0	—	309 R2	BN200L4	—	—	—	29000	37400	8020	281
94	2847	2.1	15.5	35.0	—	307 R2	BN200L4	—	11500	14500	28500	37400	10000	271
95	2819	1.8	15.3	13.0	306 L2	—	BN200L4	—	10300	11700	26400	30800	7770	260
99	2713	2.8	14.7	18.0	307 L2	—	BN200L4	—	11300	14200	28100	36800	9860	270
113	2388	2.0	13.0	13.0	306 L2	—	BN200L4	—	9780	11100	25100	29300	7350	260
113	2386	2.1	13.0	35.0	—	309 R2	BN200L4	—	—	—	27500	35400	7560	281
113	2386	2.1	13.0	35.0	—	307 R2	BN200L4	—	10900	13600	27000	35400	9450	271
195	1426	1.6	7.50	13.0	305 L1	—	BN200L4	—	6550	7560	13000	15700	4200	250
195	1426	2.9	7.50	18.0	306 L1	—	BN200L4	—	8150	9240	21300	24800	6120	260
222	1249	1.5	6.57	12.0	304 L1	—	BN200L4	—	6260	7230	12500	15100	4020	240
235	1179	1.2	6.20	11.0	303 L1	—	BN200L4	—	6140	7090	12300	14800	3940	230
235	1179	2.2	6.20	13.0	305 L1	—	BN200L4	—	6140	7090	12300	14800	3940	250
274	1014	1.5	5.33	11.0	303 L1	—	BN200L4	—	5840	6750	11800	14200	3750	230
274	1014	2.0	5.33	12.0	304 L1	—	BN200L4	—	5840	6750	11800	14200	3750	240
274	1014	2.5	5.33	13.0	305 L1	—	BN200L4	—	5840	6750	11800	14200	3750	250
344	808	1.8	4.25	11.0	303 L1	—	BN200L4	—	5420	6250	11000	13200	3480	230
344	808	2.4	4.25	12.0	304 L1	—	BN200L4	—	5420	6250	11000	13200	3480	240
406	684	2.0	3.60	13.0	303 L1	—	BN200L4	—	5420	6250	11000	13200	3480	230
406	684	2.7	3.60	18.0	304 L1	—	BN200L4	—	6750	7640	18000	21000	5070	240

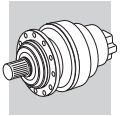
P₁ = 37 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
1.1	292061	1.2	1389	30.0	319 L4	—	BN225S4	—	—	—	636100	700800	199500	364
1.2	251235	1.4	1195	30.0	319 L4	—	BN225S4	—	—	—	608000	669900	189700	364
1.3	235882	2.2	1122	35.0	321 L4	—	BN225S4	—	—	—	731900	867900	1114500	372
1.4	222745	1.2	1059	22.0	318 L4	—	BN225S4	—	—	—	503000	520700	182200	356
1.5	211689	1.6	1007	30.0	319 L4	—	BN225S4	—	—	—	577600	636300	179200	364
1.6	198752	2.9	945	35.0	321 L4	—	BN225S4	—	—	—	695300	824500	1052600	372
1.6	191757	1.8	912	30.0	319 L4	—	BN225S4	—	—	—	560700	617700	173400	364
1.6	191609	1.4	911	22.0	318 L4	—	BN225S4	—	—	—	487700	497700	173300	356
1.6	190621	1.8	906	115.0	—	319 R4 (C)	BN225S4	—	—	—	559700	616600	173000	365
1.7	178877	2.0	850	30.0	319 L4	—	BN225S4	—	—	—	549100	605000	169400	364
1.9	163975	2.0	780	115.0	—	319 R4 (C)	BN225S4	—	—	—	535000	589400	164500	365
1.9	161448	1.7	768	22.0	318 L4	—	BN225S4	—	—	—	463300	472800	163700	356
2.0	152688	1.7	726	22.0	318 L4	—	BN225S4	—	—	—	455600	464900	160700	356
2.1	150721	2.4	717	30.0	319 L4	—	BN225S4	—	—	—	521600	574700	160000	364
2.1	145380	1.8	691	110.0	—	318 R4 (C)	BN225S4	—	—	—	448900	458100	158100	357
2.2	142543	2.5	678	30.0	319 L4	—	BN225S4	—	—	—	513000	565100	157000	364
2.3	138164	2.3	657	115.0	—	319 R4 (C)	BN225S4	—	—	—	508200	559900	155400	365
2.3	137692	2.3	655	95.0	—	319 R4 (B)	BN225S4	—	—	—	507700	559300	155200	365








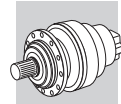
P₁ = 37 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
2.3	136035	1.9	647	22.0	318 L4	—	BN225S4	—	—	—	440100	449100	154600	356
2.4	128654	2.0	612	22.0	318 L4	—	BN225S4	—	—	—	432800	441700	151800	356
2.5	125058	2.1	595	110.0	—	318 R4 (C)	BN225S4	—	—	—	429100	437900	150300	357
2.6	120105	2.9	571	30.0	319 L4	—	BN225S4	—	—	—	487300	536800	148300	364
2.6	118445	2.6	563	95.0	—	319 R4 (B)	BN225S4	—	—	—	485200	534600	147600	365
2.7	116749	2.6	555	115.0	—	319 R4 (C)	BN225S4	—	—	—	483100	532300	146900	365
2.8	110414	2.7	525	115.0	—	319 R4 (C)	BN225S4	—	—	—	475100	523500	144200	365
2.9	108403	2.3	515	22.0	318 L4	—	BN225S4	—	—	—	411100	419500	143300	356
3.0	105373	2.4	501	110.0	—	318 R4 (C)	BN225S4	—	—	—	407600	416000	142000	357
3.0	105013	2.4	499	90.0	—	318 R4 (B)	BN225S4	—	—	—	407200	415600	141800	357
3.1	100250	2.5	477	22.0	318 L4	—	BN225S4	—	—	—	401600	409800	139700	356
3.1	99656	2.5	474	110.0	—	318 R4 (C)	BN225S4	—	—	—	400900	409100	139400	357
3.4	90334	2.7	430	90.0	—	318 R4 (B)	BN225S4	—	—	—	389200	397200	134900	357
3.5	88839	2.7	422	22.0	318 L4	—	BN225S4	—	—	—	387300	395200	134100	356
3.7	84470	2.8	402	22.0	318 L4	—	BN225S4	—	—	—	381500	389300	131900	356
3.7	83969	2.8	399	110.0	—	318 R4 (C)	BN225S4	—	—	—	380800	388600	131600	357
5.9	54883	2.2	252	35.0	317 L3	—	BN225S4	—	—	—	264500	281600	84700	348
6.1	52350	1.2	241	30.0	315 L3	—	BN225S4	—	—	—	122000	143200	50000	330
6.2	52091	1.0	240	25.0	314 L3	—	BN225S4	—	—	—	121800	143000	50000	320
7.1	45032	1.8	207	30.0	315 L3	—	BN225S4	—	—	—	116600	136900	47600	330
7.2	44810	1.4	206	25.0	314 L3	—	BN225S4	—	—	—	116400	136700	47500	320
8.5	37944	2.1	174	30.0	315 L3	—	BN225S4	—	—	—	110700	130000	45000	330
8.5	37756	1.7	174	25.0	314 L3	—	BN225S4	—	—	—	110600	129800	44900	320
9.0	35885	2.2	165	30.0	315 L3	—	BN225S4	—	—	—	108900	127900	44100	330
9.0	35885	2.3	165	35.0	316 L3	—	BN225S4	—	—	—	181100	201400	73500	340
9.0	35708	1.8	164	25.0	314 L3	—	BN225S4	—	—	—	108700	127700	44100	320
9.4	34167	1.5	157	55.0	—	314 R3 (C)	BN225S4	—	—	—	107300	126000	43400	321
9.4	34167	1.9	157	90.0	—	315 R3 (C)	BN225S4	—	—	—	107300	126000	43400	331
10.6	30236	2.7	139	30.0	315 L3	—	BN225S4	—	—	—	103500	121500	41700	330
10.6	30236	2.7	139	35.0	316 L3	—	BN225S4	—	—	—	172000	191300	69500	340
10.7	30087	2.2	138	25.0	314 L3	—	BN225S4	—	—	—	103300	121300	41600	320
11.0	29391	2.1	135	55.0	—	314 R3 (C)	BN225S4	—	—	—	102600	120400	41300	321
11.0	29391	2.6	135	90.0	—	315 R3 (C)	BN225S4	—	—	—	102600	120400	41300	331
13.0	24765	2.1	114	55.0	—	314 R3 (C)	BN225S4	—	—	—	97400	114400	39000	321
13.0	24765	2.6	114	90.0	—	315 R3 (C)	BN225S4	—	—	—	97400	114400	39000	331
13.0	24680	1.9	113	55.0	—	314 R3 (B)	BN225S4	—	—	—	97300	114300	38900	321
13.0	24680	2.4	113	75.0	—	315 R3 (B)	BN225S4	—	—	—	97300	114300	38900	331
13.7	23444	2.4	108	25.0	314 L3	—	BN225S4	—	—	—	95900	112500	38300	320
13.7	23421	2.1	108	55.0	—	314 R3 (C)	BN225S4	—	—	—	95800	112500	38300	321
13.7	23421	2.7	108	90.0	—	315 R3 (C)	BN225S4	—	—	—	95800	112500	38300	331
15.2	21230	2.6	97.6	55.0	—	314 R3 (B)	BN225S4	—	—	—	93000	109200	37000	321
16.0	20167	2.7	92.7	25.0	314 L3	—	BN225S4	—	—	—	91600	107600	36400	320
16.3	19734	2.4	90.7	55.0	—	314 R3 (C)	BN225S4	—	—	—	91000	106900	36200	321
16.3	19734	3.0	90.7	90.0	—	315 R3 (C)	BN225S4	—	—	—	91000	106900	36200	331
18.0	17889	2.9	82.3	55.0	—	314 R3 (B)	BN225S4	—	—	—	88400	103800	35000	321
20.9	15378	2.9	70.7	55.0	—	314 R3 (C)	BN225S4	—	—	—	84500	99200	33300	321
32	10499	1.4	46.7	22.0	310 L2	—	BN225S4	—	—	—	47800	60200	20900	290
38	8722	2.3	38.8	26.0	311 L2	—	BN225S4	—	—	—	53500	66600	19700	300
38	8679	1.6	38.6	22.0	310 L2	—	BN225S4	—	—	—	45200	56800	19600	290
45	7349	2.7	32.7	26.0	311 L2	—	BN225S4	—	—	—	50800	63300	18600	300
45	7313	1.8	32.6	22.0	310 L2	—	BN225S4	—	—	—	42900	54000	18600	290
48	6893	1.9	30.7	22.0	310 L2	—	BN225S4	—	—	—	42200	53000	18200	290
53	6290	2.0	28.0	22.0	310 L2	—	BN225S4	—	—	—	41000	51600	17600	290
58	5698	2.2	25.4	22.0	310 L2	—	BN225S4	—	—	—	39800	50100	17100	290
58	5693	2.1	25.3	55.0	—	310 R2 (C)	BN225S4	—	—	—	39800	50100	17100	291
68	4902	2.5	21.8	22.0	310 L2	—	BN225S4	—	—	—	38100	47900	16200	290
69	4796	2.5	21.3	55.0	—	310 R2 (C)	BN225S4	—	—	—	37800	47600	16100	291
81	4112	2.7	18.3	55.0	—	310 R2 (B)	BN225S4	—	—	—	36100	45400	15300	291
85	3906	2.9	17.4	22.0	310 L2	—	BN225S4	—	—	—	35600	44700	15100	290
89	3738	3.0	16.6	55.0	—	310 R2 (C)	BN225S4	—	—	—	35100	44100	14800	291
197	1739	2.4	7.50	18.0	306 L1	—	BN225S4	—	8150	9240	21300	24800	6120	260
239	1437	2.9	6.20	18.0	306 L1	—	BN225S4	—	7650	8670	20200	23500	5750	260








P₁ = 45 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
1.1	355606	1.0	1389	30.0	319 L4	—	BN225M4	—	—	—	636100	700800	199500	364
1.2	327642	2.7	1279	50.0	323 L4	—	BN225M4	—	—	—	—	—	1043200	380
1.2	305897	1.2	1195	30.0	319 L4	—	BN225M4	—	—	—	608000	669900	189700	364
1.3	287204	1.8	1122	35.0	321 L4	—	BN225M4	—	—	—	731900	867900	1114500	372
1.4	271209	1.0	1059	22.0	318 L4	—	BN225M4	—	—	—	499800	510000	178100	356
1.5	257747	1.3	1007	30.0	319 L4	—	BN225M4	—	—	—	577600	636300	179200	364
1.6	241996	2.4	945	35.0	321 L4	—	BN225M4	—	—	—	695300	824500	1052600	372
1.6	233478	1.4	912	30.0	319 L4	—	BN225M4	—	—	—	560700	617700	173400	364
1.6	233298	1.2	911	22.0	318 L4	—	BN225M4	—	—	—	487700	497700	173300	356
1.6	232095	1.4	906	115.0	—	319 R4 (C)	BN225M4	—	—	—	559700	616600	173000	365
1.7	217796	1.7	850	30.0	319 L4	—	BN225M4	—	—	—	549100	605000	169400	364
1.9	203904	2.7	796	35.0	321 L4	—	BN225M4	—	—	—	660400	783200	994200	372
1.9	199651	1.7	780	115.0	—	319 R4 (C)	BN225M4	—	—	—	535000	589400	164500	365
1.9	196575	1.4	768	22.0	318 L4	—	BN225M4	—	—	—	463300	472800	163700	356
2.0	188568	2.9	736	35.0	321 L4	—	BN225M4	—	—	—	645100	765000	968700	372
2.0	187451	2.8	732	125.0	—	321 R4 (C)	BN225M4	—	—	—	644000	763700	966700	373
2.0	185909	1.4	726	22.0	318 L4	—	BN225M4	—	—	—	455600	464900	160700	356
2.1	183513	1.9	717	30.0	319 L4	—	BN225M4	—	—	—	521600	574700	160000	364
2.1	177011	1.5	691	110.0	—	318 R4 (C)	BN225M4	—	—	—	448900	458100	158100	357
2.2	173556	2.0	678	30.0	319 L4	—	BN225M4	—	—	—	513000	565100	157000	364
2.3	168225	1.9	657	115.0	—	319 R4 (C)	BN225M4	—	—	—	508200	559900	155400	365
2.3	167650	1.9	655	95.0	—	319 R4 (B)	BN225M4	—	—	—	507700	559300	155200	365
2.3	165633	1.6	647	22.0	318 L4	—	BN225M4	—	—	—	440100	449100	154600	356
2.4	156646	1.7	612	22.0	318 L4	—	BN225M4	—	—	—	432800	441700	151800	356
2.5	152268	1.7	595	110.0	—	318 R4 (C)	BN225M4	—	—	—	429100	437900	150300	357
2.6	146237	2.4	571	30.0	319 L4	—	BN225M4	—	—	—	487300	536800	148300	364
2.6	144215	2.2	563	95.0	—	319 R4 (B)	BN225M4	—	—	—	485200	534600	147600	365
2.7	142150	2.2	555	115.0	—	319 R4 (C)	BN225M4	—	—	—	483100	532300	146900	365
2.8	135239	2.5	528	30.0	319 L4	—	BN225M4	—	—	—	476000	524400	144500	364
2.8	134437	2.2	525	115.0	—	319 R4 (C)	BN225M4	—	—	—	475100	523500	144200	365
2.9	131988	1.9	515	22.0	318 L4	—	BN225M4	—	—	—	411100	419500	143300	356
3.0	128299	2.0	501	110.0	—	318 R4 (C)	BN225M4	—	—	—	407600	416000	142000	357
3.0	127861	2.0	499	90.0	—	318 R4 (B)	BN225M4	—	—	—	407200	415600	141800	357
3.1	122062	2.0	477	22.0	318 L4	—	BN225M4	—	—	—	401600	409800	139700	356
3.1	121515	2.5	475	95.0	—	319 R4 (B)	BN225M4	—	—	—	460900	507800	139400	365
3.1	121338	2.0	474	110.0	—	318 R4 (C)	BN225M4	—	—	—	400900	409100	139400	357
3.3	113951	2.8	445	30.0	319 L4	—	BN225M4	—	—	—	452100	498100	136500	364
3.3	113276	2.5	442	115.0	—	319 R4 (C)	BN225M4	—	—	—	451300	497200	136200	365
3.4	109988	2.2	430	90.0	—	318 R4 (B)	BN225M4	—	—	—	389200	397200	134900	357
3.5	108168	2.2	422	22.0	318 L4	—	BN225M4	—	—	—	387300	395200	134100	356
3.7	102848	2.3	402	22.0	318 L4	—	BN225M4	—	—	—	381500	389300	131900	356
3.7	102239	2.3	399	110.0	—	318 R4 (C)	BN225M4	—	—	—	380800	388600	131600	357
4.1	92675	2.5	362	90.0	—	318 R4 (B)	BN225M4	—	—	—	369700	377300	127400	357
4.3	88267	2.9	345	115.0	—	319 R4 (C)	BN225M4	—	—	—	418800	461400	125400	365
4.3	87647	2.6	342	90.0	—	318 R4 (B)	BN225M4	—	—	—	363600	371000	125100	357
4.4	86197	2.6	337	22.0	318 L4	—	BN225M4	—	—	—	361800	369200	124400	356
4.7	80141	2.8	313	22.0	318 L4	—	BN225M4	—	—	—	353900	361200	121400	356
4.8	79666	2.8	311	110.0	—	318 R4 (C)	BN225M4	—	—	—	353300	360600	121100	357
5.1	73851	2.9	288	90.0	—	318 R4 (B)	BN225M4	—	—	—	345400	352500	118100	357
5.9	66824	1.8	252	35.0	317 L3	—	BN225M4	—	—	—	264500	281600	84700	348
6.1	63740	1.0	241	30.0	315 L3	—	BN225M4	—	—	—	122000	143200	50000	330
7.0	56305	2.5	213	35.0	317 L3	—	BN225M4	—	—	—	251200	267500	80000	348
7.1	54830	1.5	207	30.0	315 L3	—	BN225M4	—	—	—	116600	136900	47600	330
7.2	54559	1.2	206	25.0	314 L3	—	BN225M4	—	—	—	116400	136700	47500	320
8.3	47442	2.9	179	35.0	317 L3	—	BN225M4	—	—	—	238700	254100	75600	348
8.5	46199	1.7	174	30.0	315 L3	—	BN225M4	—	—	—	110700	130000	45000	330
8.5	45971	1.4	174	25.0	314 L3	—	BN225M4	—	—	—	110600	129800	44900	320
8.9	43874	2.7	166	35.0	317 L3	—	BN225M4	—	—	—	233100	248200	73600	348
9.0	43692	1.8	165	30.0	315 L3	—	BN225M4	—	—	—	108900	127900	44100	330
9.0	43692	1.9	165	35.0	316 L3	—	BN225M4	—	—	—	181100	201400	73500	340
9.0	43614	2.7	165	100.0	—	317 R3 (C)	BN225M4	—	—	—	232700	247800	73500	349
9.0	43477	1.5	164	25.0	314 L3	—	BN225M4	—	—	—	108700	127700	44100	320
9.4	41601	1.2	157	55.0	—	314 R3 (C)	BN225M4	—	—	—	107300	126000	43400	321
9.4	41601	1.6	157	90.0	—	315 R3 (C)	BN225M4	—	—	—	107300	126000	43400	331
10.6	36815	2.2	139	30.0	315 L3	—	BN225M4	—	—	—	103500	121500	41700	330
10.6	36815	2.2	139	35.0	316 L3	—	BN225M4	—	—	—	172000	191300	69500	340
10.7	36633	1.8	138	25.0	314 L3	—	BN225M4	—	—	—	103300	121300	41600	320

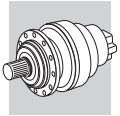


P₁ = 45 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
11.0	35786	1.7	135	55.0	—	314 R3 (C)	BN225M4	—	—	—	102600	120400	41300	321
11.0	35786	2.1	135	90.0	—	315 R3 (C)	BN225M4	—	—	—	102600	120400	41300	331
12.6	31020	2.6	117	35.0	316 L3	—	BN225M4	—	—	—	163400	181700	65600	340
13.0	30153	1.7	114	55.0	—	314 R3 (C)	BN225M4	—	—	—	97400	114400	39000	321
13.0	30153	2.1	114	90.0	—	315 R3 (C)	BN225M4	—	—	—	97400	114400	39000	331
13.0	30050	1.6	113	55.0	—	314 R3 (B)	BN225M4	—	—	—	97300	114300	38900	321
13.0	30050	2.0	113	75.0	—	315 R3 (B)	BN225M4	—	—	—	97300	114300	38900	331
13.7	28687	2.5	108	30.0	315 L3	—	BN225M4	—	—	—	96000	112700	38400	330
13.7	28687	2.6	108	35.0	316 L3	—	BN225M4	—	—	—	159600	177500	63900	340
13.7	28545	2.0	108	25.0	314 L3	—	BN225M4	—	—	—	95900	112500	38300	320
13.7	28517	1.7	108	55.0	—	314 R3 (C)	BN225M4	—	—	—	95800	112500	38300	321
13.7	28517	2.2	108	90.0	—	315 R3 (C)	BN225M4	—	—	—	95800	112500	38300	331
13.7	28517	2.5	108	90.0	—	316 R3 (C)	BN225M4	—	—	—	159300	177200	63800	341
15.2	25850	2.1	97.6	55.0	—	314 R3 (B)	BN225M4	—	—	—	93000	109200	37000	321
15.2	25850	2.7	97.6	75.0	—	315 R3 (B)	BN225M4	—	—	—	93000	109200	37000	331
16.0	24555	2.2	92.7	25.0	314 L3	—	BN225M4	—	—	—	91600	107600	36400	320
16.2	24171	2.8	91.3	30.0	315 L3	—	BN225M4	—	—	—	91200	107100	36200	330
16.2	24171	3.0	91.3	35.0	316 L3	—	BN225M4	—	—	—	151600	168600	60400	340
16.3	24028	2.0	90.7	55.0	—	314 R3 (C)	BN225M4	—	—	—	91000	106900	36200	321
16.3	24028	2.5	90.7	90.0	—	315 R3 (C)	BN225M4	—	—	—	91000	106900	36200	331
16.3	24028	2.9	90.7	90.0	—	316 R3 (C)	BN225M4	—	—	—	151300	168300	60300	341
18.0	21781	2.4	82.3	100.0	—	314 R3 (B)	BN225M4	—	—	—	194000	206600	60100	321
19.0	20599	2.5	77.8	55.0	—	314 R3 (B)	BN225M4	—	—	—	88400	103800	35000	321
20.0	19567	2.6	73.9	55.0	314 L3	—	BN225M4	—	—	—	86900	102000	34300	320
20.9	18723	2.3	70.7	35.0	—	314 R3 (C)	BN225M4	—	—	—	143800	159900	56900	321
20.9	18723	2.9	70.7	25.0	—	315 R3 (C)	BN225M4	—	—	—	85600	100500	33800	331
22.6	17356	2.9	65.5	30.0	—	314 R3 (B)	BN225M4	—	—	—	84600	99300	33300	321
23.6	16575	2.9	62.6	35.0	314 L3	—	BN225M4	—	—	—	140700	156500	55600	320
29.0	13524	2.8	51.1	55.0	—	314 R3 (B)	BN225M4	—	—	—	76600	89900	29800	321
32	12783	1.1	46.7	22.0	310 L2	—	BN225M4	—	—	—	47800	60200	20900	290
37	11078	2.7	40.5	30.0	313 L2	—	BN225M4	—	—	—	66900	79200	24600	310
38	10620	1.9	38.8	26.0	311 L2	—	BN225M4	—	—	—	53500	66600	19700	300
38	10567	1.3	38.6	22.0	310 L2	—	BN225M4	—	—	—	45200	56800	19600	290
45	8948	2.3	32.7	26.0	311 L2	—	BN225M4	—	—	—	50800	63300	18600	300
45	8904	1.5	32.6	22.0	310 L2	—	BN225M4	—	—	—	42900	54000	18600	290
48	8393	1.6	30.7	22.0	310 L2	—	BN225M4	—	—	—	42200	53000	18200	290
53	7659	1.7	28.0	22.0	310 L2	—	BN225M4	—	—	—	41000	51600	17600	290
54	7539	2.5	27.6	26.0	311 L2	—	BN225M4	—	—	—	48300	60100	17600	300
58	6972	2.6	25.5	26.0	311 L2	—	BN225M4	—	—	—	47100	58700	17100	300
58	6938	1.8	25.4	22.0	310 L2	—	BN225M4	—	—	—	39800	50100	17100	290
58	6931	1.8	25.3	55.0	—	310 R2 (C)	BN225M4	—	—	—	39800	50100	17100	291
58	6931	2.5	25.3	90.0	—	311 R2 (C)	BN225M4	—	—	—	47100	58600	17100	301
68	5968	2.0	21.8	22.0	310 L2	—	BN225M4	—	—	—	38100	47900	16200	290
69	5875	3.0	21.5	26.0	311 L2	—	BN225M4	—	—	—	44800	55800	16200	300
69	5840	2.0	21.3	55.0	—	310 R2 (C)	BN225M4	—	—	—	37800	47600	16100	291
69	5840	2.9	21.3	90.0	—	311 R2 (C)	BN225M4	—	—	—	44700	55700	16100	301
81	5007	2.2	18.3	55.0	—	310 R2 (B)	BN225M4	—	—	—	36100	45400	15300	291
85	4756	2.4	17.4	22.0	310 L2	—	BN225M4	—	—	—	35600	44700	15100	290
89	4551	2.5	16.6	55.0	—	310 R2 (C)	BN225M4	—	—	—	35100	44100	14800	291
96	4218	2.5	15.4	55.0	—	310 R2 (B)	BN225M4	—	—	—	34300	43100	14500	291
100	4028	2.7	14.7	22.0	310 L2	—	BN225M4	—	—	—	33800	42600	14200	290
197	2117	1.9	7.50	18.0	306 L1	—	BN225M4	—	8150	9240	21300	24800	6120	260
239	1750	2.4	6.20	18.0	306 L1	—	BN225M4	—	7650	8670	20200	23500	5750	260
278	1505	2.7	5.33	18.0	306 L1	—	BN225M4	—	7280	8240	19300	22400	5470	260

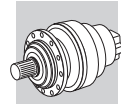
P₁ = 55 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
1.2	399701	2.2	1279	50.0	323 L4	—	BN250M4	—	—	—	—	—	1043200	380
1.2	373174	0.9	1195	30.0	319 L4	—	BN250M4	—	—	—	595600	656200	185400	364
1.3	350369	1.5	1122	35.0	321 L4	—	BN250M4	—	—	—	731900	867900	1114500	372
1.3	343828	2.5	1101	50.0	323 L4	—	BN250M4	—	—	—	—	—	992100	380
1.4	320273	2.7	1025	50.0	323 L4	—	BN250M4	—	—	—	—	—	968900	380








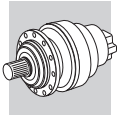
P₁ = 55 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
1.5	314433	1.1	1007	30.0	319 L4	—	BN250M4	—	—	—	577600	636300	179200	364
1.6	295218	2.0	945	35.0	321 L4	—	BN250M4	—	—	—	695300	824500	1052600	372
1.6	284828	1.2	912	30.0	319 L4	—	BN250M4	—	—	—	560700	617700	173400	364
1.6	284607	1.0	911	22.0	318 L4	—	BN250M4	—	—	—	477700	487500	169400	356
1.6	283140	1.2	906	115.0	—	319 R4 (C)	BN250M4	—	—	—	559700	616600	173000	365
1.7	265696	1.4	850	30.0	319 L4	—	BN250M4	—	—	—	549100	605000	169400	364
1.9	248748	2.2	796	35.0	321 L4	—	BN250M4	—	—	—	660400	783200	994200	372
1.9	243561	1.4	780	115.0	—	319 R4 (C)	BN250M4	—	—	—	535000	589400	164500	365
1.9	239808	1.1	768	22.0	318 L4	—	BN250M4	—	—	—	463300	472800	163700	356
2.0	230040	2.4	736	35.0	321 L4	—	BN250M4	—	—	—	645100	765000	968700	372
2.0	228677	2.3	732	125.0	—	321 R4 (C)	BN250M4	—	—	—	644000	763700	966700	373
2.0	226796	1.2	726	22.0	318 L4	—	BN250M4	—	—	—	455600	464900	160700	356
2.1	223874	1.6	717	30.0	319 L4	—	BN250M4	—	—	—	521600	574700	160000	364
2.1	215941	1.2	691	110.0	—	318 R4 (C)	BN250M4	—	—	—	448900	458100	158100	357
2.2	211727	1.7	678	30.0	319 L4	—	BN250M4	—	—	—	513000	565100	157000	364
2.3	205223	1.6	657	115.0	—	319 R4 (C)	BN250M4	—	—	—	508200	559900	155400	365
2.3	204522	1.6	655	95.0	—	319 R4 (B)	BN250M4	—	—	—	507700	559300	155200	365
2.3	202060	1.3	647	22.0	318 L4	—	BN250M4	—	—	—	440100	449100	154600	356
2.4	192681	2.6	617	125.0	—	321 R4 (C)	BN250M4	—	—	—	611700	725400	913100	373
2.4	191110	2.7	612	35.0	321 L4	—	BN250M4	—	—	—	610200	723600	910600	372
2.4	191097	1.4	612	22.0	318 L4	—	BN250M4	—	—	—	432800	441700	151800	356
2.5	185756	1.4	595	110.0	—	318 R4 (C)	BN250M4	—	—	—	429100	437900	150300	357
2.6	178399	1.9	571	30.0	319 L4	—	BN250M4	—	—	—	487300	536800	148300	364
2.6	175933	1.8	563	95.0	—	319 R4 (B)	BN250M4	—	—	—	485200	534600	147600	365
2.7	173413	1.8	555	115.0	—	319 R4 (C)	BN250M4	—	—	—	483100	532300	146900	365
2.8	165181	2.9	529	105.0	—	321 R4 (B)	BN250M4	—	—	—	584100	692700	867400	373
2.8	164982	2.0	528	30.0	319 L4	—	BN250M4	—	—	—	476000	524400	144500	364
2.8	164004	1.8	525	115.0	—	319 R4 (C)	BN250M4	—	—	—	475100	523500	144200	365
2.9	161017	1.6	515	22.0	318 L4	—	BN250M4	—	—	—	411100	419500	143300	356
2.9	160074	2.6	512	125.0	—	321 R4 (C)	BN250M4	—	—	—	578600	686200	858400	373
3.0	156517	1.6	501	110.0	—	318 R4 (C)	BN250M4	—	—	—	407600	416000	142000	357
3.0	155982	1.6	499	90.0	—	318 R4 (B)	BN250M4	—	—	—	407200	415600	141800	357
3.1	150141	2.6	481	125.0	—	321 R4 (C)	BN250M4	—	—	—	567600	673100	840200	373
3.1	148907	1.7	477	22.0	318 L4	—	BN250M4	—	—	—	401600	409800	139700	356
3.1	148240	2.0	475	95.0	—	319 R4 (B)	BN250M4	—	—	—	460900	507800	139400	365
3.1	148024	1.7	474	110.0	—	318 R4 (C)	BN250M4	—	—	—	400900	409100	139400	357
3.3	139181	2.9	446	105.0	—	321 R4 (B)	BN250M4	—	—	—	554800	658000	819300	373
3.3	139012	2.3	445	30.0	319 L4	—	BN250M4	—	—	—	452100	498100	136500	364
3.3	138189	2.0	442	115.0	—	319 R4 (C)	BN250M4	—	—	—	451300	497200	136200	365
3.4	134178	1.8	430	90.0	—	318 R4 (B)	BN250M4	—	—	—	389200	397200	134900	357
3.5	131958	1.8	422	22.0	318 L4	—	BN250M4	—	—	—	387300	395200	134100	356
3.7	125468	1.9	402	22.0	318 L4	—	BN250M4	—	—	—	381500	389300	131900	356
3.7	125263	2.5	401	95.0	—	319 R4 (B)	BN250M4	—	—	—	438200	482800	131800	365
3.7	124733	2.6	399	125.0	—	321 R4 (C)	BN250M4	—	—	—	536900	636700	789900	373
3.7	124724	1.9	399	110.0	—	318 R4 (C)	BN250M4	—	—	—	380800	388600	131600	357
3.9	118466	2.6	379	95.0	—	319 R4 (B)	BN250M4	—	—	—	430900	474800	129400	365
4.0	115627	3.0	370	105.0	—	321 R4 (B)	BN250M4	—	—	—	524800	622400	770200	373
4.1	113058	2.0	362	90.0	—	318 R4 (B)	BN250M4	—	—	—	369700	377300	127400	357
4.3	108452	3.0	347	105.0	—	321 R4 (B)	BN250M4	—	—	—	514800	610500	753900	373
4.3	108321	2.8	347	30.0	319 L4	—	BN250M4	—	—	—	419500	462200	125600	364
4.3	107679	2.4	345	115.0	—	319 R4 (C)	BN250M4	—	—	—	418800	461400	125400	365
4.3	106923	2.1	342	90.0	—	318 R4 (B)	BN250M4	—	—	—	363600	371000	125100	357
4.4	105154	2.1	337	22.0	318 L4	—	BN250M4	—	—	—	361800	369200	124400	356
4.6	99819	2.9	320	95.0	—	319 R4 (B)	BN250M4	—	—	—	409400	451000	122200	365
4.7	97767	2.3	313	22.0	318 L4	—	BN250M4	—	—	—	353900	361200	121400	356
4.8	97188	2.3	311	110.0	—	318 R4 (C)	BN250M4	—	—	—	353300	360600	121100	357
4.8	95694	2.6	306	125.0	—	321 R4 (C)	BN250M4	—	—	—	495900	588000	723100	373
5.1	90099	2.9	288	105.0	—	321 R4 (B)	BN250M4	—	—	—	487000	577500	708700	373
5.1	90093	2.4	288	90.0	—	318 R4 (B)	BN250M4	—	—	—	345400	352500	118100	357
5.6	81938	2.6	262	22.0	318 L4	—	BN250M4	—	—	—	335700	342600	114400	356
5.9	81520	1.5	252	35.0	317 L3	—	BN250M4	—	—	—	471100	558700	683100	348
5.9	77781	2.9	249	95.0	—	319 R4 (B)	BN250M4	—	—	—	379800	418500	112500	365
6.6	70202	2.9	225	90.0	—	318 R4 (B)	BN250M4	—	—	—	320500	327000	108700	357
6.7	69124	3.0	221	105.0	—	321 R4 (B)	BN250M4	—	—	—	449800	533400	648800	373
7.0	68689	2.1	213	35.0	317 L3	—	BN250M4	—	—	—	251200	267500	80000	348
7.1	66889	1.2	207	30.0	315 L3	—	BN250M4	—	—	—	116600	136900	47600	330
7.2	66558	1.0	206	25.0	314 L3	—	BN250M4	—	—	—	116400	136700	47500	320








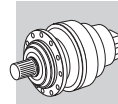
P₁ = 55 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
8.3	57876	2.4	179	35.0	317 L3	—	BN250M4	—	—	—	238700	254100	75600	348
8.5	56360	1.4	174	30.0	315 L3	—	BN250M4	—	—	—	110700	130000	45000	330
8.5	56081	1.1	174	25.0	314 L3	—	BN250M4	—	—	—	110600	129800	44900	320
8.9	53524	2.3	166	35.0	317 L3	—	BN250M4	—	—	—	233100	248200	73600	348
9.0	53302	1.5	165	30.0	315 L3	—	BN250M4	—	—	—	108900	127900	44100	330
9.0	53302	1.5	165	35.0	316 L3	—	BN250M4	—	—	—	181100	201400	73500	340
9.0	53206	2.2	165	100.0	—	317 R3 (C)	BN250M4	—	—	—	232700	247800	73500	349
9.0	53039	1.2	164	25.0	314 L3	—	BN250M4	—	—	—	108700	127700	44100	320
9.4	50751	1.0	157	55.0	—	314 R3 (C)	BN250M4	—	—	—	107300	126000	43400	321
9.4	50751	1.3	157	90.0	—	315 R3 (C)	BN250M4	—	—	—	107300	126000	43400	331
10.6	44912	1.8	139	30.0	315 L3	—	BN250M4	—	—	—	103500	121500	41700	330
10.6	44912	1.8	139	35.0	316 L3	—	BN250M4	—	—	—	172000	191300	69500	340
10.7	44831	2.6	139	100.0	—	317 R3 (C)	BN250M4	—	—	—	221000	235400	69400	349
10.7	44690	1.4	138	25.0	314 L3	—	BN250M4	—	—	—	103300	121300	41600	320
10.8	44466	2.6	138	35.0	317 L3	—	BN250M4	—	—	—	220500	234800	69200	348
11.0	43656	1.4	135	55.0	—	314 R3 (C)	BN250M4	—	—	—	102600	120400	41300	321
11.0	43656	1.7	135	90.0	—	315 R3 (C)	BN250M4	—	—	—	102600	120400	41300	331
12.4	38433	2.9	119	90.0	—	317 R3 (B)	BN250M4	—	—	—	211100	224700	65900	349
12.6	37842	2.1	117	35.0	316 L3	—	BN250M4	—	—	—	163400	181700	65600	340
12.8	37466	2.9	116	35.0	317 L3	—	BN250M4	—	—	—	209500	223000	65400	348
12.8	37244	2.6	115	100.0	—	317 R3 (C)	BN250M4	—	—	—	209100	222600	65300	349
13.0	36785	1.4	114	55.0	—	314 R3 (C)	BN250M4	—	—	—	97400	114400	39000	321
13.0	36785	1.8	114	90.0	—	315 R3 (C)	BN250M4	—	—	—	97400	114400	39000	331
13.0	36659	1.3	113	40.0	—	314 R3 (B)	BN250M4	—	—	—	95300	111900	38100	321
13.0	36659	1.6	113	75.0	—	315 R3 (B)	BN250M4	—	—	—	97300	114300	38900	331
13.7	34996	2.0	108	30.0	315 L3	—	BN250M4	—	—	—	96000	112700	38400	330
13.7	34996	2.2	108	35.0	316 L3	—	BN250M4	—	—	—	159600	177500	63900	340
13.7	34933	2.6	108	100.0	—	317 R3 (C)	BN250M4	—	—	—	205100	218400	63900	349
13.7	34823	1.6	108	25.0	314 L3	—	BN250M4	—	—	—	95900	112500	38300	320
13.7	34789	1.4	108	55.0	—	314 R3 (C)	BN250M4	—	—	—	95800	112500	38300	321
13.7	34789	1.8	108	90.0	—	315 R3 (C)	BN250M4	—	—	—	95800	112500	38300	331
13.7	34789	2.1	108	90.0	—	316 R3 (C)	BN250M4	—	—	—	159300	177200	63800	341
14.8	32383	3.0	100	90.0	—	317 R3 (B)	BN250M4	—	—	—	200500	213500	62300	349
15.2	31535	1.7	97.6	40.0	—	314 R3 (B)	BN250M4	—	—	—	91100	107000	36200	321
15.2	31535	2.2	97.6	75.0	—	315 R3 (B)	BN250M4	—	—	—	93000	109200	37000	331
16.0	29956	1.8	92.7	25.0	314 L3	—	BN250M4	—	—	—	91600	107600	36400	320
16.2	29487	2.3	91.3	30.0	315 L3	—	BN250M4	—	—	—	91200	107100	36200	330
16.2	29487	2.4	91.3	35.0	316 L3	—	BN250M4	—	—	—	151600	168600	60400	340
16.3	29313	1.6	90.7	55.0	—	314 R3 (C)	BN250M4	—	—	—	91000	106900	36200	321
16.3	29313	2.0	90.7	90.0	—	315 R3 (C)	BN250M4	—	—	—	91000	106900	36200	331
16.3	29313	2.4	90.7	90.0	—	316 R3 (C)	BN250M4	—	—	—	151300	168300	60300	341
16.5	29022	2.6	89.8	100.0	—	317 R3 (C)	BN250M4	—	—	—	194000	206600	60100	349
17.8	26903	3.0	83.3	90.0	—	317 R3 (B)	BN250M4	—	—	—	189700	201900	58600	349
18.0	26571	2.0	82.3	40.0	—	314 R3 (B)	BN250M4	—	—	—	86600	101600	34200	321
18.0	26571	2.5	82.3	75.0	—	315 R3 (B)	BN250M4	—	—	—	88400	103800	35000	331
18.9	25234	3.0	78.1	90.0	—	317 R3 (B)	BN250M4	—	—	—	186000	198100	57300	349
19.0	25129	2.0	77.8	40.0	—	314 R3 (B)	BN250M4	—	—	—	85100	100000	33600	321
19.0	25129	2.6	77.8	75.0	—	315 R3 (B)	BN250M4	—	—	—	86900	102000	34300	331
19.0	25129	2.6	77.8	75.0	—	316 R3 (B)	BN250M4	—	—	—	144500	160700	57200	341
19.3	24713	2.8	76.5	35.0	316 L3	—	BN250M4	—	—	—	143800	159900	56900	340
20.0	23871	2.1	73.9	25.0	314 L3	—	BN250M4	—	—	—	85600	100500	33800	320
20.8	22977	2.7	71.1	30.0	315 L3	—	BN250M4	—	—	—	84600	99300	33300	330
20.8	22977	2.9	71.1	35.0	316 L3	—	BN250M4	—	—	—	140700	156500	55600	340
20.9	22841	1.9	70.7	55.0	—	314 R3 (C)	BN250M4	—	—	—	84500	99200	33300	321
20.9	22841	2.4	70.7	90.0	—	315 R3 (C)	BN250M4	—	—	—	84500	99200	33300	331
20.9	22841	2.6	70.7	90.0	—	316 R3 (C)	BN250M4	—	—	—	140400	156200	55400	341
21.5	22265	2.6	68.9	100.0	—	317 R3 (C)	BN250M4	—	—	—	179200	190800	55000	349
22.6	21174	2.3	65.5	40.0	—	314 R3 (B)	BN250M4	—	—	—	80900	94900	31700	321
22.6	21174	2.9	65.5	75.0	—	315 R3 (B)	BN250M4	—	—	—	82600	96900	32400	331
22.8	20963	2.9	64.9	90.0	—	317 R3 (B)	BN250M4	—	—	—	176000	187400	53900	349
23.6	20220	2.4	62.6	25.0	314 L3	—	BN250M4	—	—	—	81400	95600	31900	320
29.0	16499	2.3	51.1	40.0	—	314 R3 (B)	BN250M4	—	—	—	75000	88100	29200	321
29.0	16499	2.9	51.1	75.0	—	315 R3 (B)	BN250M4	—	—	—	76600	89900	29800	331
29.7	16083	2.9	49.8	90.0	—	317 R3 (B)	BN250M4	—	—	—	162500	173000	49300	349
32	15594	0.9	46.7	22.0	310 L2	—	BN250M4	—	—	—	47800	60200	20900	290
37	13515	2.2	40.5	30.0	313 L2	—	BN250M4	—	—	—	66900	79200	24600	310
38	12955	1.5	38.8	26.0	311 L2	—	BN250M4	—	—	—	53500	66600	19700	300



P₁ = 55 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
38	12891	1.1	38.6	22.0	310 L2	—	BN250M4	—	—	—	45200	56800	19600	290
38	12891	2.7	38.6	40.0	314 L2	—	BN250M4	—	—	—	69000	81000	26600	320
44	11228	2.6	33.6	30.0	313 L2	—	BN250M4	—	—	—	63300	74900	23100	310
45	10916	1.9	32.7	26.0	311 L2	—	BN250M4	—	—	—	50800	63300	18600	300
45	10862	1.2	32.6	22.0	310 L2	—	BN250M4	—	—	—	42900	54000	18600	290
48	10239	1.3	30.7	22.0	310 L2	—	BN250M4	—	—	—	42200	53000	18200	290
52	9460	2.9	28.4	30.0	313 L2	—	BN250M4	—	—	—	60100	71200	21800	310
53	9344	1.4	28.0	22.0	310 L2	—	BN250M4	—	—	—	41000	51600	17600	290
54	9198	2.1	27.6	26.0	311 L2	—	BN250M4	—	—	—	48300	60100	17600	300
56	8821	2.6	26.4	90.0	—	313 R2 (C)	BN250M4	—	—	—	58900	69700	21300	311
58	8506	2.2	25.5	26.0	311 L2	—	BN250M4	—	—	—	47100	58700	17100	300
58	8464	1.5	25.4	22.0	310 L2	—	BN250M4	—	—	—	39800	50100	17100	290
58	8455	2.1	25.3	55.0	—	311 R2 (C)	BN250M4	—	—	—	39800	50100	17100	301
67	7328	2.6	22.0	90.0	—	313 R2 (C)	BN250M4	—	—	—	47100	58600	17100	311
68	7281	1.7	21.8	22.0	310 L2	—	BN250M4	—	—	—	38100	47900	16200	290
69	7167	2.4	21.5	26.0	311 L2	—	BN250M4	—	—	—	44800	55800	16200	300
69	7124	2.4	21.3	90.0	—	311 R2 (C)	BN250M4	—	—	—	44700	55700	16100	301
78	6372	3.0	19.1	75.0	—	313 R2 (B)	BN250M4	—	—	—	53400	63200	19100	311
81	6108	2.6	18.3	75.0	—	311 R2 (B)	BN250M4	—	—	—	42700	53200	15300	301
82	6007	2.8	18.0	26.0	311 L2	—	BN250M4	—	—	—	42500	52900	15200	300
85	5802	1.9	17.4	22.0	310 L2	—	BN250M4	—	—	—	35600	44700	15100	290
88	5622	2.6	16.8	90.0	—	313 R2 (C)	BN250M4	—	—	—	51400	60900	18300	311
88	5585	2.9	16.7	26.0	311 L2	—	BN250M4	—	—	—	41600	51800	14900	300
89	5552	2.6	16.6	90.0	—	311 R2 (C)	BN250M4	—	—	—	41500	51700	14800	301
93	5293	3.0	15.9	75.0	—	313 R2 (B)	BN250M4	—	—	—	50500	59800	18000	311
96	5146	3.0	15.4	75.0	—	311 R2 (B)	BN250M4	—	—	—	40500	50500	14500	301
100	4914	2.2	14.7	22.0	310 L2	—	BN250M4	—	—	—	33800	42600	14200	290
122	4061	3.0	12.2	75.0	—	313 R2 (B)	BN250M4	—	—	—	46700	55200	16400	311
123	4010	3.0	12.0	75.0	—	311 R2 (B)	BN250M4	—	—	—	37600	46900	13300	301
197	2583	1.6	7.50	18.0	306 L1	—	BN250M4	—	8150	9240	21300	24800	6120	260
238	2146	2.7	6.23	22.0	307 L1	—	BN250M4	—	8520	10700	21700	28500	7400	270
239	2135	2.0	6.20	18.0	306 L1	—	BN250M4	—	7650	8670	20200	23500	5750	260
278	1837	2.2	5.33	18.0	306 L1	—	BN250M4	—	7280	8240	19300	22400	5470	260
348	1463	2.7	4.25	18.0	306 L1	—	BN250M4	—	6750	7640	18000	21000	5070	260



23.0 - DATI TECNICI RIDUTTORI IN LINEA 300 L

23.0 - RATING CHARTS FOR IN-LINE UNITS 300 L

23.0 - TECHNISCHE DATEN DER GETRIEBE 300 L



23.0 - DONNEES TECHNIQUES REDUCTEURS 300 L

Guida alla consultazione delle tabelle.

Reading the rating chart.

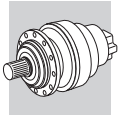
Anleitung für die richtige Konsultation der Tabellen.

Guide pour la consultation des tableaux.

301 L							2460 Nm						
n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	Pt kW	P (IEC) 	MC	MZ	HC/PC	HZ/PZ	FZ	$M_{n2\ max}$ Nm
1500	301 L1	3.48	431	840	30	7.5	71-80-90-100-112-132	1610	1610	4970	5710	1060	3400
	301 L1	4.26	352	880	30	7.5	71-80-90-100-112-132	1720	1720	5280	6070	1130	3400
	301 L1	5.77	260	930	26	7.5	71-80-90-100-112-132	1910	1910	5790	6650	1250	3400
	301 L1	7.20	208	750	17.0	7.5	71-80-90-100-112-132	2050	2050	6180	7100	1350	3400
	301 L1	9.00	167	630	11.3	7.5	71-80-90-100-112-132	2210	2210	6610	7600	1450	3400
	301 L2	12.1	124	1220	16.8	7.5	71-80-90-100-112-132	2440	2440	7230	8300	1600	3400
	301 L2	14.8	101	1280	14.4	7.5	71-80-90-100-112-132	2610	2610	7680	8820	1720	3400
	301 L2	18.2	83	1360	12.5	7.5	71-80-90-100-112-132	2790	2790	8160	9380	1840	3400

Valore di coppia nominale del riduttore indipendente dalla potenza meccanica installata / The rated torque of the gearbox, independent of installed mechanical power / Nenn Drehmomentwert des Getriebes unabhängig von der installierten mechanischen Leistung / Valeur de couple nominal du réducteur indépendant de la puissance mécanique installée

1	Coppia di riferimento	Reference torque	Bezugsdrehmoment	Couple de référence
2	Velocità di comando riduttore	Gearbox drive speed	Drehzahl am Getriebeantrieb	Vitesse angulaire à l'entrée du réducteur
3	Grandezza riduttore in esecuzione lineare	Frame size of the in-line gear unit	Getriebegröße in Linearausführung	Taille réducteur exécution coaxiale
4	Rapporto di riduzione	Gear ratio	Übersetzung	Rapport de réduction
5	Velocità angolare all'albero lento	Gearbox output speed	Drehzahl am Getriebeabtrieb	Vitesse angulaire en sortie réducteur
6	Coppia nominale all'albero lento del riduttore, basata su: - fattore di sicurezza S=1 - durata teorica di 10000 h	Gearbox rated output torque based on: - safety factor S=1 - 10000 h theoretical lifetime	Nenn-Drehmoment am Getriebeabtrieb mit Sicherheitsfaktor S=1 für eine Dauer von 10000 Std.	Couple nominal à la sortie du réducteur pendant : - facteur de sécurité S=1 - durée de 10000 h
7	Potenza nominale applicabile al riduttore, per: - fattore di sicurezza S=1 - durata teorica di 10000 h	Gearbox rated input power, based on: - safety factor S=1 - 10000 h theoretical lifetime	Nenn-Leistung am Getriebeantrieb mit: - Sicherheitsfaktor S=1 - Dauer von 10000 Std.	Puissance nominale en entrée réducteur pendant : - facteur de sécurité S=1 - durée de 10000 h
8	Potenza termica riduttore	Gearbox thermal capacity	Wärmeleistung des Getriebes	Puissance thermique réducteur
9	Grandezza motore elettrico IEC installabile	Frame size of available IEC motor	Baugröße des installierbaren IEC-Motors	Taille IEC moteur électrique à installer
10	Carichi radiali applicabili all'albero lento, basati su: - fattore di sicurezza S=1 - durata teorica di 10000 h Per forze non applicate in mezz'aria riferirsi ai diagrammi riportati a seguito delle pagine dimensionali del riduttore in oggetto	Permitted overhung loading on output shaft, based on: - safety factor S=1 - 10000 h theoretical lifetime. For forces applying off mid-point of the shaft, see diagrams provided in the pages following dimensions of the specific gearbox	Auf die Mitte der Abtriebswelle für: - Dauer von 10000 Std. applizierbare Nenn-Radialkräfte - Sicherheitsfaktor S=1 Für andere Kraftangriffspunkte verweisen wir auf die Diagramme, die den Seiten mit den Maßen der gewählten Größe folgen	Charges radiales nominales applicables à la moitié de l'arbre pendant : - facteur de sécurité S=1 - durée de 10000 h Pour d'autres positions de charge, voir diagrammes figurant à la suite des pages dimensions de la taille sélectionnée
11	Coppia massima trasmissibile dal riduttore	Max. transmissible torque	Nenn-Drehmoment am Abtrieb des Bezuggetriebes	Couple maximum du réducteur
12	Pagina delle dimensioni	Page installation drawing can be found at	Maßseiten	Page avec les dimensions

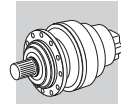


300 L

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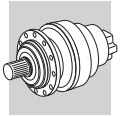
1250 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC/PC	MZ/PZ	HC	HZ	FZ	
1500	300 L1	3.48	431	470	20	7.5	71-80-90-100-112-132	1610	1610	4970	5710	1060	2000
	300 L1	4.26	352	490	18.8	7.5	71-80-90-100-112-132	1720	1720	5280	6070	1130	2400
	300 L1	5.77	260	470	13.3	7.5	71-80-90-100-112-132	1910	1910	5790	6650	1250	2400
	300 L1	7.20	208	410	9.2	7.5	71-80-90-100-112-132	2050	2050	6180	7100	1350	2400
	300 L1	9.00	167	320	5.7	7.5	71-80-90-100-112-132	2210	2210	6610	7600	1450	2400
	300 L2	12.1	124	680	9.4	7.5	71-80-90-100-112-132	2440	2440	7230	8300	1600	2000
	300 L2	14.8	101	720	8.1	7.5	71-80-90-100-112-132	2610	2610	7680	8820	1720	2000
	300 L2	18.2	83	750	6.9	7.5	71-80-90-100-112-132	2790	2790	8160	9380	1840	2400
	300 L2	20.1	75	640	5.3	7.5	71-80-90-100-112-132	2890	2890	8410	9660	1900	2000
	300 L2	24.6	61	800	5.5	7.5	71-80-90-100-112-132	3090	3090	8940	10300	2030	2400
	300 L2	30.7	49	840	4.6	7.5	71-80-90-100-112-132	3330	3330	9550	11000	2190	2400
	300 L2	33.3	45	650	3.3	7.5	71-80-90-100-112-132	3420	3420	9790	11200	2250	2400
	300 L2	38.4	39	840	3.7	7.5	71-80-90-100-112-132	3590	3590	10200	11700	2360	2400
	300 L2	41.5	36	650	2.6	7.5	71-80-90-100-112-132	3680	3680	10500	12000	2420	2400
	300 L2	51.9	28.9	650	2.1	7.5	71-80-90-100-112-132	3970	3970	11200	12900	2610	2400
	300 L2	64.8	23.1	550	1.4	7.5	71-80-90-100-112-132	4270	4270	12000	13700	2810	2400
	300 L3	51.6	29.1	850	2.8	7.5	71-80-90-100-112-132	3960	3960	11200	12800	2600	2000
	300 L3	63.2	23.7	850	2.3	7.5	71-80-90-100-112-132	4240	4240	11900	13600	2780	2400
	300 L3	69.9	21.5	650	1.6	7.5	71-80-90-100-112-132	4380	4380	12200	14000	2880	2000
	300 L3	77.5	19.4	850	1.9	7.5	71-80-90-100-112-132	4530	4530	12600	14500	2980	2400
300 L3	85.6	17.5	850	1.7	7.5	71-80-90-100-112-132	4680	4680	13000	14900	3080	2400	
300 L3	105	14.3	860	1.4	7.5	71-80-90-100-112-132	5010	5010	13800	15900	3300	2400	
300 L3	116	13.0	650	0.97	7.5	71-80-90-100-112-132	5180	5180	14200	16300	3410	2400	
300 L3	131	11.5	860	1.1	7.5	71-80-90-100-112-132	5400	5400	14800	17000	3550	2400	
300 L3	142	10.6	860	1.0	7.5	71-80-90-100-112-132	5540	5540	15100	17400	3650	2400	
300 L3	177	8.5	880	0.86	7.5	71-80-90-100-112-132	5970	5970	16200	18600	3920	2400	
300 L3	192	7.8	650	0.58	7.5	71-80-90-100-112-132	6130	6130	16600	19000	4030	2400	
300 L3	221	6.8	910	0.71	7.5	71-80-90-100-112-132	6430	6430	17300	19800	4230	2400	
300 L3	240	6.3	650	0.47	7.5	71-80-90-100-112-132	6600	6600	17700	20300	4340	2400	
300 L3	299	5.0	650	0.37	7.5	71-80-90-100-112-132	7110	7110	18900	21700	4670	2400	
300 L3	374	4.0	670	0.31	7.5	71-80-90-100-112-132	7660	7660	20200	23200	5030	2400	
300 L4	330	4.5	970	0.52	6.0	71-80-90-100-112-132	7350	7350	19500	22400	4830	2400	
300 L4	403	3.7	680	0.30	6.0	71-80-90-100-112-132	7850	7850	20700	23800	5160	2400	
300 L4	447	3.4	1020	0.40	6.0	71-80-90-100-112-132	8130	8130	21300	24500	5340	2400	
300 L4	494	3.0	1030	0.37	6.0	71-80-90-100-112-132	8400	8400	22000	25300	5520	2400	
300 L4	558	2.7	1060	0.34	6.0	71-80-90-100-112-132	8750	8750	22800	26200	5750	2400	
300 L4	616	2.4	1070	0.31	6.0	71-80-90-100-112-132	9050	9050	23500	27000	5950	2400	
300 L4	755	2.0	1110	0.26	6.0	71-80-90-100-112-132	9680	9680	25000	28700	6360	2400	
300 L4	819	1.8	1130	0.24	6.0	71-80-90-100-112-132	9940	9940	25600	29400	6540	2400	
300 L4	942	1.6	1160	0.22	6.0	71-80-90-100-112-132	10400	10400	26700	30700	6850	2400	
300 L4	1022	1.5	1170	0.20	6.0	71-80-90-100-112-132	10700	10700	27300	31400	7040	2400	
300 L4	1108	1.4	810	0.13	6.0	71-80-90-100-112-132	11000	11000	28000	32200	7230	2400	
300 L4	1275	1.2	1220	0.17	6.0	71-80-90-100-112-132	11500	11500	29200	33600	7580	2400	
300 L4	1383	1.1	850	0.11	6.0	71-80-90-100-112-132	11800	11800	29900	34000	7790	2400	
300 L4	1591	0.94	1250	0.14	6.0	71-80-90-100-112-132	12000	12400	31000	34000	8000	2400	
300 L4	1725	0.87	860	0.09	6.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400	
300 L4	2153	0.70	860	0.07	6.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400	
300 L4	2692	0.56	1000	0.07	6.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400	
1000	300 L1	3.48	287	530	16.5	9.0	71-80-90-100-112-132	1840	1840	5610	6450	1210	2000
	300 L1	4.26	235	560	14.1	9.0	71-80-90-100-112-132	1970	1970	5970	6860	1300	2400
	300 L1	5.77	173	530	10.0	9.0	71-80-90-100-112-132	2180	2180	6530	7510	1430	2400
	300 L1	7.20	139	460	6.9	9.0	71-80-90-100-112-132	2350	2350	6980	8020	1540	2400
	300 L1	9.00	111	360	4.3	9.0	71-80-90-100-112-132	2530	2530	7470	8580	1660	2400
	300 L2	12.1	83	730	6.7	9.0	71-80-90-100-112-132	2790	2790	8160	9380	1840	2000
	300 L2	14.8	67	790	5.9	9.0	71-80-90-100-112-132	2990	2990	8670	9970	1970	2000
	300 L2	18.2	55	820	5.0	9.0	71-80-90-100-112-132	3200	3200	9220	10600	2100	2400
	300 L2	20.1	50	650	3.6	9.0	71-80-90-100-112-132	3310	3310	9500	10900	2170	2000
	300 L2	24.6	41	840	3.8	9.0	71-80-90-100-112-132	3540	3540	10100	11600	2330	2400
	300 L2	30.7	33	850	3.1	9.0	71-80-90-100-112-132	3810	3810	10800	12400	2500	2400
	300 L2	33.3	30	650	2.2	9.0	71-80-90-100-112-132	3910	3910	11100	12700	2570	2400
	300 L2	38.4	26.1	850	2.5	9.0	71-80-90-100-112-132	4100	4100	11500	13300	2700	2400
	300 L2	41.5	24.1	650	1.7	9.0	71-80-90-100-112-132	4210	4210	11800	13600	2770	2400
	300 L2	51.9	19.3	650	1.4	9.0	71-80-90-100-112-132	4540	4540	12600	14500	2980	2400



300 L	214	1250 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC/PC	MZ/PZ	HC	HZ	FZ	
1000	300 L2	64.8	15.4	550	0.94	9.0	71-80-90-100-112-132	4890	4890	13500	15500	3210	2400
	300 L3	51.6	19.4	850	1.9	9.0	71-80-90-100-112-132	4530	4530	12600	14500	2980	2000
	300 L3	63.2	15.8	850	1.5	9.0	71-80-90-100-112-132	4850	4850	13400	15400	3190	2400
	300 L3	69.9	14.3	650	1.1	9.0	71-80-90-100-112-132	5010	5010	13800	15900	3290	2000
	300 L3	77.5	12.9	860	1.3	9.0	71-80-90-100-112-132	5190	5190	14200	16400	3410	2400
	300 L3	85.6	11.7	860	1.2	9.0	71-80-90-100-112-132	5360	5360	14700	16900	3530	2400
	300 L3	105	9.5	870	0.95	9.0	71-80-90-100-112-132	5740	5740	15600	17900	3770	2400
	300 L3	116	8.6	650	0.64	9.0	71-80-90-100-112-132	5930	5930	16100	18500	3900	2400
	300 L3	131	7.6	890	0.78	9.0	71-80-90-100-112-132	6180	6180	16700	19200	4060	2400
	300 L3	142	7.0	900	0.73	9.0	71-80-90-100-112-132	6350	6350	17100	19600	4170	2400
	300 L3	177	5.6	930	0.60	9.0	71-80-90-100-112-132	6830	6830	18300	21000	4490	2400
	300 L3	192	5.2	650	0.39	9.0	71-80-90-100-112-132	7020	7020	18700	21500	4620	2400
	300 L3	221	4.5	970	0.50	9.0	71-80-90-100-112-132	7360	7360	19500	22400	4840	2400
	300 L3	240	4.2	670	0.32	9.0	71-80-90-100-112-132	7560	7560	20000	23000	4970	2400
	300 L3	299	3.3	700	0.27	9.0	71-80-90-100-112-132	8140	8140	21400	24500	5350	2400
	300 L3	374	2.7	720	0.22	9.0	71-80-90-100-112-132	8770	8770	22800	26200	5760	2400
	300 L4	330	3.0	1040	0.37	7.2	71-80-90-100-112-132	8410	8410	22000	25300	5530	2400
	300 L4	403	2.5	730	0.21	7.2	71-80-90-100-112-132	8990	8990	23400	26800	5910	2400
	300 L4	447	2.2	1090	0.29	7.2	71-80-90-100-112-132	9300	9300	24100	27700	6120	2400
	300 L4	494	2.0	1110	0.27	7.2	71-80-90-100-112-132	9620	9620	24800	28500	6320	2400
	300 L4	558	1.8	1130	0.24	7.2	71-80-90-100-112-132	10000	10000	25800	29600	6590	2400
	300 L4	616	1.6	1150	0.22	7.2	71-80-90-100-112-132	10400	10400	26500	30500	6810	2400
	300 L4	755	1.3	1190	0.19	7.2	71-80-90-100-112-132	11100	11100	28200	32400	7280	2400
	300 L4	819	1.2	1210	0.17	7.2	71-80-90-100-112-132	11400	11400	28900	33200	7480	2400
	300 L4	942	1.1	1240	0.16	7.2	71-80-90-100-112-132	11900	11900	30100	34000	7840	2400
	300 L4	1022	0.98	1250	0.14	7.2	71-80-90-100-112-132	12000	12300	30900	34000	8000	2400
	300 L4	1108	0.90	860	0.09	7.2	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400
	300 L4	1275	0.78	1250	0.12	7.2	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400
	300 L4	1383	0.72	860	0.07	7.2	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400
	300 L4	1591	0.63	1250	0.09	7.2	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400
	300 L4	1725	0.58	860	0.06	7.2	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400
	300 L4	2153	0.46	860	0.05	7.2	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400
	300 L4	2692	0.37	1000	0.04	7.2	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400
500	300 L1	3.48	144	650	10.2	15.0	71-80-90-100-112-132	2320	2320	6910	7940	1530	2000
	300 L1	4.26	117	690	8.7	15.0	71-80-90-100-112-132	2490	2490	7350	8440	1630	2400
	300 L1	5.77	87	630	5.9	15.0	71-80-90-100-112-132	2750	2750	8040	9240	1810	2400
	300 L1	7.20	69	530	4.0	15.0	71-80-90-100-112-132	2960	2960	8600	9880	1950	2400
	300 L1	9.00	56	370	2.2	15.0	71-80-90-100-112-132	3190	3190	9190	10600	2100	2400
	300 L2	12.1	41	730	3.4	15.0	71-80-90-100-112-132	3520	3520	10000	11500	2310	2000
	300 L2	14.8	34	840	3.2	15.0	71-80-90-100-112-132	3770	3770	10700	12300	2480	2000
	300 L2	18.2	27.5	850	2.6	15.0	71-80-90-100-112-132	4030	4030	11300	13000	2650	2400
	300 L2	20.1	24.9	650	1.8	15.0	71-80-90-100-112-132	4170	4170	11700	13400	2740	2000
	300 L2	24.6	20.3	850	1.9	15.0	71-80-90-100-112-132	4460	4460	12400	14300	2930	2400
	300 L2	30.7	16.3	850	1.5	15.0	71-80-90-100-112-132	4800	4800	13300	15300	3160	2400
	300 L2	33.3	15.0	650	1.1	15.0	71-80-90-100-112-132	4930	4930	13600	15600	3240	2400
	300 L2	38.4	13.0	860	1.2	15.0	71-80-90-100-112-132	5170	5170	14200	16300	3400	2400
	300 L2	41.5	12.0	650	0.87	15.0	71-80-90-100-112-132	5310	5310	14500	16700	3490	2400
	300 L2	51.9	9.6	650	0.70	15.0	71-80-90-100-112-132	5720	5720	15600	17900	3760	2400
	300 L2	64.8	7.7	550	0.47	15.0	71-80-90-100-112-132	6160	6160	16600	19100	4050	2400
	300 L3	51.6	9.7	860	0.96	15.0	71-80-90-100-112-132	5710	5710	15500	17800	3750	2000
	300 L3	63.2	7.9	890	0.81	15.0	71-80-90-100-112-132	6110	6110	16500	19000	4020	2400
	300 L3	69.9	7.2	650	0.53	15.0	71-80-90-100-112-132	6310	6310	17000	19500	4150	2000
	300 L3	77.5	6.5	920	0.68	15.0	71-80-90-100-112-132	6540	6540	17500	20100	4300	2400
	300 L3	85.6	5.8	930	0.62	15.0	71-80-90-100-112-132	6760	6760	18100	20800	4440	2400
	300 L3	105	4.8	960	0.52	15.0	71-80-90-100-112-132	7230	7230	19200	22100	4750	2400
	300 L3	116	4.3	670	0.33	15.0	71-80-90-100-112-132	7470	7470	19800	22700	4910	2400
	300 L3	131	3.8	990	0.44	15.0	71-80-90-100-112-132	7780	7780	20500	23600	5120	2400
	300 L3	142	3.5	1010	0.41	15.0	71-80-90-100-112-132	8000	8000	21000	24200	5260	2400
	300 L3	177	2.8	1050	0.34	15.0	71-80-90-100-112-132	8610	8610	22500	25800	5660	2400
	300 L3	192	2.6	730	0.22	15.0	71-80-90-100-112-132	8850	8850	23000	26500	5820	2400
	300 L3	221	2.3	1090	0.28	15.0	71-80-90-100-112-132	9270	9270	24000	27600	6090	2400
	300 L3	240	2.1	750	0.18	15.0	71-80-90-100-112-132	9520	9520	24600	28300	6260	2400



300 L

214

1250 Nm

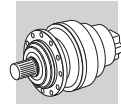
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	R _{n2} [N]					M _{n2 max} Nm
								MC/PC	MZ/PZ	HC	HZ	FZ	
500	300 L3	299	1.7	780	0.15	15.0	71-80-90-100-112-132	10300	10300	26300	30200	6740	2400
	300 L3	374	1.3	820	0.13	15.0	71-80-90-100-112-132	11000	11000	28100	32300	7260	2400
	300 L4	330	1.5	1170	0.21	12.0	71-80-90-100-112-132	10600	10600	27100	31100	6970	2400
	300 L4	403	1.2	830	0.12	12.0	71-80-90-100-112-132	11300	11300	28800	33000	7450	2400
	300 L4	447	1.1	1230	0.16	12.0	71-80-90-100-112-132	11700	11700	29700	34000	7710	2400
	300 L4	494	1.0	1250	0.15	12.0	71-80-90-100-112-132	12000	12100	30600	34000	7970	2400
	300 L4	558	0.90	1250	0.13	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400
	300 L4	616	0.81	1250	0.12	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400
	300 L4	755	0.66	1250	0.10	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400
	300 L4	819	0.61	1250	0.09	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400
	300 L4	942	0.53	1250	0.08	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400
	300 L4	1022	0.49	1250	0.07	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400
	300 L4	1108	0.45	860	0.05	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400
	300 L4	1275	0.39	1250	0.06	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400
	300 L4	1383	0.36	860	0.04	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400
	300 L4	1591	0.31	1250	0.05	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400
	300 L4	1725	0.29	860	0.03	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400
	300 L4	2153	0.23	860	0.02	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400
	300 L4	2692	0.19	1000	0.02	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400



301 L

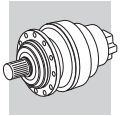
222



2460 Nm



n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	R _{n2} [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	301 L1	3.48	431	840	30	7.5	71-80-90-100-112-132	1610	1610	4970	5710	1060	3400
	301 L1	4.26	352	880	30	7.5	71-80-90-100-112-132	1720	1720	5280	6070	1130	3400
	301 L1	5.77	260	930	26	7.5	71-80-90-100-112-132	1910	1910	5790	6650	1250	3400
	301 L1	7.20	208	750	17.0	7.5	71-80-90-100-112-132	2050	2050	6180	7100	1350	3400
	301 L1	9.00	167	630	11.3	7.5	71-80-90-100-112-132	2210	2210	6610	7600	1450	3400
	301 L2	12.1	124	1220	16.8	7.5	71-80-90-100-112-132	2440	2440	7230	8300	1600	3400
	301 L2	14.8	101	1280	14.4	7.5	71-80-90-100-112-132	2610	2610	7680	8820	1720	3400
	301 L2	18.2	83	1360	12.5	7.5	71-80-90-100-112-132	2790	2790	8160	9380	1840	3400
	301 L2	20.1	75	1260	10.5	7.5	71-80-90-100-112-132	2890	2890	8410	9660	1900	3400
	301 L2	24.6	61	1490	10.1	7.5	71-80-90-100-112-132	3090	3090	8940	10300	2030	3400
	301 L2	30.7	49	1580	8.6	7.5	71-80-90-100-112-132	3330	3330	9550	11000	2190	3400
	301 L2	33.3	45	1300	6.5	7.5	71-80-90-100-112-132	3420	3420	9790	11200	2250	3400
	301 L2	38.4	39	1540	6.7	7.5	71-80-90-100-112-132	3590	3590	10200	11700	2360	3400
	301 L2	41.5	36	1300	5.2	7.5	71-80-90-100-112-132	3680	3680	10500	12000	2420	3400
	301 L2	51.9	28.9	1300	4.2	7.5	71-80-90-100-112-132	3970	3970	11200	12900	2610	3400
	301 L2	64.8	23.1	1150	3.0	7.5	71-80-90-100-112-132	4270	4270	12000	13700	2810	3400
	301 L3	51.6	29.1	1630	5.4	7.5	71-80-90-100-112-132	3960	3960	11200	12800	2600	3400
	301 L3	63.2	23.7	1650	4.5	7.5	71-80-90-100-112-132	4240	4240	11900	13600	2780	3400
	301 L3	69.9	21.5	1300	3.2	7.5	71-80-90-100-112-132	4380	4380	12200	14000	2880	3400
	301 L3	77.5	19.4	1670	3.7	7.5	71-80-90-100-112-132	4530	4530	12600	14500	2980	3400
301 L3	85.6	17.5	1680	3.4	7.5	71-80-90-100-112-132	4680	4680	13000	14900	3080	3400	
301 L3	105	14.3	1700	2.8	7.5	71-80-90-100-112-132	5010	5010	13800	15900	3300	3400	
301 L3	116	13.0	1300	1.9	7.5	71-80-90-100-112-132	5180	5180	14200	16300	3410	3400	
301 L3	131	11.5	1720	2.3	7.5	71-80-90-100-112-132	5400	5400	14800	17000	3550	3400	
301 L3	142	10.6	1720	2.1	7.5	71-80-90-100-112-132	5540	5540	15100	17400	3650	3400	
301 L3	177	8.5	1770	1.7	7.5	71-80-90-100-112-132	5970	5970	16200	18600	3920	3400	
301 L3	192	7.8	1300	1.2	7.5	71-80-90-100-112-132	6130	6130	16600	19000	4030	3400	
301 L3	221	6.8	1790	1.4	7.5	71-80-90-100-112-132	6430	6430	17300	19800	4230	3400	
301 L3	240	6.3	1300	0.93	7.5	71-80-90-100-112-132	6600	6600	17700	20300	4340	3400	
301 L3	299	5.0	1300	0.75	7.5	71-80-90-100-112-132	7110	7110	18900	21700	4670	3400	
301 L3	374	4.0	1350	0.62	7.5	71-80-90-100-112-132	7660	7660	20200	23200	5030	3400	
301 L4	330	4.5	1920	1.0	6.0	71-80-90-100-112-132	7350	7350	19500	22400	4830	3400	
301 L4	403	3.7	1370	0.60	6.0	71-80-90-100-112-132	7850	7850	20700	23800	5160	3400	
301 L4	447	3.4	2030	0.81	6.0	71-80-90-100-112-132	8130	8130	21300	24500	5340	3400	
301 L4	494	3.0	2070	0.74	6.0	71-80-90-100-112-132	8400	8400	22000	25300	5520	3400	

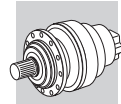


301 L							222	2460 Nm					
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	301 L4	558	2.7	2110	0.67	6.0	71-80-90-100-112-132	8750	8750	22800	26200	5750	3400
	301 L4	616	2.4	2150	0.62	6.0	71-80-90-100-112-132	9050	9050	23500	27000	5950	3400
	301 L4	755	2.0	2220	0.52	6.0	71-80-90-100-112-132	9680	9680	25000	28700	6360	3400
	301 L4	819	1.8	2240	0.49	6.0	71-80-90-100-112-132	9940	9940	25600	29400	6540	3400
	301 L4	942	1.6	2290	0.43	6.0	71-80-90-100-112-132	10400	10400	26700	30700	6850	3400
	301 L4	1022	1.5	2320	0.40	6.0	71-80-90-100-112-132	10700	10700	27300	31400	7040	3400
	301 L4	1108	1.4	1630	0.26	6.0	71-80-90-100-112-132	11000	11000	28000	32200	7230	3400
	301 L4	1275	1.2	2400	0.33	6.0	71-80-90-100-112-132	11500	11500	29200	33600	7580	3400
	301 L4	1383	1.1	1700	0.22	6.0	71-80-90-100-112-132	11800	11800	29900	34000	7790	3400
	301 L4	1591	0.94	2000	0.22	6.0	71-80-90-100-112-132	12000	12400	31000	34000	8000	3400
	301 L4	1725	0.87	1720	0.18	6.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400
	301 L4	2153	0.70	1720	0.14	6.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400
	301 L4	2692	0.56	1720	0.11	6.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400
1000	301 L1	3.48	287	950	29	9.0	71-80-90-100-112-132	1840	1840	5610	6450	1210	3400
	301 L1	4.26	235	990	25	9.0	71-80-90-100-112-132	1970	1970	5970	6860	1300	3400
	301 L1	5.77	173	1050	19.7	9.0	71-80-90-100-112-132	2180	2180	6530	7510	1430	3400
	301 L1	7.20	139	850	12.8	9.0	71-80-90-100-112-132	2350	2350	6980	8020	1540	3400
	301 L1	9.00	111	710	8.5	9.0	71-80-90-100-112-132	2530	2530	7470	8580	1660	3400
	301 L2	12.1	83	1330	12.3	9.0	71-80-90-100-112-132	2790	2790	8160	9380	1840	3400
	301 L2	14.8	67	1440	10.8	9.0	71-80-90-100-112-132	2990	2990	8670	9970	1970	3400
	301 L2	18.2	55	1530	9.4	9.0	71-80-90-100-112-132	3200	3200	9220	10600	2100	3400
	301 L2	20.1	50	1300	7.2	9.0	71-80-90-100-112-132	3310	3310	9500	10900	2170	3400
	301 L2	24.6	41	1600	7.2	9.0	71-80-90-100-112-132	3540	3540	10100	11600	2330	3400
	301 L2	30.7	33	1620	5.9	9.0	71-80-90-100-112-132	3810	3810	10800	12400	2500	3400
	301 L2	33.3	30	1300	4.3	9.0	71-80-90-100-112-132	3910	3910	11100	12700	2570	3400
	301 L2	38.4	26.1	1550	4.5	9.0	71-80-90-100-112-132	4100	4100	11500	13300	2700	3400
	301 L2	41.5	24.1	1300	3.5	9.0	71-80-90-100-112-132	4210	4210	11800	13600	2770	3400
	301 L2	51.9	19.3	1300	2.8	9.0	71-80-90-100-112-132	4540	4540	12600	14500	2980	3400
	301 L2	64.8	15.4	1150	2.0	9.0	71-80-90-100-112-132	4890	4890	13500	15500	3210	3400
	301 L3	51.6	19.4	1670	3.7	9.0	71-80-90-100-112-132	4530	4530	12600	14500	2980	3400
	301 L3	63.2	15.8	1690	3.1	9.0	71-80-90-100-112-132	4850	4850	13400	15400	3190	3400
	301 L3	69.9	14.3	1300	2.1	9.0	71-80-90-100-112-132	5010	5010	13800	15900	3290	3400
	301 L3	77.5	12.9	1710	2.5	9.0	71-80-90-100-112-132	5190	5190	14200	16400	3410	3400
	301 L3	85.6	11.7	1710	2.3	9.0	71-80-90-100-112-132	5360	5360	14700	16900	3530	3400
	301 L3	105	9.5	1740	1.9	9.0	71-80-90-100-112-132	5740	5740	15600	17900	3770	3400
	301 L3	116	8.6	1300	1.3	9.0	71-80-90-100-112-132	5930	5930	16100	18500	3900	3400
	301 L3	131	7.6	1790	1.6	9.0	71-80-90-100-112-132	6180	6180	16700	19200	4060	3400
	301 L3	142	7.0	1810	1.5	9.0	71-80-90-100-112-132	6350	6350	17100	19600	4170	3400
	301 L3	177	5.6	1860	1.2	9.0	71-80-90-100-112-132	6830	6830	18300	21000	4490	3400
	301 L3	192	5.2	1300	0.78	9.0	71-80-90-100-112-132	7020	7020	18700	21500	4620	3400
	301 L3	221	4.5	1850	0.96	9.0	71-80-90-100-112-132	7360	7360	19500	22400	4840	3400
	301 L3	240	4.2	1340	0.64	9.0	71-80-90-100-112-132	7560	7560	20000	23000	4970	3400
	301 L3	299	3.3	1390	0.53	9.0	71-80-90-100-112-132	8140	8140	21400	24500	5350	3400
	301 L3	374	2.7	1440	0.44	9.0	71-80-90-100-112-132	8770	8770	22800	26200	5760	3400
	301 L4	330	3.0	2070	0.74	7.2	71-80-90-100-112-132	8410	8410	22000	25300	5530	3400
	301 L4	403	2.5	1460	0.43	7.2	71-80-90-100-112-132	8990	8990	23400	26800	5910	3400
	301 L4	447	2.2	2180	0.58	7.2	71-80-90-100-112-132	9300	9300	24100	27700	6120	3400
	301 L4	494	2.0	2210	0.53	7.2	71-80-90-100-112-132	9620	9620	24800	28500	6320	3400
	301 L4	558	1.8	2250	0.48	7.2	71-80-90-100-112-132	10000	10000	25800	29600	6590	3400
	301 L4	616	1.6	2290	0.44	7.2	71-80-90-100-112-132	10400	10400	26500	30500	6810	3400
	301 L4	755	1.3	2360	0.37	7.2	71-80-90-100-112-132	11100	11100	28200	32400	7280	3400
	301 L4	819	1.2	2390	0.34	7.2	71-80-90-100-112-132	11400	11400	28900	33200	7480	3400
	301 L4	942	1.1	2440	0.31	7.2	71-80-90-100-112-132	11900	11900	30100	34000	7840	3400
	301 L4	1022	0.98	2460	0.28	7.2	71-80-90-100-112-132	12000	12300	30900	34000	8000	3400
	301 L4	1108	0.90	1720	0.18	7.2	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400
301 L4	1275	0.78	2460	0.23	7.2	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	
301 L4	1383	0.72	1720	0.15	7.2	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	
301 L4	1591	0.63	2000	0.15	7.2	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	
301 L4	1725	0.58	1720	0.12	7.2	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	
301 L4	2153	0.46	1720	0.09	7.2	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	
301 L4	2692	0.37	1720	0.08	7.2	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	
500	301 L1	3.48	144	1170	18.1	15.0	71-80-90-100-112-132	2320	2320	6910	7940	1530	3400



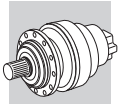
301 L							222	2460 Nm					
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 	MC	MZ	Rn ₂ [N] HC/PC	HZ/PZ	FZ	M _{n2 max} Nm
500	301 L1	4.26	117	1220	15.4	15.0	71-80-90-100-112-132	2490	2490	7350	8440	1630	3400
	301 L1	5.77	87	1250	11.7	15.0	71-80-90-100-112-132	2750	2750	8040	9240	1810	3400
	301 L1	7.20	69	1050	7.8	15.0	71-80-90-100-112-132	2960	2960	8600	9880	1950	3400
	301 L1	9.00	56	730	4.4	15.0	71-80-90-100-112-132	3190	3190	9190	10600	2100	3400
	301 L2	12.1	41	1430	6.6	15.0	71-80-90-100-112-132	3520	3520	10000	11500	2310	3400
	301 L2	14.8	34	1620	6.1	15.0	71-80-90-100-112-132	3770	3770	10700	12300	2480	3400
	301 L2	18.2	27.5	1630	5.0	15.0	71-80-90-100-112-132	4030	4030	11300	13000	2650	3400
	301 L2	20.1	24.9	1300	3.6	15.0	71-80-90-100-112-132	4170	4170	11700	13400	2740	3400
	301 L2	24.6	20.3	1660	3.8	15.0	71-80-90-100-112-132	4460	4460	12400	14300	2930	3400
	301 L2	30.7	16.3	1680	3.1	15.0	71-80-90-100-112-132	4800	4800	13300	15300	3160	3400
	301 L2	33.3	15.0	1300	2.2	15.0	71-80-90-100-112-132	4930	4930	13600	15600	3240	3400
	301 L2	38.4	13.0	1560	2.3	15.0	71-80-90-100-112-132	5170	5170	14200	16300	3400	3400
301 L2	41.5	12.0	1300	1.7	15.0	71-80-90-100-112-132	5310	5310	14500	16700	3490	3400	
301 L2	51.9	9.6	1300	1.4	15.0	71-80-90-100-112-132	5720	5720	15600	17900	3760	3400	
301 L2	64.8	7.7	1150	0.99	15.0	71-80-90-100-112-132	6160	6160	16600	19100	4050	3400	
301 L3	51.6	9.7	1740	1.9	15.0	71-80-90-100-112-132	5710	5710	15500	17800	3750	3400	
301 L3	63.2	7.9	1780	1.6	15.0	71-80-90-100-112-132	6110	6110	16500	19000	4020	3400	
301 L3	69.9	7.2	1300	1.1	15.0	71-80-90-100-112-132	6310	6310	17000	19500	4150	3400	
301 L3	77.5	6.5	1830	1.4	15.0	71-80-90-100-112-132	6540	6540	17500	20100	4300	3400	
301 L3	85.6	5.8	1850	1.2	15.0	71-80-90-100-112-132	6760	6760	18100	20800	4440	3400	
301 L3	105	4.8	1910	1.0	15.0	71-80-90-100-112-132	7230	7230	19200	22100	4750	3400	
301 L3	116	4.3	1330	0.66	15.0	71-80-90-100-112-132	7470	7470	19800	22700	4910	3400	
301 L3	131	3.8	1980	0.87	15.0	71-80-90-100-112-132	7780	7780	20500	23600	5120	3400	
301 L3	142	3.5	2010	0.81	15.0	71-80-90-100-112-132	8000	8000	21000	24200	5260	3400	
301 L3	177	2.8	2090	0.68	15.0	71-80-90-100-112-132	8610	8610	22500	25800	5660	3400	
301 L3	192	2.6	1450	0.43	15.0	71-80-90-100-112-132	8850	8850	23000	26500	5820	3400	
301 L3	221	2.3	2000	0.52	15.0	71-80-90-100-112-132	9270	9270	24000	27600	6090	3400	
301 L3	240	2.1	1510	0.36	15.0	71-80-90-100-112-132	9520	9520	24600	28300	6260	3400	
301 L3	299	1.7	1570	0.30	15.0	71-80-90-100-112-132	10300	10300	26300	30200	6740	3400	
301 L3	374	1.3	1630	0.25	15.0	71-80-90-100-112-132	11000	11000	28100	32300	7260	3400	
301 L4	330	1.5	2310	0.41	12.0	71-80-90-100-112-132	10600	10600	27100	31100	6970	3400	
301 L4	403	1.2	1650	0.24	12.0	71-80-90-100-112-132	11300	11300	28800	33000	7450	3400	
301 L4	447	1.1	2420	0.32	12.0	71-80-90-100-112-132	11700	11700	29700	34000	7710	3400	
301 L4	494	1.0	2460	0.29	12.0	71-80-90-100-112-132	12000	12100	30600	34000	7970	3400	
301 L4	558	0.90	2460	0.26	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	
301 L4	616	0.81	2460	0.24	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	
301 L4	755	0.66	2460	0.19	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	
301 L4	819	0.61	2460	0.18	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	
301 L4	942	0.53	2460	0.15	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	
301 L4	1022	0.49	2460	0.14	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	
301 L4	1108	0.45	1720	0.09	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	
301 L4	1275	0.39	2460	0.11	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	
301 L4	1383	0.36	1720	0.07	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	
301 L4	1591	0.31	2000	0.07	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	
301 L4	1725	0.29	1720	0.06	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	
301 L4	2153	0.23	1720	0.05	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	
301 L4	2692	0.19	1720	0.04	12.0	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	

303 L							230	2970 Nm					
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 	MC	MZ	Rn ₂ [N] HC/PC	HZ/PZ	FZ	M _{n2 max} Nm
1500	303 L1	3.60	417	1380	40	11.0	132-160-180-200	5010	5780	10300	12300	3210	5200
	303 L1	4.25	353	1430	40	11.0	132-160-180-200	5290	6110	10800	13000	3400	5200
	303 L1	5.33	281	1490	40	11.0	132-160-180-200	5710	6590	11500	13900	3660	5200
	303 L1	6.20	242	1400	36	11.0	132-160-180-200	6000	6930	12100	14500	3850	5200
	303 L1	7.50	200	1220	26	11.0	132-160-180-200	6400	7390	12800	15400	4100	5200
	303 L1	9.67	155	750	12.6	11.0	132-160-180-200	6960	8040	13800	16600	4470	5200
303 L2	12.5	120	1640	20.0	9.0	71-80-90-100-112-132-160	7590	8760	14900	17900	4870	5200	



303 L	230	2970 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	303 L2	15.3	98	1710	18.6	9.0	71-80-90-100-112-132-160	8120	9380	15800	19100	5210	5200
	303 L2	18.1	83	2020	18.6	9.0	71-80-90-100-112-132-160	8580	9910	16600	20000	5510	5200
	303 L2	20.8	72	1820	14.6	9.0	71-80-90-100-112-132-160	8980	10400	17300	20900	5760	5200
	303 L2	22.7	66	2100	15.4	9.0	71-80-90-100-112-132-160	9260	10700	17800	21400	5940	5200
	303 L2	24.5	61	2150	14.6	9.0	71-80-90-100-112-132-160	9490	11000	18200	21900	6090	5200
	303 L2	26.4	57	1820	11.5	9.0	71-80-90-100-112-132-160	9740	11200	18600	22400	6250	5200
	303 L2	30.8	49	2140	11.6	9.0	71-80-90-100-112-132-160	10200	11800	19500	23500	6570	5200
	303 L2	35.8	42	1820	8.5	9.0	71-80-90-100-112-132-160	10800	12400	20400	24600	6910	5200
	303 L2	38.4	39	2150	9.3	9.0	71-80-90-100-112-132-160	11000	12700	20900	25100	7070	5200
	303 L2	44.6	34	1820	6.8	9.0	71-80-90-100-112-132-160	11600	13400	21800	26300	7440	5200
	303 L2	55.8	26.9	1820	5.4	9.0	71-80-90-100-112-132-160	12500	14400	23300	28100	8010	5200
	303 L3	53.4	28.1	2170	7.0	7.5	71-80-90-100-112-132-160	12300	14200	23000	27700	7900	5200
	303 L3	63.1	23.8	2510	6.8	7.5	71-80-90-100-112-132-160	13000	15000	24200	29100	8340	5200
	303 L3	72.3	20.8	2230	5.3	7.5	71-80-90-100-112-132-160	13600	15700	25200	30300	8730	5200
	303 L3	77.2	19.4	2520	5.6	7.5	71-80-90-100-112-132-160	13900	16100	25700	30900	8930	5200
	303 L3	90.2	16.6	2250	4.3	7.5	71-80-90-100-112-132-160	14700	16900	26900	32400	9400	5200
	303 L3	105	14.4	2580	4.2	7.5	71-80-90-100-112-132-160	15400	17800	28200	33900	9880	5200
	303 L3	113	13.3	1820	2.8	7.5	71-80-90-100-112-132-160	15800	18200	28800	34700	10100	5200
	303 L3	124	12.1	1820	2.5	7.5	71-80-90-100-112-132-160	16300	18800	29700	35700	10500	5200
	303 L3	141	10.6	2610	3.2	7.5	71-80-90-100-112-132-160	17000	19700	30800	37100	10900	5200
	303 L3	152	9.8	1820	2.1	7.5	71-80-90-100-112-132-160	17500	20200	31500	37900	11200	5200
	303 L3	164	9.2	2200	2.3	7.5	71-80-90-100-112-132-160	17900	20600	32200	38800	11500	5200
	303 L3	178	8.5	2210	2.1	7.5	71-80-90-100-112-132-160	18400	21200	33000	39700	11800	5200
	303 L3	190	7.9	1830	1.7	7.5	71-80-90-100-112-132-160	18800	21700	33700	40600	12100	5200
	303 L3	220	6.8	2250	1.8	7.5	71-80-90-100-112-132-160	19700	22800	35200	42400	12700	5200
	303 L3	258	5.8	1840	1.2	7.5	71-80-90-100-112-132-160	20800	24000	36900	44400	13300	5200
	303 L3	276	5.4	2230	1.4	7.5	71-80-90-100-112-132-160	21300	24600	37700	45400	13700	5200
	303 L3	321	4.7	1860	1.00	7.5	71-80-90-100-112-132-160	22400	25800	39400	47500	14400	5200
	303 L3	389	3.9	1690	0.75	7.5	71-80-90-100-112-132-160	23900	27500	41800	50300	15300	5200
	303 L3	402	3.7	1940	0.83	7.5	71-80-90-100-112-132-160	24100	27800	42200	50700	15500	5200
	303 L4	413	3.6	2360	1.0	6.0	71-80-90-100-112-132-160	24300	28100	42500	51200	15600	5200
	303 L4	446	3.4	2810	1.1	6.0	71-80-90-100-112-132-160	25000	28800	43500	52400	16000	5200
	303 L4	492	3.0	2690	0.97	6.0	71-80-90-100-112-132-160	25800	29800	44800	53900	16600	5200
	303 L4	556	2.7	2810	0.90	6.0	71-80-90-100-112-132-160	26900	31000	46500	55900	17200	5200
	303 L4	649	2.3	2320	0.63	6.0	71-80-90-100-112-132-160	28300	32700	48700	58600	18200	5200
	303 L4	718	2.1	2150	0.53	6.0	71-80-90-100-112-132-160	29300	33800	50200	60400	18800	5200
	303 L4	816	1.8	2720	0.59	6.0	71-80-90-100-112-132-160	30500	35300	52200	62800	19600	5200
	303 L4	896	1.7	2230	0.44	6.0	71-80-90-100-112-132-160	31500	36400	53700	64600	20200	5200
	303 L4	1018	1.5	2740	0.48	6.0	71-80-90-100-112-132-160	32900	38000	55800	67100	21100	5200
	303 L4	1098	1.4	2310	0.37	6.0	71-80-90-100-112-132-160	33700	38900	57000	68600	21600	5200
	303 L4	1278	1.2	2790	0.39	6.0	71-80-90-100-112-132-160	35500	40900	59700	71800	22800	5200
	303 L4	1370	1.1	2400	0.31	6.0	71-80-90-100-112-132-160	36000	41900	60900	73300	23300	5200
303 L4	1586	0.95	2250	0.25	6.0	71-80-90-100-112-132-160	36000	42000	63700	74000	24000	5200	
303 L4	1854	0.81	2440	0.23	6.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200	
303 L4	1991	0.75	2850	0.25	6.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200	
303 L4	2243	0.67	2000	0.16	6.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200	
303 L4	2799	0.54	2000	0.13	6.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200	
1000	303 L1	3.60	278	1560	40	13.2	132-160-180-200	5730	6620	11600	13900	3680	5200
	303 L1	4.25	235	1620	40	13.2	132-160-180-200	6060	7000	12200	14600	3890	5200
	303 L1	5.33	188	1680	34	13.2	132-160-180-200	6540	7550	13000	15700	4190	5200
	303 L1	6.20	161	1580	27	13.2	132-160-180-200	6870	7930	13600	16400	4410	5200
	303 L1	7.50	133	1380	19.8	13.2	132-160-180-200	7320	8450	14400	17400	4700	5200
	303 L1	9.67	103	850	9.5	13.2	132-160-180-200	7970	9200	15600	18700	5110	5200
	303 L2	12.5	80	1850	16.4	10.8	71-80-90-100-112-132-160	8690	10000	16800	20300	5570	5200
	303 L2	15.3	65	1940	14.0	10.8	71-80-90-100-112-132-160	9300	10700	17900	21500	5960	5200
	303 L2	18.1	55	2280	14.0	10.8	71-80-90-100-112-132-160	9830	11300	18800	22600	6300	5200
	303 L2	20.8	48	2030	10.9	10.8	71-80-90-100-112-132-160	10300	11900	19600	23600	6600	5200
	303 L2	22.7	44	2140	10.5	10.8	71-80-90-100-112-132-160	10600	12200	20100	24200	6800	5200
	303 L2	24.5	41	2320	10.5	10.8	71-80-90-100-112-132-160	10900	12500	20600	24800	6970	5200
	303 L2	26.4	38	1820	7.7	10.8	71-80-90-100-112-132-160	11100	12900	21100	25300	7150	5200
	303 L2	30.8	33	2160	7.8	10.8	71-80-90-100-112-132-160	11700	13500	22000	26500	7520	5200
	303 L2	35.8	28.0	1820	5.7	10.8	71-80-90-100-112-132-160	12300	14200	23100	27700	7910	5200
	303 L2	38.4	26.0	2160	6.3	10.8	71-80-90-100-112-132-160	12600	14600	23600	28300	8100	5200

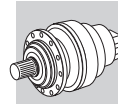


303 L

230

2970 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	R _{n2} [N]					M _{n2 max} Nm	
								MC	MZ	HC/PC	HZ/PZ	FZ		
1000	303 L2	44.6	22.4	1820	4.5	10.8	71-80-90-100-112-132-160	13300	15300	24600	29600	8510	5200	
	303 L2	55.8	17.9	1820	3.6	10.8	71-80-90-100-112-132-160	14300	16500	26300	31700	9170	5200	
	303 L3	53.4	18.7	2230	4.8	9.0	71-80-90-100-112-132-160	14100	16300	26000	31300	9040	5200	
	303 L3	63.1	15.9	2570	4.7	9.0	71-80-90-100-112-132-160	14900	17200	27300	32900	9550	5200	
	303 L3	72.3	13.8	2270	3.6	9.0	71-80-90-100-112-132-160	15600	18000	28500	34300	10000	5200	
	303 L3	77.2	12.9	2600	3.9	9.0	71-80-90-100-112-132-160	15900	18400	29000	34900	10200	5200	
	303 L3	90.2	11.1	2300	2.9	9.0	71-80-90-100-112-132-160	16800	19400	30400	36600	10800	5200	
	303 L3	105	9.6	2660	2.9	9.0	71-80-90-100-112-132-160	17600	20300	31800	38300	11300	5200	
	303 L3	113	8.9	1820	1.9	9.0	71-80-90-100-112-132-160	18100	20900	32500	39100	11600	5200	
	303 L3	124	8.0	1830	1.7	9.0	71-80-90-100-112-132-160	18700	21600	33500	40300	12000	5200	
	303 L3	141	7.1	2630	2.1	9.0	71-80-90-100-112-132-160	19500	22500	34800	41900	12500	5200	
	303 L3	152	6.6	1830	1.4	9.0	71-80-90-100-112-132-160	20000	23100	35600	42900	12800	5200	
	303 L3	164	6.1	2220	1.6	9.0	71-80-90-100-112-132-160	20500	23600	36400	43800	13100	5200	
	303 L3	178	5.6	2220	1.4	9.0	71-80-90-100-112-132-160	21000	24300	37300	44900	13500	5200	
	303 L3	190	5.3	1840	1.1	9.0	71-80-90-100-112-132-160	21500	24800	38100	45800	13800	5200	
	303 L3	220	4.5	2240	1.2	9.0	71-80-90-100-112-132-160	22600	26100	39800	47900	14500	5200	
	303 L3	258	3.9	1920	0.86	9.0	71-80-90-100-112-132-160	23800	27500	41700	50200	15300	5200	
	303 L3	276	3.6	2330	0.97	9.0	71-80-90-100-112-132-160	24400	28100	42600	51200	15600	5200	
	303 L3	321	3.1	2000	0.71	9.0	71-80-90-100-112-132-160	25600	29600	44600	53600	16400	5200	
	303 L3	389	2.6	1750	0.52	9.0	71-80-90-100-112-132-160	27300	31500	47200	56800	17500	5200	
	303 L3	402	2.5	2080	0.59	9.0	71-80-90-100-112-132-160	27600	31900	47600	57300	17700	5200	
	303 L4	413	2.4	2530	0.72	7.2	71-80-90-100-112-132-160	27900	32200	48000	57800	17900	5200	
	303 L4	446	2.2	2830	0.75	7.2	71-80-90-100-112-132-160	28600	33000	49100	59100	18300	5200	
	303 L4	492	2.0	2720	0.65	7.2	71-80-90-100-112-132-160	29500	34100	50600	60900	19000	5200	
	303 L4	556	1.8	2870	0.61	7.2	71-80-90-100-112-132-160	30800	35500	52500	63200	19700	5200	
	303 L4	649	1.5	2360	0.43	7.2	71-80-90-100-112-132-160	32400	37400	55000	66200	20800	5200	
	303 L4	718	1.4	2300	0.38	7.2	71-80-90-100-112-132-160	33500	38700	56700	68200	21500	5200	
	303 L4	816	1.2	2750	0.40	7.2	71-80-90-100-112-132-160	35000	40400	58900	70900	22400	5200	
	303 L4	896	1.1	2390	0.32	7.2	71-80-90-100-112-132-160	36000	41600	60600	72900	23100	5200	
	303 L4	1018	0.98	2770	0.32	7.2	71-80-90-100-112-132-160	36000	42000	63000	74000	24000	5200	
	303 L4	1098	0.91	2440	0.26	7.2	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200	
	303 L4	1278	0.78	2850	0.26	7.2	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200	
	303 L4	1370	0.73	2440	0.21	7.2	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200	
	303 L4	1586	0.63	2250	0.17	7.2	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200	
	303 L4	1854	0.54	2440	0.16	7.2	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200	
	303 L4	1991	0.50	2850	0.17	7.2	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200	
	303 L4	2243	0.45	2000	0.11	7.2	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200	
	303 L4	2799	0.36	2000	0.08	7.2	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200	
	500	303 L1	3.60	139	1920	29	22	132-160-180-200	7220	8340	14300	17200	4630	5200
		303 L1	4.25	118	1990	25	22	132-160-180-200	7630	8810	15000	18000	4900	5200
303 L1		5.33	94	2040	21	22	132-160-180-200	8240	9510	16000	19300	5280	5200	
303 L1		6.20	81	1820	15.8	22	132-160-180-200	8660	10000	16800	20200	5560	5200	
303 L1		7.50	67	1590	11.4	22	132-160-180-200	9230	10700	17800	21400	5920	5200	
303 L1		9.67	52	860	4.8	22	132-160-180-200	10000	11600	19200	23100	6440	5200	
303 L2		12.5	40	2150	9.6	18.0	71-80-90-100-112-132-160	10900	12600	20700	24900	7020	5200	
303 L2		15.3	33	2150	7.8	18.0	71-80-90-100-112-132-160	11700	13500	22000	26500	7510	5200	
303 L2		18.1	27.6	2460	7.5	18.0	71-80-90-100-112-132-160	12400	14300	23100	27800	7940	5200	
303 L2		20.8	24.1	2110	5.7	18.0	71-80-90-100-112-132-160	13000	15000	24100	29000	8310	5200	
303 L2		22.7	22.0	2170	5.3	18.0	71-80-90-100-112-132-160	13400	15400	24800	29800	8570	5200	
303 L2		24.5	20.4	2460	5.6	18.0	71-80-90-100-112-132-160	13700	15800	25300	30500	8780	5200	
303 L2		26.4	18.9	1820	3.8	18.0	71-80-90-100-112-132-160	14000	16200	25900	31200	9010	5200	
303 L2		30.8	16.3	2180	3.9	18.0	71-80-90-100-112-132-160	14800	17100	27100	32600	9480	5200	
303 L2		35.8	14.0	1820	2.8	18.0	71-80-90-100-112-132-160	15500	17900	28400	34200	9960	5200	
303 L2		38.4	13.0	2190	3.2	18.0	71-80-90-100-112-132-160	15900	18400	29000	34900	10200	5200	
303 L2		44.6	11.2	1820	2.3	18.0	71-80-90-100-112-132-160	16700	19300	30300	36500	10700	5200	
303 L2		55.8	9.0	1820	1.8	18.0	71-80-90-100-112-132-160	18000	20800	32400	39000	11600	5200	
303 L3		53.4	9.4	2310	2.5	15.0	71-80-90-100-112-132-160	17800	20500	32000	38500	11400	5200	
303 L3		63.1	7.9	2700	2.5	15.0	71-80-90-100-112-132-160	18800	21700	33600	40500	12000	5200	
303 L3		72.3	6.9	2310	1.8	15.0	71-80-90-100-112-132-160	19600	22700	35100	42200	12600	5200	
303 L3		77.2	6.5	2750	2.0	15.0	71-80-90-100-112-132-160	20100	23200	35800	43000	12900	5200	
303 L3		90.2	5.5	2310	1.5	15.0	71-80-90-100-112-132-160	21100	24400	37500	45100	13600	5200	
303 L3		105	4.8	2810	1.5	15.0	71-80-90-100-112-132-160	22200	25600	39200	47100	14200	5200	

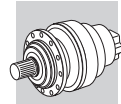




303 L	230	2970 Nm
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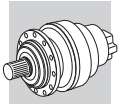
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	R _{n2} [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
500	303 L3	113	4.4	1880	0.96	15.0	71-80-90-100-112-132-160	22800	26300	40100	48200	14600	5200
	303 L3	124	4.0	1910	0.88	15.0	71-80-90-100-112-132-160	23500	27200	41300	49600	15100	5200
	303 L3	141	3.5	2670	1.1	15.0	71-80-90-100-112-132-160	24600	28400	42900	51600	15800	5200
	303 L3	152	3.3	1980	0.75	15.0	71-80-90-100-112-132-160	25200	29100	43900	52800	16200	5200
	303 L3	164	3.1	2430	0.85	15.0	71-80-90-100-112-132-160	25800	29800	44800	53900	16500	5200
	303 L3	178	2.8	2470	0.80	15.0	71-80-90-100-112-132-160	26500	30600	45900	55200	17000	5200
	303 L3	190	2.6	2060	0.62	15.0	71-80-90-100-112-132-160	27100	31300	46900	56400	17400	5200
	303 L3	220	2.3	2210	0.57	15.0	71-80-90-100-112-132-160	28500	32900	49000	58900	18300	5200
	303 L3	258	1.9	2170	0.48	15.0	71-80-90-100-112-132-160	30000	34600	51300	61700	19200	5200
	303 L3	276	1.8	2580	0.54	15.0	71-80-90-100-112-132-160	30700	35400	52400	63100	19700	5200
	303 L3	321	1.6	2260	0.40	15.0	71-80-90-100-112-132-160	32300	37300	54900	66000	20700	5200
	303 L3	389	1.3	1930	0.28	15.0	71-80-90-100-112-132-160	34400	39700	58100	69900	22100	5200
	303 L3	402	1.2	2350	0.34	15.0	71-80-90-100-112-132-160	34800	40200	58600	70600	22300	5200
	303 L4	413	1.2	2780	0.40	12.0	71-80-90-100-112-132-160	35100	40500	59100	71200	22500	5200
	303 L4	446	1.1	2950	0.39	12.0	71-80-90-100-112-132-160	36000	41600	60500	72800	23100	5200
	303 L4	492	1.0	2770	0.33	12.0	71-80-90-100-112-132-160	36000	42000	62300	74000	23900	5200
	303 L4	556	0.90	2970	0.32	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200
	303 L4	649	0.77	2410	0.22	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200
	303 L4	718	0.70	2440	0.20	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200
	303 L4	816	0.61	2770	0.20	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200
	303 L4	896	0.56	2440	0.16	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200
	303 L4	1018	0.49	2770	0.16	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200
	303 L4	1098	0.46	2440	0.13	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200
	303 L4	1278	0.39	2850	0.13	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200
	303 L4	1370	0.36	2440	0.11	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200
	303 L4	1586	0.32	2250	0.08	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200
	303 L4	1854	0.27	2440	0.08	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200
	303 L4	1991	0.25	2850	0.08	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200
	303 L4	2243	0.22	2000	0.05	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200
	303 L4	2799	0.18	2000	0.04	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	5200



304 L	240	3960 Nm
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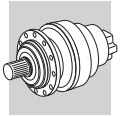
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	R _{n2} [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	304 L1	3.60	417	1840	50	12.0	132-160-180-200	5010	5780	10300	12300	3210	7300
	304 L1	4.25	353	1900	50	12.0	132-160-180-200	5290	6110	10800	13000	3400	7300
	304 L1	5.33	281	1990	50	12.0	132-160-180-200	5710	6590	11500	13900	3660	7300
	304 L1	6.57	228	1870	46	12.0	132-160-180-200	6120	7070	12300	14800	3930	7300
	304 L2	12.5	120	2680	30	9.0	71-80-90-100-112-132-160	7590	8760	14900	17900	4870	7300
	304 L2	15.3	98	2840	30	9.0	71-80-90-100-112-132-160	8120	9380	15800	19100	5210	7300
	304 L2	18.1	83	2940	27	9.0	71-80-90-100-112-132-160	8580	9910	16600	20000	5510	7300
	304 L2	20.8	72	2960	24	9.0	71-80-90-100-112-132-160	8980	10400	17300	20900	5760	7300
	304 L2	22.7	66	2790	21	9.0	71-80-90-100-112-132-160	9260	10700	17800	21400	5940	7300
	304 L2	24.5	61	3230	22	9.0	71-80-90-100-112-132-160	9490	11000	18200	21900	6090	7300
	304 L2	30.8	49	2850	15.5	9.0	71-80-90-100-112-132-160	10200	11800	19500	23500	6570	7300
	304 L2	38.4	39	2850	12.4	9.0	71-80-90-100-112-132-160	11000	12700	20900	25100	7070	7300
	304 L2	47.3	32	2390	8.4	9.0	71-80-90-100-112-132-160	11800	13600	22200	26700	7580	7300
	304 L2	59.1	25.4	2390	6.7	9.0	71-80-90-100-112-132-160	12700	14700	23700	28600	8170	7300
	304 L3	43.6	34	3190	12.6	7.5	71-80-90-100-112-132-160	11500	13300	21700	26100	7380	7300
	304 L3	53.4	28.1	3230	10.4	7.5	71-80-90-100-112-132-160	12300	14200	23000	27700	7900	7300
	304 L3	63.1	23.8	3480	9.5	7.5	71-80-90-100-112-132-160	13000	15000	24200	29100	8340	7300
	304 L3	72.3	20.8	3290	7.8	7.5	71-80-90-100-112-132-160	13600	15700	25200	30300	8730	7300
	304 L3	77.2	19.4	3490	7.8	7.5	71-80-90-100-112-132-160	13900	16100	25700	30900	8930	7300
	304 L3	90.2	16.6	3320	6.3	7.5	71-80-90-100-112-132-160	14700	16900	26900	32400	9400	7300
	304 L3	105	14.4	3520	5.8	7.5	71-80-90-100-112-132-160	15400	17800	28200	33900	9880	7300
	304 L3	111	13.6	3380	5.3	7.5	71-80-90-100-112-132-160	15700	18100	28600	34500	10100	7300
	304 L3	130	11.5	3530	4.7	7.5	71-80-90-100-112-132-160	16600	19100	30100	36200	10600	7300
	304 L3	141	10.6	3540	4.3	7.5	71-80-90-100-112-132-160	17000	19700	30800	37100	10900	7300
	304 L3	150	10.0	3440	4.0	7.5	71-80-90-100-112-132-160	17300	20000	31400	37700	11100	7300



304 L							240	3960 Nm					
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 	MC	MZ	Rn ₂ [N] HC/PC	HZ/PZ	FZ	M _{n2 max} Nm
1000	304 L4	1018	0.98	3960	0.46	7.2	71-80-90-100-112-132-160	36000	42000	63000	74000	24000	7300
	304 L4	1164	0.86	3000	0.30	7.2	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300
	304 L4	1271	0.79	3960	0.37	7.2	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300
	304 L4	1344	0.74	3710	0.33	7.2	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300
	304 L4	1586	0.63	3960	0.30	7.2	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300
	304 L4	1815	0.55	3000	0.20	7.2	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300
	304 L4	1991	0.50	3740	0.22	7.2	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300
	304 L4	2269	0.44	3000	0.16	7.2	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300
304 L4	2453	0.41	3000	0.14	7.2	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300	
500	304 L1	3.60	139	2560	38	24	132-160-180-200	7220	8340	14300	17200	4630	7300
	304 L1	4.25	118	2650	34	24	132-160-180-200	7630	8810	15000	18000	4900	7300
	304 L1	5.33	94	2720	28	24	132-160-180-200	8240	9510	16000	19300	5280	7300
	304 L1	6.57	76	2390	19.6	24	132-160-180-200	8830	10200	17100	20500	5660	7300
	304 L2	12.5	40	3160	14.0	18.0	71-80-90-100-112-132-160	10900	12600	20700	24900	7020	7300
	304 L2	15.3	33	3200	11.6	18.0	71-80-90-100-112-132-160	11700	13500	22000	26500	7510	7300
	304 L2	18.1	27.6	3470	10.7	18.0	71-80-90-100-112-132-160	12400	14300	23100	27800	7940	7300
	304 L2	20.8	24.1	3260	8.7	18.0	71-80-90-100-112-132-160	13000	15000	24100	29000	8310	7300
	304 L2	22.7	22.0	2850	7.0	18.0	71-80-90-100-112-132-160	13400	15400	24800	29800	8570	7300
	304 L2	24.5	20.4	3490	7.9	18.0	71-80-90-100-112-132-160	13700	15800	25300	30500	8780	7300
	304 L2	30.8	16.3	2850	5.2	18.0	71-80-90-100-112-132-160	14800	17100	27100	32600	9480	7300
	304 L2	38.4	13.0	2850	4.1	18.0	71-80-90-100-112-132-160	15900	18400	29000	34900	10200	7300
	304 L2	47.3	10.6	2390	2.8	18.0	71-80-90-100-112-132-160	17000	19700	30900	37100	10900	7300
	304 L2	59.1	8.5	2390	2.2	18.0	71-80-90-100-112-132-160	18400	21200	33000	39700	11800	7300
	304 L3	43.6	11.5	3410	4.5	15.0	71-80-90-100-112-132-160	16600	19200	30100	36200	10600	7300
	304 L3	53.4	9.4	3450	3.7	15.0	71-80-90-100-112-132-160	17800	20500	32000	38500	11400	7300
	304 L3	63.1	7.9	3590	3.3	15.0	71-80-90-100-112-132-160	18800	21700	33600	40500	12000	7300
	304 L3	72.3	6.9	3470	2.8	15.0	71-80-90-100-112-132-160	19600	22700	35100	42200	12600	7300
	304 L3	77.2	6.5	3630	2.7	15.0	71-80-90-100-112-132-160	20100	23200	35800	43000	12900	7300
	304 L3	90.2	5.5	3490	2.2	15.0	71-80-90-100-112-132-160	21100	24400	37500	45100	13600	7300
	304 L3	105	4.8	3690	2.0	15.0	71-80-90-100-112-132-160	22200	25600	39200	47100	14200	7300
	304 L3	111	4.5	3500	1.8	15.0	71-80-90-100-112-132-160	22600	26100	39800	47900	14500	7300
	304 L3	130	3.8	3710	1.6	15.0	71-80-90-100-112-132-160	23900	27600	41900	50400	15300	7300
	304 L3	141	3.5	3720	1.5	15.0	71-80-90-100-112-132-160	24600	28400	42900	51600	15800	7300
	304 L3	150	3.3	3510	1.3	15.0	71-80-90-100-112-132-160	25000	28900	43600	52500	16000	7300
	304 L3	165	3.0	2510	0.87	15.0	71-80-90-100-112-132-160	25800	29800	44900	54000	16600	7300
	304 L3	178	2.8	3130	1.0	15.0	71-80-90-100-112-132-160	26500	30600	45900	55200	17000	7300
	304 L3	202	2.5	2560	0.73	15.0	71-80-90-100-112-132-160	27600	31900	47700	57400	17700	7300
	304 L3	220	2.3	3740	0.97	15.0	71-80-90-100-112-132-160	28500	32900	49000	58900	18300	7300
	304 L3	273	1.8	2700	0.57	15.0	71-80-90-100-112-132-160	30600	35300	52200	62800	19600	7300
	304 L3	341	1.5	2810	0.47	15.0	71-80-90-100-112-132-160	32900	38000	55800	67200	21100	7300
	304 L3	426	1.2	2920	0.39	15.0	71-80-90-100-112-132-160	35500	40900	59700	71800	22700	7300
	304 L4	413	1.2	3620	0.52	12.0	71-80-90-100-112-132-160	35100	40500	59100	71200	22500	7300
	304 L4	446	1.1	3930	0.52	12.0	71-80-90-100-112-132-160	36000	41600	60500	72800	23100	7300
	304 L4	492	1.0	3960	0.48	12.0	71-80-90-100-112-132-160	36000	42000	62300	74000	23900	7300
	304 L4	556	0.90	3960	0.42	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300
	304 L4	649	0.77	3710	0.34	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300
	304 L4	702	0.71	3000	0.25	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300
	304 L4	816	0.61	3960	0.29	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300
	304 L4	1018	0.49	3960	0.23	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300
	304 L4	1164	0.43	3000	0.15	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300
	304 L4	1271	0.39	3960	0.18	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300
	304 L4	1344	0.37	3710	0.16	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300
	304 L4	1586	0.32	3960	0.15	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300
	304 L4	1815	0.28	3000	0.10	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300
	304 L4	1991	0.25	3740	0.11	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300
304 L4	2269	0.22	3000	0.08	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300	
304 L4	2453	0.20	3000	0.07	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	7300	



305 L							250	5800 Nm						
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 	MC	MZ	HC/PC	HZ/PZ	FZ	M _{n2 max} Nm	
1500	305 L1	3.60	417	2370	60	13.0	132-160-180-200	5010	5780	10300	12300	3210	8800	
	305 L1	4.25	353	2450	60	13.0	132-160-180-200	5290	6110	10800	13000	3400	8800	
	305 L1	5.33	281	2560	60	13.0	132-160-180-200	5710	6590	11500	13900	3660	8800	
	305 L1	6.20	242	2650	60	13.0	132-160-180-200	6000	6930	12100	14500	3850	8800	
	305 L1	7.50	200	2270	49	13.0	132-160-180-200	6400	7390	12800	15400	4100	8800	
	305 L2	12.5	120	2930	30	9.0	71-80-90-100-112-132-160	7590	8760	14900	17900	4870	8800	
	305 L2	15.3	98	3060	30	9.0	71-80-90-100-112-132-160	8120	9380	15800	19100	5210	8800	
	305 L2	18.1	83	3620	30	9.0	71-80-90-100-112-132-160	8580	9910	16600	20000	5510	8800	
	305 L2	20.8	72	3250	26	9.0	71-80-90-100-112-132-160	8980	10400	17300	20900	5760	8800	
	305 L2	22.7	66	3940	29	9.0	71-80-90-100-112-132-160	9260	10700	17800	21400	5940	8800	
	305 L2	24.5	61	3830	26	9.0	71-80-90-100-112-132-160	9490	11000	18200	21900	6090	8800	
	305 L2	26.4	57	3530	22	9.0	71-80-90-100-112-132-160	9740	11200	18600	22400	6250	8800	
	305 L2	30.8	49	4280	23	9.0	71-80-90-100-112-132-160	10200	11800	19500	23500	6570	8800	
	305 L2	35.8	42	3560	16.6	9.0	71-80-90-100-112-132-160	10800	12400	20400	24600	6910	8800	
	305 L2	38.4	39	4300	18.7	9.0	71-80-90-100-112-132-160	11000	12700	20900	25100	7070	8800	
	305 L2	44.6	34	3560	13.3	9.0	71-80-90-100-112-132-160	11600	13400	21800	26300	7440	8800	
	305 L2	55.8	26.9	3540	10.6	9.0	71-80-90-100-112-132-160	12500	14400	23300	28100	8010	8800	
	305 L3	53.4	28.1	4000	12.9	7.5	71-80-90-100-112-132-160	12300	14200	23000	27700	7900	8800	
	305 L3	63.1	23.8	4720	12.9	7.5	71-80-90-100-112-132-160	13000	15000	24200	29100	8340	8800	
	305 L3	72.3	20.8	4160	9.9	7.5	71-80-90-100-112-132-160	13600	15700	25200	30300	8730	8800	
	305 L3	77.2	19.4	4820	10.7	7.5	71-80-90-100-112-132-160	13900	16100	25700	30900	8930	8800	
	305 L3	90.2	16.6	4260	8.1	7.5	71-80-90-100-112-132-160	14700	16900	26900	32400	9400	8800	
	305 L3	105	14.4	5030	8.3	7.5	71-80-90-100-112-132-160	15400	17800	28200	33900	9880	8800	
	305 L3	113	13.3	3590	5.5	7.5	71-80-90-100-112-132-160	15800	18200	28800	34700	10100	8800	
	305 L3	124	12.1	3590	5.0	7.5	71-80-90-100-112-132-160	16300	18800	29700	35700	10500	8800	
	305 L3	141	10.6	5180	6.3	7.5	71-80-90-100-112-132-160	17000	19700	30800	37100	10900	8800	
	305 L3	152	9.8	3600	4.1	7.5	71-80-90-100-112-132-160	17500	20200	31500	37900	11200	8800	
	305 L3	164	9.2	4410	4.6	7.5	71-80-90-100-112-132-160	17900	20600	32200	38800	11500	8800	
	305 L3	178	8.5	4420	4.3	7.5	71-80-90-100-112-132-160	18400	21200	33000	39700	11800	8800	
	305 L3	190	7.9	3600	3.3	7.5	71-80-90-100-112-132-160	18800	21700	33700	40600	12100	8800	
305 L3	220	6.8	4750	3.7	7.5	71-80-90-100-112-132-160	19700	22800	35200	42400	12700	8800		
305 L3	258	5.8	3600	2.4	7.5	71-80-90-100-112-132-160	20800	24000	36900	44400	13300	8800		
305 L3	276	5.4	4460	2.8	7.5	71-80-90-100-112-132-160	21300	24600	37700	45400	13700	8800		
305 L3	321	4.7	3640	1.9	7.5	71-80-90-100-112-132-160	22400	25800	39400	47500	14400	8800		
305 L3	389	3.9	3170	1.4	7.5	71-80-90-100-112-132-160	23900	27500	41800	50300	15300	8800		
305 L3	402	3.7	3760	1.6	7.5	71-80-90-100-112-132-160	24100	27800	42200	50700	15500	8800		
305 L4	413	3.6	4720	2.0	6.0	71-80-90-100-112-132-160	24300	28100	42500	51200	15600	8800		
305 L4	446	3.4	5490	2.2	6.0	71-80-90-100-112-132-160	25000	28800	43500	52400	16000	8800		
305 L4	492	3.0	5340	1.9	6.0	71-80-90-100-112-132-160	25800	29800	44800	53900	16600	8800		
305 L4	556	2.7	5500	1.8	6.0	71-80-90-100-112-132-160	26900	31000	46500	55900	17200	8800		
305 L4	649	2.3	4510	1.2	6.0	71-80-90-100-112-132-160	28300	32700	48700	58600	18200	8800		
305 L4	718	2.1	4130	1.0	6.0	71-80-90-100-112-132-160	29300	33800	50200	60400	18800	8800		
305 L4	816	1.8	5410	1.2	6.0	71-80-90-100-112-132-160	30500	35300	52200	62800	19600	8800		
305 L4	896	1.7	4290	0.85	6.0	71-80-90-100-112-132-160	31500	36400	53700	64600	20200	8800		
305 L4	1018	1.5	5450	0.95	6.0	71-80-90-100-112-132-160	32900	38000	55800	67100	21100	8800		
305 L4	1098	1.4	4440	0.72	6.0	71-80-90-100-112-132-160	33700	38900	57000	68600	21600	8800		
305 L4	1278	1.2	5500	0.76	6.0	71-80-90-100-112-132-160	35500	40900	59700	71800	22800	8800		
305 L4	1370	1.1	4620	0.60	6.0	71-80-90-100-112-132-160	36000	41900	60900	73300	23300	8800		
305 L4	1586	0.95	4750	0.53	6.0	71-80-90-100-112-132-160	36000	42000	63700	74000	24000	8800		
305 L4	1854	0.81	4690	0.45	6.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	8800		
305 L4	1991	0.75	5600	0.50	6.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	8800		
305 L4	2243	0.67	3800	0.30	6.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	8800		
305 L4	2799	0.54	3800	0.24	6.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	8800		
1000	305 L1	3.60	278	2680	60	15.6	132-160-180-200	5730	6620	11600	13900	3680	8800	
	305 L1	4.25	235	2770	60	15.6	132-160-180-200	6060	7000	12200	14600	3890	8800	
	305 L1	5.33	188	2890	58	15.6	132-160-180-200	6540	7550	13000	15700	4190	8800	
	305 L1	6.20	161	3000	52	15.6	132-160-180-200	6870	7930	13600	16400	4410	8800	
	305 L1	7.50	133	2560	37	15.6	132-160-180-200	7320	8450	14400	17400	4700	8800	
	305 L2	12.5	80	3300	29	10.8	71-80-90-100-112-132-160	8690	10000	16800	20300	5570	8800	
	305 L2	15.3	65	3460	25	10.8	71-80-90-100-112-132-160	9300	10700	17900	21500	5960	8800	
	305 L2	18.1	55	4090	25	10.8	71-80-90-100-112-132-160	9830	11300	18800	22600	6300	8800	
	305 L2	20.8	48	3650	19.5	10.8	71-80-90-100-112-132-160	10300	11900	19600	23600	6600	8800	

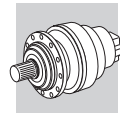


305 L	250	5800 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
500	305 L3	63.1	7.9	5360	4.9	15.0	71-80-90-100-112-132-160	18800	21700	33600	40500	12000	8800
	305 L3	72.3	6.9	4490	3.6	15.0	71-80-90-100-112-132-160	19600	22700	35100	42200	12600	8800
	305 L3	77.2	6.5	5410	4.0	15.0	71-80-90-100-112-132-160	20100	23200	35800	43000	12900	8800
	305 L3	90.2	5.5	4490	2.9	15.0	71-80-90-100-112-132-160	21100	24400	37500	45100	13600	8800
	305 L3	105	4.8	5480	3.0	15.0	71-80-90-100-112-132-160	22200	25600	39200	47100	14200	8800
	305 L3	113	4.4	3670	1.9	15.0	71-80-90-100-112-132-160	22800	26300	40100	48200	14600	8800
	305 L3	124	4.0	3720	1.7	15.0	71-80-90-100-112-132-160	23500	27200	41300	49600	15100	8800
	305 L3	141	3.5	5320	2.2	15.0	71-80-90-100-112-132-160	24600	28400	42900	51600	15800	8800
	305 L3	152	3.3	3840	1.4	15.0	71-80-90-100-112-132-160	25200	29100	43900	52800	16200	8800
	305 L3	164	3.1	4870	1.7	15.0	71-80-90-100-112-132-160	25800	29800	44800	53900	16500	8800
	305 L3	178	2.8	4940	1.6	15.0	71-80-90-100-112-132-160	26500	30600	45900	55200	17000	8800
	305 L3	190	2.6	3970	1.2	15.0	71-80-90-100-112-132-160	27100	31300	46900	56400	17400	8800
	305 L3	220	2.3	4750	1.2	15.0	71-80-90-100-112-132-160	28500	32900	49000	58900	18300	8800
	305 L3	258	1.9	4180	0.93	15.0	71-80-90-100-112-132-160	30000	34600	51300	61700	19200	8800
	305 L3	276	1.8	5140	1.1	15.0	71-80-90-100-112-132-160	30700	35400	52400	63100	19700	8800
	305 L3	321	1.6	4340	0.78	15.0	71-80-90-100-112-132-160	32300	37300	54900	66000	20700	8800
	305 L3	389	1.3	3660	0.54	15.0	71-80-90-100-112-132-160	34400	39700	58100	69900	22100	8800
	305 L3	402	1.2	4520	0.64	15.0	71-80-90-100-112-132-160	34800	40200	58600	70600	22300	8800
	305 L4	413	1.2	5480	0.78	12.0	71-80-90-100-112-132-160	35100	40500	59100	71200	22500	8800
	305 L4	446	1.1	5760	0.76	12.0	71-80-90-100-112-132-160	36000	41600	60500	72800	23100	8800
	305 L4	492	1.0	5530	0.66	12.0	71-80-90-100-112-132-160	36000	42000	62300	74000	23900	8800
	305 L4	556	0.90	5800	0.62	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	8800
	305 L4	649	0.77	4700	0.43	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	8800
	305 L4	718	0.70	4690	0.39	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	8800
	305 L4	816	0.61	5530	0.40	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	8800
	305 L4	896	0.56	4690	0.31	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	8800
	305 L4	1018	0.49	5530	0.32	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	8800
	305 L4	1098	0.46	4690	0.25	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	8800
	305 L4	1278	0.39	5600	0.26	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	8800
	305 L4	1370	0.36	4690	0.20	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	8800
	305 L4	1586	0.32	4750	0.18	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	8800
	305 L4	1854	0.27	4690	0.15	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	8800
	305 L4	1991	0.25	5600	0.17	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	8800
	305 L4	2243	0.22	3800	0.10	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	8800
	305 L4	2799	0.18	3800	0.08	12.0	71-80-90-100-112-132-160	36000	42000	64000	74000	24000	8800

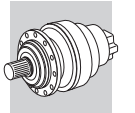
306 L	260	10840 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	306 L1	3.60	417	3760	75	18.0	160-180-200-225-250	6240	7070	16800	19500	4690	14900
	306 L1	4.25	353	3890	75	18.0	160-180-200-225-250	6590	7470	17600	20500	4950	14900
	306 L1	5.33	281	4060	75	18.0	160-180-200-225-250	7110	8060	18900	22000	5340	14900
	306 L1	6.20	242	4200	75	18.0	160-180-200-225-250	7480	8470	19700	23000	5620	14900
	306 L1	7.50	200	4090	75	18.0	160-180-200-225-250	7970	9030	20900	24300	5980	14900
	306 L2	13.0	116	4820	40	13.0	132-160-180-200	9560	10800	24600	28700	7180	14900
	306 L2	15.3	98	4990	40	13.0	132-160-180-200	10100	11400	25900	30100	7590	14900
	306 L2	18.1	83	5890	40	13.0	132-160-180-200	10700	12100	27200	31700	8020	14900
	306 L2	22.7	66	6140	40	13.0	132-160-180-200	11500	13000	29100	33900	8650	14900
	306 L2	26.4	57	6370	40	13.0	132-160-180-200	12100	13700	30500	35500	9100	14900
	306 L2	28.4	53	6700	39	13.0	132-160-180-200	12400	14100	31200	36300	9330	14900
	306 L2	33.1	45	6870	35	13.0	132-160-180-200	13100	14800	32600	38000	9810	14900
	306 L2	38.4	39	6470	28	13.0	132-160-180-200	13700	15600	34100	39700	10300	14900
	306 L2	46.5	32	6470	23	13.0	132-160-180-200	14600	16600	36100	42100	11000	14900
	306 L2	56.3	26.7	5210	15.5	13.0	132-160-180-200	15600	17700	38300	44500	11700	14900
	306 L2	72.5	20.7	5290	12.2	13.0	132-160-180-200	17000	19200	41300	48100	12700	14900
	306 L3	53.2	28.2	7100	20.0	7.5	71-80-90-100-112-132-160	15300	17300	37600	43800	11500	14900
	306 L3	65.2	23.0	7480	19.7	7.5	71-80-90-100-112-132-160	16400	18600	40000	46600	12300	14900
	306 L3	77.0	19.5	8350	18.7	7.5	71-80-90-100-112-132-160	17300	19600	42000	48900	13000	14900
	306 L3	81.9	18.3	6890	14.5	7.5	71-80-90-100-112-132-160	17700	20000	42800	49900	13300	14900



306 L 260 **10840 Nm**

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	R _{n2} [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	306 L3	88.3	17.0	8550	16.7	7.5	71-80-90-100-112-132-160	18100	20500	43800	51000	13600	14900
	306 L3	104	14.4	8900	14.7	7.5	71-80-90-100-112-132-160	19200	21700	46000	53600	14400	14900
	306 L3	112	13.4	7410	11.3	7.5	71-80-90-100-112-132-160	19600	22200	47100	54800	14800	14900
	306 L3	121	12.4	7790	11.1	7.5	71-80-90-100-112-132-160	20100	22800	48200	56100	15100	14900
	306 L3	141	10.6	7900	9.6	7.5	71-80-90-100-112-132-160	21200	24000	50400	58700	15900	14900
	306 L3	152	9.9	7590	8.6	7.5	71-80-90-100-112-132-160	21700	24600	51600	60000	16300	14900
	306 L3	190	7.9	6510	5.9	7.5	71-80-90-100-112-132-160	23400	26500	55100	64200	17600	14900
	306 L3	205	7.3	8110	6.8	7.5	71-80-90-100-112-132-160	24000	27200	56400	65600	18000	14900
	306 L3	222	6.8	6520	5.1	7.5	71-80-90-100-112-132-160	24600	27900	57700	67200	18500	14900
	306 L3	238	6.3	8180	5.9	7.5	71-80-90-100-112-132-160	25200	28600	59000	68700	19000	14900
	306 L3	268	5.6	5500	3.5	7.5	71-80-90-100-112-132-160	26200	29700	61100	71200	19700	14900
	306 L3	288	5.2	5500	3.3	7.5	71-80-90-100-112-132-160	26900	30500	62400	72700	20200	14900
	306 L3	325	4.6	5540	2.9	7.5	71-80-90-100-112-132-160	28000	31700	64700	75400	21000	14900
	306 L3	405	3.7	5670	2.4	7.5	71-80-90-100-112-132-160	30100	34100	69200	80500	22600	14900
	306 L4	391	3.8	6840	3.1	6.0	71-80-90-100-112-132-160	29800	33700	68400	79700	22400	14900
	306 L4	444	3.4	9850	3.9	6.0	71-80-90-100-112-132-160	31100	35200	71100	82800	23300	14900
	306 L4	509	2.9	9450	3.3	6.0	71-80-90-100-112-132-160	32500	36800	74100	86300	24400	14900
	306 L4	589	2.5	9320	2.8	6.0	71-80-90-100-112-132-160	34100	38700	77400	90100	25600	14900
	306 L4	636	2.4	9450	2.6	6.0	71-80-90-100-112-132-160	35000	39600	79200	92200	26300	14900
	306 L4	700	2.1	9470	2.4	6.0	71-80-90-100-112-132-160	36100	40900	81500	94900	27100	14900
	306 L4	809	1.9	7690	1.7	6.0	71-80-90-100-112-132-160	37900	43000	85100	99100	28500	14900
	306 L4	877	1.7	7710	1.6	6.0	71-80-90-100-112-132-160	39000	44100	87200	101600	29300	14900
	306 L4	1015	1.5	9460	1.7	6.0	71-80-90-100-112-132-160	40900	46300	91100	106100	30700	14900
	306 L4	1095	1.4	7790	1.3	6.0	71-80-90-100-112-132-160	41900	47500	93200	108500	31500	14900
	306 L4	1279	1.2	8400	1.2	6.0	71-80-90-100-112-132-160	44200	50100	97700	113700	33200	14900
	306 L4	1475	1.0	10100	1.2	6.0	71-80-90-100-112-132-160	45000	51000	101000	118700	34800	14900
	306 L4	1597	0.94	8630	0.96	6.0	71-80-90-100-112-132-160	45000	51000	101000	119000	35000	14900
	306 L4	1843	0.81	10100	0.97	6.0	71-80-90-100-112-132-160	45000	51000	101000	119000	35000	14900
	306 L4	2074	0.72	7000	0.60	6.0	71-80-90-100-112-132-160	45000	51000	101000	119000	35000	14900
	306 L4	2337	0.64	7000	0.53	6.0	71-80-90-100-112-132-160	45000	51000	101000	119000	35000	14900
	306 L4	2916	0.51	7000	0.43	6.0	71-80-90-100-112-132-160	45000	51000	101000	119000	35000	14900
1000	306 L1	3.60	278	4250	75	22	160-180-200-225-250	7140	8090	18900	22100	5360	14900
	306 L1	4.25	235	4390	75	22	160-180-200-225-250	7550	8550	19900	23200	5670	14900
	306 L1	5.33	188	4580	75	22	160-180-200-225-250	8140	9220	21300	24800	6120	14900
	306 L1	6.20	161	4750	75	22	160-180-200-225-250	8560	9700	22300	26000	6430	14900
	306 L1	7.50	133	4620	67	22	160-180-200-225-250	9120	10300	23600	27500	6850	14900
	306 L2	13.0	77	5450	40	15.6	132-160-180-200	10900	12400	27800	32400	8220	14900
	306 L2	15.3	65	5640	40	15.6	132-160-180-200	11600	13100	29200	34000	8690	14900
	306 L2	18.1	55	6650	40	15.6	132-160-180-200	12200	13800	30700	35800	9180	14900
	306 L2	22.7	44	6840	34	15.6	132-160-180-200	13200	14900	32900	38300	9910	14900
	306 L2	26.4	38	6780	29	15.6	132-160-180-200	13900	15700	34400	40100	10400	14900
	306 L2	28.4	35	7040	28	15.6	132-160-180-200	14200	16100	35200	41000	10700	14900
	306 L2	33.1	30	7150	24	15.6	132-160-180-200	15000	16900	36800	42900	11200	14900
	306 L2	38.4	26	6480	18.7	15.6	132-160-180-200	15700	17800	38500	44900	11800	14900
	306 L2	46.5	21.5	6480	15.5	15.6	132-160-180-200	16800	19000	40800	47500	12600	14900
	306 L2	56.3	17.8	5330	10.5	15.6	132-160-180-200	17800	20200	43200	50300	13400	14900
	306 L2	72.5	13.8	5400	8.3	15.6	132-160-180-200	19400	22000	46600	54300	14600	14900
	306 L3	53.2	18.8	7890	17.0	9.0	71-80-90-100-112-132-160	17500	19900	42500	49500	13200	14900
	306 L3	65.2	15.3	8320	14.6	9.0	71-80-90-100-112-132-160	18800	21200	45200	52600	14100	14900
	306 L3	77.0	13.0	9090	13.5	9.0	71-80-90-100-112-132-160	19800	22500	47500	55300	14900	14900
	306 L3	81.9	12.2	7310	10.2	9.0	71-80-90-100-112-132-160	20200	22900	48400	56300	15200	14900
	306 L3	88.3	11.3	9230	12.0	9.0	71-80-90-100-112-132-160	20700	23500	49500	57600	15600	14900
	306 L3	104	9.6	9610	10.6	9.0	71-80-90-100-112-132-160	21900	24800	52000	60500	16500	14900
	306 L3	112	8.9	7590	7.8	9.0	71-80-90-100-112-132-160	22500	25500	53200	61900	16900	14900
	306 L3	121	8.2	8050	7.6	9.0	71-80-90-100-112-132-160	23100	26100	54400	63300	17300	14900
	306 L3	141	7.1	8120	6.6	9.0	71-80-90-100-112-132-160	24200	27500	56900	66300	18200	14900
	306 L3	152	6.6	7590	5.7	9.0	71-80-90-100-112-132-160	24900	28200	58200	67800	18700	14900
	306 L3	190	5.3	6530	3.9	9.0	71-80-90-100-112-132-160	26800	30300	62200	72500	20100	14900
	306 L3	205	4.9	8330	4.7	9.0	71-80-90-100-112-132-160	27500	31100	63700	74100	20600	14900
	306 L3	222	4.5	6650	3.4	9.0	71-80-90-100-112-132-160	28200	31900	65200	75900	21200	14900
	306 L3	238	4.2	8550	4.1	9.0	71-80-90-100-112-132-160	28900	32700	66600	77600	21700	14900
	306 L3	268	3.7	5670	2.4	9.0	71-80-90-100-112-132-160	30000	34000	69000	80400	22600	14900
	306 L3	288	3.5	5710	2.3	9.0	71-80-90-100-112-132-160	30800	34900	70500	82100	23100	14900

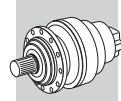


306 L		260	10840 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
500	306 L4	1095	0.46	7890	0.43	12.0	71-80-90-100-112-132-160	45000	51000	101000	119000	35000	14900
	306 L4	1279	0.39	8630	0.40	12.0	71-80-90-100-112-132-160	45000	51000	101000	119000	35000	14900
	306 L4	1475	0.34	10100	0.40	12.0	71-80-90-100-112-132-160	45000	51000	101000	119000	35000	14900
	306 L4	1597	0.31	8630	0.32	12.0	71-80-90-100-112-132-160	45000	51000	101000	119000	35000	14900
	306 L4	1843	0.27	10100	0.32	12.0	71-80-90-100-112-132-160	45000	51000	101000	119000	35000	14900
	306 L4	2074	0.24	7000	0.20	12.0	71-80-90-100-112-132-160	45000	51000	101000	119000	35000	14900
	306 L4	2337	0.21	7000	0.18	12.0	71-80-90-100-112-132-160	45000	51000	101000	119000	35000	14900
	306 L4	2916	0.17	7000	0.14	12.0	71-80-90-100-112-132-160	45000	51000	101000	119000	35000	14900

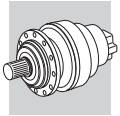
307 L		270	15680 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	307 L1	3.43	438	5110	115	22	180-200-225-250	6820	8560	17800	23300	5930	18600
	307 L1	4.09	367	5260	115	22	180-200-225-250	7230	9070	18700	24600	6290	21000
	307 L1	5.25	286	5540	115	22	180-200-225-250	7860	9860	20200	26500	6830	21000
	307 L1	6.23	241	5750	115	22	180-200-225-250	8320	10400	21300	27900	7230	21000
	307 L2	12.3	122	7510	60	18.0	132-160-180-200	10500	13100	26100	34200	9080	18600
	307 L2	14.7	102	7730	60	18.0	132-160-180-200	11100	13900	27500	36100	9640	21000
	307 L2	17.4	86	8120	60	18.0	132-160-180-200	11700	14700	28900	37900	10200	21000
	307 L2	21.8	69	8690	60	18.0	132-160-180-200	12600	15900	31000	40600	11000	21000
	307 L2	25.4	59	9090	60	18.0	132-160-180-200	13300	16700	32400	42500	11600	21000
	307 L2	28.0	54	9150	55	18.0	132-160-180-200	13700	17200	33400	43700	11900	21000
	307 L2	30.7	49	9590	52	18.0	132-160-180-200	14200	17800	34300	45000	12300	21000
	307 L2	32.6	46	9410	48	18.0	132-160-180-200	14400	18100	34900	45800	12600	21000
	307 L2	38.6	39	8310	36	18.0	132-160-180-200	15300	19200	36800	48200	13300	21000
	307 L2	46.7	32	8360	30	18.0	132-160-180-200	16300	20400	38900	51000	14200	21000
	307 L3	51.3	29.3	10700	30	11.0	71-80-90-100-112-132-160	16800	21100	40000	52400	14600	21000
	307 L3	60.5	24.8	11100	30	11.0	71-80-90-100-112-132-160	17800	22300	42100	55100	15400	21000
	307 L3	74.1	20.2	11600	27	11.0	71-80-90-100-112-132-160	19000	23800	44700	58600	16500	21000
	307 L3	80.6	18.6	10200	22	11.0	71-80-90-100-112-132-160	19500	24500	45800	60100	17000	21000
	307 L3	93.0	16.1	12200	23	11.0	71-80-90-100-112-132-160	20500	25700	47900	62700	17800	21000
	307 L3	100	15.0	12400	21	11.0	71-80-90-100-112-132-160	21000	26400	49000	64100	18300	21000
	307 L3	113	13.2	10500	16.0	11.0	71-80-90-100-112-132-160	21900	27500	50800	66500	19000	21000
	307 L3	126	11.9	13000	17.8	11.0	71-80-90-100-112-132-160	22700	28400	52400	68700	19700	21000
	307 L3	139	10.8	10700	13.3	11.0	71-80-90-100-112-132-160	23400	29400	54000	70700	20400	21000
	307 L3	146	10.3	13400	15.8	11.0	71-80-90-100-112-132-160	23800	29900	54800	71800	20700	21000
	307 L3	162	9.3	10800	11.6	11.0	71-80-90-100-112-132-160	24600	30900	56500	74000	21400	21000
	307 L3	177	8.5	12300	12.0	11.0	71-80-90-100-112-132-160	25400	31900	58000	76100	22100	21000
	307 L3	202	7.4	11000	9.4	11.0	71-80-90-100-112-132-160	26500	33300	60400	79100	23100	21000
	307 L3	221	6.8	12700	9.9	11.0	71-80-90-100-112-132-160	27300	34300	62000	81300	23800	21000
	307 L3	239	6.3	8700	6.3	11.0	71-80-90-100-112-132-160	28100	35200	63500	83300	24400	21000
	307 L3	284	5.3	11300	6.8	11.0	71-80-90-100-112-132-160	29700	37300	66900	87600	25800	21000
	307 L3	336	4.5	8840	4.5	11.0	71-80-90-100-112-132-160	31500	39500	70400	92200	27300	21000
	307 L4	349	4.3	14900	7.6	7.5	71-80-90-100-112-132-160	31800	40000	71200	93300	27700	21000
	307 L4	406	3.7	11900	5.2	7.5	71-80-90-100-112-132-160	33500	42000	74400	97500	29100	21000
	307 L4	465	3.2	12200	4.6	7.5	71-80-90-100-112-132-160	35000	44000	77500	101600	30500	21000
	307 L4	509	2.9	14000	4.9	7.5	71-80-90-100-112-132-160	36100	45300	79700	104400	31400	21000
	307 L4	579	2.6	14900	4.6	7.5	71-80-90-100-112-132-160	37700	47300	82800	108500	32800	21000
	307 L4	654	2.3	12900	3.5	7.5	71-80-90-100-112-132-160	39200	49200	85900	112600	34100	21000
	307 L4	722	2.1	15000	3.7	7.5	71-80-90-100-112-132-160	40600	50900	88500	116000	35300	21000
	307 L4	801	1.9	13300	3.0	7.5	71-80-90-100-112-132-160	42000	52700	91300	119600	36500	21000
	307 L4	906	1.7	15200	3.0	7.5	71-80-90-100-112-132-160	43800	54900	94700	124200	38000	21000
	307 L4	999	1.5	13800	2.5	7.5	71-80-90-100-112-132-160	45200	56700	97600	127800	39300	21000
	307 L4	1157	1.3	14200	2.2	7.5	71-80-90-100-112-132-160	47500	59600	101900	133600	41300	21000
	307 L4	1274	1.2	12300	1.7	7.5	71-80-90-100-112-132-160	49000	61500	104900	137500	42600	21000
	307 L4	1408	1.1	15600	2.0	7.5	71-80-90-100-112-132-160	50700	63600	108100	141700	44100	21000
	307 L4	1591	0.94	15000	1.7	7.5	71-80-90-100-112-132-160	52000	65000	109000	145000	45000	21000
	307 L4	1767	0.85	15700	1.6	7.5	71-80-90-100-112-132-160	52000	65000	109000	145000	45000	21000
	307 L4	2041	0.73	14300	1.2	7.5	71-80-90-100-112-132-160	52000	65000	109000	145000	45000	21000



307 L						270		15680 Nm					
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
500	307 L2	38.6	12.9	8620	12.4	36	132-160-180-200	22000	27700	51100	67000	19200	21000
	307 L2	46.7	10.7	8680	10.3	36	132-160-180-200	23500	29500	54100	70900	20400	21000
	307 L3	51.3	9.8	13600	15.2	22	71-80-90-100-112-132-160	24200	30400	55600	72900	21100	21000
	307 L3	60.5	8.3	13900	13.2	22	71-80-90-100-112-132-160	25600	32100	58500	76600	22300	21000
	307 L3	74.1	6.7	14300	11.0	22	71-80-90-100-112-132-160	27400	34400	62200	81500	23800	21000
	307 L3	80.6	6.2	11100	7.9	22	71-80-90-100-112-132-160	28200	35300	63700	83500	24500	21000
	307 L3	93.0	5.4	14700	9.1	22	71-80-90-100-112-132-160	29600	37100	66500	87200	25700	21000
	307 L3	100	5.0	14900	8.5	22	71-80-90-100-112-132-160	30300	38000	68100	89200	26300	21000
	307 L3	113	4.4	11500	5.8	22	71-80-90-100-112-132-160	31600	39600	70600	92500	27400	21000
	307 L3	126	4.0	14900	6.8	22	71-80-90-100-112-132-160	32700	41000	72900	95500	28400	21000
	307 L3	139	3.6	11900	4.9	22	71-80-90-100-112-132-160	33800	42400	75000	98300	29400	21000
	307 L3	146	3.4	14000	5.5	22	71-80-90-100-112-132-160	34400	43100	76200	99900	29900	21000
	307 L3	162	3.1	12300	4.4	22	71-80-90-100-112-132-160	35500	44600	78500	102900	30900	21000
	307 L3	177	2.8	12300	4.0	22	71-80-90-100-112-132-160	36600	45900	80700	105800	31800	21000
	307 L3	202	2.5	12700	3.6	22	71-80-90-100-112-132-160	38200	48000	83900	110000	33200	21000
	307 L3	221	2.3	13900	3.6	22	71-80-90-100-112-132-160	39400	49500	86300	113000	34300	21000
	307 L3	239	2.1	9860	2.4	22	71-80-90-100-112-132-160	40500	50800	88300	115800	35200	21000
	307 L3	284	1.8	13300	2.7	22	71-80-90-100-112-132-160	42800	53800	93000	121800	37200	21000
	307 L3	336	1.5	10400	1.8	22	71-80-90-100-112-132-160	45400	56900	97900	128200	39400	21000
	307 L4	349	1.4	15400	2.6	15.0	71-80-90-100-112-132-160	45900	57600	98900	129700	39900	21000
	307 L4	406	1.2	14300	2.1	15.0	71-80-90-100-112-132-160	48300	60600	103500	135600	42000	21000
	307 L4	465	1.1	14700	1.9	15.0	71-80-90-100-112-132-160	50500	63400	107800	141300	43900	21000
	307 L4	509	0.98	15000	1.7	15.0	71-80-90-100-112-132-160	52000	65000	109000	145000	45000	21000
	307 L4	579	0.86	15700	1.6	15.0	71-80-90-100-112-132-160	52000	65000	109000	145000	45000	21000
	307 L4	654	0.77	14800	1.3	15.0	71-80-90-100-112-132-160	52000	65000	109000	145000	45000	21000
	307 L4	722	0.69	15700	1.3	15.0	71-80-90-100-112-132-160	52000	65000	109000	145000	45000	21000
	307 L4	801	0.62	14800	1.1	15.0	71-80-90-100-112-132-160	52000	65000	109000	145000	45000	21000
	307 L4	906	0.55	15700	1.0	15.0	71-80-90-100-112-132-160	52000	65000	109000	145000	45000	21000
	307 L4	999	0.50	14800	0.88	15.0	71-80-90-100-112-132-160	52000	65000	109000	145000	45000	21000
	307 L4	1157	0.43	14800	0.76	15.0	71-80-90-100-112-132-160	52000	65000	109000	145000	45000	21000
	307 L4	1274	0.39	12300	0.57	15.0	71-80-90-100-112-132-160	52000	65000	109000	145000	45000	21000
	307 L4	1408	0.36	15700	0.66	15.0	71-80-90-100-112-132-160	52000	65000	109000	145000	45000	21000
	307 L4	1591	0.31	15000	0.56	15.0	71-80-90-100-112-132-160	52000	65000	109000	145000	45000	21000
	307 L4	1767	0.28	15700	0.52	15.0	71-80-90-100-112-132-160	52000	65000	109000	145000	45000	21000
	307 L4	2041	0.24	14300	0.42	15.0	71-80-90-100-112-132-160	52000	65000	109000	145000	45000	21000
	307 L4	2423	0.21	11000	0.27	15.0	71-80-90-100-112-132-160	52000	65000	109000	145000	45000	21000

309 L						280		23240 Nm					
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	309 L1	3.43	438	7010	150	25	180-200-225-250	—	—	18100	23300	4740	27900
	309 L1	4.09	367	7220	150	25	180-200-225-250	—	—	19000	24600	5030	29000
	309 L1	5.25	286	7600	150	25	180-200-225-250	—	—	20500	26500	5470	29000
	309 L1	6.23	241	7900	150	25	180-200-225-250	—	—	21600	27900	5790	29000
	309 L2	12.3	122	7890	60	18.0	132-160-180-200	—	—	26500	34200	7270	27900
	309 L2	14.7	102	9410	60	18.0	132-160-180-200	—	—	28000	36100	7710	29000
	309 L2	17.4	86	9730	60	18.0	132-160-180-200	—	—	29400	37900	8150	29000
	309 L2	21.8	69	10100	60	18.0	132-160-180-200	—	—	31500	40600	8790	29000
	309 L2	25.4	59	10500	60	18.0	132-160-180-200	—	—	32900	42500	9240	29000
	309 L2	28.0	54	12500	60	18.0	132-160-180-200	—	—	33900	43700	9550	29000
	309 L2	32.6	46	13000	60	18.0	132-160-180-200	—	—	35500	45800	10000	29000
	309 L2	38.6	39	12500	54	18.0	132-160-180-200	—	—	37400	48200	10600	29000
	309 L2	46.7	32	12500	45	18.0	132-160-180-200	—	—	39600	51000	11300	29000
	309 L3	51.3	29.3	13400	30	11.0	71-80-90-100-112-132-160	—	—	40700	52400	11700	29000
	309 L3	60.5	24.8	14100	30	11.0	71-80-90-100-112-132-160	—	—	42700	55100	12300	29000
	309 L3	74.1	20.2	15000	30	11.0	71-80-90-100-112-132-160	—	—	45400	58600	13200	29000
	309 L3	80.6	18.6	14800	30	11.0	71-80-90-100-112-132-160	—	—	46600	60100	13600	29000
	309 L3	93.0	16.1	15100	28	11.0	71-80-90-100-112-132-160	—	—	48600	62700	14200	29000

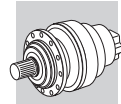


309 L

280

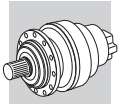
23240 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	R _{n2} [N]					M _{n2 max} Nm	
								MC	MZ	HC/PC	HZ/PZ	FZ		
1500	309 L3	100	15	16500	28	11.0	71-80-90-100-112-132-160	—	—	49700	64100	14600	29000	
	309 L3	113	13.2	15500	24	11.0	71-80-90-100-112-132-160	—	—	51600	66500	15200	29000	
	309 L3	126	11.9	16400	22	11.0	71-80-90-100-112-132-160	—	—	53200	68700	15800	29000	
	309 L3	139	10.8	16000	19.9	11.0	71-80-90-100-112-132-160	—	—	54800	70700	16300	29000	
	309 L3	162	9.3	16300	17.3	11.0	71-80-90-100-112-132-160	—	—	57400	74000	17100	29000	
	309 L3	183	8.2	14300	13.5	11.0	71-80-90-100-112-132-160	—	—	59500	76800	17800	29000	
	309 L3	202	7.4	16500	14.1	11.0	71-80-90-100-112-132-160	—	—	61300	79100	18400	29000	
	309 L3	223	6.7	13000	10.0	11.0	71-80-90-100-112-132-160	—	—	63200	81500	19100	29000	
	309 L3	239	6.3	13000	9.4	11.0	71-80-90-100-112-132-160	—	—	64600	83300	19500	29000	
	309 L3	284	5.3	15700	9.6	11.0	71-80-90-100-112-132-160	—	—	67900	87600	20700	29000	
	309 L3	336	4.5	13200	6.8	11.0	71-80-90-100-112-132-160	—	—	71500	92200	21900	29000	
	309 L4	349	4.3	21300	10.8	7.5	71-80-90-100-112-132-160	—	—	72300	93300	22100	29000	
	309 L4	406	3.7	17800	7.8	7.5	71-80-90-100-112-132-160	—	—	75600	97500	23300	29000	
	309 L4	465	3.2	18300	7.0	7.5	71-80-90-100-112-132-160	—	—	78800	101600	24400	29000	
	309 L4	509	2.9	14300	5.0	7.5	71-80-90-100-112-132-160	—	—	81000	104400	25100	29000	
	309 L4	579	2.6	21300	6.5	7.5	71-80-90-100-112-132-160	—	—	84100	108500	26200	29000	
	309 L4	654	2.3	18100	4.9	7.5	71-80-90-100-112-132-160	—	—	87300	112600	27300	29000	
	309 L4	722	2.1	21300	5.2	7.5	71-80-90-100-112-132-160	—	—	89900	116000	28200	29000	
	309 L4	801	1.9	18200	4.0	7.5	71-80-90-100-112-132-160	—	—	92800	119600	29200	29000	
	309 L4	906	1.7	17900	3.5	7.5	71-80-90-100-112-132-160	—	—	96300	124200	30400	29000	
	309 L4	999	1.5	18200	3.2	7.5	71-80-90-100-112-132-160	—	—	99100	127800	31400	29000	
	309 L4	1149	1.3	16200	2.5	7.5	71-80-90-100-112-132-160	—	—	103400	133300	32900	29000	
	309 L4	1286	1.2	16500	2.3	7.5	71-80-90-100-112-132-160	—	—	106900	137900	34200	29000	
	309 L4	1380	1.1	16700	2.2	7.5	71-80-90-100-112-132-160	—	—	109200	140900	35000	29000	
	309 L4	1605	0.93	17000	1.9	7.5	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000	
	309 L4	1723	0.87	17000	1.8	7.5	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000	
	309 L4	2003	0.75	17000	1.5	7.5	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000	
	309 L4	2423	0.62	17000	1.2	7.5	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000	
	1000	309 L1	3.43	292	7920	150	30	180-200-225-250	—	—	20400	26300	5430	27900
		309 L1	4.09	244	8150	150	30	180-200-225-250	—	—	21500	27700	5760	29000
		309 L1	5.25	190	8580	150	30	180-200-225-250	—	—	23200	29900	6260	29000
		309 L1	6.23	160	8920	150	30	180-200-225-250	—	—	24400	31500	6620	29000
309 L2		12.3	81	8900	60	22	132-160-180-200	—	—	30000	38600	8320	27900	
309 L2		14.7	68	10600	60	22	132-160-180-200	—	—	31600	40700	8820	29000	
309 L2		17.4	58	11000	60	22	132-160-180-200	—	—	33200	42800	9330	29000	
309 L2		21.8	46	11400	58	22	132-160-180-200	—	—	35500	45800	10100	29000	
309 L2		25.4	39	11500	50	22	132-160-180-200	—	—	37200	48000	10600	29000	
309 L2		28.0	36	13500	53	22	132-160-180-200	—	—	38300	49400	10900	29000	
309 L2		32.6	31	13800	47	22	132-160-180-200	—	—	40100	51700	11500	29000	
309 L2		38.6	25.9	12600	36	22	132-160-180-200	—	—	42200	54400	12200	29000	
309 L2		46.7	21.4	12700	30	22	132-160-180-200	—	—	44700	57600	13000	29000	
309 L3		51.3	19.5	14900	30	13.2	71-80-90-100-112-132-160	—	—	45900	59200	13400	29000	
309 L3		60.5	16.5	16000	30	13.2	71-80-90-100-112-132-160	—	—	48300	62300	14100	29000	
309 L3		74.1	13.5	17000	26	13.2	71-80-90-100-112-132-160	—	—	51300	66200	15100	29000	
309 L3		80.6	12.4	15700	22	13.2	71-80-90-100-112-132-160	—	—	52600	67800	15500	29000	
309 L3		93.0	10.8	16800	21	13.2	71-80-90-100-112-132-160	—	—	54900	70800	16300	29000	
309 L3		100	10.0	18600	21	13.2	71-80-90-100-112-132-160	—	—	56200	72400	16700	29000	
309 L3		113	8.8	16300	16.5	13.2	71-80-90-100-112-132-160	—	—	58300	75100	17400	29000	
309 L3		126	7.9	17300	15.7	13.2	71-80-90-100-112-132-160	—	—	60100	77600	18000	29000	
309 L3		139	7.2	16500	13.7	13.2	71-80-90-100-112-132-160	—	—	61900	79900	18600	29000	
309 L3		162	6.2	16700	11.9	13.2	71-80-90-100-112-132-160	—	—	64800	83600	19600	29000	
309 L3		183	5.5	14300	9.0	13.2	71-80-90-100-112-132-160	—	—	67200	86700	20400	29000	
309 L3		202	5.0	17000	9.7	13.2	71-80-90-100-112-132-160	—	—	69300	89300	21100	29000	
309 L3		223	4.5	13200	6.8	13.2	71-80-90-100-112-132-160	—	—	71400	92100	21800	29000	
309 L3		239	4.2	13300	6.4	13.2	71-80-90-100-112-132-160	—	—	72900	94000	22300	29000	
309 L3		284	3.5	15800	6.4	13.2	71-80-90-100-112-132-160	—	—	76700	98900	23600	29000	
309 L3		336	3.0	14000	4.8	13.2	71-80-90-100-112-132-160	—	—	80800	104200	25000	29000	
309 L4		349	2.9	21300	7.2	9.0	71-80-90-100-112-132-160	—	—	81700	105300	25300	29000	
309 L4		406	2.5	19100	5.6	9.0	71-80-90-100-112-132-160	—	—	85400	110200	26600	29000	
309 L4		465	2.2	19500	5.0	9.0	71-80-90-100-112-132-160	—	—	89000	114800	27900	29000	
309 L4	509	2.0	14400	3.3	9.0	71-80-90-100-112-132-160	—	—	91500	117900	28700	29000		
309 L4	579	1.7	21400	4.4	9.0	71-80-90-100-112-132-160	—	—	95000	122600	30000	29000		



309 L	280	23240 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	R _{n2} [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1000	309 L4	654	1.5	18200	3.3	9.0	71-80-90-100-112-132-160	—	—	98600	127100	31200	29000
	309 L4	722	1.4	21500	3.5	9.0	71-80-90-100-112-132-160	—	—	101600	131000	32300	29000
	309 L4	801	1.2	18300	2.7	9.0	71-80-90-100-112-132-160	—	—	104700	135100	33400	29000
	309 L4	906	1.1	18400	2.4	9.0	71-80-90-100-112-132-160	—	—	108700	140200	34800	29000
	309 L4	999	1.0	18300	2.2	9.0	71-80-90-100-112-132-160	—	—	110000	144400	36000	29000
	309 L4	1149	0.87	17000	1.7	9.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
	309 L4	1286	0.78	17000	1.6	9.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
	309 L4	1380	0.72	17000	1.5	9.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
	309 L4	1605	0.62	17000	1.3	9.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
	309 L4	1723	0.58	17000	1.2	9.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
	309 L4	2003	0.50	17000	1.0	9.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
	309 L4	2423	0.41	17000	0.83	9.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
500	309 L1	3.43	146	9750	150	50	180-200-225-250	—	—	25100	32400	6840	27900
	309 L1	4.09	122	10000	132	50	180-200-225-250	—	—	26500	34200	7250	29000
	309 L1	5.25	95	10600	109	50	180-200-225-250	—	—	28500	36800	7880	29000
	309 L1	6.23	80	10900	94	50	180-200-225-250	—	—	30000	38800	8350	29000
	309 L2	12.3	41	10600	48	36	132-160-180-200	—	—	36900	47600	10500	27900
	309 L2	14.7	34	12900	49	36	132-160-180-200	—	—	38900	50200	11100	29000
	309 L2	17.4	28.8	13500	43	36	132-160-180-200	—	—	40900	52700	11800	29000
	309 L2	21.8	22.9	13700	35	36	132-160-180-200	—	—	43800	56400	12700	29000
	309 L2	25.4	19.7	12800	28	36	132-160-180-200	—	—	45800	59000	13300	29000
	309 L2	28.0	17.9	14900	30	36	132-160-180-200	—	—	47200	60800	13800	29000
	309 L2	32.6	15.4	15200	26	36	132-160-180-200	—	—	49300	63600	14500	29000
	309 L2	38.6	12.9	12900	18.6	36	132-160-180-200	—	—	51900	67000	15300	29000
	309 L2	46.7	10.7	13000	15.4	36	132-160-180-200	—	—	55000	70900	16300	29000
	309 L3	51.3	9.8	17700	19.8	22	71-80-90-100-112-132-160	—	—	56500	72900	16800	29000
	309 L3	60.5	8.3	19300	18.3	22	71-80-90-100-112-132-160	—	—	59400	76600	17800	29000
	309 L3	74.1	6.7	20100	15.5	22	71-80-90-100-112-132-160	—	—	63200	81500	19100	29000
	309 L3	80.6	6.2	16700	11.9	22	71-80-90-100-112-132-160	—	—	64800	83500	19600	29000
	309 L3	93.0	5.4	17500	10.8	22	71-80-90-100-112-132-160	—	—	67600	87200	20600	29000
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	309 L3	126	4.0	17500	8.0	22	71-80-90-100-112-132-160	—	—	74000	95500	22700	29000
	309 L3	139	3.6	17500	7.2	22	71-80-90-100-112-132-160	—	—	76200	98300	23500	29000
	309 L3	162	3.1	18400	6.5	22	71-80-90-100-112-132-160	—	—	79800	102900	24700	29000
	309 L3	183	2.7	14300	4.5	22	71-80-90-100-112-132-160	—	—	82800	106800	25700	29000
	309 L3	202	2.5	19100	5.4	22	71-80-90-100-112-132-160	—	—	85300	110000	26600	29000
	309 L3	223	2.2	14700	3.8	22	71-80-90-100-112-132-160	—	—	87900	113300	27500	29000
	309 L3	239	2.1	14900	3.6	22	71-80-90-100-112-132-160	—	—	89800	115800	28200	29000
	309 L3	284	1.8	15800	3.2	22	71-80-90-100-112-132-160	—	—	94500	121800	29800	29000
	309 L3	336	1.5	15800	2.7	22	71-80-90-100-112-132-160	—	—	99400	128200	31500	29000
	309 L4	349	1.4	21500	3.6	15.0	71-80-90-100-112-132-160	—	—	100500	129700	31900	29000
	309 L4	406	1.2	21300	3.1	15.0	71-80-90-100-112-132-160	—	—	105200	135600	33600	29000
	309 L4	465	1.1	21700	2.8	15.0	71-80-90-100-112-132-160	—	—	109600	141300	35100	29000
	309 L4	509	0.98	14700	1.7	15.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
	309 L4	579	0.86	21600	2.2	15.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
	309 L4	654	0.77	18300	1.7	15.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
	309 L4	722	0.69	21600	1.8	15.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
	309 L4	801	0.62	18300	1.4	15.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
	309 L4	906	0.55	18500	1.2	15.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
	309 L4	999	0.50	18300	1.1	15.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
	309 L4	1149	0.44	17000	0.87	15.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
	309 L4	1286	0.39	17000	0.78	15.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
	309 L4	1380	0.36	17000	0.73	15.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
	309 L4	1605	0.31	17000	0.63	15.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
	309 L4	1723	0.29	17000	0.58	15.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
	309 L4	2003	0.25	17000	0.50	15.0	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000
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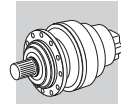


310 L

290

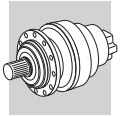
34120 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	310 L1	4.09	367	7330	175	35	200-225-250	—	—	22600	28400	9080	47600
	310 L1	5.25	286	7710	175	35	200-225-250	—	—	24300	30600	9870	47600
	310 L1	6.23	241	8020	175	35	200-225-250	—	—	25600	32200	10400	47600
	310 L2	14.7	102	10800	75	22	160-180-200-225-250	—	—	33100	41700	13900	47600
	310 L2	17.4	86	11300	75	22	160-180-200-225-250	—	—	34800	43800	14700	47600
	310 L2	21.8	69	12100	75	22	160-180-200-225-250	—	—	37300	46900	15900	47600
	310 L2	25.4	59	12700	75	22	160-180-200-225-250	—	—	39000	49100	16700	47600
	310 L2	28.0	54	12800	75	22	160-180-200-225-250	—	—	40200	50500	17200	47600
	310 L2	30.7	49	13400	73	22	160-180-200-225-250	—	—	41300	51900	17800	47600
	310 L2	32.6	46	13300	68	22	160-180-200-225-250	—	—	42000	52900	18100	47600
	310 L2	38.6	39	13600	59	22	160-180-200-225-250	—	—	44300	55700	19200	47600
	310 L2	46.7	32	14200	51	22	160-180-200-225-250	—	—	46900	58900	20500	47600
	310 L3	53.0	28.3	15800	40	18.0	132-160-180-200	—	—	48700	61200	21300	47600
	310 L3	62.6	24.0	16600	40	18.0	132-160-180-200	—	—	51200	64300	22500	47600
	310 L3	73.9	20.3	17500	40	18.0	132-160-180-200	—	—	53800	67600	23800	47600
	310 L3	80.3	18.7	17500	37	18.0	132-160-180-200	—	—	55100	69300	24500	47600
	310 L3	91.3	16.4	18600	35	18.0	132-160-180-200	—	—	57300	72100	25600	47600
	310 L3	101	14.9	18700	32	18.0	132-160-180-200	—	—	59000	74200	26400	47600
	310 L3	110	13.6	19700	31	18.0	132-160-180-200	—	—	60700	76300	27200	47600
	310 L3	119	12.6	19700	28	18.0	132-160-180-200	—	—	62000	78000	27900	47600
	310 L3	130	11.5	20700	27	18.0	132-160-180-200	—	—	63800	80200	28800	47600
	310 L3	142	10.6	20700	25	18.0	132-160-180-200	—	—	65400	82200	29600	47600
	310 L3	164	9.2	22200	23	18.0	132-160-180-200	—	—	68300	85800	31100	47600
	310 L3	177	8.5	18300	17.7	18.0	132-160-180-200	—	—	69900	87900	31900	47600
	310 L3	202	7.4	22000	18.8	18.0	132-160-180-200	—	—	72700	91400	33300	47600
	310 L3	230	6.5	21200	15.8	18.0	132-160-180-200	—	—	75600	95100	34800	47600
	310 L3	249	6.0	18400	12.7	18.0	132-160-180-200	—	—	77400	97400	35700	47600
	310 L3	295	5.1	23300	13.6	18.0	132-160-180-200	—	—	81500	102500	37800	47600
	310 L3	350	4.3	19000	9.3	18.0	132-160-180-200	—	—	85800	107900	40000	47600
	310 L4	392	3.8	19400	8.8	11.0	71-80-90-100-112-132-160	—	—	88700	111500	41500	47600
	310 L4	451	3.3	29800	11.7	11.0	71-80-90-100-112-132-160	—	—	92500	116300	43500	47600
	310 L4	507	3.0	25500	8.9	11.0	71-80-90-100-112-132-160	—	—	95800	120500	45300	47600
	310 L4	556	2.7	31600	10.1	11.0	71-80-90-100-112-132-160	—	—	98500	123900	46700	47600
	310 L4	637	2.4	26500	7.4	11.0	71-80-90-100-112-132-160	—	—	102600	129000	48800	47600
	310 L4	726	2.1	27100	6.6	11.0	71-80-90-100-112-132-160	—	—	106700	134200	51000	47600
	310 L4	818	1.8	27600	6.0	11.0	71-80-90-100-112-132-160	—	—	110600	139100	53100	47600
	310 L4	939	1.6	33200	6.3	11.0	71-80-90-100-112-132-160	—	—	115300	145000	55600	47600
	310 L4	1021	1.5	28700	5.0	11.0	71-80-90-100-112-132-160	—	—	118200	148600	57200	47600
	310 L4	1164	1.3	29300	4.5	11.0	71-80-90-100-112-132-160	—	—	123000	154600	59700	47600
	310 L4	1259	1.2	27600	3.9	11.0	71-80-90-100-112-132-160	—	—	125900	158300	61300	47600
	310 L4	1438	1.0	25800	3.2	11.0	71-80-90-100-112-132-160	—	—	131000	164700	64100	47600
	310 L4	1672	0.90	26000	2.8	11.0	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
	310 L4	1794	0.84	26000	2.6	11.0	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
	310 L4	2022	0.74	26000	2.3	11.0	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
	310 L4	2523	0.59	26000	1.8	11.0	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
1000	310 L1	4.09	244	8280	175	42	200-225-250	—	—	25500	32100	10400	47600
	310 L1	5.25	190	8710	175	42	200-225-250	—	—	27500	34500	11300	47600
	310 L1	6.23	160	9060	157	42	200-225-250	—	—	28900	36400	12000	47600
	310 L2	14.7	68	12200	75	26	160-180-200-225-250	—	—	37400	47100	15900	47600
	310 L2	17.4	58	12800	75	26	160-180-200-225-250	—	—	39300	49500	16800	47600
	310 L2	21.8	46	13700	70	26	160-180-200-225-250	—	—	42100	53000	18200	47600
	310 L2	25.4	39	14300	63	26	160-180-200-225-250	—	—	44100	55400	19100	47600
	310 L2	28.0	36	14400	57	26	160-180-200-225-250	—	—	45400	57100	19700	47600
	310 L2	30.7	33	14900	54	26	160-180-200-225-250	—	—	46700	58700	20300	47600
	310 L2	32.6	31	15100	52	26	160-180-200-225-250	—	—	47500	59700	20800	47600
	310 L2	38.6	25.9	14800	43	26	160-180-200-225-250	—	—	50000	62900	22000	47600
	310 L2	46.7	21.4	15500	37	26	160-180-200-225-250	—	—	52900	66600	23400	47600
	310 L3	53.0	18.9	17800	39	22	132-160-180-200	—	—	55000	69100	24400	47600
	310 L3	62.6	16.0	18800	34	22	132-160-180-200	—	—	57800	72700	25800	47600
	310 L3	73.9	13.5	19700	31	22	132-160-180-200	—	—	60700	76400	27300	47600
	310 L3	80.3	12.4	19800	28	22	132-160-180-200	—	—	62300	78300	28000	47600



310 L	290	34120 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	R _{n2} [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1000	310 L3	91.3	11.0	21000	26	22	132-160-180-200	—	—	64700	81400	29300	47600
	310 L3	101	9.9	21100	24	22	132-160-180-200	—	—	66700	83800	30300	47600
	310 L3	110	9.1	22200	23	22	132-160-180-200	—	—	68500	86200	31200	47600
	310 L3	119	8.4	21600	21	22	132-160-180-200	—	—	70100	88100	32000	47600
	310 L3	130	7.7	23400	21	22	132-160-180-200	—	—	72000	90600	33000	47600
	310 L3	142	7.1	22200	18.0	22	132-160-180-200	—	—	73800	92800	33900	47600
	310 L3	164	6.1	25000	17.5	22	132-160-180-200	—	—	77100	96900	35600	47600
	310 L3	177	5.6	18400	11.9	22	132-160-180-200	—	—	79000	99300	36500	47600
	310 L3	202	5.0	23400	13.3	22	132-160-180-200	—	—	82100	103200	38100	47600
	310 L3	230	4.3	21800	10.9	22	132-160-180-200	—	—	85400	107400	39800	47600
	310 L3	249	4.0	19300	8.9	22	132-160-180-200	—	—	87500	110000	40900	47600
	310 L3	295	3.4	24700	9.6	22	132-160-180-200	—	—	92000	115700	43300	47600
	310 L3	350	2.9	20600	6.8	22	132-160-180-200	—	—	96900	121800	45800	47600
	310 L4	392	2.6	21100	6.4	13.2	71-80-90-100-112-132-160	—	—	100200	125900	47600	47600
	310 L4	451	2.2	32600	8.5	13.2	71-80-90-100-112-132-160	—	—	104500	131400	49800	47600
	310 L4	507	2.0	27300	6.4	13.2	71-80-90-100-112-132-160	—	—	108200	136100	51800	47600
	310 L4	556	1.8	33000	7.0	13.2	71-80-90-100-112-132-160	—	—	111300	139900	53400	47600
	310 L4	637	1.6	28400	5.3	13.2	71-80-90-100-112-132-160	—	—	115900	145700	55900	47600
	310 L4	726	1.4	29000	4.7	13.2	71-80-90-100-112-132-160	—	—	120500	151500	58400	47600
	310 L4	818	1.2	29600	4.3	13.2	71-80-90-100-112-132-160	—	—	124900	157100	60800	47600
310 L4	939	1.1	34000	4.3	13.2	71-80-90-100-112-132-160	—	—	130200	163700	63600	47600	
310 L4	1021	0.98	30600	3.5	13.2	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600	
310 L4	1164	0.86	30600	3.1	13.2	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600	
310 L4	1259	0.79	28000	2.6	13.2	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600	
310 L4	1438	0.70	26000	2.1	13.2	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600	
310 L4	1672	0.60	26000	1.8	13.2	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600	
310 L4	1794	0.56	26000	1.7	13.2	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600	
310 L4	2022	0.49	26000	1.5	13.2	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600	
310 L4	2523	0.40	26000	1.2	13.2	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600	
500	310 L1	4.09	122	10200	134	70	200-225-250	—	—	31400	39500	13100	47600
	310 L1	5.25	95	10700	110	70	200-225-250	—	—	33800	42500	14200	47600
	310 L1	6.23	80	11200	97	70	200-225-250	—	—	35600	44800	15100	47600
	310 L2	14.7	34	15000	57	44	160-180-200-225-250	—	—	46100	58000	20100	47600
	310 L2	17.4	28.8	15700	50	44	160-180-200-225-250	—	—	48400	60900	21200	47600
	310 L2	21.8	22.9	16800	43	44	160-180-200-225-250	—	—	51900	65200	22900	47600
	310 L2	25.4	19.7	17600	39	44	160-180-200-225-250	—	—	54200	68200	24100	47600
	310 L2	28.0	17.9	17700	35	44	160-180-200-225-250	—	—	55900	70300	24900	47600
	310 L2	30.7	16.3	17800	32	44	160-180-200-225-250	—	—	57400	72200	25600	47600
	310 L2	32.6	15.4	18600	32	44	160-180-200-225-250	—	—	58500	73500	26100	47600
	310 L2	38.6	12.9	17200	25	44	160-180-200-225-250	—	—	61500	77400	27700	47600
	310 L2	46.7	10.7	18000	21	44	160-180-200-225-250	—	—	65200	81900	29500	47600
	310 L3	53.0	9.4	22000	24	36	132-160-180-200	—	—	67700	85100	30800	47600
	310 L3	62.6	8.0	23100	21	36	132-160-180-200	—	—	71100	89400	32500	47600
	310 L3	73.9	6.8	24300	18.8	36	132-160-180-200	—	—	74800	94000	34400	47600
	310 L3	80.3	6.2	22600	16.2	36	132-160-180-200	—	—	76700	96400	35300	47600
	310 L3	91.3	5.5	25900	16.2	36	132-160-180-200	—	—	79700	100200	36900	47600
	310 L3	101	5.0	23400	13.3	36	132-160-180-200	—	—	82100	103200	38100	47600
	310 L3	110	4.5	27300	14.2	36	132-160-180-200	—	—	84400	106100	39300	47600
	310 L3	119	4.2	24000	11.6	36	132-160-180-200	—	—	86300	108500	40300	47600
	310 L3	130	3.8	28700	12.6	36	132-160-180-200	—	—	88700	111500	41500	47600
	310 L3	142	3.5	24800	10.0	36	132-160-180-200	—	—	90900	114300	42700	47600
	310 L3	164	3.1	30300	10.6	36	132-160-180-200	—	—	94900	119300	44800	47600
	310 L3	177	2.8	20700	6.7	36	132-160-180-200	—	—	97200	122200	46000	47600
	310 L3	202	2.5	26300	7.5	36	132-160-180-200	—	—	101100	127100	48000	47600
	310 L3	230	2.2	21800	5.4	36	132-160-180-200	—	—	105100	132200	50200	47600
	310 L3	249	2.0	22300	5.1	36	132-160-180-200	—	—	107700	135400	51500	47600
	310 L3	295	1.7	26800	5.2	36	132-160-180-200	—	—	113300	142500	54500	47600
	310 L3	350	1.4	24000	3.9	36	132-160-180-200	—	—	119300	150000	57700	47600
	310 L4	392	1.3	24600	3.7	22	71-80-90-100-112-132-160	—	—	123300	155100	59900	47600
	310 L4	451	1.1	33900	4.5	22	71-80-90-100-112-132-160	—	—	128600	161700	62800	47600
	310 L4	507	0.99	30600	3.6	22	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
	310 L4	556	0.90	34100	3.6	22	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600



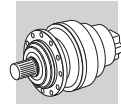
310 L	290	34120 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	R _{n2} [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
500	310 L4	637	0.79	30600	2.8	22	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
	310 L4	726	0.69	30600	2.5	22	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
	310 L4	818	0.61	30600	2.2	22	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
	310 L4	939	0.53	34100	2.1	22	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
	310 L4	1021	0.49	30600	1.8	22	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
	310 L4	1164	0.43	30600	1.6	22	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
	310 L4	1259	0.40	28000	1.3	22	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
	310 L4	1438	0.35	26000	1.1	22	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
	310 L4	1672	0.30	26000	0.92	22	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
	310 L4	1794	0.28	26000	0.86	22	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
	310 L4	2022	0.25	26000	0.76	22	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
	310 L4	2523	0.20	26000	0.61	22	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600

311 L	300	48330 Nm
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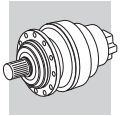
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	R _{n2} [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	311 L1	4.09	367	10600	200	35	—	—	—	26700	33200	9080	58300
	311 L1	5.25	286	11700	200	35	—	—	—	28700	35800	9870	58300
	311 L1	6.23	241	11600	200	35	—	—	—	30300	37700	10400	58300
	311 L2	14.0	107	15300	115	26	180-200-225-250	—	—	38600	48100	13700	58300
	311 L2	16.7	90	16100	115	26	180-200-225-250	—	—	40700	50700	14500	58300
	311 L2	18.0	83	16900	115	26	180-200-225-250	—	—	41600	51800	14900	58300
	311 L2	21.5	70	17400	115	26	180-200-225-250	—	—	43900	54600	15800	58300
	311 L2	25.5	59	18300	115	26	180-200-225-250	—	—	46200	57500	16700	58300
	311 L2	27.6	54	19200	115	26	180-200-225-250	—	—	47300	58900	17200	58300
	311 L2	32.7	46	20200	103	26	180-200-225-250	—	—	49800	62000	18200	58300
	311 L2	38.8	39	19700	85	26	180-200-225-250	—	—	52400	65300	19200	58300
	311 L3	50.5	29.7	22400	60	18.0	132-160-180-200	—	—	56700	70600	21000	58300
	311 L3	60.2	24.9	23700	60	18.0	132-160-180-200	—	—	59800	74500	22300	58300
	311 L3	71.1	21.1	24900	60	18.0	132-160-180-200	—	—	62800	78300	23500	58300
	311 L3	77.3	19.4	25500	57	18.0	132-160-180-200	—	—	64400	80200	24200	58300
	311 L3	89.3	16.8	26600	51	18.0	132-160-180-200	—	—	67300	83800	25400	58300
	311 L3	104	14.5	27800	46	18.0	132-160-180-200	—	—	70400	87600	26700	58300
	311 L3	115	13.1	28700	43	18.0	132-160-180-200	—	—	72500	90300	27600	58300
	311 L3	126	12.0	29500	40	18.0	132-160-180-200	—	—	74500	92800	28400	58300
	311 L3	133	11.3	30000	39	18.0	132-160-180-200	—	—	75800	94500	29000	58300
	311 L3	147	10.2	31800	37	18.0	132-160-180-200	—	—	78100	97300	30000	58300
	311 L3	161	9.3	31800	34	18.0	132-160-180-200	—	—	80300	100000	30900	58300
	311 L3	171	8.8	32600	33	18.0	132-160-180-200	—	—	81700	101800	31500	58300
	311 L3	191	7.8	32200	29	18.0	132-160-180-200	—	—	84500	105300	32700	58300
	311 L3	203	7.4	33400	28	18.0	132-160-180-200	—	—	86000	107200	33400	58300
	311 L3	245	6.1	34300	24	18.0	132-160-180-200	—	—	91100	113500	35500	58300
	311 L3	291	5.2	27000	16.0	18.0	132-160-180-200	—	—	95900	119400	37600	58300
	311 L4	348	4.3	39800	20	11.0	71-80-90-100-112-132-160	—	—	101100	126000	39900	58300
	311 L4	410	3.7	41500	18.0	11.0	71-80-90-100-112-132-160	—	—	106300	132400	42200	58300
	311 L4	512	2.9	44000	15.2	11.0	71-80-90-100-112-132-160	—	—	113600	141500	45400	58300
	311 L4	568	2.6	43000	13.4	11.0	71-80-90-100-112-132-160	—	—	117200	145900	47000	58300
	311 L4	627	2.4	39800	11.3	11.0	71-80-90-100-112-132-160	—	—	120700	150300	48600	58300
	311 L4	724	2.1	46300	11.4	11.0	71-80-90-100-112-132-160	—	—	126000	157000	51000	58300
	311 L4	825	1.8	44600	9.6	11.0	71-80-90-100-112-132-160	—	—	131000	163200	53300	58300
	311 L4	904	1.7	46900	9.2	11.0	71-80-90-100-112-132-160	—	—	134700	167800	54900	58300
	311 L4	986	1.5	42500	7.7	11.0	71-80-90-100-112-132-160	—	—	138300	172200	56500	58300
	311 L4	1058	1.4	43000	7.2	11.0	71-80-90-100-112-132-160	—	—	141200	175900	57900	58300
	311 L4	1230	1.2	43900	6.3	11.0	71-80-90-100-112-132-160	—	—	147800	184000	60800	58300
	311 L4	1415	1.1	42800	5.4	11.0	71-80-90-100-112-132-160	—	—	154100	191900	63800	58300
	311 L4	1680	0.89	34000	3.6	11.0	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300
	311 L4	1766	0.85	43000	4.3	11.0	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300
	311 L4	2096	0.72	34000	2.9	11.0	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300



1000	311 L1	4.09	244	11900	200	42	—	—	—	30100	37500	10400	58300
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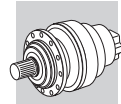
311 L	300	48330 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1000	311 L1	5.25	190	13200	200	42	—	—	—	32500	40400	11300	58300
	311 L1	6.23	160	13100	200	42	—	—	—	34200	42600	12000	58300
	311 L2	14.0	71	17300	115	31	180-200-225-250	—	—	43600	54300	15700	58300
	311 L2	16.7	60	18200	115	31	180-200-225-250	—	—	46000	57300	16600	58300
	311 L2	18.0	56	19100	115	31	180-200-225-250	—	—	47000	58500	17000	58300
	311 L2	21.5	47	19600	102	31	180-200-225-250	—	—	49500	61700	18100	58300
	311 L2	25.5	39	20600	90	31	180-200-225-250	—	—	52200	65000	19100	58300
	311 L2	27.6	36	21700	88	31	180-200-225-250	—	—	53400	66500	19600	58300
	311 L2	32.7	31	22800	78	31	180-200-225-250	—	—	56200	70000	20800	58300
	311 L2	38.8	25.8	21700	62	31	180-200-225-250	—	—	59200	73700	22000	58300
	311 L3	50.5	19.8	25300	58	22	132-160-180-200	—	—	64000	79700	24000	58300
	311 L3	60.2	16.6	26700	51	22	132-160-180-200	—	—	67500	84100	25500	58300
	311 L3	71.1	14.1	28100	45	22	132-160-180-200	—	—	71000	88400	26900	58300
	311 L3	77.3	12.9	28800	43	22	132-160-180-200	—	—	72800	90600	27700	58300
	311 L3	89.3	11.2	30100	39	22	132-160-180-200	—	—	76000	94600	29000	58300
	311 L3	104	9.6	31400	35	22	132-160-180-200	—	—	79500	99000	30500	58300
	311 L3	115	8.7	32400	32	22	132-160-180-200	—	—	81900	102000	31600	58300
	311 L3	126	8.0	33300	30	22	132-160-180-200	—	—	84100	104800	32500	58300
	311 L3	133	7.5	33900	29	22	132-160-180-200	—	—	85600	106700	33200	58300
	311 L3	147	6.8	33800	26	22	132-160-180-200	—	—	88200	109900	34300	58300
	311 L3	161	6.2	35900	26	22	132-160-180-200	—	—	90700	112900	35400	58300
	311 L3	171	5.9	34500	23	22	132-160-180-200	—	—	92300	115000	36100	58300
	311 L3	191	5.2	34300	21	22	132-160-180-200	—	—	95500	118900	37400	58300
	311 L3	203	4.9	35300	20.0	22	132-160-180-200	—	—	97200	121000	38200	58300
	311 L3	245	4.1	36400	17.0	22	132-160-180-200	—	—	102900	128100	40700	58300
	311 L3	291	3.4	28300	11.2	22	132-160-180-200	—	—	108300	134900	43100	58300
	311 L4	348	2.9	44200	15.0	13.2	71-80-90-100-112-132-160	—	—	114200	142300	45700	58300
	311 L4	410	2.4	45900	13.2	13.2	71-80-90-100-112-132-160	—	—	120000	149500	48300	58300
	311 L4	512	2.0	46500	10.7	13.2	71-80-90-100-112-132-160	—	—	128300	159800	52000	58300
	311 L4	568	1.8	44700	9.3	13.2	71-80-90-100-112-132-160	—	—	132300	164800	53800	58300
	311 L4	627	1.6	42200	8.0	13.2	71-80-90-100-112-132-160	—	—	136300	169800	55600	58300
	311 L4	724	1.4	47400	7.7	13.2	71-80-90-100-112-132-160	—	—	142300	177300	58400	58300
	311 L4	825	1.2	46200	6.6	13.2	71-80-90-100-112-132-160	—	—	148000	184300	61000	58300
	311 L4	904	1.1	48000	6.3	13.2	71-80-90-100-112-132-160	—	—	152100	189500	62800	58300
	311 L4	986	1.0	45100	5.4	13.2	71-80-90-100-112-132-160	—	—	156100	194500	64700	58300
	311 L4	1058	0.94	45200	5.1	13.2	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300
311 L4	1230	0.81	45200	4.3	13.2	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300	
311 L4	1415	0.71	43000	3.6	13.2	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300	
311 L4	1680	0.60	34000	2.4	13.2	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300	
311 L4	1766	0.57	43000	2.9	13.2	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300	
311 L4	2096	0.48	34000	1.9	13.2	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300	
500	311 L1	4.09	122	14700	194	70	—	—	—	37100	46200	13100	58300
	311 L1	5.25	95	16200	167	70	—	—	—	40000	49800	14200	58300
	311 L1	6.23	80	16100	140	70	—	—	—	42100	52400	15100	58300
	311 L2	14.0	36	21200	84	52	180-200-225-250	—	—	53700	66900	19800	58300
	311 L2	16.7	29.9	22400	74	52	180-200-225-250	—	—	56600	70500	20900	58300
	311 L2	18.0	27.8	23500	73	52	180-200-225-250	—	—	57800	72100	21500	58300
	311 L2	21.5	23.3	24100	63	52	180-200-225-250	—	—	61000	76000	22800	58300
	311 L2	25.5	19.6	25400	55	52	180-200-225-250	—	—	64200	80000	24100	58300
	311 L2	27.6	18.1	26700	54	52	180-200-225-250	—	—	65700	81900	24700	58300
	311 L2	32.7	15.3	28200	48	52	180-200-225-250	—	—	69200	86200	26200	58300
	311 L2	38.8	12.9	25500	36	52	180-200-225-250	—	—	72800	90700	27700	58300
	311 L3	50.5	9.9	31200	35	36	132-160-180-200	—	—	78800	98200	30300	58300
	311 L3	60.2	8.3	32900	31	36	132-160-180-200	—	—	83100	103500	32100	58300
	311 L3	71.1	7.0	34600	28	36	132-160-180-200	—	—	87400	108800	33900	58300
	311 L3	77.3	6.5	35400	26	36	132-160-180-200	—	—	89600	111600	34900	58300
	311 L3	89.3	5.6	37000	24	36	132-160-180-200	—	—	93500	116500	36600	58300
	311 L3	104	4.8	38700	21	36	132-160-180-200	—	—	97800	121900	38500	58300
	311 L3	115	4.4	39200	19.7	36	132-160-180-200	—	—	100800	125500	39800	58300
	311 L3	126	4.0	40600	18.6	36	132-160-180-200	—	—	103600	129000	41000	58300
	311 L3	133	3.8	40300	17.4	36	132-160-180-200	—	—	105400	131300	41800	58300

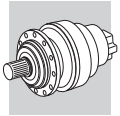


311 L							300	48330 Nm					
n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	Pt kW	P (IEC) 	MC	MZ	HC/PC	HZ/PZ	FZ	$M_{n2\ max}$ Nm
500	311 L3	147	3.4	37600	14.7	36	132-160-180-200	—	—	108600	135300	43200	58300
	311 L3	161	3.1	41700	14.9	36	132-160-180-200	—	—	111600	139000	44600	58300
	311 L3	171	2.9	38500	12.9	36	132-160-180-200	—	—	113600	141500	45400	58300
	311 L3	191	2.6	34500	10.4	36	132-160-180-200	—	—	117500	146400	47200	58300
	311 L3	203	2.5	39600	11.2	36	132-160-180-200	—	—	119600	149000	48100	58300
	311 L3	245	2.0	40300	9.4	36	132-160-180-200	—	—	126600	157800	51300	58300
	311 L3	291	1.7	31300	6.2	36	132-160-180-200	—	—	133300	166100	54300	58300
	311 L4	348	1.4	47300	8.1	22	71-80-90-100-112-132-160	—	—	140600	175100	57600	58300
	311 L4	410	1.2	47800	6.9	22	71-80-90-100-112-132-160	—	—	147800	184100	60900	58300
	311 L4	512	0.98	48300	5.6	22	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300
	311 L4	568	0.88	46900	4.9	22	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300
	311 L4	627	0.80	45200	4.3	22	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300
	311 L4	724	0.69	48300	3.9	22	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300
	311 L4	825	0.61	46900	3.4	22	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300
	311 L4	904	0.55	48300	3.2	22	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300
	311 L4	986	0.51	45200	2.7	22	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300
	311 L4	1058	0.47	45200	2.5	22	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300
	311 L4	1230	0.41	45200	2.2	22	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300
	311 L4	1415	0.35	43000	1.8	22	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300
	311 L4	1680	0.30	34000	1.2	22	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300
311 L4	1766	0.28	43000	1.4	22	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300	
311 L4	2096	0.24	34000	0.96	22	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300	

313 L							310	57970 Nm					
n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	Pt kW	P (IEC) 	MC	MZ	HC/PC	HZ/PZ	FZ	$M_{n2\ max}$ Nm
1500	313 L2	14.2	106	22600	150	30	180-200-225-250	—	—	47900	56700	16900	105000
	313 L2	16.9	89	23500	150	30	180-200-225-250	—	—	50500	59700	18000	105000
	313 L2	18.5	81	24100	150	30	180-200-225-250	—	—	51800	61400	18500	105000
	313 L2	21.8	69	25500	150	30	180-200-225-250	—	—	54400	64400	19500	105000
	313 L2	25.8	58	26700	150	30	180-200-225-250	—	—	57300	67800	20700	105000
	313 L2	28.4	53	27300	150	30	180-200-225-250	—	—	58900	69700	21300	105000
	313 L2	33.6	45	28800	143	30	180-200-225-250	—	—	62000	73400	22600	105000
	313 L2	40.5	37	29500	122	30	180-200-225-250	—	—	65600	77600	24000	105000
	313 L3	51.1	29.3	32700	60	18.0	132-160-180-200	—	—	70300	83200	25900	105000
	313 L3	61.0	24.6	34500	60	18.0	132-160-180-200	—	—	74100	87700	27500	105000
	313 L3	72.0	20.8	36300	60	18.0	132-160-180-200	—	—	77900	92200	29100	105000
	313 L3	78.3	19.2	37300	60	18.0	132-160-180-200	—	—	79900	94600	29900	105000
	313 L3	92.4	16.2	39300	60	18.0	132-160-180-200	—	—	84000	99400	31600	105000
	313 L3	110	13.7	41200	60	18.0	132-160-180-200	—	—	88400	104600	33500	105000
	313 L3	120	12.4	42100	60	18.0	132-160-180-200	—	—	90900	107600	34500	105000
	313 L3	135	11.1	44000	56	18.0	132-160-180-200	—	—	94100	111300	35800	105000
	313 L3	143	10.5	44400	53	18.0	132-160-180-200	—	—	95700	113300	36500	105000
	313 L3	151	9.9	45000	51	18.0	132-160-180-200	—	—	97300	115200	37200	105000
	313 L3	163	9.2	46000	49	18.0	132-160-180-200	—	—	99600	117800	38200	105000
	313 L3	176	8.5	45000	44	18.0	132-160-180-200	—	—	101800	120500	39100	105000
313 L3	182	8.2	39000	37	18.0	132-160-180-200	—	—	102900	121800	39600	105000	
313 L3	194	7.7	47600	42	18.0	132-160-180-200	—	—	104800	124100	40400	105000	
313 L3	209	7.2	45000	37	18.0	132-160-180-200	—	—	107200	126900	41400	105000	
313 L3	252	5.9	45000	31	18.0	132-160-180-200	—	—	113500	134300	44200	105000	
313 L3	304	4.9	39100	22	18.0	132-160-180-200	—	—	120000	142000	47000	105000	
313 L4	352	4.3	52500	26	11.0	71-80-90-100-112-132-160	—	—	125400	148400	49300	105000	
313 L4	394	3.8	55000	25	11.0	71-80-90-100-112-132-160	—	—	129700	153500	51200	105000	
313 L4	452	3.3	54000	21	11.0	71-80-90-100-112-132-160	—	—	135200	160000	53600	105000	
313 L4	514	2.9	48600	16.8	11.0	71-80-90-100-112-132-160	—	—	140500	166300	56000	105000	
313 L4	564	2.7	54800	17.2	11.0	71-80-90-100-112-132-160	—	—	144500	171000	57700	105000	
313 L4	633	2.4	52000	14.6	11.0	71-80-90-100-112-132-160	—	—	149600	177000	60000	105000	
313 L4	695	2.2	51000	13.0	11.0	71-80-90-100-112-132-160	—	—	153800	182100	61900	105000	
313 L4	790	1.9	52200	11.7	11.0	71-80-90-100-112-132-160	—	—	159800	189200	64600	105000	
313 L4	889	1.7	53100	10.6	11.0	71-80-90-100-112-132-160	—	—	165600	196000	67200	105000	



313 L							310	57970 Nm					
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 	MC	MZ	Rn ₂ [N] HC/PC	HZ/PZ	FZ	M _{n2 max} Nm
1500	313 L4	1014	1.5	54300	9.5	11.0	71-80-90-100-112-132-160	—	—	172300	203900	70200	105000
	313 L4	1117	1.3	52500	8.3	11.0	71-80-90-100-112-132-160	—	—	177300	209900	72500	105000
	313 L4	1266	1.2	56300	7.9	11.0	71-80-90-100-112-132-160	—	—	184100	217900	75600	105000
	313 L4	1394	1.1	52700	6.7	11.0	71-80-90-100-112-132-160	—	—	189500	224300	78100	105000
	313 L4	1502	1.00	58000	6.8	11.0	71-80-90-100-112-132-160	—	—	192000	229400	80000	105000
	313 L4	1817	0.83	58000	5.7	11.0	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000
	313 L4	2187	0.69	49000	4.0	11.0	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000
1000	313 L2	14.2	70	25600	150	36	180-200-225-250	—	—	54100	64000	19400	105000
	313 L2	16.9	59	26500	150	36	180-200-225-250	—	—	57000	67500	20500	105000
	313 L2	18.5	54	27200	150	36	180-200-225-250	—	—	58500	69300	21200	105000
	313 L2	21.8	46	28700	147	36	180-200-225-250	—	—	61400	72700	22300	105000
	313 L2	25.8	39	30100	130	36	180-200-225-250	—	—	64700	76600	23600	105000
	313 L2	28.4	35	30900	121	36	180-200-225-250	—	—	66500	78700	24400	105000
	313 L2	33.6	29.7	32500	107	36	180-200-225-250	—	—	70000	82900	25800	105000
	313 L2	40.5	24.7	32200	88	36	180-200-225-250	—	—	74000	87600	27500	105000
	313 L3	51.1	19.6	37000	60	22	132-160-180-200	—	—	79400	94000	29700	105000
	313 L3	61.0	16.4	39000	60	22	132-160-180-200	—	—	83700	99100	31500	105000
	313 L3	72.0	13.9	41000	60	22	132-160-180-200	—	—	88000	104100	33300	105000
	313 L3	78.3	12.8	42200	60	22	132-160-180-200	—	—	90200	106800	34200	105000
	313 L3	92.4	10.8	44300	55	22	132-160-180-200	—	—	94800	112200	36200	105000
	313 L3	110	9.1	46100	48	22	132-160-180-200	—	—	99800	118200	38300	105000
	313 L3	120	8.3	45000	43	22	132-160-180-200	—	—	102700	121500	39500	105000
	313 L3	135	7.4	49300	42	22	132-160-180-200	—	—	106200	125700	41000	105000
	313 L3	143	7.0	45000	36	22	132-160-180-200	—	—	108100	127900	41800	105000
	313 L3	151	6.6	45000	34	22	132-160-180-200	—	—	109900	130100	42600	105000
	313 L3	163	6.1	50200	35	22	132-160-180-200	—	—	112500	133100	43700	105000
	313 L3	176	5.7	45000	29	22	132-160-180-200	—	—	115000	136100	44800	105000
	313 L3	182	5.5	39000	25	22	132-160-180-200	—	—	116200	137500	45300	105000
	313 L3	194	5.2	51700	31	22	132-160-180-200	—	—	118400	140100	46300	105000
	313 L3	209	4.8	45300	25	22	132-160-180-200	—	—	121100	143300	47400	105000
	313 L3	252	4.0	46500	21	22	132-160-180-200	—	—	128200	151700	50600	105000
	313 L3	304	3.3	41000	15.5	22	132-160-180-200	—	—	135500	160400	53800	105000
	313 L4	352	2.8	52500	17.6	13.2	71-80-90-100-112-132-160	—	—	141600	167600	56500	105000
	313 L4	394	2.5	55000	16.5	13.2	71-80-90-100-112-132-160	—	—	146500	173400	58700	105000
	313 L4	452	2.2	55100	14.4	13.2	71-80-90-100-112-132-160	—	—	152700	180700	61400	105000
	313 L4	514	1.9	51900	11.9	13.2	71-80-90-100-112-132-160	—	—	158700	187800	64100	105000
	313 L4	564	1.8	55200	11.6	13.2	71-80-90-100-112-132-160	—	—	163100	193100	66100	105000
	313 L4	633	1.6	52400	9.8	13.2	71-80-90-100-112-132-160	—	—	168900	199900	68700	105000
	313 L4	695	1.4	54500	9.3	13.2	71-80-90-100-112-132-160	—	—	173700	205600	70900	105000
	313 L4	790	1.3	52600	7.9	13.2	71-80-90-100-112-132-160	—	—	180500	213600	74000	105000
	313 L4	889	1.1	56800	7.6	13.2	71-80-90-100-112-132-160	—	—	187100	221400	76900	105000
	313 L4	1014	0.99	58000	6.8	13.2	71-80-90-100-112-132-160	—	—	192000	230300	80000	105000
313 L4	1117	0.90	52800	5.6	13.2	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000	
313 L4	1266	0.79	58000	5.4	13.2	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000	
313 L4	1394	0.72	52800	4.5	13.2	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000	
313 L4	1502	0.67	58000	4.6	13.2	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000	
313 L4	1817	0.55	58000	3.8	13.2	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000	
313 L4	2187	0.46	49000	2.7	13.2	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000	
500	313 L1	4.14	121	21700	250	95	—	—	46000	54400	16200	105000	
	313 L1	5.40	93	23100	231	95	—	—	49800	58900	17700	105000	
	313 L1	6.50	77	24400	202	95	—	—	52700	62300	18800	105000	
	313 L2	14.2	35	31500	124	60	180-200-225-250	—	—	66600	78800	24400	105000
	313 L2	16.9	29.5	32700	107	60	180-200-225-250	—	—	70200	83100	25900	105000
	313 L2	18.5	27.0	33400	100	60	180-200-225-250	—	—	72100	85300	26700	105000
	313 L2	21.8	23.0	35400	90	60	180-200-225-250	—	—	75600	89500	28100	105000
	313 L2	25.8	19.4	37100	80	60	180-200-225-250	—	—	79600	94200	29800	105000
	313 L2	28.4	17.6	38000	75	60	180-200-225-250	—	—	81900	96900	30700	105000
	313 L2	33.6	14.9	40000	66	60	180-200-225-250	—	—	86200	102000	32500	105000
	313 L2	40.5	12.3	37300	51	60	180-200-225-250	—	—	91200	107900	34600	105000
	313 L3	51.1	9.8	45300	51	36	132-160-180-200	—	—	97800	115700	37400	105000
	313 L3	61.0	8.2	47200	44	36	132-160-180-200	—	—	103100	122000	39700	105000



313 L

310

57970 Nm

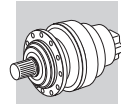
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
500	313 L3	72.0	6.9	48900	39	36	132-160-180-200	—	—	108300	128200	41900	105000
	313 L3	78.3	6.4	51400	38	36	132-160-180-200	—	—	111100	131500	43100	105000
	313 L3	92.4	5.4	53800	33	36	132-160-180-200	—	—	116800	138200	45600	105000
	313 L3	110	4.6	52000	27	36	132-160-180-200	—	—	122900	145500	48300	105000
	313 L3	120	4.1	46200	22	36	132-160-180-200	—	—	126400	149600	49800	105000
	313 L3	135	3.7	55000	23	36	132-160-180-200	—	—	130800	154800	51700	105000
	313 L3	143	3.5	47400	19.0	36	132-160-180-200	—	—	133100	157500	52700	105000
	313 L3	151	3.3	47800	18.1	36	132-160-180-200	—	—	135300	160200	53700	105000
	313 L3	163	3.1	54300	19.1	36	132-160-180-200	—	—	138500	163900	55100	105000
	313 L3	176	2.8	48800	15.9	36	132-160-180-200	—	—	141600	167600	56500	105000
	313 L3	182	2.7	41900	13.2	36	132-160-180-200	—	—	143100	169300	57100	105000
	313 L3	194	2.6	52000	15.4	36	132-160-180-200	—	—	145800	172500	58300	105000
	313 L3	209	2.4	50100	13.8	36	132-160-180-200	—	—	149100	176400	59800	105000
	313 L3	252	2.0	51700	11.8	36	132-160-180-200	—	—	157800	186800	63700	105000
	313 L3	304	1.6	45300	8.6	36	132-160-180-200	—	—	166800	197500	67800	105000
	313 L4	352	1.4	54300	9.1	22	71-80-90-100-112-132-160	—	—	174400	206400	71200	105000
	313 L4	394	1.3	55300	8.3	22	71-80-90-100-112-132-160	—	—	180400	213500	73900	105000
	313 L4	452	1.1	55400	7.2	22	71-80-90-100-112-132-160	—	—	187900	222400	77300	105000
	313 L4	514	0.97	58000	6.7	22	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000
	313 L4	564	0.89	55400	5.8	22	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000
313 L4	633	0.79	52800	4.9	22	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000	
313 L4	695	0.72	58000	4.9	22	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000	
313 L4	790	0.63	52800	4.0	22	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000	
313 L4	889	0.56	58000	3.9	22	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000	
313 L4	1014	0.49	58000	3.4	22	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000	
313 L4	1117	0.45	52800	2.8	22	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000	
313 L4	1266	0.40	58000	2.7	22	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000	
313 L4	1394	0.36	52800	2.2	22	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000	
313 L4	1502	0.33	58000	2.3	22	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000	
313 L4	1817	0.28	58000	1.9	22	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000	
313 L4	2187	0.23	49000	1.3	22	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000	



314 L

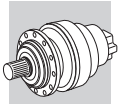
320



84000 Nm



n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	314 L2	17.4	86	33100	175	40	200-225-250	—	—	54300	63800	20400	115000
	314 L2	22.3	67	37400	175	40	200-225-250	—	—	58500	68700	22100	115000
	314 L2	26.5	57	37300	175	40	200-225-250	—	—	61600	72300	23400	115000
	314 L2	28.0	54	38200	175	40	200-225-250	—	—	62700	73600	23900	115000
	314 L2	33.2	45	40200	175	40	200-225-250	—	—	66000	77400	25300	115000
	314 L2	38.6	39	35300	152	40	200-225-250	—	—	69000	81000	26600	115000
	314 L3	62.6	24.0	48600	75	25	160-180-200-225-250	—	—	79800	93600	31200	115000
	314 L3	73.9	20.3	51100	75	25	160-180-200-225-250	—	—	83800	98400	33000	115000
	314 L3	92.7	16.2	54700	75	25	160-180-200-225-250	—	—	89700	105400	35600	115000
	314 L3	108	13.9	57200	75	25	160-180-200-225-250	—	—	93900	110200	37400	115000
	314 L3	138	10.8	64800	75	25	160-180-200-225-250	—	—	101200	118800	40700	115000
	314 L3	164	9.1	64200	67	25	160-180-200-225-250	—	—	106500	125100	43100	115000
	314 L3	174	8.6	63000	62	25	160-180-200-225-250	—	—	108300	127200	43900	115000
	314 L3	206	7.3	63800	53	25	160-180-200-225-250	—	—	114000	133900	46400	115000
	314 L3	240	6.3	52000	37	25	160-180-200-225-250	—	—	119300	140100	48800	115000
	314 L4	314	4.8	77800	40	15.0	132-160-180-200	—	—	129400	151900	53400	115000
	314 L4	388	3.9	78500	36	15.0	132-160-180-200	—	—	137900	161900	57300	115000
	314 L4	458	3.3	79100	31	15.0	132-160-180-200	—	—	144900	170100	60600	115000
	314 L4	495	3.0	79300	28	15.0	132-160-180-200	—	—	148300	174100	62200	115000
	314 L4	554	2.7	79700	26	15.0	132-160-180-200	—	—	153400	180100	64600	115000
314 L4	588	2.6	79900	24	15.0	132-160-180-200	—	—	156200	183400	65900	115000	
314 L4	668	2.2	80500	21	15.0	132-160-180-200	—	—	162300	190600	68700	115000	
314 L4	738	2.0	80900	19.5	15.0	132-160-180-200	—	—	167200	196300	71000	115000	
314 L4	858	1.7	81500	16.9	15.0	132-160-180-200	—	—	174900	205400	74700	115000	

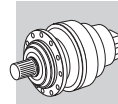


314 L							320	84000 Nm						
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 	MC	MZ	Rn ₂ [N] HC/PC	HZ/PZ	FZ	M _{n2 max} Nm	
1500	314 L4	926	1.6	74000	14.2	15.0	132-160-180-200	—	—	179000	210100	76600	115000	
	314 L4	1038	1.4	82400	14.1	15.0	132-160-180-200	—	—	185200	217400	79600	115000	
	314 L4	1099	1.4	75800	12.2	15.0	132-160-180-200	—	—	188400	221200	81100	115000	
	314 L4	1277	1.2	77400	10.8	15.0	132-160-180-200	—	—	197100	231400	85300	115000	
	314 L4	1485	1.0	66700	8.0	15.0	132-160-180-200	—	—	206000	242100	89700	115000	
	314 L4	1796	0.84	66800	6.6	15.0	132-160-180-200	—	—	206000	243000	90000	115000	
1000	314 L2	17.4	58	37400	175	48	200-225-250	—	—	61300	72000	23300	115000	
	314 L2	22.3	45	42200	175	48	200-225-250	—	—	66100	77600	25300	115000	
	314 L2	26.5	38	42100	175	48	200-225-250	—	—	69600	81700	26800	115000	
	314 L2	28.0	36	43100	171	48	200-225-250	—	—	70800	83100	27300	115000	
	314 L2	33.2	30	45300	152	48	200-225-250	—	—	74500	87500	28900	115000	
	314 L2	38.6	25.9	39600	114	48	200-225-250	—	—	77900	91500	30400	115000	
	314 L3	62.6	16.0	54900	75	30	160-180-200-225-250	—	—	90100	105800	35700	115000	
	314 L3	73.9	13.5	57700	75	30	160-180-200-225-250	—	—	94700	111200	37800	115000	
	314 L3	92.7	10.8	61800	75	30	160-180-200-225-250	—	—	101400	119000	40700	115000	
	314 L3	108	9.3	64600	69	30	160-180-200-225-250	—	—	106000	124500	42800	115000	
	314 L3	138	7.2	71400	59	30	160-180-200-225-250	—	—	114300	134200	46500	115000	
	314 L3	164	6.1	72900	51	30	160-180-200-225-250	—	—	120300	141200	49300	115000	
	314 L3	174	5.8	64800	43	30	160-180-200-225-250	—	—	122300	143600	50200	115000	
	314 L3	206	4.9	65600	37	30	160-180-200-225-250	—	—	128800	151200	53200	115000	
	314 L3	240	4.2	53400	26	30	160-180-200-225-250	—	—	134700	158200	55900	115000	
	314 L4	314	3.2	79200	30	18.0	132-160-180-200	—	—	146100	171600	61200	115000	
	314 L4	388	2.6	79900	24	18.0	132-160-180-200	—	—	155700	182800	65600	115000	
	314 L4	458	2.2	80600	21	18.0	132-160-180-200	—	—	163700	192200	69400	115000	
	314 L4	495	2.0	80900	19.4	18.0	132-160-180-200	—	—	167500	196600	71200	115000	
	314 L4	554	1.8	81400	17.4	18.0	132-160-180-200	—	—	173300	203500	73900	115000	
	314 L4	588	1.7	81700	16.4	18.0	132-160-180-200	—	—	176400	207100	75400	115000	
	314 L4	668	1.5	82200	14.6	18.0	132-160-180-200	—	—	183300	215200	78700	115000	
	314 L4	738	1.4	82700	13.3	18.0	132-160-180-200	—	—	188800	221700	81300	115000	
	314 L4	858	1.2	83300	11.5	18.0	132-160-180-200	—	—	197500	231900	85500	115000	
	314 L4	926	1.1	78300	10.0	18.0	132-160-180-200	—	—	202100	237300	87700	115000	
	314 L4	1038	0.96	84000	9.6	18.0	132-160-180-200	—	—	206000	243000	90000	115000	
	314 L4	1099	0.91	79200	8.5	18.0	132-160-180-200	—	—	206000	243000	90000	115000	
	314 L4	1277	0.78	79200	7.3	18.0	132-160-180-200	—	—	206000	243000	90000	115000	
	314 L4	1485	0.67	66800	5.3	18.0	132-160-180-200	—	—	206000	243000	90000	115000	
	314 L4	1796	0.56	66800	4.4	18.0	132-160-180-200	—	—	206000	243000	90000	115000	
	500	314 L2	17.4	28.8	46000	147	80	200-225-250	—	—	75500	88700	29400	115000
		314 L2	22.3	22.4	52000	130	80	200-225-250	—	—	81400	95600	31900	115000
		314 L2	26.5	18.9	51700	109	80	200-225-250	—	—	85700	100600	33800	115000
		314 L2	28.0	17.9	52700	105	80	200-225-250	—	—	87100	102300	34400	115000
		314 L2	33.2	15.0	55400	93	80	200-225-250	—	—	91700	107700	36500	115000
		314 L2	38.6	12.9	48300	70	80	200-225-250	—	—	96000	112700	38300	115000
314 L3		62.6	8.0	67500	62	50	160-180-200-225-250	—	—	110900	130200	45000	115000	
314 L3		73.9	6.8	70900	55	50	160-180-200-225-250	—	—	116600	136900	47600	115000	
314 L3		92.7	5.4	75900	47	50	160-180-200-225-250	—	—	124800	146500	51300	115000	
314 L3		108	4.6	77900	41	50	160-180-200-225-250	—	—	130500	153300	54000	115000	
314 L3		138	3.6	78700	33	50	160-180-200-225-250	—	—	140700	165200	58600	115000	
314 L3		164	3.0	79300	28	50	160-180-200-225-250	—	—	148100	173900	62100	115000	
314 L3		174	2.9	68700	23	50	160-180-200-225-250	—	—	150600	176800	63300	115000	
314 L3		206	2.4	69900	19.5	50	160-180-200-225-250	—	—	158500	186100	67000	115000	
314 L3		240	2.1	59200	14.2	50	160-180-200-225-250	—	—	165900	194700	70400	115000	
314 L4		314	1.6	81900	15.4	30	132-160-180-200	—	—	179900	211200	77100	115000	
314 L4		388	1.3	82900	12.6	30	132-160-180-200	—	—	191700	225100	82700	115000	
314 L4		458	1.1	83600	10.8	30	132-160-180-200	—	—	201500	236600	87400	115000	
314 L4		495	1.0	84000	10.0	30	132-160-180-200	—	—	206000	242100	89700	115000	
314 L4		554	0.90	84000	9.0	30	132-160-180-200	—	—	206000	243000	90000	115000	
314 L4		588	0.85	84000	8.4	30	132-160-180-200	—	—	206000	243000	90000	115000	
314 L4		668	0.75	84000	7.4	30	132-160-180-200	—	—	206000	243000	90000	115000	
314 L4		738	0.68	84000	6.7	30	132-160-180-200	—	—	206000	243000	90000	115000	
314 L4		858	0.58	84000	5.8	30	132-160-180-200	—	—	206000	243000	90000	115000	
314 L4		926	0.54	79200	5.1	30	132-160-180-200	—	—	206000	243000	90000	115000	



314 L							320	84000 Nm					
n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	Pt kW	P (IEC) 	MC	MZ	HC/PC	HZ/PZ	FZ	$M_{n2 \text{ max}}$ Nm
500	314 L4	1038	0.48	84000	4.8	30	132-160-180-200	—	—	206000	243000	90000	115000
	314 L4	1099	0.46	79200	4.3	30	132-160-180-200	—	—	206000	243000	90000	115000
	314 L4	1277	0.39	79200	3.7	30	132-160-180-200	—	—	206000	243000	90000	115000
	314 L4	1485	0.34	66800	2.7	30	132-160-180-200	—	—	206000	243000	90000	115000
	314 L4	1796	0.28	66800	2.2	30	132-160-180-200	—	—	206000	243000	90000	115000

315 L							330	105000 Nm					
n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	Pt kW	P (IEC) 	MC	MZ	HC/PC	HZ/PZ	FZ	$M_{n2 \text{ max}}$ Nm
1500	315 L2	17.4	86	41400	200	42	—	—	—	54300	63800	20400	135000
	315 L2	22.3	67	46800	200	42	—	—	—	58500	68700	22100	135000
	315 L2	26.5	57	46600	200	42	—	—	—	61600	72300	23400	135000
	315 L2	28.0	54	47800	200	42	—	—	—	62700	73600	23900	135000
	315 L2	33.2	45	50300	200	42	—	—	—	66000	77400	25300	135000
	315 L2	38.6	39	44100	190	42	—	—	—	69000	81000	26600	135000
	315 L3	59.6	25.2	59900	115	30	180-200-225-250	—	—	78600	92300	30700	135000
	315 L3	71.1	21.1	63100	115	30	180-200-225-250	—	—	82900	97300	32600	135000
	315 L3	91.3	16.4	68000	115	30	180-200-225-250	—	—	89300	104900	35400	135000
	315 L3	108	13.8	71600	114	30	180-200-225-250	—	—	94000	110400	37500	135000
	315 L3	139	10.8	81100	100	30	180-200-225-250	—	—	101300	119000	40700	135000
	315 L3	165	9.1	80400	84	30	180-200-225-250	—	—	106700	125200	43100	135000
	315 L3	174	8.6	78800	78	30	180-200-225-250	—	—	108500	127400	43900	135000
	315 L3	207	7.2	79800	66	30	180-200-225-250	—	—	114200	134100	46500	135000
	315 L3	241	6.2	65000	46	30	180-200-225-250	—	—	119500	140300	48900	135000
	315 L4	302	5.0	97000	57	18.0	132-160-180-200	—	—	127900	150200	52800	135000
	315 L4	370	4.1	97900	47	18.0	132-160-180-200	—	—	135900	159500	56400	135000
	315 L4	441	3.4	98700	40	18.0	132-160-180-200	—	—	143300	168200	59800	135000
	315 L4	487	3.1	99100	36	18.0	132-160-180-200	—	—	147600	173300	61800	135000
	315 L4	533	2.8	99500	33	18.0	132-160-180-200	—	—	151700	178100	63800	135000
	315 L4	591	2.5	99900	30	18.0	132-160-180-200	—	—	156400	183600	66000	135000
	315 L4	672	2.2	100600	27	18.0	132-160-180-200	—	—	162500	190800	68900	135000
	315 L4	741	2.0	101100	24	18.0	132-160-180-200	—	—	167400	196600	71200	135000
	315 L4	862	1.7	101900	21	18.0	132-160-180-200	—	—	175200	205700	74800	135000
	315 L4	930	1.6	92600	17.6	18.0	132-160-180-200	—	—	179200	210400	76800	135000
	315 L4	1043	1.4	103000	17.5	18.0	132-160-180-200	—	—	185500	217800	79700	135000
	315 L4	1104	1.4	94800	15.2	18.0	132-160-180-200	—	—	188700	221500	81300	135000
	315 L4	1284	1.2	96900	13.4	18.0	132-160-180-200	—	—	197400	231800	85400	135000
	315 L4	1492	1.0	83400	9.9	18.0	132-160-180-200	—	—	206000	242500	89800	135000
	315 L4	1805	0.83	83500	8.2	18.0	132-160-180-200	—	—	206000	243000	90000	135000
1000	315 L2	17.4	58	46700	200	50	—	—	—	61300	72000	23300	135000
	315 L2	22.3	45	52700	200	50	—	—	—	66100	77600	25300	135000
	315 L2	26.5	38	52600	200	50	—	—	—	69600	81700	26800	135000
	315 L2	28.0	36	53800	200	50	—	—	—	70800	83100	27300	135000
	315 L2	33.2	30	56600	189	50	—	—	—	74500	87500	28900	135000
	315 L2	38.6	25.9	49500	143	50	—	—	—	77900	91500	30400	135000
	315 L3	59.6	16.8	67600	115	36	180-200-225-250	—	—	88800	104200	35200	135000
	315 L3	71.1	14.1	71300	115	36	180-200-225-250	—	—	93600	109900	37300	135000
	315 L3	91.3	11.0	76900	97	36	180-200-225-250	—	—	100900	118400	40500	135000
	315 L3	108	9.2	80900	86	36	180-200-225-250	—	—	106200	124700	42900	135000
	315 L3	139	7.2	89400	74	36	180-200-225-250	—	—	114400	134400	46600	135000
	315 L3	165	6.1	91300	63	36	180-200-225-250	—	—	120500	141500	49400	135000
	315 L3	174	5.7	81100	53	36	180-200-225-250	—	—	122500	143800	50300	135000
	315 L3	207	4.8	82100	45	36	180-200-225-250	—	—	129000	151400	53200	135000
	315 L3	241	4.2	66700	32	36	180-200-225-250	—	—	134900	158400	56000	135000
	315 L4	302	3.3	98800	39	22	132-160-180-200	—	—	144500	169600	60400	135000
	315 L4	370	2.7	99700	32	22	132-160-180-200	—	—	153500	180200	64600	135000
	315 L4	441	2.3	100500	27	22	132-160-180-200	—	—	161800	190000	68500	135000

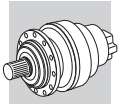


315 L	330	105000 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	R _{n2} [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1000	315 L4	487	2.1	101100	25	22	132-160-180-200	—	—	166700	195700	70800	135000
	315 L4	533	1.9	101500	23	22	132-160-180-200	—	—	171300	201100	73000	135000
	315 L4	591	1.7	102100	20	22	132-160-180-200	—	—	176600	207400	75500	135000
	315 L4	672	1.5	102800	18.1	22	132-160-180-200	—	—	183600	215500	78800	135000
	315 L4	741	1.3	103300	16.5	22	132-160-180-200	—	—	189100	222000	81500	135000
	315 L4	862	1.2	104200	14.3	22	132-160-180-200	—	—	197800	232300	85700	135000
	315 L4	930	1.1	98000	12.5	22	132-160-180-200	—	—	202400	237700	87900	135000
	315 L4	1043	0.96	105000	11.9	22	132-160-180-200	—	—	206000	243000	90000	135000
	315 L4	1104	0.91	99000	10.6	22	132-160-180-200	—	—	206000	243000	90000	135000
	315 L4	1284	0.78	99000	9.1	22	132-160-180-200	—	—	206000	243000	90000	135000
	315 L4	1492	0.67	83500	6.6	22	132-160-180-200	—	—	206000	243000	90000	135000
	315 L4	1805	0.55	83500	5.5	22	132-160-180-200	—	—	206000	243000	90000	135000
500	315 L1	4.25	118	40800	260	60	—	—	—	49500	58100	18400	135000
	315 L1	5.33	94	40500	260	60	—	—	—	53000	62200	19800	135000
	315 L1	6.20	81	35500	260	60	—	—	—	55400	65100	20800	135000
	315 L2	17.4	28.8	57500	184	84	—	—	—	75500	88700	29400	135000
	315 L2	22.3	22.4	65000	162	84	—	—	—	81400	95600	31900	135000
	315 L2	26.5	18.9	64600	136	84	—	—	—	85700	100600	33800	135000
	315 L2	28.0	17.9	65900	131	84	—	—	—	87100	102300	34400	135000
	315 L2	33.2	15.0	69200	116	84	—	—	—	91700	107700	36500	135000
	315 L2	38.6	12.9	60400	87	84	—	—	—	96000	112700	38300	135000
	315 L3	59.6	8.4	83200	80	60	180-200-225-250	—	—	109300	128300	44300	135000
	315 L3	71.1	7.0	87700	71	60	180-200-225-250	—	—	115200	135300	47000	135000
	315 L3	91.3	5.5	94400	59	60	180-200-225-250	—	—	124200	145800	51100	135000
	315 L3	108	4.6	97300	52	60	180-200-225-250	—	—	130700	153500	54100	135000
	315 L3	139	3.6	98400	41	60	180-200-225-250	—	—	140900	165400	58700	135000
	315 L3	165	3.0	99200	34	60	180-200-225-250	—	—	148300	174100	62200	135000
	315 L3	174	2.9	86000	28	60	180-200-225-250	—	—	150800	177100	63400	135000
	315 L3	207	2.4	87400	24	60	180-200-225-250	—	—	158800	186400	67100	135000
	315 L3	241	2.1	74000	17.6	60	180-200-225-250	—	—	166100	195000	70500	135000
	315 L4	302	1.7	102200	20.0	36	132-160-180-200	—	—	177900	208800	76100	135000
	315 L4	370	1.4	103300	16.5	36	132-160-180-200	—	—	188900	221800	81400	135000
	315 L4	441	1.1	104300	14.0	36	132-160-180-200	—	—	199200	233900	86300	135000
	315 L4	487	1.0	104900	12.7	36	132-160-180-200	—	—	205200	240900	89200	135000
	315 L4	533	0.94	105000	11.6	36	132-160-180-200	—	—	206000	243000	90000	135000
	315 L4	591	0.85	105000	10.5	36	132-160-180-200	—	—	206000	243000	90000	135000
	315 L4	672	0.74	105000	9.2	36	132-160-180-200	—	—	206000	243000	90000	135000
	315 L4	741	0.67	105000	8.4	36	132-160-180-200	—	—	206000	243000	90000	135000
	315 L4	862	0.58	105000	7.2	36	132-160-180-200	—	—	206000	243000	90000	135000
	315 L4	930	0.54	99000	6.3	36	132-160-180-200	—	—	206000	243000	90000	135000
	315 L4	1043	0.48	105000	6.0	36	132-160-180-200	—	—	206000	243000	90000	135000
	315 L4	1104	0.45	99000	5.3	36	132-160-180-200	—	—	206000	243000	90000	135000
	315 L4	1284	0.39	99000	4.6	36	132-160-180-200	—	—	206000	243000	90000	135000
	315 L4	1492	0.34	83500	3.3	36	132-160-180-200	—	—	206000	243000	90000	135000
315 L4	1805	0.28	83500	2.7	36	132-160-180-200	—	—	206000	243000	90000	135000	

316 L	340	138820 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	R _{n2} [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	316 L2	17.4	86	43900	200	50	—	—	—	90300	100400	33900	192000
	316 L2	22.3	67	48500	200	50	—	—	—	97300	108200	36900	192000
	316 L2	26.5	57	47700	200	50	—	—	—	102500	113900	39100	192000
316 L3	59.6	25.2	63400	115	35	180-200-225-250	—	—	130700	145300	51200	192000	
316 L3	71.1	21.1	66900	115	35	180-200-225-250	—	—	137800	153300	54300	192000	
316 L3	76.5	19.6	70100	115	35	180-200-225-250	—	—	140800	156600	55600	192000	
316 L3	91.3	16.4	72100	115	35	180-200-225-250	—	—	148500	165200	59000	192000	
316 L3	108	13.8	75900	115	35	180-200-225-250	—	—	156300	173900	62500	192000	

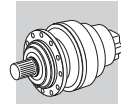


316 L

340

138820 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	R _{n2} [N]					M _{n2 max} Nm	
								MC	MZ	HC/PC	HZ/PZ	FZ		
1500	316 L3	117	12.8	79400	115	35	180-200-225-250	—	—	160000	178000	64100	192000	
	316 L3	139	10.8	81800	101	35	180-200-225-250	—	—	168500	187400	67900	192000	
	316 L3	165	9.1	82500	86	35	180-200-225-250	—	—	177400	197300	71900	192000	
	316 L4	215	7.0	93200	60	18.0	132-160-180-200	—	—	191900	213500	78500	192000	
	316 L4	256	5.9	98200	60	18.0	132-160-180-200	—	—	202400	225100	83200	192000	
	316 L4	302	5.0	103200	60	18.0	132-160-180-200	—	—	212700	236600	87900	192000	
	316 L4	329	4.6	105800	57	18.0	132-160-180-200	—	—	218100	242600	90400	192000	
	316 L4	370	4.1	109400	53	18.0	132-160-180-200	—	—	225900	251300	94000	192000	
	316 L4	441	3.4	115200	46	18.0	132-160-180-200	—	—	238200	264900	99700	192000	
	316 L4	487	3.1	118600	43	18.0	132-160-180-200	—	—	245400	272900	103100	192000	
	316 L4	533	2.8	121800	40	18.0	132-160-180-200	—	—	252200	280500	106300	192000	
	316 L4	566	2.7	123900	39	18.0	132-160-180-200	—	—	256700	285500	108400	192000	
	316 L4	591	2.5	122500	37	18.0	132-160-180-200	—	—	260100	289200	110000	192000	
	316 L4	625	2.4	126500	36	18.0	132-160-180-200	—	—	264500	294100	112000	192000	
	316 L4	685	2.2	127800	33	18.0	132-160-180-200	—	—	271800	302300	115500	192000	
	316 L4	726	2.1	128600	31	18.0	132-160-180-200	—	—	276700	307700	117800	192000	
	316 L4	741	2.0	126500	30	18.0	132-160-180-200	—	—	278400	309600	118600	192000	
	316 L4	812	1.8	130000	28	18.0	132-160-180-200	—	—	286100	318200	122300	192000	
	316 L4	862	1.7	129000	27	18.0	132-160-180-200	—	—	291300	323900	124700	192000	
	316 L4	1043	1.4	132300	23	18.0	132-160-180-200	—	—	308400	343000	132900	192000	
	316 L4	1237	1.2	122100	17.5	18.0	132-160-180-200	—	—	324600	361100	140700	192000	
	1000	316 L2	17.4	58	49500	200	60	—	—	102000	113400	38900	192000	
		316 L2	22.3	45	55000	200	60	—	—	109900	122200	42200	192000	
		316 L2	26.5	38	53800	200	60	—	—	115700	128700	44700	192000	
		316 L3	59.6	16.8	71600	115	42	180-200-225-250	—	—	147600	164100	58600	192000
		316 L3	71.1	14.1	75600	115	42	180-200-225-250	—	—	155600	173100	62100	192000
		316 L3	76.5	13.1	78900	115	42	180-200-225-250	—	—	159100	176900	63700	192000
		316 L3	91.3	11.0	81400	102	42	180-200-225-250	—	—	167700	186500	67500	192000
		316 L3	108	9.2	85700	91	42	180-200-225-250	—	—	176600	196400	71500	192000
		316 L3	117	8.5	89800	88	42	180-200-225-250	—	—	180800	201000	73400	192000
		316 L3	139	7.2	92400	76	42	180-200-225-250	—	—	190300	211600	77700	192000
316 L3		165	6.1	93100	65	42	180-200-225-250	—	—	200300	222800	82300	192000	
316 L4		215	4.7	105100	58	22	132-160-180-200	—	—	216700	241100	89800	192000	
316 L4		256	3.9	110700	51	22	132-160-180-200	—	—	228500	254200	95300	192000	
316 L4		302	3.3	116100	45	22	132-160-180-200	—	—	240200	267200	100700	192000	
316 L4		329	3.0	119000	43	22	132-160-180-200	—	—	246300	273900	103500	192000	
316 L4		370	2.7	123100	39	22	132-160-180-200	—	—	255100	283800	107600	192000	
316 L4		441	2.3	127300	34	22	132-160-180-200	—	—	269000	299200	114200	192000	
316 L4		487	2.1	128600	31	22	132-160-180-200	—	—	277100	308200	118000	192000	
316 L4		533	1.9	129900	29	22	132-160-180-200	—	—	284800	316800	121700	192000	
316 L4		566	1.8	130700	27	22	132-160-180-200	—	—	289900	322500	124100	192000	
316 L4		591	1.7	129500	26	22	132-160-180-200	—	—	293700	326600	125900	192000	
316 L4		625	1.6	132100	25	22	132-160-180-200	—	—	298700	332200	128200	192000	
316 L4		685	1.5	133400	23	22	132-160-180-200	—	—	307000	341400	132200	192000	
316 L4		726	1.4	134200	22	22	132-160-180-200	—	—	312500	347500	134800	192000	
316 L4		741	1.3	133400	21	22	132-160-180-200	—	—	314400	349700	135800	192000	
316 L4		812	1.2	135800	19.8	22	132-160-180-200	—	—	323200	359400	140000	192000	
316 L4		862	1.2	136100	18.7	22	132-160-180-200	—	—	328900	365800	142800	192000	
316 L4		1043	0.96	138800	15.7	22	132-160-180-200	—	—	345000	385000	150000	192000	
316 L4		1237	0.81	124000	11.9	22	132-160-180-200	—	—	345000	385000	150000	192000	
500		316 L2	17.4	28.8	60900	195	100	—	—	125600	139600	49000	192000	
		316 L2	22.3	22.4	67400	168	100	—	—	135300	150500	53200	192000	
	316 L2	26.5	18.9	66200	139	100	—	—	142400	158400	56300	192000		
	316 L3	59.6	8.4	88200	85	70	180-200-225-250	—	—	181700	202100	73800	192000	
	316 L3	71.1	7.0	93000	75	70	180-200-225-250	—	—	191600	213100	78300	192000	
	316 L3	76.5	6.5	98000	74	70	180-200-225-250	—	—	195800	217800	80200	192000	
	316 L3	91.3	5.5	100200	63	70	180-200-225-250	—	—	206500	229600	85100	192000	
	316 L3	108	4.6	105400	56	70	180-200-225-250	—	—	217400	241800	90100	192000	
	316 L3	117	4.3	111100	54	70	180-200-225-250	—	—	222500	247500	92500	192000	
	316 L3	139	3.6	112100	46	70	180-200-225-250	—	—	234300	260500	97900	192000	
	316 L3	165	3.0	110200	38	70	180-200-225-250	—	—	246600	274300	103700	192000	

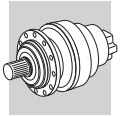


316 L	340	138820 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
500	316 L4	215	2.3	126900	35	36	132-160-180-200	—	—	266800	296800	113100	192000
	316 L4	256	2.0	129300	30	36	132-160-180-200	—	—	281400	312900	120000	192000
	316 L4	302	1.7	131600	26	36	132-160-180-200	—	—	295700	328900	126800	192000
	316 L4	329	1.5	132800	24	36	132-160-180-200	—	—	303200	337200	130400	192000
	316 L4	370	1.4	134500	22	36	132-160-180-200	—	—	314100	349300	135600	192000
	316 L4	441	1.1	137000	18.4	36	132-160-180-200	—	—	331200	368400	143800	192000
	316 L4	487	1.0	138400	16.8	36	132-160-180-200	—	—	341200	379500	148700	192000
	316 L4	533	0.94	138800	15.4	36	132-160-180-200	—	—	345000	385000	150000	192000
	316 L4	566	0.88	138800	14.5	36	132-160-180-200	—	—	345000	385000	150000	192000
	316 L4	591	0.85	138800	13.9	36	132-160-180-200	—	—	345000	385000	150000	192000
	316 L4	625	0.80	138800	13.1	36	132-160-180-200	—	—	345000	385000	150000	192000
	316 L4	685	0.73	138800	12.0	36	132-160-180-200	—	—	345000	385000	150000	192000
	316 L4	726	0.69	138800	11.3	36	132-160-180-200	—	—	345000	385000	150000	192000
	316 L4	741	0.67	138800	11.1	36	132-160-180-200	—	—	345000	385000	150000	192000
	316 L4	812	0.62	138800	10.1	36	132-160-180-200	—	—	345000	385000	150000	192000
	316 L4	862	0.58	138800	9.5	36	132-160-180-200	—	—	345000	385000	150000	192000
	316 L4	1043	0.48	138800	7.9	36	132-160-180-200	—	—	345000	385000	150000	192000
	316 L4	1237	0.40	124000	5.9	36	132-160-180-200	—	—	345000	385000	150000	192000

317 L	348	208110 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	317 L3	58.1	25.8	90300	150	35	180-200-225-250	—	—	166800	177500	50800	393000
	317 L3	69.3	21.6	93300	150	35	180-200-225-250	—	—	175800	187200	53800	393000
	317 L3	89.0	16.9	101000	150	35	180-200-225-250	—	—	189500	201800	58500	393000
	317 L3	106	14.2	105800	150	35	180-200-225-250	—	—	199500	212400	61900	393000
	317 L3	116	12.9	108300	150	35	180-200-225-250	—	—	205200	218400	63900	393000
	317 L3	138	10.9	114000	143	35	180-200-225-250	—	—	216000	230000	67700	393000
	317 L3	166	9.1	120500	125	35	180-200-225-250	—	—	228300	243100	72000	393000
	317 L3	179	8.4	136600	131	35	180-200-225-250	—	—	233800	248900	73900	393000
	317 L3	213	7.1	142200	115	35	180-200-225-250	—	—	246100	262000	78200	393000
	317 L3	252	5.9	119700	82	35	180-200-225-250	—	—	259100	275800	82800	393000
	317 L4	310	4.8	146200	60	18.0	132-160-180-200	—	—	275500	293400	88700	393000
	317 L4	360	4.2	152900	60	18.0	132-160-180-200	—	—	288300	306900	93200	393000
	317 L4	449	3.3	163300	60	18.0	132-160-180-200	—	—	307900	327800	100300	393000
	317 L4	493	3.0	166900	60	18.0	132-160-180-200	—	—	316700	337200	103500	393000
	317 L4	552	2.7	174500	56	18.0	132-160-180-200	—	—	327600	348800	107500	393000
	317 L4	619	2.4	177200	51	18.0	132-160-180-200	—	—	339000	361000	111600	393000
	317 L4	719	2.1	178400	44	18.0	132-160-180-200	—	—	354700	377600	117400	393000
	317 L4	792	1.9	186500	42	18.0	132-160-180-200	—	—	365100	388700	121200	393000
	317 L4	904	1.7	166600	33	18.0	132-160-180-200	—	—	379800	404400	126700	393000
	317 L4	1032	1.5	181300	31	18.0	132-160-180-200	—	—	395300	420900	132400	393000
317 L4	1134	1.3	168100	26	18.0	132-160-180-200	—	—	406600	432900	136600	393000	
317 L4	1318	1.1	169100	23	18.0	132-160-180-200	—	—	425400	452900	143700	393000	
317 L4	1595	0.94	170000	18.9	18.0	132-160-180-200	—	—	442000	470000	150000	393000	
317 L4	1893	0.79	156200	14.6	18.0	132-160-180-200	—	—	442000	470000	150000	393000	
1000	317 L3	58.1	17.2	101900	150	42	180-200-225-250	—	—	188300	200500	58100	393000
	317 L3	69.3	14.4	105300	150	42	180-200-225-250	—	—	198600	211400	61600	393000
	317 L3	89.0	11.2	114000	147	42	180-200-225-250	—	—	214000	227800	67000	393000
	317 L3	106	9.5	119500	130	42	180-200-225-250	—	—	225300	239900	70900	393000
	317 L3	116	8.6	122300	121	42	180-200-225-250	—	—	231700	246700	73200	393000
	317 L3	138	7.3	128800	107	42	180-200-225-250	—	—	243900	259700	77400	393000
	317 L3	166	6.0	136100	94	42	180-200-225-250	—	—	257900	274600	82400	393000
	317 L3	179	5.6	150100	96	42	180-200-225-250	—	—	264000	281100	84600	393000
	317 L3	213	4.7	154900	84	42	180-200-225-250	—	—	277900	295900	89500	393000
	317 L3	252	4.0	124600	57	42	180-200-225-250	—	—	292600	311500	94800	393000
	317 L4	310	3.2	165100	60	22	132-160-180-200	—	—	311200	331300	101500	393000
	317 L4	360	2.8	172700	57	22	132-160-180-200	—	—	325600	346600	106700	393000
	317 L4	449	2.2	181600	48	22	132-160-180-200	—	—	347700	370200	114800	393000



317 L

348

208110 Nm

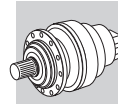
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1000	317 L4	493	2.0	178600	43	22	132-160-180-200	—	—	357700	380800	118500	393000
	317 L4	552	1.8	188400	40	22	132-160-180-200	—	—	369900	393900	123000	393000
	317 L4	619	1.6	180400	35	22	132-160-180-200	—	—	382900	407600	127800	393000
	317 L4	719	1.4	181600	30	22	132-160-180-200	—	—	400600	426500	134400	393000
	317 L4	792	1.3	199300	30	22	132-160-180-200	—	—	412300	439000	138800	393000
	317 L4	904	1.1	169300	22	22	132-160-180-200	—	—	429000	456700	145000	393000
	317 L4	1032	0.97	184300	21	22	132-160-180-200	—	—	442000	470000	150000	393000
	317 L4	1134	0.88	170000	17.7	22	132-160-180-200	—	—	442000	470000	150000	393000
	317 L4	1318	0.76	170000	15.3	22	132-160-180-200	—	—	442000	470000	150000	393000
	317 L4	1595	0.63	170000	12.6	22	132-160-180-200	—	—	442000	470000	150000	393000
	317 L4	1893	0.53	156200	9.8	22	132-160-180-200	—	—	442000	470000	150000	393000
	500	317 L2	16.9	29.5	86700	250	116	—	—	160200	170600	48500	393000
317 L2		22.1	22.6	91400	230	116	—	—	173500	184700	53000	393000	
317 L2		26.6	18.8	96700	202	116	—	—	183400	195300	56400	393000	
317 L2		28.4	17.6	110500	217	116	—	—	186900	199000	57600	393000	
317 L2		34.1	14.7	116800	191	116	—	—	197600	210400	61300	393000	
317 L2		40.5	12.3	112800	155	116	—	—	208100	221500	64900	393000	
317 L3		58.1	8.6	125400	124	70	180-200-225-250	—	—	231900	246900	73200	393000
317 L3		69.3	7.2	129700	107	70	180-200-225-250	—	—	244500	260300	77600	393000
317 L3		89.0	5.6	140100	90	70	180-200-225-250	—	—	263500	280500	84400	393000
317 L3		106	4.7	147100	80	70	180-200-225-250	—	—	277400	295300	89300	393000
317 L3		116	4.3	150500	74	70	180-200-225-250	—	—	285300	303700	92200	393000
317 L3		138	3.6	158400	66	70	180-200-225-250	—	—	300300	319700	97600	393000
317 L3		166	3.0	151900	53	70	180-200-225-250	—	—	317500	338000	103800	393000
317 L3		179	2.8	162300	52	70	180-200-225-250	—	—	325000	346100	106500	393000
317 L3		213	2.4	164400	44	70	180-200-225-250	—	—	342200	364300	112800	393000
317 L3		252	2.0	139600	32	70	180-200-225-250	—	—	360200	383500	119400	393000
317 L4		310	1.6	191500	37	36	132-160-180-200	—	—	383100	407900	127900	393000
317 L4		360	1.4	196200	32	36	132-160-180-200	—	—	400800	426700	134500	393000
317 L4		449	1.1	203400	27	36	132-160-180-200	—	—	428100	455800	144700	393000
317 L4		493	1.0	184200	22	36	132-160-180-200	—	—	440300	468800	149300	393000
317 L4		552	0.91	207100	22	36	132-160-180-200	—	—	442000	470000	150000	393000
317 L4		619	0.81	184300	17.6	36	132-160-180-200	—	—	442000	470000	150000	393000
317 L4		719	0.70	184300	15.2	36	132-160-180-200	—	—	442000	470000	150000	393000
317 L4		792	0.63	207100	15.5	36	132-160-180-200	—	—	442000	470000	150000	393000
317 L4		904	0.55	170000	11.1	36	132-160-180-200	—	—	442000	470000	150000	393000
317 L4		1032	0.48	184300	10.6	36	132-160-180-200	—	—	442000	470000	150000	393000
317 L4		1134	0.44	170000	8.9	36	132-160-180-200	—	—	442000	470000	150000	393000
317 L4		1318	0.38	170000	7.6	36	132-160-180-200	—	—	442000	470000	150000	393000
317 L4		1595	0.31	170000	6.3	36	132-160-180-200	—	—	442000	470000	150000	393000
317 L4		1893	0.26	156200	4.9	36	132-160-180-200	—	—	442000	470000	150000	393000



318 L

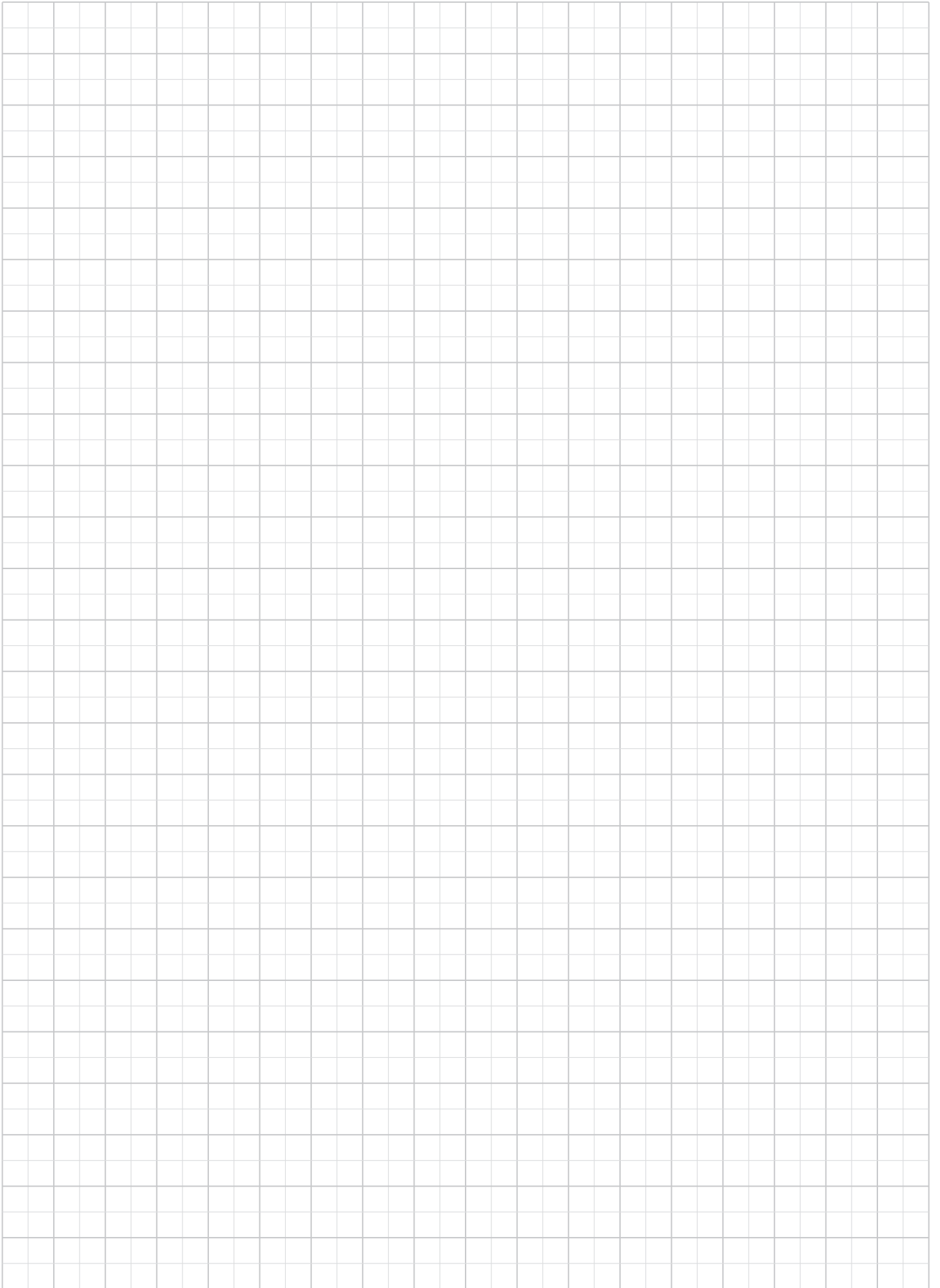
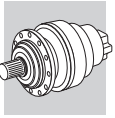
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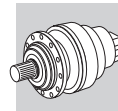
280580 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	318 L3	76.5	19.6	144900	200	40	—	—	227200	231900	74200	550000	
	318 L3	98.2	15.3	156100	200	40	—	—	244900	249900	80600	550000	
	318 L3	117	12.9	164400	200	40	—	—	257800	263100	85300	550000	
	318 L3	123	12.2	167200	200	40	—	—	262100	267500	86900	550000	
	318 L3	146	10.3	176000	200	40	—	—	275900	281600	92000	550000	
	318 L3	170	8.8	184100	186	40	—	—	288700	294600	96800	550000	
318 L4	262	5.7	209700	115	22	180-200-225-250	—	—	328800	335600	111800	550000	
318 L4	313	4.8	220800	115	22	180-200-225-250	—	—	346700	353800	118600	550000	
318 L4	337	4.5	225200	115	22	180-200-225-250	—	—	354400	361600	121500	550000	
318 L4	402	3.7	236100	104	22	180-200-225-250	—	—	373600	381300	128900	550000	
318 L4	422	3.6	239300	101	22	180-200-225-250	—	—	379300	387100	131100	550000	
318 L4	477	3.1	247200	92	22	180-200-225-250	—	—	393300	401400	136500	550000	
318 L4	515	2.9	252500	87	22	180-200-225-250	—	—	402700	410900	140100	550000	



325 L							384	1286700 Nm						
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 	Rn ₂ [N]					M _{n2 max} Nm	
								MC	MZ	HC/PC	HZ/PZ	FZ		
1000	325 L4	1279	0.78	963200	89	78	—	—	—	—	—	1400000	2000000	
500	325 L3	83.3	6.0	849100	260	115	—	—	—	—	—	770500	2000000	
	325 L3	105	4.8	908900	260	115	—	—	—	—	—	831100	2000000	
	325 L3	113	4.4	898100	260	115	—	—	—	—	—	852200	2000000	
	325 L3	120	4.2	928800	260	115	—	—	—	—	—	869100	2000000	
	325 L3	142	3.5	961400	260	115	—	—	—	—	—	919200	2000000	
	325 L3	165	3.0	1005800	260	115	—	—	—	—	—	966600	2000000	
	325 L3	205	2.4	963200	260	115	—	—	—	—	—	1040600	2000000	
	325 L4	390	1.3	1228100	186	130	—	—	—	—	—	1288600	2000000	
	325 L4	341	1.5	1206900	200	130	—	—	—	—	—	1232300	2000000	
	325 L4	390	1.3	1228100	186	130	—	—	—	—	—	1288600	2000000	
	325 L4	438	1.1	1258300	170	130	—	—	—	—	—	1339100	2000000	
	325 L4	500	1.00	1286700	152	130	—	—	—	—	—	1400000	2000000	
	325 L4	569	0.88	1286700	134	130	—	—	—	—	—	1400000	2000000	
	325 L4	628	0.80	1286700	121	130	—	—	—	—	—	1400000	2000000	
	325 L4	703	0.71	1286700	108	130	—	—	—	—	—	1400000	2000000	
	325 L4	758	0.66	1286600	100	130	—	—	—	—	—	1400000	2000000	
	325 L4	882	0.57	1286700	86	130	—	—	—	—	—	1400000	2000000	
	325 L4	1025	0.49	1286700	74	130	—	—	—	—	—	1400000	2000000	
	325 L4	1101	0.45	963200	52	130	—	—	—	—	—	1400000	2000000	
	325 L4	1279	0.39	963200	45	130	—	—	—	—	—	1400000	2000000	





24.0 - DATI TECNICI RIDUTTORI IN LINEA 300 R

24.0 - RATING CHARTS FOR IN-LINE UNITS 300 R

24.0 - TECHNISCHE DATEN DER GETRIEBE 300 R

240 - DONNEES TECHNIQUES REDUCTEURS 300 R

Guida alla consultazione delle tabelle.

Reading the rating chart.

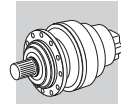
Anleitung für die richtige Konsultation der Tabellen.

Guide pour la consultation des tableaux.

301 R							2060 Nm						
n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	Pt kW	P (IEC)	MC	MZ	Rn ₂ [N] HC/PC	HZ/PZ	FZ	$M_{n2 max}$ Nm
1500	301 R2	7.13	210	1040	15.0	12.0	71-80-90-100-112-132	2050	2050	6170	7080	1350	3200
	301 R2	8.74	172	1090	15.0	12.0	71-80-90-100-112-132	2190	2190	6550	7530	1440	3200
	301 R2	11.8	127	1150	15.0	12.0	71-80-90-100-112-132	2420	2420	7180	8240	1590	3200
	301 R2	14.8	102	940	10.6	12.0	71-80-90-100-112-132	2610	2610	7670	8810	1710	3200
	301 R2	18.5	81	740	6.7	12.0	71-80-90-100-112-132	2810	2810	8200	9420	1850	3200

Valore di coppia nominale del riduttore indipendente dalla potenza meccanica installata / The rated torque of the gearbox, independent of installed mechanical power / Nenndrehmomentwert des Getriebes unabhängig von der installierten mechanischen Leistung / Valeur de couple nominal du réducteur indépendant de la puissance mécanique installée

1	Coppia di riferimento	Reference torque	Bezugsdrehmoment	Couple de référence
2	Velocità di comando riduttore	Gearbox drive speed	Drehzahl am Getriebeantrieb	Vitesse angulaire à l'entrée du réducteur
3	Grandezza riduttore in esecuzione angolare. NOTA: i suffissi (B) (C) sulla stessa grandezza indicano riduzioni angolari di dimensioni differenti: vedere le pagine dimensionali	Frame size of the right-angle gear unit. NOTE: letters (B) (C) near size indication identify different angle reduction dimensions. See pages relevant to dimensions	Getriebegröße in Winkelaußführung. HINWEIS: Die Kennzeichnungen (B) (C) an der gleichen Baugröße weisen auf die Winkelreduzierung in unterschiedlichen Maßen hin: siehe Seiten mit Maßstabellen	Taille réducteur exécution angulaire. REMARQUE: les indications (B) (C) sur la même taille indiquent des réductions angulaires de dimensions différentes. Se reporter aux pages des dimensions
4	Rapporto di riduzione	Gear ratio	Übersetzung	Rapport de réduction
5	Velocità angolare all'albero lento	Gearbox output speed	Drehzahl am Getriebeabtrieb	Vitesse angulaire en sortie réducteur
6	Coppia nominale all'albero lento del riduttore, basata su: - fattore di sicurezza S=1 - durata teorica di 10000 h	Gearbox rated output torque based on: - safety factor S=1 - 10000 h theoretical lifetime	Nenn-Drehmoment am Getriebeabtrieb mit Sicherheitsfaktor S=1 für eine Dauer von 10000 Std.	Couple nominal à la sortie du réducteur pendant : - facteur de sécurité S=1 - durée de 10000 h
7	Potenza nominale applicabile al riduttore, per: - fattore di sicurezza S=1 - durata teorica di 10000 h	Gearbox rated input power, based on: - safety factor S=1 - 10000 h theoretical lifetime	Nenn-Leistung am Getriebeantrieb mit: - Sicherheitsfaktor S=1 - Dauer von 10000 Std.	Puissance nominale en entrée réducteur pendant : - facteur de sécurité S=1 - durée de 10000 h
8	Potenza termica riduttore	Gearbox thermal capacity	Wärmeleistung des Getriebes	Puissance thermique réducteur
9	Grandezza motore elettrico IEC installabile	Frame size of available IEC motor	Baugröße des installierbaren IEC-Motors	Taille IEC moteur électrique à installer
10	Carichi radiali applicabili all'albero lento, basati su: - fattore di sicurezza S=1 - durata teorica di 10000 h Per forze non applicate in mezzzeria riferirsi ai diagrammi riportati a seguito delle pagine dimensionali del riduttore in oggetto	Permitted overhung loading on output shaft, based on: - safety factor S=1 - 10000 h theoretical lifetime. For forces applying off mid-point of the shaft, see diagrams provided in the pages following dimensions of the specific gearbox	Auf die Mitte der Abtriebswelle für: - Dauer von 10000 Std. applizierbare Nenn-Radialkräfte - Sicherheitsfaktor S=1 Für andere Kraftangriffspunkte verweisen wir auf die Diagramme, die den Seiten mit den Maßen der gewählten Größe folgen	Charges radiales nominales applicables à la moitié de l'arbre pendant : - facteur de sécurité S=1 - durée de 10000 h Pour d'autres positions de charge, voir diagrammes figurant à la suite des pages dimensions de la taille sélectionnée
11	Coppia massima trasmissibile dal riduttore	Max. transmissible torque	Nenn-Drehmoment am Abtrieb des Bezuggetriebes	Couple maximum du réducteur
12	Pagina delle dimensioni	Page installation drawing can be found at	Maßseiten	Page avec les dimensions

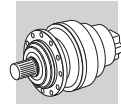


300 R	215	1250 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC/PC	MZ/PZ	HC	HZ	FZ	
500	300 R2	7.13	70	730	5.7	24	71-80-90-100-112-132	2950	2950	8570	9850	1940	2000
	300 R2	8.74	57	820	5.2	24	71-80-90-100-112-132	3160	3160	9110	10500	2080	2400
	300 R2	11.8	42	650	3.1	24	71-80-90-100-112-132	3490	3490	9980	11500	2300	2400
	300 R2	14.8	34	550	2.1	24	71-80-90-100-112-132	3760	3760	10700	12300	2470	2400
	300 R2	18.5	27.1	370	1.1	24	71-80-90-100-112-132	4050	4050	11400	13100	2660	2400
	300 R3	24.8	20.1	730	1.7	24	71-80-90-100-112-132	4470	4470	12500	14300	2940	2000
	300 R3	30.4	16.4	850	1.6	24	71-80-90-100-112-132	4790	4790	13200	15200	3150	2400
	300 R3	37.3	13.4	860	1.3	24	71-80-90-100-112-132	5120	5120	14100	16200	3370	2400
	300 R3	41.2	12.1	650	0.91	24	71-80-90-100-112-132	5290	5290	14500	16700	3480	2400
	300 R3	50.4	9.9	860	0.98	24	71-80-90-100-112-132	5660	5660	15400	17700	3720	2400
	300 R3	62.9	7.9	890	0.81	24	71-80-90-100-112-132	6100	6100	16500	18900	4010	2400
	300 R3	68.2	7.3	650	0.55	24	71-80-90-100-112-132	6260	6260	16900	19400	4120	2400
300 R3	78.7	6.4	920	0.67	24	71-80-90-100-112-132	6570	6570	17600	20200	4320	2400	
300 R3	85.2	5.9	650	0.44	24	71-80-90-100-112-132	6750	6750	18000	20700	4430	2400	
300 R3	106	4.7	660	0.35	24	71-80-90-100-112-132	7270	7270	19300	22200	4780	2400	
300 R3	133	3.8	570	0.25	24	71-80-90-100-112-132	7820	7820	20600	23700	5140	2400	
300 R4	106	4.7	960	0.54	20	71-80-90-100-112-132	7250	7250	19300	22100	4770	2400	
300 R4	130	3.9	990	0.45	20	71-80-90-100-112-132	7760	7760	20500	23500	5100	2400	
300 R4	143	3.5	690	0.29	20	71-80-90-100-112-132	8020	8020	21100	24200	5270	2400	
300 R4	159	3.1	1030	0.38	20	71-80-90-100-112-132	8300	8300	21700	25000	5460	2400	
300 R4	175	2.8	1050	0.35	20	71-80-90-100-112-132	8580	8580	22400	25700	5640	2400	
300 R4	215	2.3	1080	0.30	20	71-80-90-100-112-132	9180	9180	23800	27400	6040	2400	
300 R4	237	2.1	750	0.19	20	71-80-90-100-112-132	9490	9490	24500	28200	6240	2400	
300 R4	268	1.9	1120	0.25	20	71-80-90-100-112-132	9890	9890	25500	29200	6500	2400	
300 R4	291	1.7	1140	0.23	20	71-80-90-100-112-132	10200	10200	26100	30000	6680	2400	
300 R4	363	1.4	1180	0.19	20	71-80-90-100-112-132	10900	10900	27900	32000	7190	2400	
300 R4	394	1.3	820	0.12	20	71-80-90-100-112-132	11200	11200	28600	32800	7390	2400	
300 R4	453	1.1	1230	0.16	20	71-80-90-100-112-132	11800	11800	29800	34000	7740	2400	
300 R4	491	1.0	860	0.10	20	71-80-90-100-112-132	12000	12100	30500	34000	7950	2400	
300 R4	613	0.82	860	0.08	20	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400	
300 R4	766	0.65	860	0.07	20	71-80-90-100-112-132	12000	12500	31000	34000	8000	2400	

301 R	223	2060 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	301 R2	7.13	210	1040	15.0	12.0	71-80-90-100-112-132	2050	2050	6170	7080	1350	3200
	301 R2	8.74	172	1090	15.0	12.0	71-80-90-100-112-132	2190	2190	6550	7530	1440	3200
	301 R2	11.8	127	1150	15.0	12.0	71-80-90-100-112-132	2420	2420	7180	8240	1590	3200
	301 R2	14.8	102	940	10.6	12.0	71-80-90-100-112-132	2610	2610	7670	8810	1710	3200
	301 R2	18.5	81	740	6.7	12.0	71-80-90-100-112-132	2810	2810	8200	9420	1850	3200
	301 R3	24.8	60	1390	9.7	12.0	71-80-90-100-112-132	3100	3100	8960	10300	2040	3400
	301 R3	30.4	49	1580	8.9	12.0	71-80-90-100-112-132	3320	3320	9530	10900	2180	3400
	301 R3	37.3	40	1600	7.4	12.0	71-80-90-100-112-132	3550	3550	10100	11600	2330	3400
	301 R3	41.2	36	1300	5.4	12.0	71-80-90-100-112-132	3670	3670	10400	12000	2410	3400
	301 R3	50.4	29.8	1630	5.6	12.0	71-80-90-100-112-132	3930	3930	11100	12700	2580	3400
	301 R3	62.9	23.8	1650	4.5	12.0	71-80-90-100-112-132	4230	4230	11800	13600	2780	3400
	301 R3	68.2	22.0	1300	3.3	12.0	71-80-90-100-112-132	4340	4340	12100	13900	2860	3400
301 R3	78.7	19.1	1570	3.4	12.0	71-80-90-100-112-132	4550	4550	12700	14600	2990	3400	
301 R3	85.2	17.6	1300	2.6	12.0	71-80-90-100-112-132	4680	4680	13000	14900	3070	3400	
301 R3	106	14.1	1300	2.1	12.0	71-80-90-100-112-132	5040	5040	13900	15900	3310	3400	
301 R3	133	11.3	1150	1.5	12.0	71-80-90-100-112-132	5420	5420	14800	17000	3570	3400	
301 R4	106	14.2	1700	2.8	10.0	71-80-90-100-112-132	5030	5030	13800	15900	3310	3400	
301 R4	130	11.6	1720	2.3	10.0	71-80-90-100-112-132	5380	5380	14700	16900	3540	3400	
301 R4	143	10.5	1300	1.6	10.0	71-80-90-100-112-132	5560	5560	15200	17400	3660	3400	
301 R4	159	9.4	1740	1.9	10.0	71-80-90-100-112-132	5760	5760	15600	18000	3780	3400	
301 R4	175	8.5	1770	1.8	10.0	71-80-90-100-112-132	5950	5950	16100	18500	3910	3400	
301 R4	215	7.0	1820	1.5	10.0	71-80-90-100-112-132	6370	6370	17100	19700	4190	3400	
301 R4	237	6.3	1300	0.97	10.0	71-80-90-100-112-132	6580	6580	17600	20300	4330	3400	

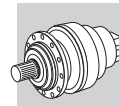


301 R	223	2060 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
500	301 R4	237	2.1	1510	0.37	20	71-80-90-100-112-132	9490	9490	24500	28200	6240	3400
	301 R4	268	1.9	2240	0.49	20	71-80-90-100-112-132	9890	9890	25500	29200	6500	3400
	301 R4	291	1.7	2270	0.46	20	71-80-90-100-112-132	10200	10200	26100	30000	6680	3400
	301 R4	363	1.4	2340	0.38	20	71-80-90-100-112-132	10900	10900	27900	32000	7190	3400
	301 R4	394	1.3	1650	0.25	20	71-80-90-100-112-132	11200	11200	28600	32800	7390	3400
	301 R4	453	1.1	2000	0.26	20	71-80-90-100-112-132	11800	11800	29800	34000	7740	3400
	301 R4	491	1.0	1710	0.21	20	71-80-90-100-112-132	12000	12100	30500	34000	7950	3400
	301 R4	613	0.82	1720	0.17	20	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400
301 R4	766	0.65	1720	0.13	20	71-80-90-100-112-132	12000	12500	31000	34000	8000	3400	

303 R	231	2970 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	303 R2	9.23	163	1680	30	18.0	71-80-90-100-112-132	6850	7910	13600	16400	4400	5200
	303 R2	10.9	138	1900	29	18.0	71-80-90-100-112-132	7240	8360	14300	17200	4650	5200
	303 R2	13.7	110	1970	24	18.0	71-80-90-100-112-132	7810	9020	15300	18400	5010	5200
	303 R2	15.9	94	1820	19.1	18.0	71-80-90-100-112-132	8220	9480	16000	19300	5270	5200
	303 R2	19.2	78	1550	13.5	18.0	71-80-90-100-112-132	8750	10100	16900	20400	5620	5200
	303 R2	24.8	61	860	5.8	18.0	71-80-90-100-112-132	9530	11000	18300	22000	6110	5200
	303 R3	25.7	58	2030	13.6	14.0	71-80-90-100-112-132	9640	11100	18500	22200	6190	5200
	303 R3	31.5	48	2110	11.5	14.0	71-80-90-100-112-132	10300	11900	19600	23600	6620	5200
	303 R3	37.1	40	2390	11.1	14.0	71-80-90-100-112-132	10900	12600	20600	24800	7000	5200
	303 R3	42.6	35	2070	8.4	14.0	71-80-90-100-112-132	11400	13200	21500	25900	7320	5200
	303 R3	46.6	32	2160	8.0	14.0	71-80-90-100-112-132	11800	13600	22100	26600	7550	5200
	303 R3	50.3	29.8	2380	8.2	14.0	71-80-90-100-112-132	12100	13900	22600	27200	7740	5200
	303 R3	54.2	27.7	1820	5.8	14.0	71-80-90-100-112-132	12400	14300	23100	27800	7930	5200
	303 R3	63.1	23.8	2170	5.9	14.0	71-80-90-100-112-132	13000	15000	24200	29100	8350	5200
	303 R3	73.3	20.5	1820	4.3	14.0	71-80-90-100-112-132	13700	15800	25300	30500	8780	5200
	303 R3	78.7	19.1	2180	4.8	14.0	71-80-90-100-112-132	14000	16200	25900	31100	8990	5200
	303 R3	91.5	16.4	1820	3.4	14.0	71-80-90-100-112-132	14700	17000	27100	32600	9450	5200
	303 R3	114	13.1	1820	2.7	14.0	71-80-90-100-112-132	15900	18300	28900	34800	10200	5200
303 R4	129	11.6	2620	3.6	12.0	71-80-90-100-112-132	16500	19100	30000	36100	10600	5200	
303 R4	148	10.1	2310	2.8	12.0	71-80-90-100-112-132	17300	20000	31300	37600	11100	5200	
303 R4	158	9.5	2660	3.0	12.0	71-80-90-100-112-132	17700	20400	31900	38400	11300	5200	
303 R4	185	8.1	2310	2.2	12.0	71-80-90-100-112-132	18600	21500	33400	40200	11900	5200	
303 R4	214	7.0	2730	2.3	12.0	71-80-90-100-112-132	19600	22600	34900	42000	12500	5200	
303 R4	231	6.5	1830	1.4	12.0	71-80-90-100-112-132	20100	23100	35700	43000	12900	5200	
303 R4	255	5.9	1840	1.3	12.0	71-80-90-100-112-132	20700	23900	36800	44300	13300	5200	
303 R4	290	5.2	2650	1.6	12.0	71-80-90-100-112-132	21600	25000	38300	46000	13900	5200	
303 R4	313	4.8	1850	1.1	12.0	71-80-90-100-112-132	22200	25600	39100	47100	14200	5200	
303 R4	336	4.5	2270	1.2	12.0	71-80-90-100-112-132	22700	26200	40000	48100	14600	5200	
303 R4	364	4.1	2310	1.1	12.0	71-80-90-100-112-132	23300	26900	40900	49300	15000	5200	
303 R4	390	3.8	1930	0.88	12.0	71-80-90-100-112-132	23900	27600	41800	50300	15300	5200	
303 R4	452	3.3	2250	0.88	12.0	71-80-90-100-112-132	25100	28900	43700	52600	16100	5200	
303 R4	528	2.8	2030	0.68	12.0	71-80-90-100-112-132	26400	30500	45800	55100	16900	5200	
303 R4	567	2.6	2430	0.76	12.0	71-80-90-100-112-132	27000	31200	46800	56300	17400	5200	
303 R4	659	2.3	2110	0.57	12.0	71-80-90-100-112-132	28400	32800	48900	58900	18200	5200	
303 R4	797	1.9	1820	0.41	12.0	71-80-90-100-112-132	30300	35000	51800	62300	19400	5200	
303 R4	824	1.8	2200	0.47	12.0	71-80-90-100-112-132	30600	35400	52300	62900	19700	5200	
1000	303 R2	9.23	108	1890	23	22	71-80-90-100-112-132	7850	9060	15400	18500	5030	5200
	303 R2	10.9	92	2140	22	22	71-80-90-100-112-132	8290	9570	16100	19400	5320	5200
	303 R2	13.7	73	2080	16.9	22	71-80-90-100-112-132	8940	10300	17300	20800	5740	5200
	303 R2	15.9	63	1820	12.7	22	71-80-90-100-112-132	9400	10900	18100	21700	6030	5200
	303 R2	19.2	52	1640	9.5	22	71-80-90-100-112-132	10000	11600	19100	23000	6430	5200
	303 R2	24.8	40	860	3.9	22	71-80-90-100-112-132	10900	12600	20700	24800	7000	5200
	303 R3	25.7	39	2160	9.6	16.8	71-80-90-100-112-132	11000	12700	20900	25100	7080	5200
	303 R3	31.5	32	2160	7.9	16.8	71-80-90-100-112-132	11800	13600	22200	26700	7580	5200
	303 R3	37.1	26.9	2460	7.6	16.8	71-80-90-100-112-132	12500	14400	23300	28100	8010	5200
	303 R3	42.6	23.5	2110	5.7	16.8	71-80-90-100-112-132	13100	15100	24300	29200	8380	5200





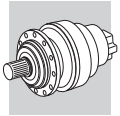
304 R







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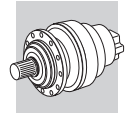
3960 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 	R _{n2} [N]					M _{n2 max} Nm		
								MC	MZ	HC/PC	HZ/PZ	FZ			
1500	304 R2	9.23	163	1680	30	18.0	71-80-90-100-112-132	6850	7910	13600	16400	4400	6600		
	304 R2		138	1980	30	18.0	71-80-90-100-112-132	7240	8360	14300	17200	4650	6600		
	304 R2		110	2490	30	18.0	71-80-90-100-112-132	7810	9020	15300	18400	5010	6600		
	304 R2		89	2390	24	18.0	71-80-90-100-112-132	8380	9670	16300	19600	5370	6600		
	304 R3	25.7	58	3020	15.0	14.0	71-80-90-100-112-132	9640	11100	18500	22200	6190	7300		
	304 R3		48	3090	15.0	14.0	71-80-90-100-112-132	10300	11900	19600	23600	6620	7300		
	304 R3		40	3440	15.0	14.0	71-80-90-100-112-132	10900	12600	20600	24800	7000	7300		
	304 R3		35	3190	12.9	14.0	71-80-90-100-112-132	11400	13200	21500	25900	7320	7300		
	304 R3		32	2850	10.5	14.0	71-80-90-100-112-132	11800	13600	22100	26600	7550	7300		
	304 R3		29.8	3460	11.9	14.0	71-80-90-100-112-132	12100	13900	22600	27200	7740	7300		
	304 R3		23.8	2850	7.8	14.0	71-80-90-100-112-132	13000	15000	24200	29100	8350	7300		
	304 R3		19.1	2850	6.2	14.0	71-80-90-100-112-132	14000	16200	25900	31100	8990	7300		
	304 R3		15.5	2390	4.2	14.0	71-80-90-100-112-132	15000	17300	27500	33100	9630	7300		
	304 R3		12.1	2390	3.4	14.0	71-80-90-100-112-132	16200	18700	29400	35400	10400	7300		
	304 R4		89.4	16.8	3330	6.6	12.0	71-80-90-100-112-132	14600	16900	26900	32300	9370	7300	
	304 R4			109	13.7	3370	5.5	12.0	71-80-90-100-112-132	15600	18000	28600	34400	10000	7300
	304 R4			129	11.6	3530	4.8	12.0	71-80-90-100-112-132	16500	19100	30000	36100	10600	7300
	304 R4			148	10.1	3440	4.1	12.0	71-80-90-100-112-132	17300	20000	31300	37600	11100	7300
	304 R4			158	9.5	3550	4.0	12.0	71-80-90-100-112-132	17700	20400	31900	38400	11300	7300
	304 R4			185	8.1	3460	3.3	12.0	71-80-90-100-112-132	18600	21500	33400	40200	11900	7300
	304 R4	214		7.0	3620	3.0	12.0	71-80-90-100-112-132	19600	22600	34900	42000	12500	7300	
	304 R4	227		6.6	3480	2.7	12.0	71-80-90-100-112-132	19900	23000	35500	42700	12800	7300	
	304 R4	267		5.6	3660	2.4	12.0	71-80-90-100-112-132	21100	24300	37300	44900	13500	7300	
	304 R4	290		5.2	3680	2.3	12.0	71-80-90-100-112-132	21600	25000	38300	46000	13900	7300	
	304 R4	307		4.9	3500	2.0	12.0	71-80-90-100-112-132	22000	25400	38900	46800	14100	7300	
	304 R4	338		4.4	2420	1.3	12.0	71-80-90-100-112-132	22800	26300	40000	48200	14600	7300	
	304 R4	364		4.1	2940	1.4	12.0	71-80-90-100-112-132	23300	26900	40900	49300	15000	7300	
	304 R4	414		3.6	2470	1.1	12.0	71-80-90-100-112-132	24300	28100	42500	51200	15600	7300	
	304 R4	452		3.3	3690	1.4	12.0	71-80-90-100-112-132	25100	28900	43700	52600	16100	7300	
	304 R4	560		2.7	2540	0.81	12.0	71-80-90-100-112-132	26900	31100	46600	56100	17300	7300	
	304 R4	699		2.1	2630	0.67	12.0	71-80-90-100-112-132	29000	33500	49800	59900	18600	7300	
	1000	304 R2		9.23	108	1890	23	21.6	71-80-90-100-112-132	7850	9060	15400	18500	5030	6600
		304 R2	92		2240	23	21.6	71-80-90-100-112-132	8290	9570	16100	19400	5320	6600	
		304 R2	73		2690	22	21.6	71-80-90-100-112-132	8940	10300	17300	20800	5740	6600	
304 R2		59	2390		15.8	21.6	71-80-90-100-112-132	9590	11100	18400	22100	6150	6600		
304 R3		25.7	39	3130	14.0	16.8	71-80-90-100-112-132	11000	12700	20900	25100	7080	7300		
304 R3			32	3180	11.6	16.8	71-80-90-100-112-132	11800	13600	22200	26700	7580	7300		
304 R3			26.9	3470	10.7	16.8	71-80-90-100-112-132	12500	14400	23300	28100	8010	7300		
304 R3			23.5	3270	8.8	16.8	71-80-90-100-112-132	13100	15100	24300	29200	8380	7300		
304 R3			21.5	2850	7.0	16.8	71-80-90-100-112-132	13500	15500	25000	30000	8640	7300		
304 R3			19.9	3490	8.0	16.8	71-80-90-100-112-132	13800	15900	25500	30700	8860	7300		
304 R3			15.9	2850	5.2	16.8	71-80-90-100-112-132	14900	17200	27300	32900	9550	7300		
304 R3			12.7	2850	4.2	16.8	71-80-90-100-112-132	16000	18500	29200	35100	10300	7300		
304 R3			10.3	2390	2.8	16.8	71-80-90-100-112-132	17200	19800	31100	37400	11000	7300		
304 R3			8.2	2390	2.3	16.8	71-80-90-100-112-132	18500	21400	33300	40000	11900	7300		
304 R4			89.4	11.2	3420	4.5	14.4	71-80-90-100-112-132	16700	19300	30300	36500	10700	7300	
304 R4				109	9.1	3450	3.7	14.4	71-80-90-100-112-132	17900	20700	32300	38800	11500	7300
304 R4				129	7.7	3590	3.3	14.4	71-80-90-100-112-132	18900	21800	33900	40800	12100	7300
304 R4				148	6.7	3470	2.8	14.4	71-80-90-100-112-132	19800	22900	35300	42500	12700	7300
304 R4				158	6.3	3640	2.7	14.4	71-80-90-100-112-132	20200	23400	36000	43300	13000	7300
304 R4				185	5.4	3490	2.2	14.4	71-80-90-100-112-132	21300	24600	37700	45400	13700	7300
304 R4		214		4.7	3700	2.0	14.4	71-80-90-100-112-132	22400	25800	39500	47500	14400	7300	
304 R4		227		4.4	3500	1.8	14.4	71-80-90-100-112-132	22800	26300	40100	48300	14600	7300	
304 R4		267		3.7	3720	1.6	14.4	71-80-90-100-112-132	24100	27800	42200	50700	15500	7300	
304 R4		290		3.4	3720	1.5	14.4	71-80-90-100-112-132	24800	28600	43200	52000	15900	7300	
304 R4		307		3.3	3510	1.4	14.4	71-80-90-100-112-132	25200	29100	43900	52800	16200	7300	
304 R4		338		3.0	2520	0.88	14.4	71-80-90-100-112-132	26000	30100	45200	54400	16700	7300	
304 R4		364		2.7	3140	1.0	14.4	71-80-90-100-112-132	26700	30800	46200	55600	17100	7300	
304 R4		414		2.4	2580	0.74	14.4	71-80-90-100-112-132	27900	32200	48100	57800	17900	7300	
304 R4		452		2.2	3740	0.98	14.4	71-80-90-100-112-132	28700	33100	49300	59400	18400	7300	
304 R4		560		1.8	2720	0.57	14.4	71-80-90-100-112-132	30800	35600	52600	63300	19800	7300	
304 R4		699		1.4	2830	0.48	14.4	71-80-90-100-112-132	33200	38300	56300	67700	21300	7300	

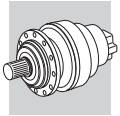




304 R							241	3960 Nm					
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
500	304 R2	9.23	54	2330	14.1	36	71-80-90-100-112-132	9890	11400	18900	22700	6340	6600
	304 R2	10.9	46	2720	13.9	36	71-80-90-100-112-132	10400	12100	19900	23900	6700	6600
	304 R2	13.7	37	2850	11.6	36	71-80-90-100-112-132	11300	13000	21300	25600	7230	6600
	304 R2	16.8	29.7	2390	7.9	36	71-80-90-100-112-132	12100	13900	22600	27200	7750	6600
	304 R3	25.7	19.5	3290	7.3	28	71-80-90-100-112-132	13900	16100	25700	30900	8920	7300
	304 R3	31.5	15.9	3330	6.1	28	71-80-90-100-112-132	14900	17200	27300	32900	9550	7300
	304 R3	37.1	13.5	3520	5.4	28	71-80-90-100-112-132	15700	18200	28700	34500	10100	7300
	304 R3	42.6	11.7	3410	4.6	28	71-80-90-100-112-132	16500	19000	29900	36000	10600	7300
	304 R3	46.6	10.7	2850	3.5	28	71-80-90-100-112-132	17000	19600	30700	37000	10900	7300
	304 R3	50.3	9.9	3540	4.0	28	71-80-90-100-112-132	17400	20100	31400	37800	11200	7300
	304 R3	63.1	7.9	2850	2.6	28	71-80-90-100-112-132	18800	21700	33700	40500	12000	7300
	304 R3	78.7	6.4	2850	2.1	28	71-80-90-100-112-132	20200	23300	36000	43300	13000	7300
	304 R3	97.0	5.2	2390	1.4	28	71-80-90-100-112-132	21700	25000	38300	46100	13900	7300
	304 R3	121	4.1	2440	1.2	28	71-80-90-100-112-132	23300	26900	40900	49300	15000	7300
	304 R4	89.4	5.6	3490	2.3	24	71-80-90-100-112-132	21100	24300	37400	45000	13500	7300
	304 R4	109	4.6	3500	1.9	24	71-80-90-100-112-132	22500	26000	39700	47800	14500	7300
	304 R4	129	3.9	3710	1.7	24	71-80-90-100-112-132	23800	27500	41700	50200	15300	7300
	304 R4	148	3.4	3510	1.4	24	71-80-90-100-112-132	24900	28800	43500	52300	16000	7300
	304 R4	158	3.2	3730	1.4	24	71-80-90-100-112-132	25500	29400	44400	53400	16400	7300
	304 R4	185	2.7	3520	1.1	24	71-80-90-100-112-132	26900	31000	46500	55900	17200	7300
	304 R4	214	2.3	3770	1.0	24	71-80-90-100-112-132	28200	32600	48600	58400	18100	7300
	304 R4	227	2.2	3550	0.93	24	71-80-90-100-112-132	28700	33200	49400	59400	18400	7300
	304 R4	267	1.9	3820	0.84	24	71-80-90-100-112-132	30400	35100	51900	62500	19500	7300
	304 R4	290	1.7	3830	0.78	24	71-80-90-100-112-132	31200	36000	53200	64000	20000	7300
	304 R4	307	1.6	3610	0.70	24	71-80-90-100-112-132	31800	36700	54100	65100	20400	7300
	304 R4	338	1.5	2810	0.49	24	71-80-90-100-112-132	32800	37900	55700	67000	21100	7300
	304 R4	364	1.4	3540	0.58	24	71-80-90-100-112-132	33700	38800	56900	68500	21600	7300
	304 R4	414	1.2	2910	0.42	24	71-80-90-100-112-132	35100	40500	59200	71200	22500	7300
	304 R4	452	1.1	3930	0.51	24	71-80-90-100-112-132	36000	41700	60700	73100	23200	7300
	304 R4	560	0.89	3010	0.32	24	71-80-90-100-112-132	36000	42000	64000	74000	24000	7300
	304 R4	699	0.71	3010	0.25	24	71-80-90-100-112-132	36000	42000	64000	74000	24000	7300



305 R							251	5600 Nm					
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	305 R2	9.23	163	1680	30	18.0	71-80-90-100-112-132	6850	7910	13600	16400	4400	7700
	305 R2	10.9	138	1980	30	18.0	71-80-90-100-112-132	7240	8360	14300	17200	4650	7700
	305 R2	13.7	110	2490	30	18.0	71-80-90-100-112-132	7810	9020	15300	18400	5010	7700
	305 R2	15.9	94	2890	30	18.0	71-80-90-100-112-132	8220	9480	16000	19300	5270	7700
	305 R2	19.2	78	2860	25	18.0	71-80-90-100-112-132	8750	10100	16900	20400	5620	7700
	305 R3	25.7	58	3630	15.0	14.0	71-80-90-100-112-132	9640	11100	18500	22200	6190	8800
	305 R3	31.5	48	3770	15.0	14.0	71-80-90-100-112-132	10300	11900	19600	23600	6620	8800
	305 R3	37.1	40	4340	15.0	14.0	71-80-90-100-112-132	10900	12600	20600	24800	7000	8800
	305 R3	42.6	35	3790	15.0	14.0	71-80-90-100-112-132	11400	13200	21500	25900	7320	8800
	305 R3	46.6	32	4310	15.0	14.0	71-80-90-100-112-132	11800	13600	22100	26600	7550	8800
	305 R3	50.3	29.8	4410	15.0	14.0	71-80-90-100-112-132	12100	13900	22600	27200	7740	8800
	305 R3	54.2	27.7	3570	11.3	14.0	71-80-90-100-112-132	12400	14300	23100	27800	7930	8800
	305 R3	63.1	23.8	4330	11.8	14.0	71-80-90-100-112-132	13000	15000	24200	29100	8350	8800
	305 R3	73.3	20.5	3580	8.4	14.0	71-80-90-100-112-132	13700	15800	25300	30500	8780	8800
	305 R3	78.7	19.1	4350	9.5	14.0	71-80-90-100-112-132	14000	16200	25900	31100	8990	8800
	305 R3	91.5	16.4	3580	6.7	14.0	71-80-90-100-112-132	14700	17000	27100	32600	9450	8800
	305 R3	114	13.1	3580	5.4	14.0	71-80-90-100-112-132	15900	18300	28900	34800	10200	8800
	305 R4	129	11.6	5200	7.1	12.0	71-80-90-100-112-132	16500	19100	30000	36100	10600	8800
	305 R4	148	10.1	4480	5.4	12.0	71-80-90-100-112-132	17300	20000	31300	37600	11100	8800
	305 R4	158	9.5	5310	6.0	12.0	71-80-90-100-112-132	17700	20400	31900	38400	11300	8800
	305 R4	185	8.1	4490	4.3	12.0	71-80-90-100-112-132	18600	21500	33400	40200	11900	8800
	305 R4	214	7.0	5390	4.5	12.0	71-80-90-100-112-132	19600	22600	34900	42000	12500	8800
	305 R4	231	6.5	3600	2.8	12.0	71-80-90-100-112-132	20100	23100	35700	43000	12900	8800

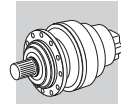


305 R							251	5600 Nm						
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm	
								MC	MZ	HC/PC	HZ/PZ	FZ		
1500	305 R4	255	5.9	3600	2.5	12.0	71-80-90-100-112-132	20700	23900	36800	44300	13300	8800	
	305 R4	290	5.2	5300	3.2	12.0	71-80-90-100-112-132	21600	25000	38300	46000	13900	8800	
	305 R4	313	4.8	3620	2.1	12.0	71-80-90-100-112-132	22200	25600	39100	47100	14200	8800	
	305 R4	336	4.5	4560	2.4	12.0	71-80-90-100-112-132	22700	26200	40000	48100	14600	8800	
	305 R4	364	4.1	4620	2.3	12.0	71-80-90-100-112-132	23300	26900	40900	49300	15000	8800	
	305 R4	390	3.8	3750	1.7	12.0	71-80-90-100-112-132	23900	27600	41800	50300	15300	8800	
	305 R4	452	3.3	4750	1.9	12.0	71-80-90-100-112-132	25100	28900	43700	52600	16100	8800	
	305 R4	528	2.8	3920	1.3	12.0	71-80-90-100-112-132	26400	30500	45800	55100	16900	8800	
	305 R4	567	2.6	4860	1.5	12.0	71-80-90-100-112-132	27000	31200	46800	56300	17400	8800	
	305 R4	659	2.3	4070	1.1	12.0	71-80-90-100-112-132	28400	32800	48900	58900	18200	8800	
	305 R4	797	1.9	3450	0.77	12.0	71-80-90-100-112-132	30300	35000	51800	62300	19400	8800	
305 R4	824	1.8	4230	0.91	12.0	71-80-90-100-112-132	30600	35400	52300	62900	19700	8800		
1000	305 R2	9.23	108	1890	23	22	71-80-90-100-112-132	7850	9060	15400	18500	5030	7700	
	305 R2	10.9	92	2240	23	22	71-80-90-100-112-132	8290	9570	16100	19400	5320	7700	
	305 R2	13.7	73	2810	23	22	71-80-90-100-112-132	8940	10300	17300	20800	5740	7700	
	305 R2	15.9	63	3270	23	22	71-80-90-100-112-132	9400	10900	18100	21700	6030	7700	
	305 R2	19.2	52	2990	17.3	22	71-80-90-100-112-132	10000	11600	19100	23000	6430	7700	
	305 R3	25.7	39	3900	15.0	16.8	71-80-90-100-112-132	11000	12700	20900	25100	7080	8800	
	305 R3	31.5	32	3950	14.4	16.8	71-80-90-100-112-132	11800	13600	22200	26700	7580	8800	
	305 R3	37.1	26.9	4600	14.2	16.8	71-80-90-100-112-132	12500	14400	23300	28100	8010	8800	
	305 R3	42.6	23.5	3990	10.7	16.8	71-80-90-100-112-132	13100	15100	24300	29200	8380	8800	
	305 R3	46.6	21.5	4340	10.7	16.8	71-80-90-100-112-132	13500	15500	25000	30000	8640	8800	
	305 R3	50.3	19.9	4700	10.7	16.8	71-80-90-100-112-132	13800	15900	25500	30700	8860	8800	
	305 R3	54.2	18.5	3580	7.6	16.8	71-80-90-100-112-132	14200	16300	26100	31400	9080	8800	
	305 R3	63.1	15.9	4370	7.9	16.8	71-80-90-100-112-132	14900	17200	27300	32900	9550	8800	
	305 R3	73.3	13.6	3590	5.6	16.8	71-80-90-100-112-132	15700	18100	28600	34400	10000	8800	
	305 R3	78.7	12.7	4380	6.4	16.8	71-80-90-100-112-132	16000	18500	29200	35100	10300	8800	
	305 R3	91.5	10.9	3600	4.5	16.8	71-80-90-100-112-132	16900	19500	30600	36800	10800	8800	
	305 R3	114	8.7	3600	3.6	16.8	71-80-90-100-112-132	18200	21000	32700	39300	11700	8800	
	305 R4	129	7.7	5370	4.9	14.4	71-80-90-100-112-132	18900	21800	33900	40800	12100	8800	
	305 R4	148	6.7	4490	3.6	14.4	71-80-90-100-112-132	19800	22900	35300	42500	12700	8800	
	305 R4	158	6.3	5420	4.0	14.4	71-80-90-100-112-132	20200	23400	36000	43300	13000	8800	
	305 R4	185	5.4	4490	2.9	14.4	71-80-90-100-112-132	21300	24600	37700	45400	13700	8800	
	305 R4	214	4.7	5480	3.0	14.4	71-80-90-100-112-132	22400	25800	39500	47500	14400	8800	
	305 R4	231	4.3	3680	1.9	14.4	71-80-90-100-112-132	23000	26500	40300	48500	14700	8800	
	305 R4	255	3.9	3740	1.7	14.4	71-80-90-100-112-132	23700	27400	41600	50000	15200	8800	
	305 R4	290	3.4	5350	2.2	14.4	71-80-90-100-112-132	24800	28600	43200	52000	15900	8800	
	305 R4	313	3.2	3850	1.5	14.4	71-80-90-100-112-132	25400	29300	44200	53200	16300	8800	
	305 R4	336	3.0	4890	1.7	14.4	71-80-90-100-112-132	26000	30000	45100	54300	16700	8800	
	305 R4	364	2.7	4960	1.6	14.4	71-80-90-100-112-132	26700	30800	46200	55600	17100	8800	
	305 R4	390	2.6	3980	1.2	14.4	71-80-90-100-112-132	27300	31600	47200	56800	17500	8800	
	305 R4	452	2.2	4750	1.2	14.4	71-80-90-100-112-132	28700	33100	49300	59400	18400	8800	
	305 R4	528	1.9	4200	0.94	14.4	71-80-90-100-112-132	30200	34900	51700	62200	19400	8800	
	305 R4	567	1.8	5160	1.1	14.4	71-80-90-100-112-132	31000	35700	52800	63500	19900	8800	
	305 R4	659	1.5	4360	0.78	14.4	71-80-90-100-112-132	32600	37600	55300	66500	20900	8800	
	305 R4	797	1.3	3670	0.54	14.4	71-80-90-100-112-132	34700	40000	58500	70400	22300	8800	
	305 R4	824	1.2	4530	0.65	14.4	71-80-90-100-112-132	35100	40500	59100	71100	22500	8800	
	500	305 R2	9.23	54	2330	14.1	36	71-80-90-100-112-132	9890	11400	18900	22700	6340	7700
		305 R2	10.9	46	2750	14.0	36	71-80-90-100-112-132	10400	12100	19900	23900	6700	7700
		305 R2	13.7	37	3340	13.6	36	71-80-90-100-112-132	11300	13000	21300	25600	7230	7700
		305 R2	15.9	31	3530	12.4	36	71-80-90-100-112-132	11800	13700	22300	26800	7600	7700
		305 R2	19.2	26.0	3040	8.8	36	71-80-90-100-112-132	12600	14600	23600	28300	8100	7700
		305 R3	25.7	19.5	4190	9.4	28	71-80-90-100-112-132	13900	16100	25700	30900	8920	8800
		305 R3	31.5	15.9	4260	7.8	28	71-80-90-100-112-132	14900	17200	27300	32900	9550	8800
		305 R3	37.1	13.5	5080	7.8	28	71-80-90-100-112-132	15700	18200	28700	34500	10100	8800
305 R3		42.6	11.7	4340	5.9	28	71-80-90-100-112-132	16500	19000	29900	36000	10600	8800	
305 R3		46.6	10.7	4390	5.4	28	71-80-90-100-112-132	17000	19600	30700	37000	10900	8800	
305 R3		50.3	9.9	5230	6.0	28	71-80-90-100-112-132	17400	20100	31400	37800	11200	8800	
305 R3		54.2	9.2	3600	3.8	28	71-80-90-100-112-132	17800	20600	32200	38700	11400	8800	
305 R3		63.1	7.9	4420	4.0	28	71-80-90-100-112-132	18800	21700	33700	40500	12000	8800	
305 R3		73.3	6.8	3600	2.8	28	71-80-90-100-112-132	19700	22800	35200	42400	12700	8800	
305 R3		78.7	6.4	4450	3.2	28	71-80-90-100-112-132	20200	23300	36000	43300	13000	8800	



305 R							251	5600 Nm					
n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	Pt kW	P (IEC) 	MC	MZ	HC/PC	HZ/PZ	FZ	$M_{n2\ max}$ Nm
500	305 R3	91.5	5.5	3600	2.3	28	71-80-90-100-112-132	21200	24500	37600	45300	13600	8800
	305 R3	114	4.4	3670	1.8	28	71-80-90-100-112-132	22900	26400	40200	48400	14700	8800
	305 R4	129	3.9	5480	2.5	24	71-80-90-100-112-132	23800	27500	41700	50200	15300	8800
	305 R4	148	3.4	4490	1.8	24	71-80-90-100-112-132	24900	28800	43500	52300	16000	8800
	305 R4	158	3.2	5490	2.1	24	71-80-90-100-112-132	25500	29400	44400	53400	16400	8800
	305 R4	185	2.7	4490	1.4	24	71-80-90-100-112-132	26900	31000	46500	55900	17200	8800
	305 R4	214	2.3	5520	1.5	24	71-80-90-100-112-132	28200	32600	48600	58400	18100	8800
	305 R4	231	2.2	4100	1.1	24	71-80-90-100-112-132	28900	33400	49700	59800	18600	8800
	305 R4	255	2.0	4170	0.97	24	71-80-90-100-112-132	29900	34500	51200	61600	19200	8800
	305 R4	290	1.7	5450	1.1	24	71-80-90-100-112-132	31200	36000	53200	64000	20000	8800
	305 R4	313	1.6	4320	0.82	24	71-80-90-100-112-132	32000	36900	54400	65400	20500	8800
	305 R4	336	1.5	5350	0.94	24	71-80-90-100-112-132	32800	37800	55600	66900	21000	8800
	305 R4	364	1.4	5400	0.88	24	71-80-90-100-112-132	33700	38800	56900	68500	21600	8800
	305 R4	390	1.3	4490	0.68	24	71-80-90-100-112-132	34400	39800	58100	69900	22100	8800
	305 R4	452	1.1	4750	0.62	24	71-80-90-100-112-132	36000	41700	60700	73100	23200	8800
	305 R4	528	0.95	4690	0.53	24	71-80-90-100-112-132	36000	42000	63700	74000	24000	8800
	305 R4	567	0.88	5600	0.58	24	71-80-90-100-112-132	36000	42000	64000	74000	24000	8800
	305 R4	659	0.76	4690	0.42	24	71-80-90-100-112-132	36000	42000	64000	74000	24000	8800
	305 R4	797	0.63	3800	0.28	24	71-80-90-100-112-132	36000	42000	64000	74000	24000	8800
	305 R4	824	0.61	4690	0.34	24	71-80-90-100-112-132	36000	42000	64000	74000	24000	8800

306 R							261	7300 Nm					
n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	Pt kW	P (IEC) 	MC	MZ	HC/PC	HZ/PZ	FZ	$M_{n2\ max}$ Nm
1500	306 R2	9.23	163	1680	30	18.0	71-80-90-100-112-132-160	8540	9670	22200	25900	6410	12000
	306 R2	10.9	138	1980	30	18.0	71-80-90-100-112-132-160	9020	10200	23400	27200	6780	12000
	306 R2	13.7	110	2490	30	18.0	71-80-90-100-112-132-160	9730	11000	25000	29100	7310	12000
	306 R2	15.9	94	2890	30	18.0	71-80-90-100-112-132-160	10200	11600	26200	30500	7690	12000
	306 R2	19.2	78	3490	30	18.0	71-80-90-100-112-132-160	10900	12400	27700	32300	8190	12000
	306 R3	33.2	45	5810	30	14.0	71-80-90-100-112-132-160	13100	14800	32700	38000	9830	14900
	306 R3	39.2	38	6550	29	14.0	71-80-90-100-112-132-160	13800	15700	34300	40000	10400	14900
	306 R3	46.3	32	7510	28	14.0	71-80-90-100-112-132-160	14600	16600	36100	42000	11000	14900
	306 R3	58.1	25.8	7580	22	14.0	71-80-90-100-112-132-160	15800	17900	38600	45000	11800	14900
	306 R3	67.5	22.2	7090	18.1	14.0	71-80-90-100-112-132-160	16600	18800	40400	47100	12500	14900
	306 R3	72.9	20.6	7420	17.5	14.0	71-80-90-100-112-132-160	17000	19300	41300	48100	12800	14900
	306 R3	84.7	17.7	7530	15.3	14.0	71-80-90-100-112-132-160	17900	20300	43300	50400	13400	14900
	306 R3	98.5	15.2	6490	11.3	14.0	71-80-90-100-112-132-160	18800	21300	45300	52700	14100	14900
	306 R3	119	12.6	6490	9.4	14.0	71-80-90-100-112-132-160	20000	22700	47900	55800	15000	14900
	306 R3	144	10.4	5490	6.6	14.0	71-80-90-100-112-132-160	21300	24200	50700	59100	16000	14900
	306 R4	158	9.5	9620	10.8	12.0	71-80-90-100-112-132-160	22000	24900	52100	60700	16500	14900
	306 R4	168	8.9	7560	8.0	12.0	71-80-90-100-112-132-160	22400	25400	53100	61800	16900	14900
	306 R4	181	8.3	9450	9.3	12.0	71-80-90-100-112-132-160	23000	26100	54300	63200	17300	14900
	306 R4	214	7.0	9730	8.1	12.0	71-80-90-100-112-132-160	24300	27600	57100	66500	18300	14900
	306 R4	230	6.5	7590	5.8	12.0	71-80-90-100-112-132-160	24900	28300	58400	68000	18700	14900
306 R4	249	6.0	8200	5.9	12.0	71-80-90-100-112-132-160	25600	29000	59700	69600	19200	14900	
306 R4	289	5.2	8280	5.1	12.0	71-80-90-100-112-132-160	26900	30500	62500	72800	20200	14900	
306 R4	312	4.8	7590	4.3	12.0	71-80-90-100-112-132-160	27600	31300	63900	74500	20700	14900	
306 R4	389	3.9	7590	3.5	12.0	71-80-90-100-112-132-160	29700	33700	68300	79600	22300	14900	
306 R4	420	3.6	8790	3.7	12.0	71-80-90-100-112-132-160	30500	34500	69900	81400	22900	14900	
306 R4	455	3.3	7020	2.7	12.0	71-80-90-100-112-132-160	31300	35500	71600	83400	23500	14900	
306 R4	488	3.1	9020	3.3	12.0	71-80-90-100-112-132-160	32000	36300	73200	85200	24100	14900	
306 R4	550	2.7	7260	2.3	12.0	71-80-90-100-112-132-160	33300	37800	75800	88300	25100	14900	
306 R4	590	2.5	8480	2.5	12.0	71-80-90-100-112-132-160	34100	38700	77400	90200	25600	14900	
306 R4	665	2.3	6010	1.6	12.0	71-80-90-100-112-132-160	35500	40300	80300	93500	26700	14900	
306 R4	830	1.8	6270	1.3	12.0	71-80-90-100-112-132-160	38300	43300	85800	99900	28700	14900	
1000	306 R2	9.23	108	1890	23	22	71-80-90-100-112-132-160	9770	11100	25100	29200	7340	12000
	306 R2	10.9	92	2240	23	22	71-80-90-100-112-132-160	10300	11700	26400	30700	7760	12000
	306 R2	13.7	73	2810	23	22	71-80-90-100-112-132-160	11100	12600	28300	32900	8370	12000

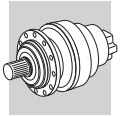


307 R	271	14000 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
500	307 R2	23.5	21.2	8480	20	70	132-160-180-200	18700	23500	44100	57700	16200	21000
	307 R3	31.6	15.8	7380	13.4	44	71-80-90-100-112-132-160	20600	25900	48100	63100	17900	18600
	307 R3	37.7	13.2	9250	14.1	44	71-80-90-100-112-132-160	21900	27400	50800	66500	19000	21000
	307 R3	44.6	11.2	10900	14.1	44	71-80-90-100-112-132-160	23100	29000	53400	69900	20100	21000
	307 R3	55.9	8.9	13500	13.9	44	71-80-90-100-112-132-160	24900	31300	57100	74800	21700	21000
	307 R3	65.0	7.7	13700	12.1	44	71-80-90-100-112-132-160	26200	32900	59800	78300	22800	21000
	307 R3	71.8	7.0	11100	8.8	44	71-80-90-100-112-132-160	27100	34000	61600	80700	23600	21000
	307 R3	78.6	6.4	12300	9.0	44	71-80-90-100-112-132-160	27900	35100	63300	82900	24300	21000
	307 R3	83.4	6.0	11200	7.7	44	71-80-90-100-112-132-160	28500	35800	64400	84400	24800	21000
	307 R3	99.0	5.1	8700	5.0	44	71-80-90-100-112-132-160	30200	37900	67800	88800	26200	21000
	307 R3	120	4.2	8930	4.3	44	71-80-90-100-112-132-160	32100	40300	71800	94100	27900	21000
	307 R4	152	3.3	14900	5.8	30	71-80-90-100-112-132-160	34800	43700	77100	101000	30300	21000
	307 R4	165	3.0	12300	4.4	30	71-80-90-100-112-132-160	35800	44900	79100	103600	31100	21000
	307 R4	191	2.6	14900	4.6	30	71-80-90-100-112-132-160	37500	47100	82500	108100	32600	21000
	307 R4	206	2.4	14900	4.3	30	71-80-90-100-112-132-160	38500	48300	84400	110600	33500	21000
	307 R4	232	2.2	13000	3.3	30	71-80-90-100-112-132-160	40100	50300	87600	114700	34800	21000
	307 R4	258	1.9	15100	3.5	30	71-80-90-100-112-132-160	41500	52100	90400	118400	36100	21000
	307 R4	284	1.8	13500	2.8	30	71-80-90-100-112-132-160	42900	53800	93100	121900	37300	21000
	307 R4	300	1.7	14400	2.8	30	71-80-90-100-112-132-160	43700	54800	94500	123900	38000	21000
	307 R4	331	1.5	13800	2.5	30	71-80-90-100-112-132-160	45100	56600	97400	127600	39200	21000
	307 R4	363	1.4	12300	2.0	30	71-80-90-100-112-132-160	46500	58400	100100	131200	40400	21000
	307 R4	413	1.2	14400	2.1	30	71-80-90-100-112-132-160	48600	61000	104100	136400	42200	21000
	307 R4	453	1.1	14900	1.9	30	71-80-90-100-112-132-160	50100	62800	107000	140200	43500	21000
	307 R4	490	1.0	11000	1.3	30	71-80-90-100-112-132-160	51400	64500	109000	143600	44700	21000
	307 R4	581	0.86	14300	1.5	30	71-80-90-100-112-132-160	52000	65000	109000	145000	45000	21000
	307 R4	690	0.72	11000	0.94	30	71-80-90-100-112-132-160	52000	65000	109000	145000	45000	21000

309 R	281	16460 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	309 R2	13.0	116	5110	66	35	132-160-180-200	—	—	26900	34700	7390	27400
	309 R2	15.5	97	6090	66	35	132-160-180-200	—	—	28400	36600	7830	27400
	309 R2	19.8	76	7820	66	35	132-160-180-200	—	—	30600	39400	8510	27400
	309 R2	23.5	64	9280	66	35	132-160-180-200	—	—	32200	41500	9010	27400
	309 R3	31.6	47	5580	30	22	71-80-90-100-112-132-160	—	—	35200	45400	9950	27900
	309 R3	37.7	40	6650	30	22	71-80-90-100-112-132-160	—	—	37100	47800	10500	29000
	309 R3	44.6	34	7860	30	22	71-80-90-100-112-132-160	—	—	39000	50300	11100	29000
	309 R3	55.9	26.8	9860	30	22	71-80-90-100-112-132-160	—	—	41700	53800	12000	29000
	309 R3	65.0	23.1	11200	30	22	71-80-90-100-112-132-160	—	—	43700	56300	12600	29000
	309 R3	71.8	20.9	12700	30	22	71-80-90-100-112-132-160	—	—	45000	58000	13100	29000
	309 R3	83.4	18.0	14000	29	22	71-80-90-100-112-132-160	—	—	47100	60700	13700	29000
	309 R3	99.0	15.2	12800	22	22	71-80-90-100-112-132-160	—	—	49500	63900	14500	29000
	309 R3	120	12.5	12900	18.6	22	71-80-90-100-112-132-160	—	—	52500	67600	15500	29000
	309 R4	152	9.9	18600	15.0	15.0	71-80-90-100-112-132-160	—	—	56300	72700	16800	29000
	309 R4	165	9.1	16300	15.0	15.0	71-80-90-100-112-132-160	—	—	57800	74500	17300	29000
	309 R4	191	7.9	17300	15.0	15.0	71-80-90-100-112-132-160	—	—	60300	77800	18100	29000
	309 R4	206	7.3	19800	15.0	15.0	71-80-90-100-112-132-160	—	—	61700	79600	18600	29000
	309 R4	232	6.5	16700	12.7	15.0	71-80-90-100-112-132-160	—	—	64000	82500	19300	29000
	309 R4	258	5.8	17400	12.0	15.0	71-80-90-100-112-132-160	—	—	66000	85200	20000	29000
	309 R4	284	5.3	16900	10.5	15.0	71-80-90-100-112-132-160	—	—	68000	87700	20700	29000
	309 R4	331	4.5	17200	9.2	15.0	71-80-90-100-112-132-160	—	—	71200	91800	21800	29000
	309 R4	374	4.0	14300	6.8	15.0	71-80-90-100-112-132-160	—	—	73800	95200	22700	29000
	309 R4	413	3.6	17900	7.7	15.0	71-80-90-100-112-132-160	—	—	76100	98100	23400	29000
	309 R4	457	3.3	13800	5.4	15.0	71-80-90-100-112-132-160	—	—	78400	101100	24200	29000
	309 R4	490	3.1	14000	5.1	15.0	71-80-90-100-112-132-160	—	—	80100	103300	24800	29000
	309 R4	581	2.6	15800	4.8	15.0	71-80-90-100-112-132-160	—	—	84300	108700	26200	29000
	309 R4	690	2.2	14800	3.8	15.0	71-80-90-100-112-132-160	—	—	88700	114400	27800	29000

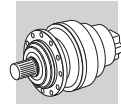




309 R

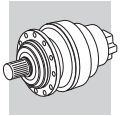
281

16460 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1000	309 R2	13.0	77	5770	50	42	132-160-180-200	—	—	30400	39200	8450	27400
	309 R2	15.5	65	6880	50	42	132-160-180-200	—	—	32100	41300	8970	27400
	309 R2	19.8	50	8830	50	42	132-160-180-200	—	—	34500	44500	9740	27400
	309 R2	23.5	42	10200	48	42	132-160-180-200	—	—	36400	46900	10300	27400
	309 R3	31.6	32	6300	23	26	71-80-90-100-112-132-160	—	—	39700	51200	11400	27900
	309 R3	37.7	26.5	7510	23	26	71-80-90-100-112-132-160	—	—	41900	54000	12100	29000
	309 R3	44.6	22.4	8870	23	26	71-80-90-100-112-132-160	—	—	44000	56800	12800	29000
	309 R3	55.9	17.9	11100	23	26	71-80-90-100-112-132-160	—	—	47100	60800	13800	29000
	309 R3	65.0	15.4	12500	22	26	71-80-90-100-112-132-160	—	—	49300	63600	14500	29000
	309 R3	71.8	13.9	14300	23	26	71-80-90-100-112-132-160	—	—	50800	65500	15000	29000
	309 R3	83.4	12.0	15500	21	26	71-80-90-100-112-132-160	—	—	53100	68500	15700	29000
	309 R3	99.0	10.1	13000	15.1	26	71-80-90-100-112-132-160	—	—	56000	72200	16700	29000
	309 R3	120	8.4	13000	12.5	26	71-80-90-100-112-132-160	—	—	59200	76400	17700	29000
	309 R4	152	6.6	20200	15.0	18.0	71-80-90-100-112-132-160	—	—	63600	82100	19200	29000
	309 R4	165	6.1	16700	12.0	18.0	71-80-90-100-112-132-160	—	—	65200	84100	19800	29000
	309 R4	191	5.2	17500	10.8	18.0	71-80-90-100-112-132-160	—	—	68100	87800	20700	29000
	309 R4	206	4.9	21300	12.2	18.0	71-80-90-100-112-132-160	—	—	69700	89900	21200	29000
	309 R4	232	4.3	17200	8.8	18.0	71-80-90-100-112-132-160	—	—	72300	93200	22100	29000
	309 R4	258	3.9	17500	8.0	18.0	71-80-90-100-112-132-160	—	—	74600	96200	22900	29000
	309 R4	284	3.5	17500	7.3	18.0	71-80-90-100-112-132-160	—	—	76800	99000	23700	29000
309 R4	331	3.0	18500	6.6	18.0	71-80-90-100-112-132-160	—	—	80400	103700	24900	29000	
309 R4	374	2.7	14300	4.5	18.0	71-80-90-100-112-132-160	—	—	83400	107500	25900	29000	
309 R4	413	2.4	19200	5.5	18.0	71-80-90-100-112-132-160	—	—	85900	110800	26800	29000	
309 R4	457	2.2	14800	3.8	18.0	71-80-90-100-112-132-160	—	—	88500	114200	27700	29000	
309 R4	490	2.0	14900	3.6	18.0	71-80-90-100-112-132-160	—	—	90400	116600	28400	29000	
309 R4	581	1.7	15800	3.2	18.0	71-80-90-100-112-132-160	—	—	95200	122700	30000	29000	
309 R4	690	1.4	15900	2.7	18.0	71-80-90-100-112-132-160	—	—	100200	129200	31800	29000	
500	309 R2	13.0	39	6780	29	70	132-160-180-200	—	—	37400	48300	10700	27400
	309 R2	15.5	32	7950	29	70	132-160-180-200	—	—	39500	50900	11300	27400
	309 R2	19.8	25.2	10200	29	70	132-160-180-200	—	—	42500	54800	12300	27400
	309 R2	23.5	21.2	11200	26	70	132-160-180-200	—	—	44800	57700	13000	27400
	309 R3	31.6	15.8	7760	14.1	44	71-80-90-100-112-132-160	—	—	48900	63100	14300	27900
	309 R3	37.7	13.2	9250	14.1	44	71-80-90-100-112-132-160	—	—	51600	66500	15200	29000
	309 R3	44.6	11.2	10900	14.1	44	71-80-90-100-112-132-160	—	—	54200	69900	16100	29000
	309 R3	55.9	8.9	13700	14.1	44	71-80-90-100-112-132-160	—	—	58000	74800	17300	29000
	309 R3	65.0	7.7	14100	12.5	44	71-80-90-100-112-132-160	—	—	60700	78300	18200	29000
	309 R3	71.8	7.0	16400	13.1	44	71-80-90-100-112-132-160	—	—	62500	80700	18800	29000
	309 R3	83.4	6.0	16700	11.5	44	71-80-90-100-112-132-160	—	—	65400	84400	19800	29000
	309 R3	99.0	5.1	13000	7.5	44	71-80-90-100-112-132-160	—	—	68900	88800	21000	29000
	309 R3	120	4.2	13400	6.4	44	71-80-90-100-112-132-160	—	—	72900	94100	22400	29000
	309 R4	152	3.3	21300	8.3	30	71-80-90-100-112-132-160	—	—	78300	101000	24200	29000
	309 R4	165	3.0	18400	6.6	30	71-80-90-100-112-132-160	—	—	80300	103600	24900	29000
	309 R4	191	2.6	17500	5.4	30	71-80-90-100-112-132-160	—	—	83900	108100	26100	29000
	309 R4	206	2.4	21300	6.1	30	71-80-90-100-112-132-160	—	—	85800	110600	26800	29000
	309 R4	232	2.2	18100	4.6	30	71-80-90-100-112-132-160	—	—	89000	114700	27900	29000
	309 R4	258	1.9	17800	4.1	30	71-80-90-100-112-132-160	—	—	91800	118400	28900	29000
	309 R4	284	1.8	18200	3.8	30	71-80-90-100-112-132-160	—	—	94500	121900	29800	29000
309 R4	331	1.5	20600	3.7	30	71-80-90-100-112-132-160	—	—	99000	127600	31400	29000	
309 R4	374	1.3	14600	2.3	30	71-80-90-100-112-132-160	—	—	102700	132400	32700	29000	
309 R4	413	1.2	21300	3.1	30	71-80-90-100-112-132-160	—	—	105800	136400	33800	29000	
309 R4	457	1.1	16700	2.2	30	71-80-90-100-112-132-160	—	—	109000	140600	34900	29000	
309 R4	490	1.0	16900	2.0	30	71-80-90-100-112-132-160	—	—	110000	143600	35800	29000	
309 R4	581	0.86	15800	1.6	30	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000	
309 R4	690	0.72	17000	1.5	30	71-80-90-100-112-132-160	—	—	110000	145000	36000	29000	



310 R							291	34120 Nm					
n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	Pt kW	P (IEC) 	MC	MZ	Rn ₂ [N] HC/PC	HZ/PZ	FZ	M_{n2} max Nm
1500	310 R2 (B)	12.0	125	10100	130	55	180-200-225	—	—	31200	39200	13000	47600
	310 R2 (B)	15.4	97	10700	115	55	180-200-225	—	—	33600	42300	14100	47600
	310 R2 (B)	18.3	82	11100	101	55	180-200-225	—	—	35400	44500	15000	47600
	310 R2 (C)	16.6	90	11200	112	55	180-200-225-250	—	—	34400	43200	14500	47600
	310 R2 (C)	21.3	70	11800	92	55	180-200-225-250	—	—	37100	46600	15800	47600
	310 R2 (C)	25.3	59	12200	81	55	180-200-225-250	—	—	39000	49000	16700	47600
	310 R3	37.7	40	6650	30	22	71-80-90-100-112-132-160	—	—	44000	55300	19000	47600
	310 R3	44.6	34	7860	30	22	71-80-90-100-112-132-160	—	—	46200	58100	20100	47600
	310 R3	55.9	26.8	9860	30	22	71-80-90-100-112-132-160	—	—	49500	62200	21700	47600
	310 R3	65.0	23.1	11500	30	22	71-80-90-100-112-132-160	—	—	51700	65100	22800	47600
	310 R3	71.8	20.9	12700	30	22	71-80-90-100-112-132-160	—	—	53300	67000	23600	47600
	310 R3	78.6	19.1	13900	30	22	71-80-90-100-112-132-160	—	—	54800	68900	24300	47600
	310 R3	83.4	18.0	14700	30	22	71-80-90-100-112-132-160	—	—	55800	70100	24800	47600
	310 R3	99.0	15.2	16400	29	22	71-80-90-100-112-132-160	—	—	58700	73800	26300	47600
	310 R3	120	12.5	17400	25	22	71-80-90-100-112-132-160	—	—	62200	78200	28000	47600
	310 R4	136	11.0	21000	27	15.0	71-80-90-100-112-132-160	—	—	64600	81200	29200	47600
	310 R4	160	9.4	22000	24	15.0	71-80-90-100-112-132-160	—	—	67800	85300	30900	47600
	310 R4	189	7.9	23200	22	15.0	71-80-90-100-112-132-160	—	—	71300	89700	32600	47600
	310 R4	206	7.3	22100	19.0	15.0	71-80-90-100-112-132-160	—	—	73100	91900	33500	47600
	310 R4	234	6.4	24700	18.7	15.0	71-80-90-100-112-132-160	—	—	76000	95600	35000	47600
310 R4	258	5.8	22800	15.7	15.0	71-80-90-100-112-132-160	—	—	78300	98400	36200	47600	
310 R4	283	5.3	26100	16.4	15.0	71-80-90-100-112-132-160	—	—	80500	101200	37300	47600	
310 R4	305	4.9	23400	13.6	15.0	71-80-90-100-112-132-160	—	—	82300	103500	38200	47600	
310 R4	334	4.5	27400	14.6	15.0	71-80-90-100-112-132-160	—	—	84600	106300	39400	47600	
310 R4	363	4.1	24100	11.8	15.0	71-80-90-100-112-132-160	—	—	86700	109000	40500	47600	
310 R4	419	3.6	29000	12.3	15.0	71-80-90-100-112-132-160	—	—	90500	113800	42500	47600	
310 R4	454	3.3	20000	7.8	15.0	71-80-90-100-112-132-160	—	—	92700	116600	43600	47600	
310 R4	517	2.9	25600	8.8	15.0	71-80-90-100-112-132-160	—	—	96400	121200	45600	47600	
310 R4	590	2.5	21800	6.6	15.0	71-80-90-100-112-132-160	—	—	100300	126100	47600	47600	
310 R4	639	2.3	21500	6.0	15.0	71-80-90-100-112-132-160	—	—	102700	129100	48900	47600	
310 R4	757	2.0	26400	6.2	15.0	71-80-90-100-112-132-160	—	—	108100	135900	51700	47600	
310 R4	898	1.7	23200	4.6	15.0	71-80-90-100-112-132-160	—	—	113800	143100	54800	47600	
1000	310 R2 (B)	12.0	83	11400	106	66	180-200-225	—	—	35200	44300	14900	47600
	310 R2 (B)	15.4	65	12000	87	66	180-200-225	—	—	38000	47700	16200	47600
	310 R2 (B)	18.3	55	12500	76	66	180-200-225	—	—	40000	50200	17100	47600
	310 R2 (C)	16.6	60	12600	84	66	180-200-225-250	—	—	38800	48800	16600	47600
	310 R2 (C)	21.3	47	13300	69	66	180-200-225-250	—	—	41800	52600	18000	47600
	310 R2 (C)	25.3	39	13500	59	66	180-200-225-250	—	—	44100	55400	19100	47600
	310 R3	37.7	26.5	7510	23	26	71-80-90-100-112-132-160	—	—	49600	62400	21800	47600
	310 R3	44.6	22.4	8870	23	26	71-80-90-100-112-132-160	—	—	52200	65600	23000	47600
	310 R3	55.9	17.9	11100	23	26	71-80-90-100-112-132-160	—	—	55900	70200	24900	47600
	310 R3	65.0	15.4	12900	23	26	71-80-90-100-112-132-160	—	—	58400	73500	26100	47600
	310 R3	71.8	13.9	14300	23	26	71-80-90-100-112-132-160	—	—	60200	75700	27000	47600
	310 R3	78.6	12.7	15700	23	26	71-80-90-100-112-132-160	—	—	61900	77800	27800	47600
	310 R3	83.4	12.0	16600	23	26	71-80-90-100-112-132-160	—	—	63000	79200	28400	47600
	310 R3	99.0	10.1	18200	21	26	71-80-90-100-112-132-160	—	—	66300	83400	30100	47600
	310 R3	120	8.4	18300	17.5	26	71-80-90-100-112-132-160	—	—	70200	88300	32000	47600
	310 R4	136	7.4	23700	21	18.0	71-80-90-100-112-132-160	—	—	72900	91700	33400	47600
	310 R4	160	6.2	24900	18.3	18.0	71-80-90-100-112-132-160	—	—	76600	96400	35300	47600
	310 R4	189	5.3	26100	16.3	18.0	71-80-90-100-112-132-160	—	—	80500	101300	37300	47600
	310 R4	206	4.9	23500	13.5	18.0	71-80-90-100-112-132-160	—	—	82600	103800	38400	47600
	310 R4	234	4.3	27800	14.0	18.0	71-80-90-100-112-132-160	—	—	85800	107900	40100	47600
310 R4	258	3.9	24400	11.2	18.0	71-80-90-100-112-132-160	—	—	88400	111200	41400	47600	
310 R4	283	3.5	29300	12.3	18.0	71-80-90-100-112-132-160	—	—	90900	114300	42700	47600	
310 R4	305	3.3	25100	9.7	18.0	71-80-90-100-112-132-160	—	—	92900	116800	43800	47600	
310 R4	334	3.0	30700	10.9	18.0	71-80-90-100-112-132-160	—	—	95500	120100	45100	47600	
310 R4	363	2.8	25800	8.4	18.0	71-80-90-100-112-132-160	—	—	97900	123100	46400	47600	
310 R4	419	2.4	32000	9.0	18.0	71-80-90-100-112-132-160	—	—	102200	128600	48700	47600	
310 R4	454	2.2	21800	5.7	18.0	71-80-90-100-112-132-160	—	—	104700	131700	50000	47600	
310 R4	517	1.9	27400	6.3	18.0	71-80-90-100-112-132-160	—	—	108900	136900	52200	47600	
310 R4	590	1.7	21800	4.4	18.0	71-80-90-100-112-132-160	—	—	113200	142400	54500	47600	
310 R4	639	1.6	23500	4.4	18.0	71-80-90-100-112-132-160	—	—	116000	145800	56000	47600	

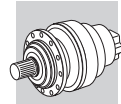




310 R	291	34120 Nm
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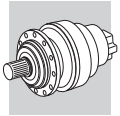
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1000	310 R4	757	1.3	27300	4.3	18.0	71-80-90-100-112-132-160	—	—	122000	153500	59200	47600
	310 R4	898	1.1	25400	3.3	18.0	71-80-90-100-112-132-160	—	—	128500	161600	62700	47600
500	310 R2 (B)	12.0	42	14100	65	110	180-200-225	—	—	43400	54500	18800	47600
	310 R2 (B)	15.4	32	14800	53	110	180-200-225	—	—	46700	58800	20400	47600
	310 R2 (B)	18.3	27.3	14700	45	110	180-200-225	—	—	49200	61900	21600	47600
	310 R2 (C)	16.6	30	15500	52	110	180-200-225-250	—	—	47800	60100	20900	47600
	310 R2 (C)	21.3	23.4	16300	43	110	180-200-225-250	—	—	51500	64800	22700	47600
	310 R2 (C)	25.3	19.7	15700	35	110	180-200-225-250	—	—	54200	68200	24100	47600
	310 R3	37.7	13.2	9250	14.1	44	71-80-90-100-112-132-160	—	—	61100	76900	27500	47600
	310 R3	44.6	11.2	10900	14.1	44	71-80-90-100-112-132-160	—	—	64200	80800	29000	47600
	310 R3	55.9	8.9	13700	14.1	44	71-80-90-100-112-132-160	—	—	68800	86500	31300	47600
	310 R3	65.0	7.7	15900	14.1	44	71-80-90-100-112-132-160	—	—	71900	90500	32900	47600
	310 R3	71.8	7.0	17600	14.1	44	71-80-90-100-112-132-160	—	—	74100	93200	34000	47600
	310 R3	78.6	6.4	18900	13.8	44	71-80-90-100-112-132-160	—	—	76200	95800	35100	47600
	310 R3	83.4	6.0	20500	14.1	44	71-80-90-100-112-132-160	—	—	77500	97500	35800	47600
	310 R3	99.0	5.1	18400	10.7	44	71-80-90-100-112-132-160	—	—	81600	102600	37900	47600
	310 R3	120	4.2	19100	9.2	44	71-80-90-100-112-132-160	—	—	86400	108700	40400	47600
	310 R4	136	3.7	29000	12.6	30	71-80-90-100-112-132-160	—	—	89800	112900	42100	47600
	310 R4	160	3.1	30400	11.2	30	71-80-90-100-112-132-160	—	—	94300	118600	44500	47600
	310 R4	189	2.6	31800	9.9	30	71-80-90-100-112-132-160	—	—	99200	124700	47000	47600
	310 R4	206	2.4	26400	7.6	30	71-80-90-100-112-132-160	—	—	101700	127800	48400	47600
	310 R4	234	2.1	32600	8.2	30	71-80-90-100-112-132-160	—	—	105700	132900	50500	47600
	310 R4	258	1.9	27400	6.3	30	71-80-90-100-112-132-160	—	—	108800	136900	52200	47600
	310 R4	283	1.8	33000	6.9	30	71-80-90-100-112-132-160	—	—	111900	140700	53800	47600
	310 R4	305	1.6	28200	5.5	30	71-80-90-100-112-132-160	—	—	114400	143800	55100	47600
	310 R4	334	1.5	33300	5.9	30	71-80-90-100-112-132-160	—	—	117600	147800	56800	47600
	310 R4	363	1.4	29000	4.7	30	71-80-90-100-112-132-160	—	—	120600	151600	58400	47600
	310 R4	419	1.2	33700	4.8	30	71-80-90-100-112-132-160	—	—	125900	158300	61300	47600
	310 R4	454	1.1	25400	3.3	30	71-80-90-100-112-132-160	—	—	128900	162100	62900	47600
	310 R4	517	0.97	30600	3.5	30	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
	310 R4	590	0.85	21800	2.2	30	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
	310 R4	639	0.78	26000	2.4	30	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
	310 R4	757	0.66	28000	2.2	30	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600
	310 R4	898	0.56	26000	1.7	30	71-80-90-100-112-132-160	—	—	133000	166000	65000	47600



311 R	301	48330 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	311 R2 (B)	12.0	125	11900	150	75	180-200-225-250	—	—	36900	45900	13000	58300
	311 R2 (B)	15.4	97	15400	150	75	180-200-225-250	—	—	39700	49500	14100	58300
	311 R2 (B)	18.3	82	16000	146	75	180-200-225-250	—	—	41800	52100	15000	58300
	311 R2 (C)	16.6	90	14400	144	90	180-200-225-250	—	—	40600	50600	14500	58300
	311 R2 (C)	21.3	70	16900	132	90	180-200-225-250	—	—	43800	54500	15800	58300
	311 R2 (C)	25.3	59	17600	116	90	180-200-225-250	—	—	46100	57400	16700	58300
	311 R3	53.0	28.3	20300	66	40	132-160-180-200	—	—	57500	71600	21300	58300
	311 R3	63.2	23.7	24000	65	40	132-160-180-200	—	—	60600	75500	22600	58300
	311 R3	68.0	22.1	24000	61	40	132-160-180-200	—	—	62000	77200	23200	58300
	311 R3	81.1	18.5	25900	55	40	132-160-180-200	—	—	65400	81400	24600	58300
	311 R3	96.3	15.6	27200	49	40	132-160-180-200	—	—	68800	85700	26000	58300
	311 R3	104	14.4	28700	47	40	132-160-180-200	—	—	70400	87700	26700	58300
	311 R3	124	12.1	30200	42	40	132-160-180-200	—	—	74100	92400	28300	58300
	311 R3	147	10.2	26900	32	40	132-160-180-200	—	—	78100	97200	29900	58300
	311 R4	154	9.7	26400	30	22	71-80-90-100-112-132-160	—	—	79300	98700	30500	58300
	311 R4	182	8.2	31200	30	22	71-80-90-100-112-132-160	—	—	83300	103800	32200	58300
311 R4	198	7.6	33800	30	22	71-80-90-100-112-132-160	—	—	85400	106400	33100	58300	
311 R4	229	6.6	35300	27	22	71-80-90-100-112-132-160	—	—	89200	111100	34700	58300	
311 R4	266	5.6	36900	25	22	71-80-90-100-112-132-160	—	—	93300	116200	36500	58300	

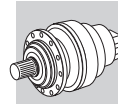


311 R							301	48330 Nm						
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 	MC	MZ	R _{n2} [N]		M _{n2 max} Nm		
								HC/PC	HZ/PZ	FZ				
1500	311 R4	294	5.1	38000	23	22	71-80-90-100-112-132-160	—	—	96100	119700	37700	58300	
	311 R4	322	4.7	39000	22	22	71-80-90-100-112-132-160	—	—	98800	123100	38900	58300	
	311 R4	341	4.4	39200	20	22	71-80-90-100-112-132-160	—	—	100600	125300	39700	58300	
	311 R4	413	3.6	40600	17.4	22	71-80-90-100-112-132-160	—	—	106500	132600	42300	58300	
	311 R4	438	3.4	37500	15.2	22	71-80-90-100-112-132-160	—	—	108400	135000	43100	58300	
	311 R4	490	3.1	34500	12.5	22	71-80-90-100-112-132-160	—	—	112100	139600	44800	58300	
	311 R4	520	2.9	38600	13.2	22	71-80-90-100-112-132-160	—	—	114100	142100	45700	58300	
	311 R4	629	2.4	39700	11.2	22	71-80-90-100-112-132-160	—	—	120800	150500	48600	58300	
311 R4	746	2.0	30500	7.3	22	71-80-90-100-112-132-160	—	—	127200	158400	51500	58300		
1000	311 R2 (B)	12.0	83	13500	125	90	180-200-225-250	—	—	41600	51800	14900	58300	
	311 R2 (B)	15.4	65	17400	126	90	180-200-225-250	—	—	44900	55900	16200	58300	
	311 R2 (B)	18.3	55	18100	110	90	180-200-225-250	—	—	47200	58800	17100	58300	
	311 R2 (C)	16.6	60	16200	109	108	180-200-225-250	—	—	45900	57200	16600	58300	
	311 R2 (C)	21.3	47	19100	100	108	180-200-225-250	—	—	49500	61600	18000	58300	
	311 R2 (C)	25.3	39	19500	85	108	180-200-225-250	—	—	52100	64800	19100	58300	
	311 R3	53.0	18.9	22900	50	48	132-160-180-200	—	—	65000	80900	24400	58300	
	311 R3	63.2	15.8	27100	49	48	132-160-180-200	—	—	68500	85300	25900	58300	
	311 R3	68.0	14.7	27100	46	48	132-160-180-200	—	—	70000	87200	26500	58300	
	311 R3	81.1	12.3	29200	41	48	132-160-180-200	—	—	73800	91900	28100	58300	
	311 R3	96.3	10.4	30700	37	48	132-160-180-200	—	—	77700	96800	29800	58300	
	311 R3	104	9.6	32200	35	48	132-160-180-200	—	—	79500	99100	30600	58300	
	311 R3	124	8.1	33000	31	48	132-160-180-200	—	—	83700	104300	32400	58300	
	311 R3	147	6.8	27000	21	48	132-160-180-200	—	—	88200	109800	34300	58300	
	311 R4	154	6.5	29800	23	26	71-80-90-100-112-132-160	—	—	89500	111500	34900	58300	
	311 R4	182	5.5	35200	23	26	71-80-90-100-112-132-160	—	—	94100	117200	36900	58300	
	311 R4	198	5.0	38200	23	26	71-80-90-100-112-132-160	—	—	96500	120200	37900	58300	
	311 R4	229	4.4	39600	21	26	71-80-90-100-112-132-160	—	—	100700	125500	39800	58300	
	311 R4	266	3.8	41200	18.3	26	71-80-90-100-112-132-160	—	—	105400	131300	41800	58300	
	311 R4	294	3.4	41000	16.5	26	71-80-90-100-112-132-160	—	—	108600	135200	43200	58300	
	311 R4	322	3.1	43300	15.9	26	71-80-90-100-112-132-160	—	—	111600	139000	44500	58300	
	311 R4	341	2.9	42200	14.6	26	71-80-90-100-112-132-160	—	—	113600	141500	45400	58300	
	311 R4	413	2.4	43500	12.5	26	71-80-90-100-112-132-160	—	—	120200	149800	48400	58300	
	311 R4	438	2.3	40100	10.8	26	71-80-90-100-112-132-160	—	—	122400	152500	49400	58300	
	311 R4	490	2.0	34700	8.4	26	71-80-90-100-112-132-160	—	—	126600	157700	51200	58300	
	311 R4	520	1.9	40500	9.2	26	71-80-90-100-112-132-160	—	—	128800	160500	52300	58300	
	311 R4	629	1.6	41200	7.8	26	71-80-90-100-112-132-160	—	—	136400	169900	55700	58300	
	311 R4	746	1.3	32500	5.2	26	71-80-90-100-112-132-160	—	—	143600	178900	59000	58300	
	500	311 R2 (B)	12.0	42	16700	77	150	180-200-225-250	—	—	51200	63800	18800	58300
		311 R2 (B)	15.4	32	21400	77	150	180-200-225-250	—	—	55200	68800	20400	58300
		311 R2 (B)	18.3	27.3	21400	65	150	180-200-225-250	—	—	58100	72400	21600	58300
		311 R2 (C)	16.6	30	20000	67	180	180-200-225-250	—	—	56500	70400	20900	58300
311 R2 (C)		21.3	23.4	23500	61	180	180-200-225-250	—	—	60900	75800	22700	58300	
311 R2 (C)		25.3	19.7	22500	49	180	180-200-225-250	—	—	64100	79800	24100	58300	
311 R3		53.0	9.4	28100	30	80	132-160-180-200	—	—	80000	99600	30800	58300	
311 R3		63.2	7.9	33400	30	80	132-160-180-200	—	—	84300	105000	32600	58300	
311 R3		68.0	7.4	32400	27	80	132-160-180-200	—	—	86200	107400	33400	58300	
311 R3		81.1	6.2	36000	25	80	132-160-180-200	—	—	90900	113200	35500	58300	
311 R3		96.3	5.2	34300	20	80	132-160-180-200	—	—	95700	119200	37500	58300	
311 R3		104	4.8	35500	19.5	80	132-160-180-200	—	—	97900	122000	38500	58300	
311 R3		124	4.0	36500	16.9	80	132-160-180-200	—	—	103100	128400	40800	58300	
311 R3		147	3.4	28400	11.1	80	132-160-180-200	—	—	108500	135200	43200	58300	
311 R4		154	3.2	36700	14.1	44	71-80-90-100-112-132-160	—	—	110200	137300	43900	58300	
311 R4		182	2.7	43400	14.1	44	71-80-90-100-112-132-160	—	—	115800	144300	46400	58300	
311 R4		198	2.5	43300	12.9	44	71-80-90-100-112-132-160	—	—	118800	148000	47700	58300	
311 R4		229	2.2	46200	11.9	44	71-80-90-100-112-132-160	—	—	124000	154500	50100	58300	
311 R4		266	1.9	46600	10.4	44	71-80-90-100-112-132-160	—	—	129700	161600	52700	58300	
311 R4		294	1.7	44800	9.0	44	71-80-90-100-112-132-160	—	—	133600	166500	54400	58300	
311 R4		322	1.6	47100	8.7	44	71-80-90-100-112-132-160	—	—	137400	171100	56100	58300	
311 R4		341	1.5	45400	7.9	44	71-80-90-100-112-132-160	—	—	139800	174200	57200	58300	
311 R4		413	1.2	46200	6.6	44	71-80-90-100-112-132-160	—	—	148000	184400	61000	58300	
311 R4		438	1.1	44300	6.0	44	71-80-90-100-112-132-160	—	—	150700	187700	62200	58300	



311 R							301	48330 Nm					
n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	Pt kW	P (IEC) 	MC	MZ	HC/PC	HZ/PZ	FZ	$M_{n2\ max}$ Nm
500	311 R4	490	1.0	35200	4.2	44	71-80-90-100-112-132-160	—	—	155800	194100	64600	58300
	311 R4	520	0.96	43000	4.9	44	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300
	311 R4	629	0.80	43000	4.0	44	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300
	311 R4	746	0.67	34000	2.7	44	71-80-90-100-112-132-160	—	—	157000	195000	65000	58300

313 R							311	57970 Nm						
n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	Pt kW	P (IEC) 	MC	MZ	HC/PC	HZ/PZ	FZ	$M_{n2\ max}$ Nm	
1500	313 R2 (B)	12.2	123	12100	150	75	180-200-225-250	—	—	45700	54100	16100	86300	
	313 R2 (B)	15.9	95	15700	150	75	180-200-225-250	—	—	49500	58600	17600	86300	
	313 R2 (B)	19.1	79	19100	150	75	180-200-225-250	—	—	52300	61900	18700	86300	
	313 R2 (C)	16.8	89	14600	144	90	180-200-225-250	—	—	50400	59600	17900	105000	
	313 R2 (C)	22.0	68	19000	144	90	180-200-225-250	—	—	54600	64600	19600	105000	
	313 R2 (C)	26.4	57	22800	144	90	180-200-225-250	—	—	57700	68300	20800	105000	
	313 R3	53.7	28.0	20500	66	40	132-160-180-200	—	—	71300	84400	26400	105000	
	313 R3	64.0	23.4	24500	66	40	132-160-180-200	—	—	75200	89000	28000	105000	
	313 R3	69.9	21.4	26700	66	40	132-160-180-200	—	—	77200	91400	28800	105000	
	313 R3	82.2	18.3	31400	66	40	132-160-180-200	—	—	81100	95900	30400	105000	
	313 R3	97.5	15.4	37300	66	40	132-160-180-200	—	—	85300	101000	32200	105000	
	313 R3	107	14.0	38800	62	40	132-160-180-200	—	—	87800	103900	33200	105000	
	313 R3	127	11.8	40700	55	40	132-160-180-200	—	—	92400	109400	35100	105000	
	313 R3	153	9.8	39000	44	40	132-160-180-200	—	—	97700	115600	37400	105000	
	313 R4	185	8.1	31600	30	22	71-80-90-100-112-132-160	—	—	103300	122300	39800	105000	
	313 R4	201	7.5	34300	30	22	71-80-90-100-112-132-160	—	—	106000	125400	40900	105000	
	313 R4	237	6.3	40500	30	22	71-80-90-100-112-132-160	—	—	111400	131800	43200	105000	
	313 R4	281	5.3	48100	30	22	71-80-90-100-112-132-160	—	—	117200	138800	45800	105000	
	313 R4	309	4.9	44500	26	22	71-80-90-100-112-132-160	—	—	120600	142700	47200	105000	
	313 R4	346	4.3	53000	27	22	71-80-90-100-112-132-160	—	—	124700	147600	49000	105000	
	313 R4	387	3.9	46700	21	22	71-80-90-100-112-132-160	—	—	129100	152800	50900	105000	
	313 R4	450	3.3	47700	18.8	22	71-80-90-100-112-132-160	—	—	135100	159800	53600	105000	
	313 R4	496	3.0	52100	18.6	22	71-80-90-100-112-132-160	—	—	139000	164500	55300	105000	
	313 R4	535	2.8	48900	16.2	22	71-80-90-100-112-132-160	—	—	142200	168300	56700	105000	
	313 R4	647	2.3	50400	13.8	22	71-80-90-100-112-132-160	—	—	150500	178100	60400	105000	
	313 R4	778	1.9	44200	10.1	22	71-80-90-100-112-132-160	—	—	159100	188300	64300	105000	
	1000	313 R2 (B)	12.2	82	13700	126	90	180-200-225-250	—	—	51600	61100	18400	86300
		313 R2 (B)	15.9	63	17700	124	90	180-200-225-250	—	—	55900	66100	20100	86300
		313 R2 (B)	19.1	52	21800	127	90	180-200-225-250	—	—	59100	69900	21400	86300
		313 R2 (C)	16.8	59	16400	109	108	180-200-225-250	—	—	56900	67400	20500	105000
		313 R2 (C)	22.0	46	21400	109	108	180-200-225-250	—	—	61600	72900	22400	105000
		313 R2 (C)	26.4	38	25000	105	108	180-200-225-250	—	—	65100	77100	23800	105000
		313 R3	53.7	18.6	23200	50	48	132-160-180-200	—	—	80600	95300	30200	105000
		313 R3	64.0	15.6	27700	50	48	132-160-180-200	—	—	84900	100500	32000	105000
313 R3		69.9	14.3	30200	50	48	132-160-180-200	—	—	87200	103200	33000	105000	
313 R3		82.2	12.2	35500	50	48	132-160-180-200	—	—	91500	108300	34800	105000	
313 R3		97.5	10.3	42100	50	48	132-160-180-200	—	—	96400	114100	36800	105000	
313 R3		107	9.3	42800	46	48	132-160-180-200	—	—	99100	117300	38000	105000	
313 R3		127	7.9	43400	39	48	132-160-180-200	—	—	104400	123500	40200	105000	
313 R3		153	6.5	39000	29	48	132-160-180-200	—	—	110300	130600	42800	105000	
313 R4		185	5.4	35700	23	26	71-80-90-100-112-132-160	—	—	116700	138100	45500	105000	
313 R4		201	5.0	38800	23	26	71-80-90-100-112-132-160	—	—	119700	141600	46800	105000	
313 R4		237	4.2	45600	23	26	71-80-90-100-112-132-160	—	—	125800	148900	49500	105000	
313 R4		281	3.6	49700	21	26	71-80-90-100-112-132-160	—	—	132400	156700	52400	105000	
313 R4		309	3.2	47600	18.2	26	71-80-90-100-112-132-160	—	—	136200	161200	54100	105000	
313 R4		346	2.9	54500	18.6	26	71-80-90-100-112-132-160	—	—	140900	166700	56100	105000	
313 R4		387	2.6	49500	15.1	26	71-80-90-100-112-132-160	—	—	145800	172500	58300	105000	
313 R4		450	2.2	50700	13.3	26	71-80-90-100-112-132-160	—	—	152500	180500	61300	105000	
313 R4		496	2.0	52200	12.5	26	71-80-90-100-112-132-160	—	—	157000	185800	63300	105000	

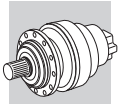


313 R	311	57970 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1000	313 R4	535	1.9	52200	11.6	26	71-80-90-100-112-132-160	—	—	160600	190000	64900	105000
	313 R4	647	1.5	53900	9.9	26	71-80-90-100-112-132-160	—	—	170000	201200	69200	105000
	313 R4	778	1.3	47100	7.2	26	71-80-90-100-112-132-160	—	—	179700	212700	73600	105000
500	313 R2 (B)	12.2	41	17000	78	150	180-200-225-250	—	—	63600	75200	23200	86300
	313 R2 (B)	15.9	32	21900	77	150	180-200-225-250	—	—	68800	81400	25300	86300
	313 R2 (B)	19.1	26.2	26900	78	150	180-200-225-250	—	—	72700	86100	26900	86300
	313 R2 (C)	16.8	29.7	20200	67	180	180-200-225-250	—	—	70100	82900	25800	105000
	313 R2 (C)	22.0	22.8	26400	67	180	180-200-225-250	—	—	75900	89800	28200	105000
	313 R2 (C)	26.4	18.9	28300	60	180	180-200-225-250	—	—	80200	94900	30000	105000
	313 R3	53.7	9.3	28400	30	80	132-160-180-200	—	—	99200	117400	38000	105000
	313 R3	64.0	7.8	34100	31	80	132-160-180-200	—	—	104600	123800	40300	105000
	313 R3	69.9	7.1	37200	31	80	132-160-180-200	—	—	107400	127100	41500	105000
	313 R3	82.2	6.1	43700	31	80	132-160-180-200	—	—	112700	133400	43800	105000
	313 R3	97.5	5.1	50000	29	80	132-160-180-200	—	—	118700	140400	46400	105000
	313 R3	107	4.7	45100	24	80	132-160-180-200	—	—	122000	144400	47900	105000
	313 R3	127	3.9	46600	21	80	132-160-180-200	—	—	128500	152000	50700	105000
	313 R3	153	3.3	41100	15.4	80	132-160-180-200	—	—	135800	160700	53900	105000
	313 R4	185	2.7	43900	14.1	44	71-80-90-100-112-132-160	—	—	143700	170000	57400	105000
	313 R4	201	2.5	47700	14.1	44	71-80-90-100-112-132-160	—	—	147300	174400	59000	105000
	313 R4	237	2.1	53000	13.2	44	71-80-90-100-112-132-160	—	—	154900	183300	62400	105000
	313 R4	281	1.8	51300	10.8	44	71-80-90-100-112-132-160	—	—	163000	192900	66000	105000
	313 R4	309	1.6	53500	10.2	44	71-80-90-100-112-132-160	—	—	167700	198400	68100	105000
	313 R4	346	1.4	55200	9.5	44	71-80-90-100-112-132-160	—	—	173400	205200	70700	105000
	313 R4	387	1.3	55500	8.5	44	71-80-90-100-112-132-160	—	—	179500	212400	73500	105000
	313 R4	450	1.1	57000	7.5	44	71-80-90-100-112-132-160	—	—	187800	222200	77300	105000
	313 R4	496	1.0	53000	6.3	44	71-80-90-100-112-132-160	—	—	192000	228800	79800	105000
	313 R4	535	0.94	58000	6.4	44	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000
	313 R4	647	0.77	58000	5.3	44	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000
	313 R4	778	0.64	49000	3.7	44	71-80-90-100-112-132-160	—	—	192000	231000	80000	105000

314 R	321	84000 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	314 R3 (B)	51.1	29.4	38500	130	55	180-200-225	—	—	75000	88100	29200	115000
	314 R3 (B)	65.5	22.9	49700	130	55	180-200-225	—	—	80900	94900	31700	115000
	314 R3 (B)	77.8	19.3	51500	114	55	180-200-225	—	—	85100	100000	33600	115000
	314 R3 (B)	82.3	18.2	52400	110	55	180-200-225	—	—	86600	101600	34200	115000
	314 R3 (B)	97.6	15.4	55100	97	55	180-200-225	—	—	91100	107000	36200	115000
	314 R3 (B)	113	13.2	48000	73	55	180-200-225	—	—	95300	111900	38100	115000
	314 R3 (C)	70.7	21.2	43900	107	55	180-200-225-250	—	—	82700	97100	32500	115000
	314 R3 (C)	90.7	16.5	47300	90	55	180-200-225-250	—	—	89200	104700	35300	115000
	314 R3 (C)	108	13.9	49800	80	55	180-200-225-250	—	—	93900	110200	37400	115000
	314 R3 (C)	114	13.2	51700	78	55	180-200-225-250	—	—	95400	112100	38100	115000
	314 R3 (C)	135	11.1	60500	77	55	180-200-225-250	—	—	100500	118000	40300	115000
	314 R3 (C)	157	9.5	52000	57	55	180-200-225-250	—	—	105100	123400	42400	115000
	314 R4	160	9.4	56200	35	22	71-80-90-100-112-132-160	—	—	105800	124200	42700	115000
	314 R4	189	7.9	59000	35	22	71-80-90-100-112-132-160	—	—	111200	130500	45100	115000
	314 R4	238	6.3	71100	35	22	71-80-90-100-112-132-160	—	—	119000	139700	48700	115000
	314 R4	276	5.4	75700	35	22	71-80-90-100-112-132-160	—	—	124500	146200	51200	115000
	314 R4	354	4.2	78200	35	22	71-80-90-100-112-132-160	—	—	134200	157500	55600	115000
	314 R4	421	3.6	78800	33	22	71-80-90-100-112-132-160	—	—	141300	165900	58900	115000
	314 R4	445	3.4	67800	27	22	71-80-90-100-112-132-160	—	—	143600	168700	60000	115000
	314 R4	528	2.8	68800	23	22	71-80-90-100-112-132-160	—	—	151200	177500	63500	115000
314 R4	614	2.4	57600	16.7	22	71-80-90-100-112-132-160	—	—	158200	185800	66800	115000	
1000	314 R3 (B)	51.1	19.6	43500	98	66	180-200-225	—	—	84700	99500	33400	115000
	314 R3 (B)	65.5	15.3	56500	99	66	180-200-225	—	—	91300	107200	36300	115000
	314 R3 (B)	77.8	12.9	58000	86	66	180-200-225	—	—	96100	112900	38400	115000



314 R

321

84000 Nm

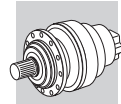
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1000	314 R3 (B)	82.3	12.2	58900	82	66	180-200-225	—	—	97800	114800	39100	115000
	314 R3 (B)	97.6	10.2	62000	73	66	180-200-225	—	—	102900	120800	41400	115000
	314 R3 (B)	113	8.8	52000	53	66	180-200-225	—	—	107700	126400	43600	115000
	314 R3 (C)	70.7	14.1	49600	81	66	180-200-225-250	—	—	93400	109700	37200	115000
	314 R3 (C)	90.7	11.0	53500	68	66	180-200-225-250	—	—	100700	118200	40400	115000
	314 R3 (C)	108	9.3	56300	60	66	180-200-225-250	—	—	106000	124500	42800	115000
	314 R3 (C)	114	8.8	57700	58	66	180-200-225-250	—	—	107800	126600	43600	115000
	314 R3 (C)	135	7.4	63700	54	66	180-200-225-250	—	—	113500	133200	46200	115000
	314 R3 (C)	157	6.4	52000	38	66	180-200-225-250	—	—	118700	139400	48600	115000
	314 R4	160	6.2	63400	35	26	71-80-90-100-112-132-160	—	—	119500	140300	48900	115000
	314 R4	189	5.3	66700	35	26	71-80-90-100-112-132-160	—	—	125600	147400	51700	115000
	314 R4	238	4.2	77000	35	26	71-80-90-100-112-132-160	—	—	134400	157800	55700	115000
	314 R4	276	3.6	78700	34	26	71-80-90-100-112-132-160	—	—	140600	165100	58600	115000
	314 R4	354	2.8	79600	27	26	71-80-90-100-112-132-160	—	—	151500	177900	63700	115000
	314 R4	421	2.4	80200	23	26	71-80-90-100-112-132-160	—	—	159500	187300	67400	115000
	314 R4	445	2.2	70700	18.8	26	71-80-90-100-112-132-160	—	—	162200	190500	68700	115000
	314 R4	528	1.9	72400	16.2	26	71-80-90-100-112-132-160	—	—	170800	200500	72700	115000
	314 R4	614	1.6	61600	11.9	26	71-80-90-100-112-132-160	—	—	178700	209800	76500	115000
500	314 R3 (B)	51.1	9.8	53600	60	110	180-200-225	—	—	104300	122500	42100	115000
	314 R3 (B)	65.5	7.6	69400	61	110	180-200-225	—	—	112400	132000	45700	115000
	314 R3 (B)	77.8	6.4	71700	53	110	180-200-225	—	—	118400	139000	48400	115000
	314 R3 (B)	82.3	6.1	64600	45	110	180-200-225	—	—	120400	141300	49300	115000
	314 R3 (B)	97.6	5.1	65400	38	110	180-200-225	—	—	126700	148800	52200	115000
	314 R3 (B)	113	4.4	52900	27	110	180-200-225	—	—	132600	155600	54900	115000
	314 R3 (C)	70.7	7.1	61100	50	110	180-200-225-250	—	—	115000	135100	46900	115000
	314 R3 (C)	90.7	5.5	65800	42	110	180-200-225-250	—	—	124000	145500	51000	115000
	314 R3 (C)	108	4.6	69000	37	110	180-200-225-250	—	—	130500	153200	53900	115000
	314 R3 (C)	114	4.4	66200	33	110	180-200-225-250	—	—	132700	155800	55000	115000
	314 R3 (C)	135	3.7	67200	29	110	180-200-225-250	—	—	139700	164000	58200	115000
	314 R3 (C)	157	3.2	55500	20	110	180-200-225-250	—	—	146200	171600	61200	115000
	314 R4	160	3.1	74700	28	44	71-80-90-100-112-132-160	—	—	147100	172700	61600	115000
	314 R4	189	2.6	78200	24	44	71-80-90-100-112-132-160	—	—	154600	181500	65100	115000
	314 R4	238	2.1	80700	20	44	71-80-90-100-112-132-160	—	—	165500	194300	70200	115000
	314 R4	276	1.8	81400	17.4	44	71-80-90-100-112-132-160	—	—	173100	203300	73800	115000
	314 R4	354	1.4	82500	13.8	44	71-80-90-100-112-132-160	—	—	186600	219100	80300	115000
	314 R4	421	1.2	83200	11.7	44	71-80-90-100-112-132-160	—	—	196400	230600	85000	115000
	314 R4	445	1.1	77900	10.4	44	71-80-90-100-112-132-160	—	—	199700	234500	86600	115000
	314 R4	528	0.95	79200	8.9	44	71-80-90-100-112-132-160	—	—	206000	243000	90000	115000
	314 R4	614	0.81	66800	6.4	44	71-80-90-100-112-132-160	—	—	206000	243000	90000	115000

315 R



331

105000 Nm



n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	315 R3 (B)	51.1	29.4	48100	150	75	180-200-225-250	—	—	75000	88100	29200	135000
	315 R3 (B)	65.5	22.9	62100	150	75	180-200-225-250	—	—	80900	94900	31700	135000
	315 R3 (B)	77.8	19.3	64400	143	75	180-200-225-250	—	—	85100	100000	33600	135000
	315 R3 (B)	82.3	18.2	65500	137	75	180-200-225-250	—	—	86600	101600	34200	135000
	315 R3 (B)	97.6	15.4	68800	121	75	180-200-225-250	—	—	91100	107000	36200	135000
	315 R3 (B)	113	13.2	60000	91	75	180-200-225-250	—	—	95300	111900	38100	135000
	315 R3 (C)	70.7	21.2	54900	134	90	180-200-225-250	—	—	82700	97100	32500	135000
	315 R3 (C)	90.7	16.5	59200	112	90	180-200-225-250	—	—	89200	104700	35300	135000
	315 R3 (C)	108	13.9	62300	100	90	180-200-225-250	—	—	93900	110200	37400	135000
	315 R3 (C)	114	13.2	64700	98	90	180-200-225-250	—	—	95400	112100	38100	135000
	315 R3 (C)	135	11.1	75700	96	90	180-200-225-250	—	—	100500	118000	40300	135000
	315 R3 (C)	157	9.5	65000	71	90	180-200-225-250	—	—	105100	123400	42400	135000
	315 R4	225	6.7	77700	61	40	132-160-180-200	—	—	117100	137500	47800	135000
	315 R4	269	5.6	82000	54	40	132-160-180-200	—	—	123500	145000	50700	135000
	315 R4	345	4.3	96000	49	40	132-160-180-200	—	—	133100	156200	55100	135000

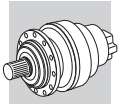


315 R	 331	105000 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 	Rn ₂ [N]					M _{n2 max} Nm	
								MC	MZ	HC/PC	HZ/PZ	FZ		
1500	315 R4	409	3.7	98300	43	40	132-160-180-200	—	—	140100	164500	58400	135000	
	315 R4	525	2.9	99400	34	40	132-160-180-200	—	—	151000	177300	63400	135000	
	315 R4	623	2.4	100200	29	40	132-160-180-200	—	—	158900	186600	67200	135000	
	315 R4	659	2.3	88200	24	40	132-160-180-200	—	—	161600	189800	68400	135000	
	315 R4	782	1.9	90300	20	40	132-160-180-200	—	—	170200	199800	72400	135000	
	315 R4	909	1.6	76900	15.0	40	132-160-180-200	—	—	178000	209000	76200	135000	
1000	315 R3 (B)	51.1	19.6	54400	122	90	180-200-225-250	—	—	84700	99500	33400	135000	
	315 R3 (B)	65.5	15.3	70700	124	90	180-200-225-250	—	—	91300	107200	36300	135000	
	315 R3 (B)	77.8	12.9	72500	107	90	180-200-225-250	—	—	96100	112900	38400	135000	
	315 R3 (B)	82.3	12.2	73700	103	90	180-200-225-250	—	—	97800	114800	39100	135000	
	315 R3 (B)	97.6	10.2	77500	91	90	180-200-225-250	—	—	102900	120800	41400	135000	
	315 R3 (B)	113	8.8	65000	66	90	180-200-225-250	—	—	107700	126400	43600	135000	
	315 R3 (C)	70.7	14.1	62000	101	108	180-200-225-250	—	—	93400	109700	37200	135000	
	315 R3 (C)	90.7	11.0	66800	85	108	180-200-225-250	—	—	100700	118200	40400	135000	
	315 R3 (C)	108	9.3	70400	75	108	180-200-225-250	—	—	106000	124500	42800	135000	
	315 R3 (C)	114	8.8	72100	73	108	180-200-225-250	—	—	107800	126600	43600	135000	
	315 R3 (C)	135	7.4	79600	68	108	180-200-225-250	—	—	113500	133200	46200	135000	
	315 R3 (C)	157	6.4	65000	47	108	180-200-225-250	—	—	118700	139400	48600	135000	
	315 R4	225	4.4	86800	46	48	132-160-180-200	—	—	132300	155300	54800	135000	
	315 R4	269	3.7	90500	40	48	132-160-180-200	—	—	139500	163700	58100	135000	
	315 R4	345	2.9	98900	34	48	132-160-180-200	—	—	150300	176500	63100	135000	
	315 R4	409	2.4	100100	29	48	132-160-180-200	—	—	158200	185800	66800	135000	
	315 R4	525	1.9	101500	23	48	132-160-180-200	—	—	170500	200200	72600	135000	
	315 R4	623	1.6	102400	19.4	48	132-160-180-200	—	—	179500	210800	76900	135000	
	315 R4	659	1.5	93300	16.8	48	132-160-180-200	—	—	182500	214300	78300	135000	
	315 R4	782	1.3	95600	14.5	48	132-160-180-200	—	—	192200	225600	82900	135000	
	315 R4	909	1.1	82200	10.7	48	132-160-180-200	—	—	201000	236000	87200	135000	
	500	315 R3 (B)	51.1	9.8	67000	75	150	180-200-225-250	—	—	104300	122500	42100	135000
		315 R3 (B)	65.5	7.6	86800	76	150	180-200-225-250	—	—	112400	132000	45700	135000
		315 R3 (B)	77.8	6.4	89600	66	150	180-200-225-250	—	—	118400	139000	48400	135000
315 R3 (B)		82.3	6.1	80700	56	150	180-200-225-250	—	—	120400	141300	49300	135000	
315 R3 (B)		97.6	5.1	81700	48	150	180-200-225-250	—	—	126700	148800	52200	135000	
315 R3 (B)		113	4.4	66200	33	150	180-200-225-250	—	—	132600	155600	54900	135000	
315 R3 (C)		70.7	7.1	76400	62	180	180-200-225-250	—	—	115000	135100	46900	135000	
315 R3 (C)		90.7	5.5	82300	52	180	180-200-225-250	—	—	124000	145500	51000	135000	
315 R3 (C)		108	4.6	86200	46	180	180-200-225-250	—	—	130500	153200	53900	135000	
315 R3 (C)		114	4.4	82800	42	180	180-200-225-250	—	—	132700	155800	55000	135000	
315 R3 (C)		135	3.7	84000	36	180	180-200-225-250	—	—	139700	164000	58200	135000	
315 R3 (C)		157	3.2	69300	25	180	180-200-225-250	—	—	146200	171600	61200	135000	
315 R4		225	2.2	98500	26	80	132-160-180-200	—	—	162800	191200	69000	135000	
315 R4		269	1.9	100900	22	80	132-160-180-200	—	—	171700	201600	73200	135000	
315 R4		345	1.4	102900	17.7	80	132-160-180-200	—	—	185000	217200	79500	135000	
315 R4		409	1.2	103900	15.0	80	132-160-180-200	—	—	194800	228700	84200	135000	
315 R4		525	0.95	105000	11.8	80	132-160-180-200	—	—	206000	243000	90000	135000	
315 R4		623	0.80	105000	10.0	80	132-160-180-200	—	—	206000	243000	90000	135000	
315 R4		659	0.76	99000	8.9	80	132-160-180-200	—	—	206000	243000	90000	135000	
315 R4		782	0.64	99000	7.5	80	132-160-180-200	—	—	206000	243000	90000	135000	
315 R4		909	0.55	83500	5.4	80	132-160-180-200	—	—	206000	243000	90000	135000	

316 R	 341	138820 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	316 R3 (B)	51.1	29.4	50000	150	75	180-200-225-250	—	—	124800	138800	48600	192000
	316 R3 (B)	65.5	22.9	63800	150	75	180-200-225-250	—	—	134500	149500	52800	192000
	316 R3 (B)	77.8	19.3	65800	146	75	180-200-225-250	—	—	141600	157400	55900	192000
	316 R3 (C)	70.7	21.2	59300	144	90	180-200-225-250	—	—	137600	153000	54200	192000
	316 R3 (C)	90.7	16.5	69800	132	90	180-200-225-250	—	—	148200	164900	58900	192000
	316 R3 (C)	108	13.9	72500	116	90	180-200-225-250	—	—	156100	173600	62300	192000

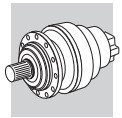


316 R	341	138820 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm	
								MC	MZ	HC/PC	HZ/PZ	FZ		
1500	316 R4	225	6.7	94500	74	45	132-160-180-200	—	—	194700	216600	79700	192000	
	316 R4	269	5.6	99700	66	45	132-160-180-200	—	—	205300	228300	84600	192000	
	316 R4	289	5.2	105700	65	45	132-160-180-200	—	—	209900	233400	86600	192000	
	316 R4	345	4.3	107300	55	45	132-160-180-200	—	—	221300	246100	91900	192000	
	316 R4	409	3.7	112700	49	45	132-160-180-200	—	—	232900	259100	97300	192000	
	316 R4	443	3.4	117300	47	45	132-160-180-200	—	—	238500	265200	99900	192000	
	316 R4	525	2.9	118900	40	45	132-160-180-200	—	—	251000	279200	105700	192000	
	316 R4	623	2.4	115400	33	45	132-160-180-200	—	—	264300	293900	111900	192000	
1000	316 R3 (B)	51.1	19.6	56900	128	90	180-200-225-250	—	—	140900	156700	55700	192000	
	316 R3 (B)	65.5	15.3	72400	127	90	180-200-225-250	—	—	151900	168900	60500	192000	
	316 R3 (B)	77.8	12.9	74300	110	90	180-200-225-250	—	—	159900	177800	64000	192000	
	316 R3 (C)	70.7	14.1	66900	109	108	180-200-225-250	—	—	155300	172800	62000	192000	
	316 R3 (C)	90.7	11.0	78800	100	108	180-200-225-250	—	—	167400	186200	67400	192000	
	316 R3 (C)	108	9.3	81900	87	108	180-200-225-250	—	—	176200	196000	71400	192000	
	316 R4	225	4.4	106600	56	54	132-160-180-200	—	—	219900	244600	91300	192000	
	316 R4	269	3.7	112200	49	54	132-160-180-200	—	—	231900	257900	96800	192000	
	316 R4	289	3.5	116700	48	54	132-160-180-200	—	—	237000	263600	99200	192000	
	316 R4	345	2.9	120700	41	54	132-160-180-200	—	—	249900	277900	105200	192000	
	316 R4	409	2.4	126200	36	54	132-160-180-200	—	—	263100	292600	111400	192000	
	316 R4	443	2.3	127400	34	54	132-160-180-200	—	—	269300	299500	114300	192000	
	316 R4	525	1.9	127500	29	54	132-160-180-200	—	—	283500	315300	121000	192000	
	316 R4	623	1.6	119300	23	54	132-160-180-200	—	—	298500	331900	128100	192000	
	500	316 R3 (B)	51.1	9.8	70800	79	150	180-200-225-250	—	—	173500	192900	70100	192000
		316 R3 (B)	65.5	7.6	90400	79	150	180-200-225-250	—	—	187000	207900	76200	192000
316 R3 (B)		77.8	6.4	91500	67	150	180-200-225-250	—	—	196800	218900	80700	192000	
316 R3 (C)		70.7	7.1	82400	67	180	180-200-225-250	—	—	191300	212700	78100	192000	
316 R3 (C)		90.7	5.5	97000	61	180	180-200-225-250	—	—	206100	229200	84900	192000	
316 R3 (C)		108	4.6	99600	53	180	180-200-225-250	—	—	217000	241300	89900	192000	
316 R4		225	2.2	127600	34	90	132-160-180-200	—	—	270700	301100	115000	192000	
316 R4		269	1.9	130000	29	90	132-160-180-200	—	—	285500	317500	122000	192000	
316 R4		289	1.7	131000	27	90	132-160-180-200	—	—	291800	324500	124900	192000	
316 R4		345	1.4	133500	23	90	132-160-180-200	—	—	307700	342200	132500	192000	
316 R4		409	1.2	135900	19.6	90	132-160-180-200	—	—	323900	360200	140300	192000	
316 R4		443	1.1	137000	18.3	90	132-160-180-200	—	—	331600	368700	144000	192000	
316 R4		525	0.95	138800	15.6	90	132-160-180-200	—	—	345000	385000	150000	192000	
316 R4		623	0.80	124000	11.8	90	132-160-180-200	—	—	345000	385000	150000	192000	

317 R	349	187860 Nm
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n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	317 R3 (B)	49.8	30	46900	150	90	180-200-225-250	—	—	159200	169500	48200	393000
	317 R3 (B)	64.9	23.1	61200	150	90	180-200-225-250	—	—	172400	183500	52700	393000
	317 R3 (B)	78.1	19.2	75100	150	90	180-200-225-250	—	—	182200	194000	56000	393000
	317 R3 (B)	83.3	18.0	80200	150	90	180-200-225-250	—	—	185800	197800	57200	393000
	317 R3 (B)	100	15.0	96200	150	90	180-200-225-250	—	—	196400	209100	60900	393000
	317 R3 (B)	119	12.6	111000	150	90	180-200-225-250	—	—	206700	220100	64400	393000
	317 R3 (C)	68.9	21.8	57800	144	100	180-200-225-250	—	—	175500	186900	53700	393000
	317 R3 (C)	89.8	16.7	75300	144	100	180-200-225-250	—	—	190000	202300	58700	393000
	317 R3 (C)	108	13.9	90600	144	100	180-200-225-250	—	—	200900	213900	62400	393000
	317 R3 (C)	115	13.0	96600	144	100	180-200-225-250	—	—	204800	218100	63800	393000
	317 R3 (C)	139	10.8	116300	144	100	180-200-225-250	—	—	216500	230500	67800	393000
	317 R3 (C)	165	9.1	118900	124	100	180-200-225-250	—	—	227900	242700	71800	393000
	317 R4	220	6.8	81400	66	50	132-160-180-200	—	—	248500	264500	79000	393000
	317 R4	262	5.7	97200	66	50	132-160-180-200	—	—	262000	278900	83800	393000
	317 R4	336	4.5	124700	66	50	132-160-180-200	—	—	282300	300600	91100	393000
	317 R4	399	3.8	148000	66	50	132-160-180-200	—	—	297200	316500	96500	393000
317 R4	438	3.4	157000	64	50	132-160-180-200	—	—	305700	325500	99500	393000	



318 R

357

280580 Nm

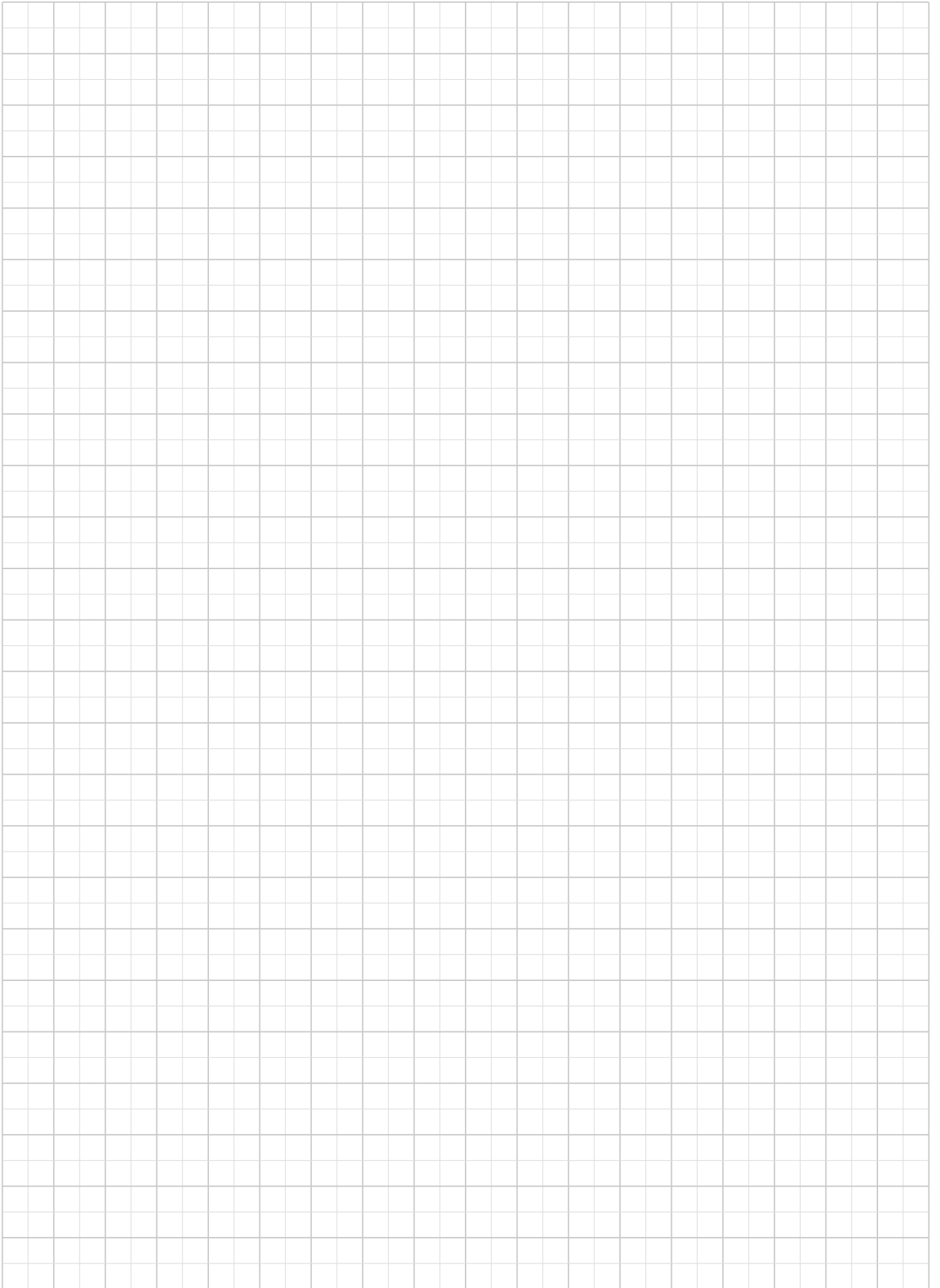
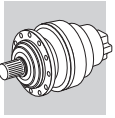
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm
								MC	MZ	HC/PC	HZ/PZ	FZ	
1500	318 R4 (B)	499	3.0	250300	89	90	180-200-225-250	—	—	398900	407000	138600	550000
	318 R4 (C)	311	4.8	220500	126	110	180-200-225-250	—	—	346100	353200	118400	550000
	318 R4 (C)	399	3.8	235700	105	110	180-200-225-250	—	—	373000	380600	128700	550000
	318 R4 (C)	474	3.2	246800	92	110	180-200-225-250	—	—	392600	400700	136200	550000
	318 R4 (C)	501	3.0	250600	89	110	180-200-225-250	—	—	399300	407500	138800	550000
	318 R4 (C)	595	2.5	262400	78	110	180-200-225-250	—	—	420300	428900	146900	550000
	318 R4 (C)	691	2.2	265600	68	110	180-200-225-250	—	—	439700	448800	154500	550000
1000	318 R4 (B)	225	4.5	225300	119	108	180-200-225-250	—	—	354500	361800	121600	550000
	318 R4 (B)	288	3.5	240900	99	108	180-200-225-250	—	—	382100	389900	132100	550000
	318 R4 (B)	342	2.9	252200	87	108	180-200-225-250	—	—	402200	410500	139900	550000
	318 R4 (B)	362	2.8	256000	84	108	180-200-225-250	—	—	409000	417400	142500	550000
	318 R4 (B)	430	2.3	264300	73	108	180-200-225-250	—	—	430600	439400	150900	550000
	318 R4 (B)	499	2.0	267100	63	108	180-200-225-250	—	—	450400	459700	158700	550000
	318 R4 (C)	311	3.2	245800	93	132	180-200-225-250	—	—	390800	398900	135500	550000
	318 R4 (C)	399	2.5	262900	78	132	180-200-225-250	—	—	421200	429900	147300	550000
	318 R4 (C)	474	2.1	266200	66	132	180-200-225-250	—	—	443400	452500	155900	550000
	318 R4 (C)	501	2.0	267200	63	132	180-200-225-250	—	—	450900	460200	158800	550000
	318 R4 (C)	595	1.7	270500	54	132	180-200-225-250	—	—	474700	484400	168200	550000
	318 R4 (C)	691	1.4	273400	47	132	180-200-225-250	—	—	496600	506800	176800	550000
	500	318 R4 (B)	225	2.2	265200	70	180	180-200-225-250	—	—	436500	445400	153200
318 R4 (B)		288	1.7	269900	55	180	180-200-225-250	—	—	470400	480000	166500	550000
318 R4 (B)		342	1.5	273200	47	180	180-200-225-250	—	—	495200	505300	176300	550000
318 R4 (B)		362	1.4	274200	45	180	180-200-225-250	—	—	503000	513900	179600	550000
318 R4 (B)		430	1.2	277600	38	180	180-200-225-250	—	—	503000	541000	190100	550000
318 R4 (B)		499	1.0	280600	33	180	180-200-225-250	—	—	503000	565000	199900	550000
318 R4 (C)		311	1.6	271300	52	220	180-200-225-250	—	—	481200	491100	170700	550000
318 R4 (C)		399	1.3	276200	41	220	180-200-225-250	—	—	503000	529200	185500	550000
318 R4 (C)		474	1.1	279500	35	220	180-200-225-250	—	—	503000	557100	196400	550000
318 R4 (C)		501	1.00	280600	33	220	180-200-225-250	—	—	503000	565000	200000	550000
318 R4 (C)		595	0.84	280600	28	220	180-200-225-250	—	—	503000	565000	200000	550000
318 R4 (C)		691	0.72	280600	24	220	180-200-225-250	—	—	503000	565000	200000	550000

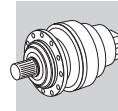
319 R

365

403720 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)	Rn ₂ [N]					M _{n2 max} Nm	
								MC	MZ	HC/PC	HZ/PZ	FZ		
1500	319 R4 (B)	249	6.0	227700	150	95	180-200-225-250	—	—	372100	409900	109900	680000	
	319 R4 (B)	320	4.7	289000	150	95	180-200-225-250	—	—	401000	441800	119400	680000	
	319 R4 (B)	379	4.0	304200	142	95	180-200-225-250	—	—	422100	465100	126500	680000	
	319 R4 (B)	401	3.7	310500	137	95	180-200-225-250	—	—	429200	472900	128800	680000	
	319 R4 (B)	475	3.2	300900	112	95	180-200-225-250	—	—	451500	497400	136300	680000	
	319 R4 (B)	563	2.7	313000	99	95	180-200-225-250	—	—	475300	523700	144300	680000	
	319 R4 (B)	655	2.3	321300	87	95	180-200-225-250	—	—	497300	547900	151700	680000	
	319 R4 (C)	345	4.4	259700	134	115	180-200-225-250	—	—	410200	451900	122500	680000	
	319 R4 (C)	442	3.4	279900	112	115	180-200-225-250	—	—	442100	487100	133100	680000	
	319 R4 (C)	525	2.9	294600	100	115	180-200-225-250	—	—	465400	512700	140900	680000	
	319 R4 (C)	555	2.7	306300	98	115	180-200-225-250	—	—	473200	521400	143600	680000	
	319 R4 (C)	657	2.3	322200	87	115	180-200-225-250	—	—	497800	548400	151900	680000	
	319 R4 (C)	780	1.9	331100	75	115	180-200-225-250	—	—	524000	577300	160800	680000	
	319 R4 (C)	906	1.7	335900	66	115	180-200-225-250	—	—	548200	604000	169100	680000	
	1000	319 R4 (B)	249	4.0	257100	122	114	180-200-225-250	—	—	420200	462900	125800	680000
		319 R4 (B)	320	3.1	323900	120	114	180-200-225-250	—	—	452800	498900	136700	680000
		319 R4 (B)	379	2.6	342600	107	114	180-200-225-250	—	—	476700	525200	144800	680000
319 R4 (B)		401	2.5	348100	103	114	180-200-225-250	—	—	484800	534100	147500	680000	
319 R4 (B)		475	2.1	326400	81	114	180-200-225-250	—	—	509900	561800	156000	680000	
319 R4 (B)		563	1.8	335400	70	114	180-200-225-250	—	—	536800	591400	165200	680000	
319 R4 (B)		655	1.5	339600	61	114	180-200-225-250	—	—	561600	618700	173700	680000	
319 R4 (C)		345	2.9	293300	101	138	180-200-225-250	—	—	463300	510400	140200	680000	
319 R4 (C)		442	2.3	316100	85	138	180-200-225-250	—	—	499300	550100	152400	680000	
319 R4 (C)		525	1.9	332800	75	138	180-200-225-250	—	—	525600	579100	161300	680000	





25.0 - DATI TECNICI MOTORI-DUTTORI 3/V - 3/A

25.0 - 3/V - 3/A GEARMOTOR RATING CHARTS

25.0 - 3/V - 3/A TECHNISCHE DATEN DER GETRIEBEMOTOREN

25.0 - DONNEES TECHNIQUES MOTOREDUCTEURS 3/V - 3/A

Guida alla consultazione delle tabelle.

Reading the rating chart.

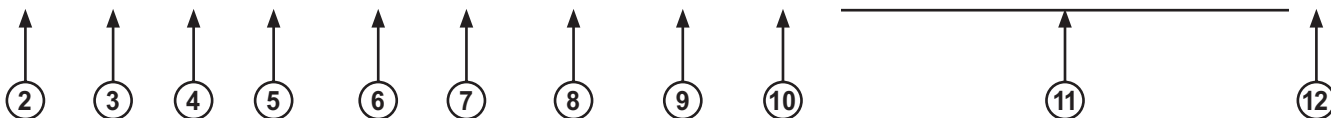
Anleitung für die richtige Konsultation der Tabellen.

Guide pour la consultation des tableaux

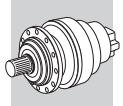


P₁ = 0.12 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
0.64	1720	1.5	2337	-	3/V 01 L3	-	BN 63A 4	-	12000	12500	31000	34000	8000	224
0.80	860	0.9	1869	-	3/V 00 L3	-	BN 63A 4	-	12000	12500	31000	34000	8000	216
0.80	1720	1.8	1869	-	3/V 01 L3	-	BN 63A 4	-	12000	12500	31000	34000	8000	224
1.0	860	1.1	1495	-	3/V 00 L3	-	BN 63A 4	-	12000	12200	30700	34000	7990	216
1.0	1720	2.1	1495	-	3/V 01 L3	-	BN 63A 4	-	12000	12200	30700	34000	7990	224



1	Potenza trasmessa in entrata riduttore	Power applied at gearbox input shaft	Am Getriebeantrieb übertragene Leistung	Puissance transmise à l'entrée du réducteur
2	Velocità angolare all'albero lento	Gearbox output speed	Drehzahl am Getriebeabtrieb	Vitesse angulaire en sortie réducteur
3	Coppia trasmessa all'albero lento	Torque delivered at gearbox output shaft	Übertragenes Drehmoment am Getriebeabtrieb	Couple transmise en sortie réducteur
4	Fattore di sicurezza	Safety factor	Sicherheitsfaktor	Facteur de sécurité
5	Rapporto di riduzione	Gear ratio	Übersetzung	Rapport de réduction
6	Potenza termica riduttore	Gearbox thermal capacity	Wärmeleistung des Getriebes	Puissance thermique réducteur
7	Grandezza riduttore combinato serie 300 + riduttore a vite senza fine	Model and frame size of combined planetary + worm gear unit	Baugröße des kombinierten Getriebemotors der Serie 300 + Schneckengetriebe	Taille réducteur combiné série 300 + réducteur à vis sans fin série
8	Grandezza riduttore combinato serie 300 + riduttore ad assi ortogonali serie A	Model and frame size of combined planetary + helical bevel gear unit, A type	Baugröße des kombinierten Getriebemotors der Serie 300 + Kegelaradgetriebe der Serie A	Taille réducteur combiné série 300 + réducteur à axes orthogonaux série A
9	Grandezza motore IEC e polarità	IEC motor size and pole number	Baugröße des Kompaktmotors und Anzahl der Pole	Taille moteur IEC et n° pôles
10	Grandezza motore compatto e polarità	Compact motor size and pole number	Baugröße des Kompaktmotors und Anzahl der Pole	Taille moteur compact et n° pôles
11	Carico radiale applicabile sull'albero lento, calcolato per: - fattore di sicurezza S=1 - durata teorica di 10000 h Per forze non agenti in mezzeria riferirsi ai diagrammi riportati a seguito delle pagine dimensionali del riduttore in oggetto	Permitted overhung loading on output shaft, based on: - safety factor S=1 - 10000 h theoretical lifetime For forces applying off the mid-point, see diagrams provided in the pages following dimensions of the specific gearbox	Auf die Mitte der Abtriebswelle für eine Dauer von 10000 Std. applizierbare Nenn-Radialkräfte und Sicherheitsfaktor S=1 Für andere Kraftangriffspunkte verweisen wir auf die Diagramme, die den Seiten mit den Maßen der gewählten Größe folgen	Charges radiales applicables en milieu d'arbre de sortie pendant : - facteur de sécurité S=1 - durée de 10000 heures Pour d'autres positions de charge, voir diagrammes figurant à la suite des pages dimensions de la taille sélectionnée
12	Pagina delle dimensioni. Le dimensioni dei motoriduttori si riferiscono ad abbinamenti con motori di produzione BONFIGLIOLI	Page installation drawing can be found at. Gearmotor dimensions refer to matches with BONFIGLIOLI motors only	Maßseiten. Die Maß der Getriebemotoren sind nur im Fall einer Montage mit Motoren der BONFIGLIOLI gültig	Page avec les dimensions. Les dimensions des motoréducteurs sont valables seulement avec moteurs BONFIGLIOLI

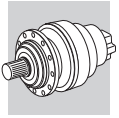


P₁ = 0.18 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
3.6	1000	2.8	415	-	3/V 00 L3	-	BN 63B 4	-	7930	7930	20900	24000	5210	216
3.8	830	1.8	393	-	-	3/A 01 L2	BN 63B 4	-	7790	7790	20500	23600	5120	225
3.8	540	1.2	391	-	-	3/A 00 L2	BN 63B 4	-	7770	7770	20500	23500	5110	217
4.1	560	1.3	369	-	-	3/A 00 L2	BN 63B 4	-	7630	7630	20100	23100	5010	217
4.7	440	1.2	319	-	-	3/A 00 L2	BN 63B 4	-	7260	7260	19300	22100	4770	217
5.1	650	1.9	296	-	-	3/A 00 L2	BN 63B 4	-	7080	7080	18900	21700	4660	217
5.9	550	1.8	253	-	-	3/A 00 L2	BN 63B 4	-	6720	6720	18000	20700	4420	217
6.9	620	2.4	219	-	-	3/A 00 L2	BN 63B 4	-	6400	6400	17200	19800	4210	217
7.4	650	2.7	203	-	-	3/A 00 L2	BN 63B 4	-	6240	6240	16800	19300	4100	217
8.8	550	2.7	171	-	-	3/A 00 L2	BN 63B 4	-	5900	5900	16000	18400	3880	217

P₁ = 0.25 kW

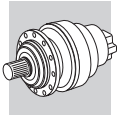
n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
1.0	1720	1.0	1495	-	3/V 01 L3	-	BN 63C 4	-	12000	12200	30700	34000	7990	224
1.1	1880	1.3	1381	-	3/V 01 L3	-	BN 63C 4	-	11800	11800	29900	34000	7780	224
1.3	1650	1.2	1198	-	3/V 01 L3	-	BN 63C 4	-	11300	11300	28700	33000	7420	224
1.4	1190	1.0	1107	-	3/V 00 L3	-	BN 63C 4	-	11000	11000	28000	32200	7230	216
1.4	1990	1.6	1105	-	3/V 01 L3	-	BN 63C 4	-	11000	11000	28000	32200	7230	224
1.5	1600	1.3	997	-	3/V 01 L3	-	BN 63C 4	-	10600	10600	27100	31200	6980	224
1.7	1230	1.3	903	-	3/V 01 L3	-	BN 63C 4	-	10300	10300	26400	30300	6760	224
1.8	1110	1.3	818	-	3/V 00 L3	-	BN 63C 4	-	9940	9940	25600	29400	6540	216
1.9	1540	1.5	799	-	3/V 01 L3	-	BN 63C 4	-	9860	9860	25400	29200	6480	224
2.1	1800	1.5	731	-	-	3/A 03 L2	BN 63C 4	-	29400	34000	50500	60700	18900	233
2.2	1100	1.3	689	-	3/V 00 L3	-	BN 63C 4	-	9390	9390	24300	27900	6170	216
2.2	1710	2.1	689	-	3/V 01 L3	-	BN 63C 4	-	9390	9390	24300	27900	6170	224
2.3	1150	1.1	665	-	-	3/A 01 L2	BN 63C 4	-	9280	9280	24000	27600	6100	225
2.3	1090	1.5	654	-	3/V 00 L3	-	BN 63C 4	-	9230	9230	23900	27500	6070	216
2.3	1180	1.6	654	-	3/V 01 L3	-	BN 63C 4	-	9230	9230	23900	27500	6070	224
2.5	1800	1.8	605	-	-	3/A 03 L2	BN 63C 4	-	27600	31900	47700	57400	17700	233
2.6	1740	1.9	574	-	-	3/A 03 L2	BN 63C 4	-	27200	31400	46900	56500	17400	233
2.7	720	1.1	562	-	3/V 00 L3	-	BN 63C 4	-	8770	8770	22900	26300	5770	216
2.7	1400	2.1	562	-	3/V 01 L3	-	BN 63C 4	-	8770	8770	22900	26300	5770	224
2.8	1120	1.3	533	-	-	3/A 01 L2	BN 63C 4	-	8620	8620	22500	25800	5660	225
2.9	2520	3.0	520	-	-	3/A 04 L2	BN 63C 4	-	26300	30300	45600	54800	16900	243
2.9	1040	1.7	509	-	3/V 00 L3	-	BN 63C 4	-	8490	8490	22200	25500	5580	216
2.9	1270	2.1	509	-	3/V 01 L3	-	BN 63C 4	-	8490	8490	22200	25500	5580	224
3.0	1720	2.1	495	-	-	3/A 03 L2	BN 63C 4	-	25900	29800	44900	54000	16600	233
3.3	1150	1.6	454	-	-	3/A 01 L2	BN 63C 4	-	8170	8170	21400	24600	5370	225
3.4	1370	2.4	443	-	3/V 01 L3	-	BN 63C 4	-	8100	8100	21300	24400	5330	224
3.4	690	1.0	441	-	-	3/A 00 L2	BN 63C 4	-	8090	8090	21200	24400	5320	217
3.4	730	1.5	436	-	3/V 00 L3	-	BN 63C 4	-	8060	8060	21200	24300	5300	216
3.6	1000	2.0	415	-	3/V 00 L3	-	BN 63C 4	-	7930	7930	20900	24000	5210	216
3.7	1940	2.9	409	-	-	3/A 03 L2	BN 63C 4	-	24300	28000	42400	51000	15600	233
3.8	830	1.3	393	-	-	3/A 01 L2	BN 63C 4	-	7790	7790	20500	23600	5120	225
4.1	560	0.9	369	-	-	3/A 00 L2	BN 63C 4	-	7630	7630	20100	23100	5010	217
4.1	1340	2.3	364	-	-	3/A 01 L2	BN 63C 4	-	7590	7590	20100	23000	4990	225
4.8	1150	2.3	311	-	-	3/A 01 L2	BN 63C 4	-	7200	7200	19100	22000	4740	225
5.1	650	1.4	296	-	-	3/A 00 L2	BN 63C 4	-	7080	7080	18900	21700	4660	217
5.6	1010	2.3	269	-	-	3/A 01 L2	BN 63C 4	-	6860	6860	18300	21000	4510	225
5.9	1150	2.8	255	-	-	3/A 01 L2	BN 63C 4	-	6740	6740	18000	20700	4430	225
5.9	550	1.3	253	-	-	3/A 00 L2	BN 63C 4	-	6720	6720	18000	20700	4420	217
6.8	830	2.3	220	-	-	3/A 01 L2	BN 63C 4	-	6410	6410	17200	19800	4220	225
6.9	620	1.7	219	-	-	3/A 00 L2	BN 63C 4	-	6400	6400	17200	19800	4210	217
7.4	650	2.0	203	-	-	3/A 00 L2	BN 63C 4	-	6240	6240	16800	19300	4100	217
8.8	550	2.0	171	-	-	3/A 00 L2	BN 63C 4	-	5900	5900	16000	18400	3880	217
11.2	550	2.5	134	-	-	3/A 00 L2	BN 63C 4	-	5440	5440	14900	17100	3580	217

**P₁ = 0.55 kW**

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
2.7	1400	1.0	562	-	3/V 01 L3	-	BN 80A 4	-	8770	8770	22900	26300	5770	224
2.8	2730	1.9	544	-	3/V 03 L3	-	BN 80A 4	M 1LA 4	26700	30800	46200	55600	17100	232
2.8	3920	2.5	529	-	3/V 05 L3	-	BN 80A 4	M 1LA 4	26400	30500	45800	55100	17000	252
2.9	2520	1.4	520	-	-	3/A 04 L2	BN 80A 4	M 1LA 4	26300	30300	45600	54800	16900	243
2.9	1270	1.0	509	-	3/V 01 L3	-	BN 80A 4	-	8490	8490	22200	25500	5580	224
3.0	2020	1.4	502	-	3/V 03 L3	-	BN 80A 4	M 1LA 4	26000	30000	45100	54300	16700	232
3.0	3010	2.3	501	-	3/V 04 L3	-	BN 80A 4	M 1LA 4	26000	30000	45100	54200	16700	242
3.0	1720	1.0	495	-	-	3/A 03 L2	BN 80A 4	M 1LA 4	25900	29800	44900	54000	16600	233
3.1	3880	2.3	491	-	-	3/A 05 L2	BN 80A 4	M 1LA 4	25800	29800	44800	53900	16500	253
3.2	2500	1.5	469	-	-	3/A 04 L2	BN 80A 4	M 1LA 4	25400	29300	44200	53100	16300	243
3.3	2310	1.9	460	-	3/V 03 L3	-	BN 80A 4	M 1LA 4	25200	29100	43900	52900	16200	232
3.3	3730	2.9	453	-	3/V 04 L3	-	BN 80A 4	M 1LA 4	25100	29000	43700	52600	16100	242
3.4	1370	1.1	443	-	3/V 01 L3	-	BN 80A 4	-	8100	8100	21300	24400	5330	224
3.5	1880	1.5	430	-	3/V 01 L3	-	BN 80A 4	-	8020	8020	21100	24200	5270	224
3.6	1000	0.9	415	-	3/V 00 L3	-	BN 80A 4	-	7930	7930	20900	24000	5210	216
3.7	1940	1.4	409	-	-	3/A 03 L2	BN 80A 4	M 1LA 4	24300	28000	42400	51000	15600	233
3.8	3180	2.3	398	-	-	3/A 05 L2	BN 80A 4	M 1LA 4	24000	27800	42100	50600	15400	253
3.8	2210	1.9	395	-	3/V 03 L3	-	BN 80A 4	M 1LA 4	24000	27700	42000	50500	15400	232
3.9	2450	1.8	386	-	-	3/A 04 L2	BN 80A 4	M 1LA 4	23800	27500	41700	50200	15300	243
4.1	1340	1.1	364	-	-	3/A 01 L2	BN 80A 4	M 1LA 4	7590	7590	20100	23000	4990	225
4.3	2020	1.7	352	-	-	3/A 03 L2	BN 80A 4	M 1LA 4	23100	26600	40500	48800	14800	233
4.3	2430	2.0	349	-	-	3/A 04 L2	BN 80A 4	M 1LA 4	23000	26600	40400	48600	14800	243
4.6	1660	1.5	326	-	-	3/A 03 L2	BN 80A 4	M 1LA 4	22500	26000	39600	47600	14400	233
4.7	2400	2.2	317	-	-	3/A 04 L2	BN 80A 4	M 1LA 4	22300	25700	39300	47300	14300	243
4.8	1150	1.1	311	-	-	3/A 01 L2	BN 80A 4	M 1LA 4	7200	7200	19100	22000	4740	225
5.3	2850	2.9	283	-	-	3/A 04 L2	BN 80A 4	M 1LA 4	21500	24800	38000	45700	13800	243
5.6	1840	2.0	269	-	-	3/A 03 L2	BN 80A 4	M 1LA 4	21100	24400	37400	45000	13500	233
5.6	1840	2.0	269	-	-	3/A 03 L2	BN 80A 4	M 1LA 4	21100	24400	37400	45000	13500	233
5.6	1010	1.1	269	-	-	3/A 01 L2	BN 80A 4	M 1LA 4	6860	6860	18300	21000	4510	225
5.9	1150	1.3	255	-	-	3/A 01 L2	BN 80A 4	M 1LA 4	6740	6740	18000	20700	4430	225
6.8	1650	2.2	220	-	-	3/A 03 L2	BN 80A 4	M 1LA 4	19700	22800	35200	42300	12700	233
6.8	830	1.1	220	-	-	3/A 01 L2	BN 80A 4	M 1LA 4	6410	6410	17200	19800	4220	225
7.3	1300	1.8	204	-	-	3/A 01 L2	BN 80A 4	M 1LA 4	6260	6260	16900	19400	4120	225
7.4	650	0.9	203	-	-	3/A 00 L2	BN 80A 4	M 1LA 4	6240	6240	16800	19300	4100	217
8.1	1030	1.6	184	-	-	3/A 01 L2	BN 80A 4	M 1LA 4	6050	6050	16400	18800	3980	225
8.3	1830	2.9	182	-	-	3/A 03 L2	BN 80A 4	M 1LA 4	18500	21400	33200	40000	11900	233
8.8	550	0.9	171	-	-	3/A 00 L2	BN 80A 4	M 1LA 4	5900	5900	16000	18400	3880	217
9.0	1150	2.0	166	-	-	3/A 01 L2	BN 80A 4	M 1LA 4	5850	5850	15900	18200	3840	225
11.2	550	1.2	134	-	-	3/A 00 L2	BN 80A 4	M 1LA 4	5440	5440	14900	17100	3580	217
11.3	1300	2.8	133	-	-	3/A 01 L2	BN 80A 4	M 1LA 4	5430	5430	14800	17100	3570	225
14.0	650	1.7	107	-	-	3/A 00 L2	BN 80A 4	M 1LA 4	5050	5050	13900	16000	3320	217
15.0	550	1.6	100	-	-	3/A 00 L2	BN 80A 4	M 1LA 4	4940	4940	13600	15600	3240	217
16.9	550	1.8	88.6	-	-	3/A 00 L2	BN 80A 4	M 1LA 4	4740	4740	13100	15100	3120	217
18.7	650	2.3	80.2	-	-	3/A 00 L2	BN 80A 4	M 1LA 4	4580	4580	12700	14600	3010	217
21.1	650	2.6	71.0	-	-	3/A 00 L2	BN 80A 4	M 1LA 4	4400	4400	12300	14100	2890	217

P₁ = 0.75 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
0.30	34100	2.0	5081	-	3/V 10 L4	-	BN 80B 4	-	-	-	133000	166000	65000	292
0.30	34100	2.0	5081	-	3/V 10 L4	-	BN 80B 4	-	-	-	133000	166000	65000	292
0.30	48300	2.7	5021	-	3/V 11 L4	-	BN 80B 4	-	-	-	157000	195000	65000	302
0.32	30600	1.9	4637	-	3/V 10 L4	-	BN 80B 4	-	-	-	133000	166000	65000	292
0.32	30600	1.9	4637	-	3/V 10 L4	-	BN 80B 4	-	-	-	133000	166000	65000	292
0.34	45200	2.9	4410	-	3/V 11 L4	-	BN 80B 4	-	-	-	157000	195000	65000	302
0.37	30600	1.9	4036	-	3/V 10 L4	-	BN 80B 4	-	-	-	133000	166000	65000	292
0.37	30600	1.9	4036	-	3/V 10 L4	-	BN 80B 4	-	-	-	133000	166000	65000	292
0.42	30600	2.4	3570	-	3/V 10 L4	-	BN 80B 4	-	-	-	133000	166000	65000	292
0.42	30600	2.4	3570	-	3/V 10 L4	-	BN 80B 4	-	-	-	133000	166000	65000	292
0.46	34100	2.7	3273	-	3/V 10 L4	-	BN 80B 4	-	-	-	133000	166000	65000	292
0.46	34100	2.7	3273	-	3/V 10 L4	-	BN 80B 4	-	-	-	133000	166000	65000	292
0.53	30600	2.8	2835	-	3/V 10 L4	-	BN 80B 4	-	-	-	133000	166000	65000	292
0.53	30600	2.8	2835	-	3/V 10 L4	-	BN 80B 4	-	-	-	133000	166000	65000	292

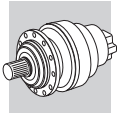


P₁ = 0.75 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
9.0	1150	1.5	166	-	-	3/A 01 L2	BN 80B 4	M 2SA 4	5850	5850	15900	18200	3840	225
11.3	1300	2.1	133	-	-	3/A 01 L2	BN 80B 4	M 2SA 4	5430	5430	14800	17100	3570	225
14.0	650	1.3	107	-	-	3/A 00 L2	BN 80B 4	M 2SA 4	5050	5050	13900	16000	3320	217
14.8	1150	2.4	102	-	-	3/A 01 L2	BN 80B 4	M 2SA 4	4960	4960	13700	15700	3260	225
15.0	550	1.2	100	-	-	3/A 00 L2	BN 80B 4	M 2SA 4	4940	4940	13600	15600	3240	217
16.9	550	1.3	88.6	-	-	3/A 00 L2	BN 80B 4	M 2SA 4	4740	4740	13100	15100	3120	217
18.7	650	1.7	80.2	-	-	3/A 00 L2	BN 80B 4	M 2SA 4	4580	4580	12700	14600	3010	217
21.1	650	2.0	71.0	-	-	3/A 00 L2	BN 80B 4	M 2SA 4	4400	4400	12300	14100	2890	217
24.5	650	2.3	61.2	-	-	3/A 00 L2	BN 80B 4	M 2SA 4	4190	4190	11700	13500	2750	217
28.9	550	2.3	51.8	-	-	3/A 00 L2	BN 80B 4	M 2SA 4	3960	3960	11200	12800	2610	217
38	550	3.0	39.6	-	-	3/A 00 L2	BN 80B 4	M 2SA 4	3620	3620	10300	11800	2380	217

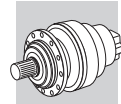
P₁ = 1.1 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
0.30	34100	1.3	5081	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.30	34100	1.3	5081	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.30	53000	2.1	5046	-	3/V 13 L4	-	BN 90S 4	-	-	-	192000	231000	80000	312
0.30	48300	1.8	5021	-	3/V 11 L4	-	BN 90S 4	-	-	-	157000	195000	65000	302
0.32	30600	1.3	4637	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.32	30600	1.3	4637	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.33	58000	2.4	4536	-	3/V 13 L4	-	BN 90S 4	-	-	-	192000	231000	80000	312
0.34	45200	1.9	4410	-	3/V 11 L4	-	BN 90S 4	-	-	-	157000	195000	65000	302
0.37	48300	2.3	4106	-	3/V 11 L4	-	BN 90S 4	-	-	-	157000	195000	65000	302
0.37	55400	2.6	4046	-	3/V 13 L4	-	BN 90S 4	-	-	-	192000	231000	80000	312
0.37	30600	1.3	4036	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.37	30600	1.3	4036	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.42	30600	1.6	3570	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.42	30600	1.6	3570	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.42	42300	2.3	3557	-	3/V 11 L4	-	BN 90S 4	-	-	-	157000	195000	65000	302
0.43	58000	2.9	3515	-	3/V 13 L4	-	BN 90S 4	-	-	-	192000	231000	80000	312
0.46	34100	1.8	3273	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.46	34100	1.8	3273	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.46	55400	3.0	3263	-	3/V 13 L4	-	BN 90S 4	-	-	-	192000	231000	80000	312
0.47	46900	2.5	3222	-	3/V 11 L4	-	BN 90S 4	-	-	-	157000	195000	65000	302
0.52	48300	2.9	2887	-	3/V 11 L4	-	BN 90S 4	-	-	-	157000	195000	65000	302
0.53	30600	1.9	2835	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.53	30600	1.9	2835	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.61	11000	0.9	2472	-	3/V 07 L3	-	BN 90S 4	-	52000	65000	109000	145000	45000	272
0.61	34100	2.4	2455	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.61	34100	2.4	2455	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.68	32300	2.5	2209	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.68	32300	2.5	2209	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.70	11000	1.0	2150	-	3/V 07 L3	-	BN 90S 4	-	52000	65000	109000	145000	45000	272
0.74	29400	2.5	2016	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.74	29400	2.5	2016	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.76	12300	1.3	1964	-	3/V 07 L3	-	BN 90S 4	-	52000	65000	109000	145000	45000	272
0.82	26700	2.5	1826	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.82	26700	2.5	1826	-	3/V 10 L4	-	BN 90S 4	-	-	-	133000	166000	65000	292
0.85	8630	0.9	1768	-	3/V 06 L3	-	BN 90S 4	-	45000	51000	101000	119000	35000	262
0.97	11000	1.3	1545	-	3/V 07 L3	-	BN 90S 4	-	52000	65000	109000	145000	45000	272
1.1	12300	1.7	1411	-	3/V 07 L3	-	BN 90S 4	-	50700	63600	108200	141800	44100	272
1.1	8400	1.1	1395	-	3/V 06 L3	-	BN 90S 4	-	45000	51000	100200	116700	34200	262
1.2	14500	2.2	1288	-	3/V 07 L3	-	BN 90S 4	-	49200	61700	105300	138000	42800	272
1.2	7820	1.3	1212	-	3/V 06 L3	-	BN 90S 4	-	43400	49200	96100	111900	32600	262
1.3	10600	1.7	1159	-	3/V 07 L3	-	BN 90S 4	-	47500	59600	102000	133700	41300	272
1.3	8250	1.3	1153	-	3/V 06 L3	-	BN 90S 4	-	42700	48400	94700	110200	32100	262
1.5	14400	2.6	1015	-	3/V 07 L3	-	BN 90S 4	-	45400	57000	98000	128400	39500	272
1.5	9450	1.8	992	-	3/V 06 L3	-	BN 90S 4	-	40600	46000	90500	105400	30500	262
1.6	7890	1.4	930	-	3/V 06 L3	-	BN 90S 4	-	39700	45000	88800	103400	29800	262
1.6	12300	2.5	920	-	3/V 07 L3	-	BN 90S 4	-	44000	55200	95200	124700	38200	272
1.9	4200	1.0	793	-	3/V 05 L3	-	BN 90S 4	-	30200	34900	51700	62200	19400	252
1.9	7680	1.8	791	-	3/V 06 L3	-	BN 90S 4	-	37600	42600	84500	98400	28300	262








P₁ = 1.5 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
					MC/PC	MZ/PZ	HC	HZ	FZ					
0.30	34100	1.0	5081	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.30	34100	1.0	5081	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.30	53000	1.5	5046	-	3/V 13 L4	-	BN 90LA 4	-	-	-	192000	231000	80000	312
0.30	48300	1.3	5021	-	3/V 11 L4	-	BN 90LA 4	-	-	-	157000	195000	65000	302
0.32	30600	1.0	4637	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.32	30600	1.0	4637	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.33	58000	1.8	4536	-	3/V 13 L4	-	BN 90LA 4	-	-	-	192000	231000	80000	312
0.34	45200	1.4	4410	-	3/V 11 L4	-	BN 90LA 4	-	-	-	157000	195000	65000	302
0.37	48300	1.7	4106	-	3/V 11 L4	-	BN 90LA 4	-	-	-	157000	195000	65000	302
0.37	55400	1.9	4046	-	3/V 13 L4	-	BN 90LA 4	-	-	-	192000	231000	80000	312
0.37	30600	1.0	4036	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.37	30600	1.0	4036	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.42	30600	1.2	3570	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.42	30600	1.2	3570	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.42	42300	1.7	3557	-	3/V 11 L4	-	BN 90LA 4	-	-	-	157000	195000	65000	302
0.43	58000	2.1	3515	-	3/V 13 L4	-	BN 90LA 4	-	-	-	192000	231000	80000	312
0.46	34100	1.3	3273	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.46	34100	1.3	3273	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.46	55400	2.2	3263	-	3/V 13 L4	-	BN 90LA 4	-	-	-	192000	231000	80000	312
0.47	46900	1.8	3222	-	3/V 11 L4	-	BN 90LA 4	-	-	-	157000	195000	65000	302
0.52	48300	2.1	2887	-	3/V 11 L4	-	BN 90LA 4	-	-	-	157000	195000	65000	302
0.53	30600	1.4	2835	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.53	30600	1.4	2835	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.54	55400	2.8	2773	-	3/V 13 L4	-	BN 90LA 4	-	-	-	192000	231000	80000	312
0.60	48300	2.4	2510	-	3/V 11 L4	-	BN 90LA 4	-	-	-	157000	195000	65000	302
0.61	34100	1.7	2455	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.61	34100	1.7	2455	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.68	32300	1.9	2209	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.68	32300	1.9	2209	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.74	29400	1.8	2016	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.74	29400	1.8	2016	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.76	12300	0.9	1964	-	3/V 07 L3	-	BN 90LA 4	-	52000	65000	109000	145000	45000	272
0.82	26700	1.9	1826	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.82	26700	1.9	1826	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.91	33300	2.5	1657	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.91	33300	2.5	1657	-	3/V 10 L4	-	BN 90LA 4	-	-	-	133000	166000	65000	292
0.97	11000	1.0	1545	-	3/V 07 L3	-	BN 90LA 4	-	52000	65000	109000	145000	45000	272
1.1	12300	1.2	1411	-	3/V 07 L3	-	BN 90LA 4	-	50700	63600	108200	141800	44100	272
1.2	14500	1.6	1288	-	3/V 07 L3	-	BN 90LA 4	-	49200	61700	105300	138000	42800	272
1.2	7820	0.9	1212	-	3/V 06 L3	-	BN 90LA 4	-	43400	49200	96100	111900	32600	262
1.3	10600	1.2	1159	-	3/V 07 L3	-	BN 90LA 4	-	47500	59600	102000	133700	41300	272
1.3	8250	1.0	1153	-	3/V 06 L3	-	BN 90LA 4	-	42700	48400	94700	110200	32100	262
1.5	14400	1.9	1015	-	3/V 07 L3	-	BN 90LA 4	-	45400	57000	98000	128400	39500	272
1.5	9450	1.3	992	-	3/V 06 L3	-	BN 90LA 4	-	40600	46000	90500	105400	30500	262
1.6	7890	1.0	930	-	3/V 06 L3	-	BN 90LA 4	-	39700	45000	88800	103400	29800	262
1.6	12300	1.8	920	-	3/V 07 L3	-	BN 90LA 4	-	44000	55200	95200	124700	38200	272
1.9	7680	1.3	791	-	3/V 06 L3	-	BN 90LA 4	-	37600	42600	84500	98400	28300	262
1.9	9970	1.6	773	-	3/V 07 L3	-	BN 90LA 4	-	41500	52100	90300	118400	36100	272
2.0	14200	2.5	761	-	3/V 07 L3	-	BN 90LA 4	-	41300	51800	89900	117800	35900	272
2.2	7540	1.3	698	-	3/V 06 L3	-	BN 90LA 4	-	36100	40900	81400	94800	27100	262
2.2	6020	1.0	671	-	-	3/A 06 L2	BN 90LA 4	M 3SA 4	35600	40400	80500	93700	26800	263
2.3	9370	1.7	661	-	3/V 06 L3	-	BN 90LA 4	-	35500	40200	80100	93300	26600	262
2.3	14400	2.9	655	-	3/V 07 L3	-	BN 90LA 4	-	39300	49300	85900	112600	34100	272
2.4	4460	1.0	623	-	3/V 05 L3	-	BN 90LA 4	-	27900	32200	48100	57900	17900	252
2.5	5920	1.1	611	-	-	3/A 06 L2	BN 90LA 4	M 3SA 4	34500	39100	78300	91100	25900	263
2.6	4870	1.0	576	-	3/V 05 L3	-	BN 90LA 4	-	27200	31400	47000	56500	17400	252
2.6	8560	1.8	569	-	3/V 06 L3	-	BN 90LA 4	-	33700	38200	76600	89200	25300	262
2.7	7270	1.4	555	-	-	3/A 06 L2	BN 90LA 4	M 3SA 4	33400	37900	76000	88500	25100	263
2.8	3920	0.9	529	-	3/V 05 L3	-	BN 90LA 4	-	26400	30500	45800	55100	17000	252
2.8	7590	1.8	527	-	3/V 06 L3	-	BN 90LA 4	-	32900	37200	74900	87200	24700	262
3.0	7150	1.6	505	-	-	3/A 06 L2	BN 90LA 4	M 3SA 4	32400	36700	73900	86100	24400	263
3.3	4820	1.3	462	-	3/V 05 L3	-	BN 90LA 4	-	25300	29200	44000	52900	16200	252
3.3	3730	1.1	453	-	3/V 04 L3	-	BN 90LA 4	-	25100	29000	43700	52600	16100	242
3.4	9180	2.3	439	-	-	3/A 07 L2	BN 90LA 4	M 3SA 4	34400	43100	76200	99900	29900	273
3.5	7760	2.0	435	-	-	3/A 06 L2	BN 90LA 4	M 3SA 4	30800	34900	70600	82300	23200	263
3.5	8820	2.5	427	-	3/V 06 L3	-	BN 90LA 4	-	30600	34700	70300	81800	23000	262
3.6	4400	1.1	422	-	-	3/A 05 L2	BN 90LA 4	M 3SA 4	24500	28300	42800	51500	15700	253

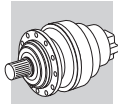


P₁ = 1.5 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
3.7	9080	2.5	405	–	–	3/A 07 L2	BN 90LA 4	M 3SA 4	33500	42000	74400	97500	29100	273
3.8	3760	1.2	396	–	3/V 05 L3	–	BN 90LA 4	–	24000	27700	42000	50500	15400	252
3.8	7590	2.3	395	–	3/V 06 L3	–	BN 90LA 4	–	29900	33800	68700	80000	22400	262
3.9	5640	1.6	388	–	–	3/A 06 L2	BN 90LA 4	M 3SA 4	29700	33600	68300	79500	22300	263
3.9	9020	2.8	386	–	3/V 07 L3	–	BN 90LA 4	–	32900	41300	73400	96100	28600	272
3.9	3510	1.2	384	–	3/V 04 L3	–	BN 90LA 4	–	23700	27400	41600	50100	15200	242
3.9	6180	1.8	380	–	–	3/A 06 L2	BN 90LA 4	M 3SA 4	29500	33400	67900	79000	22200	263
4.6	3650	1.2	329	–	–	3/A 05 L2	BN 90LA 4	M 3SA 4	22600	26100	39700	47800	14500	253
4.7	6610	2.3	321	–	–	3/A 06 L2	BN 90LA 4	M 3SA 4	27900	31600	64500	75100	20900	263
5.3	2850	1.1	283	–	–	3/A 04 L2	BN 90LA 4	M 3SA 4	21500	24800	38000	45700	13800	243
5.4	3600	1.4	280	–	–	3/A 05 L2	BN 90LA 4	M 3SA 4	21400	24700	37800	45500	13700	253
5.6	5500	2.3	267	–	–	3/A 06 L2	BN 90LA 4	M 3SA 4	26200	29700	61000	71100	19700	263
6.0	3500	1.5	250	–	–	3/A 04 L2	BN 90LA 4	M 3SA 4	20600	23800	36600	44000	13200	243
6.2	4290	1.9	241	–	–	3/A 05 L2	BN 90LA 4	M 3SA 4	20300	23500	36200	43500	13000	253
6.6	3500	1.7	226	–	–	3/A 04 L2	BN 90LA 4	M 3SA 4	19900	23000	35500	42700	12800	243
7.1	3100	1.6	212	–	–	3/A 05 L2	BN 90LA 4	M 3SA 4	19500	22500	34800	41900	12500	253
7.1	3100	1.6	212	–	–	3/A 05 L2	BN 90LA 4	M 3SA 4	19500	22500	34800	41900	12500	253
7.3	3500	1.8	205	–	–	3/A 04 L2	BN 90LA 4	M 3SA 4	19300	22300	34500	41500	12400	243
8.3	1830	1.1	182	–	–	3/A 03 L2	BN 90LA 4	M 3SA 4	18500	21400	33200	40000	11900	233
8.5	3600	2.2	175	–	–	3/A 05 L2	BN 90LA 4	M 3SA 4	18300	21100	32900	39600	11700	253
8.6	2970	1.8	174	–	–	3/A 04 L2	BN 90LA 4	M 3SA 4	18200	21100	32800	39500	11700	243
9.2	2900	1.9	162	–	–	3/A 04 L2	BN 90LA 4	M 3SA 4	17800	20600	32100	38700	11400	243
9.2	2900	1.9	162	–	–	3/A 05 L2	BN 90LA 4	M 3SA 4	17800	20600	32100	38700	11400	253
10.1	2390	1.7	149	–	–	3/A 04 L2	BN 90LA 4	M 3SA 4	17300	20000	31300	37700	11100	243
10.7	3600	2.7	141	–	–	3/A 05 L2	BN 90LA 4	M 3SA 4	17000	19600	30800	37000	10900	253
11.3	1300	1.0	133	–	–	3/A 01 L2	BN 90LA 4	M 3SA 4	5430	5430	14800	17100	3570	225
11.6	2720	2.2	129	–	–	3/A 04 L2	BN 90LA 4	M 3SA 4	16500	19100	30000	36100	10600	243
12.8	2390	2.2	117	–	–	3/A 04 L2	BN 90LA 4	M 3SA 4	16000	18500	29100	35000	10300	243
14.7	2550	2.7	102	–	–	3/A 04 L2	BN 90LA 4	M 3SA 4	15300	17600	27900	33600	9790	243
14.8	1150	1.2	102	–	–	3/A 01 L2	BN 90LA 4	M 3SA 4	4960	4960	13700	15700	3260	225
15.5	1690	1.9	96.9	–	–	3/A 03 L2	BN 90LA 4	M 3SA 4	15000	17300	27500	33100	9630	233
16.5	2390	2.8	90.7	–	–	3/A 04 L2	BN 90LA 4	M 3SA 4	14700	17000	27000	32500	9420	243
16.9	1650	2.0	88.5	–	–	3/A 03 L2	BN 90LA 4	M 3SA 4	14600	16800	26800	32200	9340	233
18.4	1300	1.7	81.3	–	–	3/A 01 L2	BN 90LA 4	M 3SA 4	4610	4610	12800	14700	3030	225
20.2	1150	1.7	74.2	–	–	3/A 01 L2	BN 90LA 4	M 3SA 4	4470	4470	12400	14300	2940	225
20.5	1800	2.6	73.2	–	–	3/A 03 L2	BN 90LA 4	M 3SA 4	13700	15800	25300	30400	8770	233
21.1	650	1.0	71.0	–	–	3/A 00 L2	BN 90LA 4	M 3SA 4	4400	4400	12300	14100	2890	217
23.8	1550	2.6	62.9	–	–	3/A 03 L2	BN 90LA 4	M 3SA 4	13000	15000	24200	29100	8340	233
24.5	650	1.1	61.2	–	–	3/A 00 L2	BN 90LA 4	M 3SA 4	4190	4190	11700	13500	2750	217
25.2	1260	2.3	59.4	–	–	3/A 01 L2	BN 90LA 4	M 3SA 4	4150	4150	11600	13400	2730	225
27.7	1180	2.3	54.2	–	–	3/A 01 L2	BN 90LA 4	M 3SA 4	4020	4020	11300	13000	2650	225
28.9	550	1.1	51.8	–	–	3/A 00 L2	BN 90LA 4	M 3SA 4	3960	3960	11200	12800	2610	217
31	830	1.8	49.1	–	–	3/A 01 L2	BN 90LA 4	M 3SA 4	3890	3890	11000	12600	2560	225
34	930	2.3	43.9	–	–	3/A 01 L2	BN 90LA 4	M 3SA 4	3750	3750	10600	12200	2470	225
36	650	1.7	41.5	–	–	3/A 00 L2	BN 90LA 4	M 3SA 4	3680	3680	10500	12000	2420	217
37	870	2.3	40.1	–	–	3/A 01 L2	BN 90LA 4	M 3SA 4	3640	3640	10300	11900	2390	225
38	550	1.5	39.6	–	–	3/A 00 L2	BN 90LA 4	M 3SA 4	3620	3620	10300	11800	2380	217
42	760	2.3	35.8	–	–	3/A 01 L2	BN 90LA 4	M 3SA 4	3500	3500	10000	11500	2300	225
47	650	2.2	31.7	–	–	3/A 00 L2	BN 90LA 4	M 3SA 4	3370	3370	9650	11100	2210	217
64	580	2.6	23.4	–	–	3/A 00 L2	BN 90LA 4	M 3SA 4	3040	3040	8810	10100	2000	217
78	470	2.6	19.1	–	–	3/A 00 L2	BN 90LA 4	M 3SA 4	2840	2840	8290	9530	1870	217

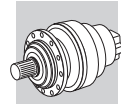
P₁ = 1.85 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
0.30	53000	1.2	5046	–	3/V 13 L4	–	BN 90LB 4	–	–	–	192000	231000	80000	312
0.30	48300	1.1	5021	–	3/V 11 L4	–	BN 90LB 4	–	–	–	157000	195000	65000	302
0.33	58000	1.4	4536	–	3/V 13 L4	–	BN 90LB 4	–	–	–	192000	231000	80000	312
0.34	45200	1.1	4410	–	3/V 11 L4	–	BN 90LB 4	–	–	–	157000	195000	65000	302
0.37	48300	1.4	4106	–	3/V 11 L4	–	BN 90LB 4	–	–	–	157000	195000	65000	302
0.37	55400	1.5	4046	–	3/V 13 L4	–	BN 90LB 4	–	–	–	192000	231000	80000	312
0.42	30600	1.0	3570	–	3/V 10 L4	–	BN 90LB 4	–	–	–	133000	166000	65000	292
0.42	30600	1.0	3570	–	3/V 10 L4	–	BN 90LB 4	–	–	–	133000	166000	65000	292








P₁ = 1.85 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
					MC/PC	MZ/PZ	HC	HZ	FZ					
0.42	42300	1.4	3557	-	3/V 11 L4	-	BN 90LB 4	-	-	-	157000	195000	65000	302
0.43	58000	1.7	3515	-	3/V 13 L4	-	BN 90LB 4	-	-	-	192000	231000	80000	312
0.46	34100	1.1	3273	-	3/V 10 L4	-	BN 90LB 4	-	-	-	133000	166000	65000	292
0.46	34100	1.1	3273	-	3/V 10 L4	-	BN 90LB 4	-	-	-	133000	166000	65000	292
0.46	55400	1.7	3263	-	3/V 13 L4	-	BN 90LB 4	-	-	-	192000	231000	80000	312
0.47	46900	1.5	3222	-	3/V 11 L4	-	BN 90LB 4	-	-	-	157000	195000	65000	302
0.52	48300	1.7	2887	-	3/V 11 L4	-	BN 90LB 4	-	-	-	157000	195000	65000	302
0.53	30600	1.1	2835	-	3/V 10 L4	-	BN 90LB 4	-	-	-	133000	166000	65000	292
0.53	30600	1.1	2835	-	3/V 10 L4	-	BN 90LB 4	-	-	-	133000	166000	65000	292
0.54	55400	2.2	2773	-	3/V 13 L4	-	BN 90LB 4	-	-	-	192000	231000	80000	312
0.60	48300	2.0	2510	-	3/V 11 L4	-	BN 90LB 4	-	-	-	157000	195000	65000	302
0.61	34100	1.4	2455	-	3/V 10 L4	-	BN 90LB 4	-	-	-	133000	166000	65000	292
0.61	34100	1.4	2455	-	3/V 10 L4	-	BN 90LB 4	-	-	-	133000	166000	65000	292
0.68	32300	1.5	2209	-	3/V 10 L4	-	BN 90LB 4	-	-	-	133000	166000	65000	292
0.68	32300	1.5	2209	-	3/V 10 L4	-	BN 90LB 4	-	-	-	133000	166000	65000	292
0.74	29400	1.5	2016	-	3/V 10 L4	-	BN 90LB 4	-	-	-	133000	166000	65000	292
0.74	29400	1.5	2016	-	3/V 10 L4	-	BN 90LB 4	-	-	-	133000	166000	65000	292
0.82	26700	1.5	1826	-	3/V 10 L4	-	BN 90LB 4	-	-	-	133000	166000	65000	292
0.82	26700	1.5	1826	-	3/V 10 L4	-	BN 90LB 4	-	-	-	133000	166000	65000	292
0.91	33300	2.0	1657	-	3/V 10 L4	-	BN 90LB 4	-	-	-	133000	166000	65000	292
0.91	33300	2.0	1657	-	3/V 10 L4	-	BN 90LB 4	-	-	-	133000	166000	65000	292
1.1	12300	1.0	1411	-	3/V 07 L3	-	BN 90LB 4	-	50700	63600	108200	141800	44100	272
1.2	14500	1.3	1288	-	3/V 07 L3	-	BN 90LB 4	-	49200	61700	105300	138000	42800	272
1.3	10600	1.0	1159	-	3/V 07 L3	-	BN 90LB 4	-	47500	59600	102000	133700	41300	272
1.5	14400	1.6	1015	-	3/V 07 L3	-	BN 90LB 4	-	45400	57000	98000	128400	39500	272
1.5	9450	1.0	992	-	3/V 06 L3	-	BN 90LB 4	-	40600	46000	90500	105400	30500	262
1.6	12300	1.5	920	-	3/V 07 L3	-	BN 90LB 4	-	44000	55200	95200	124700	38200	272
1.9	7680	1.1	791	-	3/V 06 L3	-	BN 90LB 4	-	37600	42600	84500	98400	28300	262
1.9	9970	1.3	773	-	3/V 07 L3	-	BN 90LB 4	-	41500	52100	90300	118400	36100	272
2.0	14200	2.0	761	-	3/V 07 L3	-	BN 90LB 4	-	41300	51800	89900	117800	35900	272
2.2	7540	1.1	698	-	3/V 06 L3	-	BN 90LB 4	-	36100	40900	81400	94800	27100	262
2.3	9370	1.4	661	-	3/V 06 L3	-	BN 90LB 4	-	35500	40200	80100	93300	26600	262
2.3	14400	2.4	655	-	3/V 07 L3	-	BN 90LB 4	-	39300	49300	85900	112600	34100	272
2.6	8560	1.5	569	-	3/V 06 L3	-	BN 90LB 4	-	33700	38200	76600	89200	25300	262
2.7	7270	1.2	555	-	-	3/A 06 L2	BN 90LB 4	-	33400	37900	76000	88500	25100	263
2.8	7590	1.4	527	-	3/V 06 L3	-	BN 90LB 4	-	32900	37200	74900	87200	24700	262
3.0	13600	2.7	507	-	3/V 07 L3	-	BN 90LB 4	-	36100	45300	79600	104300	31400	272
3.0	7150	1.3	505	-	-	3/A 06 L2	BN 90LB 4	-	32400	36700	73900	86100	24400	263
3.3	4820	1.0	462	-	3/V 05 L3	-	BN 90LB 4	-	25300	29200	44000	52900	16200	252
3.3	12300	2.7	460	-	3/V 07 L3	-	BN 90LB 4	-	34900	43800	77300	101300	30400	272
3.4	9180	1.9	439	-	-	3/A 07 L2	BN 90LB 4	-	34400	43100	76200	99900	29900	273
3.5	7760	1.6	435	-	-	3/A 06 L2	BN 90LB 4	-	30800	34900	70600	82300	23200	263
3.5	8820	2.0	427	-	3/V 06 L3	-	BN 90LB 4	-	30600	34700	70300	81800	23000	262
3.7	9080	2.0	405	-	-	3/A 07 L2	BN 90LB 4	-	33500	42000	74400	97500	29100	273
3.8	3760	0.9	396	-	3/V 05 L3	-	BN 90LB 4	-	24000	27700	42000	50500	15400	252
3.8	7590	1.9	395	-	3/V 06 L3	-	BN 90LB 4	-	29900	33800	68700	80000	22400	262
3.9	5640	1.3	388	-	-	3/A 06 L2	BN 90LB 4	-	29700	33600	68300	79500	22300	263
3.9	9020	2.2	386	-	3/V 07 L3	-	BN 90LB 4	-	32900	41300	73400	96100	28600	272
3.9	3510	1.0	384	-	3/V 04 L3	-	BN 90LB 4	-	23700	27400	41600	50100	15200	242
3.9	6180	1.4	380	-	-	3/A 06 L2	BN 90LB 4	-	29500	33400	67900	79000	22200	263
4.6	3650	1.0	329	-	-	3/A 05 L2	BN 90LB 4	-	22600	26100	39700	47800	14500	253
4.7	6610	1.8	321	-	-	3/A 06 L2	BN 90LB 4	-	27900	31600	64500	75100	20900	263
5.3	8700	2.8	282	-	-	3/A 07 L2	BN 90LB 4	-	29600	37200	66700	87400	25800	273
5.4	3600	1.1	280	-	-	3/A 05 L2	BN 90LB 4	-	21400	24700	37800	45500	13700	253
5.4	7760	2.5	276	-	-	3/A 06 L2	BN 90LB 4	-	26500	30000	61600	71800	19900	263
5.6	5500	1.8	267	-	-	3/A 06 L2	BN 90LB 4	-	26200	29700	61000	71100	19700	263
6.0	3500	1.2	250	-	-	3/A 04 L2	BN 90LB 4	-	20600	23800	36600	44000	13200	243
6.2	4290	1.5	241	-	-	3/A 05 L2	BN 90LB 4	-	20300	23500	36200	43500	13000	253
6.6	3500	1.3	226	-	-	3/A 04 L2	BN 90LB 4	-	19900	23000	35500	42700	12800	243
6.8	6520	2.6	221	-	-	3/A 06 L2	BN 90LB 4	-	24600	27900	57700	67100	18500	263
7.1	3100	1.3	212	-	-	3/A 05 L2	BN 90LB 4	-	19500	22500	34800	41900	12500	253
7.1	3100	1.3	212	-	-	3/A 05 L2	BN 90LB 4	-	19500	22500	34800	41900	12500	253
7.3	3500	1.5	205	-	-	3/A 04 L2	BN 90LB 4	-	19300	22300	34500	41500	12400	243
7.6	5500	2.5	198	-	-	3/A 06 L2	BN 90LB 4	-	23700	26900	55800	65000	17800	263
8.5	3600	1.8	175	-	-	3/A 05 L2	BN 90LB 4	-	18300	21100	32900	39600	11700	253
8.6	2970	1.5	174	-	-	3/A 04 L2	BN 90LB 4	-	18200	21100	32800	39500	11700	243
9.2	2900	1.5	162	-	-	3/A 04 L2	BN 90LB 4	-	17800	20600	32100	38700	11400	243

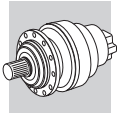


P₁ = 1.85 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]						
									MC/PC	MZ/PZ	HC	HZ	FZ		
9.2	2900	1.5	162	-	-	3/A 05 L2	BN 90LB 4	-	-	17800	20600	32100	38700	11400	253
10.1	2390	1.4	149	-	-	3/A 04 L2	BN 90LB 4	-	-	17300	20000	31300	37700	11100	243
10.7	3600	2.2	141	-	-	3/A 05 L2	BN 90LB 4	-	-	17000	19600	30800	37000	10900	253
11.6	2720	1.8	129	-	-	3/A 04 L2	BN 90LB 4	-	-	16500	19100	30000	36100	10600	243
12.4	3520	2.5	121	-	-	3/A 05 L2	BN 90LB 4	-	-	16200	18700	29400	35400	10400	253
12.8	2390	1.8	117	-	-	3/A 04 L2	BN 90LB 4	-	-	16000	18500	29100	35000	10300	243
14.5	3080	2.6	104	-	-	3/A 05 L2	BN 90LB 4	-	-	15300	17700	28100	33800	9840	253
14.7	2550	2.2	102	-	-	3/A 04 L2	BN 90LB 4	-	-	15300	17600	27900	33600	9790	243
14.8	1150	1.0	102	-	-	3/A 01 L2	BN 90LB 4	-	-	4960	4960	13700	15700	3260	225
15.5	1690	1.5	96.9	-	-	3/A 03 L2	BN 90LB 4	-	-	15000	17300	27500	33100	9630	233
16.5	2390	2.3	90.7	-	-	3/A 04 L2	BN 90LB 4	-	-	14700	17000	27000	32500	9420	243
16.9	1650	1.6	88.5	-	-	3/A 03 L2	BN 90LB 4	-	-	14600	16800	26800	32200	9340	233
18.4	2370	2.5	81.7	-	-	3/A 04 L2	BN 90LB 4	-	-	14200	16400	26200	31500	9100	243
18.4	1300	1.4	81.3	-	-	3/A 01 L2	BN 90LB 4	-	-	4610	4610	12800	14700	3030	225
20.2	1150	1.3	74.2	-	-	3/A 01 L2	BN 90LB 4	-	-	4470	4470	12400	14300	2940	225
20.5	1800	2.1	73.2	-	-	3/A 03 L2	BN 90LB 4	-	-	13700	15800	25300	30400	8770	233
23.8	1550	2.1	62.9	-	-	3/A 03 L2	BN 90LB 4	-	-	13000	15000	24200	29100	8340	233
24.5	650	0.9	61.2	-	-	3/A 00 L2	BN 90LB 4	-	-	4190	4190	11700	13500	2750	217
25.2	1260	1.8	59.4	-	-	3/A 01 L2	BN 90LB 4	-	-	4150	4150	11600	13400	2730	225
27.7	1180	1.9	54.2	-	-	3/A 01 L2	BN 90LB 4	-	-	4020	4020	11300	13000	2650	225
28.6	1650	2.7	52.5	-	-	3/A 03 L2	BN 90LB 4	-	-	12200	14100	22900	27600	7850	233
28.6	1650	2.7	52.5	-	-	3/A 03 L2	BN 90LB 4	-	-	12200	14100	22900	27600	7850	233
28.9	550	0.9	51.8	-	-	3/A 00 L2	BN 90LB 4	-	-	3960	3960	11200	12800	2610	217
31	830	1.5	49.1	-	-	3/A 01 L2	BN 90LB 4	-	-	3890	3890	11000	12600	2560	225
34	930	1.8	43.9	-	-	3/A 01 L2	BN 90LB 4	-	-	3750	3750	10600	12200	2470	225
36	650	1.4	41.5	-	-	3/A 00 L2	BN 90LB 4	-	-	3680	3680	10500	12000	2420	217
37	870	1.9	40.1	-	-	3/A 01 L2	BN 90LB 4	-	-	3640	3640	10300	11900	2390	225
38	550	1.2	39.6	-	-	3/A 00 L2	BN 90LB 4	-	-	3620	3620	10300	11800	2380	217
42	760	1.8	35.8	-	-	3/A 01 L2	BN 90LB 4	-	-	3500	3500	10000	11500	2300	225
47	650	1.8	31.7	-	-	3/A 00 L2	BN 90LB 4	-	-	3370	3370	9650	11100	2210	217
64	580	2.1	23.4	-	-	3/A 00 L2	BN 90LB 4	-	-	3040	3040	8810	10100	2000	217
78	470	2.1	19.1	-	-	3/A 00 L2	BN 90LB 4	-	-	2840	2840	8290	9530	1870	217

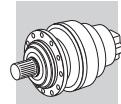
P₁ = 2.2 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]						
									MC/PC	MZ/PZ	HC	HZ	FZ		
0.29	99000	1.7	5234	-	3/V 15 L4	-	BN 100LA 4	-	-	-	-	206000	243000	90000	332
0.30	53000	1.0	5046	-	3/V 13 L4	-	BN 100LA 4	-	-	-	-	192000	231000	80000	312
0.30	48300	0.9	5021	-	3/V 11 L4	-	BN 100LA 4	-	-	-	-	157000	195000	65000	302
0.30	83200	1.6	4959	-	3/V 14 L4	-	BN 100LA 4	-	-	-	-	206000	243000	90000	322
0.30	105000	1.9	4950	-	3/V 15 L4	-	BN 100LA 4	-	-	-	-	206000	243000	90000	332
0.30	124000	2.3	4950	-	3/V 16 L4	-	BN 100LA 4	-	-	-	-	345000	385000	150000	342
0.33	58000	1.2	4536	-	3/V 13 L4	-	BN 100LA 4	-	-	-	-	192000	231000	80000	312
0.34	45200	1.0	4410	-	3/V 11 L4	-	BN 100LA 4	-	-	-	-	157000	195000	65000	302
0.35	83200	1.8	4312	-	3/V 14 L4	-	BN 100LA 4	-	-	-	-	206000	243000	90000	322
0.36	105000	2.3	4171	-	3/V 15 L4	-	BN 100LA 4	-	-	-	-	206000	243000	90000	332
0.37	48300	1.2	4106	-	3/V 11 L4	-	BN 100LA 4	-	-	-	-	157000	195000	65000	302
0.37	55400	1.3	4046	-	3/V 13 L4	-	BN 100LA 4	-	-	-	-	192000	231000	80000	312
0.38	75500	1.7	3993	-	3/V 14 L4	-	BN 100LA 4	-	-	-	-	206000	243000	90000	322
0.42	42300	1.2	3557	-	3/V 11 L4	-	BN 100LA 4	-	-	-	-	157000	195000	65000	302
0.43	58000	1.4	3515	-	3/V 13 L4	-	BN 100LA 4	-	-	-	-	192000	231000	80000	312
0.46	34100	0.9	3273	-	3/V 10 L4	-	BN 100LA 4	-	-	-	-	133000	166000	65000	292
0.46	34100	0.9	3273	-	3/V 10 L4	-	BN 100LA 4	-	-	-	-	133000	166000	65000	292
0.46	55400	1.5	3263	-	3/V 13 L4	-	BN 100LA 4	-	-	-	-	192000	231000	80000	312
0.47	46900	1.3	3222	-	3/V 11 L4	-	BN 100LA 4	-	-	-	-	157000	195000	65000	302
0.47	80100	2.2	3182	-	3/V 14 L4	-	BN 100LA 4	-	-	-	-	206000	243000	90000	322
0.52	48300	1.5	2887	-	3/V 11 L4	-	BN 100LA 4	-	-	-	-	157000	195000	65000	302
0.53	30600	0.9	2835	-	3/V 10 L4	-	BN 100LA 4	-	-	-	-	133000	166000	65000	292
0.53	30600	0.9	2835	-	3/V 10 L4	-	BN 100LA 4	-	-	-	-	133000	166000	65000	292
0.54	83200	2.7	2782	-	3/V 14 L4	-	BN 100LA 4	-	-	-	-	206000	243000	90000	322
0.54	55400	1.9	2773	-	3/V 13 L4	-	BN 100LA 4	-	-	-	-	192000	231000	80000	312
0.60	48300	1.7	2510	-	3/V 11 L4	-	BN 100LA 4	-	-	-	-	157000	195000	65000	302
0.61	34100	1.2	2455	-	3/V 10 L4	-	BN 100LA 4	-	-	-	-	133000	166000	65000	292








P₁ = 2.2 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
					MC/PC	MZ/PZ	HC	HZ	FZ					
0.61	34100	1.2	2455	-	3/V 10 L4	-	BN 100LA 4	-	-	-	133000	166000	65000	292
0.62	49000	1.9	2430	-	3/V 13 L3	-	BN 100LA 4	-	-	-	192000	231000	80000	312
0.64	34000	1.4	2329	-	3/V 11 L3	-	BN 100LA 4	-	-	-	157000	195000	65000	302
0.65	66800	2.8	2318	-	3/V 14 L3	-	BN 100LA 4	-	-	-	206000	243000	90000	322
0.68	32300	1.3	2209	-	3/V 10 L4	-	BN 100LA 4	-	-	-	133000	166000	65000	292
0.68	32300	1.3	2209	-	3/V 10 L4	-	BN 100LA 4	-	-	-	133000	166000	65000	292
0.74	58000	2.8	2019	-	3/V 13 L3	-	BN 100LA 4	-	-	-	192000	231000	80000	312
0.74	29400	1.3	2016	-	3/V 10 L4	-	BN 100LA 4	-	-	-	133000	166000	65000	292
0.74	29400	1.3	2016	-	3/V 10 L4	-	BN 100LA 4	-	-	-	133000	166000	65000	292
0.76	43000	2.1	1963	-	3/V 11 L3	-	BN 100LA 4	-	-	-	157000	195000	65000	302
0.82	26700	1.3	1826	-	3/V 10 L4	-	BN 100LA 4	-	-	-	133000	166000	65000	292
0.82	26700	1.3	1826	-	3/V 10 L4	-	BN 100LA 4	-	-	-	133000	166000	65000	292
0.84	22000	1.2	1792	-	3/V 09 L3	-	BN 100LA 4	-	-	-	110000	145000	36000	282
0.91	33300	1.7	1657	-	3/V 10 L4	-	BN 100LA 4	-	-	-	133000	166000	65000	292
0.91	33300	1.7	1657	-	3/V 10 L4	-	BN 100LA 4	-	-	-	133000	166000	65000	292
0.92	43000	2.5	1636	-	3/V 11 L3	-	BN 100LA 4	-	-	-	157000	195000	65000	302
1.0	18300	1.1	1497	-	3/V 09 L3	-	BN 100LA 4	-	-	-	110000	144300	36000	282
1.1	21800	1.4	1411	-	3/V 10 L3	-	BN 100LA 4	-	-	-	130300	163800	63700	292
1.2	14500	1.1	1288	-	3/V 07 L3	-	BN 100LA 4	-	49200	61700	105300	138000	42800	272
1.2	21500	1.5	1288	-	3/V 09 L3	-	BN 100LA 4	-	-	-	107000	138000	34200	282
1.2	35100	2.6	1274	-	3/V 11 L3	-	BN 100LA 4	-	-	-	149300	186000	61600	302
1.2	21800	1.6	1227	-	3/V 10 L3	-	BN 100LA 4	-	-	-	124900	157100	60800	292
1.3	16200	1.2	1159	-	3/V 09 L3	-	BN 100LA 4	-	-	-	103600	133700	33000	282
1.3	29100	2.4	1120	-	3/V 10 L3	-	BN 100LA 4	-	-	-	121600	152800	59000	292
1.5	14400	1.3	1015	-	3/V 07 L3	-	BN 100LA 4	-	45400	57000	98000	128400	39500	272
1.5	18100	1.7	1004	-	3/V 09 L3	-	BN 100LA 4	-	-	-	99300	128000	31500	282
1.5	31800	2.9	1004	-	3/V 10 L3	-	BN 100LA 4	-	-	-	117600	147900	56900	292
1.6	12300	1.2	920	-	3/V 07 L3	-	BN 100LA 4	-	44000	55200	95200	124700	38200	272
1.6	21800	2.1	920	-	3/V 10 L3	-	BN 100LA 4	-	-	-	114600	144100	55200	292
1.8	20100	2.1	840	-	3/V 09 L3	-	BN 100LA 4	-	-	-	94100	121400	29700	282
1.9	21400	2.5	800	-	3/V 09 L3	-	BN 100LA 4	-	-	-	92700	119600	29200	282
1.9	7680	0.9	791	-	3/V 06 L3	-	BN 100LA 4	-	37600	42600	84500	98400	28300	262
1.9	9970	1.1	773	-	3/V 07 L3	-	BN 100LA 4	-	41500	52100	90300	118400	36100	272
2.0	14200	1.7	761	-	3/V 07 L3	-	BN 100LA 4	-	41300	51800	89900	117800	35900	272
2.0	14400	1.7	761	-	3/V 09 L3	-	BN 100LA 4	-	-	-	91300	117800	28700	282
2.2	7540	0.9	698	-	3/V 06 L3	-	BN 100LA 4	-	36100	40900	81400	94800	27100	262
2.3	9370	1.2	661	-	3/V 06 L3	-	BN 100LA 4	-	35500	40200	80100	93300	26600	262
2.3	14400	2.0	655	-	3/V 07 L3	-	BN 100LA 4	-	39300	49300	85900	112600	34100	272
2.3	17600	2.4	655	-	3/V 09 L3	-	BN 100LA 4	-	-	-	87300	112600	27300	282
2.6	8560	1.3	569	-	3/V 06 L3	-	BN 100LA 4	-	33700	38200	76600	89200	25300	262
2.7	7270	1.0	555	-	-	3/A 06 L2	BN 100LA 4	M 3LA 4	33400	37900	76000	88500	25100	263
2.8	7590	1.2	527	-	3/V 06 L3	-	BN 100LA 4	-	32900	37200	74900	87200	24700	262
3.0	13600	2.3	507	-	3/V 07 L3	-	BN 100LA 4	-	36100	45300	79600	104300	31400	272
3.0	7150	1.1	505	-	-	3/A 06 L2	BN 100LA 4	M 3LA 4	32400	36700	73900	86100	24400	263
3.3	12300	2.3	460	-	3/V 07 L3	-	BN 100LA 4	-	34900	43800	77300	101300	30400	272
3.4	9180	1.6	439	-	-	3/A 07 L2	BN 100LA 4	M 3LA 4	34400	43100	76200	99900	29900	273
3.5	7760	1.4	435	-	-	3/A 06 L2	BN 100LA 4	M 3LA 4	30800	34900	70600	82300	23200	263
3.5	8820	1.7	427	-	3/V 06 L3	-	BN 100LA 4	-	30600	34700	70300	81800	23000	262
3.7	9080	1.7	405	-	-	3/A 07 L2	BN 100LA 4	M 3LA 4	33500	42000	74400	97500	29100	273
3.8	7590	1.6	395	-	3/V 06 L3	-	BN 100LA 4	-	29900	33800	68700	80000	22400	262
3.9	5640	1.1	388	-	-	3/A 06 L2	BN 100LA 4	M 3LA 4	29700	33600	68300	79500	22300	263
3.9	9020	1.9	386	-	3/V 07 L3	-	BN 100LA 4	-	32900	41300	73400	96100	28600	272
3.9	6180	1.2	380	-	-	3/A 06 L2	BN 100LA 4	M 3LA 4	29500	33400	67900	79000	22200	263
4.4	11500	2.6	341	-	-	3/A 07 L2	BN 100LA 4	M 3LA 4	31600	39700	70700	92600	27500	273
4.7	6610	1.6	321	-	-	3/A 06 L2	BN 100LA 4	M 3LA 4	27900	31600	64500	75100	20900	263
5.3	8700	2.3	282	-	-	3/A 07 L2	BN 100LA 4	M 3LA 4	29600	37200	66700	87400	25800	273
5.4	3600	0.9	280	-	-	3/A 05 L2	BN 100LA 4	M 3LA 4	21400	24700	37800	45500	13700	253
5.4	7760	2.1	276	-	-	3/A 06 L2	BN 100LA 4	M 3LA 4	26500	30000	61600	71800	19900	263
5.6	5500	1.6	267	-	-	3/A 06 L2	BN 100LA 4	M 3LA 4	26200	29700	61000	71100	19700	263
6.0	3500	1.0	250	-	-	3/A 04 L2	BN 100LA 4	M 3LA 4	20600	23800	36600	44000	13200	243
6.2	9000	2.8	241	-	-	3/A 07 L2	BN 100LA 4	M 3LA 4	28200	35300	63700	83500	24500	273
6.2	4290	1.3	241	-	-	3/A 05 L2	BN 100LA 4	M 3LA 4	20300	23500	36200	43500	13000	253
6.6	3500	1.1	226	-	-	3/A 04 L2	BN 100LA 4	M 3LA 4	19900	23000	35500	42700	12800	243
6.8	6520	2.2	221	-	-	3/A 06 L2	BN 100LA 4	M 3LA 4	24600	27900	57700	67100	18500	263
7.1	3100	1.1	212	-	-	3/A 05 L2	BN 100LA 4	M 3LA 4	19500	22500	34800	41900	12500	253
7.1	3100	1.1	212	-	-	3/A 05 L2	BN 100LA 4	M 3LA 4	19500	22500	34800	41900	12500	253
7.3	3500	1.3	205	-	-	3/A 04 L2	BN 100LA 4	M 3LA 4	19300	22300	34500	41500	12400	243

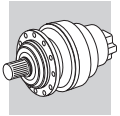


P₁ = 2.2 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]						
									MC/PC	MZ/PZ	HC	HZ	FZ		
7.6	5500	2.1	198	-	-	3/A 06 L2	BN 100LA 4	M 3LA 4	-	23700	26900	55800	65000	17800	263
8.5	3600	1.5	175	-	-	3/A 05 L2	BN 100LA 4	M 3LA 4	-	18300	21100	32900	39600	11700	253
8.6	2970	1.3	174	-	-	3/A 04 L2	BN 100LA 4	M 3LA 4	-	18200	21100	32800	39500	11700	243
9.2	2900	1.3	162	-	-	3/A 04 L2	BN 100LA 4	M 3LA 4	-	17800	20600	32100	38700	11400	243
9.2	2900	1.3	162	-	-	3/A 05 L2	BN 100LA 4	M 3LA 4	-	17800	20600	32100	38700	11400	253
10.1	2390	1.2	149	-	-	3/A 04 L2	BN 100LA 4	M 3LA 4	-	17300	20000	31300	37700	11100	243
10.7	3600	1.9	141	-	-	3/A 05 L2	BN 100LA 4	M 3LA 4	-	17000	19600	30800	37000	10900	253
11.6	2720	1.5	129	-	-	3/A 04 L2	BN 100LA 4	M 3LA 4	-	16500	19100	30000	36100	10600	243
12.4	3520	2.1	121	-	-	3/A 05 L2	BN 100LA 4	M 3LA 4	-	16200	18700	29400	35400	10400	253
12.8	2390	1.5	117	-	-	3/A 04 L2	BN 100LA 4	M 3LA 4	-	16000	18500	29100	35000	10300	243
14.5	3080	2.2	104	-	-	3/A 05 L2	BN 100LA 4	M 3LA 4	-	15300	17700	28100	33800	9840	253
14.7	2550	1.8	102	-	-	3/A 04 L2	BN 100LA 4	M 3LA 4	-	15300	17600	27900	33600	9790	243
15.5	1690	1.3	96.9	-	-	3/A 03 L2	BN 100LA 4	M 3LA 4	-	15000	17300	27500	33100	9630	233
16.5	2390	1.9	90.7	-	-	3/A 04 L2	BN 100LA 4	M 3LA 4	-	14700	17000	27000	32500	9420	243
16.9	1650	1.4	88.5	-	-	3/A 03 L2	BN 100LA 4	M 3LA 4	-	14600	16800	26800	32200	9340	233
18.4	2370	2.1	81.7	-	-	3/A 04 L2	BN 100LA 4	M 3LA 4	-	14200	16400	26200	31500	9100	243
18.4	1300	1.2	81.3	-	-	3/A 01 L2	BN 100LA 4	M 3LA 4	-	4610	4610	12800	14700	3030	225
19.8	3060	3.0	75.8	-	-	3/A 05 L2	BN 100LA 4	M 3LA 4	-	13800	16000	25600	30800	8870	253
20.2	1150	1.1	74.2	-	-	3/A 01 L2	BN 100LA 4	M 3LA 4	-	4470	4470	12400	14300	2940	225
20.5	1800	1.8	73.2	-	-	3/A 03 L2	BN 100LA 4	M 3LA 4	-	13700	15800	25300	30400	8770	233
21.9	2510	2.7	68.4	-	-	3/A 04 L2	BN 100LA 4	M 3LA 4	-	13400	15400	24800	29800	8580	243
23.8	1550	1.8	62.9	-	-	3/A 03 L2	BN 100LA 4	M 3LA 4	-	13000	15000	24200	29100	8340	233
25.2	1260	1.6	59.4	-	-	3/A 01 L2	BN 100LA 4	M 3LA 4	-	4150	4150	11600	13400	2730	225
27.7	1180	1.6	54.2	-	-	3/A 01 L2	BN 100LA 4	M 3LA 4	-	4020	4020	11300	13000	2650	225
28.6	1650	2.3	52.5	-	-	3/A 03 L2	BN 100LA 4	M 3LA 4	-	12200	14100	22900	27600	7850	233
28.6	1650	2.3	52.5	-	-	3/A 03 L2	BN 100LA 4	M 3LA 4	-	12200	14100	22900	27600	7850	233
31	830	1.2	49.1	-	-	3/A 01 L2	BN 100LA 4	M 3LA 4	-	3890	3890	11000	12600	2560	225
34	930	1.6	43.9	-	-	3/A 01 L2	BN 100LA 4	M 3LA 4	-	3750	3750	10600	12200	2470	225
36	650	1.2	41.5	-	-	3/A 00 L2	BN 100LA 4	M 3LA 4	-	3680	3680	10500	12000	2420	217
37	1650	3.0	40.5	-	-	3/A 03 L2	BN 100LA 4	M 3LA 4	-	11200	13000	21200	25500	7200	233
37	870	1.6	40.1	-	-	3/A 01 L2	BN 100LA 4	M 3LA 4	-	3640	3640	10300	11900	2390	225
38	550	1.0	39.6	-	-	3/A 00 L2	BN 100LA 4	M 3LA 4	-	3620	3620	10300	11800	2380	217
42	760	1.6	35.8	-	-	3/A 01 L2	BN 100LA 4	M 3LA 4	-	3500	3500	10000	11500	2300	225
47	650	1.5	31.7	-	-	3/A 00 L2	BN 100LA 4	M 3LA 4	-	3370	3370	9650	11100	2210	217
48	1180	2.8	31.2	-	-	3/A 01 L2	BN 100LA 4	M 3LA 4	-	3340	3340	9600	11000	2200	225
64	580	1.8	23.4	-	-	3/A 00 L2	BN 100LA 4	M 3LA 4	-	3040	3040	8810	10100	2000	217
65	870	2.8	23.0	-	-	3/A 01 L2	BN 100LA 4	M 3LA 4	-	3020	3020	8760	10100	1990	225
78	470	1.8	19.1	-	-	3/A 00 L2	BN 100LA 4	M 3LA 4	-	2840	2840	8290	9530	1870	217
80	710	2.8	18.8	-	-	3/A 01 L2	BN 100LA 4	M 3LA 4	-	2830	2830	8250	9470	1860	225

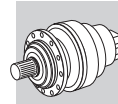
P₁ = 3 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
0.29	99000	1.3	5234	-	3/V 15 L4	-	BN 100LB 4	-	-	-	206000	243000	90000	332
0.30	83200	1.2	4959	-	3/V 14 L4	-	BN 100LB 4	-	-	-	206000	243000	90000	322
0.30	105000	1.5	4950	-	3/V 15 L4	-	BN 100LB 4	-	-	-	206000	243000	90000	332
0.30	124000	1.7	4950	-	3/V 16 L4	-	BN 100LB 4	-	-	-	345000	385000	150000	342
0.33	58000	0.9	4536	-	3/V 13 L4	-	BN 100LB 4	-	-	-	192000	231000	80000	312
0.35	83200	1.4	4312	-	3/V 14 L4	-	BN 100LB 4	-	-	-	206000	243000	90000	322
0.36	105000	1.7	4171	-	3/V 15 L4	-	BN 100LB 4	-	-	-	206000	243000	90000	332
0.36	138800	2.3	4171	-	3/V 16 L4	-	BN 100LB 4	-	-	-	345000	385000	150000	342
0.37	55400	1.0	4046	-	3/V 13 L4	-	BN 100LB 4	-	-	-	192000	231000	80000	312
0.38	75500	1.2	3993	-	3/V 14 L4	-	BN 100LB 4	-	-	-	206000	243000	90000	322
0.43	58000	1.1	3515	-	3/V 13 L4	-	BN 100LB 4	-	-	-	192000	231000	80000	312
0.43	138800	2.7	3514	-	3/V 16 L4	-	BN 100LB 4	-	-	-	345000	385000	150000	342
0.46	55400	1.1	3263	-	3/V 13 L4	-	BN 100LB 4	-	-	-	192000	231000	80000	312
0.46	135500	2.9	3250	-	3/V 16 L4	-	BN 100LB 4	-	-	-	345000	385000	150000	342
0.47	46900	0.9	3222	-	3/V 11 L4	-	BN 100LB 4	-	-	-	157000	195000	65000	302
0.47	80100	1.7	3182	-	3/V 14 L4	-	BN 100LB 4	-	-	-	206000	243000	90000	322
0.52	48300	1.1	2887	-	3/V 11 L4	-	BN 100LB 4	-	-	-	157000	195000	65000	302
0.54	83200	2.0	2782	-	3/V 14 L4	-	BN 100LB 4	-	-	-	206000	243000	90000	322
0.54	55400	1.4	2773	-	3/V 13 L4	-	BN 100LB 4	-	-	-	192000	231000	80000	312
0.55	114100	2.9	2738	-	3/V 16 L4	-	BN 100LB 4	-	-	-	345000	385000	150000	342








P₁ = 3 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
0.60	48300	1.3	2510	-	3/V 11 L4	-	BN 100LB 4	-	-	-	157000	195000	65000	302
0.60	83200	2.4	2504	-	3/V 14 L4	-	BN 100LB 4	-	-	-	206000	243000	90000	322
0.62	49000	1.4	2430	-	3/V 13 L3	-	BN 100LB 4	-	-	-	192000	231000	80000	312
0.64	34000	1.0	2329	-	3/V 11 L3	-	BN 100LB 4	-	-	-	157000	195000	65000	302
0.65	66800	2.1	2318	-	3/V 14 L3	-	BN 100LB 4	-	-	-	206000	243000	90000	322
0.68	32300	1.0	2209	-	3/V 10 L4	-	BN 100LB 4	-	-	-	133000	166000	65000	292
0.68	32300	1.0	2209	-	3/V 10 L4	-	BN 100LB 4	-	-	-	133000	166000	65000	292
0.74	58000	2.1	2019	-	3/V 13 L3	-	BN 100LB 4	-	-	-	192000	231000	80000	312
0.74	29400	1.0	2016	-	3/V 10 L4	-	BN 100LB 4	-	-	-	133000	166000	65000	292
0.74	29400	1.0	2016	-	3/V 10 L4	-	BN 100LB 4	-	-	-	133000	166000	65000	292
0.75	71000	2.6	1994	-	3/V 14 L3	-	BN 100LB 4	-	-	-	206000	243000	90000	322
0.76	43000	1.6	1963	-	3/V 11 L3	-	BN 100LB 4	-	-	-	157000	195000	65000	302
0.82	26700	1.0	1826	-	3/V 10 L4	-	BN 100LB 4	-	-	-	133000	166000	65000	292
0.82	26700	1.0	1826	-	3/V 10 L4	-	BN 100LB 4	-	-	-	133000	166000	65000	292
0.84	22000	0.9	1792	-	3/V 09 L3	-	BN 100LB 4	-	-	-	110000	145000	36000	282
0.89	58000	2.4	1682	-	3/V 13 L3	-	BN 100LB 4	-	-	-	192000	231000	80000	312
0.91	33300	1.3	1657	-	3/V 10 L4	-	BN 100LB 4	-	-	-	133000	166000	65000	292
0.91	33300	1.3	1657	-	3/V 10 L4	-	BN 100LB 4	-	-	-	133000	166000	65000	292
0.92	43000	1.8	1636	-	3/V 11 L3	-	BN 100LB 4	-	-	-	157000	195000	65000	302
0.94	56600	2.6	1589	-	3/V 14 L3	-	BN 100LB 4	-	-	-	206000	243000	90000	322
1.1	57400	2.8	1418	-	3/V 13 L3	-	BN 100LB 4	-	-	-	190500	225400	78500	312
1.1	21800	1.1	1411	-	3/V 10 L3	-	BN 100LB 4	-	-	-	130300	163800	63700	292
1.1	44700	2.3	1378	-	3/V 11 L3	-	BN 100LB 4	-	-	-	152900	190400	63200	302
1.1	47700	2.6	1339	-	3/V 14 L3	-	BN 100LB 4	-	-	-	199900	234700	86700	322
1.2	52800	2.9	1291	-	3/V 13 L3	-	BN 100LB 4	-	-	-	185200	219200	76100	312
1.2	21500	1.2	1288	-	3/V 09 L3	-	BN 100LB 4	-	-	-	107000	138000	34200	282
1.2	35100	1.9	1274	-	3/V 11 L3	-	BN 100LB 4	-	-	-	149300	186000	61600	302
1.2	21800	1.2	1227	-	3/V 10 L3	-	BN 100LB 4	-	-	-	124900	157100	60800	292
1.3	16200	0.9	1159	-	3/V 09 L3	-	BN 100LB 4	-	-	-	103600	133700	33000	282
1.3	29100	1.8	1120	-	3/V 10 L3	-	BN 100LB 4	-	-	-	121600	152800	59000	292
1.5	14400	1.0	1015	-	3/V 07 L3	-	BN 100LB 4	-	45400	57000	98000	128400	39500	272
1.5	35700	2.6	1004	-	3/V 11 L3	-	BN 100LB 4	-	-	-	139000	173200	56900	302
1.5	18100	1.2	1004	-	3/V 09 L3	-	BN 100LB 4	-	-	-	99300	128000	31500	282
1.5	31800	2.2	1004	-	3/V 10 L3	-	BN 100LB 4	-	-	-	117600	147900	56900	292
1.6	12300	0.9	920	-	3/V 07 L3	-	BN 100LB 4	-	44000	55200	95200	124700	38200	272
1.6	21800	1.6	920	-	3/V 10 L3	-	BN 100LB 4	-	-	-	114600	144100	55200	292
1.8	20100	1.6	840	-	3/V 09 L3	-	BN 100LB 4	-	-	-	94100	121400	29700	282
1.9	21400	1.8	800	-	3/V 09 L3	-	BN 100LB 4	-	-	-	92700	119600	29200	282
2.0	14200	1.3	761	-	3/V 07 L3	-	BN 100LB 4	-	41300	51800	89900	117800	35900	272
2.0	14400	1.3	761	-	3/V 09 L3	-	BN 100LB 4	-	-	-	91300	117800	28700	282
2.3	14400	1.5	655	-	3/V 07 L3	-	BN 100LB 4	-	39300	49300	85900	112600	34100	272
2.3	17600	1.8	655	-	3/V 09 L3	-	BN 100LB 4	-	-	-	87300	112600	27300	282
2.6	8560	1.0	569	-	3/V 06 L3	-	BN 100LB 4	-	33700	38200	76600	89200	25300	262
2.8	7590	0.9	527	-	3/V 06 L3	-	BN 100LB 4	-	32900	37200	74900	87200	24700	262
3.0	13600	1.7	507	-	3/V 07 L3	-	BN 100LB 4	-	36100	45300	79600	104300	31400	272
3.3	12300	1.7	460	-	3/V 07 L3	-	BN 100LB 4	-	34900	43800	77300	101300	30400	272
3.4	17700	2.7	442	-	3/V 09 L3	-	BN 100LB 4	-	-	-	77600	100100	24000	282
3.4	9180	1.2	439	-	-	3/A 07 L2	BN 100LB 4	M 3LB 4	34400	43100	76200	99900	29900	273
3.5	7760	1.0	435	-	-	3/A 06 L2	BN 100LB 4	M 3LB 4	30800	34900	70600	82300	23200	263
3.5	8820	1.3	427	-	3/V 06 L3	-	BN 100LB 4	-	30600	34700	70300	81800	23000	262
3.7	9080	1.3	405	-	-	3/A 07 L2	BN 100LB 4	M 3LB 4	33500	42000	74400	97500	29100	273
3.8	7590	1.2	395	-	3/V 06 L3	-	BN 100LB 4	-	29900	33800	68700	80000	22400	262
3.9	9020	1.4	386	-	3/V 07 L3	-	BN 100LB 4	-	32900	41300	73400	96100	28600	272
3.9	6180	0.9	380	-	-	3/A 06 L2	BN 100LB 4	M 3LB 4	29500	33400	67900	79000	22200	263
4.1	13000	2.3	370	-	3/V 09 L3	-	BN 100LB 4	-	-	-	73600	94900	22600	282
4.4	11500	1.9	341	-	-	3/A 07 L2	BN 100LB 4	M 3LB 4	31600	39700	70700	92600	27500	273
4.7	6610	1.2	321	-	-	3/A 06 L2	BN 100LB 4	M 3LB 4	27900	31600	64500	75100	20900	263
5.3	8700	1.7	282	-	-	3/A 07 L2	BN 100LB 4	M 3LB 4	29600	37200	66700	87400	25800	273
5.4	7760	1.6	276	-	-	3/A 06 L2	BN 100LB 4	M 3LB 4	26500	30000	61600	71800	19900	263
5.6	5500	1.2	267	-	-	3/A 06 L2	BN 100LB 4	M 3LB 4	26200	29700	61000	71100	19700	263
6.2	9000	2.1	241	-	-	3/A 07 L2	BN 100LB 4	M 3LB 4	28200	35300	63700	83500	24500	273
6.2	4290	1.0	241	-	-	3/A 05 L2	BN 100LB 4	M 3LB 4	20300	23500	36200	43500	13000	253
6.7	9000	2.3	223	-	-	3/A 07 L2	BN 100LB 4	M 3LB 4	27400	34400	62200	81500	23800	273
6.8	6520	1.7	221	-	-	3/A 06 L2	BN 100LB 4	M 3LB 4	24600	27900	57700	67100	18500	263
7.3	3500	0.9	205	-	-	3/A 04 L2	BN 100LB 4	M 3LB 4	19300	22300	34500	41500	12400	243
7.6	5500	1.6	198	-	-	3/A 06 L2	BN 100LB 4	M 3LB 4	23700	26900	55800	65000	17800	263
7.6	8700	2.5	198	-	-	3/A 07 L2	BN 100LB 4	M 3LB 4	26300	33000	60000	78600	22900	273

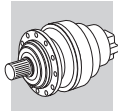


P₁ = 3 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]						
									MC/PC	MZ/PZ	HC	HZ	FZ		
7.9	7760	2.3	190	-	-	3/A 06 L2	BN 100LB 4	M 3LB 4	-	23400	26500	55100	64200	17600	263
8.5	3600	1.1	175	-	-	3/A 05 L2	BN 100LB 4	M 3LB 4	-	18300	21100	32900	39600	11700	253
8.6	2970	0.9	174	-	-	3/A 04 L2	BN 100LB 4	M 3LB 4	-	18200	21100	32800	39500	11700	243
9.2	6500	2.2	164	-	-	3/A 06 L2	BN 100LB 4	M 3LB 4	-	22300	25200	52700	61400	16700	263
9.2	2900	1.0	162	-	-	3/A 04 L2	BN 100LB 4	M 3LB 4	-	17800	20600	32100	38700	11400	243
9.2	2900	1.0	162	-	-	3/A 05 L2	BN 100LB 4	M 3LB 4	-	17800	20600	32100	38700	11400	253
10.7	3600	1.4	141	-	-	3/A 05 L2	BN 100LB 4	M 3LB 4	-	17000	19600	30800	37000	10900	253
11.6	2720	1.2	129	-	-	3/A 04 L2	BN 100LB 4	M 3LB 4	-	16500	19100	30000	36100	10600	243
12.0	5440	2.4	125	-	-	3/A 06 L2	BN 100LB 4	M 3LB 4	-	20300	23000	48600	56500	15300	263
12.4	3520	1.6	121	-	-	3/A 05 L2	BN 100LB 4	M 3LB 4	-	16200	18700	29400	35400	10400	253
12.8	2390	1.1	117	-	-	3/A 04 L2	BN 100LB 4	M 3LB 4	-	16000	18500	29100	35000	10300	243
14.5	3080	1.6	104	-	-	3/A 05 L2	BN 100LB 4	M 3LB 4	-	15300	17700	28100	33800	9840	253
14.7	2550	1.4	102	-	-	3/A 04 L2	BN 100LB 4	M 3LB 4	-	15300	17600	27900	33600	9790	243
15.5	1690	1.0	96.9	-	-	3/A 03 L2	BN 100LB 4	M 3LB 4	-	15000	17300	27500	33100	9630	233
16.5	2390	1.4	90.7	-	-	3/A 04 L2	BN 100LB 4	M 3LB 4	-	14700	17000	27000	32500	9420	243
16.9	1650	1.0	88.5	-	-	3/A 03 L2	BN 100LB 4	M 3LB 4	-	14600	16800	26800	32200	9340	233
17.5	3520	2.3	85.6	-	-	3/A 05 L2	BN 100LB 4	M 3LB 4	-	14400	16600	26500	31900	9240	253
18.4	2370	1.6	81.7	-	-	3/A 04 L2	BN 100LB 4	M 3LB 4	-	14200	16400	26200	31500	9100	243
19.8	3060	2.2	75.8	-	-	3/A 05 L2	BN 100LB 4	M 3LB 4	-	13800	16000	25600	30800	8870	253
20.5	1800	1.3	73.2	-	-	3/A 03 L2	BN 100LB 4	M 3LB 4	-	13700	15800	25300	30400	8770	233
20.7	3310	2.5	72.5	-	-	3/A 05 L2	BN 100LB 4	M 3LB 4	-	13600	15700	25200	30400	8740	253
21.9	2510	2.0	68.4	-	-	3/A 04 L2	BN 100LB 4	M 3LB 4	-	13400	15400	24800	29800	8580	243
23.8	1550	1.4	62.9	-	-	3/A 03 L2	BN 100LB 4	M 3LB 4	-	13000	15000	24200	29100	8340	233
24.0	3220	2.8	62.6	-	-	3/A 05 L2	BN 100LB 4	M 3LB 4	-	13000	15000	24200	29100	8330	253
24.0	2850	2.5	62.4	-	-	3/A 04 L2	BN 100LB 4	M 3LB 4	-	13000	15000	24100	29000	8320	243
25.2	1260	1.2	59.4	-	-	3/A 01 L2	BN 100LB 4	M 3LB 4	-	4150	4150	11600	13400	2730	225
27.5	2390	2.4	54.5	-	-	3/A 04 L2	BN 100LB 4	M 3LB 4	-	12400	14300	23200	27900	7950	243
27.7	1180	1.2	54.2	-	-	3/A 01 L2	BN 100LB 4	M 3LB 4	-	4020	4020	11300	13000	2650	225
28.6	1650	1.7	52.5	-	-	3/A 03 L2	BN 100LB 4	M 3LB 4	-	12200	14100	22900	27600	7850	233
28.6	1650	1.7	52.5	-	-	3/A 03 L2	BN 100LB 4	M 3LB 4	-	12200	14100	22900	27600	7850	233
30	2270	2.5	49.7	-	-	3/A 04 L2	BN 100LB 4	M 3LB 4	-	12000	13900	22500	27100	7710	243
31	830	0.9	49.1	-	-	3/A 01 L2	BN 100LB 4	M 3LB 4	-	3890	3890	11000	12600	2560	225
34	930	1.2	43.9	-	-	3/A 01 L2	BN 100LB 4	M 3LB 4	-	3750	3750	10600	12200	2470	225
35	1800	2.3	43.4	-	-	3/A 03 L2	BN 100LB 4	M 3LB 4	-	11500	13300	21600	26000	7370	233
37	1650	2.2	40.5	-	-	3/A 03 L2	BN 100LB 4	M 3LB 4	-	11200	13000	21200	25500	7200	233
37	870	1.2	40.1	-	-	3/A 01 L2	BN 100LB 4	M 3LB 4	-	3640	3640	10300	11900	2390	225
42	760	1.2	35.8	-	-	3/A 01 L2	BN 100LB 4	M 3LB 4	-	3500	3500	10000	11500	2300	225
45	1800	2.9	33.5	-	-	3/A 03 L2	BN 100LB 4	M 3LB 4	-	10500	12200	20000	24100	6760	233
47	650	1.1	31.7	-	-	3/A 00 L2	BN 100LB 4	M 3LB 4	-	3370	3370	9650	11100	2210	217
48	1180	2.1	31.2	-	-	3/A 01 L2	BN 100LB 4	M 3LB 4	-	3340	3340	9600	11000	2200	225
52	1550	3.0	28.8	-	-	3/A 03 L2	BN 100LB 4	M 3LB 4	-	10000	11600	19100	23000	6430	233
64	580	1.4	23.4	-	-	3/A 00 L2	BN 100LB 4	M 3LB 4	-	3040	3040	8810	10100	2000	217
65	870	2.1	23.0	-	-	3/A 01 L2	BN 100LB 4	M 3LB 4	-	3020	3020	8760	10100	1990	225
65	1240	3.0	23.0	-	-	3/A 03 L2	BN 100LB 4	M 3LB 4	-	9290	10700	17900	21500	5960	233
77	1050	3.0	19.4	-	-	3/A 03 L2	BN 100LB 4	M 3LB 4	-	8790	10100	17000	20500	5640	233
78	470	1.3	19.1	-	-	3/A 00 L2	BN 100LB 4	M 3LB 4	-	2840	2840	8290	9530	1870	217
80	710	2.1	18.8	-	-	3/A 01 L2	BN 100LB 4	M 3LB 4	-	2830	2830	8250	9470	1860	225

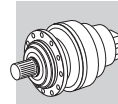
P₁ = 4 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
0.29	99000	1.0	5234	-	3/V 15 L4	-	BN 112M 4	-	-	-	206000	243000	90000	332
0.30	105000	1.1	4950	-	3/V 15 L4	-	BN 112M 4	-	-	-	206000	243000	90000	332
0.30	124000	1.3	4950	-	3/V 16 L4	-	BN 112M 4	-	-	-	345000	385000	150000	342
0.34	203000	2.4	4449	-	3/V 17 L4	-	BN 112M 4	-	-	-	442000	470000	150000	350
0.35	83200	1.0	4312	-	3/V 14 L4	-	BN 112M 4	-	-	-	206000	243000	90000	322
0.36	105000	1.3	4171	-	3/V 15 L4	-	BN 112M 4	-	-	-	206000	243000	90000	332
0.36	138800	1.7	4171	-	3/V 16 L4	-	BN 112M 4	-	-	-	345000	385000	150000	342
0.38	75500	0.9	3993	-	3/V 14 L4	-	BN 112M 4	-	-	-	206000	243000	90000	322
0.43	138800	2.0	3514	-	3/V 16 L4	-	BN 112M 4	-	-	-	345000	385000	150000	342
0.46	135500	2.1	3250	-	3/V 16 L4	-	BN 112M 4	-	-	-	345000	385000	150000	342
0.47	80100	1.2	3182	-	3/V 14 L4	-	BN 112M 4	-	-	-	206000	243000	90000	322
0.54	83200	1.5	2782	-	3/V 14 L4	-	BN 112M 4	-	-	-	206000	243000	90000	322








P₁ = 4 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
0.54	55400	1.1	2773	-	3/V 13 L4	-	BN 112M 4	-	-	-	192000	231000	80000	312
0.55	114100	2.1	2738	-	3/V 16 L4	-	BN 112M 4	-	-	-	345000	385000	150000	342
0.60	48300	0.9	2510	-	3/V 11 L4	-	BN 112M 4	-	-	-	157000	195000	65000	302
0.60	83200	1.8	2504	-	3/V 14 L4	-	BN 112M 4	-	-	-	206000	243000	90000	322
0.62	49000	1.1	2430	-	3/V 13 L3	-	BN 112M 4	-	-	-	192000	231000	80000	312
0.65	66800	1.5	2318	-	3/V 14 L3	-	BN 112M 4	-	-	-	206000	243000	90000	322
0.74	58000	1.5	2019	-	3/V 13 L3	-	BN 112M 4	-	-	-	192000	231000	80000	312
0.75	71000	1.9	1994	-	3/V 14 L3	-	BN 112M 4	-	-	-	206000	243000	90000	322
0.76	43000	1.2	1963	-	3/V 11 L3	-	BN 112M 4	-	-	-	157000	195000	65000	302
0.89	58000	1.8	1682	-	3/V 13 L3	-	BN 112M 4	-	-	-	192000	231000	80000	312
0.90	75500	2.4	1662	-	3/V 14 L3	-	BN 112M 4	-	-	-	206000	243000	90000	322
0.91	33300	1.0	1657	-	3/V 10 L4	-	BN 112M 4	-	-	-	133000	166000	65000	292
0.91	33300	1.0	1657	-	3/V 10 L4	-	BN 112M 4	-	-	-	133000	166000	65000	292
0.92	43000	1.4	1636	-	3/V 11 L3	-	BN 112M 4	-	-	-	157000	195000	65000	302
0.94	56600	1.9	1589	-	3/V 14 L3	-	BN 112M 4	-	-	-	206000	243000	90000	322
1.1	57400	2.1	1418	-	3/V 13 L3	-	BN 112M 4	-	-	-	190500	225400	78500	312
1.1	44700	1.7	1378	-	3/V 11 L3	-	BN 112M 4	-	-	-	152900	190400	63200	302
1.1	47700	1.9	1339	-	3/V 14 L3	-	BN 112M 4	-	-	-	199900	234700	86700	322
1.1	62300	2.4	1324	-	3/V 14 L3	-	BN 112M 4	-	-	-	199300	233900	86300	322
1.2	52800	2.1	1291	-	3/V 13 L3	-	BN 112M 4	-	-	-	185200	219200	76100	312
1.2	35100	1.4	1274	-	3/V 11 L3	-	BN 112M 4	-	-	-	149300	186000	61600	302
1.2	21800	0.9	1227	-	3/V 10 L3	-	BN 112M 4	-	-	-	124900	157100	60800	292
1.3	29100	1.3	1120	-	3/V 10 L3	-	BN 112M 4	-	-	-	121600	152800	59000	292
1.3	52500	2.4	1116	-	3/V 14 L3	-	BN 112M 4	-	-	-	189300	222200	81500	322
1.4	51200	2.4	1088	-	3/V 13 L3	-	BN 112M 4	-	-	-	175900	208200	71900	312
1.5	35700	1.9	1004	-	3/V 11 L3	-	BN 112M 4	-	-	-	139000	173200	56900	302
1.5	18100	0.9	1004	-	3/V 09 L3	-	BN 112M 4	-	-	-	99300	128000	31500	282
1.5	31800	1.6	1004	-	3/V 10 L3	-	BN 112M 4	-	-	-	117600	147900	56900	292
1.6	21800	1.2	920	-	3/V 10 L3	-	BN 112M 4	-	-	-	114600	144100	55200	292
1.7	41000	2.4	900	-	3/V 11 L3	-	BN 112M 4	-	-	-	134500	167600	54800	302
1.8	20100	1.2	840	-	3/V 09 L3	-	BN 112M 4	-	-	-	94100	121400	29700	282
1.9	21400	1.4	800	-	3/V 09 L3	-	BN 112M 4	-	-	-	92700	119600	29200	282
2.0	14200	1.0	761	-	3/V 07 L3	-	BN 112M 4	-	41300	51800	89900	117800	35900	272
2.0	14400	0.9	761	-	3/V 09 L3	-	BN 112M 4	-	-	-	91300	117800	28700	282
2.3	14400	1.1	655	-	3/V 07 L3	-	BN 112M 4	-	39300	49300	85900	112600	34100	272
2.3	17600	1.3	655	-	3/V 09 L3	-	BN 112M 4	-	-	-	87300	112600	27300	282
3.0	13600	1.3	507	-	3/V 07 L3	-	BN 112M 4	-	36100	45300	79600	104300	31400	272
3.3	12300	1.3	460	-	3/V 07 L3	-	BN 112M 4	-	34900	43800	77300	101300	30400	272
3.4	17700	2.0	442	-	3/V 09 L3	-	BN 112M 4	-	-	-	77600	100100	24000	282
3.5	8820	1.0	427	-	3/V 06 L3	-	BN 112M 4	-	30600	34700	70300	81800	23000	262
3.7	9080	0.9	405	-	-	3/A 07 L2	BN 112M 4	M 3LC 4	33500	42000	74400	97500	29100	273
3.9	9020	1.1	386	-	3/V 07 L3	-	BN 112M 4	-	32900	41300	73400	96100	28600	272
4.1	13000	1.7	370	-	3/V 09 L3	-	BN 112M 4	-	-	-	73600	94900	22600	282
4.4	11500	1.4	341	-	-	3/A 07 L2	BN 112M 4	M 3LC 4	31600	39700	70700	92600	27500	273
5.3	8700	1.3	282	-	-	3/A 07 L2	BN 112M 4	M 3LC 4	29600	37200	66700	87400	25800	273
5.4	7760	1.2	276	-	-	3/A 06 L2	BN 112M 4	M 3LC 4	26500	30000	61600	71800	19900	263
6.2	9000	1.6	241	-	-	3/A 07 L2	BN 112M 4	M 3LC 4	28200	35300	63700	83500	24500	273
6.7	9000	1.7	223	-	-	3/A 07 L2	BN 112M 4	M 3LC 4	27400	34400	62200	81500	23800	273
6.8	6520	1.2	221	-	-	3/A 06 L2	BN 112M 4	M 3LC 4	24600	27900	57700	67100	18500	263
7.6	5500	1.2	198	-	-	3/A 06 L2	BN 112M 4	M 3LC 4	23700	26900	55800	65000	17800	263
7.6	8700	1.8	198	-	-	3/A 07 L2	BN 112M 4	M 3LC 4	26300	33000	60000	78600	22900	273
7.9	7760	1.7	190	-	-	3/A 06 L2	BN 112M 4	M 3LC 4	23400	26500	55100	64200	17600	263
8.3	10900	2.5	180	-	-	3/A 07 L2	BN 112M 4	M 3LC 4	25500	32000	58300	76500	22200	273
9.2	6500	1.7	164	-	-	3/A 06 L2	BN 112M 4	M 3LC 4	22300	25200	52700	61400	16700	263
9.7	9000	2.4	155	-	-	3/A 07 L2	BN 112M 4	M 3LC 4	24300	30500	55800	73100	21100	273
10.7	7760	2.3	141	-	-	3/A 06 L2	BN 112M 4	M 3LC 4	21200	24000	50400	58700	15900	263
10.7	3600	1.0	141	-	-	3/A 05 L2	BN 112M 4	M 3LC 4	17000	19600	30800	37000	10900	253
12.0	5440	1.8	125	-	-	3/A 06 L2	BN 112M 4	M 3LC 4	20300	23000	48600	56500	15300	263
12.4	3520	1.2	121	-	-	3/A 05 L2	BN 112M 4	M 3LC 4	16200	18700	29400	35400	10400	253
13.4	6180	2.3	112	-	-	3/A 06 L2	BN 112M 4	M 3LC 4	19600	22200	47100	54800	14700	263
14.5	3080	1.2	104	-	-	3/A 05 L2	BN 112M 4	M 3LC 4	15300	17700	28100	33800	9840	253
14.7	2550	1.0	102	-	-	3/A 04 L2	BN 112M 4	M 3LC 4	15300	17600	27900	33600	9790	243
15.3	5380	2.2	98.3	-	-	3/A 06 L2	BN 112M 4	M 3LC 4	18800	21300	45200	52700	14100	263
16.5	2390	1.1	90.7	-	-	3/A 04 L2	BN 112M 4	M 3LC 4	14700	17000	27000	32500	9420	243
16.9	6210	2.8	88.5	-	-	3/A 06 L2	BN 112M 4	M 3LC 4	18100	20600	43800	51000	13600	263
17.5	3520	1.7	85.6	-	-	3/A 05 L2	BN 112M 4	M 3LC 4	14400	16600	26500	31900	9240	253
18.4	2370	1.2	81.7	-	-	3/A 04 L2	BN 112M 4	M 3LC 4	14200	16400	26200	31500	9100	243

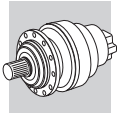


P₁ = 4 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]						
									MC/PC	MZ/PZ	HC	HZ	FZ		
19.8	3060	1.6	75.8	–	–	3/A 05 L2	BN 112M 4	M 3LC 4	–	13800	16000	25600	30800	8870	253
20.5	1800	1.0	73.2	–	–	3/A 03 L2	BN 112M 4	M 3LC 4	–	13700	15800	25300	30400	8770	233
20.7	3310	1.9	72.5	–	–	3/A 05 L2	BN 112M 4	M 3LC 4	–	13600	15700	25200	30400	8740	253
21.9	2510	1.5	68.4	–	–	3/A 04 L2	BN 112M 4	M 3LC 4	–	13400	15400	24800	29800	8580	243
23.8	1550	1.0	62.9	–	–	3/A 03 L2	BN 112M 4	M 3LC 4	–	13000	15000	24200	29100	8340	233
24.0	3220	2.1	62.6	–	–	3/A 05 L2	BN 112M 4	M 3LC 4	–	13000	15000	24200	29100	8330	253
24.0	2850	1.9	62.4	–	–	3/A 04 L2	BN 112M 4	M 3LC 4	–	13000	15000	24100	29000	8320	243
26.3	3310	2.4	57.0	–	–	3/A 05 L2	BN 112M 4	M 3LC 4	–	12600	14500	23500	28300	8070	253
27.5	2390	1.8	54.5	–	–	3/A 04 L2	BN 112M 4	M 3LC 4	–	12400	14300	23200	27900	7950	243
28.2	3040	2.3	53.3	–	–	3/A 05 L2	BN 112M 4	M 3LC 4	–	12300	14200	23000	27700	7890	253
28.6	1650	1.3	52.5	–	–	3/A 03 L2	BN 112M 4	M 3LC 4	–	12200	14100	22900	27600	7850	233
28.6	1650	1.3	52.5	–	–	3/A 03 L2	BN 112M 4	M 3LC 4	–	12200	14100	22900	27600	7850	233
30	2270	1.9	49.7	–	–	3/A 04 L2	BN 112M 4	M 3LC 4	–	12000	13900	22500	27100	7710	243
34	2850	2.6	44.3	–	–	3/A 04 L2	BN 112M 4	M 3LC 4	–	11600	13300	21800	26200	7420	243
35	1800	1.7	43.4	–	–	3/A 03 L2	BN 112M 4	M 3LC 4	–	11500	13300	21600	26000	7370	233
37	1650	1.7	40.5	–	–	3/A 03 L2	BN 112M 4	M 3LC 4	–	11200	13000	21200	25500	7200	233
38	2270	2.4	39.1	–	–	3/A 04 L2	BN 112M 4	M 3LC 4	–	11100	12800	21000	25200	7120	243
43	2270	2.6	35.3	–	–	3/A 04 L2	BN 112M 4	M 3LC 4	–	10700	12400	20300	24500	6880	243
45	1800	2.2	33.5	–	–	3/A 03 L2	BN 112M 4	M 3LC 4	–	10500	12200	20000	24100	6760	233
48	1180	1.5	31.2	–	–	3/A 01 L2	BN 112M 4	M 3LC 4	–	3340	3340	9600	11000	2200	225
52	1550	2.2	28.8	–	–	3/A 03 L2	BN 112M 4	M 3LC 4	–	10000	11600	19100	23000	6430	233
64	580	1.0	23.4	–	–	3/A 00 L2	BN 112M 4	M 3LC 4	–	3040	3040	8810	10100	2000	217
65	870	1.5	23.0	–	–	3/A 01 L2	BN 112M 4	M 3LC 4	–	3020	3020	8760	10100	1990	225
65	1240	2.2	23.0	–	–	3/A 03 L2	BN 112M 4	M 3LC 4	–	9290	10700	17900	21500	5960	233
77	1050	2.2	19.4	–	–	3/A 03 L2	BN 112M 4	M 3LC 4	–	8790	10100	17000	20500	5640	233
78	470	1.0	19.1	–	–	3/A 00 L2	BN 112M 4	M 3LC 4	–	2840	2840	8290	9530	1870	217
80	710	1.5	18.8	–	–	3/A 01 L2	BN 112M 4	M 3LC 4	–	2830	2830	8250	9470	1860	225

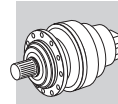
P₁ = 5.5 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
0.29	280600	2.0	5099	–	3/V 18 L4	–	BN 132S 4	–	–	–	503000	565000	200000	358
0.30	155000	1.1	4970	–	3/V 17 L4	–	BN 132S 4	–	–	–	442000	470000	150000	350
0.30	124000	1.0	4950	–	3/V 16 L4	–	BN 132S 4	–	–	–	345000	385000	150000	342
0.34	359700	2.9	4457	–	3/V 19 L4	–	BN 132S 4	–	–	–	638000	702000	200000	366
0.34	203000	1.8	4449	–	3/V 17 L4	–	BN 132S 4	–	–	–	442000	470000	150000	350
0.34	280600	2.3	4386	–	3/V 18 L4	–	BN 132S 4	–	–	–	503000	565000	200000	358
0.36	105000	1.0	4171	–	3/V 15 L4	–	BN 132S 4	–	–	–	206000	243000	90000	332
0.36	138800	1.3	4171	–	3/V 16 L4	–	BN 132S 4	–	–	–	345000	385000	150000	342
0.36	184300	1.6	4129	–	3/V 17 L4	–	BN 132S 4	–	–	–	442000	470000	150000	350
0.41	280600	2.8	3696	–	3/V 18 L4	–	BN 132S 4	–	–	–	503000	565000	200000	358
0.43	138800	1.5	3514	–	3/V 16 L4	–	BN 132S 4	–	–	–	345000	385000	150000	342
0.43	280600	2.9	3495	–	3/V 18 L4	–	BN 132S 4	–	–	–	503000	565000	200000	358
0.43	99000	1.0	3489	–	3/V 15 L4	–	BN 132S 4	–	–	–	206000	243000	90000	332
0.45	105000	1.2	3300	–	3/V 15 L4	–	BN 132S 4	–	–	–	206000	243000	90000	332
0.46	135500	1.6	3250	–	3/V 16 L4	–	BN 132S 4	–	–	–	345000	385000	150000	342
0.47	80100	0.9	3182	–	3/V 14 L4	–	BN 132S 4	–	–	–	206000	243000	90000	322
0.47	190800	2.2	3168	–	3/V 17 L4	–	BN 132S 4	–	–	–	442000	470000	150000	350
0.54	83200	1.1	2782	–	3/V 14 L4	–	BN 132S 4	–	–	–	206000	243000	90000	322
0.54	105000	1.4	2780	–	3/V 15 L4	–	BN 132S 4	–	–	–	206000	243000	90000	332
0.54	166400	2.3	2773	–	3/V 17 L4	–	BN 132S 4	–	–	–	442000	470000	150000	350
0.55	114100	1.6	2738	–	3/V 16 L4	–	BN 132S 4	–	–	–	345000	385000	150000	342
0.60	83200	1.3	2504	–	3/V 14 L4	–	BN 132S 4	–	–	–	206000	243000	90000	322
0.64	138800	2.1	2343	–	3/V 16 L4	–	BN 132S 4	–	–	–	345000	385000	150000	342
0.65	66800	1.1	2318	–	3/V 14 L3	–	BN 132S 4	–	–	–	206000	243000	90000	322
0.65	83500	1.5	2318	–	3/V 15 L3	–	BN 132S 4	–	–	–	206000	243000	90000	332
0.69	128500	2.1	2167	–	3/V 16 L4	–	BN 132S 4	–	–	–	345000	385000	150000	342
0.74	58000	1.1	2019	–	3/V 13 L3	–	BN 132S 4	–	–	–	192000	231000	80000	312
0.75	71000	1.4	1994	–	3/V 14 L3	–	BN 132S 4	–	–	–	206000	243000	90000	322
0.75	94300	1.9	1994	–	3/V 15 L3	–	BN 132S 4	–	–	–	206000	243000	90000	332
0.82	108300	2.1	1826	–	3/V 16 L4	–	BN 132S 4	–	–	–	345000	385000	150000	342
0.89	58000	1.3	1682	–	3/V 13 L3	–	BN 132S 4	–	–	–	192000	231000	80000	312
0.90	75500	1.8	1662	–	3/V 14 L3	–	BN 132S 4	–	–	–	206000	243000	90000	322








P₁ = 5.5 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
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0.92	43000	1.0	1636	-	3/V 11 L3	-	BN 132S 4	-	-	-	157000	195000	65000	302
0.93	49000	1.1	1620	-	3/V 13 L3	-	BN 132S 4	-	-	-	192000	231000	80000	312
0.94	56600	1.4	1589	-	3/V 14 L3	-	BN 132S 4	-	-	-	206000	243000	90000	322
0.94	112100	2.7	1589	-	3/V 16 L3	-	BN 132S 4	-	-	-	345000	385000	150000	342
1.1	57400	1.6	1418	-	3/V 13 L3	-	BN 132S 4	-	-	-	190500	225400	78500	312
1.1	86900	2.4	1400	-	3/V 15 L3	-	BN 132S 4	-	-	-	202600	237900	88000	332
1.1	44700	1.3	1378	-	3/V 11 L3	-	BN 132S 4	-	-	-	152900	190400	63200	302
1.1	47700	1.4	1339	-	3/V 14 L3	-	BN 132S 4	-	-	-	199900	234700	86700	322
1.1	97300	2.8	1329	-	3/V 15 L3	-	BN 132S 4	-	-	-	199500	234200	86400	332
1.1	62300	1.8	1324	-	3/V 14 L3	-	BN 132S 4	-	-	-	199300	233900	86300	322
1.2	52800	1.6	1291	-	3/V 13 L3	-	BN 132S 4	-	-	-	185200	219200	76100	312
1.2	35100	1.1	1274	-	3/V 11 L3	-	BN 132S 4	-	-	-	149300	186000	61600	302
1.3	29100	1.0	1120	-	3/V 10 L3	-	BN 132S 4	-	-	-	121600	152800	59000	292
1.3	52500	1.8	1116	-	3/V 14 L3	-	BN 132S 4	-	-	-	189300	222200	81500	322
1.4	43200	1.5	1103	-	3/V 11 L3	-	BN 132S 4	-	-	-	143000	178100	58700	302
1.4	51200	1.8	1088	-	3/V 13 L3	-	BN 132S 4	-	-	-	175900	208200	71900	312
1.5	54300	1.9	1009	-	3/V 13 L3	-	BN 132S 4	-	-	-	172000	203600	70100	312
1.5	35700	1.4	1004	-	3/V 11 L3	-	BN 132S 4	-	-	-	139000	173200	56900	302
1.5	31800	1.2	1004	-	3/V 10 L3	-	BN 132S 4	-	-	-	117600	147900	56900	292
1.5	61900	2.2	997	-	3/V 14 L3	-	BN 132S 4	-	-	-	183000	214800	78500	322
1.7	41000	1.8	900	-	3/V 11 L3	-	BN 132S 4	-	-	-	134500	167600	54800	302
1.7	55200	2.3	893	-	3/V 14 L3	-	BN 132S 4	-	-	-	177000	207800	75700	322
1.7	53800	2.3	870	-	3/V 13 L3	-	BN 132S 4	-	-	-	164500	194700	66700	312
1.8	41400	1.8	827	-	3/V 11 L3	-	BN 132S 4	-	-	-	131100	163400	53300	302
1.9	21400	1.0	800	-	3/V 09 L3	-	BN 132S 4	-	-	-	92700	119600	29200	282
1.9	49300	2.2	794	-	3/V 14 L3	-	BN 132S 4	-	-	-	170900	200700	72800	322
1.9	22400	1.0	773	-	3/V 10 L3	-	BN 132S 4	-	-	-	108700	136700	52100	292
2.0	45800	2.3	741	-	3/V 13 L3	-	BN 132S 4	-	-	-	156800	185500	63200	312
2.1	40200	2.1	720	-	3/V 11 L3	-	BN 132S 4	-	-	-	125800	156700	50900	302
2.1	21900	1.1	701	-	3/V 10 L3	-	BN 132S 4	-	-	-	105600	132800	50400	292
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2.3	17600	1.0	655	-	3/V 09 L3	-	BN 132S 4	-	-	-	87300	112600	27300	282
2.3	40000	2.2	644	-	3/V 11 L3	-	BN 132S 4	-	-	-	121700	151600	49000	302
2.4	21800	1.2	614	-	3/V 10 L3	-	BN 132S 4	-	-	-	101500	127600	48300	292
2.7	25900	1.6	560	-	3/V 10 L3	-	BN 132S 4	-	-	-	98700	124100	46800	292
3.0	13600	0.9	507	-	3/V 07 L3	-	BN 132S 4	-	36100	45300	79600	104300	31400	272
3.0	14300	1.0	507	-	3/V 09 L3	-	BN 132S 4	-	-	-	80900	104300	25100	282
3.0	25900	1.8	507	-	3/V 10 L3	-	BN 132S 4	-	-	-	95800	120500	45300	292
3.3	12300	0.9	460	-	3/V 07 L3	-	BN 132S 4	-	34900	43800	77300	101300	30400	272
3.4	17700	1.5	442	-	3/V 09 L3	-	BN 132S 4	-	-	-	77600	100100	24000	282
3.4	26700	2.2	436	-	3/V 10 L3	-	BN 132S 4	-	-	-	91600	115200	43100	292
4.1	13000	1.3	370	-	3/V 09 L3	-	BN 132S 4	-	-	-	73600	94900	22600	282
4.4	11500	1.1	341	-	-	3/A 07 L2	BN 132S 4	-	31600	39700	70700	92600	27500	273
5.3	8700	1.0	282	-	-	3/A 07 L2	BN 132S 4	-	29600	37200	66700	87400	25800	273
6.2	9000	1.2	241	-	-	3/A 07 L2	BN 132S 4	-	28200	35300	63700	83500	24500	273
6.7	9000	1.3	223	-	-	3/A 07 L2	BN 132S 4	-	27400	34400	62200	81500	23800	273
6.8	6520	0.9	221	-	-	3/A 06 L2	BN 132S 4	-	24600	27900	57700	67100	18500	263
7.6	8700	1.4	198	-	-	3/A 07 L2	BN 132S 4	-	26300	33000	60000	78600	22900	273
7.9	7760	1.3	190	-	-	3/A 06 L2	BN 132S 4	-	23400	26500	55100	64200	17600	263
8.3	10900	1.9	180	-	-	3/A 07 L2	BN 132S 4	-	25500	32000	58300	76500	22200	273
9.2	6500	1.2	164	-	-	3/A 06 L2	BN 132S 4	-	22300	25200	52700	61400	16700	263
9.7	9000	1.8	155	-	-	3/A 07 L2	BN 132S 4	-	24300	30500	55800	73100	21100	273
10.7	7760	1.7	141	-	-	3/A 06 L2	BN 132S 4	-	21200	24000	50400	58700	15900	263
10.7	11100	2.5	140	-	-	3/A 07 L2	BN 132S 4	-	23500	29500	54100	70900	20400	273
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12.0	5440	1.3	125	-	-	3/A 06 L2	BN 132S 4	-	20300	23000	48600	56500	15300	263
13.4	6180	1.7	112	-	-	3/A 06 L2	BN 132S 4	-	19600	22200	47100	54800	14700	263
13.8	8860	2.6	109	-	-	3/A 07 L2	BN 132S 4	-	21600	27100	50100	65700	18800	273
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15.3	5380	1.7	98.3	-	-	3/A 06 L2	BN 132S 4	-	18800	21300	45200	52700	14100	263
16.9	6210	2.1	88.5	-	-	3/A 06 L2	BN 132S 4	-	18100	20600	43800	51000	13600	263
17.5	3520	1.3	85.6	-	-	3/A 05 L2	BN 132S 4	-	14400	16600	26500	31900	9240	253
18.5	6480	2.4	81.2	-	-	3/A 06 L2	BN 132S 4	-	17600	20000	42700	49700	13200	263
19.8	3060	1.2	75.8	-	-	3/A 05 L2	BN 132S 4	-	13800	16000	25600	30800	8870	253
20.7	3310	1.4	72.5	-	-	3/A 05 L2	BN 132S 4	-	13600	15700	25200	30400	8740	253
21.5	5690	2.5	69.9	-	-	3/A 06 L2	BN 132S 4	-	16800	19000	40800	47500	12600	263

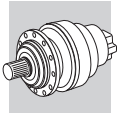


P₁ = 5.5 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]						
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21.9	2510	1.1	68.4	-	-	3/A 04 L2	BN 132S 4	-	-	13400	15400	24800	29800	8580	243
24.0	3220	1.6	62.6	-	-	3/A 05 L2	BN 132S 4	-	-	13000	15000	24200	29100	8330	253
24.0	2850	1.4	62.4	-	-	3/A 04 L2	BN 132S 4	-	-	13000	15000	24100	29000	8320	243
26.3	3310	1.8	57.0	-	-	3/A 05 L2	BN 132S 4	-	-	12600	14500	23500	28300	8070	253
26.9	4530	2.5	55.7	-	-	3/A 06 L2	BN 132S 4	-	-	15500	17600	38100	44400	11700	263
27.5	2390	1.3	54.5	-	-	3/A 04 L2	BN 132S 4	-	-	12400	14300	23200	27900	7950	243
28.2	3040	1.7	53.3	-	-	3/A 05 L2	BN 132S 4	-	-	12300	14200	23000	27700	7890	253
30	2270	1.4	49.7	-	-	3/A 04 L2	BN 132S 4	-	-	12000	13900	22500	27100	7710	243
32	3840	2.5	47.2	-	-	3/A 06 L2	BN 132S 4	-	-	14700	16700	36300	42300	11000	263
34	2850	2.0	44.3	-	-	3/A 04 L2	BN 132S 4	-	-	11600	13300	21800	26200	7420	243
34	3310	2.3	44.0	-	-	3/A 05 L2	BN 132S 4	-	-	11500	13300	21700	26100	7400	253
38	2270	1.8	39.1	-	-	3/A 04 L2	BN 132S 4	-	-	11100	12800	21000	25200	7120	243
38	3020	2.4	39.0	-	-	3/A 05 L2	BN 132S 4	-	-	11100	12800	21000	25200	7110	253
43	2270	2.0	35.3	-	-	3/A 04 L2	BN 132S 4	-	-	10700	12400	20300	24500	6880	243
50	2270	2.3	30.2	-	-	3/A 04 L2	BN 132S 4	-	-	10200	11700	19400	23300	6530	243
59	1920	2.3	25.6	-	-	3/A 04 L2	BN 132S 4	-	-	9630	11100	18500	22200	6180	243

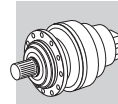
P₁ = 7.5 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]						
									MC/PC	MZ/PZ	HC	HZ	FZ		
0.29	403700	2.2	5164	-	3/V 19 L4	-	BN 132MA 4	-	-	-	-	638000	702000	200000	366
0.29	280600	1.5	5099	-	3/V 18 L4	-	BN 132MA 4	-	-	-	-	503000	565000	200000	358
0.34	359700	2.1	4457	-	3/V 19 L4	-	BN 132MA 4	-	-	-	-	638000	702000	200000	366
0.34	203000	1.3	4449	-	3/V 17 L4	-	BN 132MA 4	-	-	-	-	442000	470000	150000	350
0.34	280600	1.7	4386	-	3/V 18 L4	-	BN 132MA 4	-	-	-	-	503000	565000	200000	358
0.36	138800	0.9	4171	-	3/V 16 L4	-	BN 132MA 4	-	-	-	-	345000	385000	150000	342
0.36	184300	1.2	4129	-	3/V 17 L4	-	BN 132MA 4	-	-	-	-	442000	470000	150000	350
0.37	380000	2.5	4095	-	3/V 19 L4	-	BN 132MA 4	-	-	-	-	638000	702000	200000	366
0.41	280600	2.0	3696	-	3/V 18 L4	-	BN 132MA 4	-	-	-	-	503000	565000	200000	358
0.43	138800	1.1	3514	-	3/V 16 L4	-	BN 132MA 4	-	-	-	-	345000	385000	150000	342
0.43	280600	2.1	3495	-	3/V 18 L4	-	BN 132MA 4	-	-	-	-	503000	565000	200000	358
0.46	135500	1.1	3250	-	3/V 16 L4	-	BN 132MA 4	-	-	-	-	345000	385000	150000	342
0.46	367600	2.9	3231	-	3/V 19 L4	-	BN 132MA 4	-	-	-	-	638000	702000	200000	366
0.47	190800	1.6	3168	-	3/V 17 L4	-	BN 132MA 4	-	-	-	-	442000	470000	150000	350
0.51	273300	2.4	2945	-	3/V 18 L4	-	BN 132MA 4	-	-	-	-	503000	565000	200000	358
0.54	105000	1.0	2780	-	3/V 15 L4	-	BN 132MA 4	-	-	-	-	206000	243000	90000	332
0.54	166400	1.7	2773	-	3/V 17 L4	-	BN 132MA 4	-	-	-	-	442000	470000	150000	350
0.55	114100	1.1	2738	-	3/V 16 L4	-	BN 132MA 4	-	-	-	-	345000	385000	150000	342
0.60	83200	0.9	2504	-	3/V 14 L4	-	BN 132MA 4	-	-	-	-	206000	243000	90000	322
0.61	280600	2.9	2464	-	3/V 18 L4	-	BN 132MA 4	-	-	-	-	503000	565000	200000	358
0.64	138800	1.5	2343	-	3/V 16 L4	-	BN 132MA 4	-	-	-	-	345000	385000	150000	342
0.65	83500	1.0	2318	-	3/V 15 L3	-	BN 132MA 4	-	-	-	-	206000	243000	90000	332
0.65	212900	2.4	2295	-	3/V 18 L4	-	BN 132MA 4	-	-	-	-	503000	565000	200000	358
0.69	128500	1.5	2167	-	3/V 16 L4	-	BN 132MA 4	-	-	-	-	345000	385000	150000	342
0.75	71000	1.0	1994	-	3/V 14 L3	-	BN 132MA 4	-	-	-	-	206000	243000	90000	322
0.75	94300	1.4	1994	-	3/V 15 L3	-	BN 132MA 4	-	-	-	-	206000	243000	90000	332
0.82	108300	1.5	1826	-	3/V 16 L4	-	BN 132MA 4	-	-	-	-	345000	385000	150000	342
0.89	58000	1.0	1682	-	3/V 13 L3	-	BN 132MA 4	-	-	-	-	192000	231000	80000	312
0.90	75500	1.3	1662	-	3/V 14 L3	-	BN 132MA 4	-	-	-	-	206000	243000	90000	322
0.90	99000	1.7	1662	-	3/V 15 L3	-	BN 132MA 4	-	-	-	-	206000	243000	90000	332
0.94	56600	1.0	1589	-	3/V 14 L3	-	BN 132MA 4	-	-	-	-	206000	243000	90000	322
0.94	112100	2.0	1589	-	3/V 16 L3	-	BN 132MA 4	-	-	-	-	345000	385000	150000	342
1.1	57400	1.1	1418	-	3/V 13 L3	-	BN 132MA 4	-	-	-	-	190500	225400	78500	312
1.1	86900	1.7	1400	-	3/V 15 L3	-	BN 132MA 4	-	-	-	-	202600	237900	88000	332
1.1	44700	0.9	1378	-	3/V 11 L3	-	BN 132MA 4	-	-	-	-	152900	190400	63200	302
1.1	47700	1.0	1339	-	3/V 14 L3	-	BN 132MA 4	-	-	-	-	199900	234700	86700	322
1.1	97300	2.0	1329	-	3/V 15 L3	-	BN 132MA 4	-	-	-	-	199500	234200	86400	332
1.1	62300	1.3	1324	-	3/V 14 L3	-	BN 132MA 4	-	-	-	-	199300	233900	86300	322
1.1	112100	2.4	1324	-	3/V 16 L3	-	BN 132MA 4	-	-	-	-	331300	368500	143900	342
1.2	52800	1.1	1291	-	3/V 13 L3	-	BN 132MA 4	-	-	-	-	185200	219200	76100	312
1.3	92200	2.2	1120	-	3/V 15 L3	-	BN 132MA 4	-	-	-	-	189500	222500	81600	332
1.3	52500	1.3	1116	-	3/V 14 L3	-	BN 132MA 4	-	-	-	-	189300	222200	81500	322



P₁ = 7.5 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
1.4	43200	1.1	1103	-	3/V 11 L3	-	BN 132MA 4	-	-	-	143000	178100	58700	302
1.4	51200	1.3	1088	-	3/V 13 L3	-	BN 132MA 4	-	-	-	175900	208200	71900	312
1.5	54300	1.4	1009	-	3/V 13 L3	-	BN 132MA 4	-	-	-	172000	203600	70100	312
1.5	35700	1.0	1004	-	3/V 11 L3	-	BN 132MA 4	-	-	-	139000	173200	56900	302
1.5	61900	1.6	997	-	3/V 14 L3	-	BN 132MA 4	-	-	-	183000	214800	78500	322
1.5	93500	2.4	997	-	3/V 15 L3	-	BN 132MA 4	-	-	-	183000	214800	78500	332
1.7	41000	1.3	900	-	3/V 11 L3	-	BN 132MA 4	-	-	-	134500	167600	54800	302
1.7	55200	1.7	893	-	3/V 14 L3	-	BN 132MA 4	-	-	-	177000	207800	75700	322
1.7	53800	1.7	870	-	3/V 13 L3	-	BN 132MA 4	-	-	-	164500	194700	66700	312
1.8	80400	2.5	840	-	3/V 15 L3	-	BN 132MA 4	-	-	-	173800	204100	74200	332
1.8	41400	1.3	827	-	3/V 11 L3	-	BN 132MA 4	-	-	-	131100	163400	53300	302
1.9	49300	1.6	794	-	3/V 14 L3	-	BN 132MA 4	-	-	-	170900	200700	72800	322
2.0	45800	1.7	741	-	3/V 13 L3	-	BN 132MA 4	-	-	-	156800	185500	63200	312
2.1	40200	1.5	720	-	3/V 11 L3	-	BN 132MA 4	-	-	-	125800	156700	50900	302
2.2	43000	1.7	695	-	3/V 14 L3	-	BN 132MA 4	-	-	-	164300	192800	69700	322
2.3	40000	1.6	644	-	3/V 11 L3	-	BN 132MA 4	-	-	-	121700	151600	49000	302
2.7	25900	1.2	560	-	3/V 10 L3	-	BN 132MA 4	-	-	-	98700	124100	46800	292
3.0	25900	1.3	507	-	3/V 10 L3	-	BN 132MA 4	-	-	-	95800	120500	45300	292
3.4	17700	1.1	442	-	3/V 09 L3	-	BN 132MA 4	-	-	-	77600	100100	24000	282
3.4	26700	1.5	436	-	3/V 10 L3	-	BN 132MA 4	-	-	-	91600	115200	43100	292
4.1	13000	0.9	370	-	3/V 09 L3	-	BN 132MA 4	-	-	-	73600	94900	22600	282
6.7	9000	0.9	223	-	-	3/A 07 L2	BN 132MA 4	M 4LA 4	27400	34400	62200	81500	23800	273
7.6	8700	1.0	198	-	-	3/A 07 L2	BN 132MA 4	M 4LA 4	26300	33000	60000	78600	22900	273
7.9	7760	0.9	190	-	-	3/A 06 L2	BN 132MA 4	M 4LA 4	23400	26500	55100	64200	17600	263
8.3	10900	1.4	180	-	-	3/A 07 L2	BN 132MA 4	M 4LA 4	25500	32000	58300	76500	22200	273
9.7	9000	1.3	155	-	-	3/A 07 L2	BN 132MA 4	M 4LA 4	24300	30500	55800	73100	21100	273
10.7	7760	1.2	141	-	-	3/A 06 L2	BN 132MA 4	M 4LA 4	21200	24000	50400	58700	15900	263
10.7	11100	1.8	140	-	-	3/A 07 L2	BN 132MA 4	M 4LA 4	23500	29500	54100	70900	20400	273
11.6	11100	1.9	130	-	-	3/A 07 L2	BN 132MA 4	M 4LA 4	22900	28700	52900	69300	19900	273
12.0	5440	1.0	125	-	-	3/A 06 L2	BN 132MA 4	M 4LA 4	20300	23000	48600	56500	15300	263
13.4	6180	1.2	112	-	-	3/A 06 L2	BN 132MA 4	M 4LA 4	19600	22200	47100	54800	14700	263
13.8	8860	1.8	109	-	-	3/A 07 L2	BN 132MA 4	M 4LA 4	21600	27100	50100	65700	18800	273
15.3	5380	1.2	98.3	-	-	3/A 06 L2	BN 132MA 4	M 4LA 4	18800	21300	45200	52700	14100	263
16.9	6210	1.5	88.5	-	-	3/A 06 L2	BN 132MA 4	M 4LA 4	18100	20600	43800	51000	13600	263
17.1	10200	2.6	87.7	-	-	3/A 07 L2	BN 132MA 4	M 4LA 4	20100	25200	47000	61600	17500	273
17.5	3520	0.9	85.6	-	-	3/A 05 L2	BN 132MA 4	M 4LA 4	14400	16600	26500	31900	9240	253
18.5	6480	1.8	81.2	-	-	3/A 06 L2	BN 132MA 4	M 4LA 4	17600	20000	42700	49700	13200	263
20.7	3310	1.0	72.5	-	-	3/A 05 L2	BN 132MA 4	M 4LA 4	13600	15700	25200	30400	8740	253
21.5	5690	1.8	69.9	-	-	3/A 06 L2	BN 132MA 4	M 4LA 4	16800	19000	40800	47500	12600	263
22.0	7940	2.5	68.3	-	-	3/A 07 L2	BN 132MA 4	M 4LA 4	18500	23200	43600	57200	16100	273
24.0	3220	1.1	62.6	-	-	3/A 05 L2	BN 132MA 4	M 4LA 4	13000	15000	24200	29100	8330	253
24.0	2850	1.0	62.4	-	-	3/A 04 L2	BN 132MA 4	M 4LA 4	13000	15000	24100	29000	8320	243
24.9	6010	2.2	60.1	-	-	3/A 06 L2	BN 132MA 4	M 4LA 4	15900	18100	39000	45500	12000	263
26.2	6650	2.5	57.3	-	-	3/A 07 L2	BN 132MA 4	M 4LA 4	17400	21900	41400	54200	15200	273
26.3	3310	1.3	57.0	-	-	3/A 05 L2	BN 132MA 4	M 4LA 4	12600	14500	23500	28300	8070	253
26.9	4530	1.8	55.7	-	-	3/A 06 L2	BN 132MA 4	M 4LA 4	15500	17600	38100	44400	11700	263
27.5	2390	1.0	54.5	-	-	3/A 04 L2	BN 132MA 4	M 4LA 4	12400	14300	23200	27900	7950	243
28.2	3040	1.3	53.3	-	-	3/A 05 L2	BN 132MA 4	M 4LA 4	12300	14200	23000	27700	7890	253
29.0	5170	2.2	51.7	-	-	3/A 06 L2	BN 132MA 4	M 4LA 4	15200	17200	37300	43400	11400	263
30	2270	1.0	49.7	-	-	3/A 04 L2	BN 132MA 4	M 4LA 4	12000	13900	22500	27100	7710	243
32	3840	1.8	47.2	-	-	3/A 06 L2	BN 132MA 4	M 4LA 4	14700	16700	36300	42300	11000	263
34	2850	1.4	44.3	-	-	3/A 04 L2	BN 132MA 4	M 4LA 4	11600	13300	21800	26200	7420	243
34	3310	1.6	44.0	-	-	3/A 05 L2	BN 132MA 4	M 4LA 4	11500	13300	21700	26100	7400	253
37	4910	2.6	41.1	-	-	3/A 06 L2	BN 132MA 4	M 4LA 4	14000	15900	34800	40500	10500	263
38	2270	1.3	39.1	-	-	3/A 04 L2	BN 132MA 4	M 4LA 4	11100	12800	21000	25200	7120	243
38	3020	1.7	39.0	-	-	3/A 05 L2	BN 132MA 4	M 4LA 4	11100	12800	21000	25200	7110	253
43	2270	1.4	35.3	-	-	3/A 04 L2	BN 132MA 4	M 4LA 4	10700	12400	20300	24500	6880	243
43	3490	2.2	34.9	-	-	3/A 06 L2	BN 132MA 4	M 4LA 4	13300	15100	33200	38600	9990	263
46	3920	2.6	32.7	-	-	3/A 06 L2	BN 132MA 4	M 4LA 4	13000	14700	32500	37900	9780	263
47	3310	2.3	32.2	-	-	3/A 05 L2	BN 132MA 4	M 4LA 4	10400	12000	19800	23800	6670	253
50	2270	1.7	30.2	-	-	3/A 04 L2	BN 132MA 4	M 4LA 4	10200	11700	19400	23300	6530	243
54	2830	2.2	27.7	-	-	3/A 04 L2	BN 132MA 4	M 4LA 4	9890	11400	18900	22800	6350	243
54	2850	2.3	27.7	-	-	3/A 05 L2	BN 132MA 4	M 4LA 4	9890	11400	18900	22800	6350	253
54	3320	2.6	27.7	-	-	3/A 06 L2	BN 132MA 4	M 4LA 4	12300	14000	30900	36000	9250	263
59	1920	1.6	25.6	-	-	3/A 04 L2	BN 132MA 4	M 4LA 4	9630	11100	18500	22200	6180	243
68	2270	2.3	22.1	-	-	3/A 04 L2	BN 132MA 4	M 4LA 4	9170	10600	17700	21300	5880	243
68	2270	2.3	22.1	-	-	3/A 05 L2	BN 132MA 4	M 4LA 4	9170	10600	17700	21300	5880	253

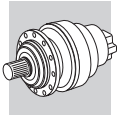


P₁ = 7.5 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
80	1920	2.2	18.7	-	-	3/A 04 L2	BN 132MA 4	M 4LA 4	8680	10000	16800	20200	5570	243
80	1920	2.2	18.7	-	-	3/A 05 L2	BN 132MA 4	M 4LA 4	8680	10000	16800	20200	5570	253

P₁ = 9.2 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
0.29	403700	1.8	5164	-	3/V 19 L4	-	BN 132MB 4	-	-	-	638000	702000	200000	366
0.29	280600	1.2	5099	-	3/V 18 L4	-	BN 132MB 4	-	-	-	503000	565000	200000	358
0.30	552000	2.5	5040	-	3/V 21 L4	-	BN 132MB 4	-	-	-	779000	923000	1200000	374
0.33	553700	2.6	4550	-	3/V 21 L4	-	BN 132MB 4	-	-	-	779000	923000	1200000	374
0.34	359700	1.7	4457	-	3/V 19 L4	-	BN 132MB 4	-	-	-	638000	702000	200000	366
0.34	203000	1.1	4449	-	3/V 17 L4	-	BN 132MB 4	-	-	-	442000	470000	150000	350
0.34	280600	1.4	4386	-	3/V 18 L4	-	BN 132MB 4	-	-	-	503000	565000	200000	358
0.36	184300	1.0	4129	-	3/V 17 L4	-	BN 132MB 4	-	-	-	442000	470000	150000	350
0.37	380000	2.0	4095	-	3/V 19 L4	-	BN 132MB 4	-	-	-	638000	702000	200000	366
0.40	460000	2.6	3780	-	3/V 21 L4	-	BN 132MB 4	-	-	-	779000	923000	1200000	374
0.41	280600	1.6	3696	-	3/V 18 L4	-	BN 132MB 4	-	-	-	503000	565000	200000	358
0.43	280600	1.7	3495	-	3/V 18 L4	-	BN 132MB 4	-	-	-	503000	565000	200000	358
0.46	135500	0.9	3250	-	3/V 16 L4	-	BN 132MB 4	-	-	-	345000	385000	150000	342
0.46	367600	2.4	3231	-	3/V 19 L4	-	BN 132MB 4	-	-	-	638000	702000	200000	366
0.47	190800	1.3	3168	-	3/V 17 L4	-	BN 132MB 4	-	-	-	442000	470000	150000	350
0.51	273300	2.0	2945	-	3/V 18 L4	-	BN 132MB 4	-	-	-	503000	565000	200000	358
0.54	166400	1.4	2773	-	3/V 17 L4	-	BN 132MB 4	-	-	-	442000	470000	150000	350
0.55	114100	0.9	2738	-	3/V 16 L4	-	BN 132MB 4	-	-	-	345000	385000	150000	342
0.58	365200	3.0	2582	-	3/V 19 L4	-	BN 132MB 4	-	-	-	638000	702000	200000	366
0.61	280600	2.4	2464	-	3/V 18 L4	-	BN 132MB 4	-	-	-	503000	565000	200000	358
0.64	138800	1.3	2343	-	3/V 16 L4	-	BN 132MB 4	-	-	-	345000	385000	150000	342
0.65	212900	2.0	2295	-	3/V 18 L4	-	BN 132MB 4	-	-	-	503000	565000	200000	358
0.69	128500	1.3	2167	-	3/V 16 L4	-	BN 132MB 4	-	-	-	345000	385000	150000	342
0.75	94300	1.1	1994	-	3/V 15 L3	-	BN 132MB 4	-	-	-	206000	243000	90000	332
0.82	108300	1.3	1826	-	3/V 16 L4	-	BN 132MB 4	-	-	-	345000	385000	150000	342
0.90	75500	1.0	1662	-	3/V 14 L3	-	BN 132MB 4	-	-	-	206000	243000	90000	322
0.90	99000	1.4	1662	-	3/V 15 L3	-	BN 132MB 4	-	-	-	206000	243000	90000	332
0.94	112100	1.6	1589	-	3/V 16 L3	-	BN 132MB 4	-	-	-	345000	385000	150000	342
1.1	57400	0.9	1418	-	3/V 13 L3	-	BN 132MB 4	-	-	-	190500	225400	78500	312
1.1	86900	1.4	1400	-	3/V 15 L3	-	BN 132MB 4	-	-	-	202600	237900	88000	332
1.1	154100	2.5	1365	-	3/V 17 L3	-	BN 132MB 4	-	-	-	429900	457700	145400	350
1.1	97300	1.6	1329	-	3/V 15 L3	-	BN 132MB 4	-	-	-	199500	234200	86400	332
1.1	62300	1.1	1324	-	3/V 14 L3	-	BN 132MB 4	-	-	-	199300	233900	86300	322
1.1	112100	1.9	1324	-	3/V 16 L3	-	BN 132MB 4	-	-	-	331300	368500	143900	342
1.2	52800	0.9	1291	-	3/V 13 L3	-	BN 132MB 4	-	-	-	185200	219200	76100	312
1.2	150900	2.6	1215	-	3/V 17 L3	-	BN 132MB 4	-	-	-	415100	442000	139800	350
1.3	128000	2.5	1134	-	3/V 17 L3	-	BN 132MB 4	-	-	-	406600	432900	136600	350
1.3	92200	1.8	1120	-	3/V 15 L3	-	BN 132MB 4	-	-	-	189500	222500	81600	332
1.3	52500	1.1	1116	-	3/V 14 L3	-	BN 132MB 4	-	-	-	189300	222200	81500	322
1.4	51200	1.1	1088	-	3/V 13 L3	-	BN 132MB 4	-	-	-	175900	208200	71900	312
1.4	119600	2.5	1059	-	3/V 16 L3	-	BN 132MB 4	-	-	-	309800	344600	133600	342
1.5	128400	2.6	1024	-	3/V 17 L3	-	BN 132MB 4	-	-	-	394300	419900	132100	350
1.5	54300	1.1	1009	-	3/V 13 L3	-	BN 132MB 4	-	-	-	172000	203600	70100	312
1.5	61900	1.3	997	-	3/V 14 L3	-	BN 132MB 4	-	-	-	183000	214800	78500	322
1.5	93500	2.0	997	-	3/V 15 L3	-	BN 132MB 4	-	-	-	183000	214800	78500	332
1.7	41000	1.0	900	-	3/V 11 L3	-	BN 132MB 4	-	-	-	134500	167600	54800	302
1.7	55200	1.4	893	-	3/V 14 L3	-	BN 132MB 4	-	-	-	177000	207800	75700	322
1.7	100800	2.5	893	-	3/V 16 L3	-	BN 132MB 4	-	-	-	294300	327300	126200	342
1.7	53800	1.4	870	-	3/V 13 L3	-	BN 132MB 4	-	-	-	164500	194700	66700	312
1.8	106700	2.6	851	-	3/V 17 L3	-	BN 132MB 4	-	-	-	373000	397100	124200	350
1.8	80400	2.0	840	-	3/V 15 L3	-	BN 132MB 4	-	-	-	173800	204100	74200	332
1.8	41400	1.1	827	-	3/V 11 L3	-	BN 132MB 4	-	-	-	131100	163400	53300	302
1.9	49300	1.3	794	-	3/V 14 L3	-	BN 132MB 4	-	-	-	170900	200700	72800	322
1.9	99700	2.6	794	-	3/V 16 L3	-	BN 132MB 4	-	-	-	284200	316100	121400	342
2.0	45800	1.4	741	-	3/V 13 L3	-	BN 132MB 4	-	-	-	156800	185500	63200	312
2.1	40200	1.2	720	-	3/V 11 L3	-	BN 132MB 4	-	-	-	125800	156700	50900	302
2.2	43000	1.4	695	-	3/V 14 L3	-	BN 132MB 4	-	-	-	164300	192800	69700	322

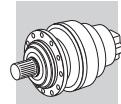


P₁ = 9.2 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
2.2	84000	2.6	669	-	3/V 16 L3	-	BN 132MB 4	-	-	270000	300300	114600	342	
2.3	88300	2.7	665	-	3/V 15 L3	-	BN 132MB 4	-	-	162000	190200	68600	332	
2.3	40000	1.3	644	-	3/V 11 L3	-	BN 132MB 4	-	-	121700	151600	49000	302	
2.7	25900	1.0	560	-	3/V 10 L3	-	BN 132MB 4	-	-	98700	124100	46800	292	
2.7	81700	3.0	560	-	3/V 15 L3	-	BN 132MB 4	-	-	153900	180700	64800	332	
3.0	25900	1.1	507	-	3/V 10 L3	-	BN 132MB 4	-	-	95800	120500	45300	292	
3.4	65100	3.0	446	-	3/V 15 L3	-	BN 132MB 4	-	-	143800	168800	60100	332	
3.4	26700	1.3	436	-	3/V 10 L3	-	BN 132MB 4	-	-	91600	115200	43100	292	
8.3	10900	1.1	180	-	-	3/A 07 L2	BN 132MB 4	M 4LB 4	25500	32000	58300	76500	22200	273
9.7	9000	1.1	155	-	-	3/A 07 L2	BN 132MB 4	M 4LB 4	24300	30500	55800	73100	21100	273
10.7	7760	1.0	141	-	-	3/A 06 L2	BN 132MB 4	M 4LB 4	21200	24000	50400	58700	15900	263
10.7	11100	1.5	140	-	-	3/A 07 L2	BN 132MB 4	M 4LB 4	23500	29500	54100	70900	20400	273
11.6	11100	1.6	130	-	-	3/A 07 L2	BN 132MB 4	M 4LB 4	22900	28700	52900	69300	19900	273
13.4	6180	1.0	112	-	-	3/A 06 L2	BN 132MB 4	M 4LB 4	19600	22200	47100	54800	14700	263
13.8	8860	1.5	109	-	-	3/A 07 L2	BN 132MB 4	M 4LB 4	21600	27100	50100	65700	18800	273
15.3	5380	1.0	98.3	-	-	3/A 06 L2	BN 132MB 4	M 4LB 4	18800	21300	45200	52700	14100	263
16.9	6210	1.3	88.5	-	-	3/A 06 L2	BN 132MB 4	M 4LB 4	18100	20600	43800	51000	13600	263
17.1	10200	2.1	87.7	-	-	3/A 07 L2	BN 132MB 4	M 4LB 4	20100	25200	47000	61600	17500	273
18.5	6480	1.4	81.2	-	-	3/A 06 L2	BN 132MB 4	M 4LB 4	17600	20000	42700	49700	13200	263
21.5	5690	1.5	69.9	-	-	3/A 06 L2	BN 132MB 4	M 4LB 4	16800	19000	40800	47500	12600	263
22.0	7940	2.1	68.3	-	-	3/A 07 L2	BN 132MB 4	M 4LB 4	18500	23200	43600	57200	16100	273
24.0	3220	0.9	62.6	-	-	3/A 05 L2	BN 132MB 4	M 4LB 4	13000	15000	24200	29100	8330	253
24.9	6010	1.8	60.1	-	-	3/A 06 L2	BN 132MB 4	M 4LB 4	15900	18100	39000	45500	12000	263
26.2	6650	2.1	57.3	-	-	3/A 07 L2	BN 132MB 4	M 4LB 4	17400	21900	41400	54200	15200	273
26.3	3310	1.0	57.0	-	-	3/A 05 L2	BN 132MB 4	M 4LB 4	12600	14500	23500	28300	8070	253
26.9	4530	1.5	55.7	-	-	3/A 06 L2	BN 132MB 4	M 4LB 4	15500	17600	38100	44400	11700	263
28.2	3040	1.0	53.3	-	-	3/A 05 L2	BN 132MB 4	M 4LB 4	12300	14200	23000	27700	7890	253
29.0	5170	1.8	51.7	-	-	3/A 06 L2	BN 132MB 4	M 4LB 4	15200	17200	37300	43400	11400	263
32	3840	1.5	47.2	-	-	3/A 06 L2	BN 132MB 4	M 4LB 4	14700	16700	36300	42300	11000	263
34	2850	1.2	44.3	-	-	3/A 04 L2	BN 132MB 4	M 4LB 4	11600	13300	21800	26200	7420	243
34	3310	1.4	44.0	-	-	3/A 05 L2	BN 132MB 4	M 4LB 4	11500	13300	21700	26100	7400	253
37	4910	2.1	41.1	-	-	3/A 06 L2	BN 132MB 4	M 4LB 4	14000	15900	34800	40500	10500	263
38	2270	1.0	39.1	-	-	3/A 04 L2	BN 132MB 4	M 4LB 4	11100	12800	21000	25200	7120	243
38	3020	1.4	39.0	-	-	3/A 05 L2	BN 132MB 4	M 4LB 4	11100	12800	21000	25200	7110	253
43	2270	1.2	35.3	-	-	3/A 04 L2	BN 132MB 4	M 4LB 4	10700	12400	20300	24500	6880	243
43	3490	1.8	34.9	-	-	3/A 06 L2	BN 132MB 4	M 4LB 4	13300	15100	33200	38600	9990	263
46	3920	2.2	32.7	-	-	3/A 06 L2	BN 132MB 4	M 4LB 4	13000	14700	32500	37900	9780	263
47	3310	1.8	32.2	-	-	3/A 05 L2	BN 132MB 4	M 4LB 4	10400	12000	19800	23800	6670	253
50	2270	1.4	30.2	-	-	3/A 04 L2	BN 132MB 4	M 4LB 4	10200	11700	19400	23300	6530	243
54	2830	1.8	27.7	-	-	3/A 04 L2	BN 132MB 4	M 4LB 4	9890	11400	18900	22800	6350	243
54	2850	1.8	27.7	-	-	3/A 05 L2	BN 132MB 4	M 4LB 4	9890	11400	18900	22800	6350	253
54	3320	2.2	27.7	-	-	3/A 06 L2	BN 132MB 4	M 4LB 4	12300	14000	30900	36000	9250	263
59	1920	1.4	25.6	-	-	3/A 04 L2	BN 132MB 4	M 4LB 4	9630	11100	18500	22200	6180	243
68	2270	1.8	22.1	-	-	3/A 04 L2	BN 132MB 4	M 4LB 4	9170	10600	17700	21300	5880	243
68	2270	1.8	22.1	-	-	3/A 05 L2	BN 132MB 4	M 4LB 4	9170	10600	17700	21300	5880	253
80	1920	1.8	18.7	-	-	3/A 04 L2	BN 132MB 4	M 4LB 4	8680	10000	16800	20200	5570	243
80	1920	1.8	18.7	-	-	3/A 05 L2	BN 132MB 4	M 4LB 4	8680	10000	16800	20200	5570	253

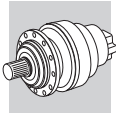
P₁ = 11 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
0.29	403700	1.5	5164	-	3/V 19 L4	-	BN 160MR 4	-	-	638000	702000	200000	366	
0.29	280600	1.0	5099	-	3/V 18 L4	-	BN 160MR 4	-	-	503000	565000	200000	358	
0.30	552000	2.1	5040	-	3/V 21 L4	-	BN 160MR 4	-	-	779000	923000	1200000	374	
0.33	553700	2.2	4550	-	3/V 21 L4	-	BN 160MR 4	-	-	779000	923000	1200000	374	
0.34	359700	1.4	4457	-	3/V 19 L4	-	BN 160MR 4	-	-	638000	702000	200000	366	
0.34	280600	1.2	4386	-	3/V 18 L4	-	BN 160MR 4	-	-	503000	565000	200000	358	
0.37	380000	1.7	4095	-	3/V 19 L4	-	BN 160MR 4	-	-	638000	702000	200000	366	
0.40	460000	2.2	3780	-	3/V 21 L4	-	BN 160MR 4	-	-	779000	923000	1200000	374	
0.41	280600	1.4	3696	-	3/V 18 L4	-	BN 160MR 4	-	-	503000	565000	200000	358	
0.42	536400	2.6	3600	-	3/V 21 L4	-	BN 160MR 4	-	-	779000	923000	1200000	374	
0.43	280600	1.5	3495	-	3/V 18 L4	-	BN 160MR 4	-	-	503000	565000	200000	358	
0.46	367600	2.0	3231	-	3/V 19 L4	-	BN 160MR 4	-	-	638000	702000	200000	366	



P₁ = 11 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
0.47	190800	1.1	3168	-	3/V 17 L4	-	BN 160MR 4	-	-	-	442000	470000	150000	350
0.51	273300	1.7	2945	-	3/V 18 L4	-	BN 160MR 4	-	-	-	503000	565000	200000	358
0.54	166400	1.2	2773	-	3/V 17 L4	-	BN 160MR 4	-	-	-	442000	470000	150000	350
0.58	365200	2.5	2582	-	3/V 19 L4	-	BN 160MR 4	-	-	-	638000	702000	200000	366
0.60	155000	1.1	2485	-	3/V 17 L4	-	BN 160MR 4	-	-	-	442000	470000	150000	350
0.61	280600	2.0	2464	-	3/V 18 L4	-	BN 160MR 4	-	-	-	503000	565000	200000	358
0.64	138800	1.1	2343	-	3/V 16 L4	-	BN 160MR 4	-	-	-	345000	385000	150000	342
0.65	212900	1.7	2295	-	3/V 18 L4	-	BN 160MR 4	-	-	-	503000	565000	200000	358
0.69	128500	1.1	2167	-	3/V 16 L4	-	BN 160MR 4	-	-	-	345000	385000	150000	342
0.73	184300	1.5	2065	-	3/V 17 L4	-	BN 160MR 4	-	-	-	442000	470000	150000	350
0.75	94300	0.9	1994	-	3/V 15 L3	-	BN 160MR 4	-	-	-	206000	243000	90000	332
0.81	280600	2.6	1848	-	3/V 18 L4	-	BN 160MR 4	-	-	-	503000	565000	200000	358
0.82	108300	1.1	1826	-	3/V 16 L4	-	BN 160MR 4	-	-	-	345000	385000	150000	342
0.84	184300	1.8	1780	-	3/V 17 L4	-	BN 160MR 4	-	-	-	442000	470000	150000	350
0.86	280600	2.7	1748	-	3/V 18 L4	-	BN 160MR 4	-	-	-	503000	565000	200000	358
0.90	99000	1.1	1662	-	3/V 15 L3	-	BN 160MR 4	-	-	-	206000	243000	90000	332
0.94	112100	1.4	1589	-	3/V 16 L3	-	BN 160MR 4	-	-	-	345000	385000	150000	342
1.0	255400	3.0	1473	-	3/V 18 L4	-	BN 160MR 4	-	-	-	503000	563100	198800	358
1.1	86900	1.2	1400	-	3/V 15 L3	-	BN 160MR 4	-	-	-	202600	237900	88000	332
1.1	154100	2.1	1365	-	3/V 17 L3	-	BN 160MR 4	-	-	-	429900	457700	145400	350
1.1	97300	1.4	1329	-	3/V 15 L3	-	BN 160MR 4	-	-	-	199500	234200	86400	332
1.1	112100	1.6	1324	-	3/V 16 L3	-	BN 160MR 4	-	-	-	331300	368500	143900	342
1.2	150900	2.2	1215	-	3/V 17 L3	-	BN 160MR 4	-	-	-	415100	442000	139800	350
1.3	128000	2.1	1134	-	3/V 17 L3	-	BN 160MR 4	-	-	-	406600	432900	136600	350
1.3	92200	1.5	1120	-	3/V 15 L3	-	BN 160MR 4	-	-	-	189500	222500	81600	332
1.4	119600	2.1	1059	-	3/V 16 L3	-	BN 160MR 4	-	-	-	309800	344600	133600	342
1.5	128400	2.2	1024	-	3/V 17 L3	-	BN 160MR 4	-	-	-	394300	419900	132100	350
1.5	54300	0.9	1009	-	3/V 13 L3	-	BN 160MR 4	-	-	-	172000	203600	70100	312
1.5	61900	1.1	997	-	3/V 14 L3	-	BN 160MR 4	-	-	-	183000	214800	78500	322
1.5	93500	1.6	997	-	3/V 15 L3	-	BN 160MR 4	-	-	-	183000	214800	78500	332
1.7	55200	1.2	893	-	3/V 14 L3	-	BN 160MR 4	-	-	-	177000	207800	75700	322
1.7	100800	2.1	893	-	3/V 16 L3	-	BN 160MR 4	-	-	-	294300	327300	126200	342
1.7	53800	1.2	870	-	3/V 13 L3	-	BN 160MR 4	-	-	-	164500	194700	66700	312
1.8	106700	2.2	851	-	3/V 17 L3	-	BN 160MR 4	-	-	-	373000	397100	124200	350
1.8	80400	1.7	840	-	3/V 15 L3	-	BN 160MR 4	-	-	-	173800	204100	74200	332
1.9	44500	0.9	810	-	3/V 13 L3	-	BN 160MR 4	-	-	-	161100	190600	65100	312
1.9	141200	3.0	810	-	3/V 17 L3	-	BN 160MR 4	-	-	-	367600	391400	122100	350
1.9	49300	1.1	794	-	3/V 14 L3	-	BN 160MR 4	-	-	-	170900	200700	72800	322
1.9	99700	2.2	794	-	3/V 16 L3	-	BN 160MR 4	-	-	-	284200	316100	121400	342
2.0	45800	1.2	741	-	3/V 13 L3	-	BN 160MR 4	-	-	-	156800	185500	63200	312
2.1	40200	1.0	720	-	3/V 11 L3	-	BN 160MR 4	-	-	-	125800	156700	50900	302
2.2	43000	1.2	695	-	3/V 14 L3	-	BN 160MR 4	-	-	-	164300	192800	69700	322
2.2	50700	1.3	673	-	3/V 13 L3	-	BN 160MR 4	-	-	-	152300	180300	61200	312
2.2	84000	2.2	669	-	3/V 16 L3	-	BN 160MR 4	-	-	-	270000	300300	114600	342
2.3	70200	1.8	665	-	3/V 14 L3	-	BN 160MR 4	-	-	-	162000	190200	68600	322
2.3	88300	2.3	665	-	3/V 15 L3	-	BN 160MR 4	-	-	-	162000	190200	68600	332
2.3	40000	1.1	644	-	3/V 11 L3	-	BN 160MR 4	-	-	-	121700	151600	49000	302
2.6	57100	1.6	579	-	3/V 14 L3	-	BN 160MR 4	-	-	-	155500	182600	65500	322
2.6	49300	1.5	567	-	3/V 13 L3	-	BN 160MR 4	-	-	-	144700	171300	57800	312
2.7	81700	2.5	560	-	3/V 15 L3	-	BN 160MR 4	-	-	-	153900	180700	64800	332
2.7	39000	1.2	551	-	3/V 11 L3	-	BN 160MR 4	-	-	-	116100	144600	46600	302
2.9	52000	1.7	516	-	3/V 13 L3	-	BN 160MR 4	-	-	-	140700	166500	56100	312
2.9	34500	1.2	510	-	3/V 11 L3	-	BN 160MR 4	-	-	-	113400	141300	45400	302
3.0	57800	1.9	498	-	3/V 14 L3	-	BN 160MR 4	-	-	-	148600	174500	62300	322
3.0	85600	2.8	498	-	3/V 15 L3	-	BN 160MR 4	-	-	-	148600	174500	62300	332
3.4	47700	1.8	446	-	3/V 14 L3	-	BN 160MR 4	-	-	-	143800	168800	60100	322
3.4	65100	2.5	446	-	3/V 15 L3	-	BN 160MR 4	-	-	-	143800	168800	60100	332
3.4	26700	1.1	436	-	3/V 10 L3	-	BN 160MR 4	-	-	-	91600	115200	43100	292
3.5	40900	1.6	430	-	3/V 11 L3	-	BN 160MR 4	-	-	-	107800	134200	42800	302
3.5	47300	1.8	425	-	3/V 13 L3	-	BN 160MR 4	-	-	-	132700	157100	52600	312
3.8	46100	1.9	397	-	3/V 14 L3	-	BN 160MR 4	-	-	-	138800	163000	57800	322
3.9	67400	2.9	386	-	3/V 15 L3	-	BN 160MR 4	-	-	-	137700	161700	57300	332
4.1	39500	1.8	370	-	3/V 13 L3	-	BN 160MR 4	-	-	-	127300	150700	50200	312
8.3	10900	0.9	180	-	-	3/A 07 L2	BN 160MR 4	M 4LC 4	25500	32000	58300	76500	22200	273
9.7	9000	0.9	155	-	-	3/A 07 L2	BN 160MR 4	M 4LC 4	24300	30500	55800	73100	21100	273
10.7	11100	1.2	140	-	-	3/A 07 L2	BN 160MR 4	M 4LC 4	23500	29500	54100	70900	20400	273
11.6	11100	1.3	130	-	-	3/A 07 L2	BN 160MR 4	M 4LC 4	22900	28700	52900	69300	19900	273

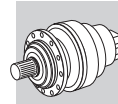


P₁ = 11 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
13.8	8860	1.3	109	-	-	3/A 07 L2	BN 160MR 4	M 4LC 4	21600	27100	50100	65700	18800	273
16.9	6210	1.1	88.5	-	-	3/A 06 L2	BN 160MR 4	M 4LC 4	18100	20600	43800	51000	13600	263
17.1	10200	1.7	87.7	-	-	3/A 07 L2	BN 160MR 4	M 4LC 4	20100	25200	47000	61600	17500	273
18.5	6480	1.2	81.2	-	-	3/A 06 L2	BN 160MR 4	M 4LC 4	17600	20000	42700	49700	13200	263
21.5	5690	1.2	69.9	-	-	3/A 06 L2	BN 160MR 4	M 4LC 4	16800	19000	40800	47500	12600	263
22.0	7940	1.7	68.3	-	-	3/A 07 L2	BN 160MR 4	M 4LC 4	18500	23200	43600	57200	16100	273
24.9	6010	1.5	60.1	-	-	3/A 06 L2	BN 160MR 4	M 4LC 4	15900	18100	39000	45500	12000	263
26.2	6650	1.7	57.3	-	-	3/A 07 L2	BN 160MR 4	M 4LC 4	17400	21900	41400	54200	15200	273
26.9	4530	1.2	55.7	-	-	3/A 06 L2	BN 160MR 4	M 4LC 4	15500	17600	38100	44400	11700	263
29.0	5170	1.5	51.7	-	-	3/A 06 L2	BN 160MR 4	M 4LC 4	15200	17200	37300	43400	11400	263
30	8380	2.6	49.2	-	-	3/A 07 L2	BN 160MR 4	M 4LC 4	16600	20800	39500	51800	14400	273
32	3840	1.2	47.2	-	-	3/A 06 L2	BN 160MR 4	M 4LC 4	14700	16700	36300	42300	11000	263
34	2850	1.0	44.3	-	-	3/A 04 L2	-	M 4LC 4	11600	13300	21800	26200	7420	243
34	3310	1.1	44.0	-	-	3/A 05 L2	-	M 4LC 4	11500	13300	21700	26100	7400	253
37	4910	1.8	41.1	-	-	3/A 06 L2	BN 160MR 4	M 4LC 4	14000	15900	34800	40500	10500	263
38	3020	1.2	39.0	-	-	3/A 05 L2	-	M 4LC 4	11100	12800	21000	25200	7110	253
43	2270	1.0	35.3	-	-	3/A 04 L2	-	M 4LC 4	10700	12400	20300	24500	6880	243
43	3490	1.5	34.9	-	-	3/A 06 L2	BN 160MR 4	M 4LC 4	13300	15100	33200	38600	9990	263
46	3920	1.8	32.7	-	-	3/A 06 L2	BN 160MR 4	M 4LC 4	13000	14700	32500	37900	9780	263
47	3310	1.5	32.2	-	-	3/A 05 L2	-	M 4LC 4	10400	12000	19800	23800	6670	253
50	2270	1.1	30.2	-	-	3/A 04 L2	-	M 4LC 4	10200	11700	19400	23300	6530	243
54	2830	1.5	27.7	-	-	3/A 04 L2	-	M 4LC 4	9890	11400	18900	22800	6350	243
54	2850	1.5	27.7	-	-	3/A 05 L2	-	M 4LC 4	9890	11400	18900	22800	6350	253
54	3320	1.8	27.7	-	-	3/A 06 L2	BN 160MR 4	M 4LC 4	12300	14000	30900	36000	9250	263
59	1920	1.1	25.6	-	-	3/A 04 L2	-	M 4LC 4	9630	11100	18500	22200	6180	243
68	2270	1.5	22.1	-	-	3/A 04 L2	-	M 4LC 4	9170	10600	17700	21300	5880	243
68	2270	1.5	22.1	-	-	3/A 05 L2	-	M 4LC 4	9170	10600	17700	21300	5880	253
80	1920	1.5	18.7	-	-	3/A 04 L2	-	M 4LC 4	8680	10000	16800	20200	5570	243
80	1920	1.5	18.7	-	-	3/A 05 L2	-	M 4LC 4	8680	10000	16800	20200	5570	253

P₁ = 15 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
0.29	403700	1.1	5164	-	3/V 19 L4	-	BN 160L 4	-	-	-	638000	702000	200000	366
0.30	552000	1.6	5040	-	3/V 21 L4	-	BN 160L 4	-	-	-	779000	923000	1200000	374
0.33	553700	1.6	4550	-	3/V 21 L4	-	BN 160L 4	-	-	-	779000	923000	1200000	374
0.34	359700	1.1	4457	-	3/V 19 L4	-	BN 160L 4	-	-	-	638000	702000	200000	366
0.37	380000	1.3	4095	-	3/V 19 L4	-	BN 160L 4	-	-	-	638000	702000	200000	366
0.40	460000	1.6	3780	-	3/V 21 L4	-	BN 160L 4	-	-	-	779000	923000	1200000	374
0.41	280600	1.0	3696	-	3/V 18 L4	-	BN 160L 4	-	-	-	503000	565000	200000	358
0.42	536400	1.9	3600	-	3/V 21 L4	-	BN 160L 4	-	-	-	779000	923000	1200000	374
0.43	280600	1.1	3495	-	3/V 18 L4	-	BN 160L 4	-	-	-	503000	565000	200000	358
0.46	367600	1.5	3231	-	3/V 19 L4	-	BN 160L 4	-	-	-	638000	702000	200000	366
0.51	273300	1.2	2945	-	3/V 18 L4	-	BN 160L 4	-	-	-	503000	565000	200000	358
0.56	536400	2.5	2700	-	3/V 21 L4	-	BN 160L 4	-	-	-	779000	923000	1200000	374
0.58	365200	1.9	2582	-	3/V 19 L4	-	BN 160L 4	-	-	-	638000	702000	200000	366
0.60	511700	2.6	2520	-	3/V 21 L4	-	BN 160L 4	-	-	-	779000	923000	1200000	374
0.61	280600	1.5	2464	-	3/V 18 L4	-	BN 160L 4	-	-	-	503000	565000	200000	358
0.65	212900	1.2	2295	-	3/V 18 L4	-	BN 160L 4	-	-	-	503000	565000	200000	358
0.73	184300	1.1	2065	-	3/V 17 L4	-	BN 160L 4	-	-	-	442000	470000	150000	350
0.81	280600	1.9	1848	-	3/V 18 L4	-	BN 160L 4	-	-	-	503000	565000	200000	358
0.84	184300	1.4	1780	-	3/V 17 L4	-	BN 160L 4	-	-	-	442000	470000	150000	350
0.86	280600	2.0	1748	-	3/V 18 L4	-	BN 160L 4	-	-	-	503000	565000	200000	358
0.94	112100	1.0	1589	-	3/V 16 L3	-	BN 160L 4	-	-	-	345000	385000	150000	342
1.0	255400	2.2	1473	-	3/V 18 L4	-	BN 160L 4	-	-	-	503000	563100	198800	358
1.1	154100	1.5	1365	-	3/V 17 L3	-	BN 160L 4	-	-	-	429900	457700	145400	350
1.1	97300	1.0	1329	-	3/V 15 L3	-	BN 160L 4	-	-	-	199500	234200	86400	332
1.1	112100	1.2	1324	-	3/V 16 L3	-	BN 160L 4	-	-	-	331300	368500	143900	342
1.2	276700	2.8	1232	-	3/V 18 L4	-	BN 160L 4	-	-	-	503000	533700	187300	358
1.2	150900	1.6	1215	-	3/V 17 L3	-	BN 160L 4	-	-	-	415100	442000	139800	350
1.3	275600	3.0	1165	-	3/V 18 L4	-	BN 160L 4	-	-	-	503000	524900	183800	358
1.3	128000	1.5	1134	-	3/V 17 L3	-	BN 160L 4	-	-	-	406600	432900	136600	350
1.3	92200	1.1	1120	-	3/V 15 L3	-	BN 160L 4	-	-	-	189500	222500	81600	332

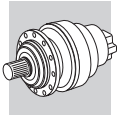


P₁ = 15 kW






n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
1.4	119600	1.6	1059	-	3/V 16 L3	-	BN 160L 4	-	-	-	309800	344600	133600	342
1.5	128400	1.6	1024	-	3/V 17 L3	-	BN 160L 4	-	-	-	394300	419900	132100	350
1.5	93500	1.2	997	-	3/V 15 L3	-	BN 160L 4	-	-	-	183000	214800	78500	332
1.7	100800	1.6	893	-	3/V 16 L3	-	BN 160L 4	-	-	-	294300	327300	126200	342
1.8	106700	1.6	851	-	3/V 17 L3	-	BN 160L 4	-	-	-	373000	397100	124200	350
1.8	80400	1.3	840	-	3/V 15 L3	-	BN 160L 4	-	-	-	173800	204100	74200	332
1.9	141200	2.2	810	-	3/V 17 L3	-	BN 160L 4	-	-	-	367600	391400	122100	350
1.9	99700	1.6	794	-	3/V 16 L3	-	BN 160L 4	-	-	-	284200	316100	121400	342
2.2	142900	2.6	683	-	3/V 17 L3	-	BN 160L 4	-	-	-	349200	371800	115400	350
2.2	50700	1.0	673	-	3/V 13 L3	-	BN 160L 4	-	-	-	152300	180300	61200	312
2.2	84000	1.6	669	-	3/V 16 L3	-	BN 160L 4	-	-	-	270000	300300	114600	342
2.3	70200	1.3	665	-	3/V 14 L3	-	BN 160L 4	-	-	-	162000	190200	68600	322
2.3	88300	1.7	665	-	3/V 15 L3	-	BN 160L 4	-	-	-	162000	190200	68600	332
2.5	134700	2.7	608	-	3/V 17 L3	-	BN 160L 4	-	-	-	337200	359000	111000	350
2.6	57100	1.2	579	-	3/V 14 L3	-	BN 160L 4	-	-	-	155500	182600	65500	322
2.6	49300	1.1	567	-	3/V 13 L3	-	BN 160L 4	-	-	-	144700	171300	57800	312
2.6	118700	2.6	567	-	3/V 17 L3	-	BN 160L 4	-	-	-	330300	351700	108500	350
2.7	81700	1.9	560	-	3/V 15 L3	-	BN 160L 4	-	-	-	153900	180700	64800	332
2.7	39000	0.9	551	-	3/V 11 L3	-	BN 160L 4	-	-	-	116100	144600	46600	302
2.8	110900	2.6	530	-	3/V 16 L3	-	BN 160L 4	-	-	-	251700	279900	106000	342
2.9	52000	1.3	516	-	3/V 13 L3	-	BN 160L 4	-	-	-	140700	166500	56100	312
3.0	57800	1.4	498	-	3/V 14 L3	-	BN 160L 4	-	-	-	148600	174500	62300	322
3.0	85600	2.1	498	-	3/V 15 L3	-	BN 160L 4	-	-	-	148600	174500	62300	332
3.4	47700	1.4	446	-	3/V 14 L3	-	BN 160L 4	-	-	-	143800	168800	60100	322
3.4	65100	1.9	446	-	3/V 15 L3	-	BN 160L 4	-	-	-	143800	168800	60100	332
3.4	93400	2.6	446	-	3/V 16 L3	-	BN 160L 4	-	-	-	239100	265900	100100	342
3.5	40900	1.2	430	-	3/V 11 L3	-	BN 160L 4	-	-	-	107800	134200	42800	302
3.5	47300	1.4	425	-	3/V 13 L3	-	BN 160L 4	-	-	-	132700	157100	52600	312
3.8	46100	1.4	397	-	3/V 14 L3	-	BN 160L 4	-	-	-	138800	163000	57800	322
3.9	67400	2.1	386	-	3/V 15 L3	-	BN 160L 4	-	-	-	137700	161700	57300	332
4.1	39500	1.4	370	-	3/V 13 L3	-	BN 160L 4	-	-	-	127300	150700	50200	312
10.7	11100	0.9	140	-	-	3/A 07 L2	BN 160L 4	M 5SB 4	23500	29500	54100	70900	20400	273
11.6	11100	1.0	130	-	-	3/A 07 L2	BN 160L 4	M 5SB 4	22900	28700	52900	69300	19900	273
13.8	8860	0.9	109	-	-	3/A 07 L2	BN 160L 4	M 5SB 4	21600	27100	50100	65700	18800	273
17.1	10200	1.3	87.7	-	-	3/A 07 L2	BN 160L 4	M 5SB 4	20100	25200	47000	61600	17500	273
21.5	5690	0.9	69.9	-	-	3/A 06 L2	BN 160L 4	M 5SB 4	16800	19000	40800	47500	12600	263
22.0	7940	1.3	68.3	-	-	3/A 07 L2	BN 160L 4	M 5SB 4	18500	23200	43600	57200	16100	273
24.9	6010	1.1	60.1	-	-	3/A 06 L2	BN 160L 4	M 5SB 4	15900	18100	39000	45500	12000	263
26.2	6650	1.3	57.3	-	-	3/A 07 L2	BN 160L 4	M 5SB 4	17400	21900	41400	54200	15200	273
26.9	4530	0.9	55.7	-	-	3/A 06 L2	BN 160L 4	M 5SB 4	15500	17600	38100	44400	11700	263
29.0	5170	1.1	51.7	-	-	3/A 06 L2	BN 160L 4	M 5SB 4	15200	17200	37300	43400	11400	263
30	8380	1.9	49.2	-	-	3/A 07 L2	BN 160L 4	M 5SB 4	16600	20800	39500	51800	14400	273
32	3840	0.9	47.2	-	-	3/A 06 L2	BN 160L 4	M 5SB 4	14700	16700	36300	42300	11000	263
36	9620	2.6	41.5	-	-	3/A 07 L2	BN 160L 4	M 5SB 4	15700	19600	37600	49200	13600	273
37	4910	1.3	41.1	-	-	3/A 06 L2	BN 160L 4	M 5SB 4	14000	15900	34800	40500	10500	263
43	3490	1.1	34.9	-	-	3/A 06 L2	BN 160L 4	M 5SB 4	13300	15100	33200	38600	9990	263
46	3920	1.3	32.7	-	-	3/A 06 L2	BN 160L 4	M 5SB 4	13000	14700	32500	37900	9780	263
46	7940	2.7	32.3	-	-	3/A 07 L2	BN 160L 4	M 5SB 4	14400	18100	34900	45700	12500	273
54	3320	1.3	27.7	-	-	3/A 06 L2	BN 160L 4	M 5SB 4	12300	14000	30900	36000	9250	263
55	6650	2.7	27.1	-	-	3/A 07 L2	BN 160L 4	M 5SB 4	13600	17000	33100	43300	11800	273

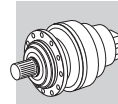
P₁ = 18.5 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
0.29	403700	0.9	5164	-	3/V 19 L4	-	BN 180M 4	-	-	-	638000	702000	200000	366
0.30	552000	1.3	5040	-	3/V 21 L4	-	BN 180M 4	-	-	-	779000	923000	1200000	374
0.33	553700	1.3	4550	-	3/V 21 L4	-	BN 180M 4	-	-	-	779000	923000	1200000	374
0.37	380000	1.0	4095	-	3/V 19 L4	-	BN 180M 4	-	-	-	638000	702000	200000	366
0.40	460000	1.3	3780	-	3/V 21 L4	-	BN 180M 4	-	-	-	779000	923000	1200000	374
0.42	536400	1.6	3600	-	3/V 21 L4	-	BN 180M 4	-	-	-	779000	923000	1200000	374
0.46	367600	1.2	3231	-	3/V 19 L4	-	BN 180M 4	-	-	-	638000	702000	200000	366
0.51	273300	1.0	2945	-	3/V 18 L4	-	BN 180M 4	-	-	-	503000	565000	200000	358
0.56	536400	2.0	2700	-	3/V 21 L4	-	BN 180M 4	-	-	-	779000	923000	1200000	374








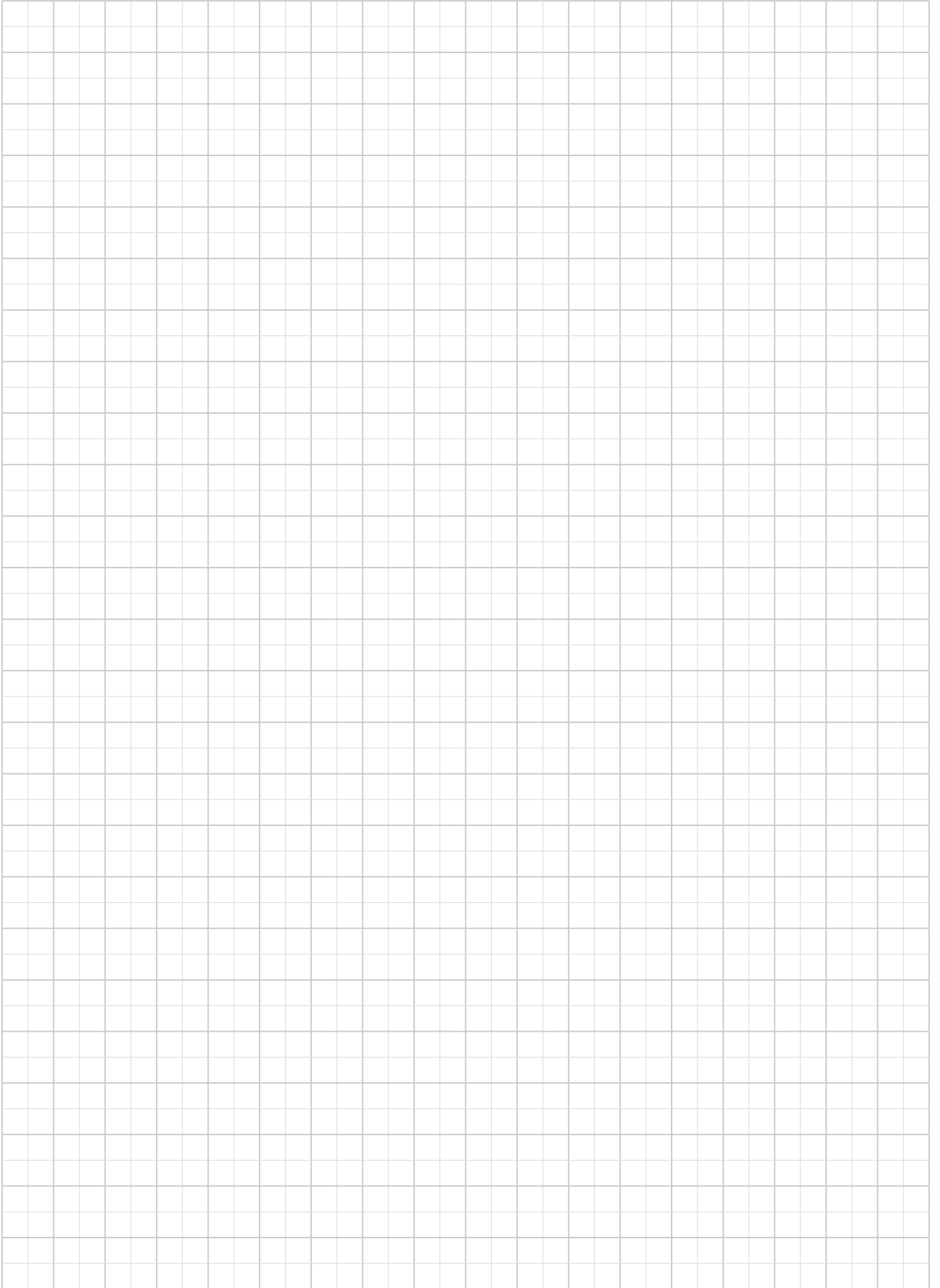
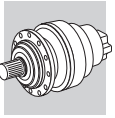
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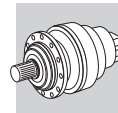
n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
0.58	365200	1.5	2582	-	3/V 19 L4	-	BN 180M 4	-	-	-	638000	702000	200000	366
0.60	511700	2.1	2520	-	3/V 21 L4	-	BN 180M 4	-	-	-	779000	923000	1200000	374
0.61	280600	1.2	2464	-	3/V 18 L4	-	BN 180M 4	-	-	-	503000	565000	200000	358
0.65	212900	1.0	2295	-	3/V 18 L4	-	BN 180M 4	-	-	-	503000	565000	200000	358
0.66	553700	2.5	2275	-	3/V 21 L4	-	BN 180M 4	-	-	-	779000	923000	1200000	374
0.73	184300	0.9	2065	-	3/V 17 L4	-	BN 180M 4	-	-	-	442000	470000	150000	350
0.79	460000	2.5	1890	-	3/V 21 L4	-	BN 180M 4	-	-	-	779000	923000	1200000	374
0.81	280600	1.6	1848	-	3/V 18 L4	-	BN 180M 4	-	-	-	503000	565000	200000	358
0.83	536400	3.0	1800	-	3/V 21 L4	-	BN 180M 4	-	-	-	779000	923000	1200000	374
0.84	184300	1.1	1780	-	3/V 17 L4	-	BN 180M 4	-	-	-	442000	470000	150000	350
0.86	280600	1.7	1748	-	3/V 18 L4	-	BN 180M 4	-	-	-	503000	565000	200000	358
1.0	255400	1.8	1473	-	3/V 18 L4	-	BN 180M 4	-	-	-	503000	563100	198800	358
1.1	154100	1.3	1365	-	3/V 17 L3	-	BN 180M 4	-	-	-	429900	457700	145400	350
1.1	112100	1.0	1324	-	3/V 16 L3	-	BN 180M 4	-	-	-	331300	368500	143900	342
1.2	276700	2.3	1232	-	3/V 18 L4	-	BN 180M 4	-	-	-	503000	533700	187300	358
1.2	150900	1.3	1215	-	3/V 17 L3	-	BN 180M 4	-	-	-	415100	442000	139800	350
1.3	275600	2.4	1165	-	3/V 18 L4	-	BN 180M 4	-	-	-	503000	524900	183800	358
1.3	128000	1.3	1134	-	3/V 17 L3	-	BN 180M 4	-	-	-	406600	432900	136600	350
1.3	92200	0.9	1120	-	3/V 15 L3	-	BN 180M 4	-	-	-	189500	222500	81600	332
1.4	119600	1.3	1059	-	3/V 16 L3	-	BN 180M 4	-	-	-	309800	344600	133600	342
1.5	128400	1.3	1024	-	3/V 17 L3	-	BN 180M 4	-	-	-	394300	419900	132100	350
1.5	93500	1.0	997	-	3/V 15 L3	-	BN 180M 4	-	-	-	183000	214800	78500	332
1.5	237400	2.5	982	-	3/V 18 L4	-	BN 180M 4	-	-	-	488500	498600	173600	358
1.7	100800	1.3	893	-	3/V 16 L3	-	BN 180M 4	-	-	-	294300	327300	126200	342
1.8	106700	1.3	851	-	3/V 17 L3	-	BN 180M 4	-	-	-	373000	397100	124200	350
1.8	80400	1.0	840	-	3/V 15 L3	-	BN 180M 4	-	-	-	173800	204100	74200	332
1.9	141200	1.8	810	-	3/V 17 L3	-	BN 180M 4	-	-	-	367600	391400	122100	350
1.9	99700	1.3	794	-	3/V 16 L3	-	BN 180M 4	-	-	-	284200	316100	121400	342
2.0	185000	2.5	765	-	3/V 18 L4	-	BN 180M 4	-	-	-	453300	462600	159800	358
2.2	142900	2.1	683	-	3/V 17 L3	-	BN 180M 4	-	-	-	349200	371800	115400	350
2.2	84000	1.3	669	-	3/V 16 L3	-	BN 180M 4	-	-	-	270000	300300	114600	342
2.3	70200	1.1	665	-	3/V 14 L3	-	BN 180M 4	-	-	-	162000	190200	68600	322
2.3	88300	1.4	665	-	3/V 15 L3	-	BN 180M 4	-	-	-	162000	190200	68600	332
2.5	134700	2.2	608	-	3/V 17 L3	-	BN 180M 4	-	-	-	337200	359000	111000	350
2.6	57100	1.0	579	-	3/V 14 L3	-	BN 180M 4	-	-	-	155500	182600	65500	322
2.6	118700	2.1	567	-	3/V 17 L3	-	BN 180M 4	-	-	-	330300	351700	108500	350
2.7	81700	1.5	560	-	3/V 15 L3	-	BN 180M 4	-	-	-	153900	180700	64800	332
2.8	110900	2.1	530	-	3/V 16 L3	-	BN 180M 4	-	-	-	251700	279900	106000	342
2.9	52000	1.0	516	-	3/V 13 L3	-	BN 180M 4	-	-	-	140700	166500	56100	312
2.9	128400	2.5	512	-	3/V 17 L3	-	BN 180M 4	-	-	-	320300	341000	104800	350
3.0	57800	1.2	498	-	3/V 14 L3	-	BN 180M 4	-	-	-	148600	174500	62300	322
3.0	85600	1.7	498	-	3/V 15 L3	-	BN 180M 4	-	-	-	148600	174500	62300	332
3.4	47700	1.1	446	-	3/V 14 L3	-	BN 180M 4	-	-	-	143800	168800	60100	322
3.4	65100	1.5	446	-	3/V 15 L3	-	BN 180M 4	-	-	-	143800	168800	60100	332
3.4	93400	2.1	446	-	3/V 16 L3	-	BN 180M 4	-	-	-	239100	265900	100100	342
3.5	40900	1.0	430	-	3/V 11 L3	-	BN 180M 4	-	-	-	107800	134200	42800	302
3.5	47300	1.1	425	-	3/V 13 L3	-	BN 180M 4	-	-	-	132700	157100	52600	312
3.5	106700	2.5	425	-	3/V 17 L3	-	BN 180M 4	-	-	-	303000	322600	98500	350
3.8	46100	1.2	397	-	3/V 14 L3	-	BN 180M 4	-	-	-	138800	163000	57800	322
3.8	99700	2.5	397	-	3/V 16 L3	-	BN 180M 4	-	-	-	230900	256800	96300	342
3.9	67400	1.7	386	-	3/V 15 L3	-	BN 180M 4	-	-	-	137700	161700	57300	332
4.1	39500	1.1	370	-	3/V 13 L3	-	BN 180M 4	-	-	-	127300	150700	50200	312
17.1	10200	1.1	87.7	-	-	3/A 07 L2	BN 180M 4	M 5LA 4	20100	25200	47000	61600	17500	273
22.0	7940	1.1	68.3	-	-	3/A 07 L2	BN 180M 4	M 5LA 4	18500	23200	43600	57200	16100	273
24.9	6010	0.9	60.1	-	-	3/A 06 L2	BN 180M 4	M 5LA 4	15900	18100	39000	45500	12000	263
26.2	6650	1.1	57.3	-	-	3/A 07 L2	BN 180M 4	M 5LA 4	17400	21900	41400	54200	15200	273
29.0	5170	0.9	51.7	-	-	3/A 06 L2	BN 180M 4	M 5LA 4	15200	17200	37300	43400	11400	263
30	8380	1.5	49.2	-	-	3/A 07 L2	BN 180M 4	M 5LA 4	16600	20800	39500	51800	14400	273
36	9620	2.1	41.5	-	-	3/A 07 L2	BN 180M 4	M 5LA 4	15700	19600	37600	49200	13600	273
37	4910	1.1	41.1	-	-	3/A 06 L2	BN 180M 4	M 5LA 4	14000	15900	34800	40500	10500	263
43	3490	0.9	34.9	-	-	3/A 06 L2	BN 180M 4	M 5LA 4	13300	15100	33200	38600	9990	263
46	3920	1.1	32.7	-	-	3/A 06 L2	BN 180M 4	M 5LA 4	13000	14700	32500	37900	9780	263
46	7940	2.2	32.3	-	-	3/A 07 L2	BN 180M 4	M 5LA 4	14400	18100	34900	45700	12500	273
54	3320	1.1	27.7	-	-	3/A 06 L2	BN 180M 4	M 5LA 4	12300	14000	30900	36000	9250	263
55	6650	2.2	27.1	-	-	3/A 07 L2	BN 180M 4	M 5LA 4	13600	17000	33100	43300	11800	273



P₁ = 22 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC/PC	MZ/PZ	HC	HZ	FZ	
0.30	552000	1.1	5040	-	3/V 21 L4	-	BN 180L 4	-	-	-	779000	923000	1200000	374
0.33	553700	1.1	4550	-	3/V 21 L4	-	BN 180L 4	-	-	-	779000	923000	1200000	374
0.40	460000	1.1	3780	-	3/V 21 L4	-	BN 180L 4	-	-	-	779000	923000	1200000	374
0.42	536400	1.3	3600	-	3/V 21 L4	-	BN 180L 4	-	-	-	779000	923000	1200000	374
0.46	367600	1.0	3231	-	3/V 19 L4	-	BN 180L 4	-	-	-	638000	702000	200000	366
0.56	536400	1.7	2700	-	3/V 21 L4	-	BN 180L 4	-	-	-	779000	923000	1200000	374
0.58	365200	1.3	2582	-	3/V 19 L4	-	BN 180L 4	-	-	-	638000	702000	200000	366
0.60	511700	1.8	2520	-	3/V 21 L4	-	BN 180L 4	-	-	-	779000	923000	1200000	374
0.61	280600	1.0	2464	-	3/V 18 L4	-	BN 180L 4	-	-	-	503000	565000	200000	358
0.66	553700	2.1	2275	-	3/V 21 L4	-	BN 180L 4	-	-	-	779000	923000	1200000	374
0.79	460000	2.1	1890	-	3/V 21 L4	-	BN 180L 4	-	-	-	779000	923000	1200000	374
0.81	280600	1.3	1848	-	3/V 18 L4	-	BN 180L 4	-	-	-	503000	565000	200000	358
0.83	536400	2.5	1800	-	3/V 21 L4	-	BN 180L 4	-	-	-	779000	923000	1200000	374
0.84	184300	0.9	1780	-	3/V 17 L4	-	BN 180L 4	-	-	-	442000	470000	150000	350
0.86	280600	1.4	1748	-	3/V 18 L4	-	BN 180L 4	-	-	-	503000	565000	200000	358
0.99	512200	2.9	1517	-	3/V 21 L4	-	BN 180L 4	-	-	-	779000	923000	1200000	374
1.0	255400	1.5	1473	-	3/V 18 L4	-	BN 180L 4	-	-	-	503000	563100	198800	358
1.1	154100	1.1	1365	-	3/V 17 L3	-	BN 180L 4	-	-	-	429900	457700	145400	350
1.2	425500	2.9	1260	-	3/V 21 L4	-	BN 180L 4	-	-	-	742400	880400	1132200	374
1.2	276700	1.9	1232	-	3/V 18 L4	-	BN 180L 4	-	-	-	503000	533700	187300	358
1.2	150900	1.1	1215	-	3/V 17 L3	-	BN 180L 4	-	-	-	415100	442000	139800	350
1.3	275600	2.0	1165	-	3/V 18 L4	-	BN 180L 4	-	-	-	503000	524900	183800	358
1.3	128000	1.1	1134	-	3/V 17 L3	-	BN 180L 4	-	-	-	406600	432900	136600	350
1.4	119600	1.1	1059	-	3/V 16 L3	-	BN 180L 4	-	-	-	309800	344600	133600	342
1.5	128400	1.1	1024	-	3/V 17 L3	-	BN 180L 4	-	-	-	394300	419900	132100	350
1.5	237400	2.1	982	-	3/V 18 L4	-	BN 180L 4	-	-	-	488500	498600	173600	358
1.7	100800	1.1	893	-	3/V 16 L3	-	BN 180L 4	-	-	-	294300	327300	126200	342
1.8	106700	1.1	851	-	3/V 17 L3	-	BN 180L 4	-	-	-	373000	397100	124200	350
1.9	141200	1.5	810	-	3/V 17 L3	-	BN 180L 4	-	-	-	367600	391400	122100	350
1.9	99700	1.1	794	-	3/V 16 L3	-	BN 180L 4	-	-	-	284200	316100	121400	342
2.0	185000	2.1	765	-	3/V 18 L4	-	BN 180L 4	-	-	-	453300	462600	159800	358
2.2	142900	1.8	683	-	3/V 17 L3	-	BN 180L 4	-	-	-	349200	371800	115400	350
2.2	84000	1.1	669	-	3/V 16 L3	-	BN 180L 4	-	-	-	270000	300300	114600	342
2.3	70200	0.9	665	-	3/V 14 L3	-	BN 180L 4	-	-	-	162000	190200	68600	322
2.3	88300	1.2	665	-	3/V 15 L3	-	BN 180L 4	-	-	-	162000	190200	68600	332
2.5	134700	1.9	608	-	3/V 17 L3	-	BN 180L 4	-	-	-	337200	359000	111000	350
2.6	118700	1.8	567	-	3/V 17 L3	-	BN 180L 4	-	-	-	330300	351700	108500	350
2.7	81700	1.3	560	-	3/V 15 L3	-	BN 180L 4	-	-	-	153900	180700	64800	332
2.8	110900	1.8	530	-	3/V 16 L3	-	BN 180L 4	-	-	-	251700	279900	106000	342
2.9	128400	2.1	512	-	3/V 17 L3	-	BN 180L 4	-	-	-	320300	341000	104800	350
3.0	57800	1.0	498	-	3/V 14 L3	-	BN 180L 4	-	-	-	148600	174500	62300	322
3.0	85600	1.4	498	-	3/V 15 L3	-	BN 180L 4	-	-	-	148600	174500	62300	332
3.4	47700	0.9	446	-	3/V 14 L3	-	BN 180L 4	-	-	-	143800	168800	60100	322
3.4	65100	1.3	446	-	3/V 15 L3	-	BN 180L 4	-	-	-	143800	168800	60100	332
3.4	93400	1.8	446	-	3/V 16 L3	-	BN 180L 4	-	-	-	239100	265900	100100	342
3.5	47300	0.9	425	-	3/V 13 L3	-	BN 180L 4	-	-	-	132700	157100	52600	312
3.5	106700	2.1	425	-	3/V 17 L3	-	BN 180L 4	-	-	-	303000	322600	98500	350
3.7	126000	2.6	405	-	3/V 17 L3	-	BN 180L 4	-	-	-	298600	317900	96900	350
3.8	46100	1.0	397	-	3/V 14 L3	-	BN 180L 4	-	-	-	138800	163000	57800	322
3.8	99700	2.1	397	-	3/V 16 L3	-	BN 180L 4	-	-	-	230900	256800	96300	342
3.9	67400	1.4	386	-	3/V 15 L3	-	BN 180L 4	-	-	-	137700	161700	57300	332
4.1	39500	0.9	370	-	3/V 13 L3	-	BN 180L 4	-	-	-	127300	150700	50200	312
30	8380	1.3	49.2	-	-	3/A 07 L2	BN 180L 4	-	16600	20800	39500	51800	14400	273
36	9620	1.8	41.5	-	-	3/A 07 L2	BN 180L 4	-	15700	19600	37600	49200	13600	273
37	4910	0.9	41.1	-	-	3/A 06 L2	BN 180L 4	-	14000	15900	34800	40500	10500	263
46	3920	0.9	32.7	-	-	3/A 06 L2	BN 180L 4	-	13000	14700	32500	37900	9780	263
46	7940	1.9	32.3	-	-	3/A 07 L2	BN 180L 4	-	14400	18100	34900	45700	12500	273
54	3320	0.9	27.7	-	-	3/A 06 L2	BN 180L 4	-	12300	14000	30900	36000	9250	263
55	6650	1.9	27.1	-	-	3/A 07 L2	BN 180L 4	-	13600	17000	33100	43300	11800	273





26.0 - DATI TECNICI RIDUTTORI COMBINATI VITE-PLANETARI - 3/V

26.0 - 3/V - PLANETARYWORM RATING CHARTS

26.0 - 3/VF - TECHNISCHE DATEN DER GETRIEBE

26.0 - DONNEES TECHNIQUES REDUCTEURS COMBINÉ 3/V

Guida alla consultazione delle tabelle.

Reading the rating chart.

Anleitung für die richtige Konsultation der Tabellen.

Guide pour la consultation des tableaux

3/V 00 L3

1250 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)			Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ				
1500	3/V 00L3	415	3.6	1000	0.57	—	B5 / B14			7930	7930	20900	24000	5210	216
	3/V 00L3	436	3.4	730	0.42	—	63	71	—	8060	8060	21200	24300	5300	216
	3/V 00L3	509	2.9	1040	0.48	—	63	71	80	8490	8490	22200	25500	5580	216
	3/V 00L3	562	2.7	720	0.30	—	63	71	80	8770	8770	22900	26300	5770	216
	3/V 00L3	654	2.3	1090	0.41	—	63	71	—	9230	9230	23900	27500	6070	216

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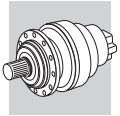
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1	Coppia di riferimento	Reference torque	Bezugsdrehmoment	Couple de référence
2	Velocità di comando riduttore	Gearbox drive speed	Drehzahl am Getriebeantrieb	Vitesse angulaire à l'entrée du réducteur
3	Grandezza riduttore in esecuzione combinata vite + epicicloidale	Frame size of combined worm + planetary gearbox	Baugröße des Getriebes 300 + kombinierten Schneckengetriebe	Taille réducteur combiné série 300 + réducteur à vis sans fin
4	Rapporto di riduzione	Gear ratio	Übersetzung	Rapport de réduction
5	Velocità angolare in uscita riduttore	Gearbox output speed	Drehzahl am Getriebeabtrieb	Vitesse angulaire en sortie réducteur
6	Coppia nominale all'albero lento del riduttore, basata su: - fattore di sicurezza S=1 - durata di 10000 h	Gearbox rated output torque, based on: - safety factor S=1 - 10000 hrs theoretical lifetime	Nenn-Drehmoment am Getriebeabtrieb mit Sicherheitsfaktor S=1 für eine Dauer von 10000 h	Couple nominal à la sortie du réducteur avec facteur de sécurité S=1 pendant une durée de 10000 h
7	Potenza nominale all'albero veloce del riduttore, basata su: - fattore di sicurezza S=1 - durata teorica di 10000 h	Gearbox rated input power, based on: - safety factor S=1 - 10000 hrs theoretical lifetime	Nenn-Leistung im Getriebeantrieb mit: - Sicherheitsfaktor S=1 - Dauer von 10000 h	Puissance nominale en entrée réducteur avec facteur de sécurité S=1 pendant une durée de 10000 h
8	Potenza termica riduttore	Gearbox thermal capacity	Wärmeleistung	Puissance thermique réducteur
9	Grandezza motore elettrico IEC installabile. - Le predisposizioni contrassegnate con * sono dotate di una linguetta ribassata.	Frame size of compatible IEC electric motor - IEC inputs marked with * feature a lowered key.	Baugröße einbaubarer IEC-Elektromotor. - Alle Getriebe, die * gekennzeichnet sind, werden mit einer weiter unten eingebauten Passfeder geliefert.	Taille IEC moteur électrique à installer. - Les moteurs dont les prédispositions sont repérées par * sont dotée en série d'une clavette à hauteur réduite.
10	Carichi radiali applicabili all'albero lento, basati su - fattore di sicurezza S=1 - durata teorica 10000 h Per forze non applicate in mezzzeria riferirsi ai diagrammi riportati a seguito delle pagine dimensionali del riduttore in oggetto	Permitted overhung loading on output shaft, based on: - safety factor S=1 - 10000 hrs theoretical lifetime For forces applying off the shaft midpoint, see diagrams provided in the pages following dimensions of the gearbox under study	Auf die Mitte der Abtriebswelle für eine Dauer von 10000 Std. applizierbare Nenn-Radialkräfte und Sicherheitsfaktor S=1 Für andere Kraftangriffspunkte verweisen wir auf die Diagramme, die den Seiten mit den Maßen der gewählten Größe folgen	Charges radiales nominales applicables à la moitié de l'arbre pendant : - facteur de sécurité S=1 - durée de 10000 h Pour d'autres positions de charge, voir diagrammes figurant à la suite des pages dimensions de la taille sélectionnée
11	Pagina delle dimensioni	Page installation drawing can be found at	Maßseiten	Page avec les dimensions






3/V 00 L3

1250 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 			Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ				
1500	3/V 00L3	415	3.6	1000	0.57	—	B5 / B14			7930	7930	20900	24000	5210	216
	3/V 00L3	436	3.4	730	0.42	—	63	71	80						
	3/V 00L3	509	2.9	1040	0.48	—	63	71	80						
	3/V 00L3	562	2.7	720	0.30	—	63	71	80						
	3/V 00L3	654	2.3	1090	0.41	—	63	71	—						
	3/V 00L3	689	2.2	1100	0.37	—	63	71	80						
	3/V 00L3	818	1.8	1110	0.36	—	63	71	—						
	3/V 00L3	903	1.7	790	0.23	—	63	71	—						
	3/V 00L3	997	1.5	800	0.18	—	63	71	80						
	3/V 00L3	1107	1.4	1190	0.28	—	63	71	—						
	3/V 00L3	1198	1.3	830	0.17	—	63	71	—						
	3/V 00L3	1381	1.1	1230	0.24	—	63	71	—						
	3/V 00L3	1495	1.0	860	0.14	—	63	71	—						
	3/V 00L3	1869	0.80	860	0.12	—	63	71	—						
	3/V 00L3	2337	0.64	860	0.10	—	63	71	—						




3/V 01 L3

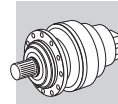
2460 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 			Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ				
1500	3/V 01L3	430	3.5	1880	0.90	—	B5 / B14			8020	8020	21100	24200	5270	224
	3/V 01L3	443	3.4	1370	0.66	—	63	71	80						
	3/V 01L3	509	2.9	1270	0.58	—	63	71	80						
	3/V 01L3	562	2.7	1400	0.58	—	63	71	80						
	3/V 01L3	654	2.3	1180	0.45	—	63	71	—						
	3/V 01L3	689	2.2	1710	0.58	—	63	71	80						
	3/V 01L3	799	1.9	1540	0.43	—	63	71	80						
	3/V 01L3	903	1.7	1230	0.36	—	63	71	—						
	3/V 01L3	997	1.5	1600	0.36	—	63	71	80						
	3/V 01L3	1105	1.4	1990	0.45	—	63	71	—						
	3/V 01L3	1198	1.3	1650	0.34	—	63	71	—						
	3/V 01L3	1381	1.1	1880	0.36	—	63	71	—						
	3/V 01L3	1495	1.0	1720	0.29	—	63	71	—						
	3/V 01L3	1869	0.80	1720	0.24	—	63	71	—						
	3/V 01L3	2337	0.64	1720	0.20	—	63	71	—						

3/V 03 L3




2970 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 			Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ				
1500	3/V 03L3	395	3.8	2210	1.2	—	B5 / B14			24000	27700	42000	50500	15400	232
	3/V 03L3	460	3.3	2310	1.1	—	71	80	90						
	3/V 03L3	502	3.0	2020	0.83	—	71	80	90						
	3/V 03L3	544	2.8	2730	1.1	—	71	80	90						
	3/V 03L3	623	2.4	2220	0.80	—	71	80	90						
	3/V 03L3	736	2.0	2720	0.83	—	71	80	90						
	3/V 03L3	793	1.9	2180	0.62	—	71	80	90						
	3/V 03L3	923	1.6	2670	0.65	—	71	80	90						
	3/V 03L3	1023	1.5	2710	0.66	—	71	80	—						
	3/V 03L3	1189	1.3	2340	0.49	—	71	80	—						
	3/V 03L3	1385	1.1	2820	0.51	—	71	80	—						
	3/V 03L3	1610	0.93	2440	0.38	—	71	80	—						
	3/V 03L3	1728	0.87	2850	0.41	—	71	80	—						
	3/V 03L3	2009	0.75	2440	0.30	—	71	80	—						
	3/V 03L3	2511	0.60	2300	0.23	—	71	80	—						






3/V 04 L3

3960 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 					Rn ₂ [N]						
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ		
1500	3/V 04L3	384	3.9	3510	1.9	—	B5	B5 / B14					23700	27400	41600	50100	15200	242
	3/V 04L3	453	3.3	3730	1.7	—	71	80	90	100	112	25100	29000	43700	52600	16100	242	
	3/V 04L3	501	3.0	3010	1.4	—	71	80	90	100	112	26000	30000	45100	54200	16700	242	
	3/V 04L3	568	2.6	3160	1.2	—	71	80	90	100	112	27100	31300	46800	56300	17400	242	
	3/V 04L3	623	2.4	3530	1.2	—	71	80	90	100	112	27900	32200	48100	57900	17900	242	
	3/V 04L3	710	2.1	2640	0.73	—	71	80	90	100	112	29200	33700	50000	60200	18700	242	
	3/V 04L3	769	1.9	3330	0.90	—	71	80	90	100	112	29900	34600	51300	61700	19200	242	
	3/V 04L3	887	1.7	2740	0.61	—	71	80	90	100	112	31400	36300	53500	64400	20100	242	
	3/V 04L3	981	1.5	3860	0.91	—	71	80	90	100	112	32500	37500	55100	66300	20800	242	
	3/V 04L3	1152	1.3	3570	0.67	—	71	80	90	100	112	34300	39600	57900	69600	22000	242	
	3/V 04L3	1231	1.2	3610	0.68	—	71	80	90	100	112	35000	40400	59000	71000	22500	242	
	3/V 04L3	1419	1.1	2970	0.45	—	71	80	90	100	112	36000	42000	61600	74000	23600	242	
	3/V 04L3	1536	0.98	3740	0.56	—	71	80	90	100	112	36000	42000	63100	74000	24000	242	
	3/V 04L3	1774	0.85	3000	0.37	—	71	80	90	100	112	36000	42000	64000	74000	24000	242	
	3/V 04L3	1893	0.79	3000	0.37	—	71	80	90	100	112	36000	42000	64000	74000	24000	242	
	3/V 04L3	2366	0.63	3000	0.29	—	71	80	90	100	112	36000	42000	64000	74000	24000	242	




3/V 05 L3

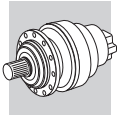
5800 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 					Rn ₂ [N]						
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ		
1500	3/V 05L3	396	3.8	3760	1.9	—	B5	B5 / B14					24000	27700	42000	50500	15400	252
	3/V 05L3	462	3.3	4820	2.0	—	71	80	90	100	112	25300	29200	44000	52900	16200	252	
	3/V 05L3	529	2.8	3920	1.5	—	71	80	90	100	112	26400	30500	45800	55100	17000	252	
	3/V 05L3	576	2.6	4870	1.7	—	71	80	90	100	112	27200	31400	47000	56500	17400	252	
	3/V 05L3	623	2.4	4460	1.6	—	71	80	90	100	112	27900	32200	48100	57900	17900	252	
	3/V 05L3	715	2.1	4120	1.2	—	71	80	90	100	112	29200	33700	50200	60300	18800	252	
	3/V 05L3	793	1.9	4200	1.1	—	71	80	90	100	112	30200	34900	51700	62200	19400	252	
	3/V 05L3	894	1.7	4290	1.0	—	71	80	90	100	112	31500	36300	53600	64500	20200	252	
	3/V 05L3	1057	1.4	4410	0.97	—	71	80	90	100	112	33300	38400	56400	67800	21400	252	
	3/V 05L3	1116	1.3	4460	0.83	—	71	80	90	100	112	33900	39100	57300	69000	21700	252	
	3/V 05L3	1231	1.2	5470	1.0	—	71	80	90	100	112	35000	40400	59000	71000	22500	252	
	3/V 05L3	1431	1.0	4650	0.75	—	71	80	90	100	112	36000	42000	61700	74000	23600	252	
	3/V 05L3	1674	0.90	4430	0.57	—	71	80	90	100	112	36000	42000	64000	74000	24000	252	
	3/V 05L3	1786	0.84	4690	0.61	—	71	80	90	100	112	36000	42000	64000	74000	24000	252	
	3/V 05L3	2232	0.67	4430	0.46	—	71	80	90	100	112	36000	42000	64000	74000	24000	252	

3/V 06 L3

10840 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 					Rn ₂ [N]						
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ		
1500	3/V 06L3	395	3.8	7590	3.8	—	B5	B5 / B14					29900	33800	68700	80000	22400	262
	3/V 06L3	427	3.5	8820	4.1	—	71	80	90	100	112	30600	34700	70300	81800	23000	262	
	3/V 06L3	527	2.8	7590	2.9	—	71	80	90	100	112	32900	37200	74900	87200	24700	262	
	3/V 06L3	569	2.6	8560	3.0	—	71	80	90	100	112	33700	38200	76600	89200	25300	262	
	3/V 06L3	661	2.3	9370	2.8	—	71	80	90	100	112	35500	40200	80100	93300	26600	262	
	3/V 06L3	698	2.2	7540	2.1	—	71	80	90	100	112	36100	40900	81400	94800	27100	262	
	3/V 06L3	791	1.9	7680	2.1	—	71	80	90	100	112	37600	42600	84500	98400	28300	262	
	3/V 06L3	930	1.6	7890	1.7	—	71	80	90	100	112	39700	45000	88800	103400	29800	262	
	3/V 06L3	992	1.5	9450	2.1	—	71	80	90	100	112	40600	46000	90500	105400	30500	262	
	3/V 06L3	1153	1.3	8250	1.6	—	71	80	90	100	112	42700	48400	94700	110200	32100	262	
	3/V 06L3	1212	1.2	7820	1.5	—	71	80	90	100	112	43400	49200	96100	111900	32600	262	
	3/V 06L3	1395	1.1	8400	1.3	—	71	80	90	100	112	45000	51000	100200	116700	34200	262	
	3/V 06L3	1768	0.85	8630	1.1	—	71	80	90	100	112	45000	51000	101000	119000	35000	262	
	3/V 06L3	2139	0.70	8500	0.91	—	71	80	90	100	112	45000	51000	101000	119000	35000	262	
	3/V 06L3	2588	0.58	7000	0.62	—	71	80	90	100	112	45000	51000	101000	119000	35000	262	



3/V 07 L3

15680 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)					Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ	
1500	3/V 07L3	386	3.9	9020	4.5	—	B5 / B14					32900	41300	73400	96100	28600	272
	3/V 07L3	460	3.3	12300	5.3	—	80	90	100	112	132	34900	43800	77300	101300	30400	272
	3/V 07L3	507	3.0	13600	5.3	—	80	90	100	112	132	36100	45300	79600	104300	31400	272
	3/V 07L3	655	2.3	14400	4.8	—	80	90	100	112	132	39300	49300	85900	112600	34100	272
	3/V 07L3	761	2.0	14200	4.0	—	80	90	100	112	132	41300	51800	89900	117800	35900	272
	3/V 07L3	773	1.9	9970	2.6	—	80	90	100	112	132	41500	52100	90300	118400	36100	272
	3/V 07L3	920	1.6	12300	2.9	—	80	90	100	112	132	44000	55200	95200	124700	38200	272
	3/V 07L3	1015	1.5	14400	3.1	—	80	90	100	112	132	45400	57000	98000	128400	39500	272
	3/V 07L3	1159	1.3	10600	2.0	—	80	90	100	112	132	47500	59600	102000	133700	41300	272
	3/V 07L3	1288	1.2	14500	2.5	—	80	90	100	112	132	49200	61700	105300	138000	42800	272
	3/V 07L3	1411	1.1	12300	2.0	—	80	90	100	112	132	50700	63600	108200	141800	44100	272
	3/V 07L3	1545	0.97	11000	1.6	—	80	90	100	112	132	52000	65000	109000	145000	45000	272
	3/V 07L3	1964	0.76	12300	1.5	—	80	90	100	112	132	52000	65000	109000	145000	45000	272
	3/V 07L3	2150	0.70	11000	1.2	—	80	90	100	112	132	52000	65000	109000	145000	45000	272
	3/V 07L3	2472	0.61	11000	1.1	—	80	90	100	112	132	52000	65000	109000	145000	45000	272

3/V 09 L3

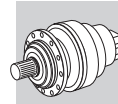
23240 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)					Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ	
1500	3/V 09L3	370	4.1	13000	7.3	—	B5					—	—	73600	94900	22600	282
	3/V 09L3	442	3.4	17700	8.4	—	100	112	132	—	—	—	77600	100100	24000	282	
	3/V 09L3	507	3.0	14300	5.6	—	—	—	132	160	—	—	80900	104300	25100	282	
	3/V 09L3	655	2.3	17600	5.6	—	100	112	132	—	—	—	87300	112600	27300	282	
	3/V 09L3	761	2.0	14400	3.9	—	100	112	132	—	—	—	91300	117800	28700	282	
	3/V 09L3	800	1.9	21400	5.8	—	100	112	132	—	—	—	92700	119600	29200	282	
	3/V 09L3	840	1.8	20100	5.0	—	100	112	132	—	—	—	94100	121400	29700	282	
	3/V 09L3	1004	1.5	18100	3.9	—	100	112	132	—	—	—	99300	128000	31500	282	
	3/V 09L3	1159	1.3	16200	2.9	—	100	112	132	—	—	—	103600	133700	33000	282	
	3/V 09L3	1288	1.2	21500	3.6	—	100	112	132	—	—	—	107000	138000	34200	282	
	3/V 09L3	1497	1.0	18300	2.6	—	100	112	132	—	—	—	110000	144300	36000	282	
	3/V 09L3	1623	0.92	14700	2.1	—	100	112	—	—	—	—	110000	145000	36000	282	
	3/V 09L3	1792	0.84	22000	2.8	—	100	112	—	—	—	—	110000	145000	36000	282	
	3/V 09L3	2150	0.70	17000	1.7	—	100	112	132	—	—	—	110000	145000	36000	282	
	3/V 09L3	2472	0.61	17000	1.6	—	100	112	—	—	—	—	110000	145000	36000	282	

3/V 10 L3




34120 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)					Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ	
1500	3/V 10L3	436	3.4	26700	12.2	—	B5					—	—	91600	115200	43100	292
	3/V 10L3	507	3.0	25900	10.2	—	—	—	132	160 (*)	—	—	95800	120500	45300	292	
	3/V 10L3	560	2.7	25900	9.2	—	—	—	132	160 (*)	—	—	98700	124100	46800	292	
	3/V 10L3	614	2.4	21800	7.1	—	—	—	132	160 (*)	—	—	101500	127600	48300	292	
	3/V 10L3	701	2.1	21900	6.0	—	—	—	132	160 (*)	—	—	105600	132800	50400	292	
	3/V 10L3	773	1.9	22400	5.8	—	—	—	132	160 (*)	—	—	108700	136700	52100	292	
	3/V 10L3	920	1.6	21800	4.9	—	100	112	132	—	—	—	114600	144100	55200	292	
	3/V 10L3	1004	1.5	31800	6.9	—	100	112	132	—	—	—	117600	147900	56900	292	
	3/V 10L3	1120	1.3	29100	5.6	—	100	112	132	—	—	—	121600	152800	59000	292	
	3/V 10L3	1227	1.2	21800	3.9	—	100	112	132	—	—	—	124900	157100	60800	292	
	3/V 10L3	1411	1.1	21800	3.3	—	100	112	132	—	—	—	130300	163800	63700	292	






3/V 10 L4

34120 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 					Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ	
1500	3/V 10L4	1657	0.91	33300	4.1	—	B5					—	—	133000	166000	65000	292
							71	80	90	100	112						
							B5 / B14										
							71	80	90	100	112						
							71	80	90	100	112						
							71	80	90	100	112						
							71	80	90	100	112						
							71	80	90	100	112						
							71	80	90	100	112						
							71	80	90	100	112						
							71	80	90	100	112						
							71	80	90	100	112						




3/V 11 L3

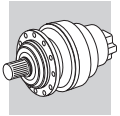
48330 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 					Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ	
1500	3/V 11L3	430	3.5	40900	18.7	—	B5					—	—	107800	134200	42800	302
							—	—	—	160	180 (*)						
							—	—	—	160	180 (*)						
							—	—	—	160	180 (*)						
							—	—	132	160	—						
							—	—	132	160	—						
							—	—	132	160	—						
							100	112	132	—	—						
							100	112	132	—	—						
							—	—	132	160	—						
							100	112	132	—	—						
							100	112	132	—	—						
							100	112	132	—	—						
							100	112	132	—	—						
							100	112	132	—	—						

3/V 11 L4




48330 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 					Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ	
1500	3/V 11L4	2510	0.60	48300	3.9	—	B5 / B14					—	—	157000	195000	65000	302
							80	90	100	112	132						
							80	90	100	112	132						
							80	90	100	112	132						
							80	90	100	112	132						
							80	90	100	112	132						
							80	90	100	112	132						
							80	90	100	112	132						






3/V 13 L3

57970 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 					Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC		HZ	FZ
1500	3/V 13L3	370	4.1	39500	21	—	B5					—	—	127300	150700	50200	312
	3/V 13L3	425	3.5	47300	21	—	—	—	—	160	180 (*)	—	—	132700	157100	52600	312
	3/V 13L3	516	2.9	52000	19.8	—	—	—	—	160	180 (*)	—	—	140700	166500	56100	312
	3/V 13L3	567	2.6	49300	17.1	—	—	—	—	160	180 (*)	—	—	144700	171300	57800	312
	3/V 13L3	673	2.2	50700	14.8	—	—	—	—	160	180 (*)	—	—	152300	180300	61200	312
	3/V 13L3	741	2.0	45800	13.2	—	—	—	132	160	—	—	—	156800	185500	63200	312
	3/V 13L3	810	1.9	44500	10.8	—	—	—	—	160	180 (*)	—	—	161100	190600	65100	312
	3/V 13L3	870	1.7	53800	13.2	—	—	—	132	160	—	—	—	164500	194700	66700	312
	3/V 13L3	1009	1.5	54300	10.8	—	—	—	132	160	—	—	—	172000	203600	70100	312
	3/V 13L3	1088	1.4	51200	10.3	—	100	112	132	—	—	—	—	175900	208200	71900	312
	3/V 13L3	1291	1.2	52800	9.0	—	100	112	132	—	—	—	—	185200	219200	76100	312
	3/V 13L3	1418	1.1	57400	8.9	—	100	112	132	—	—	—	—	190500	225400	78500	312
	3/V 13L3	1620	0.93	49000	6.5	—	—	—	132	160	—	—	—	192000	231000	80000	312
	3/V 13L3	1682	0.89	57970	7.6	—	100	112	132	—	—	—	—	192000	231000	80000	312
	3/V 13L3	2019	0.74	57970	6.5	—	100	112	132	—	—	—	—	192000	231000	80000	312
	3/V 13L3	2430	0.62	49000	4.5	—	100	112	132	—	—	—	—	192000	231000	80000	312




3/V 13 L4

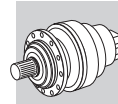
57970 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 					Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC		HZ	FZ
1500	3/V 13L4	2773	0.54	55400	4.5	—	B5 / B14					—	—	192000	231000	80000	312
	3/V 13L4	3263	0.46	55400	3.5	—	80	90	100	112	132	—	—	192000	231000	80000	312
	3/V 13L4	3515	0.43	57970	3.4	—	80	90	100	112	132	—	—	192000	231000	80000	312
	3/V 13L4	4046	0.37	55400	3.1	—	80	90	100	112	132	—	—	192000	231000	80000	312
	3/V 13L4	4536	0.33	57970	2.9	—	80	90	100	112	132	—	—	192000	231000	80000	312
	3/V 13L4	5046	0.30	53000	2.4	—	80	90	100	112	132	—	—	192000	231000	80000	312

3/V 14L3

84000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 					Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC		HZ	FZ
1500	3/V 14L3	397	3.8	46100	22	—	B5					—	—	138800	163000	57800	322
	3/V 14L3	446	3.4	47700	21	—	—	—	—	160	180 (*)	—	—	143800	168800	60100	322
	3/V 14L3	498	3.0	57800	22	—	—	—	—	160	180 (*)	—	—	148600	174500	62300	322
	3/V 14L3	579	2.6	57100	18.7	—	—	—	—	160	180 (*)	—	—	155500	182600	65500	322
	3/V 14L3	665	2.3	70200	21	—	—	—	—	160	180 (*)	—	—	162000	190200	68600	322
	3/V 14L3	695	2.2	43000	13.2	—	—	—	132	160	—	—	—	164300	192800	69700	322
	3/V 14L3	794	1.9	49300	12.5	—	—	—	132	160	—	—	—	170900	200700	72800	322
	3/V 14L3	893	1.7	55200	13.2	—	—	—	132	160	—	—	—	177000	207800	75700	322
	3/V 14L3	997	1.5	61900	12.5	—	—	—	132	160	—	—	—	183000	214800	78500	322
	3/V 14L3	1116	1.3	52500	10.3	—	100	112	132	—	—	—	—	189300	222200	81500	322
	3/V 14L3	1324	1.1	62300	10.3	—	100	112	132	—	—	—	—	199300	233900	86300	322
	3/V 14L3	1339	1.1	47700	8.0	—	100	112	132	—	—	—	—	199900	234700	86700	322
	3/V 14L3	1589	0.94	56600	8.0	—	100	112	132	—	—	—	—	206000	243000	90000	322
	3/V 14L3	1662	0.90	75500	10.0	—	100	112	132	—	—	—	—	206000	243000	90000	322
	3/V 14L3	1994	0.75	71000	8.0	—	100	112	132	—	—	—	—	206000	243000	90000	322
	3/V 14L3	2318	0.65	66800	6.5	—	100	112	132	—	—	—	—	206000	243000	90000	322



3/V 14 L4

84000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)				Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ					
1500	3/V 14L4	2504	0.60	83200	7.4	—	B5				—	—	206000	243000	90000	322
	3/V 14L4	2782	0.54	83200	6.4	—	100	112	132	—						
	3/V 14L4	3182	0.47	80100	5.2	—	100	112	132	—						
	3/V 14L4	3472	0.43	75500	4.5	—	—	—	132	160						
	3/V 14L4	3993	0.38	75500	3.9	—	100	112	132	—						
	3/V 14L4	4312	0.35	83200	4.3	—	100	112	132	—						
	3/V 14L4	4959	0.30	83200	3.7	—	100	112	132	—						

3/V 15 L3

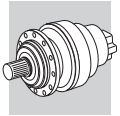
105000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)					Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ						
1500	3/V 15L3	386	3.9	67400	33	—	B5					—	—	137700	161700	57300	332
	3/V 15L3	446	3.4	65100	29	—	132	160	180	200	225						
	3/V 15L3	498	3.0	85600	33	—	132	160	180	200	225						
	3/V 15L3	560	2.7	81700	29	—	132	160	180	200	225						
	3/V 15L3	665	2.3	88300	26	—	132	160	180	200	225						
	3/V 15L3	840	1.8	80400	19.2	—	132	160	180	200	225						
	3/V 15L3	997	1.5	93500	18.9	—	132	160	180	200	225						
	3/V 15L3	1120	1.3	92200	17.6	—	132	160	180	200	225						
	3/V 15L3	1329	1.1	97300	15.7	—	132	160	180	200	225						
	3/V 15L3	1400	1.1	86900	13.6	—	132	160	180	200	225						
	3/V 15L3	1662	0.90	99000	13.1	—	132	160	180	200	225						
	3/V 15L3	1994	0.75	94300	10.8	—	132	160	180	200	225						
	3/V 15L3	2318	0.65	83500	8.2	—	132	160	180	200	225						

3/V 15 L4

105000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)				Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ					
1500	3/V 15L4	2780	0.54	105000	7.7	—	B5				—	—	206000	243000	90000	332
	3/V 15L4	3300	0.45	105000	6.5	—	—	—	132	160 (*)						
	3/V 15L4	3489	0.43	99000	5.8	—	—	—	132	160 (*)						
	3/V 15L4	4171	0.36	105000	5.4	—	100	112	132	—						
	3/V 15L4	4950	0.30	105000	4.6	—	100	112	132	—						
	3/V 15L4	5234	0.29	99000	4.1	—	100	112	132	—						



3/V 16 L3

138820 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)					Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ	
1500	3/V 16L3	397	3.8	99700	48	—	B5					—	—	230900	256800	96300	342
	3/V 16L3	446	3.4	93400	41	—	132	160	180	200	225	—	—	239100	265900	100100	342
	3/V 16L3	530	2.8	110900	41	—	132	160	180	200	225	—	—	251700	279900	106000	342
	3/V 16L3	669	2.2	84000	25	—	132	160	180	200	225	—	—	270000	300300	114600	342
	3/V 16L3	794	1.9	99700	25	—	132	160	180	200	225	—	—	284200	316100	121400	342
	3/V 16L3	893	1.7	100800	24	—	132	160	180	200	225	—	—	294300	327300	126200	342
	3/V 16L3	1059	1.4	119600	24	—	132	160	180	200	225	—	—	309800	344600	133600	342
	3/V 16L3	1324	1.1	112100	18.6	—	132	160	180	200	225	—	—	331300	368500	143900	342
	3/V 16L3	1589	0.94	112100	15.5	—	132	160	180	200	225	—	—	345000	385000	150000	342

3/V 16 L4

138820 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)					Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ	
1500	3/V 16L4	1826	0.82	108300	12.2	—	B5					—	—	345000	385000	150000	342
	3/V 16L4	2167	0.69	128500	12.2	—	—	—	132	160 (*)	—	—	—	345000	385000	150000	342
	3/V 16L4	2343	0.64	138800	12.1	—	—	—	132	160 (*)	—	—	—	345000	385000	150000	342
	3/V 16L4	2738	0.55	114100	9.0	—	100	112	132	—	—	—	—	345000	385000	150000	342
	3/V 16L4	3250	0.46	135500	9.0	—	100	112	132	—	—	—	—	345000	385000	150000	342
	3/V 16L4	3514	0.43	138800	8.5	—	100	112	132	—	—	—	—	345000	385000	150000	342
	3/V 16L4	4171	0.36	138800	7.2	—	100	112	132	—	—	—	—	345000	385000	150000	342
	3/V 16L4	4950	0.30	124000	5.4	—	100	112	132	—	—	—	—	345000	385000	150000	342

3/V 17 L3

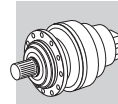
208110 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)					Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ	
1500	3/V 17L3	405	3.7	126000	58	—	B5					—	—	298600	317900	96900	350
	3/V 17L3	425	3.5	106700	48	—	132	160	180	200	225	—	—	303000	322600	98500	350
	3/V 17L3	512	2.9	128400	48	—	132	160	180	200	225	—	—	320300	341000	104800	350
	3/V 17L3	567	2.6	118700	41	—	132	160	180	200	225	—	—	330300	351700	108500	350
	3/V 17L3	608	2.5	134700	42	—	132	160	180	200	225	—	—	337200	359000	111000	350
	3/V 17L3	683	2.2	142900	41	—	132	160	180	200	225	—	—	349200	371800	115400	350
	3/V 17L3	810	1.9	141200	34	—	132	160	180	200	225	—	—	367600	391400	122100	350
	3/V 17L3	851	1.8	106700	25	—	132	160	180	200	225	—	—	373000	397100	124200	350
	3/V 17L3	1024	1.5	128400	25	—	132	160	180	200	225	—	—	394300	419900	132100	350
	3/V 17L3	1134	1.3	128000	24	—	132	160	180	200	225	—	—	406600	432900	136600	350
	3/V 17L3	1215	1.2	150900	25	—	132	160	180	200	225	—	—	415100	442000	139800	350
	3/V 17L3	1365	1.1	154100	24	—	132	160	180	200	225	—	—	429900	457700	145400	350

3/V 17 L4




208110 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)					Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ	
1500	3/V 17L4	1780	0.84	184300	21	—	B5					—	—	442000	470000	150000	350
	3/V 17L4	2065	0.73	184300	17.5	—	—	—	—	160	180 (*)	—	—	442000	470000	150000	350
	3/V 17L4	2485	0.60	155000	12.2	—	—	—	—	160	180 (*)	—	—	442000	470000	150000	350
	3/V 17L4	2773	0.54	166400	13.2	—	—	—	132	160	—	—	—	442000	470000	150000	350
	3/V 17L4	3168	0.47	190800	12.5	—	—	—	132	160	—	—	—	442000	470000	150000	350
	3/V 17L4	3583	0.42	170000	9.6	—	—	—	—	160	180 (*)	—	—	442000	470000	150000	350
	3/V 17L4	4129	0.36	184300	9.3	—	—	—	132	160	—	—	—	442000	470000	150000	350
	3/V 17L4	4449	0.34	203000	10.3	—	100	112	132	—	—	—	—	442000	470000	150000	350
	3/V 17L4	4970	0.30	155000	6.5	—	—	—	132	160	—	—	—	442000	470000	150000	350






3/V 18 L4

280580 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 					Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ	
1500	3/V 18L4	765	2.0	185000	47	—	B5					—	—	453300	462600	159800	358
	3/V 18L4	982	1.5	237400	47	—	132	160	180	200	225	—	—	488500	498600	173600	358
	3/V 18L4	1165	1.3	275600	46	—	132	160	180	200	225	—	—	503000	524900	183800	358
	3/V 18L4	1232	1.2	276700	43	—	132	160	180	200	225	—	—	503000	533700	187300	358
	3/V 18L4	1473	1.0	255400	34	—	132	160	180	200	225	—	—	503000	563100	198800	358
	3/V 18L4	1748	0.86	280580	31	—	132	160	180	200	225	—	—	503000	565000	200000	358
	3/V 18L4	1848	0.81	280580	30	—	132	160	180	200	225	—	—	503000	565000	200000	358
	3/V 18L4	2295	0.65	212900	19.2	—	132	160	180	200	225	—	—	503000	565000	200000	358
	3/V 18L4	2464	0.61	280580	23	—	132	160	180	200	225	—	—	503000	565000	200000	358
	3/V 18L4	2945	0.51	273300	19.2	—	132	160	180	200	225	—	—	503000	565000	200000	358
	3/V 18L4	3495	0.43	280580	16.6	—	132	160	180	200	225	—	—	503000	565000	200000	358
	3/V 18L4	3696	0.41	280580	15.7	—	132	160	180	200	225	—	—	503000	565000	200000	358
	3/V 18L4	4386	0.34	280580	13.3	—	132	160	180	200	225	—	—	503000	565000	200000	358
	3/V 18L4	5099	0.29	280580	11.4	—	132	160	180	200	225	—	—	503000	565000	200000	358




3/V 19 L4

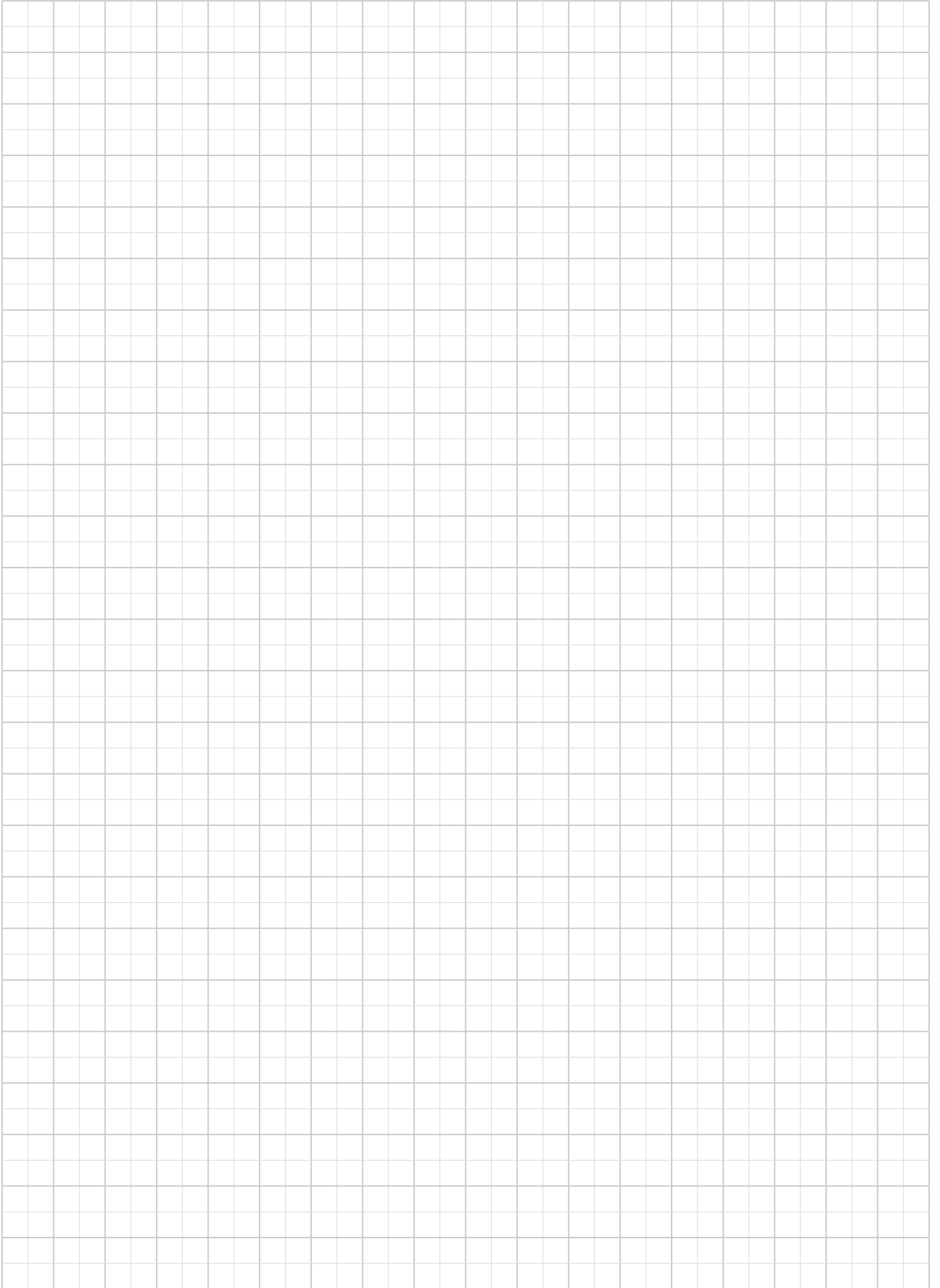
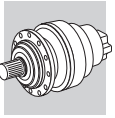
476410 Nm

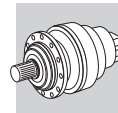
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 					Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ	
1500	3/V 19L4	2582	0.58	365200	29	—	B5					—	—	638000	702000	200000	366
	3/V 19L4	3231	0.46	367600	23	—	132	160	180	200	225	—	—	638000	702000	200000	366
	3/V 19L4	4095	0.37	380000	19.2	—	132	160	180	200	225	—	—	638000	702000	200000	366
	3/V 19L4	4457	0.34	359700	16.3	—	132	160	180	200	225	—	—	638000	702000	200000	366
	3/V 19L4	5164	0.29	403700	17.3	—	132	160	180	200	225	—	—	638000	702000	200000	366

3/V 21 L4

655740 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 					Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ	
1500	3/V 21L4	1062	1.4	443000	79	—	B5					—	—	705200	836300	1069400	374
	3/V 21L4	1260	1.2	425500	65	—	132	160	180	200	225	—	—	742400	880400	1132200	374
	3/V 21L4	1517	0.99	512200	65	—	132	160	180	200	225	—	—	779000	923000	1200000	374
	3/V 21L4	1800	0.83	536400	57	—	132	160	180	200	225	—	—	779000	923000	1200000	374
	3/V 21L4	1890	0.79	460000	48	—	132	160	180	200	225	—	—	779000	923000	1200000	374
	3/V 21L4	2275	0.66	553700	48	—	132	160	180	200	225	—	—	779000	923000	1200000	374
	3/V 21L4	2520	0.60	511700	41	—	132	160	180	200	225	—	—	779000	923000	1200000	374
	3/V 21L4	2700	0.56	536400	39	—	132	160	180	200	225	—	—	779000	923000	1200000	374
	3/V 21L4	3600	0.42	536400	30	—	132	160	180	200	225	—	—	779000	923000	1200000	374
	3/V 21L4	3780	0.40	460000	25	—	132	160	180	200	225	—	—	779000	923000	1200000	374
	3/V 21L4	4550	0.33	553700	25	—	132	160	180	200	225	—	—	779000	923000	1200000	374
	3/V 21L4	5040	0.30	552000	24	—	132	160	180	200	225	—	—	779000	923000	1200000	374





27.0 - DATI TECNICI RIDUTTORI COMBINATI - 3/A

27.0 - 3/A - COMBINED UNITS RATING CHARTS

27.0 - 3/A - TECHNISCHE DATEN DER GETRIEBE

27.0 - DONNEES TECHNIQUES REDUCTEURS COMBINÉ 3/A

Guida alla consultazione delle tabelle.

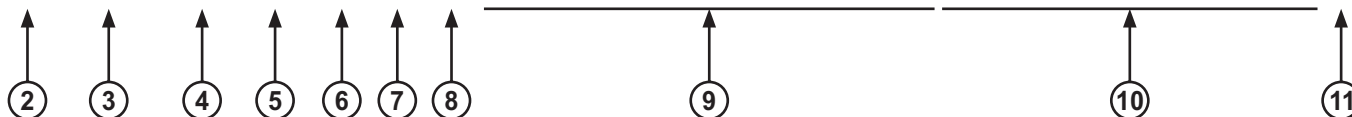
Reading the rating chart.

Anleitung für die richtige Konsultation der Tabellen.

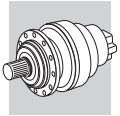
Guide pour la consultation des tableaux



3/A 00 L2							1250 Nm															
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)										Rn₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ											
1500	3/A 00 L2	19.1	78	470	4.3	—	63	71	80	90	100	112	—	—	—	2840	2840	8290	9530	1870	217	
	3/A 00 L2	23.4	64	580	4.3	—	63	71	80	90	100	112	—	—	—	3040	3040	8810	10100	2000	217	
	3/A 00 L2	31.7	47	650	3.5	—	63	71	80	90	100	112	—	—	—	3370	3370	9650	11100	2210	217	
	3/A 00 L2	39.6	38	550	2.4	—	63	71	80	90	100	112	—	—	—	3620	3620	10300	11800	2380	217	
	3/A 00 L2	41.5	36	650	2.7	—	63	71	80	90	100	112	—	—	—	3680	3680	10500	12000	2420	217	






1	Coppia di riferimento	Reference torque	Bezugsdrehmoment	Couple de référence
2	Velocità di comando riduttore	Gearbox drive speed	Drehzahl am Getriebeantrieb	Vitesse angulaire à l'entrée du réducteur
3	Grandezza riduttore in esecuzione combinata planetario-ortogonale	Frame size of combined planetary+bevel helical unit	Baugröße des kombinierten Getriebes 300 + Kegelpadgetriebe Serie A	Taille réducteur combiné série 300 + réducteur à axes orthogonaux série A
4	Rapporto di riduzione	Gear ratio	Übersetzung	Rapport de réduction
5	Velocità angolare all'albero lento	Gearbox output speed	Drehzahl am Getriebeabtrieb	Vitesse angulaire en sortie réducteur
6	Coppia nominale all'albero lento del riduttore, basata su: - fattore di sicurezza S=1 - durata teorica di 10000 h	Gearbox rated output torque, based on: - safety factor S=1 - 10000 h theoretical lifetime	Nenn-Drehmoment am Getriebeabtrieb mit: - Sicherheitsfaktor S=1 - Dauer von 10000 h	Couple nominal à la sortie du réducteur pendant : - facteur de sécurité S=1 - durée de 10000 h
7	Potenza nominale all'albero veloce del riduttore, basata su: - fattore di sicurezza S=1 - durata teorica di 10000 h	Gearbox rated input power, based on: - safety factor S=1 - 10000 h theoretical lifetime	Nenn-Leistung im Getriebeantrieb mit: - Sicherheitsfaktor S=1 - Dauer von 10000 h	Puissance nominale en entrée réducteur pendant : - facteur de sécurité S=1 - durée de 10000 h
8	Potenza termica riduttore	Gearbox thermal capacity	Wärmeleistung	Puissance thermique réducteur
9	Grandezza motore elettrico IEC installabile	Frame size of available IEC motor	Baugröße einbaubarer IEC-Elektromotor	Taille IEC moteur électrique à installer
10	Carichi radiali applicabili all'albero lento, basati su: - fattore di sicurezza S=1 - durata teorica 10000 h Per forze non applicate in mezzzeria riferirsi ai diagrammi riportati a seguito delle pagine dimensionali del riduttore in oggetto	Permitted overhung loading on output shaft, based on: - safety factor S=1 - 10000 hrs theoretical lifetime For forces applying off the shaft midpoint, see diagrams provided in the pages following dimensions of the gearbox under study	Auf die Mitte der Abtriebswelle für: - Dauer von 10000 Std. applizierbare Nenn-Radialkräfte - Sicherheitsfaktor S=1 Für andere Kraftangriffspunkte verweisen wir auf die Diagramme, die den Seiten mit den Maßen der gewählten Größe folgen	Charges radiales nominales applicables à la moitié de l'arbre pendant : - facteur de sécurité S=1 - durée de 10000 h Pour d'autres positions de charge, voir diagrammes figurant à la suite des pages dimensions de la taille sélectionnée
11	Pagina delle dimensioni	Page installation drawing can be found at	Maßseiten	Page avec les dimensions






3/A 00 L2

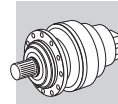
1250 Nm




n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 										Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ						
1500	3/A 00 L2	19.1	78	470	4.3	—	63	71	80	90	100	112	—	—	—	2840	2840	8290	9530	1870	217	
	3/A 00 L2	23.4	64	580	4.3	—	63	71	80	90	100	112	—	—	—	3040	3040	8810	10100	2000	217	
	3/A 00 L2	31.7	47	650	3.5	—	63	71	80	90	100	112	—	—	—	3370	3370	9650	11100	2210	217	
	3/A 00 L2	39.6	38	550	2.4	—	63	71	80	90	100	112	—	—	—	3620	3620	10300	11800	2380	217	
	3/A 00 L2	41.5	36	650	2.7	—	63	71	80	90	100	112	—	—	—	3680	3680	10500	12000	2420	217	
	3/A 00 L2	51.8	28.9	550	1.8	—	63	71	80	90	100	112	—	—	—	3960	3960	11200	12800	2610	217	
	3/A 00 L2	61.2	24.5	650	1.8	—	63	71	80	90	100	112	—	—	—	4190	4190	11700	13500	2750	217	
	3/A 00 L2	71.0	21.1	650	1.6	—	63	71	80	90	100	112	—	—	—	4400	4400	12300	14100	2890	217	
	3/A 00 L2	80.2	18.7	650	1.4	—	63	71	80	90	100	112	—	—	—	4580	4580	12700	14600	3010	217	
	3/A 00 L2	88.6	16.9	550	1.1	—	63	71	80	90	100	112	—	—	—	4740	4740	13100	15100	3120	217	
	3/A 00 L2	100	15.0	550	0.95	—	63	71	80	90	100	112	—	—	—	4940	4940	13600	15600	3240	217	
	3/A 00 L2	107	14.0	650	1.0	—	63	71	80	90	100	112	—	—	—	5050	5050	13900	16000	3320	217	
	3/A 00 L2	134	11.2	550	0.71	—	63	71	80	90	100	112	—	—	—	5440	5440	14900	17100	3580	217	
	3/A 00 L2	171	8.8	550	0.55	—	63	71	80	90	100	112	—	—	—	5900	5900	16000	18400	3880	217	
	3/A 00 L2	203	7.4	650	0.55	—	63	71	80	90	100	112	—	—	—	6240	6240	16800	19300	4100	217	
	3/A 00 L2	219	6.9	620	0.49	—	63	71	80	90	100	112	—	—	—	6400	6400	17200	19800	4210	217	
	3/A 00 L2	253	5.9	550	0.37	—	63	71	80	90	100	112	—	—	—	6720	6720	18000	20700	4420	217	
	3/A 00 L2	296	5.1	650	0.38	—	63	71	80	90	100	112	—	—	—	7080	7080	18900	21700	4660	217	
	3/A 00 L2	319	4.7	440	0.24	—	63	71	—	—	—	—	—	—	7260	7260	19300	22100	4770	217		
	3/A 00 L2	369	4.1	560	0.26	—	63	71	80	90	100	112	—	—	—	7630	7630	20100	23100	5010	217	
	3/A 00 L2	391	3.8	540	0.24	—	63	71	—	—	—	—	—	—	7770	7770	20500	23500	5110	217		
	3/A 00 L2	441	3.4	690	0.27	—	63	71	—	—	—	—	—	—	8090	8090	21200	24400	5320	217		
	3/A 00 L2	550	2.7	590	0.19	—	63	71	—	—	—	—	—	—	8710	8710	22700	26100	5730	217		
	3/A 00 L2	660	2.3	610	0.16	—	63	71	—	—	—	—	—	—	9250	9250	24000	27500	6080	217		




3/A 01 L2

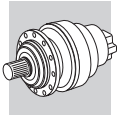
2460 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 										Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ						
1500	3/A 01 L2	18.8	80	710	6.5	—	—	—	80	90	100	112	—	—	—	2830	2830	8250	9470	1860	225	
	3/A 01 L2	23.0	65	870	6.5	—	—	—	80	90	100	112	—	—	—	3020	3020	8760	10100	1990	225	
	3/A 01 L2	31.2	48	1180	6.5	—	—	—	80	90	100	112	—	—	—	3340	3340	9600	11000	2200	225	
	3/A 01 L2	35.8	42	760	3.7	—	—	—	80	90	100	112	—	—	—	3500	3500	10000	11500	2300	225	
	3/A 01 L2	40.1	37	870	3.7	—	63	71	80	90	100	112	—	—	—	3640	3640	10300	11900	2390	225	
	3/A 01 L2	43.9	34	930	3.7	—	—	—	80	90	100	112	—	—	—	3750	3750	10600	12200	2470	225	
	3/A 01 L2	49.1	31	830	2.9	—	63	71	80	90	100	112	—	—	—	3890	3890	11000	12600	2560	225	
	3/A 01 L2	54.2	27.7	1180	3.7	—	63	71	80	90	100	112	—	—	—	4020	4020	11300	13000	2650	225	
	3/A 01 L2	59.4	25.2	1260	3.7	—	—	—	80	90	100	112	—	—	—	4150	4150	11600	13400	2730	225	
	3/A 01 L2	74.2	20.2	1150	2.7	—	—	—	80	90	100	112	—	—	—	4470	4470	12400	14300	2940	225	
	3/A 01 L2	81.3	18.4	1300	2.8	—	63	71	80	90	100	112	—	—	—	4610	4610	12800	14700	3030	225	
	3/A 01 L2	102	14.8	1150	2.0	—	63	71	80	90	100	112	—	—	—	4960	4960	13700	15700	3260	225	
	3/A 01 L2	133	11.3	1300	1.7	—	63	71	80	90	100	112	—	—	—	5430	5430	14800	17100	3570	225	
	3/A 01 L2	166	9.0	1150	1.2	—	63	71	80	90	100	112	—	—	—	5850	5850	15900	18200	3840	225	
	3/A 01 L2	184	8.1	1030	0.97	—	63	71	80	90	100	112	—	—	—	6050	6050	16400	18800	3980	225	
	3/A 01 L2	204	7.3	1300	1.1	—	63	71	80	90	100	112	—	—	—	6260	6260	16900	19400	4120	225	
	3/A 01 L2	220	6.8	830	0.65	—	63	71	80	90	100	112	—	—	—	6410	6410	17200	19800	4220	225	
	3/A 01 L2	255	5.9	1150	0.78	—	63	71	80	90	100	112	—	—	—	6740	6740	18000	20700	4430	225	
	3/A 01 L2	269	5.6	1010	0.65	—	63	71	80	90	100	112	—	—	—	6860	6860	18300	21000	4510	225	
	3/A 01 L2	311	4.8	1150	0.64	—	63	71	80	90	100	112	—	—	—	7200	7200	19100	22000	4740	225	
	3/A 01 L2	364	4.1	1340	0.64	—	63	71	80	90	100	112	—	—	—	7590	7590	20100	23000	4990	225	
	3/A 01 L2	393	3.8	830	0.36	—	63	71	—	—	—	—	—	—	7790	7790	20500	23600	5120	225		
	3/A 01 L2	454	3.3	1150	0.44	—	63	71	80	90	100	112	—	—	—	8170	8170	21400	24600	5370	225	
	3/A 01 L2	533	2.8	1120	0.36	—	63	71	—	—	—	—	—	—	8620	8620	22500	25800	5660	225		
	3/A 01 L2	665	2.3	1150	0.30	—	63	71	—	—	—	—	—	—	9280	9280	24000	27600	6100	225		



3/A 03 L2										2970 Nm											
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 							Rn ₂ [N]							
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ					
1500	3/A 03 L2	19.4	77	1050	9.3	—	—	—	80	90	100	112	—	—	—	8790	10100	17000	20500	5640	233
	3/A 03 L2	23.0	65	1240	9.3	—	—	—	80	90	100	112	—	—	—	9290	10700	17900	21500	5960	233
	3/A 03 L2	28.8	52	1550	9.3	—	—	—	80	90	100	112	—	—	—	10000	11600	19100	23000	6430	233
	3/A 03 L2	33.5	45	1800	9.3	—	—	—	80	90	100	112	—	—	—	10500	12200	20000	24100	6760	233
	3/A 03 L2	40.5	37	1650	7.0	—	—	—	80	90	100	112	—	—	—	11200	13000	21200	25500	7200	233
	3/A 03 L2	43.4	35	1800	7.2	—	—	—	80	90	100	112	—	—	—	11500	13300	21600	26000	7370	233
	3/A 03 L2	52.5	28.6	1650	5.4	—	—	—	80	90	100	112	—	—	—	12200	14100	22900	27600	7850	233
	3/A 03 L2	52.5	28.6	1650	5.4	—	—	—	80	90	100	112	—	—	—	12200	14100	22900	27600	7850	233
	3/A 03 L2	62.9	23.8	1550	4.2	—	63	71	80	90	100	112	—	—	—	13000	15000	24200	29100	8340	233
	3/A 03 L2	73.2	20.5	1800	4.2	—	63	71	80	90	100	112	—	—	—	13700	15800	25300	30400	8770	233
	3/A 03 L2	88.5	16.9	1650	3.2	—	63	71	80	90	100	112	—	—	—	14600	16800	26800	32200	9340	233
	3/A 03 L2	96.9	15.5	1690	3.0	—	63	71	80	90	100	112	—	—	—	15000	17300	27500	33100	9630	233
	3/A 03 L2	182	8.3	1830	1.7	—	63	71	80	90	100	112	—	—	—	18500	21400	33200	40000	11900	233
	3/A 03 L2	220	6.8	1650	1.3	—	63	71	80	90	100	112	—	—	—	19700	22800	35200	42300	12700	233
	3/A 03 L2	269	5.6	1840	1.2	—	63	71	80	90	100	112	—	—	—	21100	24400	37400	45000	13500	233
	3/A 03 L2	269	5.6	1840	1.2	—	63	71	80	90	100	112	—	—	—	21100	24400	37400	45000	13500	233
	3/A 03 L2	326	4.6	1660	0.88	—	63	71	80	90	100	112	—	—	—	22500	26000	39600	47600	14400	233
	3/A 03 L2	352	4.3	2020	0.99	—	63	71	80	90	100	112	—	—	—	23100	26600	40500	48800	14800	233
	3/A 03 L2	409	3.7	1940	0.82	—	63	71	80	90	100	112	—	—	—	24300	28000	42400	51000	15600	233
	3/A 03 L2	495	3.0	1720	0.60	—	63	71	80	90	100	112	—	—	—	25900	29800	44900	54000	16600	233
3/A 03 L2	574	2.6	1740	0.52	—	63	71	80	90	100	112	—	—	—	27200	31400	46900	56500	17400	233	
3/A 03 L2	605	2.5	1800	0.51	—	63	71	80	90	100	112	—	—	—	27600	31900	47700	57400	17700	233	
3/A 03 L2	731	2.1	1800	0.42	—	63	71	80	90	100	112	—	—	—	29400	34000	50500	60700	18900	233	

3/A 04 L2										3960 Nm											
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 							Rn ₂ [N]							
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ					
1500	3/A 04 L2	18.7	80	1920	17.7	—	—	—	80	90	100	112	132	—	—	8680	10000	16800	20200	5570	243
	3/A 04 L2	22.1	68	2270	17.7	—	—	—	80	90	100	112	132	—	—	9170	10600	17700	21300	5880	243
	3/A 04 L2	25.6	59	1920	12.9	—	—	—	80	90	100	112	132	—	—	9630	11100	18500	22200	6180	243
	3/A 04 L2	27.7	54	2830	17.6	—	—	—	80	90	100	112	132	—	—	9890	11400	18900	22800	6350	243
	3/A 04 L2	30.2	50	2270	12.9	—	—	—	80	90	100	112	132	—	—	10200	11700	19400	23300	6530	243
	3/A 04 L2	35.3	43	2270	11.1	—	—	—	80	90	100	112	132	—	—	10700	12400	20300	24500	6880	243
	3/A 04 L2	39.1	38	2270	10.0	—	—	—	80	90	100	112	132	—	—	11100	12800	21000	25200	7120	243
	3/A 04 L2	44.3	34	2850	11.1	—	—	—	80	90	100	112	132	—	—	11600	13300	21800	26200	7420	243
	3/A 04 L2	49.7	30	2270	7.9	—	63	71	80	90	100	112	132	—	—	12000	13900	22500	27100	7710	243
	3/A 04 L2	54.5	27.5	2390	7.5	—	—	—	80	90	100	112	132	—	—	12400	14300	23200	27900	7950	243
	3/A 04 L2	62.4	24.0	2850	7.9	—	63	71	80	90	100	112	132	—	—	13000	15000	24100	29000	8320	243
	3/A 04 L2	68.4	21.9	2510	6.3	—	—	—	80	90	100	112	132	—	—	13400	15400	24800	29800	8580	243
	3/A 04 L2	81.7	18.4	2370	5.0	—	63	71	80	90	100	112	132	—	—	14200	16400	26200	31500	9100	243
	3/A 04 L2	90.7	16.5	2390	4.5	—	—	—	80	90	100	112	132	—	—	14700	17000	27000	32500	9420	243
	3/A 04 L2	102	14.7	2550	4.3	—	63	71	80	90	100	112	132	—	—	15300	17600	27900	33600	9790	243
	3/A 04 L2	117	12.8	2390	3.5	—	—	—	80	90	100	112	132	—	—	16000	18500	29100	35000	10300	243
	3/A 04 L2	129	11.6	2720	3.6	—	63	71	80	90	100	112	132	—	—	16500	19100	30000	36100	10600	243
	3/A 04 L2	149	10.1	2390	2.8	—	63	71	80	90	100	112	132	—	—	17300	20000	31300	37700	11100	243
	3/A 04 L2	162	9.2	2900	3.1	—	63	71	80	90	100	112	132	—	—	17800	20600	32100	38700	11400	243
	3/A 04 L2	174	8.6	2970	2.9	—	63	71	80	90	100	112	—	—	—	18200	21100	32800	39500	11700	243
	3/A 04 L2	205	7.3	3500	2.9	—	63	71	80	90	100	112	—	—	—	19300	22300	34500	41500	12400	243
	3/A 04 L2	226	6.6	3500	2.7	—	63	71	80	90	100	112	—	—	—	19900	23000	35500	42700	12800	243
	3/A 04 L2	250	6.0	3500	2.4	—	63	71	80	90	100	112	—	—	—	20600	23800	36600	44000	13200	243
	3/A 04 L2	283	5.3	2850	1.7	—	63	71	80	90	100	112	—	—	—	21500	24800	38000	45700	13800	243
	3/A 04 L2	317	4.7	2400	1.3	—	63	71	80	90	100	112	—	—	—	22300	25700	39300	47300	14300	243
	3/A 04 L2	349	4.3	2430	1.2	—	63	71	80	90	100	112	—	—	—	23000	26600	40400	48600	14800	243
	3/A 04 L2	386	3.9	2450	1.1	—	63	71	80	90	100	112	—	—	—	23800	27500	41700	50200	15300	243
	3/A 04 L2	469	3.2	2500	0.92	—	63	71	80	90	100	112	—	—	—	25400	29300	44200	53100	16300	243
	3/A 04 L2	520	2.9	2520	0.84	—	63	71	80	90	100	112	—	—	—	26300	30300	45600	54800	16900	243



3/A 05 L2

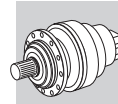
5800 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)														R _{n2} [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ										
1500	3/A 05L2	18.7	80	1920	17.7	—	—	—	80	90	100	112	132	—	—	8680	10000	16800	20200	5570	253					
	3/A 05L2	22.1	68	2270	17.7	—	—	—	80	90	100	112	132	—	—	9170	10600	17700	21300	5880	253					
	3/A 05L2	27.7	54	2850	17.7	—	—	—	80	90	100	112	132	—	—	9890	11400	18900	22800	6350	253					
	3/A 05L2	32.2	47	3310	17.7	—	—	—	80	90	100	112	132	—	—	10400	12000	19800	23800	6670	253					
	3/A 05L2	39.0	38	3020	13.3	—	—	—	80	90	100	112	132	—	—	11100	12800	21000	25200	7110	253					
	3/A 05L2	44.0	34	3310	12.9	—	—	—	80	90	100	112	132	—	—	11500	13300	21700	26100	7400	253					
	3/A 05L2	53.3	28.2	3040	9.8	—	—	—	80	90	100	112	132	—	—	12300	14200	23000	27700	7890	253					
	3/A 05L2	57.0	26.3	3310	10.0	—	—	—	80	90	100	112	132	—	—	12600	14500	23500	28300	8070	253					
	3/A 05L2	62.6	24.0	3220	8.9	—	—	—	80	90	100	112	132	—	—	13000	15000	24200	29100	8330	253					
	3/A 05L2	72.5	20.7	3310	7.9	—	63	71	80	90	100	112	132	—	—	13600	15700	25200	30400	8740	253					
	3/A 05L2	75.8	19.8	3060	7.0	—	—	—	80	90	100	112	132	—	—	13800	16000	25600	30800	8870	253					
	3/A 05L2	85.6	17.5	3520	7.1	—	—	—	80	90	100	112	132	—	—	14400	16600	26500	31900	9240	253					
	3/A 05L2	104	14.5	3080	5.1	—	—	—	80	90	100	112	132	—	—	15300	17700	28100	33800	9840	253					
	3/A 05L2	121	12.4	3520	5.0	—	63	71	80	90	100	112	132	—	—	16200	18700	29400	35400	10400	253					
	3/A 05L2	141	10.7	3600	4.4	—	63	71	80	90	100	112	132	—	—	17000	19600	30800	37000	10900	253					
	3/A 05L2	162	9.2	2900	3.1	—	63	71	80	90	100	112	132	—	—	17800	20600	32100	38700	11400	253					
	3/A 05L2	175	8.5	3600	3.5	—	63	71	80	90	100	112	—	—	—	18300	21100	32900	39600	11700	253					
	3/A 05L2	212	7.1	3100	2.5	—	63	71	80	90	100	112	—	—	—	19500	22500	34800	41900	12500	253					
	3/A 05L2	212	7.1	3100	2.5	—	63	71	80	90	100	112	—	—	—	19500	22500	34800	41900	12500	253					
	3/A 05L2	241	6.2	4290	3.1	—	63	71	80	90	100	112	—	—	—	20300	23500	36200	43500	13000	253					
	3/A 05L2	280	5.4	3600	2.2	—	63	71	80	90	100	112	—	—	—	21400	24700	37800	45500	13700	253					
	3/A 05L2	329	4.6	3650	1.9	—	63	71	80	90	100	112	—	—	—	22600	26100	39700	47800	14500	253					
	3/A 05L2	398	3.8	3180	1.4	—	63	71	80	90	100	112	—	—	—	24000	27800	42100	50600	15400	253					
	3/A 05L2	422	3.6	4400	1.8	—	63	71	80	90	100	112	—	—	—	24500	28300	42800	51500	15700	253					
	3/A 05L2	491	3.1	3880	1.4	—	63	71	80	90	100	112	—	—	—	25800	29800	44800	53900	16500	253					
	3/A 05L2	594	2.5	3300	0.96	—	63	71	80	90	100	112	—	—	—	27500	31700	47400	57100	17600	253					

3/A 06 L2




10840 Nm

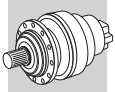
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC)																		R _{n2} [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ														
1500	3/A 06L2	27.7	54	3320	21	—	—	—	80	90	100	112	132	160	180	12300	14000	30900	36000	9250	263									
	3/A 06L2	32.7	46	3920	21	—	—	—	80	90	100	112	132	160	180	13000	14700	32500	37900	9780	263									
	3/A 06L2	34.9	43	3490	17.2	—	—	—	80	90	100	112	132	160	180	13300	15100	33200	38600	9990	263									
	3/A 06L2	41.1	37	4910	21	—	—	—	80	90	100	112	132	160	180	14000	15900	34800	40500	10500	263									
	3/A 06L2	47.2	32	3840	14.0	—	—	—	80	90	100	112	132	160	180	14700	16700	36300	42300	11000	263									
	3/A 06L2	51.7	29.0	5170	17.2	—	—	—	80	90	100	112	132	160	180	15200	17200	37300	43400	11400	263									
	3/A 06L2	55.7	26.9	4530	14.0	—	—	—	80	90	100	112	132	160	180	15500	17600	38100	44400	11700	263									
	3/A 06L2	60.1	24.9	6010	17.2	—	—	—	80	90	100	112	132	160	180	15900	18100	39000	45500	12000	263									
	3/A 06L2	69.9	21.5	5690	14.0	—	—	—	80	90	100	112	132	160	180	16800	19000	40800	47500	12600	263									
	3/A 06L2	81.2	18.5	6480	13.8	—	—	—	80	90	100	112	132	160	180	17600	20000	42700	49700	13200	263									
	3/A 06L2	88.5	16.9	6210	12.1	—	—	—	80	90	100	112	132	160	180	18100	20600	43800	51000	13600	263									
	3/A 06L2	98.3	15.3	5380	9.4	—	—	—	80	90	100	112	132	160	180	18800	21300	45200	52700	14100	263									
	3/A 06L2	112	13.4	6180	9.8	—	—	—	80	90	100	112	132	160	180	19600	22200	47100	54800	14700	263									
	3/A 06L2	125	12.0	5440	7.5	—	—	—	80	90	100	112	132	160	180	20300	23000	48600	56500	15300	263									
	3/A 06L2	141	10.7	7760	9.8	—	—	—	80	90	100	112	132	160	180	21200	24000	50400	58700	15900	263									
	3/A 06L2	164	9.2	6500	7.1	—	—	—	80	90	100	112	132	160	180	22300	25200	52700	61400	16700	263									
	3/A 06L2	190	7.9	7760	7.3	—	—	—	80	90	100	112	132	160	180	23400	26500	55100	64200	17600	263									
	3/A 06L2	198	7.6	5500	4.9	—	—	—	80	90	100	112	132	160	180	23700	26900	55800	65000	17800	263									
	3/A 06L2	221	6.8	6520	5.3	—	—	—	80	90	100	112	132	160	180	24600	27900	57700	67100	18500	263									
	3/A 06L2	267	5.6	5500	3.7	—	—	—	80	90	100	112	132	160	180	26200	29700	61000	71100	19700	263									
	3/A 06L2	276	5.4	7760	5.0	—	63	71	80	90	100	112	132	160	180	26500	30000	61600	71800	19900	263									
	3/A 06L2	321	4.7	6610	3.7	—	63	71	80	90	100	112	132	160	180	27900	31600	64500	75100	20900	263									
	3/A 06L2	388	3.9	5640	2.6	—	63	71	80	90	100	112	132	160	180	29700	33600	68300	79500	22300	263									
	3/A 06L2	380	3.9	6180	2.9	—	63	71	80	90	100	112	132	160	180	29500	33400	67900	79000	22200	263									
	3/A 06L2	435	3.5	7760	3.2	—	63	71	80	90	100	112	132	160	180	30800	34900	70600	82300	23200	263									
	3/A 06L2	505	3.0	7150	2.5	—	63	71	80	90	100	112	132	160	180	32400	36700	73900	86100	24400	263									
	3/A 06L2	555	2.7	7270	2.3	—	63	71	80	90	100	112	132	160	180	33400	37900	76000	88500	25100	263									
	3/A 06L2	611	2.5	5920	1.7	—	63	71	80	90	100	112	132	160	180	34500	39100	78300	91100	25900	263									
	3/A 06L2	671	2.2	6020	1.6	—	63	71	80	90	100	112	132	160	180	35600	40400	80500	93700	26800	263									



3/A 07 L2

15680 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 												Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ	MC/PC	MZ/PZ	HC	HZ	FZ								
1500	3/A 07L2	27.1	55	6650	42	—	—	—	—	—	—	—	132	160	180	13600	17000	33100	43300	11800	273			
	3/A 07L2	32.3	46	7940	42	—	—	—	—	—	—	—	132	160	180	14400	18100	34900	45700	12500	273			
	3/A 07L2	41.5	36	9620	40	—	—	—	—	—	—	—	132	160	180	15700	19600	37600	49200	13600	273			
	3/A 07L2	49.2	30	8380	29	—	—	—	—	—	—	—	132	160	180	16600	20800	39500	51800	14400	273			
	3/A 07L2	57.3	26.2	6650	20	—	—	—	80	90	100	112	132	160	180	17400	21900	41400	54200	15200	273			
	3/A 07L2	68.3	22.0	7940	20	—	—	—	80	90	100	112	132	160	180	18500	23200	43600	57200	16100	273			
	3/A 07L2	87.7	17.1	10200	20	—	—	—	80	90	100	112	132	160	180	20100	25200	47000	61600	17500	273			
	3/A 07L2	109	13.8	8860	14.5	—	—	—	80	90	100	112	132	160	180	21600	27100	50100	65700	18800	273			
	3/A 07L2	130	11.6	11100	15.2	—	—	—	80	90	100	112	132	160	180	22900	28700	52900	69300	19900	273			
	3/A 07L2	140	10.7	11100	14.1	—	—	—	80	90	100	112	132	160	180	23500	29500	54100	70900	20400	273			
	3/A 07L2	155	9.7	9000	10.3	—	—	—	80	90	100	112	132	160	180	24300	30500	55800	73100	21100	273			
	3/A 07L2	180	8.3	10900	10.8	—	—	—	80	90	100	112	132	160	180	25500	32000	58300	76500	22200	273			
	3/A 07L2	198	7.6	8700	7.8	—	—	—	80	90	100	112	132	160	180	26300	33000	60000	78600	22900	273			
	3/A 07L2	223	6.7	9000	7.2	—	63	71	80	90	100	112	132	160	180	27400	34400	62200	81500	23800	273			
	3/A 07L2	241	6.2	9000	6.6	—	63	71	80	90	100	112	132	160	180	28200	35300	63700	83500	24500	273			
	3/A 07L2	282	5.3	8700	5.5	—	—	—	80	90	100	112	132	160	180	29600	37200	66700	87400	25800	273			
3/A 07L2	341	4.4	11500	6.0	—	63	71	80	90	100	112	132	160	180	31600	39700	70700	92600	27500	273				
3/A 07L2	405	3.7	9080	4.0	—	63	71	80	90	100	112	132	160	180	33500	42000	74400	97500	29100	273				
3/A 07L2	439	3.4	9180	3.7	—	63	71	80	90	100	112	132	160	180	34400	43100	76200	99900	29900	273				



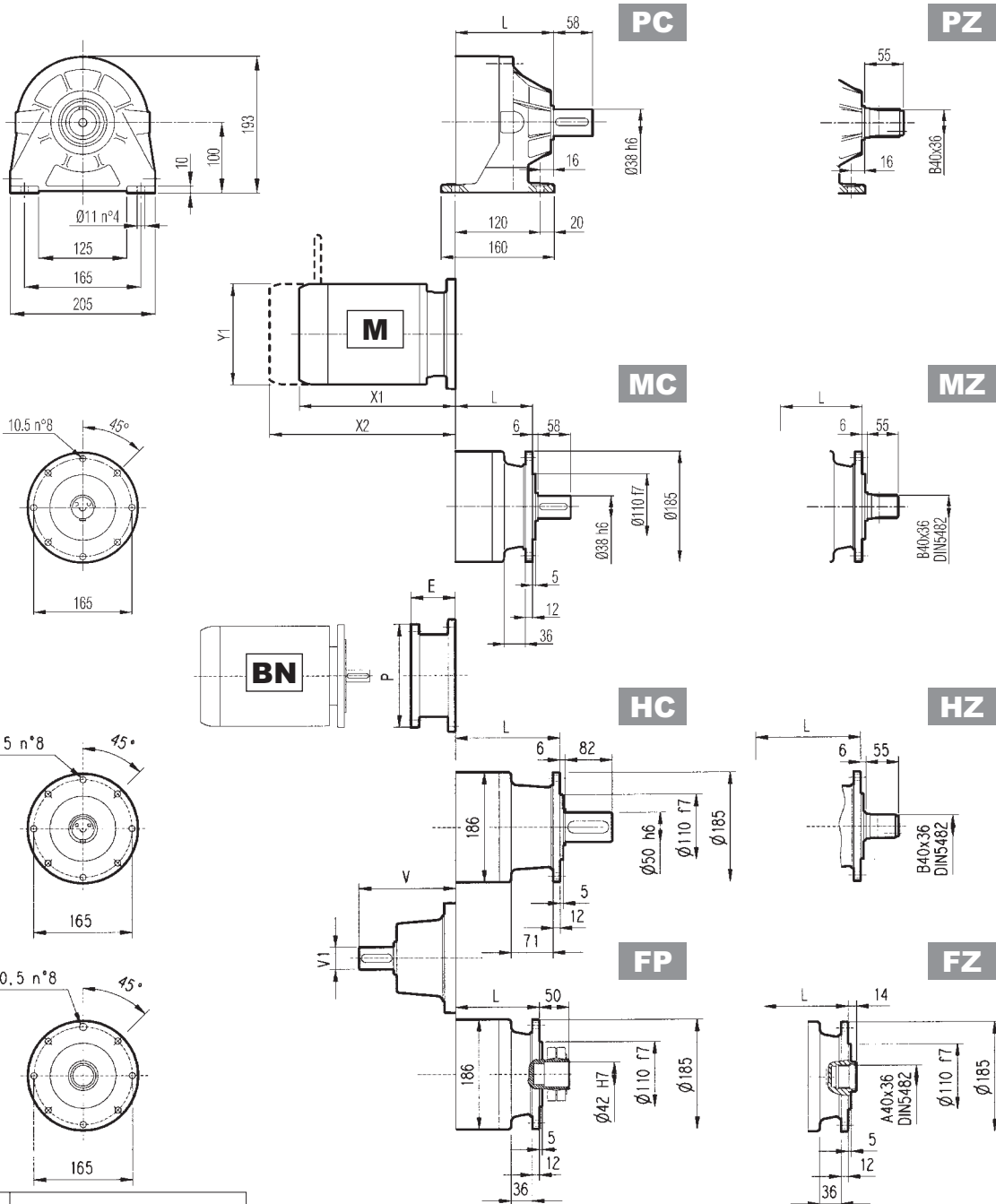
300 L

28.0 - DIMENSIONI

28.0 - DIMENSIONS

28.0 - ABMESSUNGEN

28.0 - DIMENSIONS

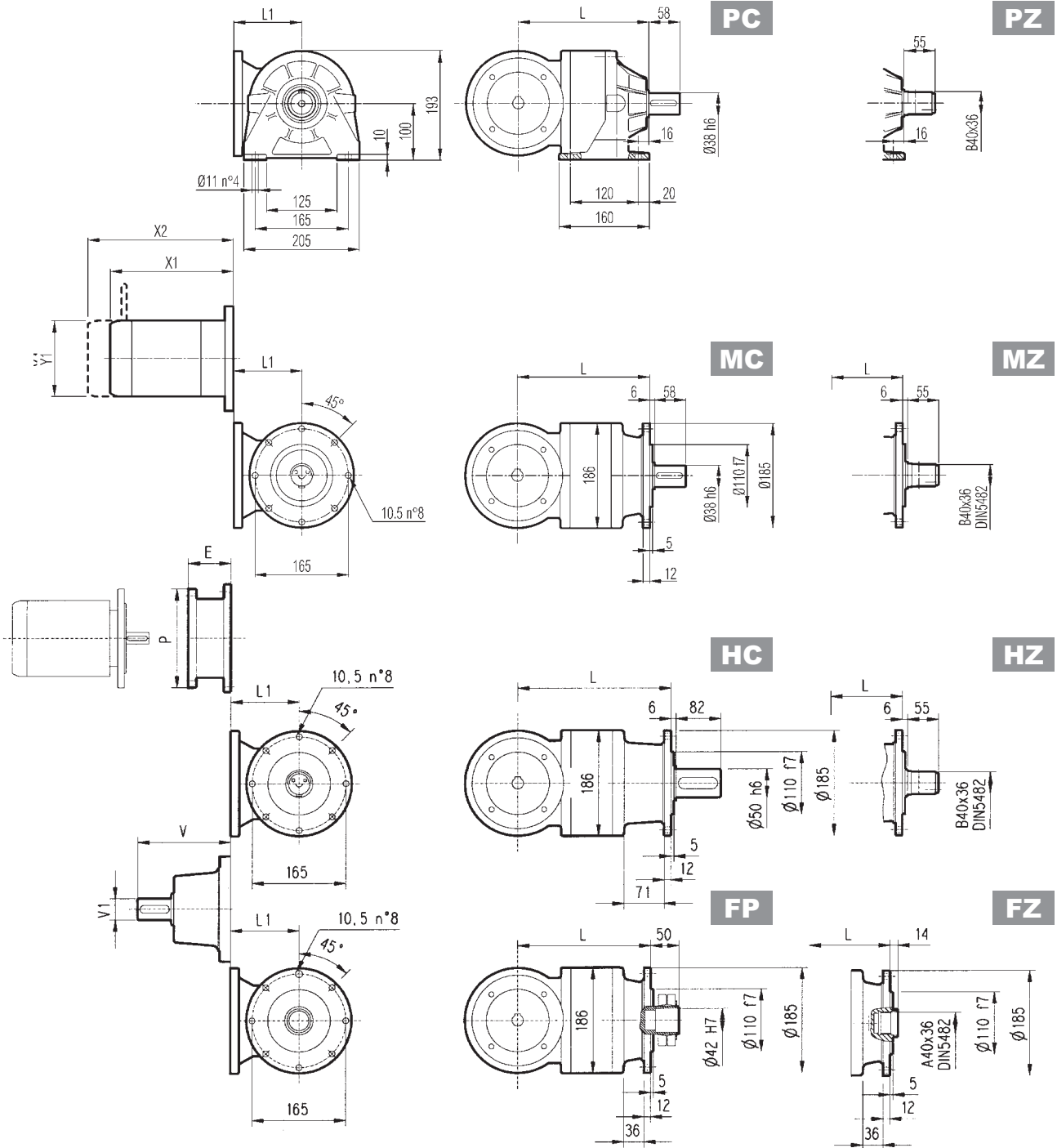
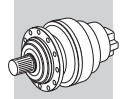


FP $M_{2max} = 1300 \text{ Nm}$

	L				Kg									
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1	Kg	V	V1	Kg
300 L1	80	86	115	80	18	23	20	16	137.5	24	6	158	38	7
300 L2	133	139	168	133	22	27	24	20	137.5	24	6	158	38	7
300 L3	186	192	221	186	26	31	28	24	137.5	24	6	158	38	7
300 L4	239	245	274	239	30	35	32	28	137.5	24	6	158	38	7

	P71		P80		P90		P100		P112		P132	
	E	P	E	P	E	P	E	P	E	P	E	P
300 L1	65	160	84	200	84	200	94	250	94	250	114	300
300 L2	65	160	84	200	84	200	94	250	94	250	114	300
300 L3	65	160	84	200	84	200	94	250	94	250	114	300
300 L4	65	160	84	200	84	200	94	250	94	250	114	300

	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
300 L1	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258
300 L2	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258
300 L3	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258
300 L4	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258

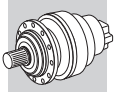


FP $M_{2max} = 1300 \text{ Nm}$

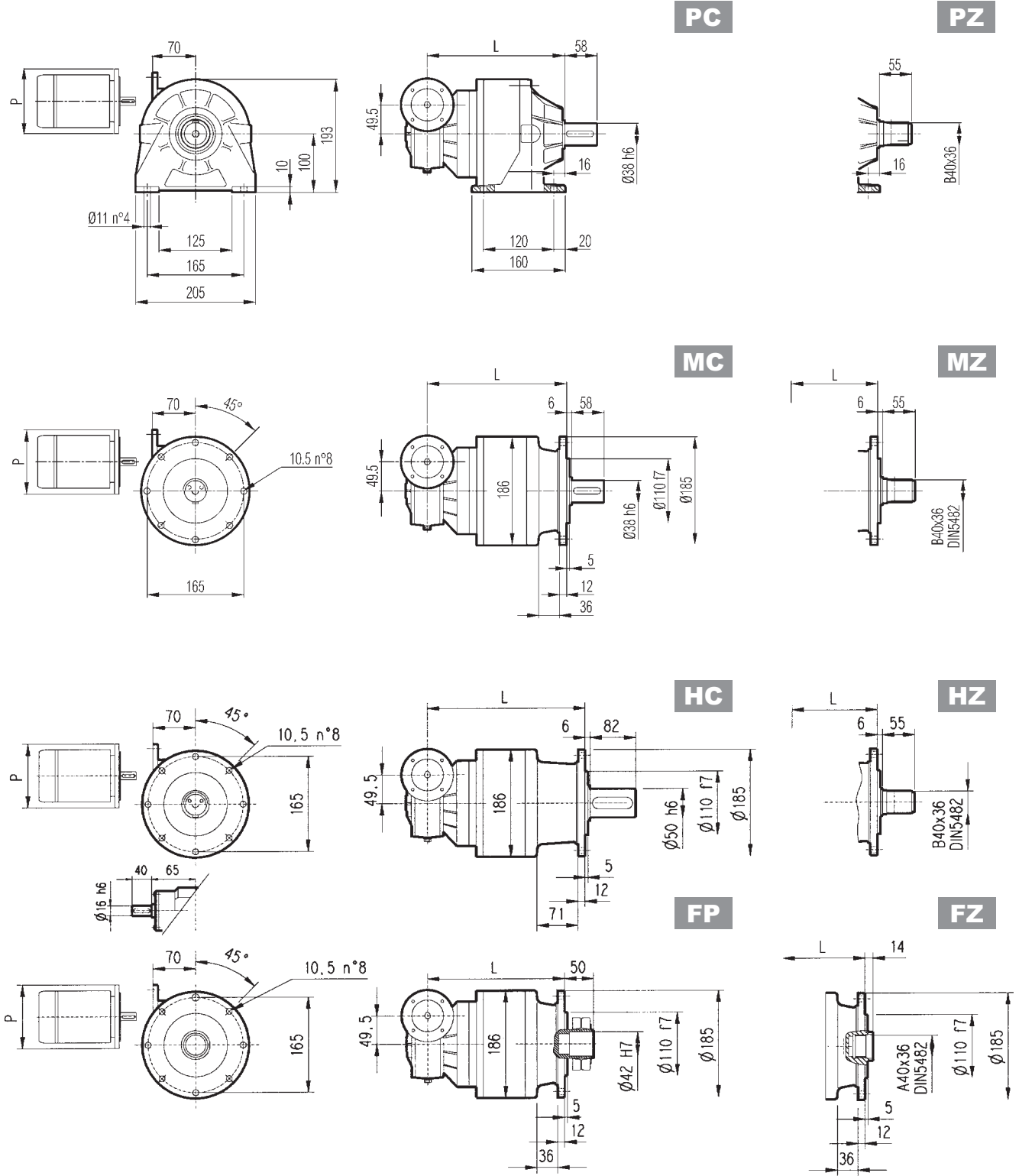
	L				L1	Kg				V	V1	Kg	V	V1	Kg
	MC - MZ	PC - PZ	HC - HZ	FP - FZ		MC - MZ	PC - PZ	HC - HZ	FP - FZ						
300 R2	172	178	207	172	122	32	37	34	30	137.5	24	6	158	38	7
300 R3	225	231	260	225	122	36	41	38	34	137.5	24	6	158	38	7
300 R4	278	284	313	278	122	40	45	42	38	137.5	24	6	158	38	7

	P71		P80		P90		P100		P112		P132	
	E	P	E	P	E	P	E	P	E	P	E	P
300 R2	65	160	84	200	84	200	94	250	94	250	114	300
300 R3	65	160	84	200	84	200	94	250	94	250	114	300
300 R4	65	160	84	200	84	200	94	250	94	250	114	300

	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
300 R2	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258
300 R3	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-
300 R4	253	314	138	328	400	156	373	469	195	-	-	-	-	-	-

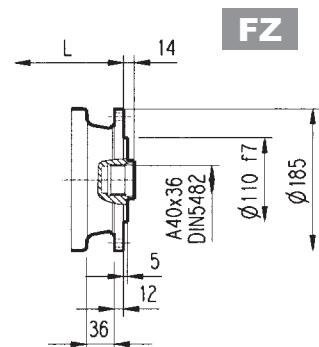
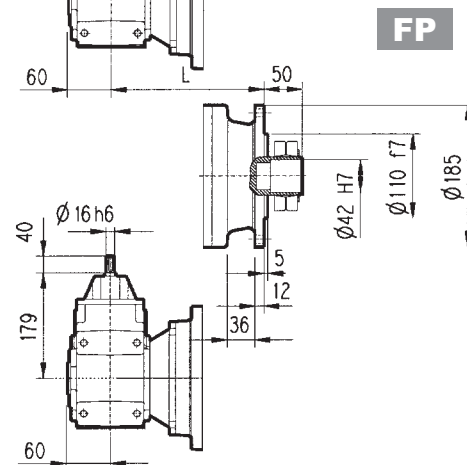
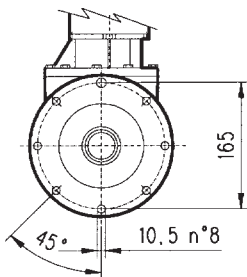
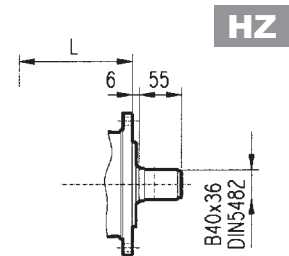
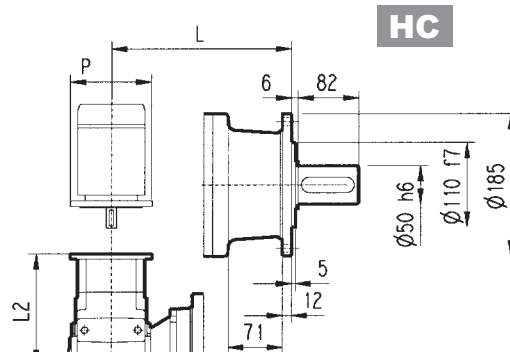
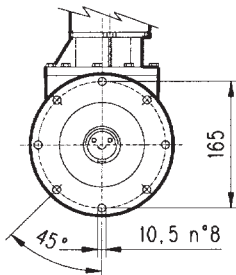
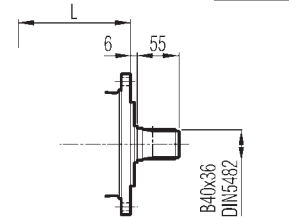
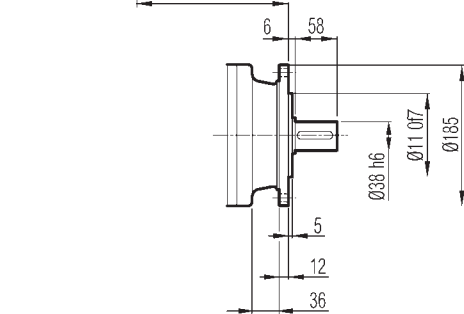
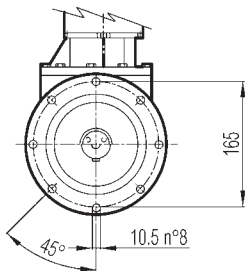
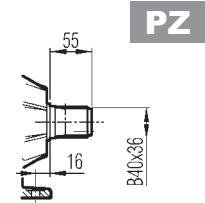
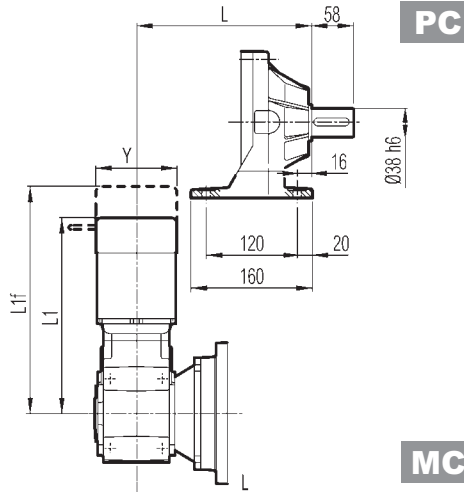
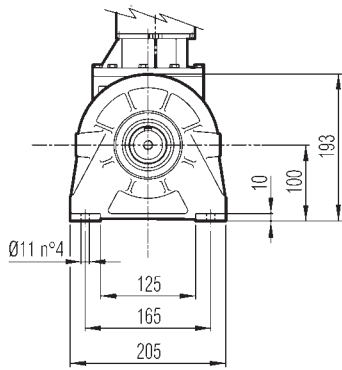
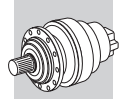


3V 00 L3



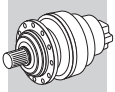
FP $M_{2max} = 1300 \text{ Nm}$

3V 00 L3	L				$\overset{\circ}{\text{Kg}}$				P63	P71	P80
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	P	P	P
	255	261	290	255	25	30	27	23	140	160	200



FP $M_{2max} = 1300 \text{ Nm}$

3/A 00 L2	L						$\overset{\circ}{\text{Kg}}$															
	MC - MZ		PC - PZ		HC - HZ		FP - FZ		MC - MZ		PC - PZ		HC - HZ		FP - FZ							
	193		199		228		193		38		43		40		36							
3/A 00 L2	P63		P71		P80		P90		P100		S1 + M1		S2 + M2S			S3 + M3SA			S3 + M3LA			
	L2	P	L2	P	L2	P	L2	P	L2	P	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
	212.5	140	212.5	160	232	200	232	200	242	250	368	428	138	394	466	156	439	535	195	470	563	195

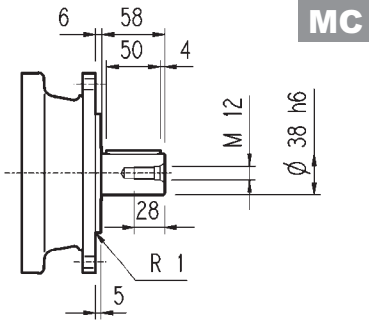


300 L

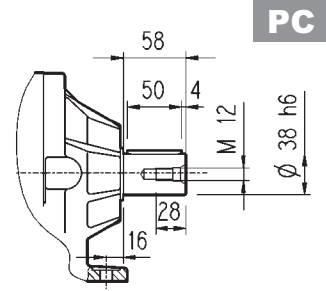
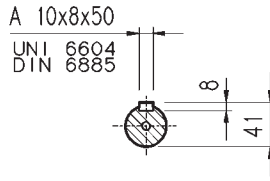
300 R

3/V 00 L3

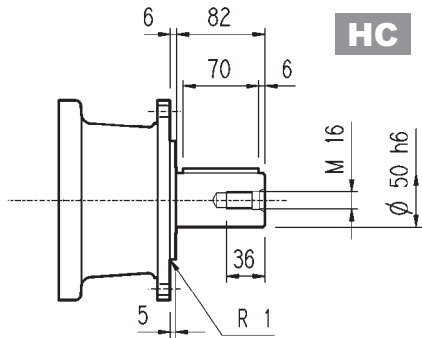
3/A 00 L2



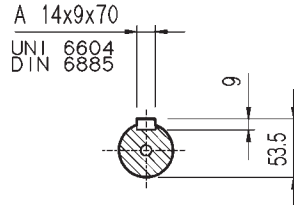
MC



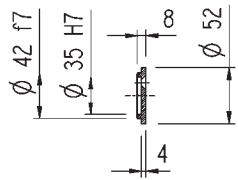
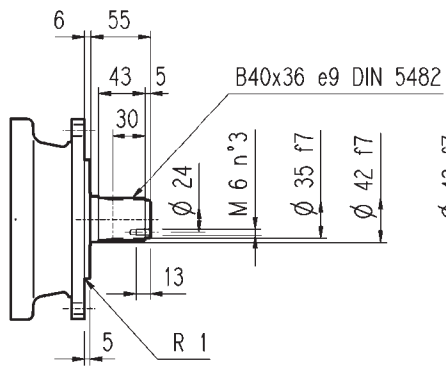
PC



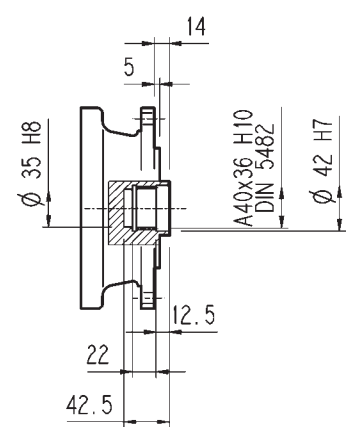
HC



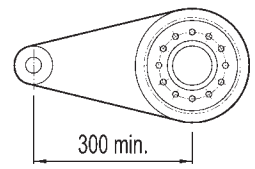
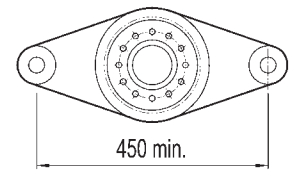
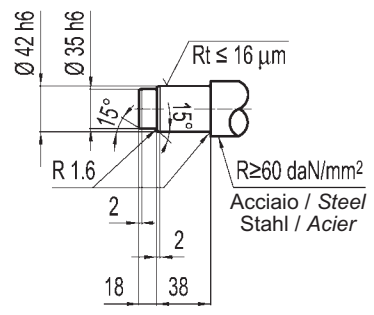
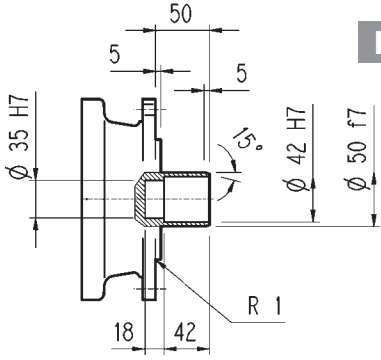
MZ HZ



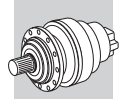
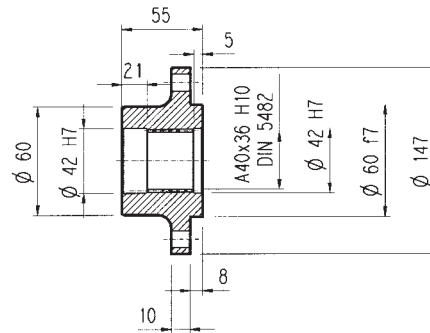
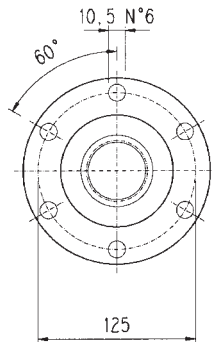
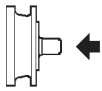
FZ



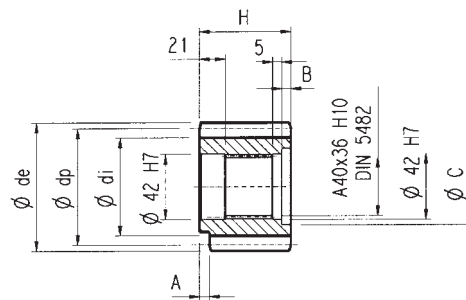
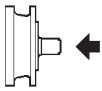
FP



FP $M_{2max} = 1300 \text{ Nm}$

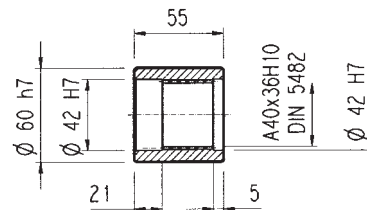
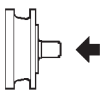
300 L**300 R****3/V 00 L3****3/A 00 L2**
Flangia / Flange
Flansch / Brides
W0A

Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

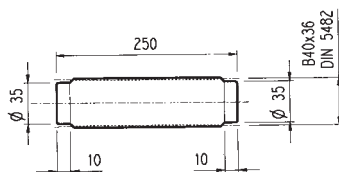
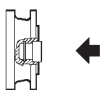
Pignoni / Pinion gears
Ritzel / Pignons
P...

	m	z	x	dp	di	de	H	A	B	C	☆
PBE	4.5	14	0.507	63	56	75.5	55	0	0	0	□
PCE	5	14	0.500	70	62.5	84.8	65	0	10	53	□
PDC	6	12	0.250	72	61	84.8	59	14	4	54	□
PDE	6	14	0.500	84	73	99.6	65	0	10	54	□

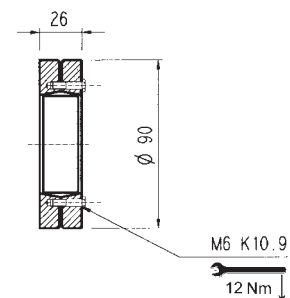
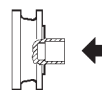
☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifié 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cémenté et tempré 18NiCrMo5

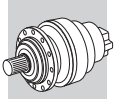
Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure
MOA

Materiale : Acciaio 16CrNi4
 Material : Steel 16CrNi4
 Material : Stahl 16CrNi4
 Matière : Acier 16CrNi4

Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée
B0A

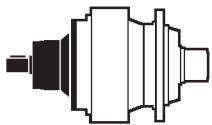
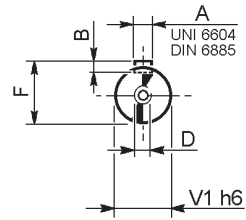
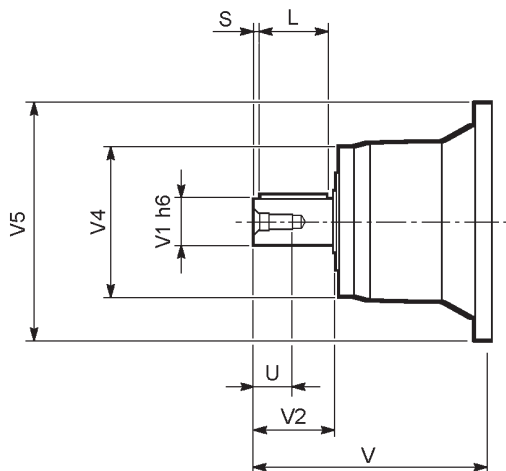
Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
 Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
 Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
 Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage
GOA



300 L

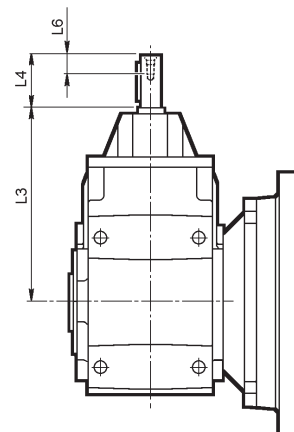
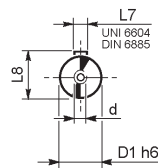
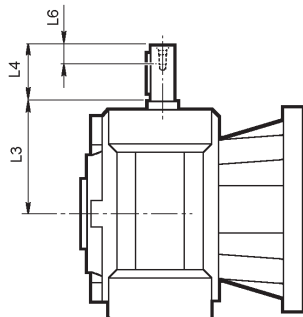
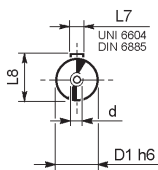
300 R



	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
300 L1	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
300 L2	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
300 L3	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
300 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
300 R2-R3-R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

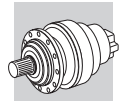
3/V 00 L3

3/A 00 L2



	D1 h6	L3	L4	L6	L7	L8	d
3/V 00 L3 HS	16	65	40	16	5	18	M6

	D1 h6	L3	L4	L6	L7	L8	d
3/A 00 L2 HS	16	179	40	16	5	18	M6

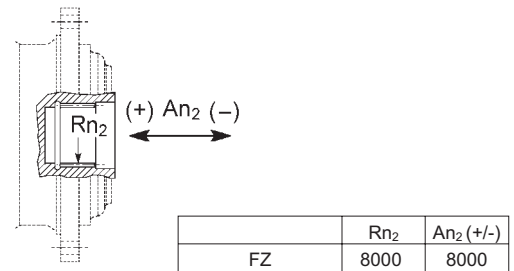
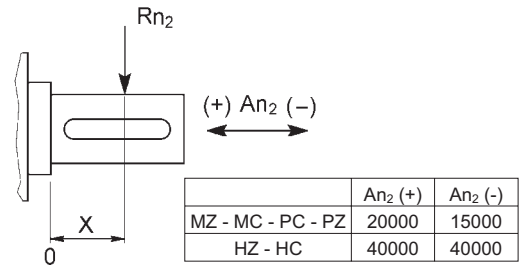
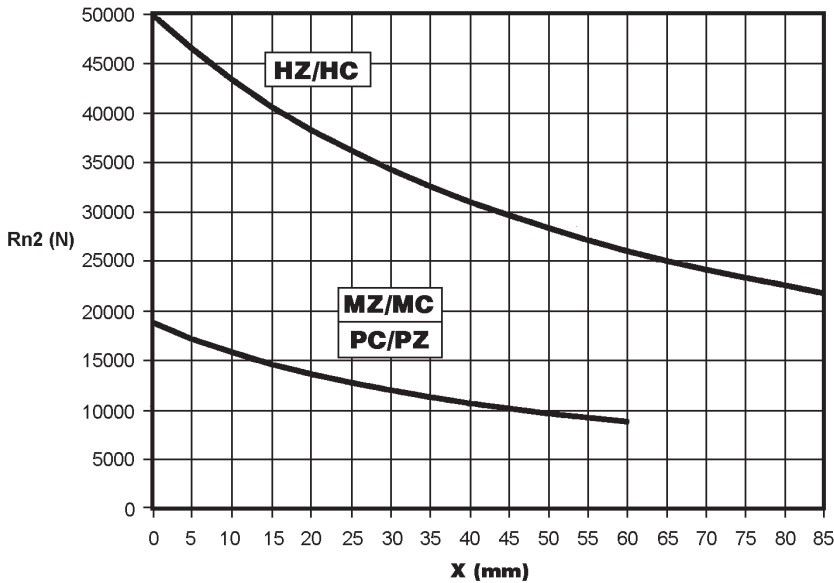


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $Fh_2 : n_2 \cdot h = 10000$

Permissible radial and axial loads on output shaft with $Fh_2 : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $Fh_2 : n_2 \cdot h = 10000$

Charges radiales et axiales admises sur l'arbre lent pour une valeur de $Fh_2 : n_2 \cdot h = 10000$



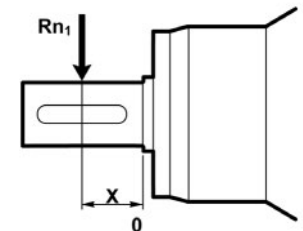
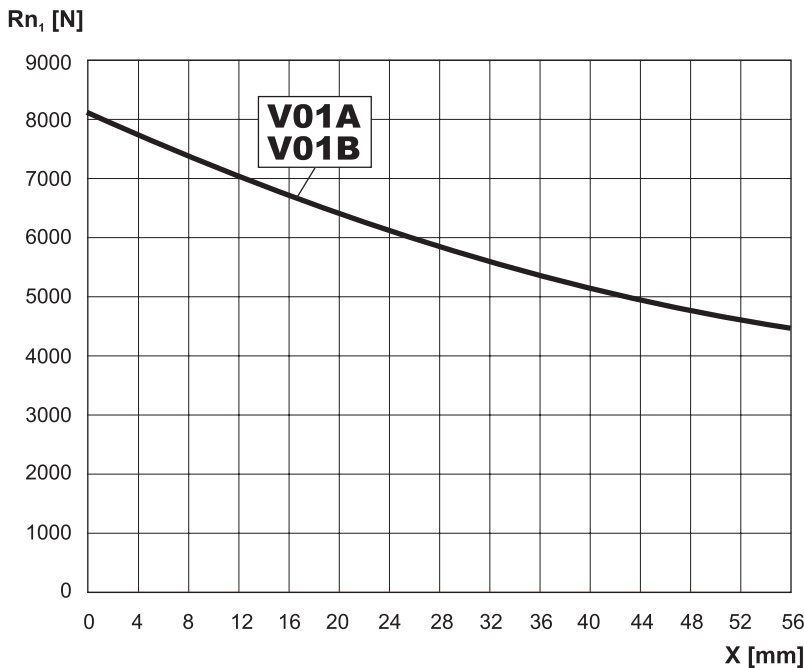
Fattore fh_2 correttivo per carichi sugli alberi Load corrective factor fh_2 on shafts Korrektionsfaktor fh_2 für wellenbelastungen Facteur de correction fh_2 pour charges sur les arbres	$Fh_2 = n_2 \cdot h$						
		10000	25000	50000	100000	500000	1000000
fh_2	MZ-MC-PC-PZ-FZ	1	0.74	0.58	0.46	0.27	0.21
	HZ - HC	1	0.76	0.61	0.50	0.31	0.25

Carichi radiali ammissibili sull'albero veloce per un valore di $Fh_1 : n_1 \cdot h = 250000$

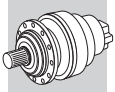
Permissible radial loads on input shaft with $Fh_1 : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $Fh_1 : n_1 \cdot h = 250000$

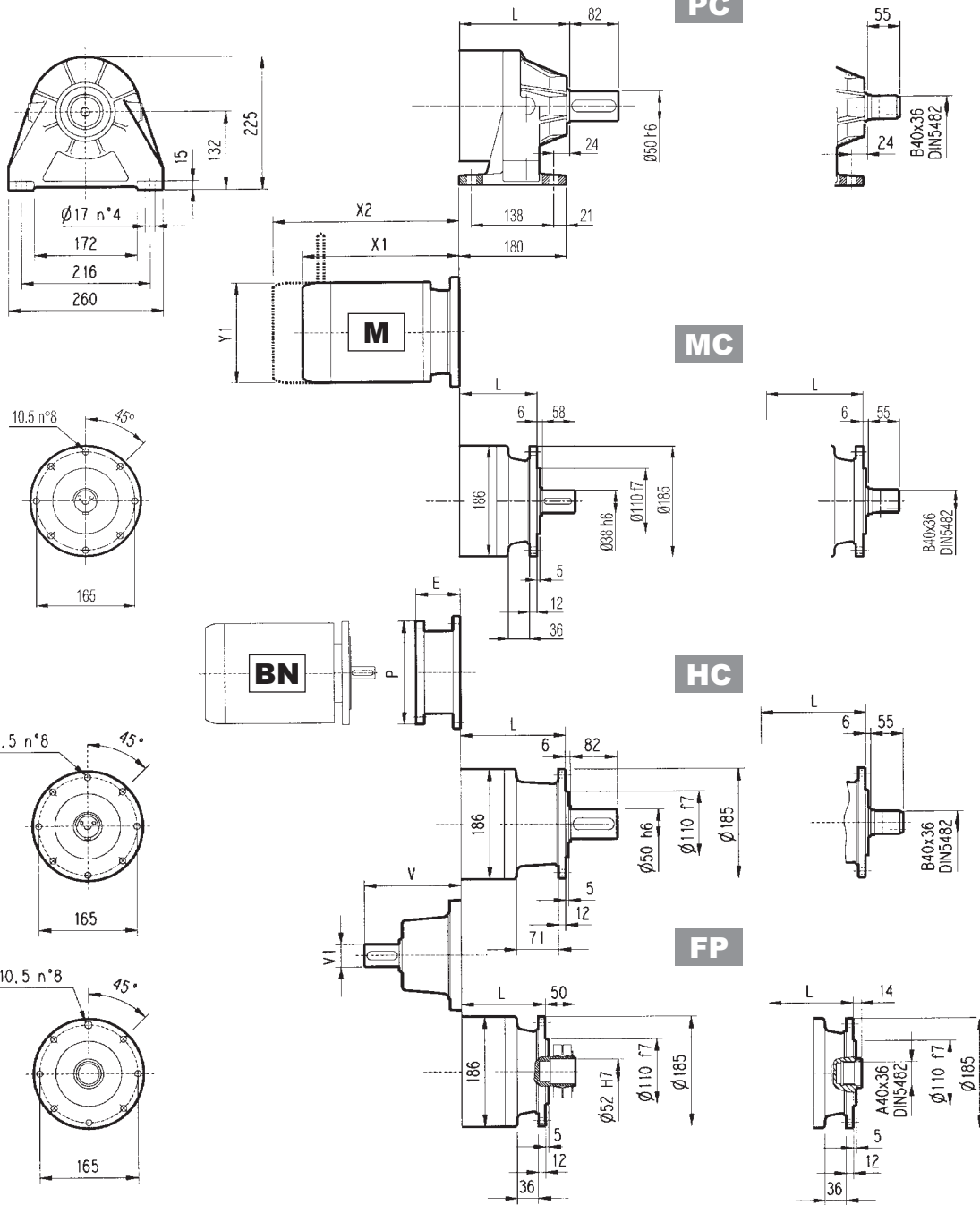
Charges radiales admises sur l'arbre d'entrée pour une valeur de $Fh_1 : n_1 \cdot h = 250000$



Fattore fh_1 correttivo per carichi sugli alberi Load corrective factor fh_1 on shafts Korrektionsfaktor fh_1 für wellenbelastungen Facteur de correction fh_1 pour charges sur les arbres	$Fh_1 = n_1 \cdot h$						
		250000	500000	1000000	2000000	5000000	10000000
fh_1	1	0.79	0.63	0.50	0.37	0.29	



301 L

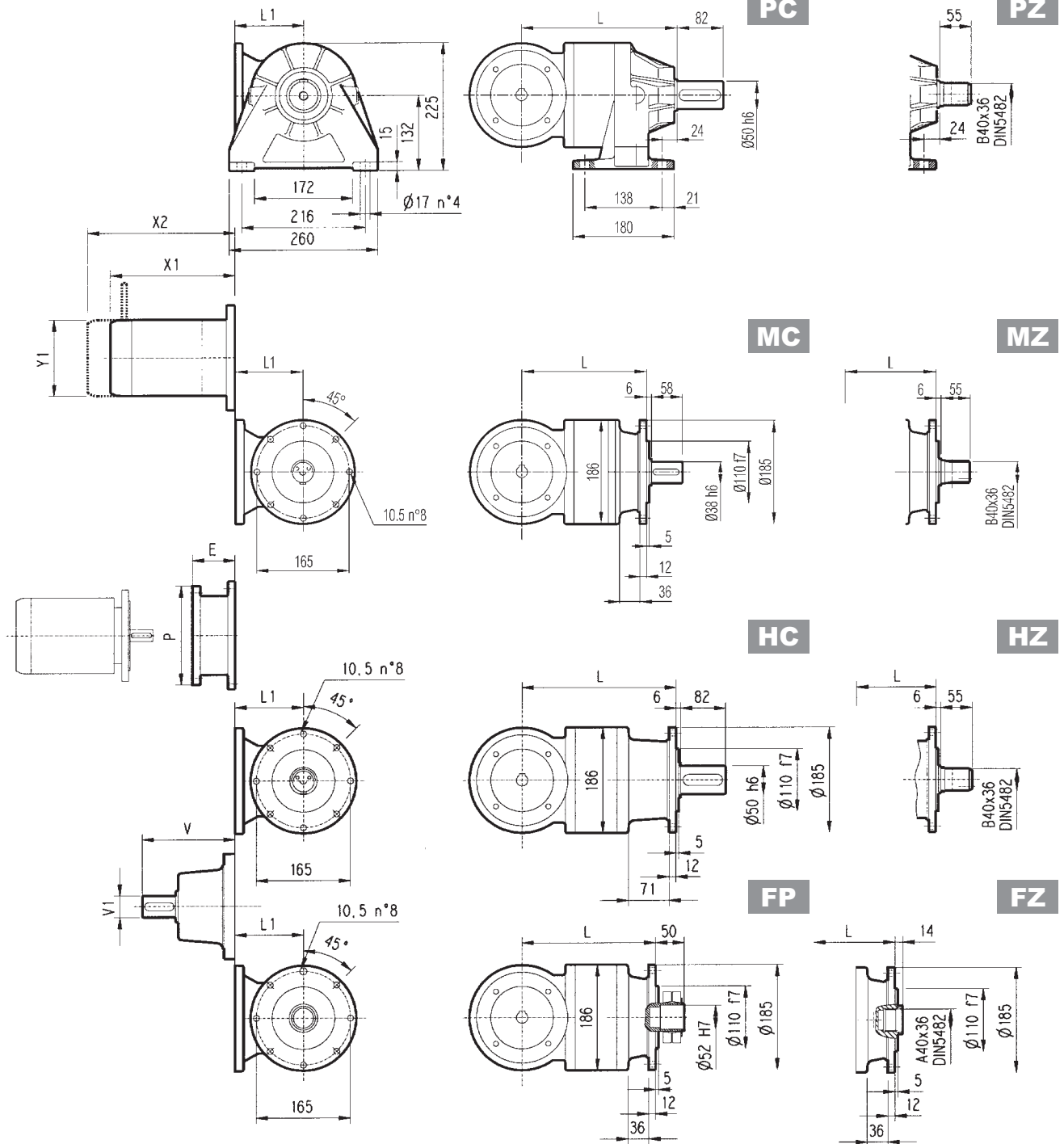
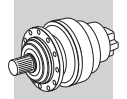


FP $M_{2max} = 2400 \text{ Nm}$

	L				Kg				V	V1	Kg	V	V1	Kg
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ						
301 L1	92	132	126	92	21	26	23	19	137.5	24	6	158	38	7
301 L2	145	185	176	145	25	30	27	23	137.5	24	6	158	38	7
301 L3	198	238	232	198	29	34	31	27	137.5	24	6	158	38	7
301 L4	251	291	285	251	33	38	35	31	137.5	24	6	158	38	7

	P71		P80		P90		P100		P112		P132	
	E	P	E	P	E	P	E	P	E	P	E	P
301 L1	65	160	84	200	84	200	94	250	94	250	114	300
301 L2	65	160	84	200	84	200	94	250	94	250	114	300
301 L3	65	160	84	200	84	200	94	250	94	250	114	300
301 L4	65	160	84	200	84	200	94	250	94	250	114	300

	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
301 L1	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258
301 L2	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258
301 L3	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258
301 L4	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258

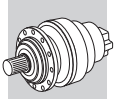


FP $M_{2max} = 2400 \text{ Nm}$

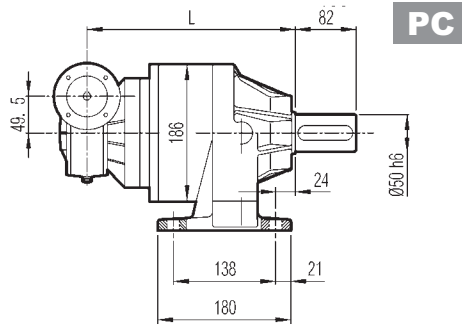
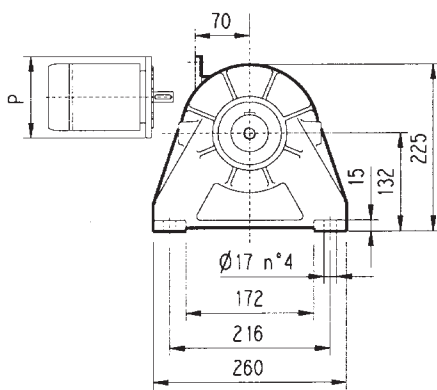
	L				L1	Kg				V	V1	Kg	V	V1	Kg
	MC - MZ	PC - PZ	HC - HZ	FP - FZ		MC - MZ	PC - PZ	HC - HZ	FP - FZ						
301 R2	184	225	219	184	122	35	42	37	33	137.5	24	6	158	38	7
301 R3	237	278	272	237	122	39	46	41	37	137.5	24	6	158	38	7
301 R4	290	331	325	290	122	43	50	45	41	137.5	24	6	158	38	7

	P71		P80		P90		P100		P112		P132	
	E	P	E	P	E	P	E	P	E	P	E	P
301 R2	65	160	84	200	84	200	94	250	94	250	114	300
301 R3	65	160	84	200	84	200	94	250	94	250	114	300
301 R4	65	160	84	200	84	200	94	250	94	250	114	300

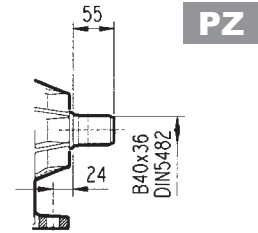
	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
301 R2	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258
301 R3	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-
301 R4	253	314	138	328	400	156	373	469	195	-	-	-	-	-	-



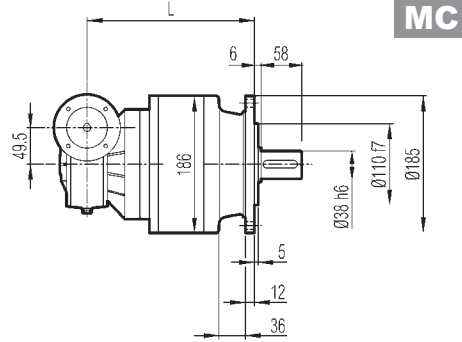
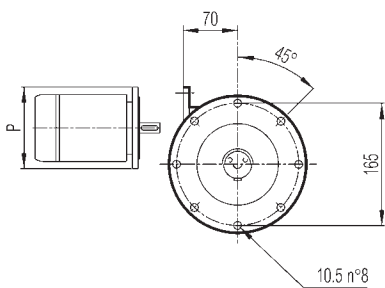
3/V 01 L3



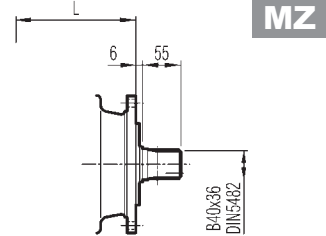
PC



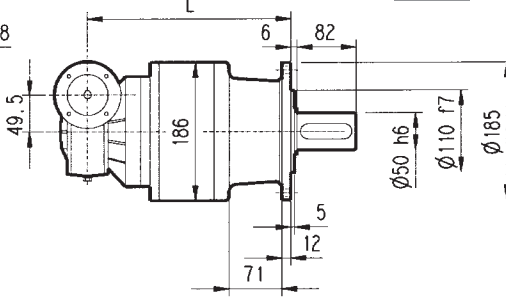
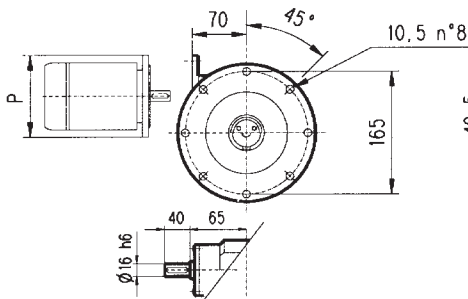
PZ



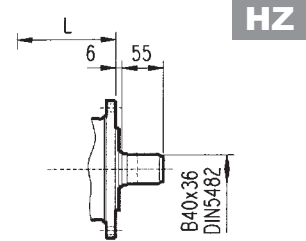
MC



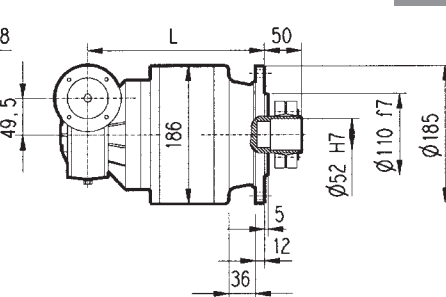
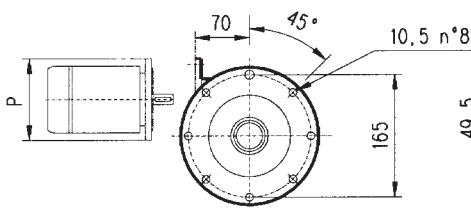
MZ



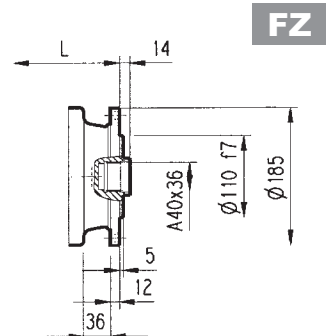
HC



HZ



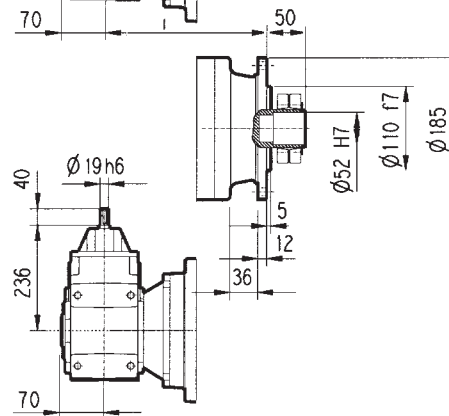
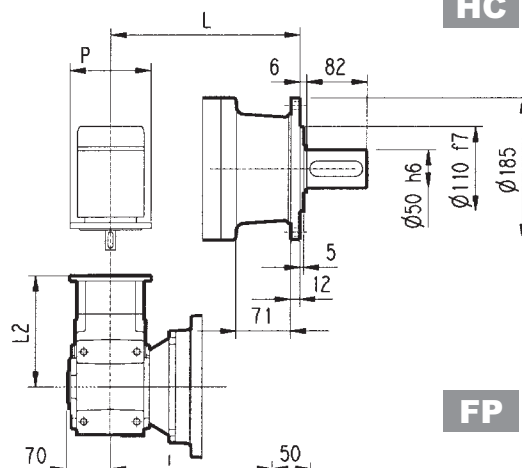
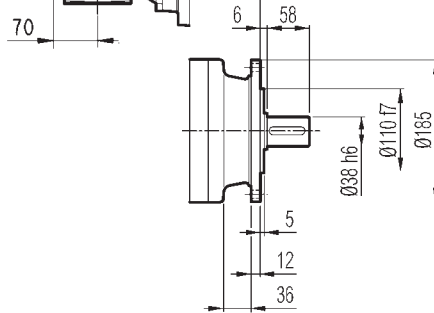
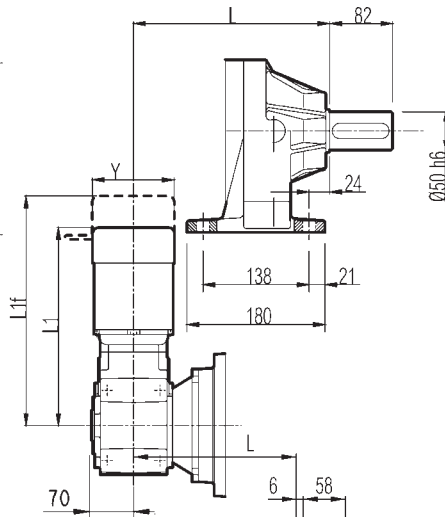
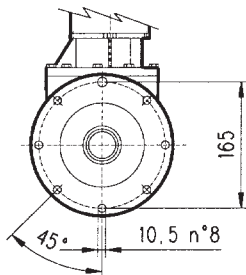
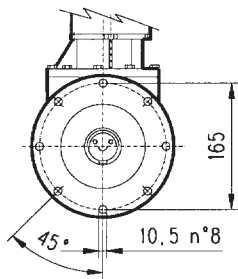
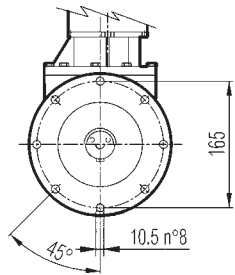
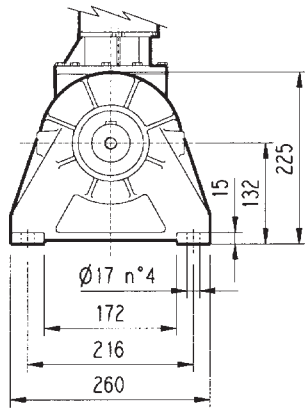
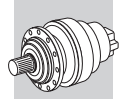
FP



FZ

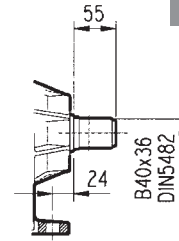
FP $M_{2max} = 2400 \text{ Nm}$

3/V 01 L3	L				$\overset{\circ}{\text{Kg}}$				P63	P71	P80
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	P	P	P
	267	308	302	267	28	35	30	26	140	160	200



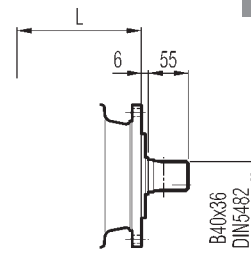
PC

PZ



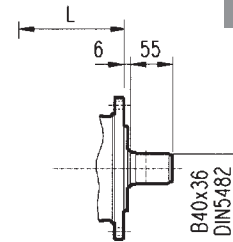
MC

MZ



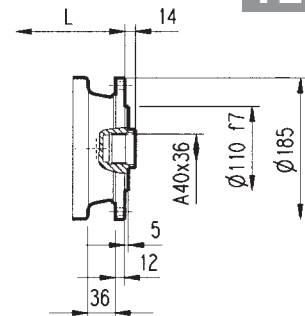
HC

HZ



FP

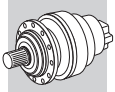
FZ



FP $M_{2max} = 2400 \text{ Nm}$

3/A 01 L2	L				Kg			
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ
3/A 01 L2	202	208	237	202	40	46	43	40

3/A 01 L2	P63		P71		P80		P90		P100		S1 + M1			S2 + M2S			S3 + M3SA			S3 + M3LA		
	L2	P	L2	P	L2	P	L2	P	L2	P	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
3/A 01 L2	226	140	226	160	245.5	200	245.5	200	255.5	250	382	442	138	408	480	156	453	549	195	484	577	195

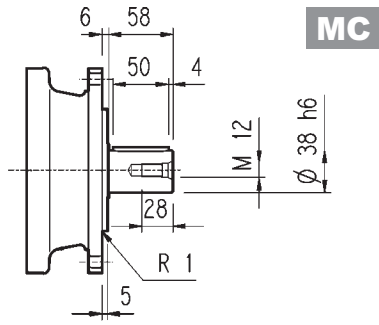


301 L

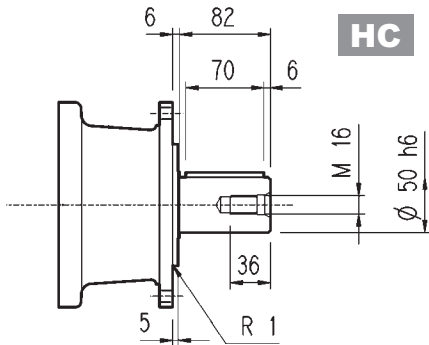
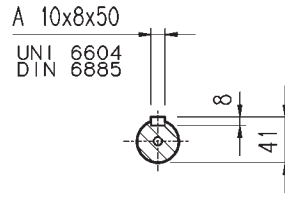
301 R

3/V 01 L3

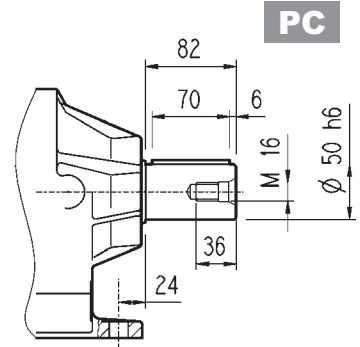
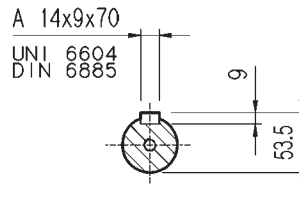
3/A 01 L2



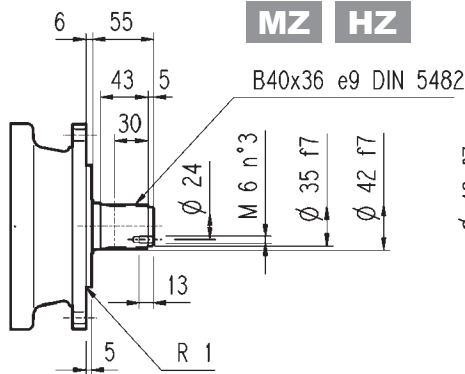
MC



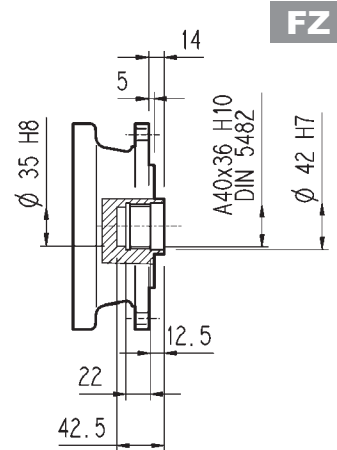
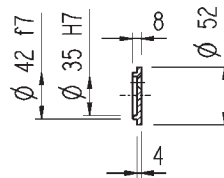
HC



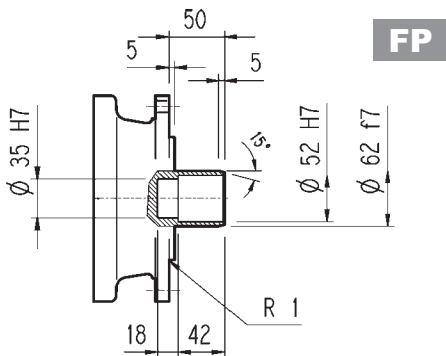
PC



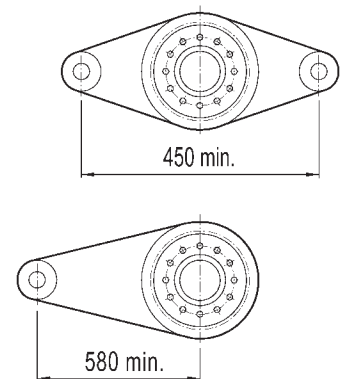
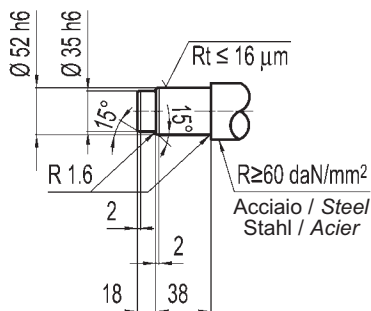
MZ HZ



FZ

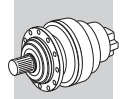
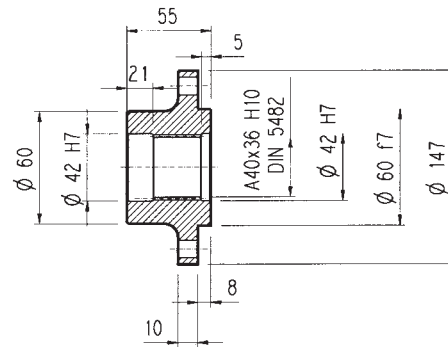
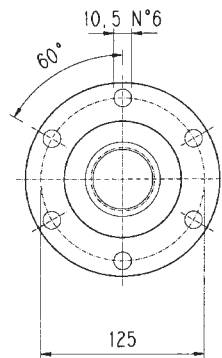
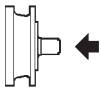


FP

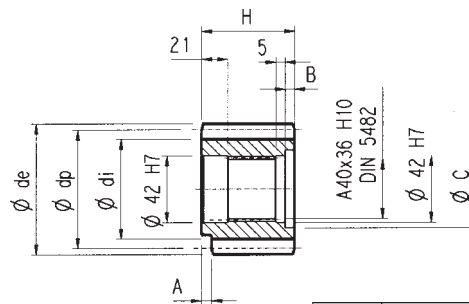
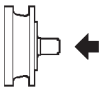


FP

M_{2max} = 2400 Nm

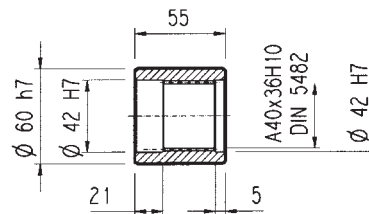
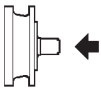
301 L**301 R****3/V 01 L3****3/A 01 L2**
Flangia / Flange
Flansch / Brides
W0A

Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

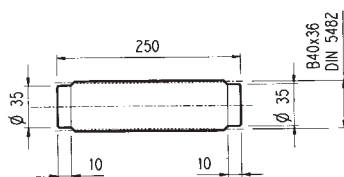
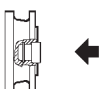
Pignoni / Pinion gears
Ritzel / Pignons
P...

	m	z	x	dp	di	de	H	A	B	C	☆
PBE	4.5	14	0.507	63	56	75.5	55	0	0	0	□
PCE	5	14	0.500	70	62.5	84.8	65	0	10	53	□
PDC	6	12	0.250	72	61	84.8	59	14	4	54	□
PDE	6	14	0.500	84	73	99.6	65	0	10	54	□

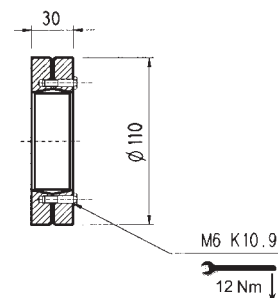
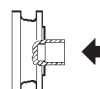
☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifiée 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cémenté et tempré 18NiCrMo5

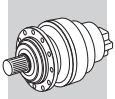
Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure
MOA

Materiale : Acciaio 16CrNi4
 Material : Steel 16CrNi4
 Material : Stahl 16CrNi4
 Matière : Acier 16CrNi4

Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée
B0A

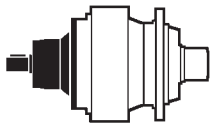
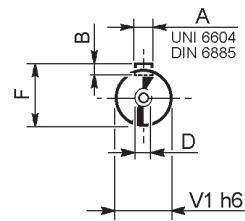
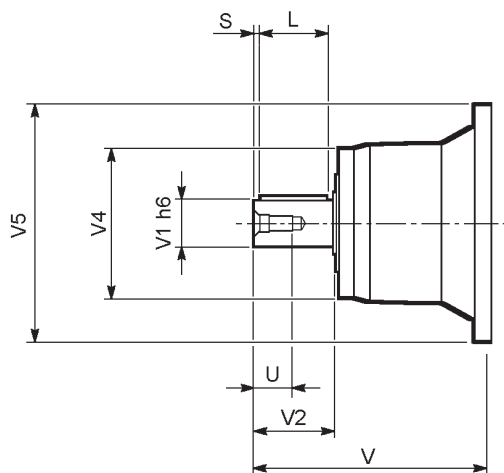
Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
 Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
 Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
 Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage
GOA



301 L

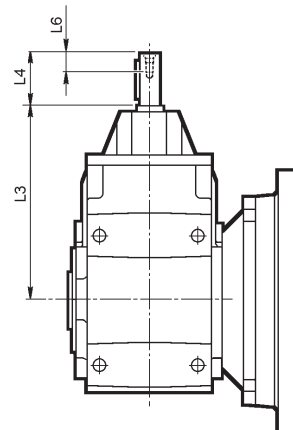
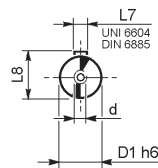
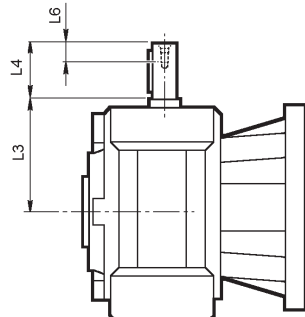
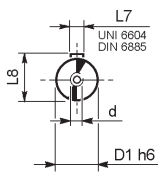
301 R



	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
301 L1	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
301 L2	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
301 L3	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
301 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
301 R2-R3-R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

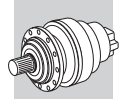
3/V 01 L3

3/A 01 L2



	D1 h6	L3	L4	L6	L7	L8	d
3/V 01 L3_HS	16	65	40	16	5	18	M6

	D1 h6	L3	L4	L6	L7	L8	d
3/A 01 L2_HS	19	235.5	40	16	6	21.5	M6

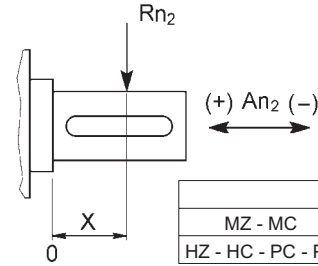
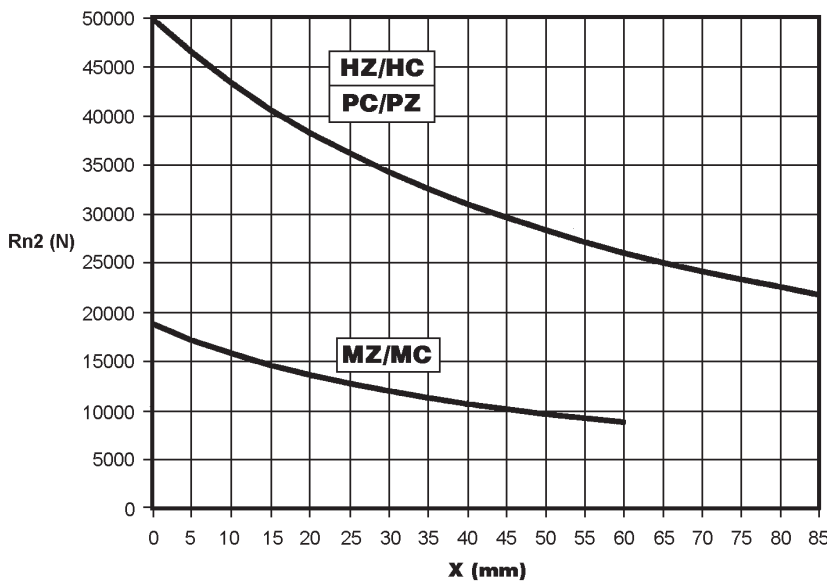


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $Fh_2 : n_2 \cdot h = 10000$

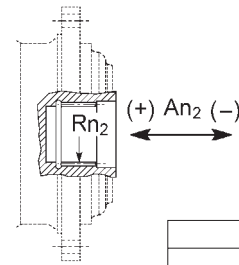
Permissible radial and axial loads on output shaft with $Fh_2 : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $Fh_2 : n_2 \cdot h = 10000$

Charges radiales et axiales admises sur l'arbre lent pour une valeur de $Fh_2 : n_2 \cdot h = 10000$



	An ₂ (+)	An ₂ (-)
MZ - MC	20000	15000
HZ - HC - PC - PZ	40000	40000



	Rn ₂	An ₂ (+/-)
FZ	8000	8000

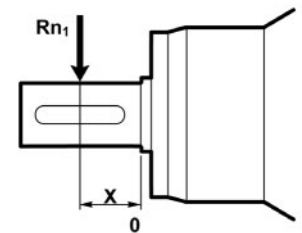
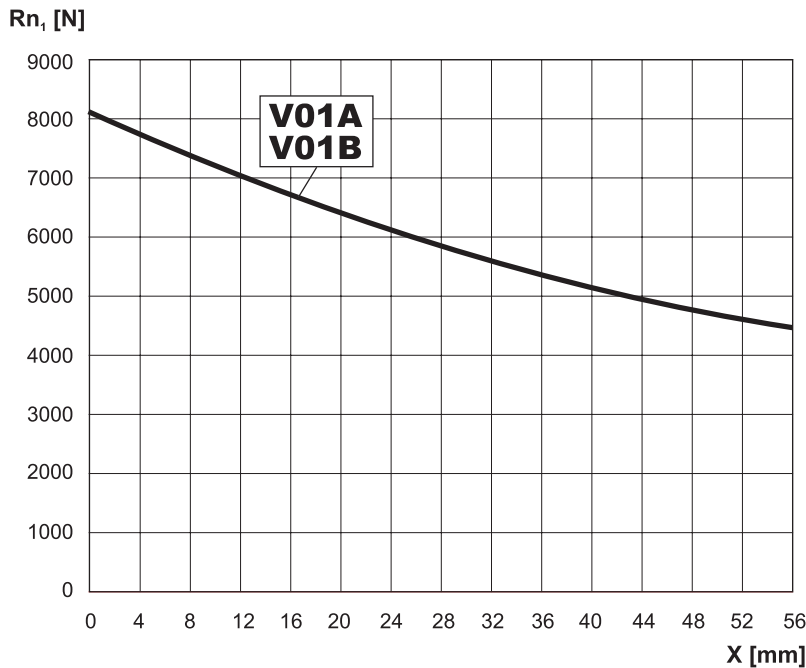
Fattore fh_2 correttivo per carichi sugli alberi Load corrective factor fh_2 on shafts Korrektionsfaktor fh_2 für wellenbelastungen Facteur de correction fh_2 pour charges sur les arbres	$Fh_2 = n_2 \cdot h$						
		10000	25000	50000	100000	500000	1000000
fh_2	MZ - MC - FZ	1	0.74	0.58	0.46	0.27	0.21
	HZ - HC - PC - PZ	1	0.76	0.61	0.50	0.31	0.25

Carichi radiali ammissibili sull'albero veloce per un valore di $Fh_1 : n_1 \cdot h = 250000$

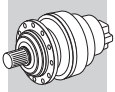
Permissible radial loads on input shaft with $Fh_1 : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $Fh_1 : n_1 \cdot h = 250000$

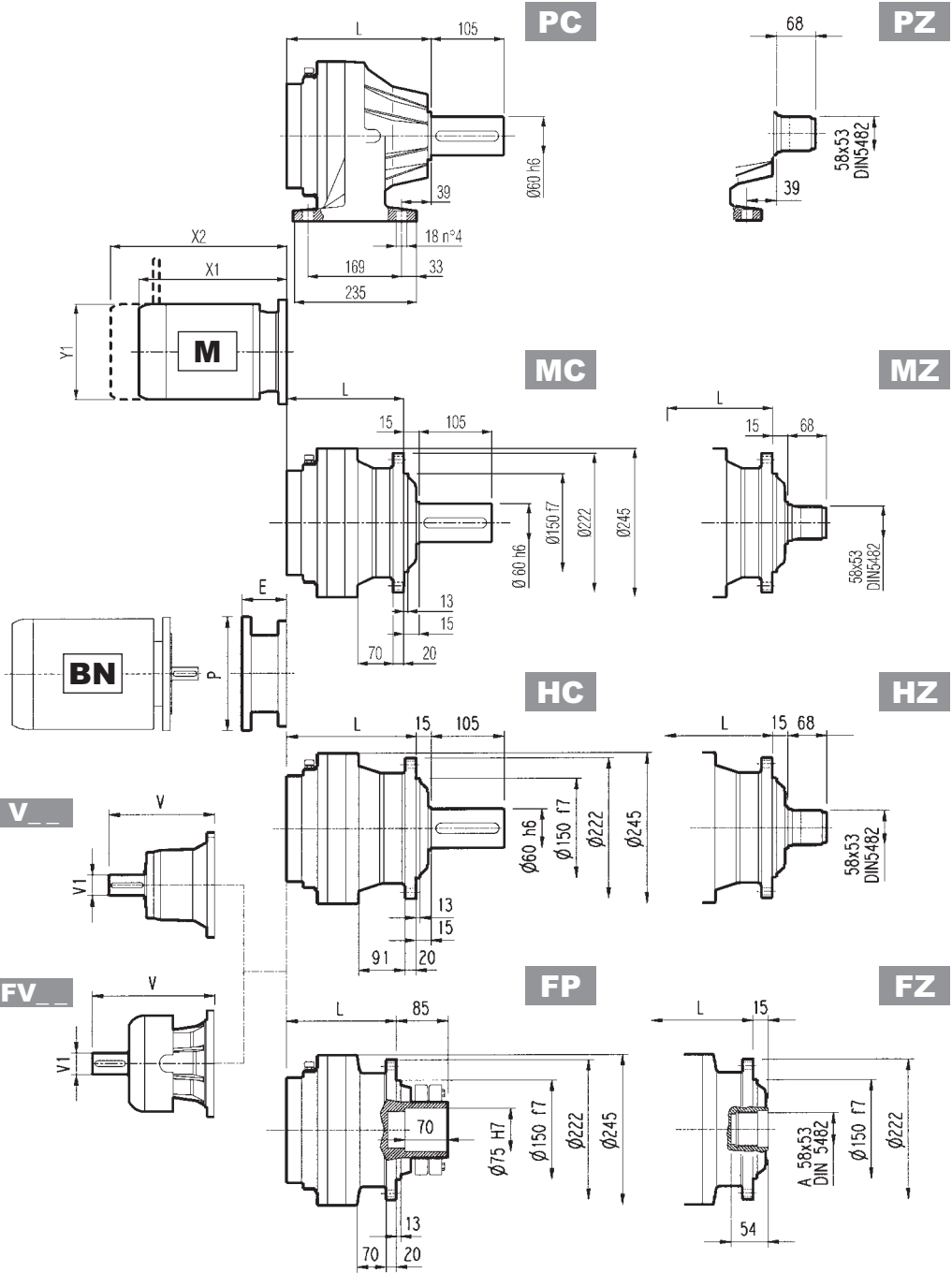
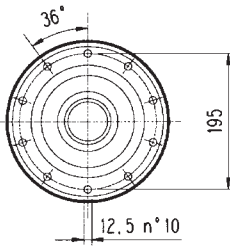
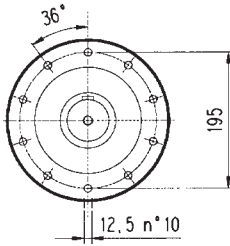
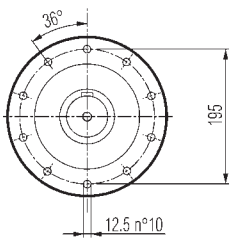
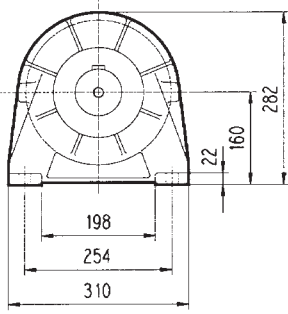
Charges radiales admises sur l'arbre d'entrée pour une valeur de $Fh_1 : n_1 \cdot h = 250000$



Fattore fh_1 correttivo per carichi sugli alberi Load corrective factor fh_1 on shafts Korrektionsfaktor fh_1 für wellenbelastungen Facteur de correction fh_1 pour charges sur les arbres	$Fh_1 = n_1 \cdot h$						
		250000	500000	1000000	2000000	5000000	10000000
fh_1	1	0.79	0.63	0.50	0.37	0.29	



303 L

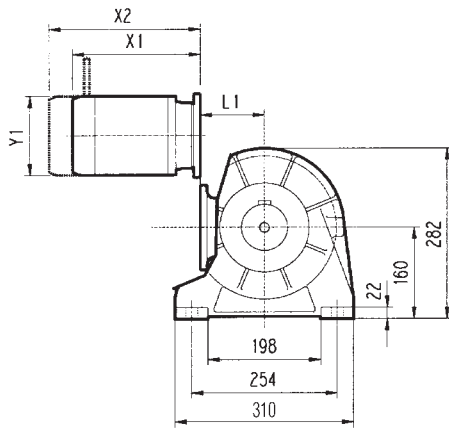
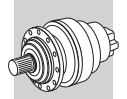


FP $M_{2max} = 5200 \text{ Nm}$

	L				Kg				Kg				Kg							
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
303 L1	125	165	150	125	31	40	35	31	239	48	15	-	-	-	276	48	17	-	-	-
303 L2	178	218	203	178	35	44	39	35	137.5	24	6	158	38	7	-	-	-	-	-	-
303 L3	231	271	256	231	39	48	43	39	137.5	24	6	158	38	7	-	-	-	-	-	-
303 L4	284	324	309	284	43	52	47	43	137.5	24	6	158	38	7	-	-	-	-	-	-

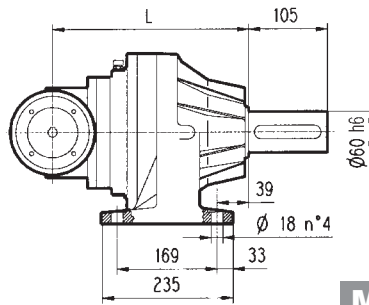
	P71		P80		P90		P100		P112		P132		P160		P180		P200	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
303 L1	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400
303 L2	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-
303 L3	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-
303 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-

	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
303 L1	-	-	-	-	-	-	-	-	-	-	-	-	460	571	258	552	692	310	596	736	310
303 L2	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
303 L3	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
303 L4	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-



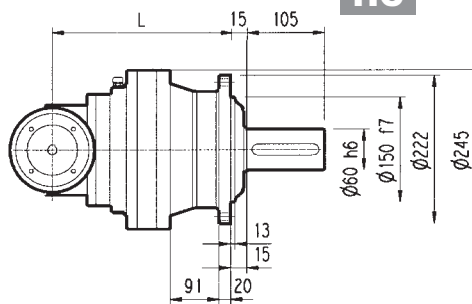
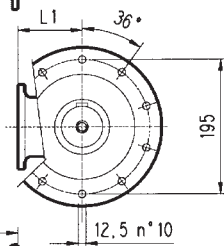
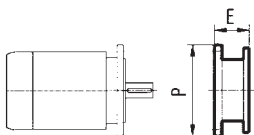
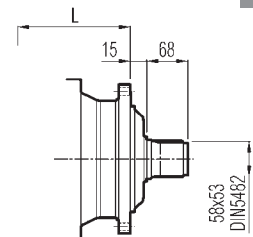
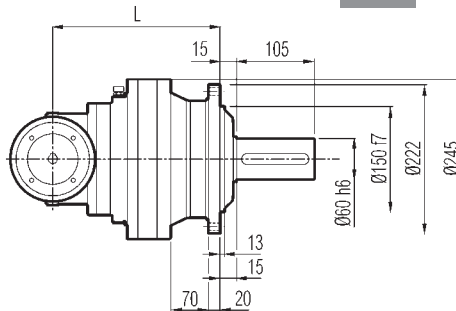
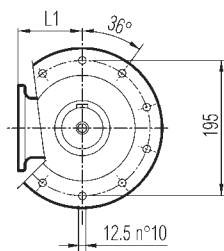
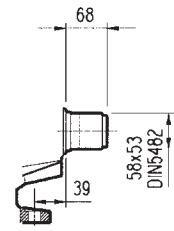
PC

PZ



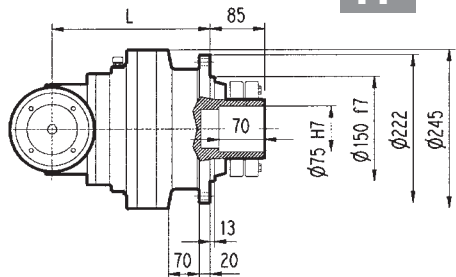
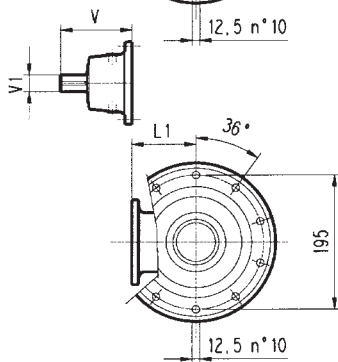
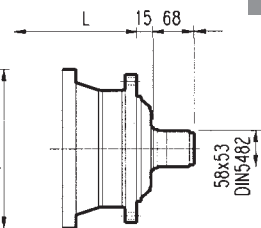
MC

MZ



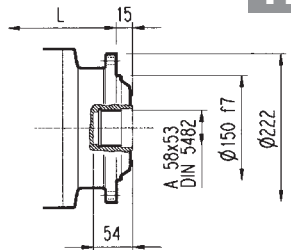
HC

HZ



FP

FZ

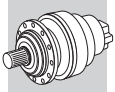


FP	$M_{2max} = 5200 \text{ Nm}$
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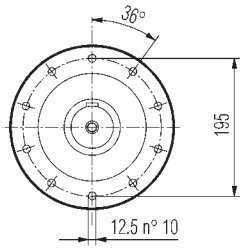
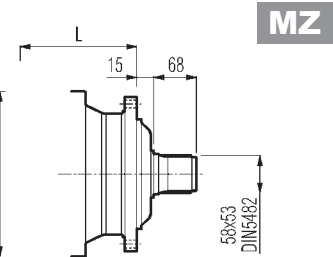
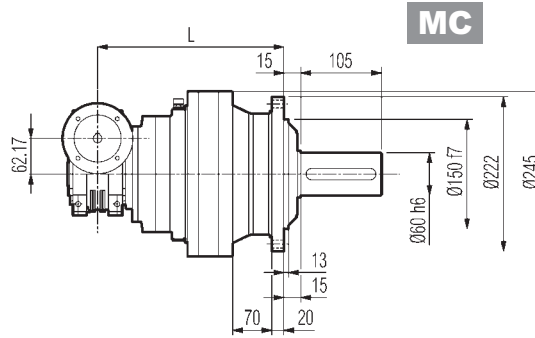
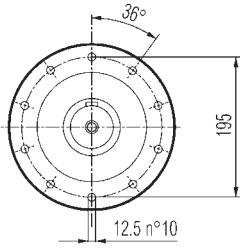
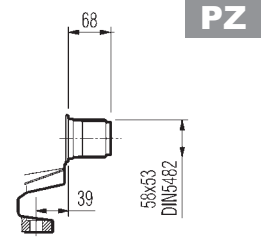
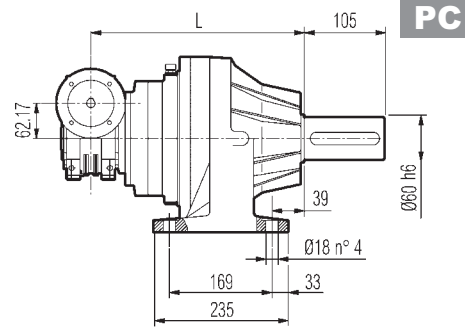
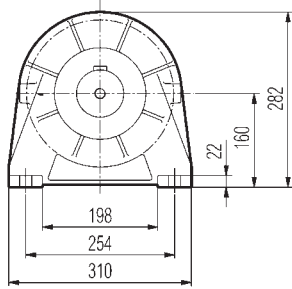
	L				L1	Kg				Kg					
	MC - MZ	PC - PZ	HC - HZ	FP - FZ		MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1	V	V1		
303 R2	217	257	242	217	140	51	60	55	51	137.5	24	6	158	38	7
303 R3	270	310	295	270	122	49	58	53	49	137.5	24	6	158	38	7
303 R4	323	363	348	323	122	53	62	57	53	137.5	24	6	158	38	7

	P71		P80		P90		P100		P112		P132	
	E	P	E	P	E	P	E	P	E	P	E	P
303 R2	65	160	84	200	84	200	94	250	94	250	114	300
303 R3	65	160	84	200	84	200	94	250	94	250	114	300
303 R4	65	160	84	200	84	200	94	250	94	250	114	300

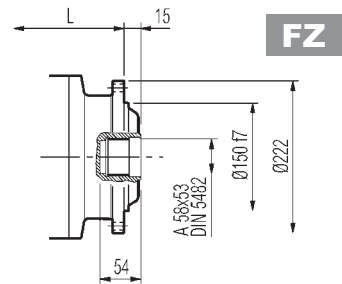
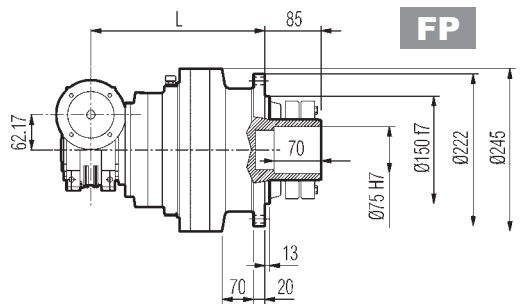
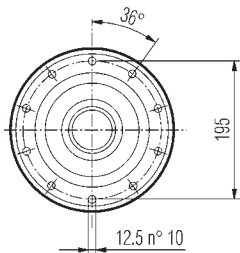
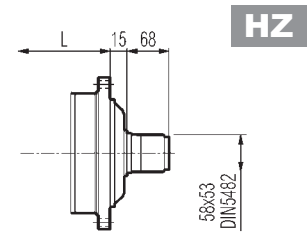
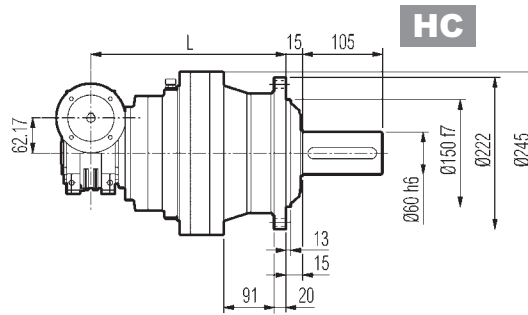
	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
303 R2	-	-	-	328	400	156	373	469	195	405	497	195	508	619	258
303 R3	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-
303 R4	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-



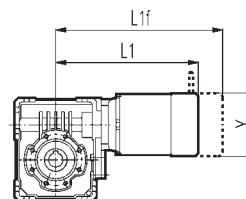
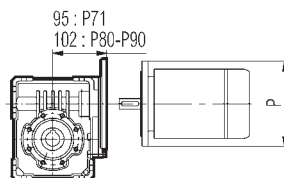
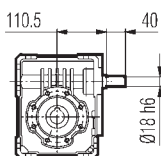
3/V 03 L3



A →



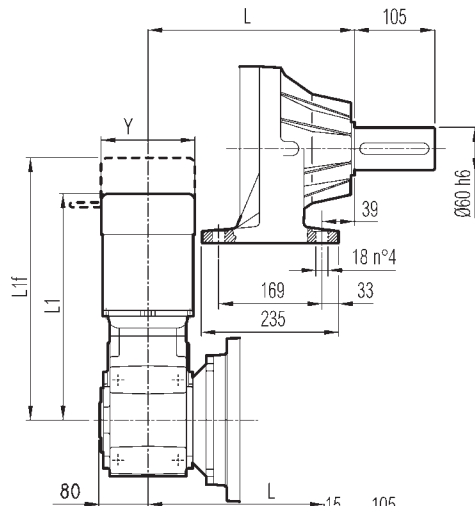
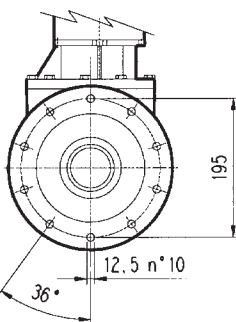
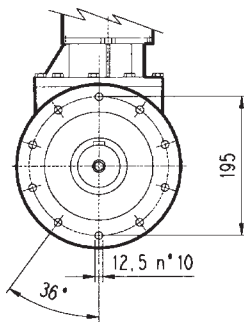
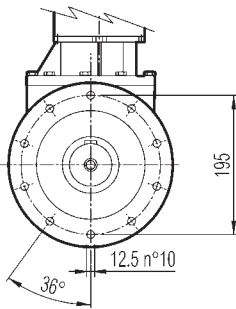
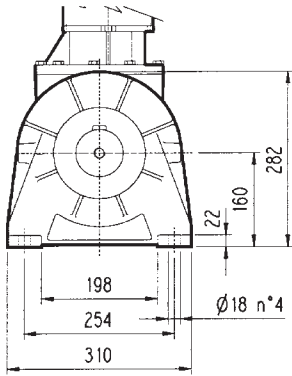
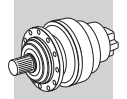
Vista da A
View from A



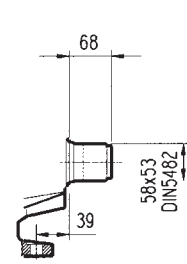
FP

M_{2max} = 5200 Nm

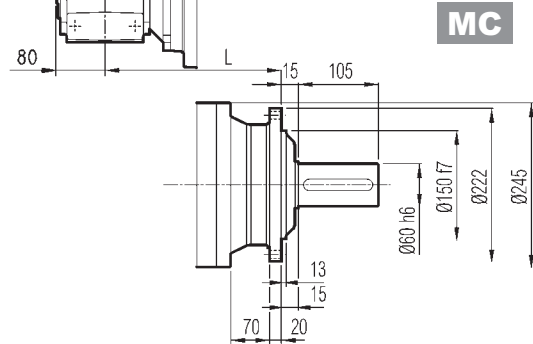
3/V 03 L3	L				Kg				
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	
	270	330	315	270	43	51	45	41	
3/V 03 L3	P71	P80	P90	S1 + M1			S2 + M2S		
	P	P	P	L1	L1f	Y	L1	L1f	Y
	160	200	200	289	350	138	317	393	156



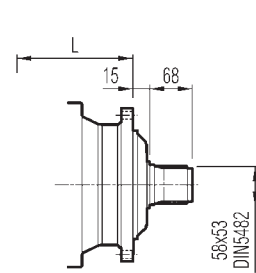
PC



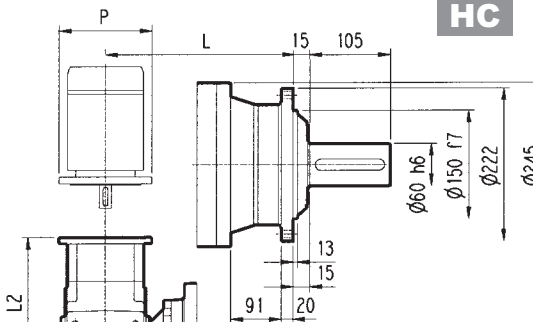
PZ



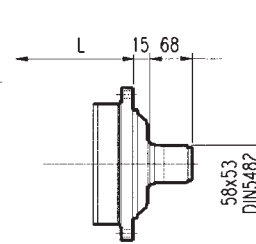
MC



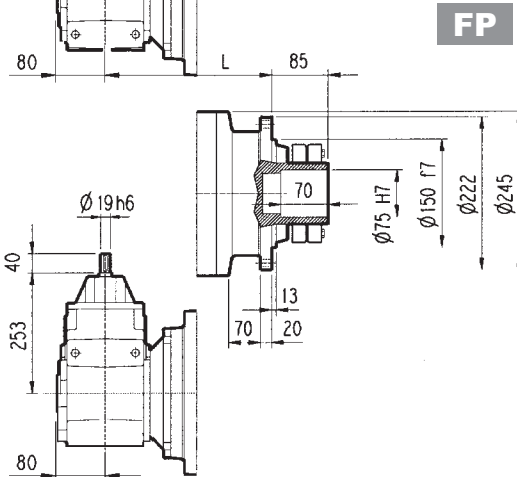
MZ



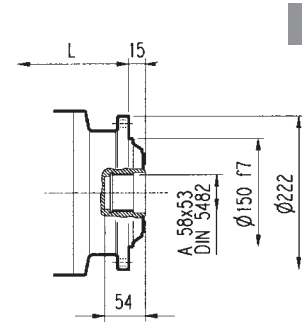
HC



HZ



FP

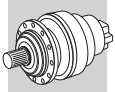


FZ

FP $M_{2max} = 5200 \text{ Nm}$

3/A 03 L2	L				Kg			
	MC - MZ		PC - PZ		MC - MZ		PC - PZ	
	225	285	270	225	63	71	65	60

3/A 03 L2	P63		P71		P80		P90		P100		P112			S1 + M1			S2 + M2S			S3 + M3SA			S3 + M3LA		
	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	
	243	140	243	160	262	200	262	200	272	250	272	250	399	416	138	425	497	156	470	467	195	501	518	195	

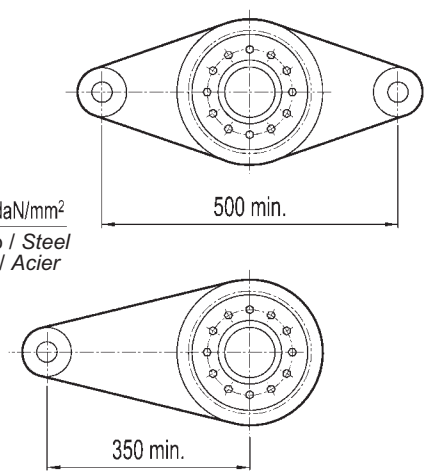
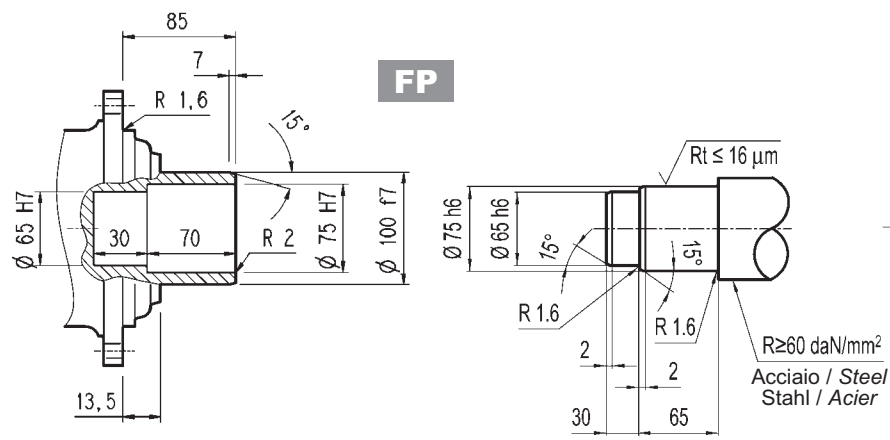
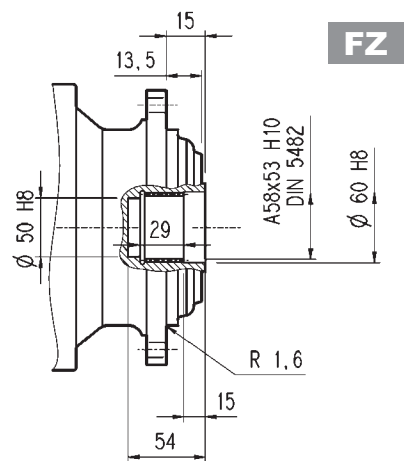
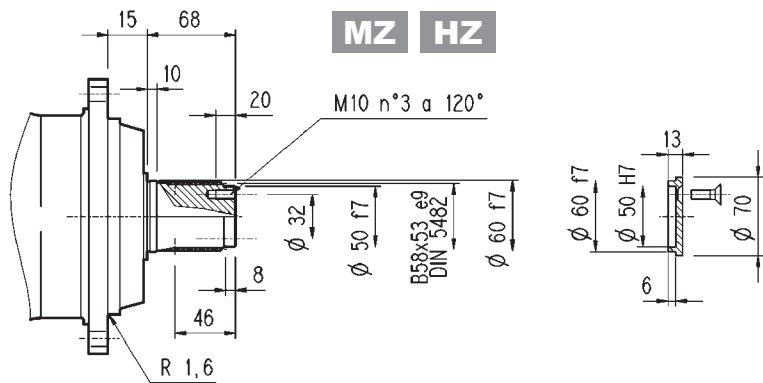
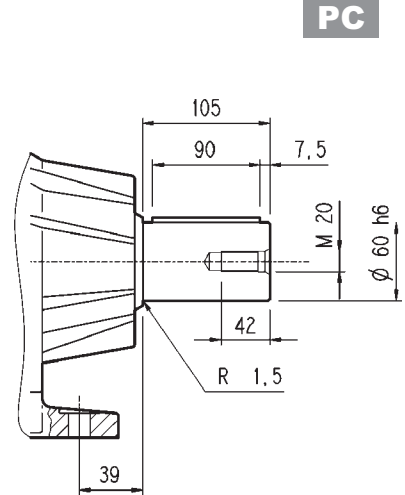
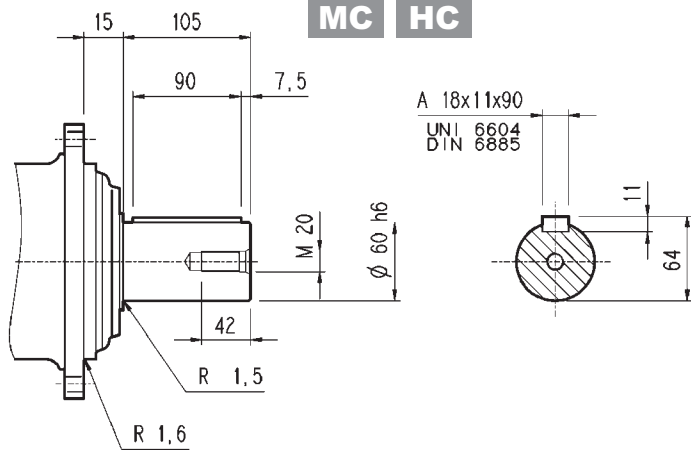


303 L

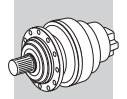
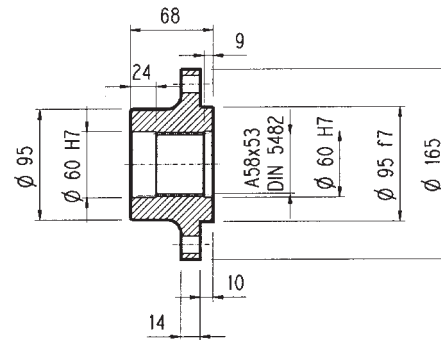
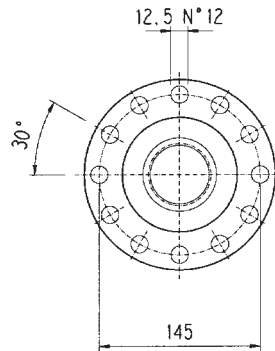
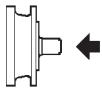
303 R

3/V 03 L3

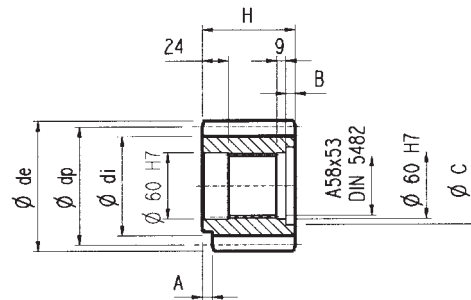
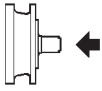
3/A 03 L2



FP	M_{2max} = 5200 Nm
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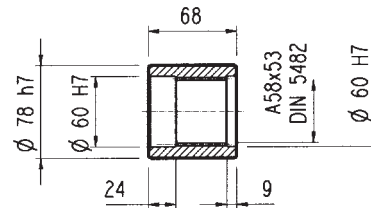
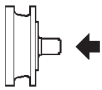

Flangia / Flange
Flansch / Brides
W0A


Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

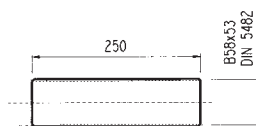
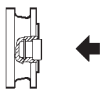
Pignoni / Pinion gears
Ritzel / Pignons
P...


	m	z	x	dp	di	de	H	A	B	C	☆
PCL1	5	19	0	95	82	104	77	12	9	72	□
PCL2	5	19	0	95	82	104	68	0	0	0	□
PCM	5	20	0	100	87.5	110	68	18	0	0	■
PCP	5	22	0	110	97.5	120	68	18	0	0	■
PDE	6	14	0.500	84	75	99.6	68	0	0	0	□
PDI	6	18	0.500	108	99	123.6	68	0	0	0	□
PDM	6	20	0.833	120	115	140	68	0	0	0	□
PFD	8	13	0.675	104	95	127.6	68	0	0	0	■
PFE1	8	14	0	112	92	126	68	0	0	0	■
PFE2	8	14	0	112	92	126	80	0	12	72	■
PFF	8	15	0	120	100	136	68	0	0	0	□
PFP	8	22	0	176	156	190	77	12	10	71	□
PHG	10	16	0.500	160	145	188	75	0	7	72	□

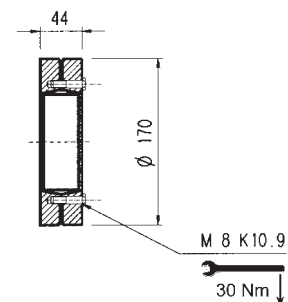
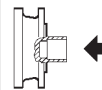
☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifiée 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cémenté et tempré 18NiCrMo5

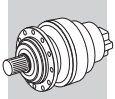
Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure
MOA


Materiale : Acciaio 16CrNi4
 Material : Steel 16CrNi4
 Material : Stahl 16CrNi4
 Matière : Acier 16CrNi4

Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée
B0A


Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
 Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
 Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
 Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

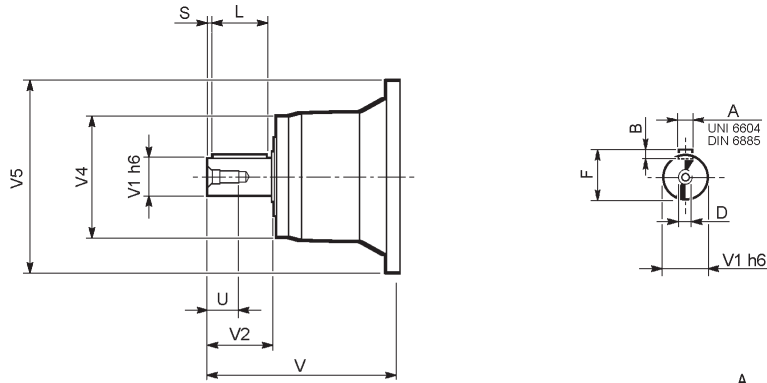
Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage
G0A




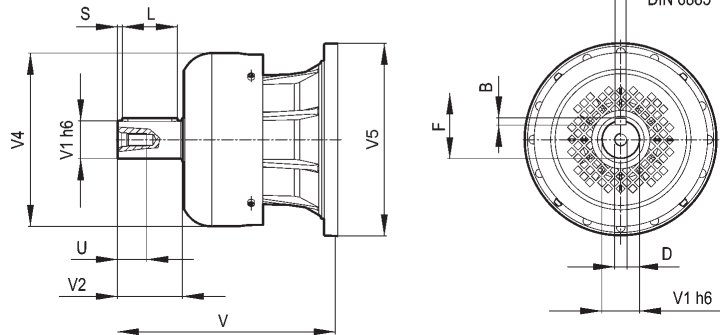
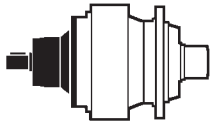
303 L

303 R

V



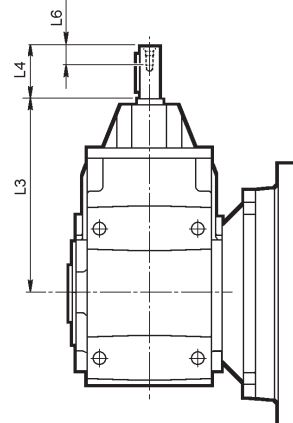
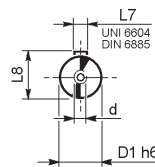
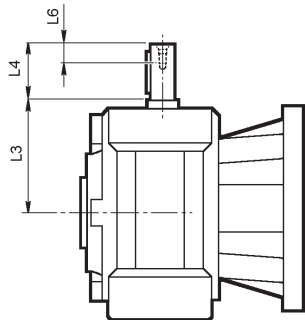
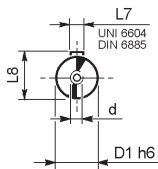
FV



	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
303 L1	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
303 L2	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
303 L3	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
303 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
303 R2-R3-R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

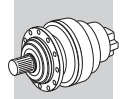
3/V 03 L3

3/A 03 L2



	D1 h6	L3	L4	L6	L7	L8	d
3/V 03 L3_HS	18	110.5	40	16	6	20.5	M6

	D1 h6	L3	L4	L6	L7	L8	d
3/A 03 L2_HS	19	252.5	40	16	6	21.5	M6

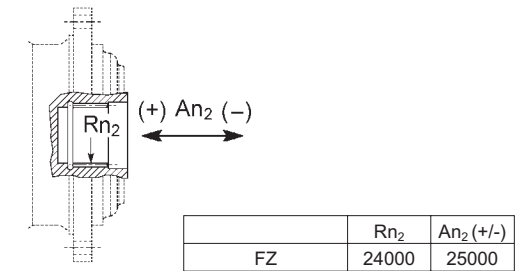
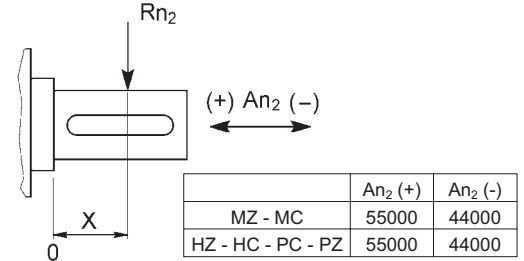
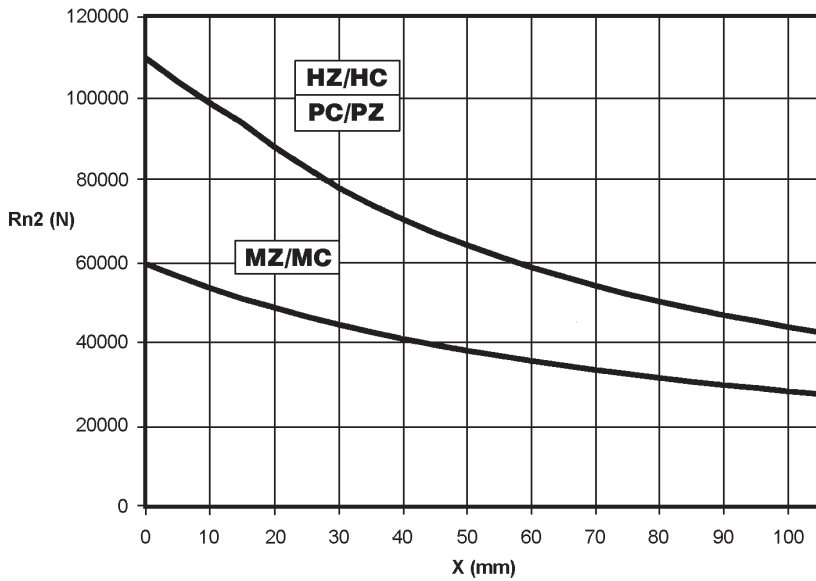


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $Fh_2 : n_2 \cdot h = 10000$

Permissible radial and axial loads on output shaft with $Fh_2 : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $Fh_2 : n_2 \cdot h = 10000$

Charges radiales et axiales admissibles sur l'arbre lent pour une valeur de $Fh_2 : n_2 \cdot h = 10000$



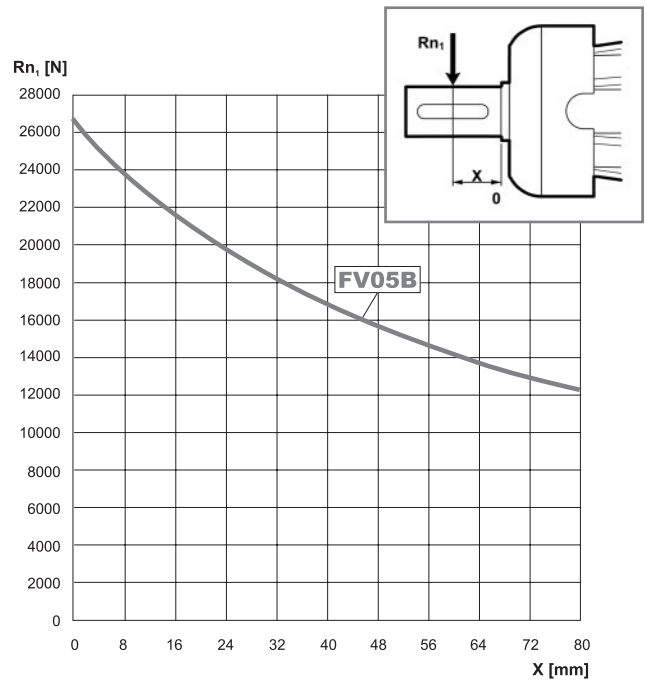
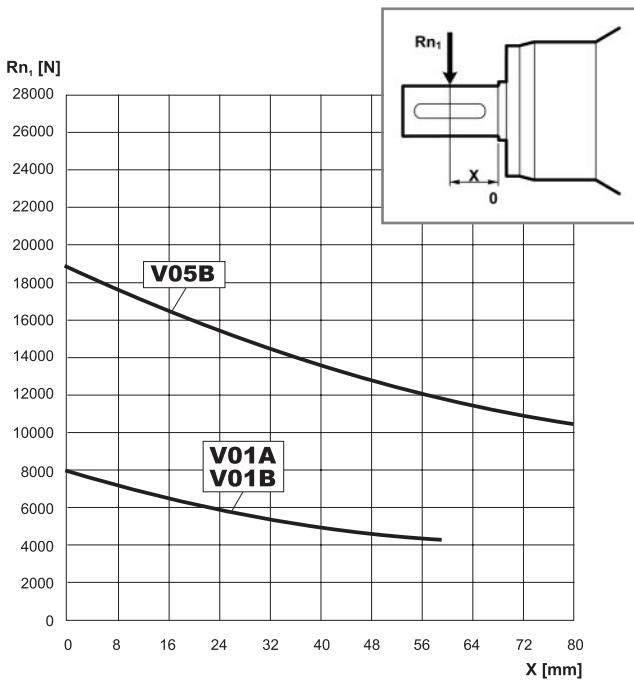
Fattore fh_2 correttivo per carichi sugli alberi Load corrective factor fh_2 on shafts Korrektionsfaktor fh_2 für wellenbelastungen Facteur de correction fh_2 pour charges sur les arbres	$Fh_2 = n_2 \cdot h$							
		10000	25000	50000	100000	500000	1000000	
	fh_2	MZ - MC - FZ	1	0.74	0.58	0.46	0.27	0.21
	HZ - HC - PC - PZ	1	0.76	0.61	0.50	0.31	0.25	

Carichi radiali ammissibili sull'albero veloce per un valore di $Fh_1 : n_1 \cdot h = 250000$

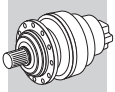
Permissible radial loads on input shaft with $Fh_1 : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $Fh_1 : n_1 \cdot h = 250000$

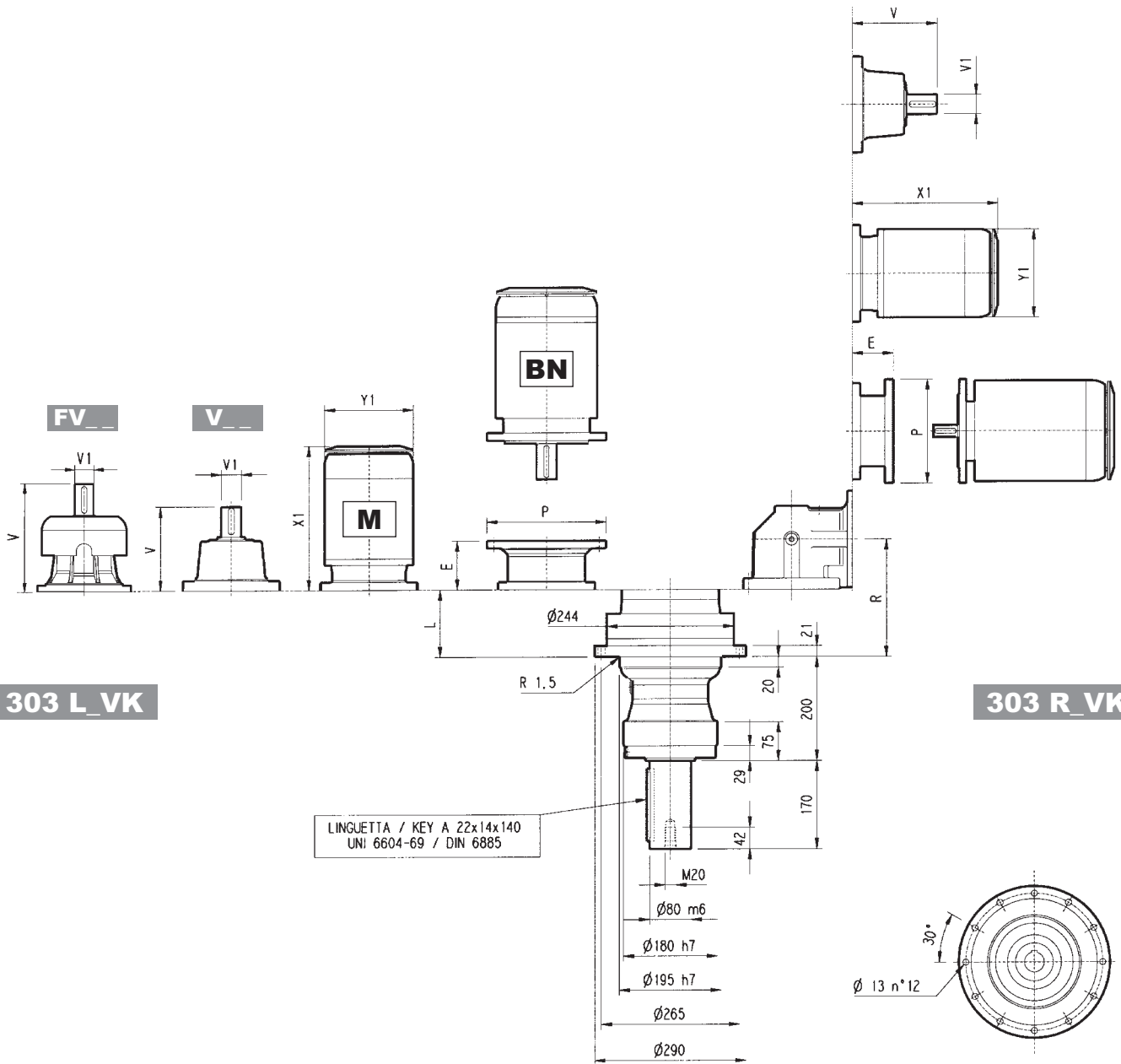
Charges radiales admises sur l'arbre d'entrée pour une valeur de $Fh_1 : n_1 \cdot h = 250000$



Fattore fh_1 correttivo per carichi sugli alberi Load corrective factor fh_1 on shafts Korrektionsfaktor fh_1 für wellenbelastungen Facteur de correction fh_1 pour charges sur les arbres	$Fh_1 = n_1 \cdot h$							
		250000	500000	1000000	2000000	5000000	10000000	
	fh_1		1	0.79	0.63	0.50	0.37	0.29



303_VK



303 L_VK

303 R_VK

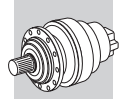
LINGUETTA / KEY A 22x14x140
UNI 6604-69 / DIN 6885

	L													P71		P80		P90		P100		P112		P132		P160		P180		P200		
		Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P		
303 L1	51	65	239	48	15	-	-	-	276	48	17	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	144	350	174	400
303 L2	104	70	137.5	24	6	158	38	7	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	
303 L3	157	73	137.5	24	6	158	38	7	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	
303 L4	210	77	137.5	24	6	158	38	7	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	

	R	R1	Kg							P71		P80		P90		P100		P112		P132	
				V	V1	Kg	V	V1	Kg	E	P	E	P	E	P	E	P	E	P	E	P
303 R2	143	140	85	137.5	24	6	158	38	7	65	160	84	200	84	200	94	250	94	250	114	300
303 R3	196	122	83	137.5	24	6	158	38	7	65	160	84	200	84	200	94	250	94	250	114	300
303 R4	249	122	87	137.5	24	6	158	38	7	65	160	84	200	84	200	94	250	94	250	114	300

	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
303 L1	-	-	-	-	-	-	-	-	-	-	-	-	460	571	258	552	692	310	596	736	310
303 L2	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
303 L3	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
303 L4	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-

	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
303 R2	-	-	-	328	400	156	373	469	195	405	497	195	508	619	258
303 R3	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-
303 R4	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 303_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 303_VK, with radial force applying at a distance x from shaft shoulder.

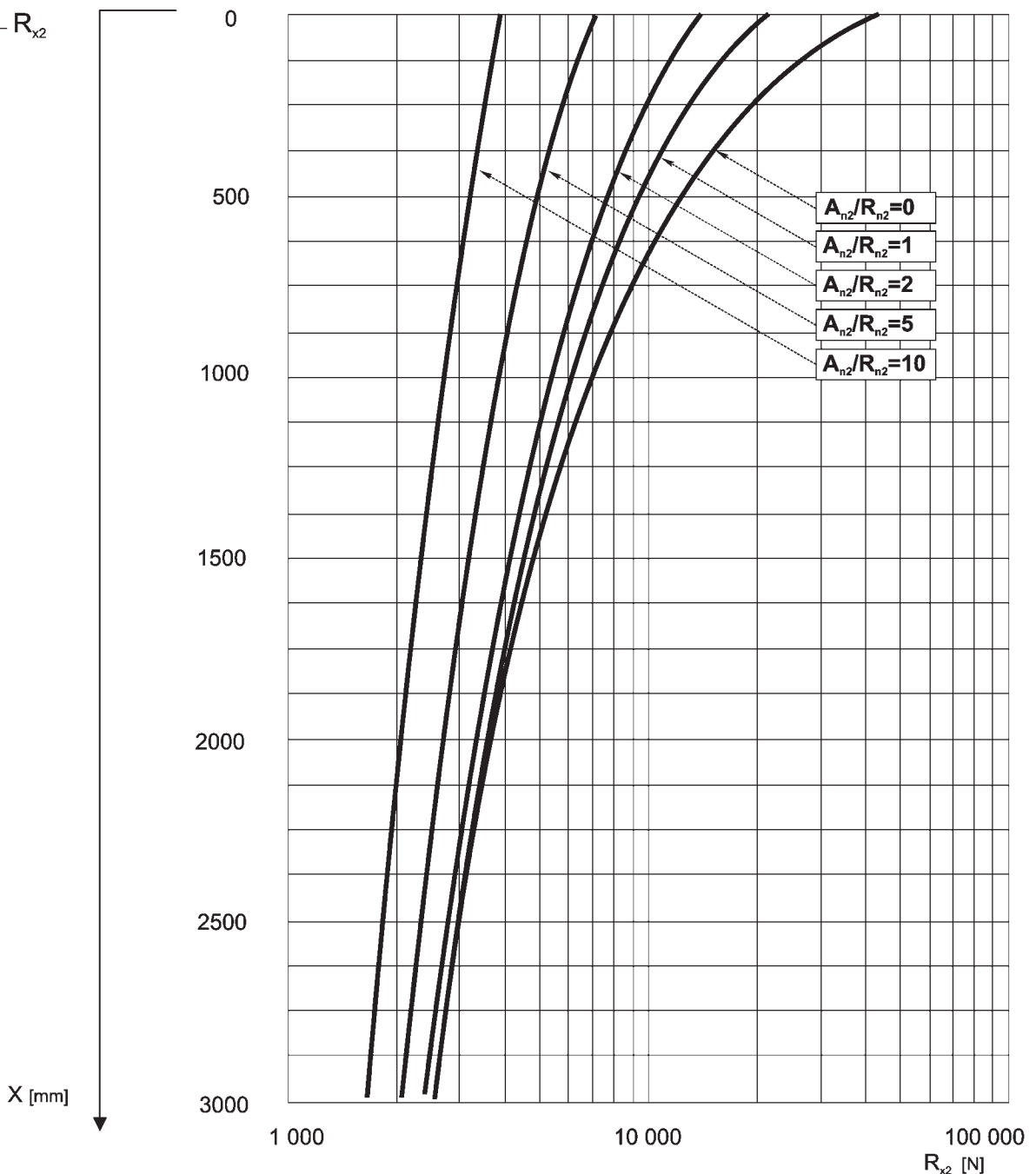
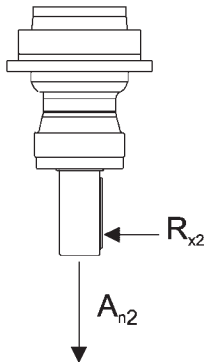
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

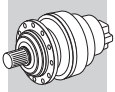
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 303_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

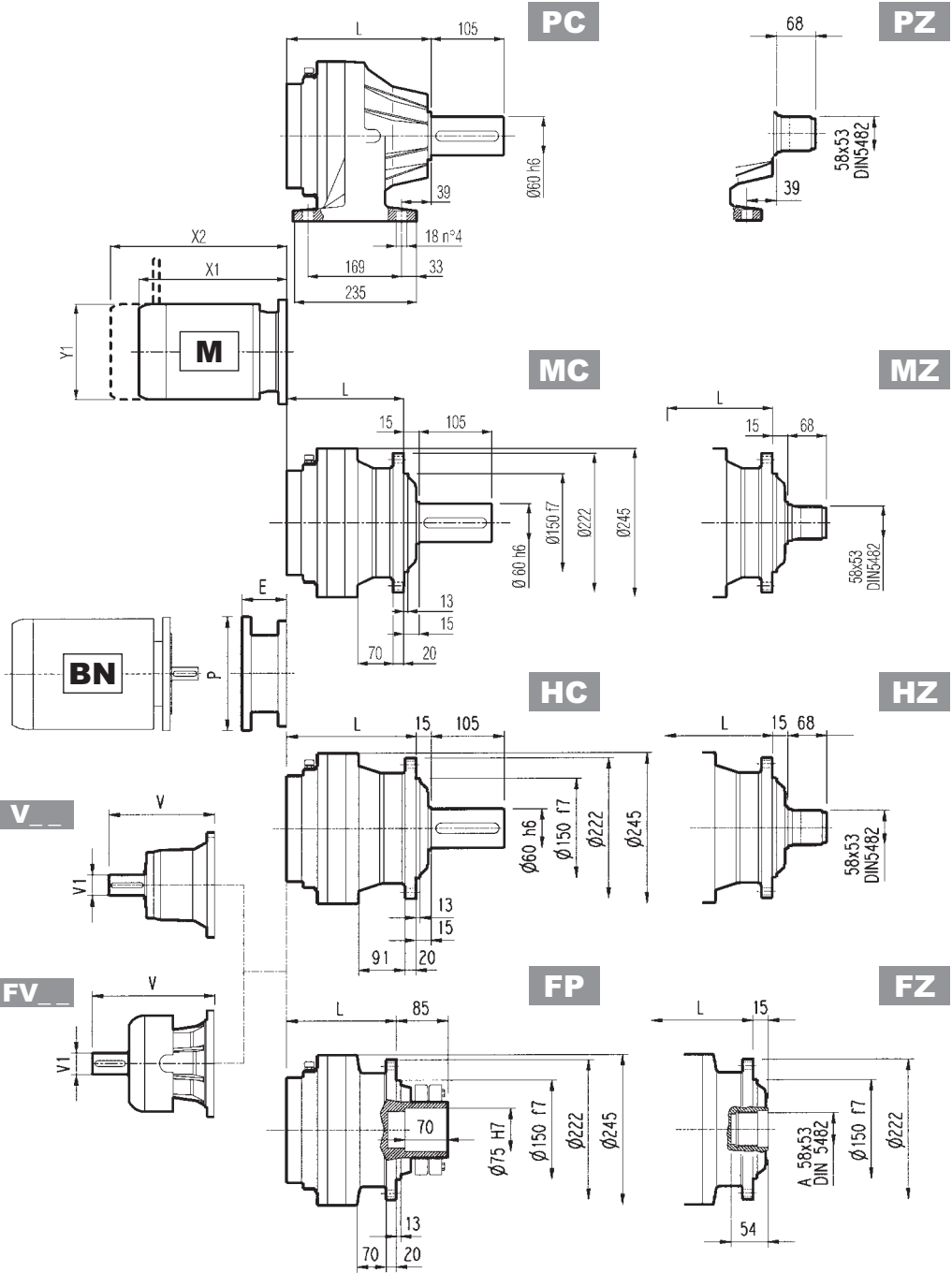
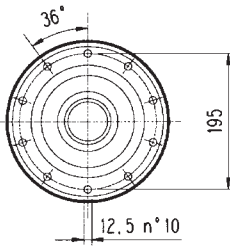
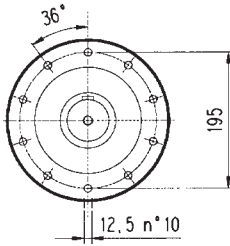
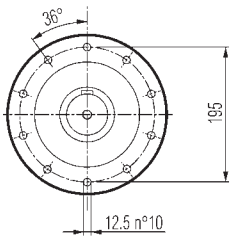
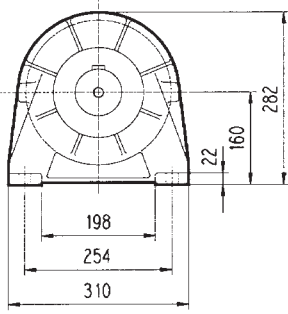
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 303_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.





304 L

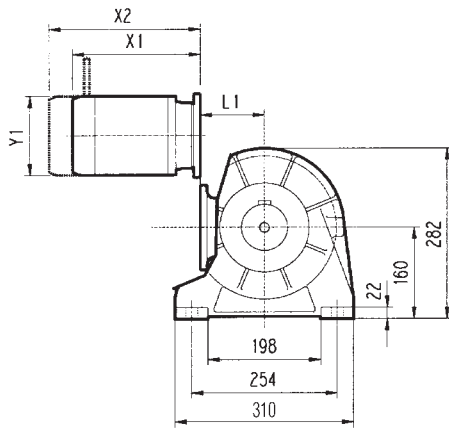
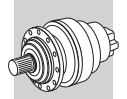


FP $M_{2max} = 7300 \text{ Nm}$

	L				Kg				Kg				Kg							
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
304 L1	125	165	150	125	31	40	35	31	239	48	15	-	-	-	276	48	17	-	-	-
304 L2	190	230	215	190	38	47	42	38	137.5	24	6	158	38	7	-	-	-	-	-	-
304 L3	243	283	268	243	42	51	46	42	137.5	24	6	158	38	7	-	-	-	-	-	-
304 L4	296	336	321	296	46	55	50	46	137.5	24	6	158	38	7	-	-	-	-	-	-

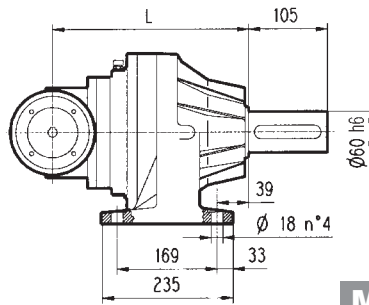
	P71		P80		P90		P100		P112		P132		P160		P180		P200	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
304 L1	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400
304 L2	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-
304 L3	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-
304 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-

	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		S5 + M5S			S5 + M5L			
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	X1	X2	Y1	X1	X2	Y1	
304 L1	-	-	-	-	-	-	-	-	-	-	-	-	460	571	258	552	692	310	596	736	310
304 L2	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
304 L3	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
304 L4	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-



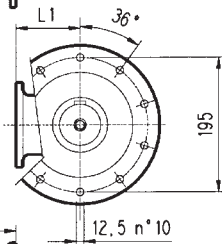
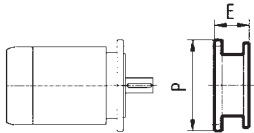
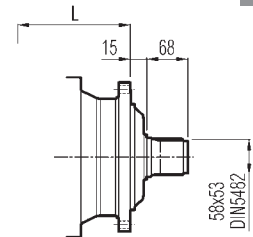
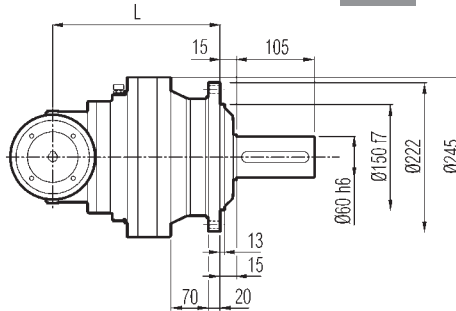
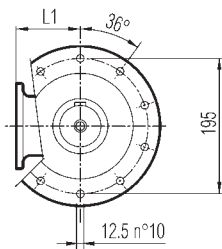
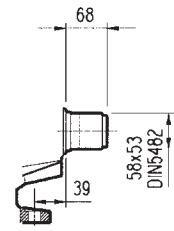
PC

PZ



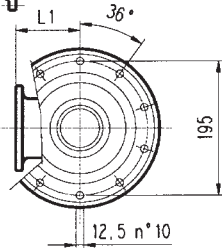
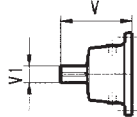
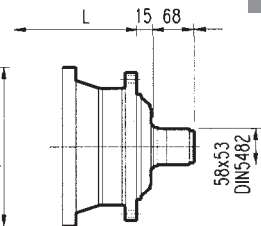
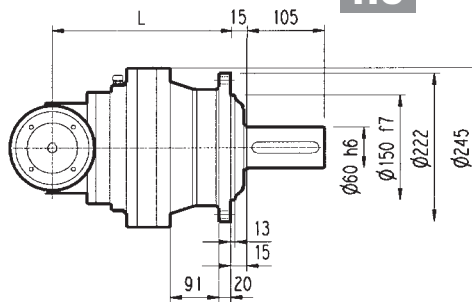
MC

MZ



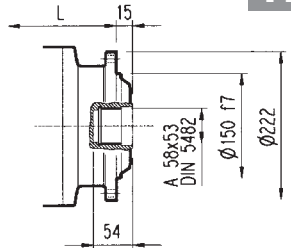
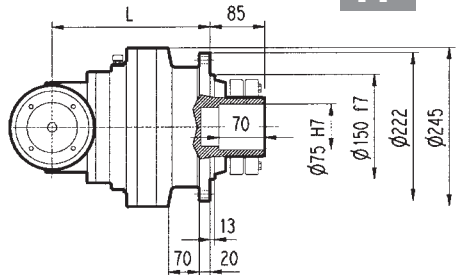
HC

HZ



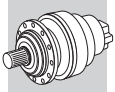
FP

FZ

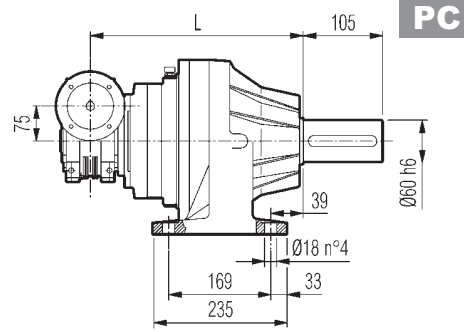
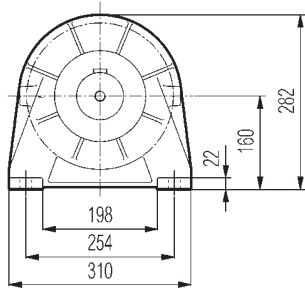


FP $M_{2max} = 7300 \text{ Nm}$

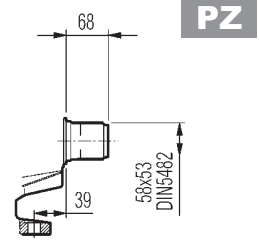
	L				L1	Kg				Icon					
	MC - MZ	PC - PZ	HC - HZ	FP - FZ		MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1	Kg	V	V1	Kg
304 R2	217	257	242	217	140	51	60	55	51	137.5	24	6	158	38	7
304 R3	282	322	307	282	122	52	61	56	52	137.5	24	6	158	38	7
304 R4	335	375	360	335	122	56	65	60	56	137.5	24	6	158	38	7
	P71		P80		P90		P100		P112		P132				
	E	P	E	P	E	P	E	P	E	P	E	P			
304 R2	65	160	84	200	84	200	94	250	94	250	114	300			
304 R3	65	160	84	200	84	200	94	250	94	250	114	300			
304 R4	65	160	84	200	84	200	94	250	94	250	114	300			
	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
304 R2	-	-	-	328	400	156	373	469	195	405	497	195	508	619	258
304 R3	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-
304 R4	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-



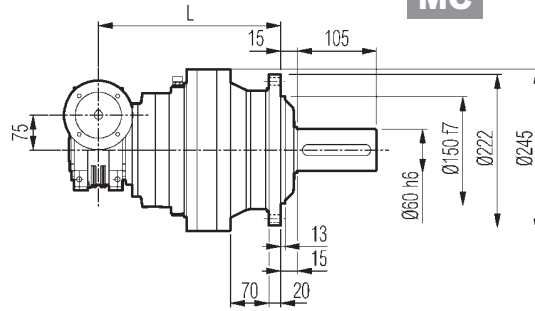
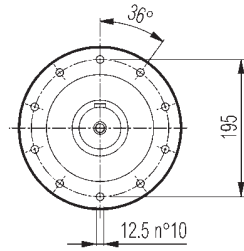
3/V 04 L3



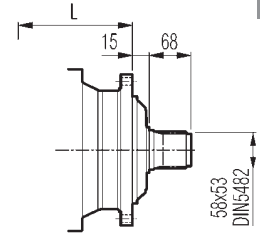
PC



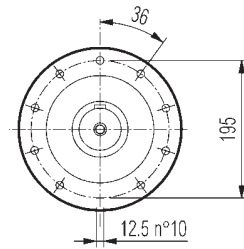
PZ



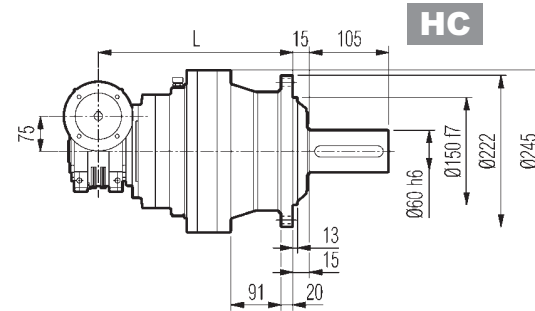
MC



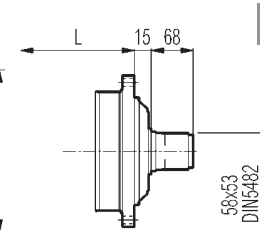
MZ



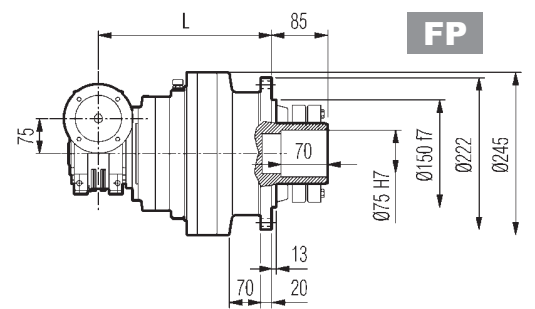
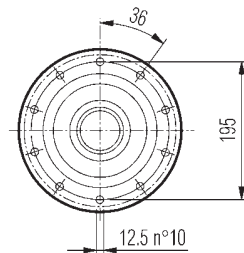
A →



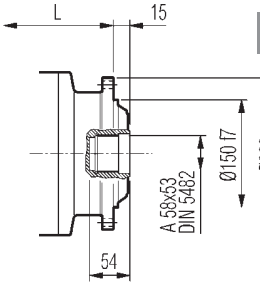
HC



HZ

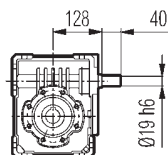


FP

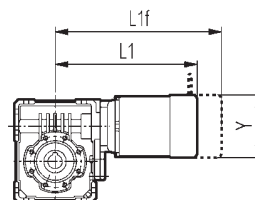
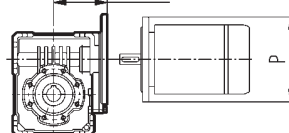


FZ

Vista da View from A



112 : P71-P80-P90
120 : P100-P112

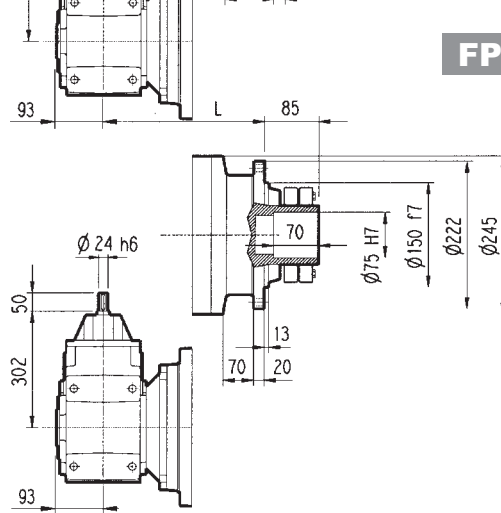
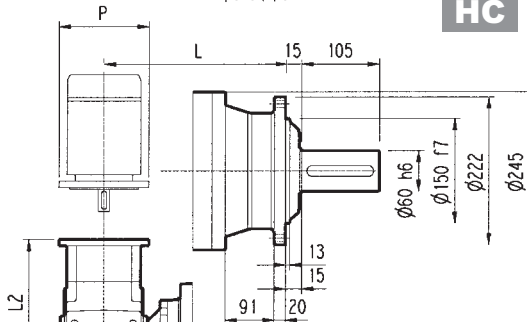
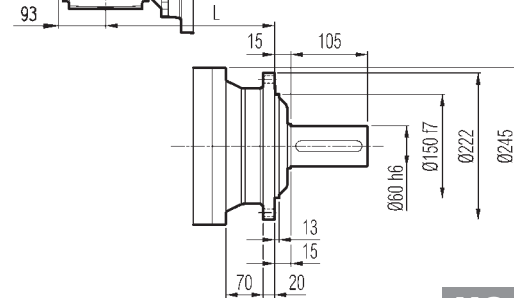
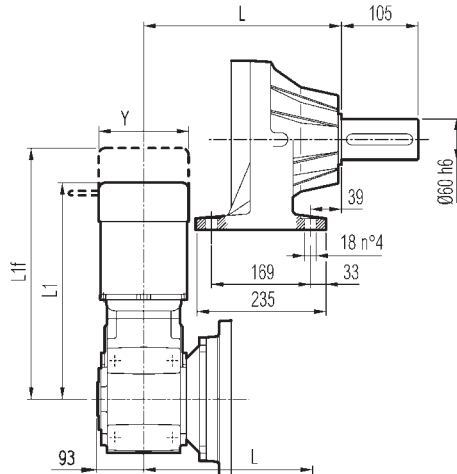
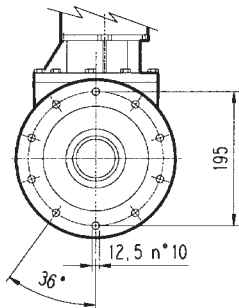
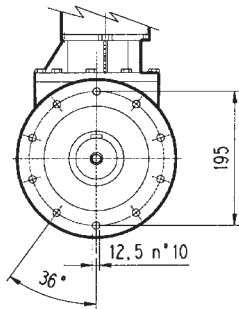
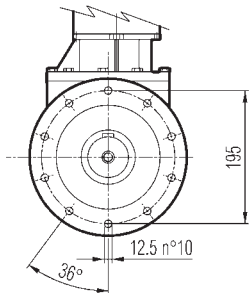
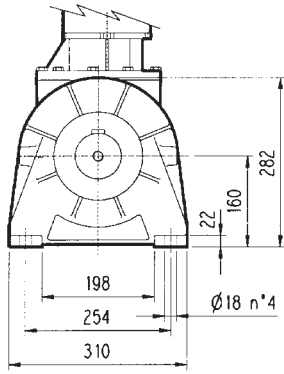
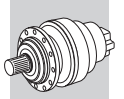


FP

M_{2max} = 7300 Nm

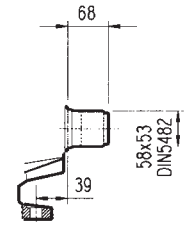
3/V 04 L3	L				Kg				P71	P80	P90	P100
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	P	P	P	P
	305	345	330	305	47	56	51	47	160	200	200	250

3/V 04 L3	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L		
	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
	308	369	138	333	409	156	376	472	193	408	499	193



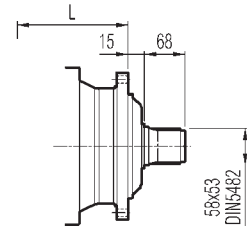
PC

PZ



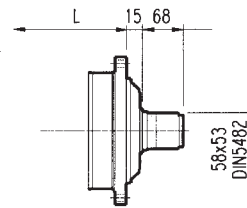
MC

MZ



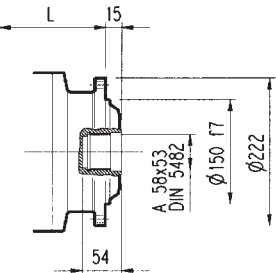
HC

HZ



FP

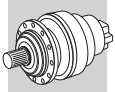
FZ



FP

M_{2max} = 7300 Nm

3/A 04 L2	L								D1	L3	L4				
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ							
	258	298	283	258	80	95	90	80	24	302	50				
3/A 04 L2	P63		P71		P80		P90		P100		P112		P132		
	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P	
	263	140	263	160	282.5	200	282.5	200	292.5	250	292.5	250	329	457	
3/A 04 L2	S1 + M1			S2 + M2S			S3 + M3SA			S3 + M3LA			S4 + M4		
	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
	418	439	138	447	517	156	490	487	195	522	538	195	630	738	258



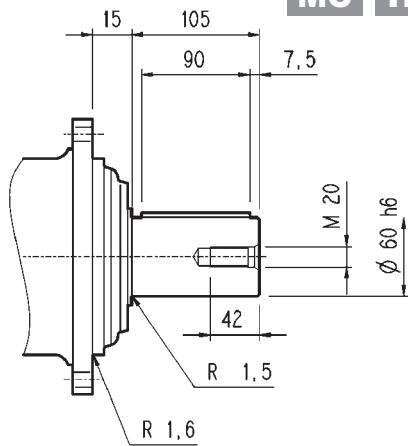
304 L

304 R

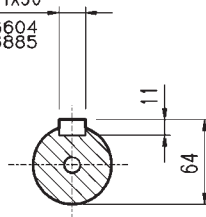
3/V 04 L3

3/A 04 L2

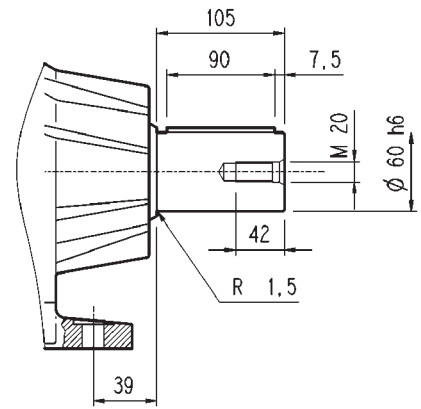
MC HC



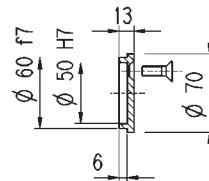
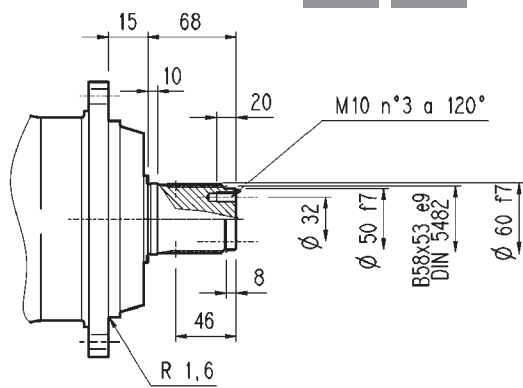
A 18x11x90
UNI 6604
DIN 6885



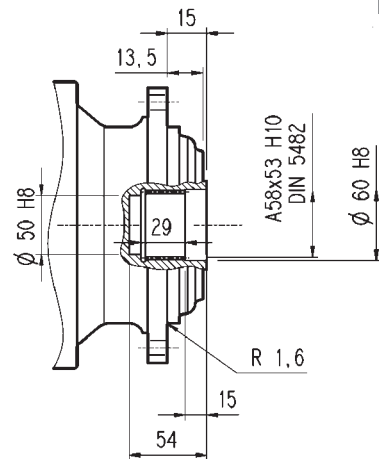
PC



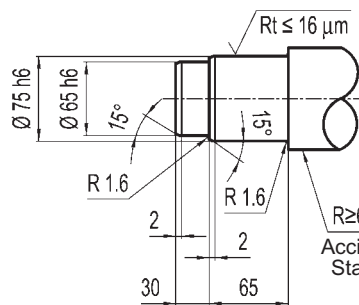
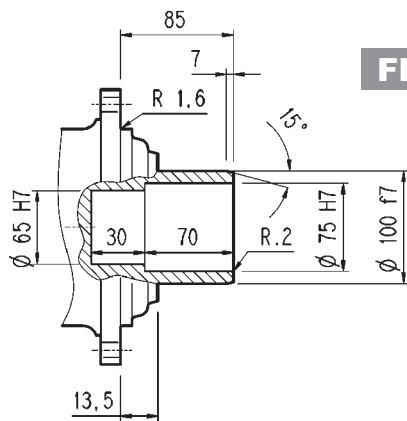
MZ HZ



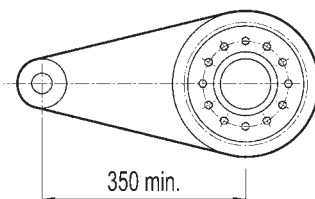
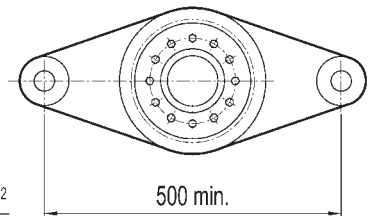
FZ



FP

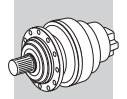
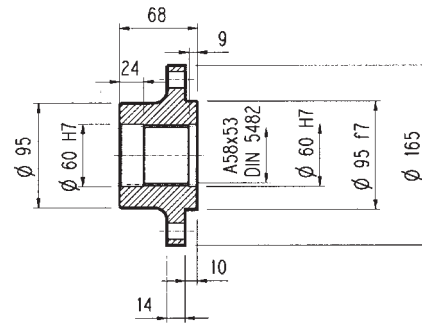
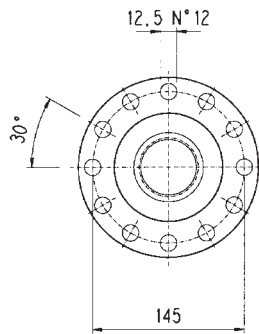
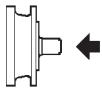


$R \ge 60 \text{ daN/mm}^2$
Acciaio / Steel
Stahl / Acier

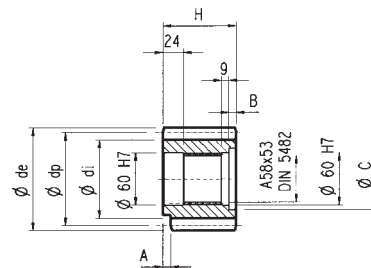
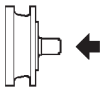


FP

$M_{2max} = 7300 \text{ Nm}$

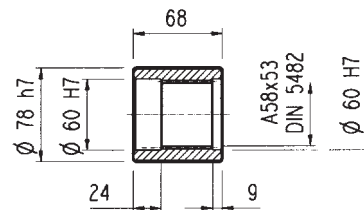
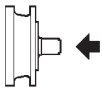
304 L**304 R****3/V 04 L3****3/A 04 L2**
Flangia / Flange
Flansch / Brides
W0A

Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

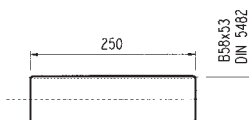
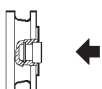
Pignoni / Pinion gears
Ritzel / Pignons
P...

	m	z	x	dp	di	de	H	A	B	C	☆
PCL1	5	19	0	95	82	104	77	12	9	72	□
PCL2	5	19	0	95	82	104	68	0	0	0	□
PCM	5	20	0	100	87.5	110	68	18	0	0	■
PCP	5	22	0	110	97.5	120	68	18	0	0	■
PDE	6	14	0.500	84	75	99.6	68	0	0	0	□
PDI	6	18	0.500	108	99	123.6	68	0	0	0	□
PDM	6	20	0.833	120	115	140	68	0	0	0	□
PFD	8	13	0.675	104	95	127.6	68	0	0	0	■
PFE1	8	14	0	112	92	126	68	0	0	0	■
PFE2	8	14	0	112	92	126	80	0	12	72	■
PFF	8	15	0	120	100	136	68	0	0	0	□
PFP	8	22	0	176	156	190	77	12	10	71	□
PHG	10	16	0.500	160	145	188	75	0	7	72	□

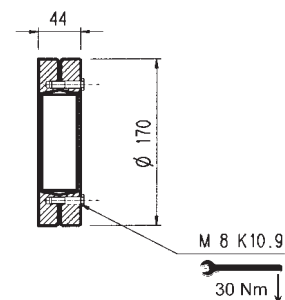
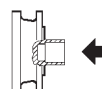
☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifié 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cémenté et tempré 18NiCrMo5

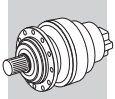
Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure
MOA

Materiale : Acciaio 16CrNi4
 Material : Steel 16CrNi4
 Material : Stahl 16CrNi4
 Matière : Acier 16CrNi4

Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée
B0A

Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
 Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
 Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
 Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

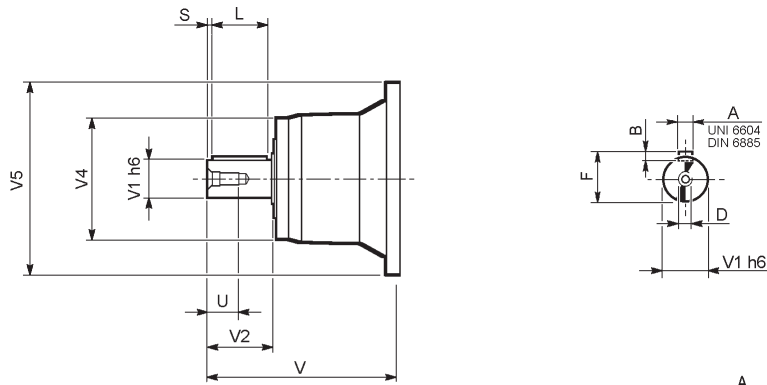
Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage
G0A



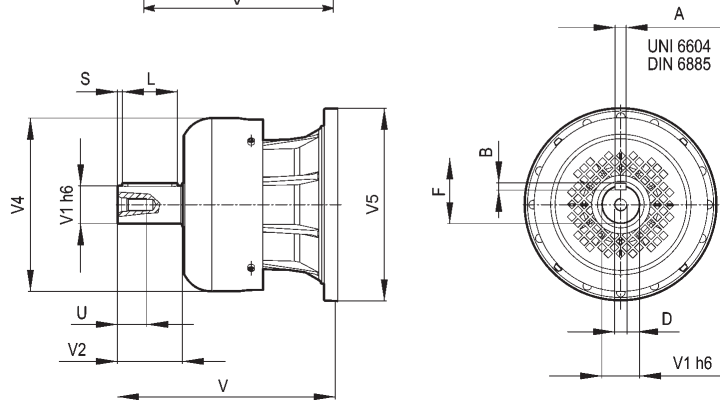
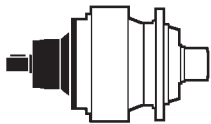
304 L

304 R

V



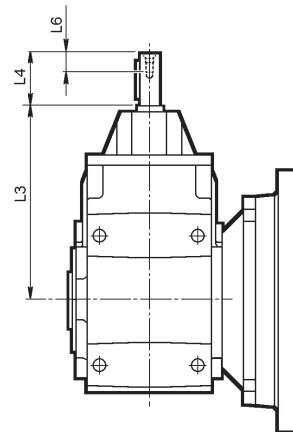
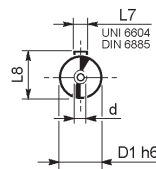
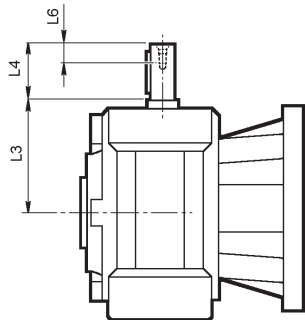
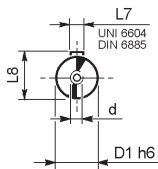
FV



	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
304 L1	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
304 L2	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
304 L3	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
304 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
304 R2-R3-R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

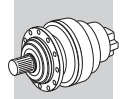
3/V 04 L3

3/A 04 L2



	D1 h6	L3	L4	L6	L7	L8	d
3/V 04 L3_HS	19	128	40	16	6	21.5	M6

	D1 h6	L3	L4	L6	L7	L8	d
3/A 04 L2_HS	24	302	50	19	8	27	M8

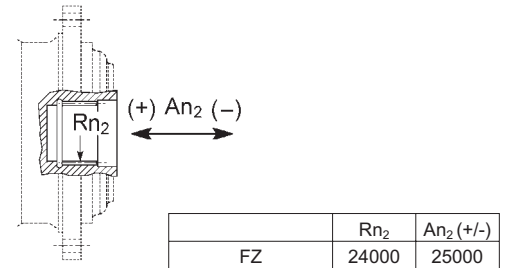
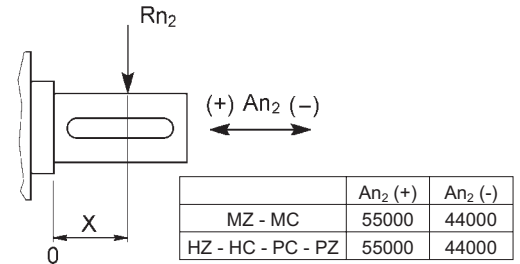
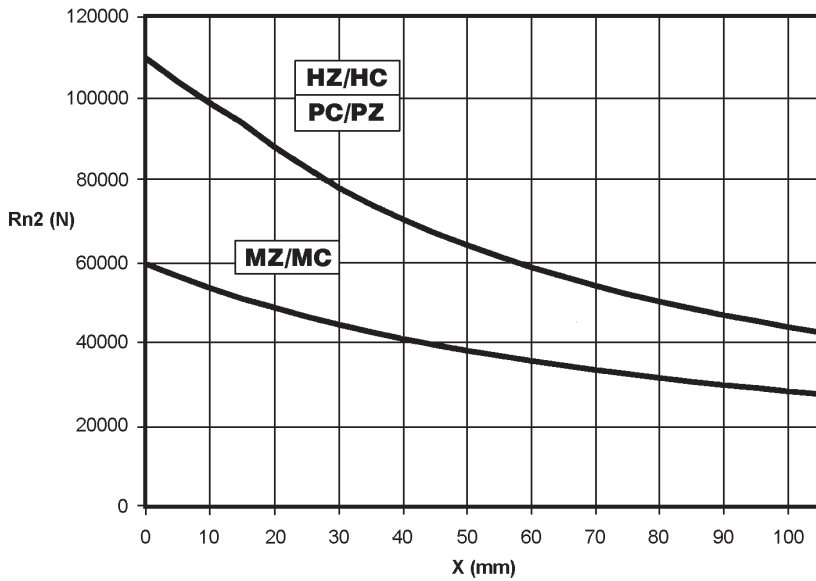


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $Fh_2 : n_2 \cdot h = 10000$

Permissible radial and axial loads on output shaft with $Fh_2 : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $Fh_2 : n_2 \cdot h = 10000$

Charges radiales et axiales admissibles sur l'arbre lent pour une valeur de $Fh_2 : n_2 \cdot h = 10000$



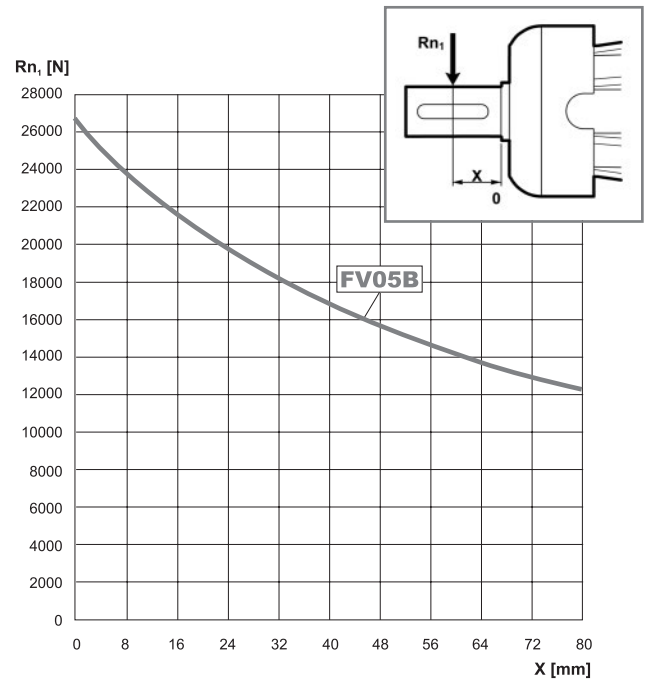
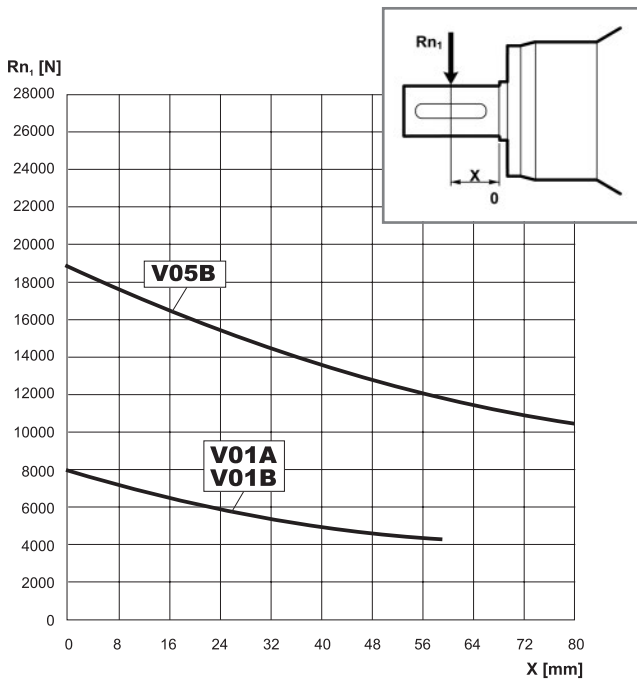
Fattore f_{h_2} correttivo per carichi sugli alberi Load corrective factor f_{h_2} on shafts Korrektionsfaktor f_{h_2} für wellenbelastungen Facteur de correction f_{h_2} pour charges sur les arbres	$Fh_2 = n_2 \cdot h$	10000	25000	50000	100000	500000	1000000
		f_{h_2}	MZ - MC - FZ	1	0.74	0.58	0.46
	HZ - HC - PC - PZ	1	0.76	0.61	0.50	0.31	0.25

Carichi radiali ammissibili sull'albero veloce per un valore di $Fh_1 : n_1 \cdot h = 250000$

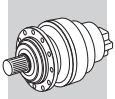
Permissible radial loads on input shaft with $Fh_1 : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $Fh_1 : n_1 \cdot h = 250000$

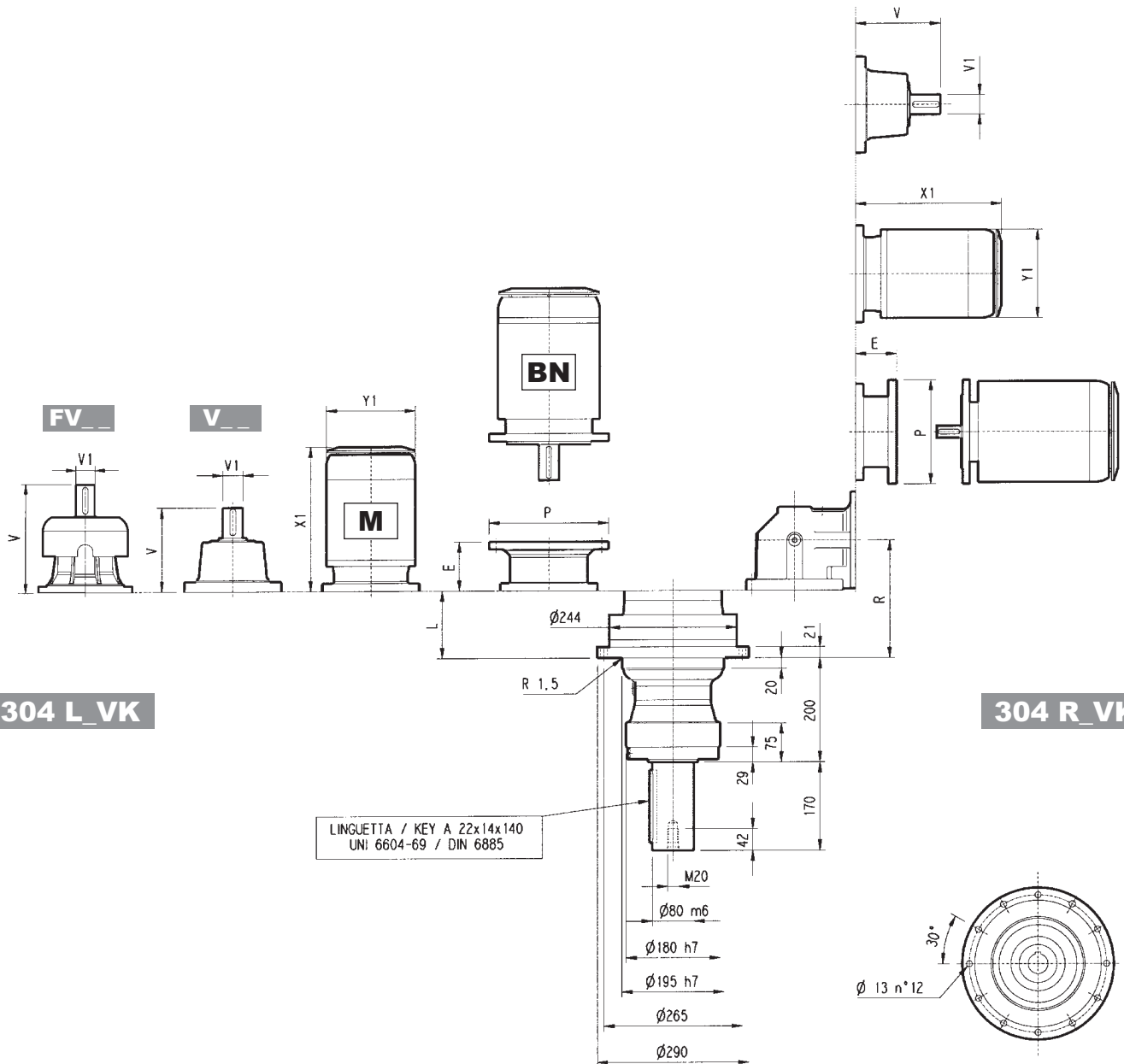
Charges radiales admises sur l'arbre d'entrée pour une valeur de $Fh_1 : n_1 \cdot h = 250000$



Fattore f_{h_1} correttivo per carichi sugli alberi Load corrective factor f_{h_1} on shafts Korrektionsfaktor f_{h_1} für wellenbelastungen Facteur de correction f_{h_1} pour charges sur les arbres	$Fh_1 = n_1 \cdot h$	250000	500000	1000000	2000000	5000000	10000000
		f_{h_1}	1	0.79	0.63	0.50	0.37



304_VK



304 L_VK

304 R_VK

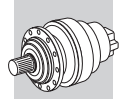
LINGUETTA / KEY A 22x14x140
UNI 6604-69 / DIN 6885

	L		V						V1						P71		P80		P90		P100		P112		P132		P160		P180		P200	
	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	
304 L1	51	65	239	48	15	-	-	-	276	48	17	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	144	350	174	400
304 L2	116	73	137.5	24	6	158	38	7	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	
304 L3	169	76	137.5	24	6	158	38	7	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	
304 L4	222	80	137.5	24	6	158	38	7	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	

	R		V						V1						P71		P80		P90		P100		P112		P132	
	R1	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg	kg
304 R2	143	140	85	137.5	24	6	158	38	7	65	160	84	200	84	200	94	250	94	250	94	250	94	250	114	300	
304 R3	208	122	86	137.5	24	6	158	38	7	65	160	84	200	84	200	94	250	94	250	94	250	94	250	114	300	
304 R4	261	122	90	137.5	24	6	158	38	7	65	160	84	200	84	200	94	250	94	250	94	250	94	250	114	300	

	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
304 L1	-	-	-	-	-	-	-	-	-	-	-	-	460	571	258	552	692	310	596	736	310
304 L2	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
304 L3	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
304 L4	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-

	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
304 R2	-	-	-	328	400	156	373	469	195	405	497	195	508	619	258
304 R3	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-
304 R4	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 304_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 304_VK, with radial force applying at a distance x from shaft shoulder.

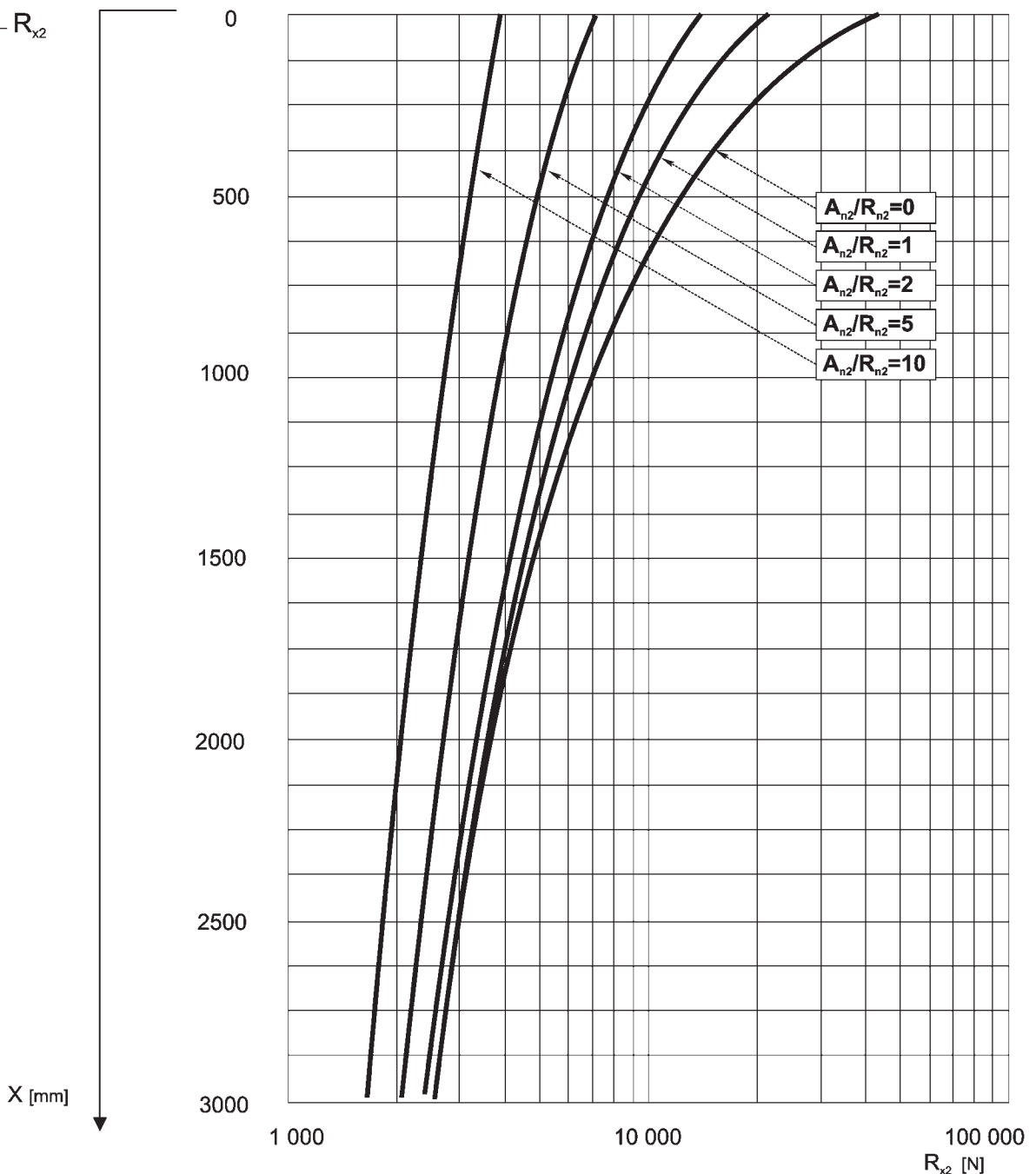
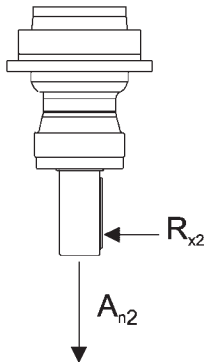
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

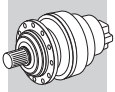
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 304_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

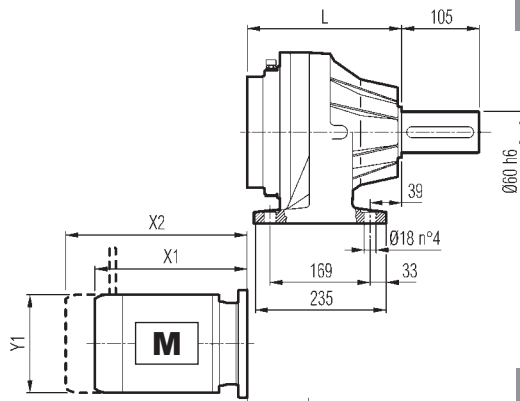
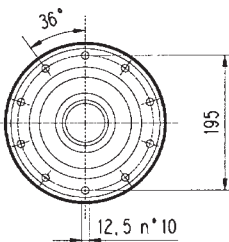
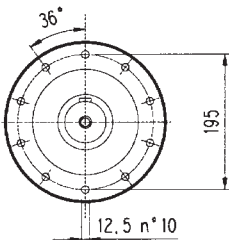
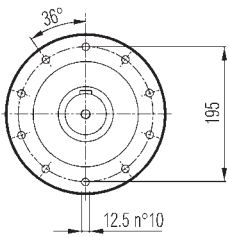
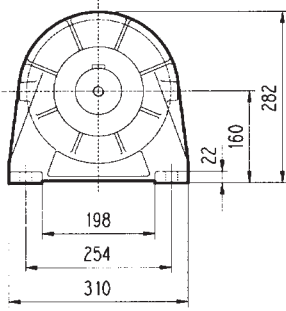
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 304_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.



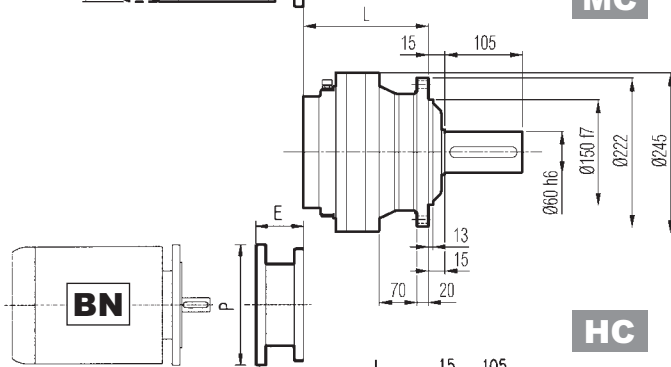


305 L



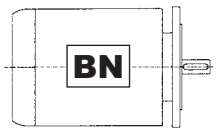
PC

PZ



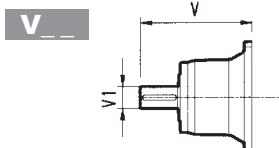
MC

MZ



HC

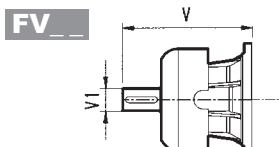
HZ



V

HC

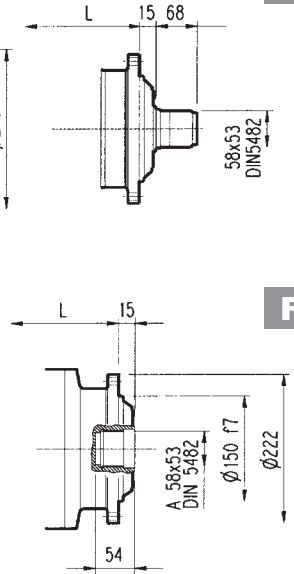
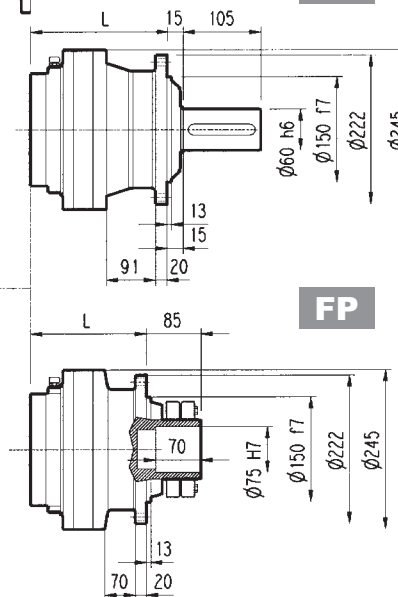
HZ



FV

FP

FZ

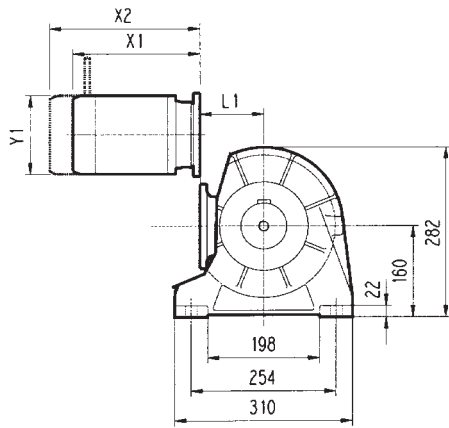
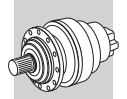


FP $M_{2max} = 7500 \text{ Nm}$

	L				Kg				Kg				Kg							
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
305 L1	143	183	168	143	36	45	40	36	239	48	15	-	-	-	276	48	17	-	-	-
305 L2	208	248	233	208	43	52	47	43	137.5	24	6	158	38	7	-	-	-	-	-	-
305 L3	261	301	286	261	47	56	51	47	137.5	24	6	158	38	7	-	-	-	-	-	-
305 L4	314	354	339	314	51	60	55	51	137.5	24	6	158	38	7	-	-	-	-	-	-

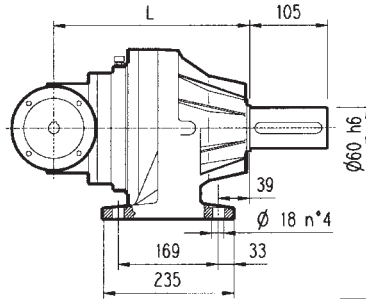
	P71		P80		P90		P100		P112		P132		P160		P180		P200	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
305 L1	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400
305 L2	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-
305 L3	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-
305 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-

	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y
305 L1	-	-	-	-	-	-	-	-	-	-	-	-	460	571	258	552	692	310	596	736	310
305 L2	-	-	-	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
305 L3	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
305 L4	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-



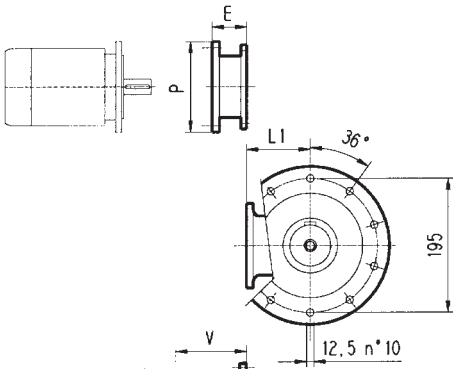
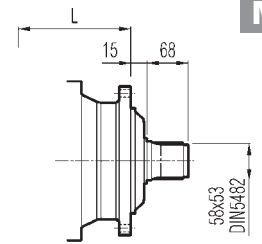
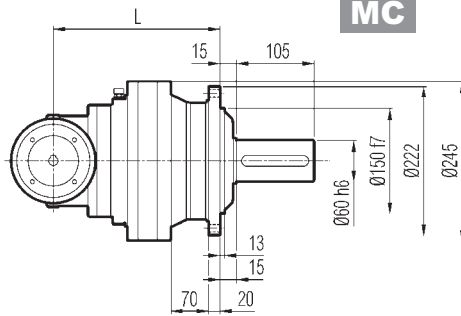
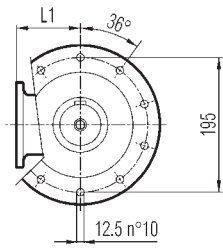
PC

PZ



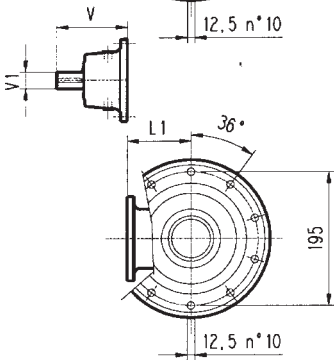
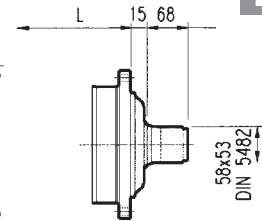
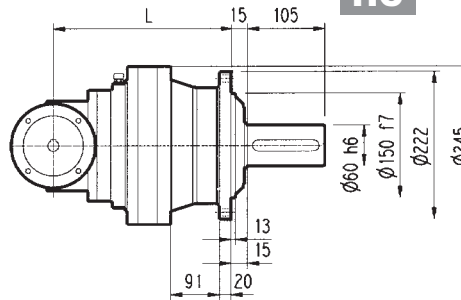
MC

MZ



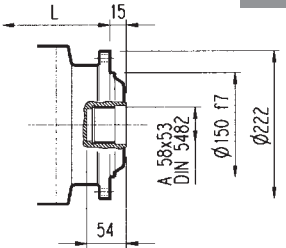
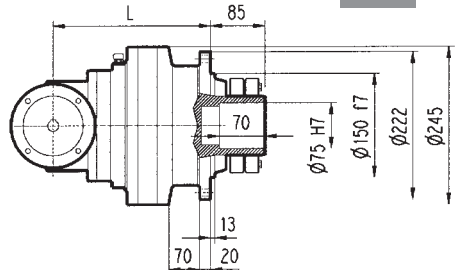
HC

HZ



FP

FZ

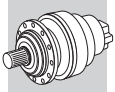


FP $M_{2max} = 7500 \text{ Nm}$

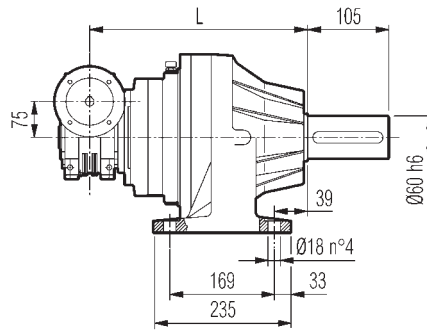
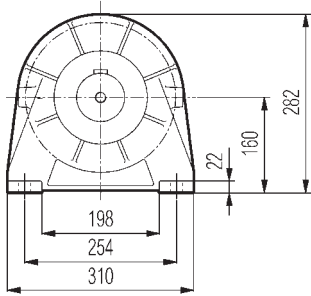
	L				L1	Kg				V	V1	Kg	V	V1	Kg
	MC - MZ	PC - PZ	HC - HZ	FP - FZ		MC - MZ	PC - PZ	HC - HZ	FP - FZ						
305 R2	235	375	260	235	140	56	65	60	56	137.5	24	6	158	38	7
305 R3	300	340	325	300	122	57	66	61	57	137.5	24	6	158	38	7
305 R4	353	393	378	353	122	61	70	65	61	137.5	24	6	158	38	7

	P71		P80		P90		P100		P112		P132	
	E	P	E	P	E	P	E	P	E	P	E	P
305 R2	65	160	84	200	84	200	94	250	94	250	114	300
305 R3	65	160	84	200	84	200	94	250	94	250	114	300
305 R4	65	160	84	200	84	200	94	250	94	250	114	300

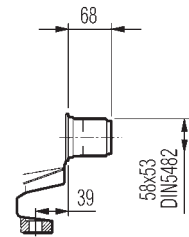
	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
305 R2	-	-	-	328	400	156	373	469	195	405	497	195	508	619	258
305 R3	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258
305 R4	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258



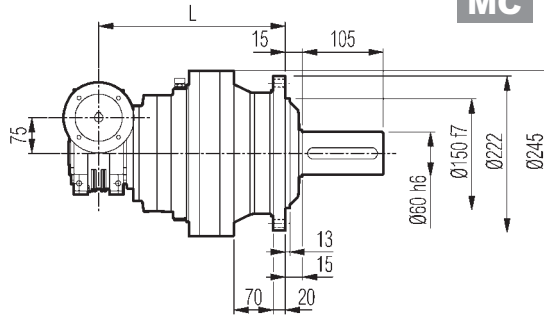
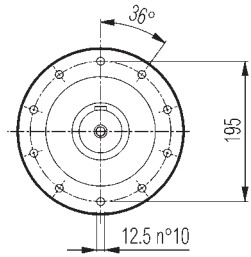
3/V 05 L3



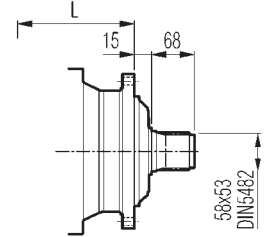
PC



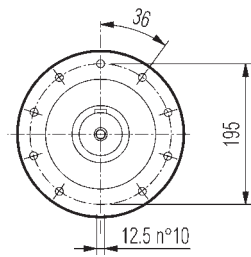
PZ



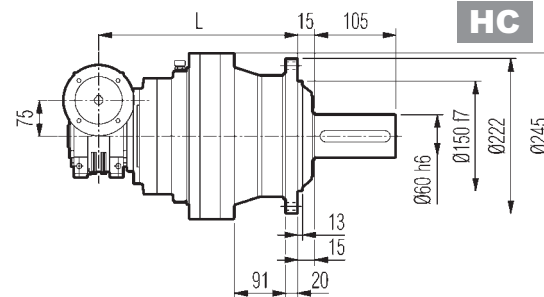
MC



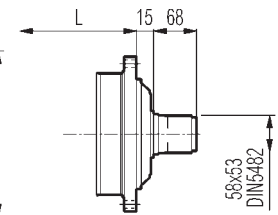
MZ



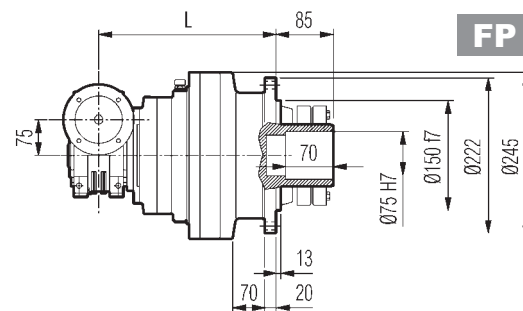
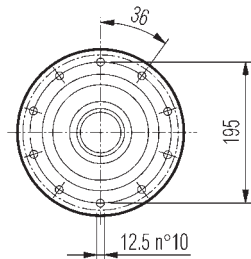
A →



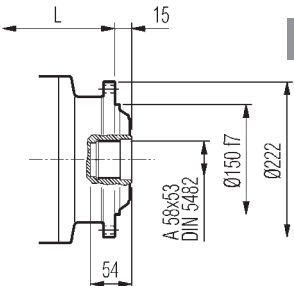
HC



HZ

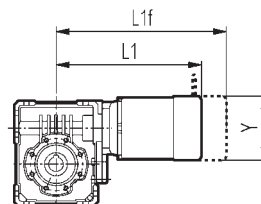
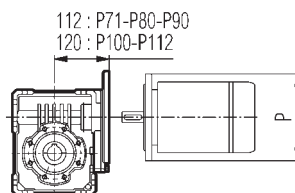
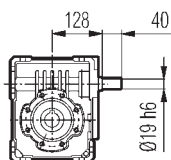


FP



FZ

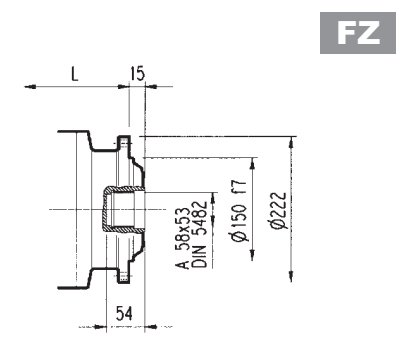
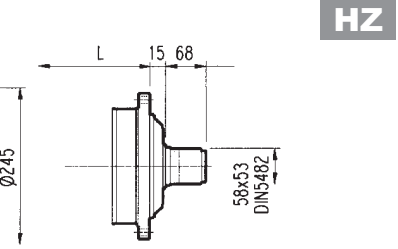
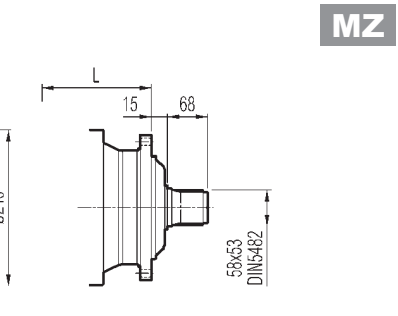
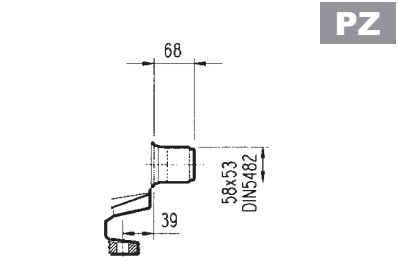
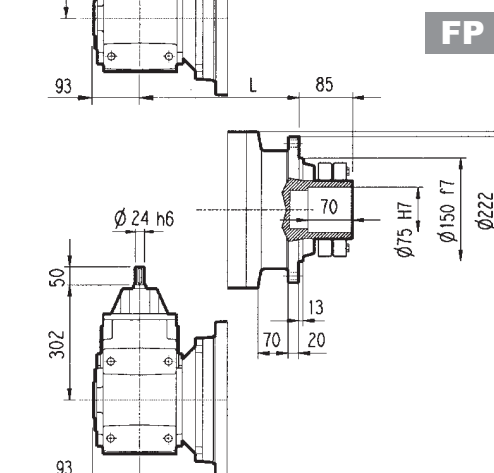
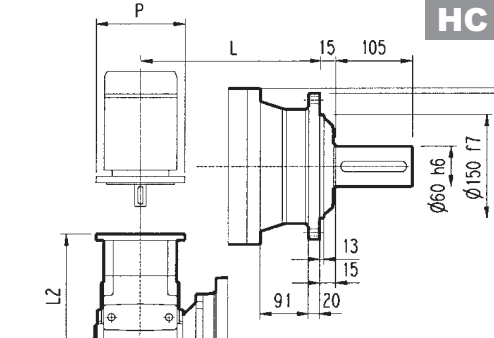
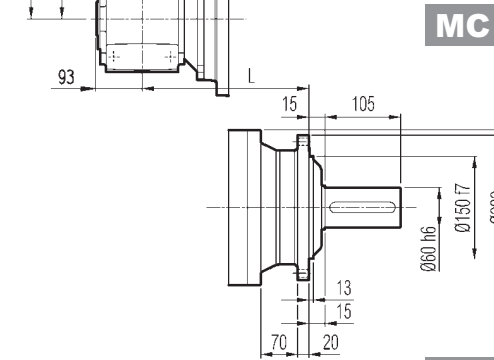
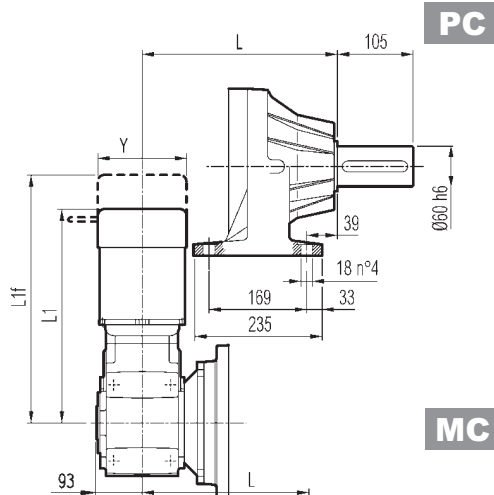
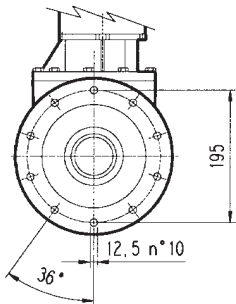
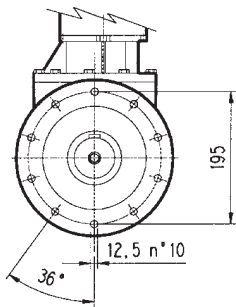
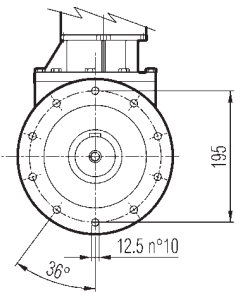
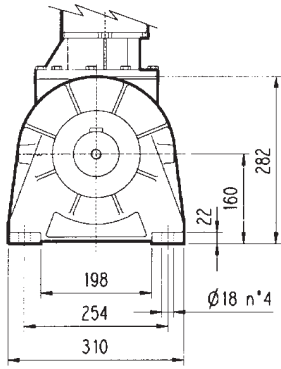
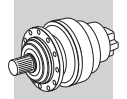
Vista da
View from **A**



FP

M_{2max} = 7500 Nm

3/V 05 L3	L			Kg				P71	P80	P90	P100	
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	P	P	P	P
	323	363	348	323	51	60	55	51	160	200	200	250
3/V 05 L3	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L		
	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
	308	369	138	333	409	156	376	472	193	408	499	193

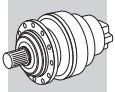


FP $M_{2max} = 7500 \text{ Nm}$

3/A 05 L2	L				kg	D1	L3	L4
	MC - MZ	PC - PZ	HC - HZ	FP - FZ				
	276	316	301	276	90	24	302	50

3/A 05 L2	P63		P71		P80		P90		P100		P112		P132	
	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P
	263	140	263	160	282.5	200	282.5	200	292.5	250	292.5	250	329	457

3/A 05 L2	S1 + M1			S2 + M2S			S3 + M3SA			S3 + M3LA			S4 + M4		
	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
	418	439	138	447	517	156	490	487	195	522	538	195	630	738	258



305 L

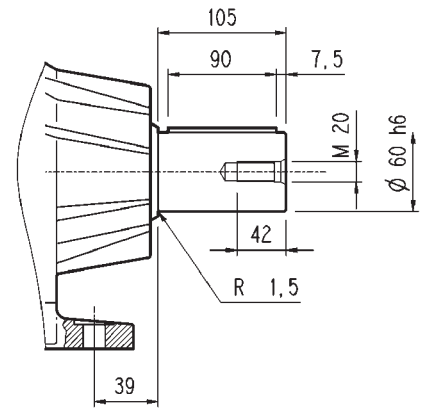
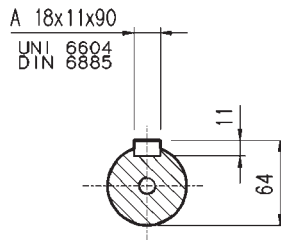
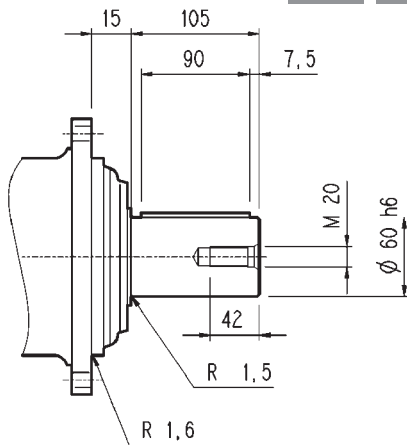
305 R

3/V 05 L3

3/A 05 L2

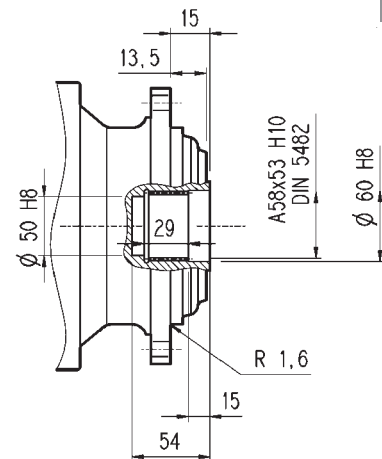
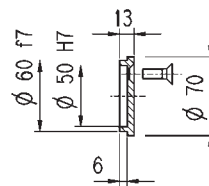
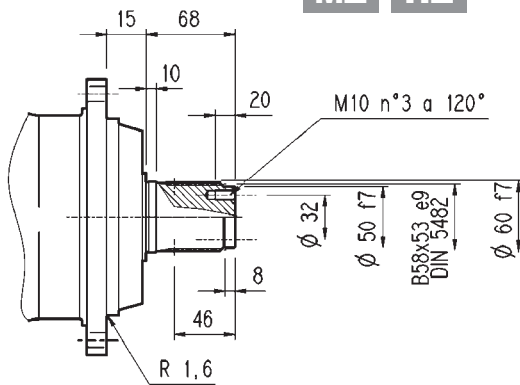
MC HC

PC

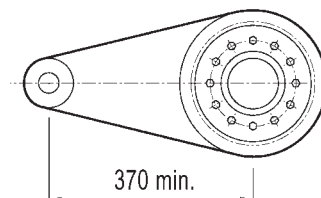
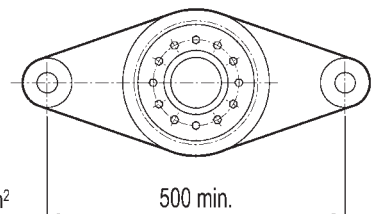
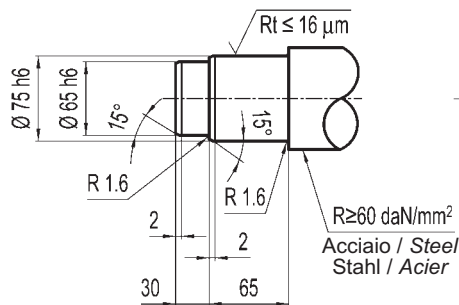
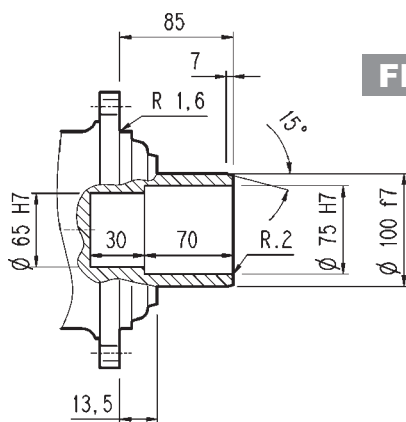


MZ HZ

FZ

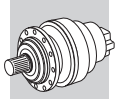
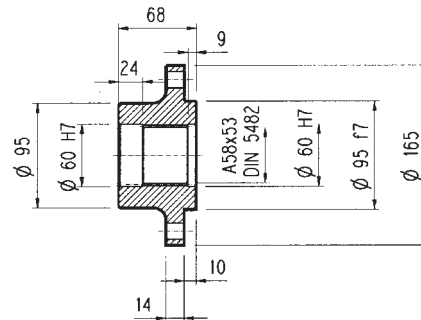
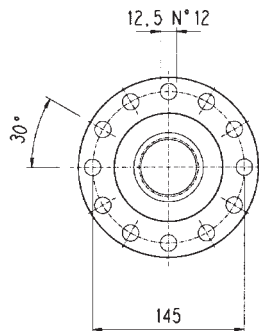
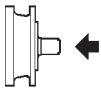


FP

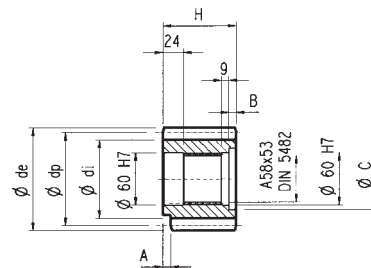
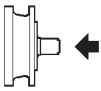


FP

M_{2max} = 7500 Nm

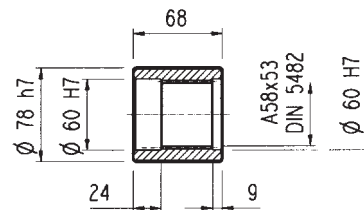
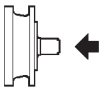

Flangia / Flange
Flansch / Brides
W0A


Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

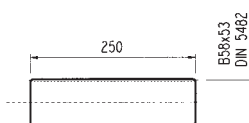
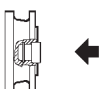
Pignoni / Pinion gears
Ritzel / Pignons
P...


	m	z	x	dp	di	de	H	A	B	C	☆
PCL1	5	19	0	95	82	104	77	12	9	72	□
PCL2	5	19	0	95	82	104	68	0	0	0	□
PCM	5	20	0	100	87.5	110	68	18	0	0	■
PCP	5	22	0	110	97.5	120	68	18	0	0	■
PDE	6	14	0.500	84	75	99.6	68	0	0	0	□
PDI	6	18	0.500	108	99	123.6	68	0	0	0	□
PDM	6	20	0.833	120	115	140	68	0	0	0	□
PFD	8	13	0.675	104	95	127.6	68	0	0	0	■
PFE1	8	14	0	112	92	126	68	0	0	0	■
PFE2	8	14	0	112	92	126	80	0	12	72	■
PFF	8	15	0	120	100	136	68	0	0	0	□
PFP	8	22	0	176	156	190	77	12	10	71	□
PHG	10	16	0.500	160	145	188	75	0	7	72	□

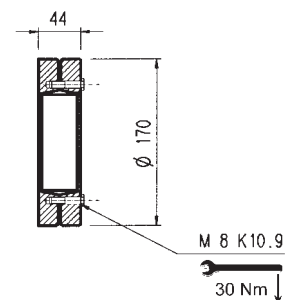
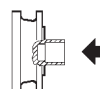
☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifié 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cimenté et tempré 18NiCrMo5

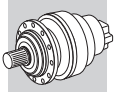
Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure
MOA


Materiale : Acciaio 16CrNi4
 Material : Steel 16CrNi4
 Material : Stahl 16CrNi4
 Matière : Acier 16CrNi4

Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée
B0A


Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
 Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
 Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
 Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

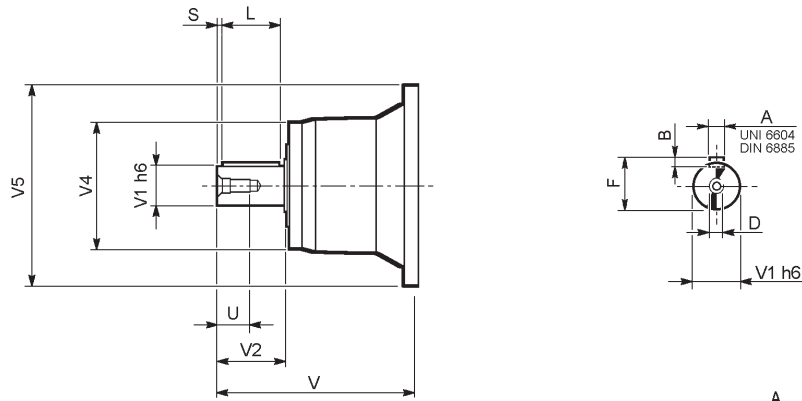
Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage
G0A




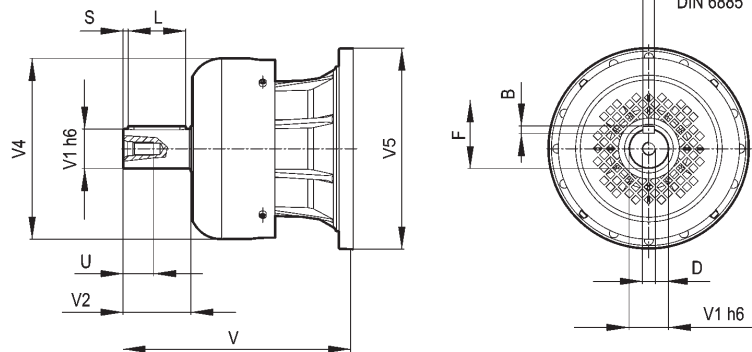
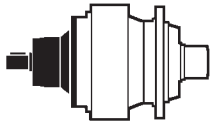
305 L

305 R

V



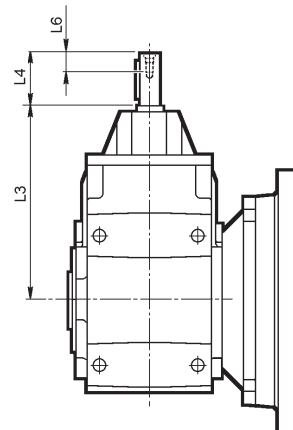
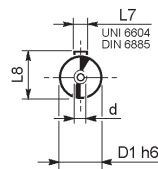
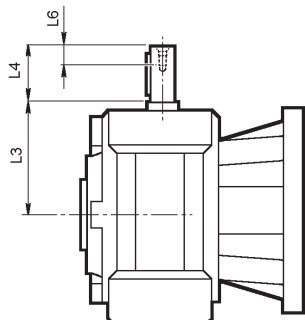
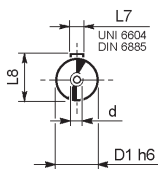
FV



	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
305 L1	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
305 L2	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
305 L3	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
305 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
305 R2-R3-R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

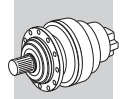
3/V 05 L3

3/A 05 L2



	D1 h6	L3	L4	L6	L7	L8	d
3/V 05 L3_HS	19	128	40	16	6	21.5	M6

	D1 h6	L3	L4	L6	L7	L8	d
3/A 05 L2_HS	24	302	50	19	8	27	M8

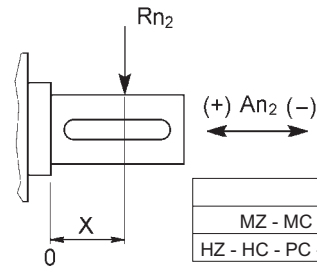
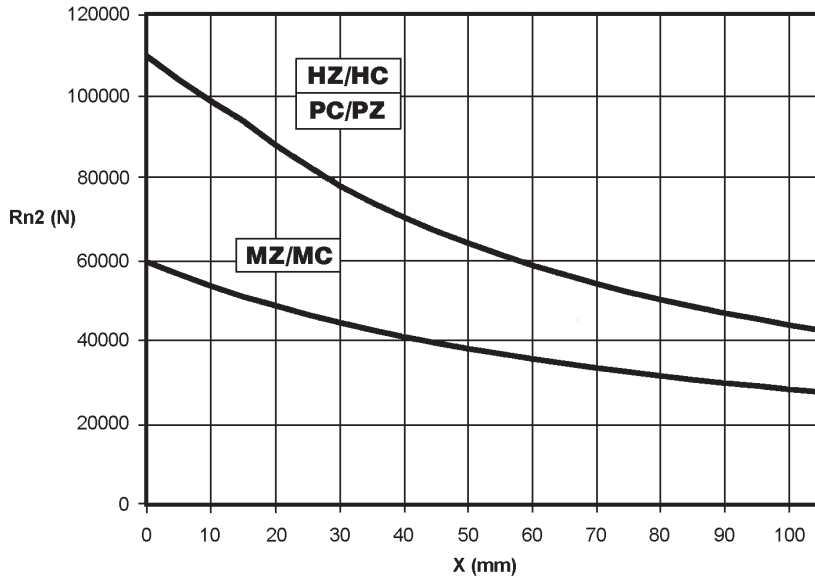


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $Fh_2 : n_2 \cdot h = 10000$

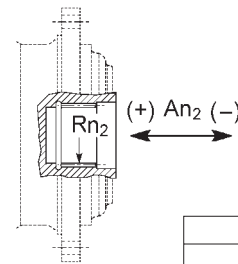
Permissible radial and axial loads on output shaft with $Fh_2 : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $Fh_2 : n_2 \cdot h = 10000$

Charges radiales et axiales admises sur l'arbre lent pour une valeur de $Fh_2 : n_2 \cdot h = 10000$



	An ₂ (+)	An ₂ (-)
MZ - MC	55000	44000
HZ - HC - PC - PZ	55000	44000



	Rn ₂	An ₂ (+/-)
FZ	24000	25000

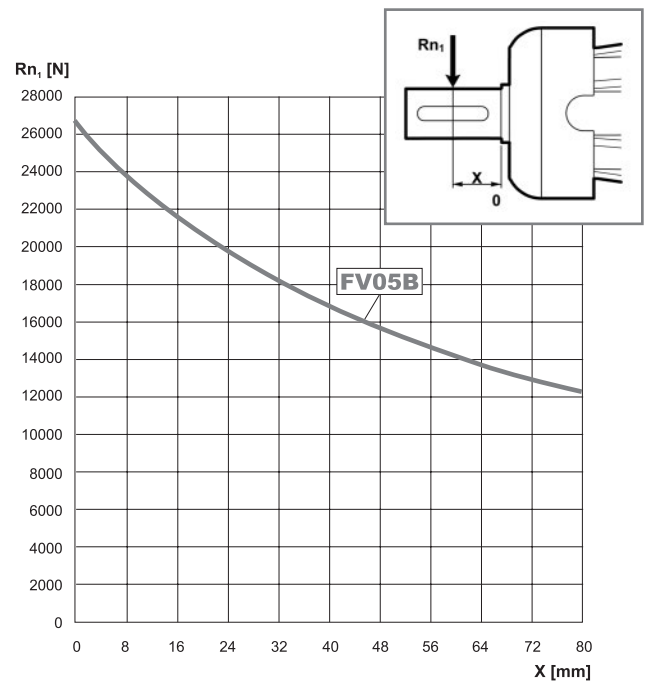
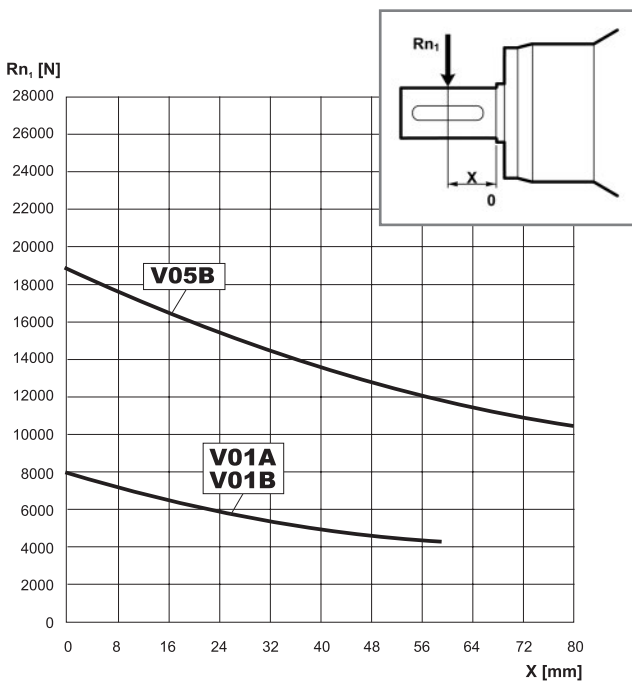
Fattore fh_2 correttivo per carichi sugli alberi Load corrective factor fh_2 on shafts Korrektionsfaktor fh_2 für wellenbelastungen Facteur de correction fh_2 pour charges sur les arbres	$Fh_2 = n_2 \cdot h$						
		10000	25000	50000	100000	500000	1000000
fh_2	MZ - MC - FZ	1	0.74	0.58	0.46	0.27	0.21
	HZ - HC - PC - PZ	1	0.76	0.61	0.50	0.31	0.25

Carichi radiali ammissibili sull'albero veloce per un valore di $Fh_1 : n_1 \cdot h = 250000$

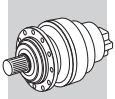
Permissible radial loads on input shaft with $Fh_1 : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $Fh_1 : n_1 \cdot h = 250000$

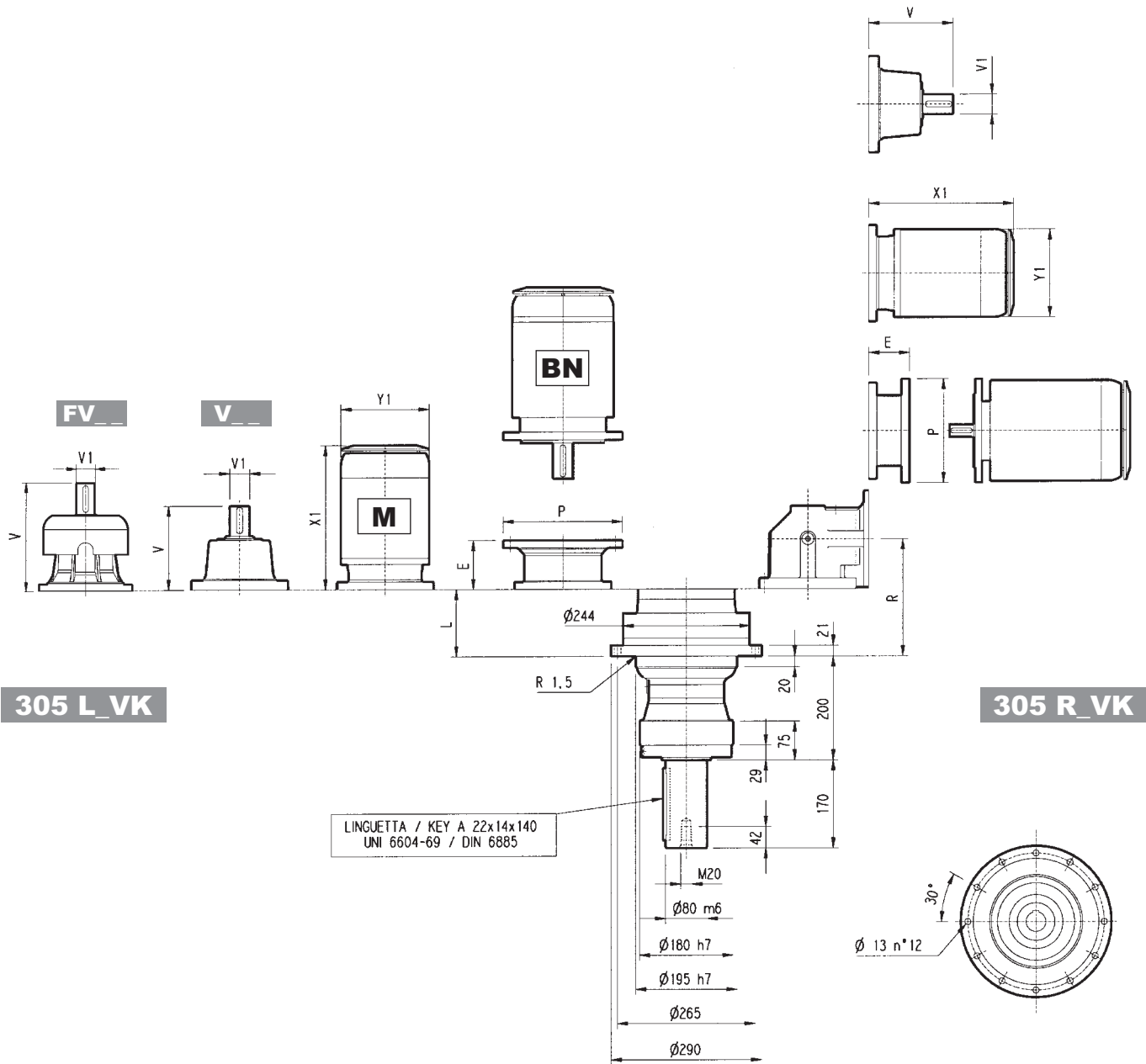
Charges radiales admises sur l'arbre d'entrée pour une valeur de $Fh_1 : n_1 \cdot h = 250000$



Fattore fh_1 correttivo per carichi sugli alberi Load corrective factor fh_1 on shafts Korrektionsfaktor fh_1 für wellenbelastungen Facteur de correction fh_1 pour charges sur les arbres	$Fh_1 = n_1 \cdot h$						
		250000	500000	1000000	2000000	5000000	10000000
fh_1	1	0.79	0.63	0.50	0.37	0.29	



305_VK



305 L_VK

305 R_VK

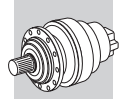
LINGUETTA / KEY A 22x14x140
UNI 6604-69 / DIN 6885

	L	Kg	Speaker						Microphone						P71		P80		P90		P100		P112		P132		P160		P180		P200	
			V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V	Kg	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P		
305 L1	69	70	239	48	15	-	-	-	276	48	17	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	144	350	174	400
305 L2	134	77	137.5	24	6	158	38	7	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	
305 L3	187	81	137.5	24	6	158	38	7	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	
305 L4	240	85	137.5	24	6	158	38	7	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	

	R	R1	Kg	Speaker						P71		P80		P90		P100		P112		P132	
				V	V1	Kg	V	V1	Kg	E	P	E	P	E	P	E	P	E	P	E	P
305 R2	161	140	90	137.5	24	6	158	38	7	65	160	84	200	84	200	94	250	94	250	114	300
305 R3	226	122	92	137.5	24	6	158	38	7	65	160	84	200	84	200	94	250	94	250	114	300
305 R4	279	122	95	137.5	24	6	158	38	7	65	160	84	200	84	200	94	250	94	250	114	300

	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y
305 L1	-	-	-	-	-	-	-	-	-	-	-	-	460	571	258	552	692	310	596	736	310
305 L2	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
305 L3	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
305 L4	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-

	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
305 R2	-	-	-	328	400	156	373	469	195	405	497	195	508	619	258
305 R3	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258
305 R4	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 305_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 305_VK, with radial force applying at a distance x from shaft shoulder.

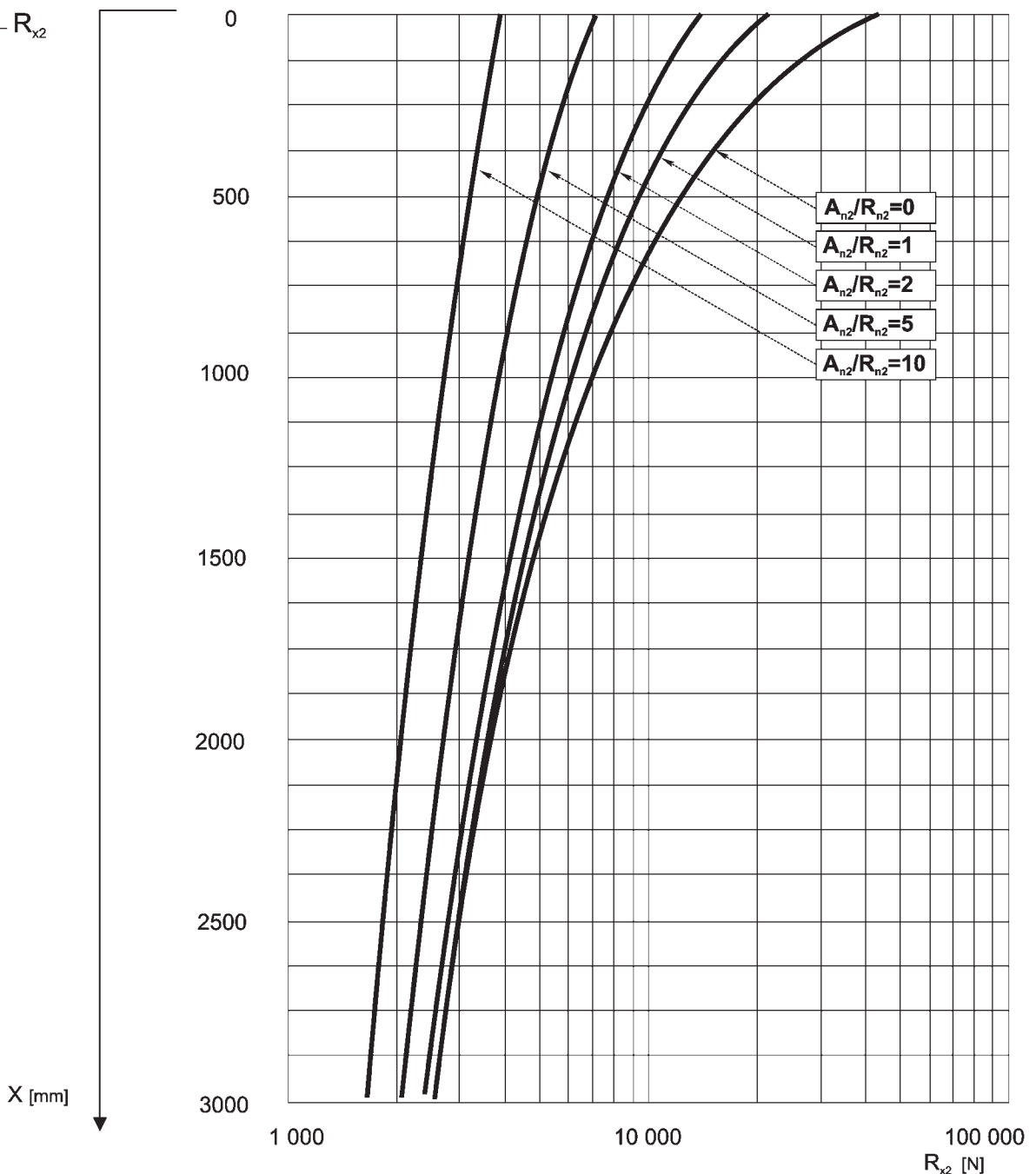
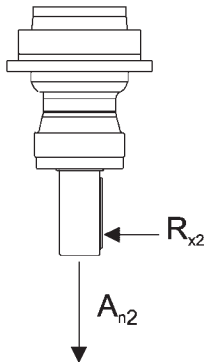
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

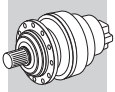
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 305_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

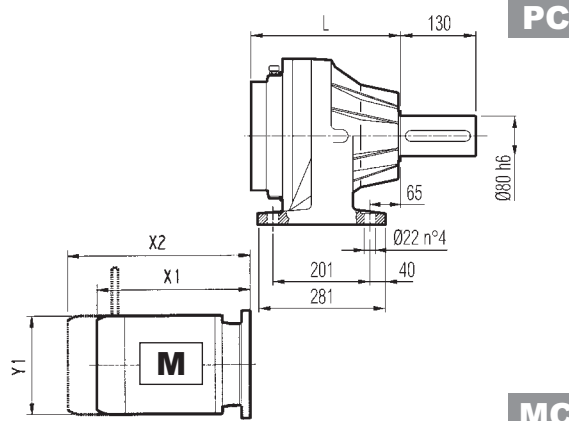
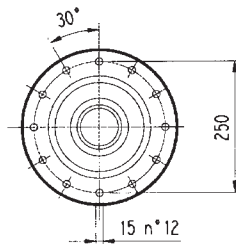
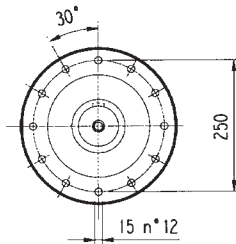
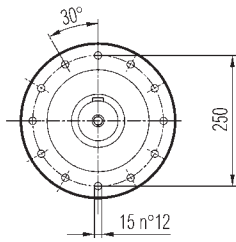
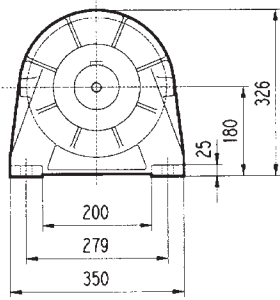
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 305_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.

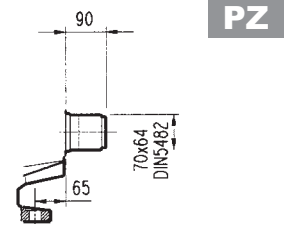




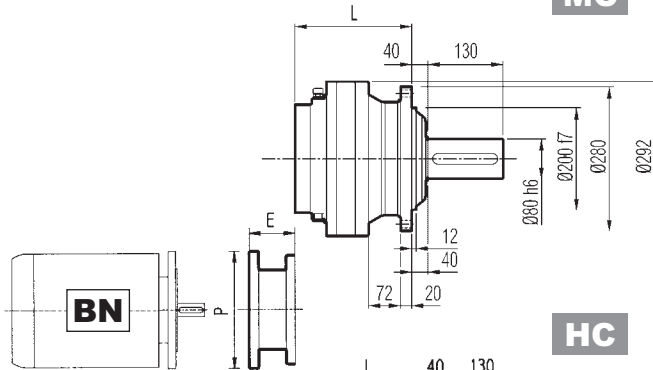
306 L



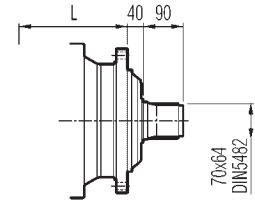
PC



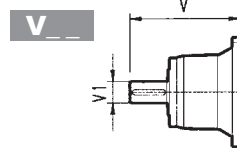
PZ



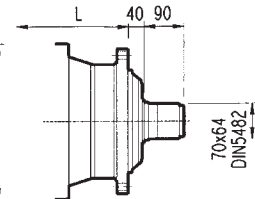
MC



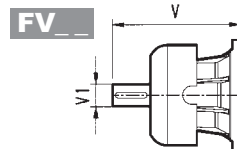
MZ



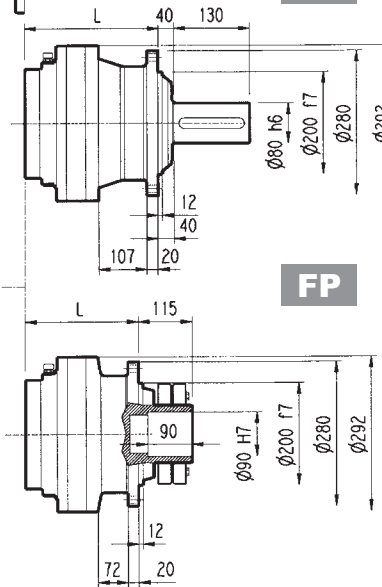
HC



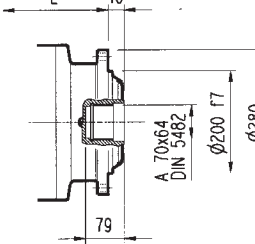
HZ



FP



FZ

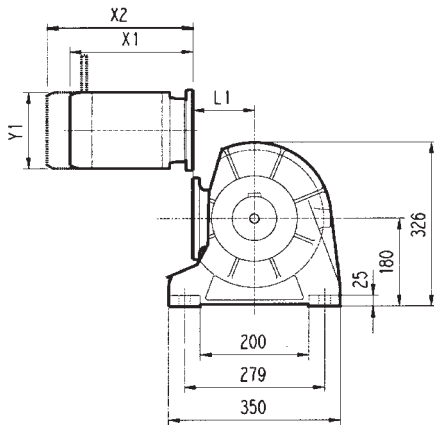
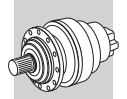


FP $M_{2max} = 12000 \text{ Nm}$

	L				Kg				Kg				Kg							
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
306 L1	160	235	195	160	65	85	70	65	307	60	23	-	-	-	357	60	28	-	-	-
306 L2	225	300	260	225	74	95	79	74	239	48	15	-	-	-	276	48	17	-	-	-
306 L3	278	353	313	278	78	98	83	78	137.5	24	6	158	38	7	-	-	-	-	-	-
306 L4	331	406	366	331	82	103	87	82	137.5	24	6	158	38	7	-	-	-	-	-	-

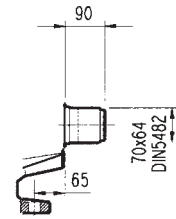
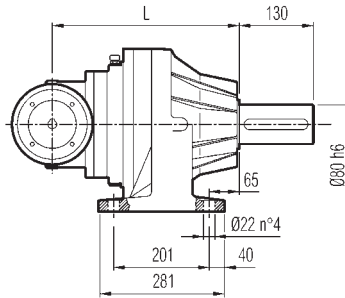
	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
306 L1	-	-	-	-	-	-	-	-	-	-	-	-	144	350	153	350	183	400	212	450	193	550
306 L2	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
306 L3	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-
306 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-

	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y
306 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
306 L2	-	-	-	-	-	-	-	-	-	-	-	-	460	571	258	552	692	310	596	736	310
306 L3	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
306 L4	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-



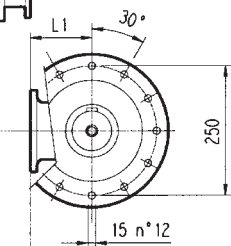
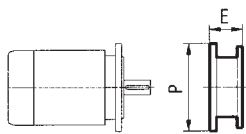
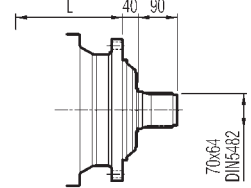
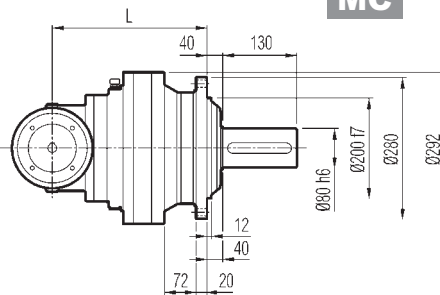
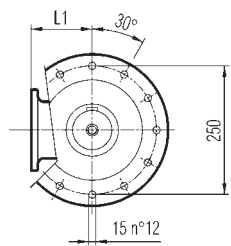
PC

PZ



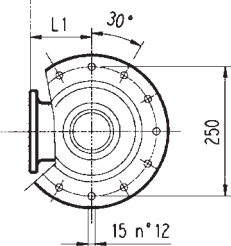
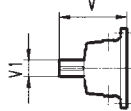
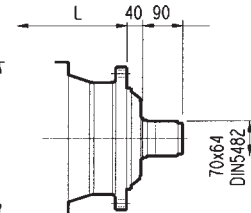
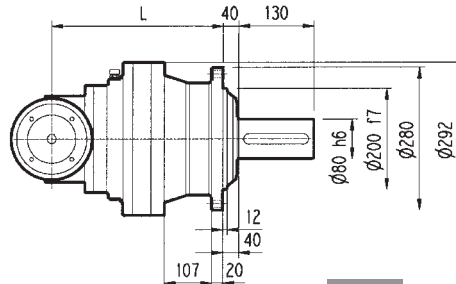
MC

MZ



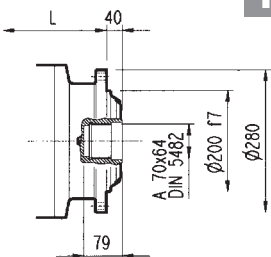
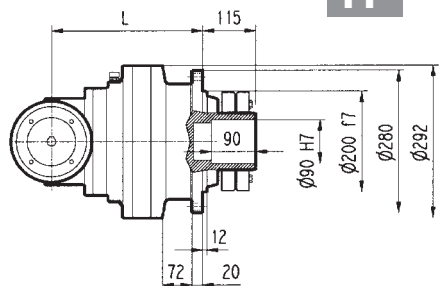
HC

HZ



FP

FZ



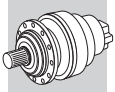
FP

$M_{2max} = 12000 \text{ Nm}$

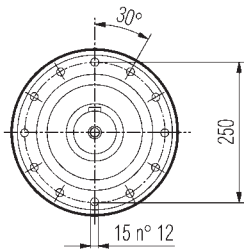
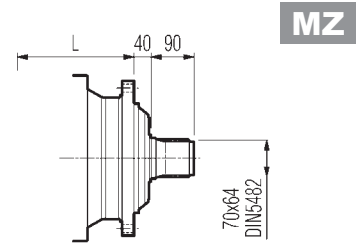
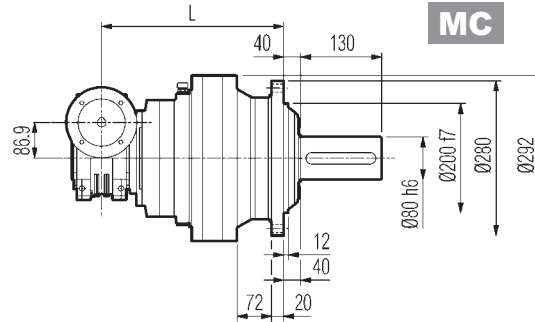
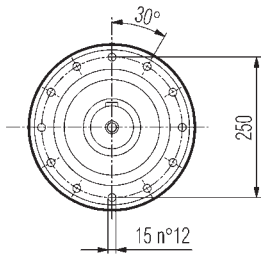
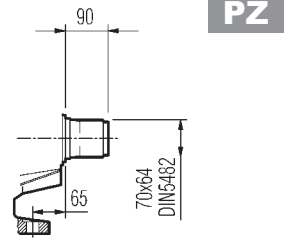
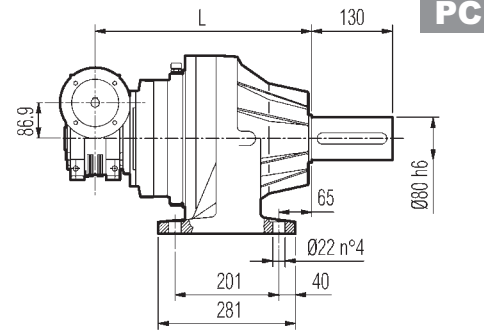
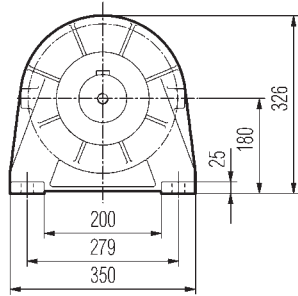
	L				L1	Kg				V	V1	Kg	V	V1	Kg
	MC - MZ	PC - PZ	HC - HZ	FP - FZ		MC - MZ	PC - PZ	HC - HZ	FP - FZ						
306 R2	297	372	332	297	140	89	105	94	89	137.5	24	6	158	38	7
306 R3	317	392	352	317	140	85	100	90	85	137.5	24	6	158	38	7
306 R4	370	445	405	370	122	79	95	84	79	137.5	24	6	158	38	7

	P71		P80		P90		P100		P112		P132		P160	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P
306 R2	65	160	84	200	84	200	94	250	94	250	114	300	144	350
306 R3	65	160	84	200	84	200	94	250	94	250	114	300	144	350
306 R4	65	160	84	200	84	200	94	250	94	250	114	300	144	350

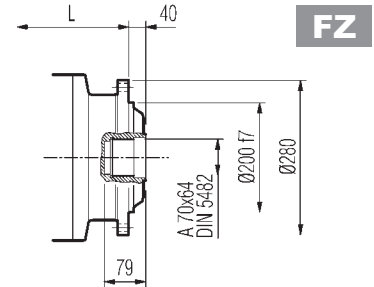
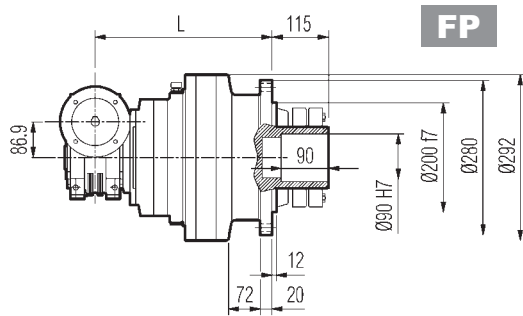
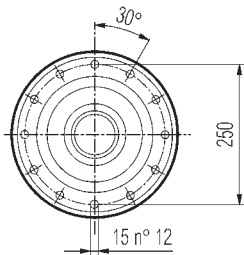
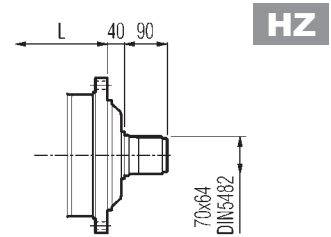
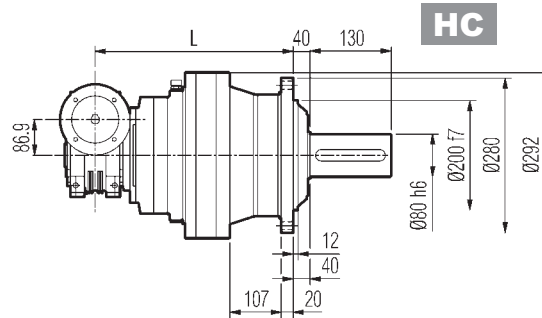
	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
306 R2	-	-	-	328	400	156	373	469	195	405	497	195	508	619	258
306 R3	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258
306 R4	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258



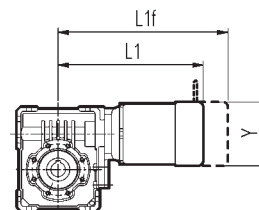
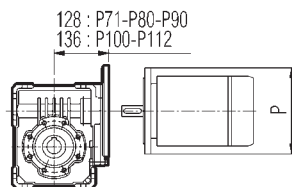
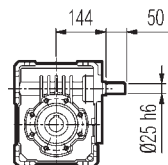
3/V 06 L3



A →



Vista da View from A

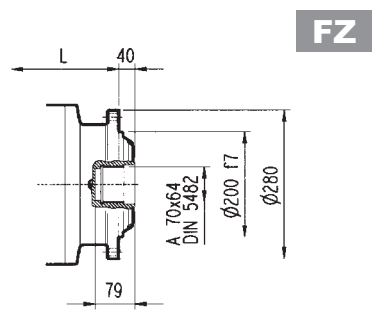
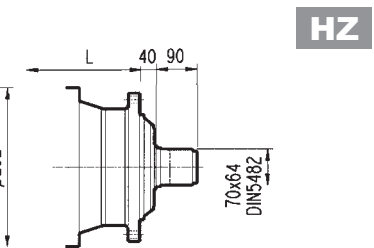
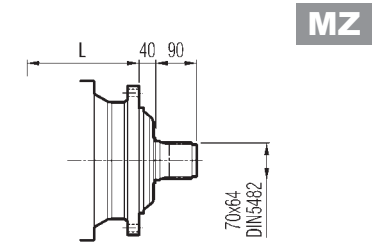
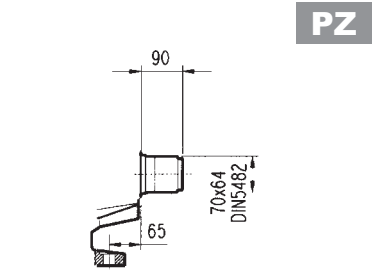
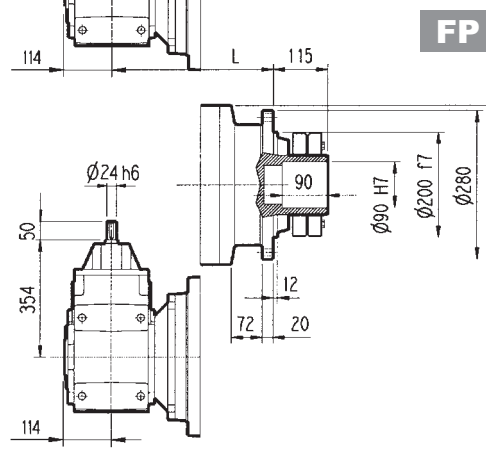
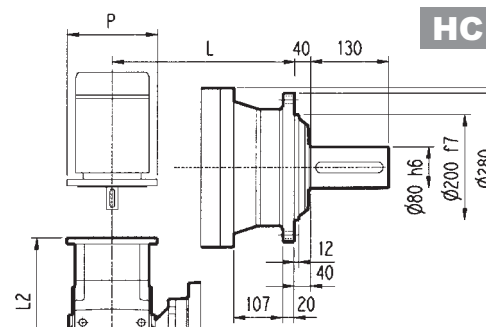
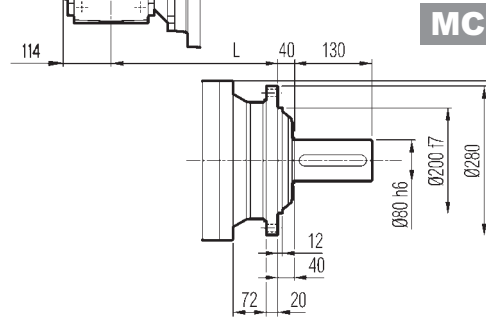
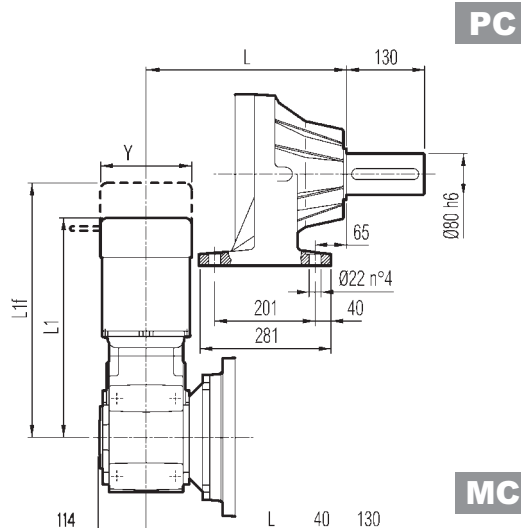
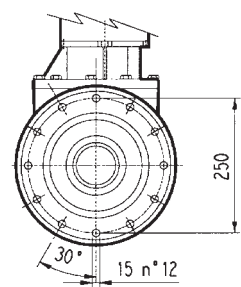
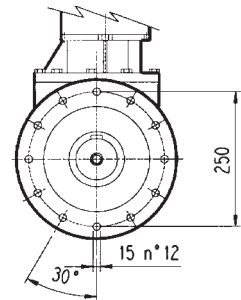
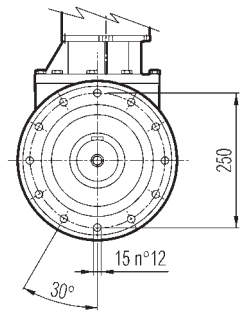
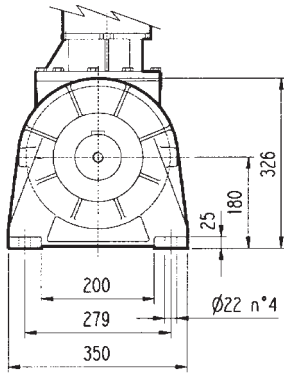
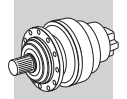


FP

M_{2max} = 12000 Nm

	L				Kg				P71	P80	P90	P100	P112
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	P	P	P	P	P
3/V 06 L3	370	445	405	370	80	111	95	80	160	200	200	250	250

	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L		
	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
3/V 06 L3	324	385	138	349	425	156	392	477	193	424	515	193

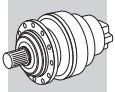


FP $M_{2max} = 12000 \text{ Nm}$

3/A 06 L2	L				MC - MZ	PC - PZ	HC - HZ	FP - FZ	D1	L3	L4
	MC - MZ	PC - PZ	HC - HZ	FP - FZ							
3/A 06 L2	340	415	375	340	140	170	150	140	24	354	50

3/A 06 L2	P63		P71		P80		P90		P100		P112		P132		P160		P180	
	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P
3/A 06 L2	314.5	140	314.5	160	334	200	334	200	344	250	344	250	380.5	300	431	350	431	350

3/A 06 L2	S1 + M1			S2 + M2S			S3 + M3SA			S3 + M3LA			S4 + M4		
	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
3/A 06 L2	445	508	138	568	517	156	541	637	195	572	665	195	678	789	258



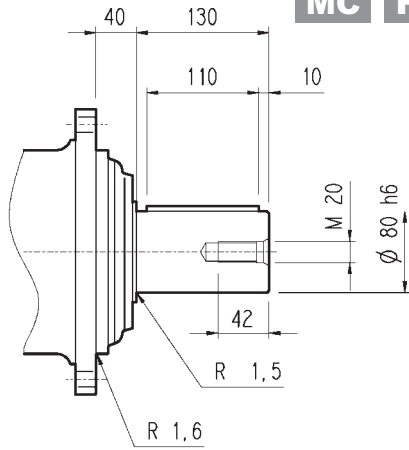
306 L

306 R

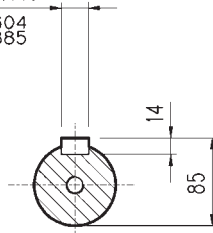
3/V 06 L3

3/A 06 L2

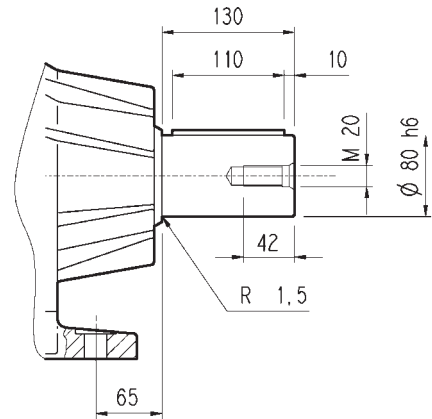
MC HC



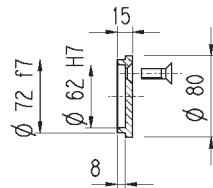
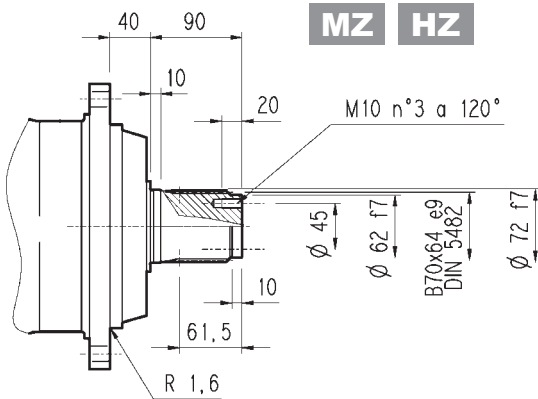
A 22x14x110
UNI 6604
DIN 6885



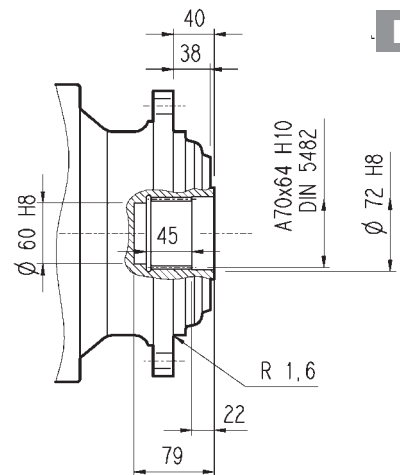
PC



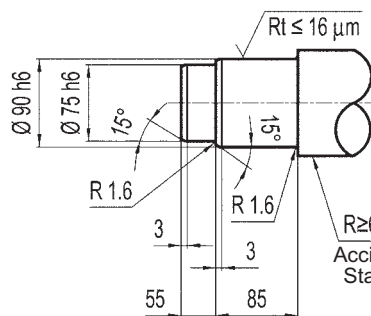
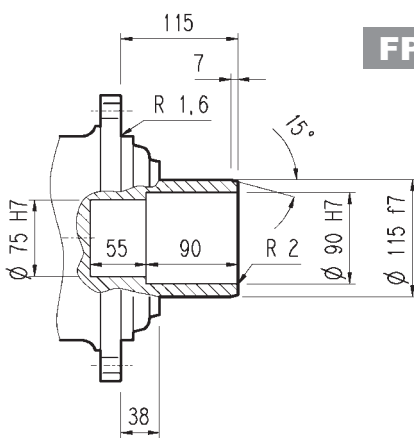
MZ HZ



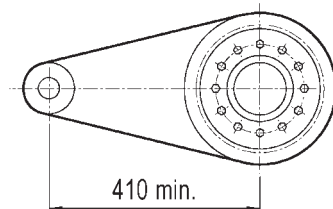
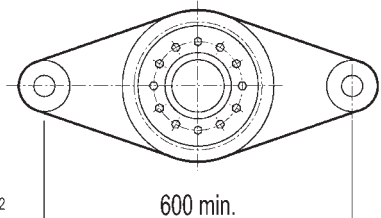
FZ



FP

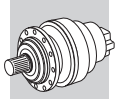


R ≥ 60 daN/mm²
Acciaio / Steel
Stahl / Acier

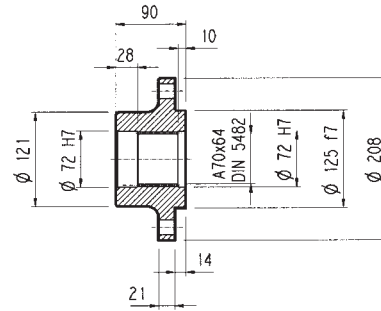
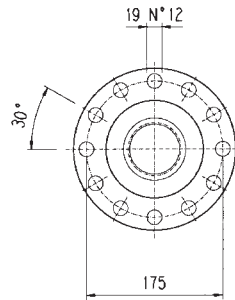
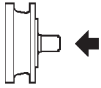


FP

M_{2max} = 12000 Nm


Flangia / Flange
Flansch / Brides

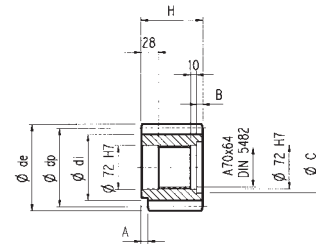
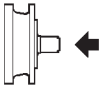
W0A



Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

Pignoni / Pinion gears
Ritzel / Pignons

P...

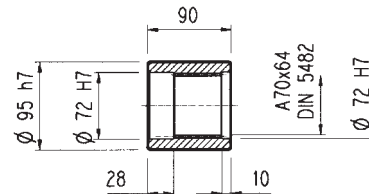
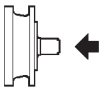


	m	z	x	dp	di	de	H	A	B	C	☆
PFF1	8	15	0	120	100	134	90	0	0	0	□
PFF2	8	15	0.500	120	108	141	90	0	0	0	□
PHB	10	11	0.500	110	95	136	90	10	0	0	□
PHC1	10	12	0.450	120	104	145	90	0	0	0	□
PHC2	10	12	0.320	120	100	144.2	90	0	0	0	□
PHC3	10	12	0.350	120	101	144	90	0	0	0	□
PHD1	10	13	0.950	130	124	165	90	0	0	0	□
PHD2	10	13	0.500	130	115	159	90	0	0	0	□
PHE1	10	14	0	140	115	160	90	0	0	0	□
PHE2	10	14	0.500	140	125	166	90	0	0	0	■
PHF	10	15	0	150	127	167	90	24	0	0	□
PHH	10	17	0.480	170	154	197.5	90	10	0	0	□
PHM	10	20	0	200	175	220	90	10	0	0	■

☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifiée 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cémenté et tempré 18NiCrMo5

Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure

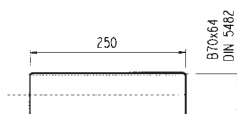
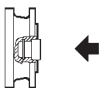
MOA



Materiale : Acciaio 16CrNi4
 Material : Steel 16CrNi4
 Material : Stahl 16CrNi4
 Matière : Acier 16CrNi4

Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée

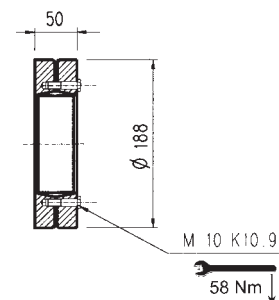
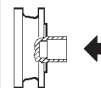
B0A

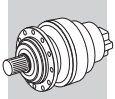


Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
 Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
 Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
 Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

GOA

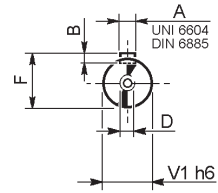
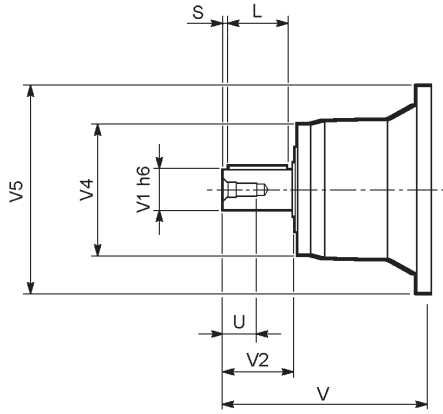




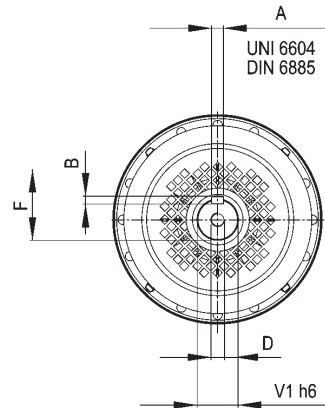
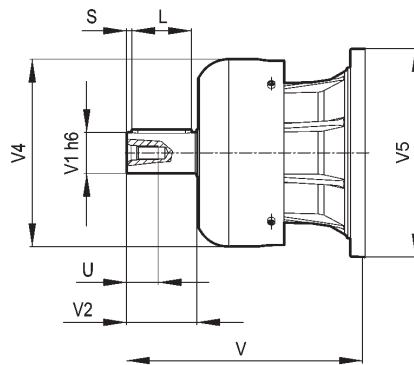
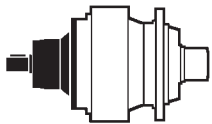
306 L

306 R

V



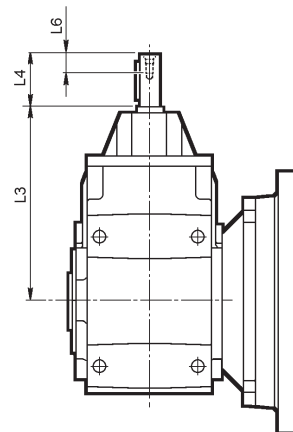
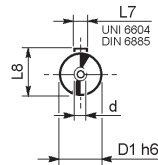
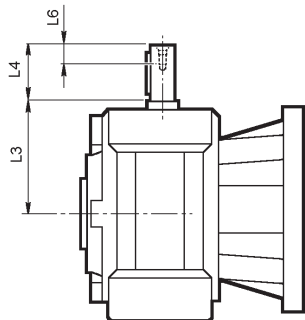
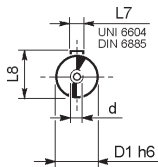
FV



	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
306 L1	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36
306 L2	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
306 L3	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
306 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
306 R2-R3-R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

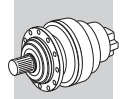
3/V 06 L3

3/A 06 L2



	D1 h6	L3	L4	L6	L7	L8	d
3/V 06 L3_HS	25	144	50	19	8	28	M8

	D1 h6	L3	L4	L6	L7	L8	d
3/A 06 L2_HS	24	354	50	19	8	27	M8

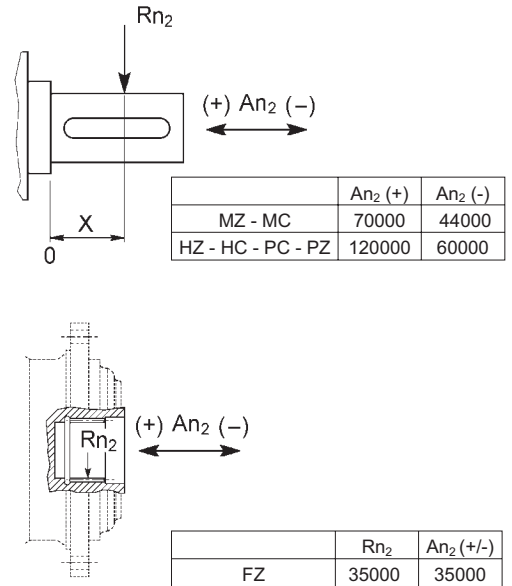
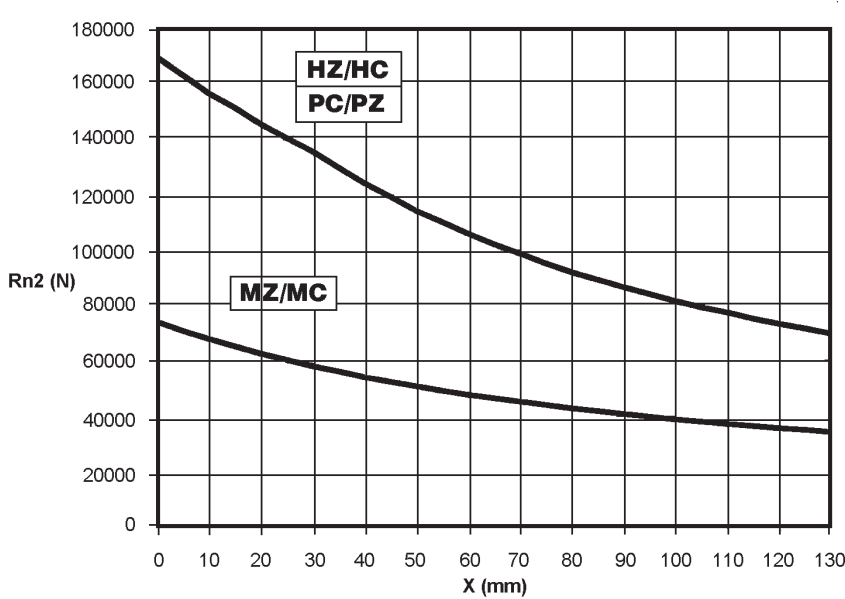


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $Fh_2 : n_2 \cdot h = 10000$

Permissible radial and axial loads on output shaft with $Fh_2 : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $Fh_2 : n_2 \cdot h = 10000$

Charges radiales et axiales admises sur l'arbre lent pour une valeur de $Fh_2 : n_2 \cdot h = 10000$



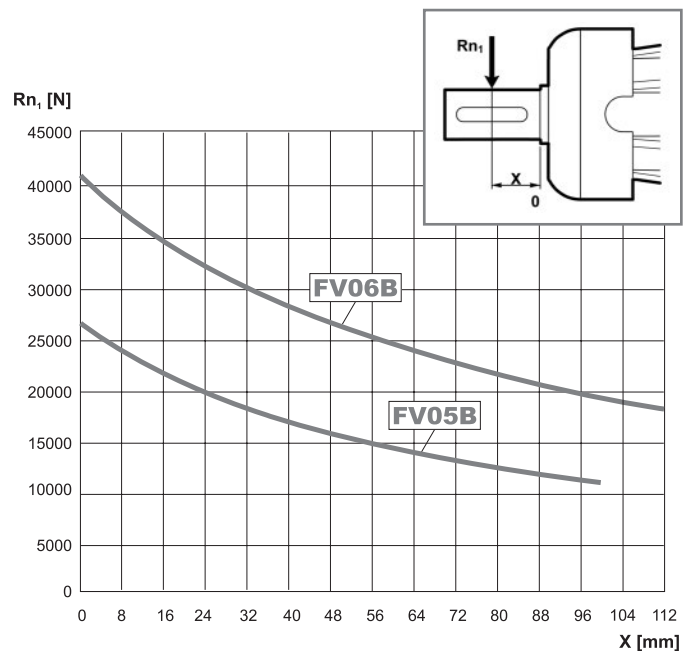
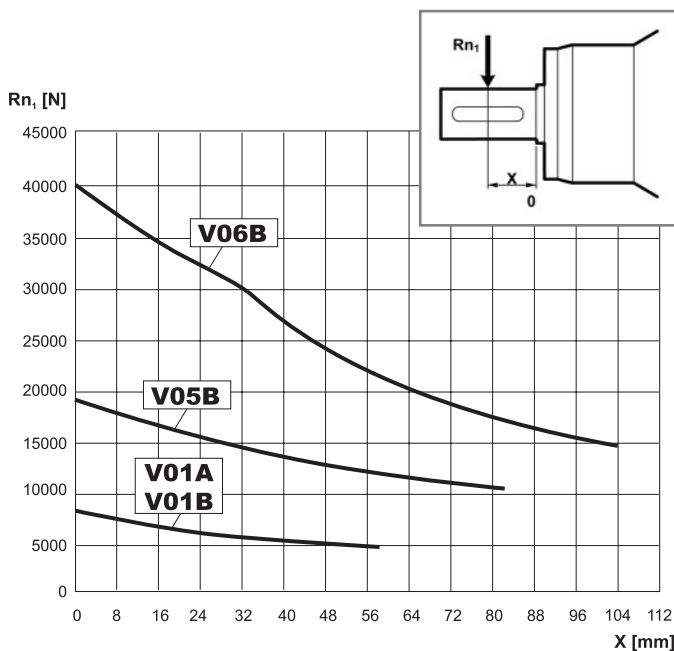
Fattore fh_2 correttivo per carichi sugli alberi Load corrective factor fh_2 on shafts Korrektionsfaktor fh_2 für wellenbelastungen Facteur de correction fh_2 pour charges sur les arbres	$Fh_2 = n_2 \cdot h$							
		10000	25000	50000	100000	500000	1000000	
fh_2	MZ - MC - FZ	1	0.74	0.58	0.46	0.27	0.21	
	HZ - HC - PC - PZ	1	0.76	0.61	0.50	0.31	0.25	

Carichi radiali ammissibili sull'albero veloce per un valore di $Fh_1 : n_1 \cdot h = 250000$

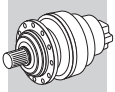
Permissible radial loads on input shaft with $Fh_1 : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $Fh_1 : n_1 \cdot h = 250000$

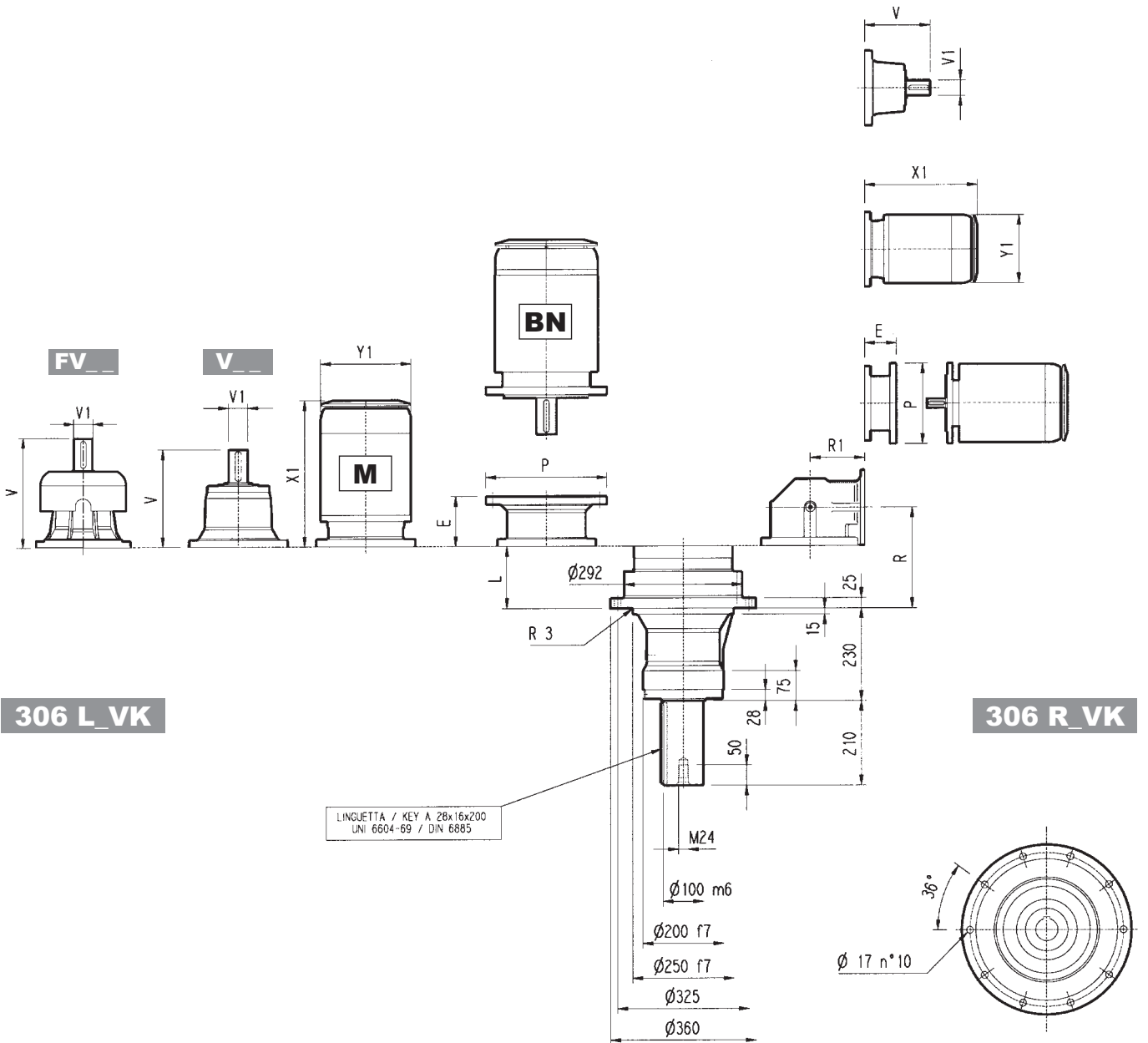
Charges radiales admises sur l'arbre d'entrée pour une valeur de $Fh_1 : n_1 \cdot h = 250000$



Fattore fh_1 correttivo per carichi sugli alberi Load corrective factor fh_1 on shafts Korrektionsfaktor fh_1 für wellenbelastungen Facteur de correction fh_1 pour charges sur les arbres	$Fh_1 = n_1 \cdot h$						
		250000	500000	1000000	2000000	5000000	10000000
fh_1	1	0.79	0.63	0.50	0.37	0.29	



306_VK



306 L_VK

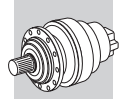
306 R_VK

	L	Kg	Pulley						P71						P80	P90	P100	P112	P132	P160	P180	P200	P225	P250					
			V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg	E	P	E	P	E	P	E	P	E	P	E	P			
306 L1	75	110	307	60	23	-	-	-	357	60	28	-	-	-	-	-	-	-	-	144	350	153	350	183	400	212	450	193	550
306 L2	140	120	239	48	15	-	-	-	276	48	17	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-
306 L3	193	125	137.5	24	6	158	38	7	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-
306 L4	246	130	137.5	24	6	158	38	7	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-

	R	R1	Kg	Pulley						P71		P80		P90		P100		P112		P132		P160	
				V	V1	Kg	V	V1	Kg	E	P	E	P	E	P	E	P	E	P	E	P	E	P
306 R2	212	140	130	137.5	24	6	158	38	7	65	160	84	200	84	200	94	250	94	250	114	300	144	350
306 R3	232	140	125	137.5	24	6	158	38	7	65	160	84	200	84	200	94	250	94	250	114	300	144	350
306 R4	285	122	120	137.5	24	6	158	38	7	65	160	84	200	84	200	94	250	94	250	114	300	144	350

	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y
306 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
306 L2	-	-	-	-	-	-	-	-	-	-	-	-	460	571	258	552	692	310	596	736	310
306 L3	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
306 L4	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-

	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
306 R2	-	-	-	328	400	156	373	469	195	405	497	195	508	619	258
306 R3	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258
306 R4	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 306_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 306_VK, with radial force applying at a distance x from shaft shoulder.

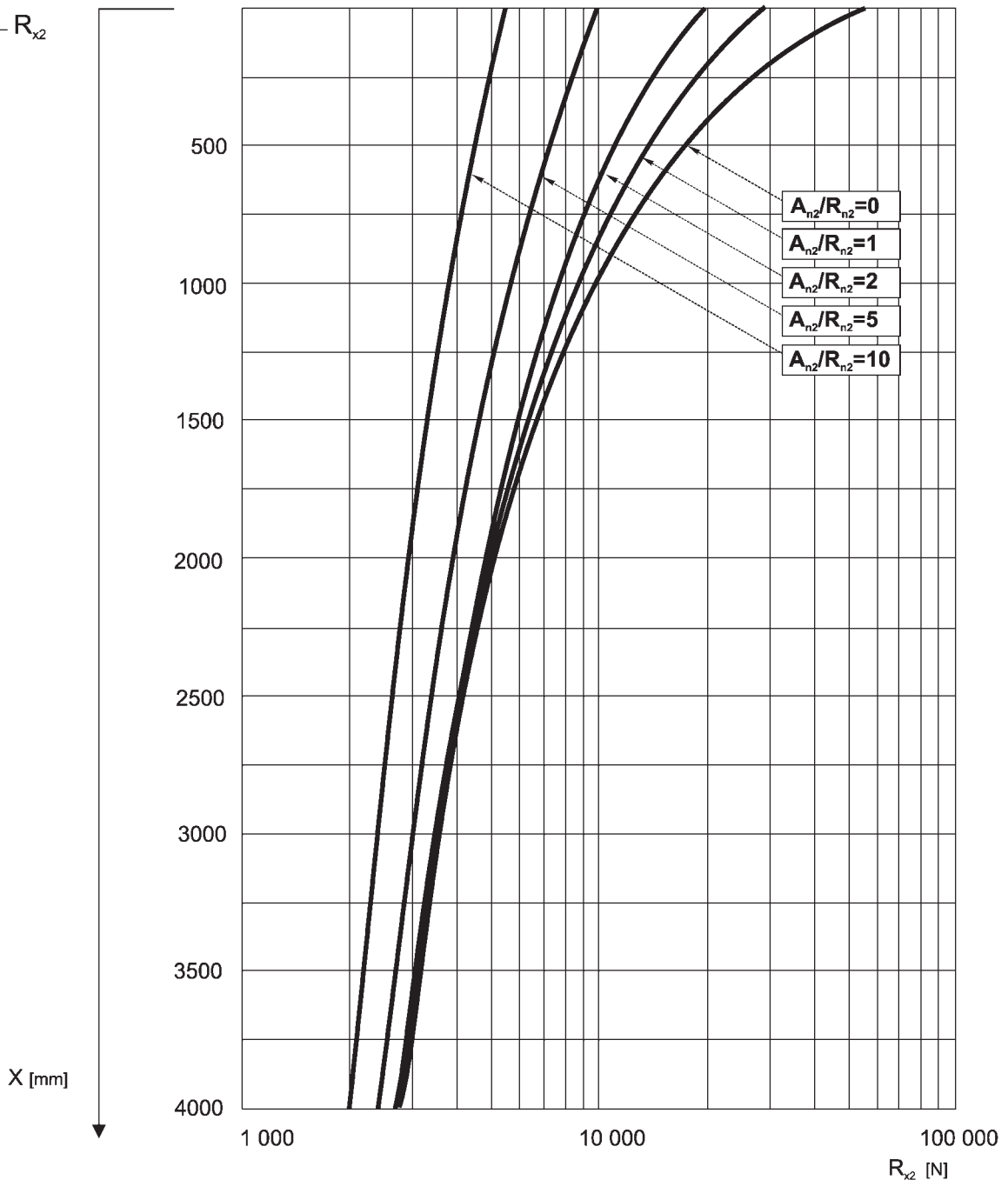
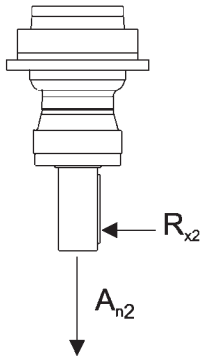
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

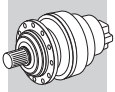
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 306_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

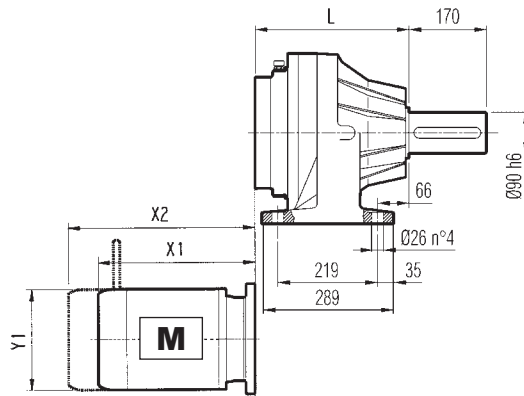
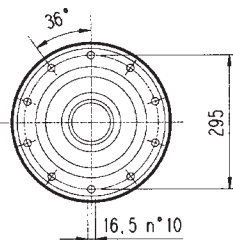
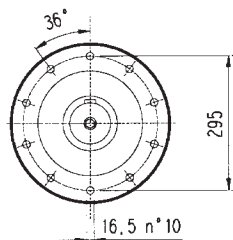
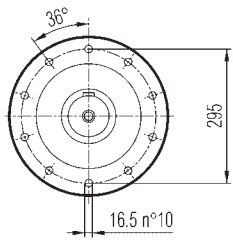
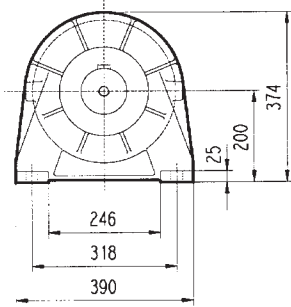
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 306_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.

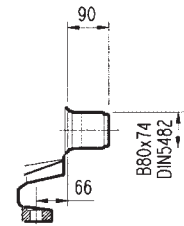




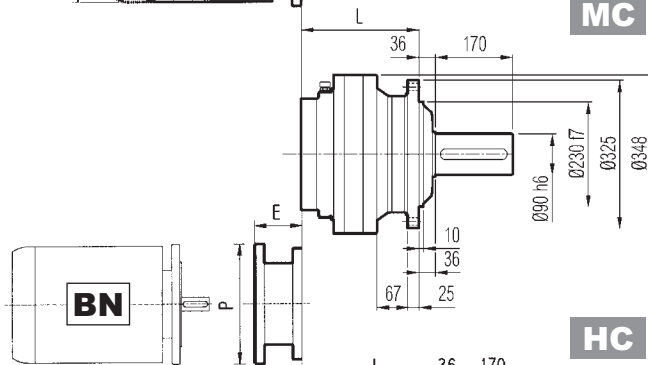
307 L



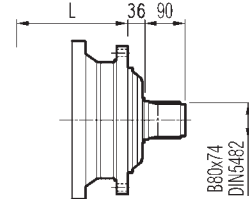
PC



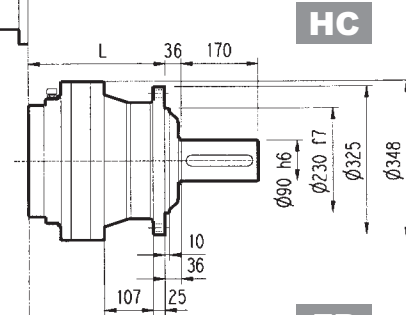
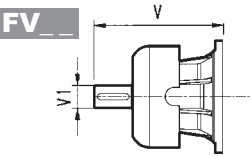
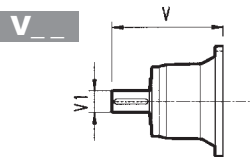
PZ



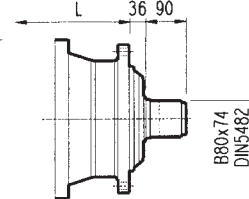
MC



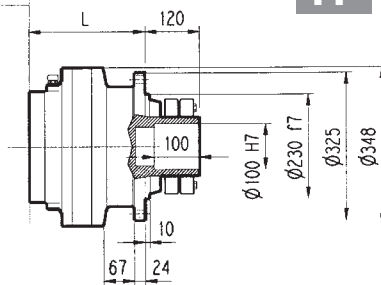
MZ



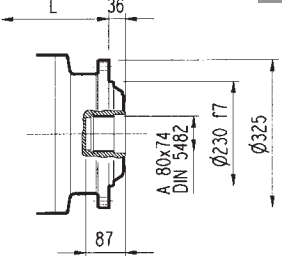
HC



HZ



FP



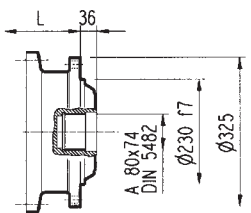
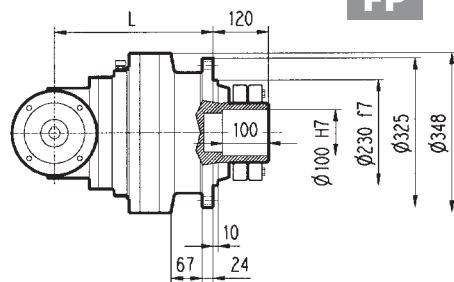
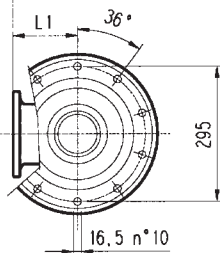
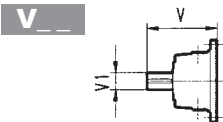
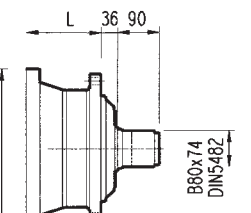
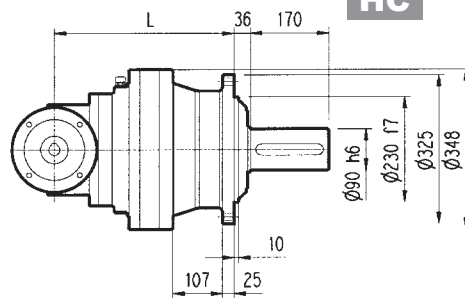
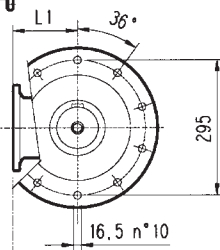
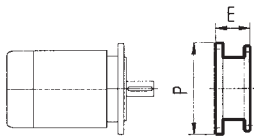
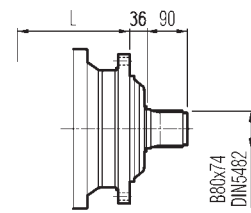
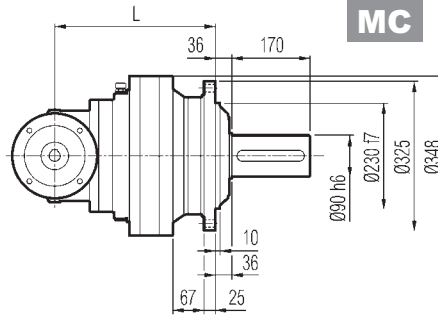
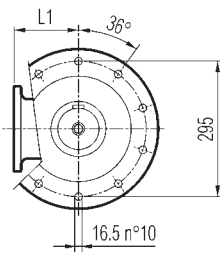
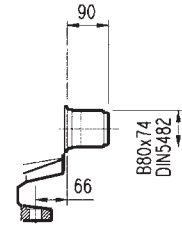
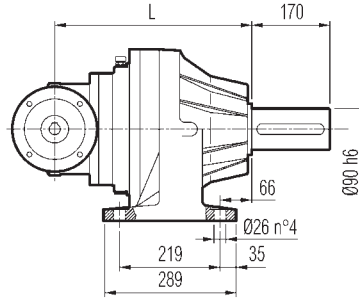
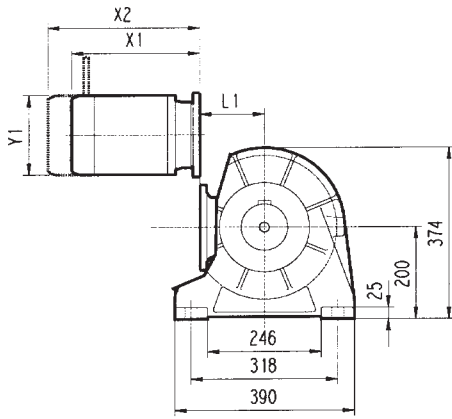
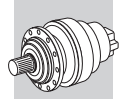
FZ

FP $M_{2max} = 18200 \text{ Nm}$

	L				Kg				Kg				Kg							
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
307 L1	165	246	210	165	85	120	105	85	315	80	35	313	60	28	375	80	48	363	60	34
307 L2	254	335	299	254	97	132	117	97	239	48	15	-	-	-	276	48	17	-	-	-
307 L3	319	400	364	319	104	139	124	104	137.5	24	6	158	38	7	-	-	-	-	-	-
307 L4	372	453	417	372	108	143	128	108	137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
307 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	195	350	186	400	216	450	215	550
307 L2	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
307 L3	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-
307 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-

	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y
307 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
307 L2	-	-	-	-	-	-	-	-	-	-	-	-	460	571	258	552	692	310	596	736	310
307 L3	-	-	-	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
307 L4	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-

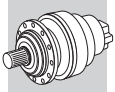


FP $M_{2max} = 18200 \text{ Nm}$

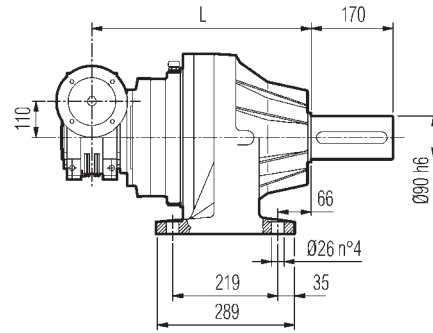
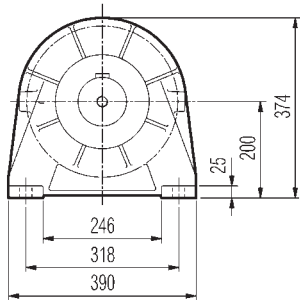
	L				L1	Kg				V				V1					
	MC - MZ	PC - PZ	HC - HZ	FP - FZ		MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1	Kg	V	V1	Kg	V	V1	Kg	
307 R2	284	365	329	284	225	135	170	155	135	239	48	15	-	-	276	48	17	-	-
307 R3	346	427	391	346	140	117	152	137	117	137.5	24	6	158	38	7	-	-	-	-
307 R4	411	492	456	411	122	118	153	138	118	137.5	24	6	158	38	7	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
307 R2	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400
307 R3	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-
307 R4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-

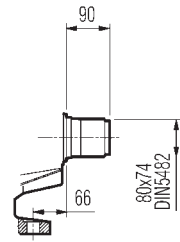
	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
307 R2	-	-	-	-	-	-	-	-	-	-	-	-	508	619	258	552	692	310	596	736	310
307 R3	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258	-	-	-	-	-	-
307 R4	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258	-	-	-	-	-	-



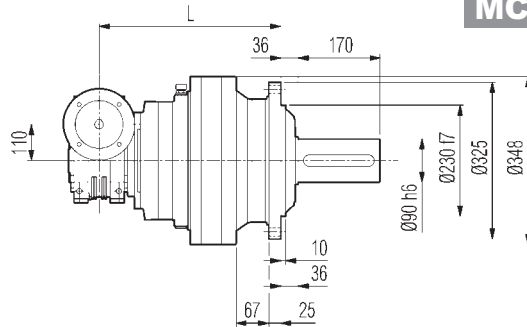
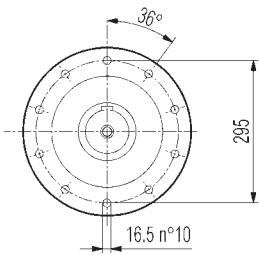
3/V 07 L3



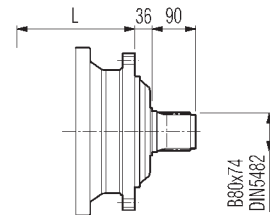
PC



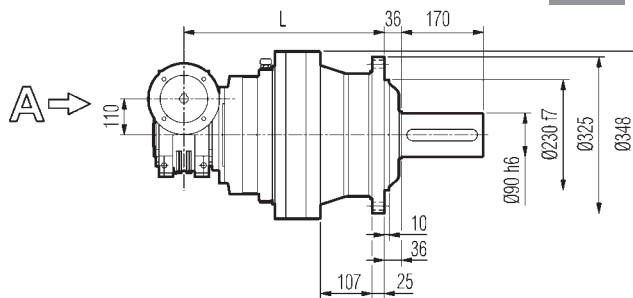
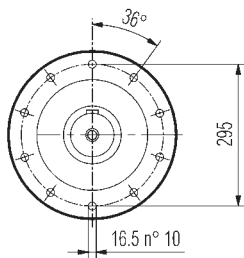
PZ



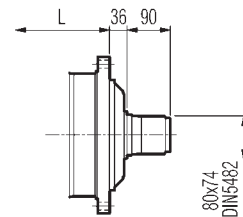
MC



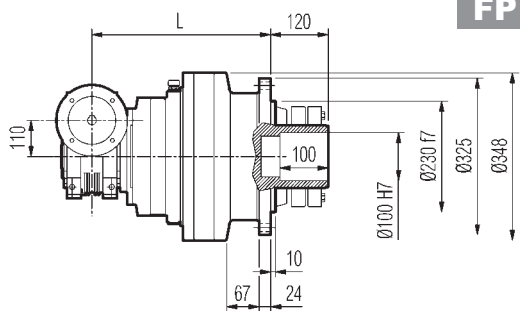
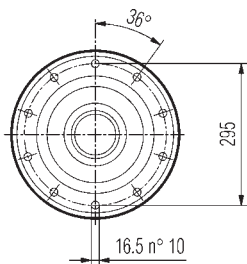
MZ



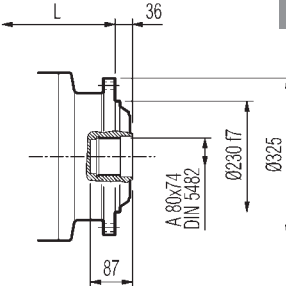
HC



HZ

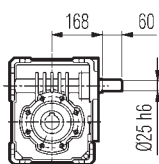


FP

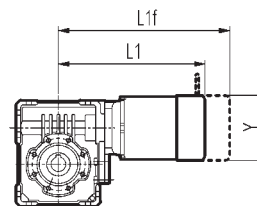
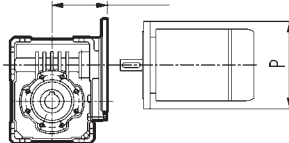


FZ

Vista da View from **A**



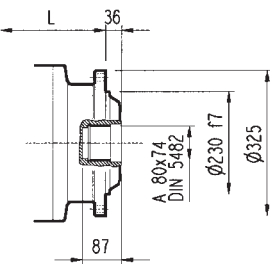
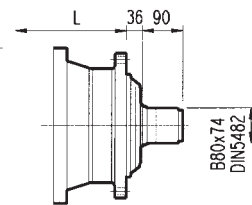
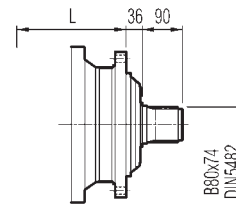
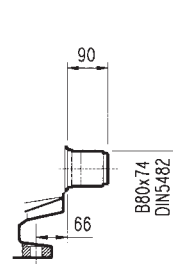
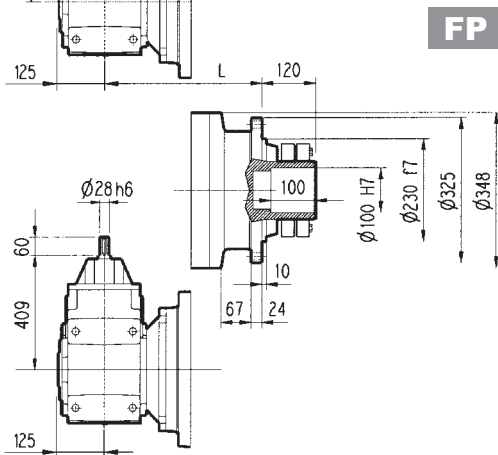
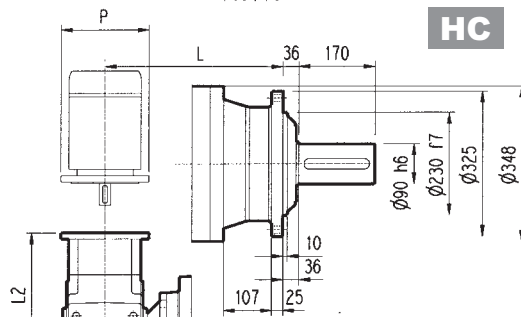
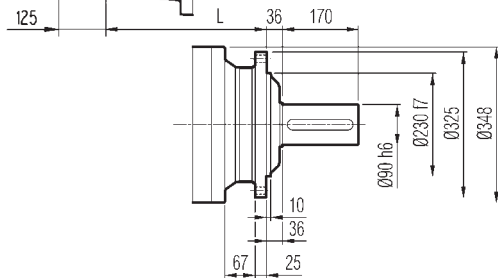
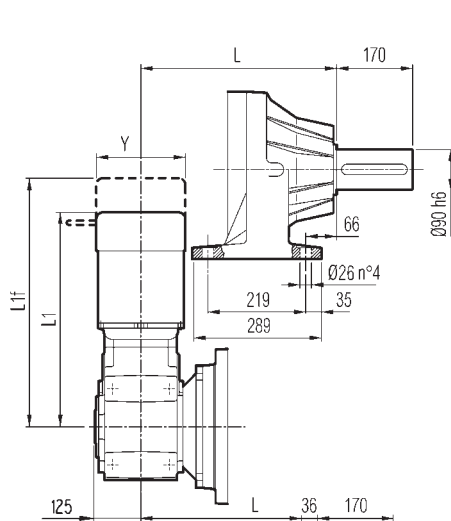
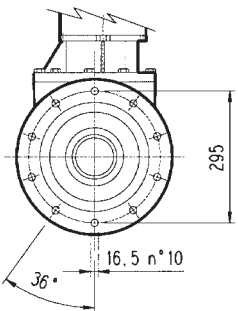
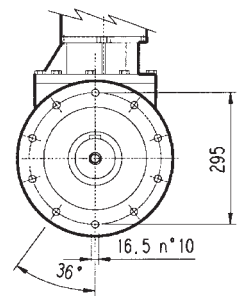
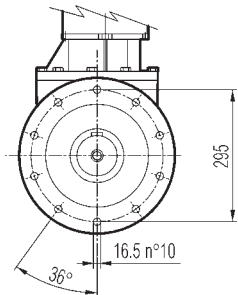
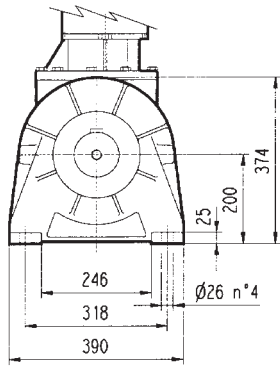
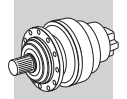
143 : P80-P90
151 : P100-P112



FP

$M_{2max} = 18200 \text{ Nm}$

3/V 07 L3	L				Kg				P80	P90	P100	P112
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	P	P	P	P
	414	495	459	414	130	165	150	130	200	200	250	250
3/V 07 L3	S2 + M2S			S3 + M3S			S3 + M3L					
	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y			
	364	440	156	407	503	193	439	530	193			



PC

PZ

MC

MZ

HC

HZ

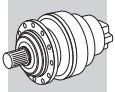
FP

FZ

FP

M_{2max} = 18200 Nm

3/A 07 L2	L								Kg									
	MC - MZ		PC - PZ		HC - HZ		FP - FZ			MC - MZ	PC - PZ	HC - HZ	FP - FZ					
	336		417		381		336		200	230	210	200						
	P80		P90		P100		P112		P132		P160		P180					
3/A 07 L2	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P				
	371	200	371	200	381	250	381	250	416.5	300	468	350	468	350				
	S2 + M2			S3 + M3SA			S3 + M3LA			S4 + M4			S5 + M5S			S5 + M5L		
3/A 07 L2	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
	535	605	156	578.5	674.5	195	610.5	701.5	195	718.5	827.5	258	970	1110	-	1014	1154	-



307 L

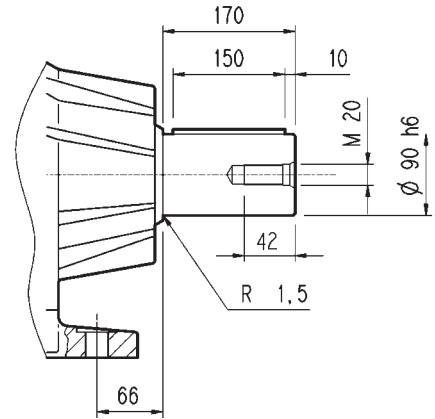
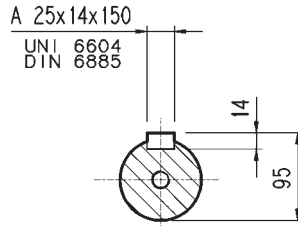
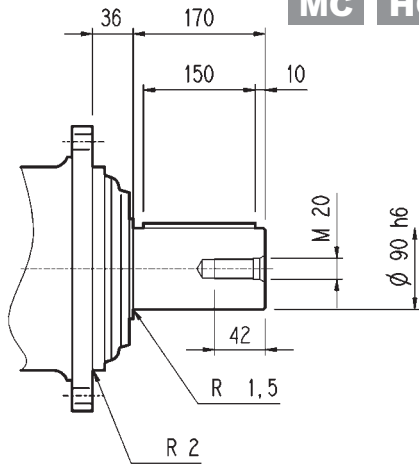
307 R

3/V 07 L3

3/A 07 L2

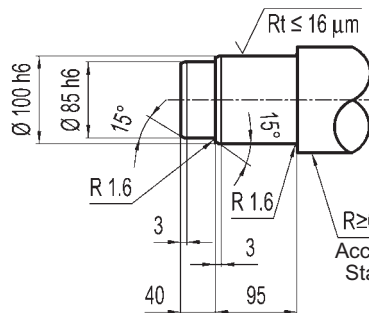
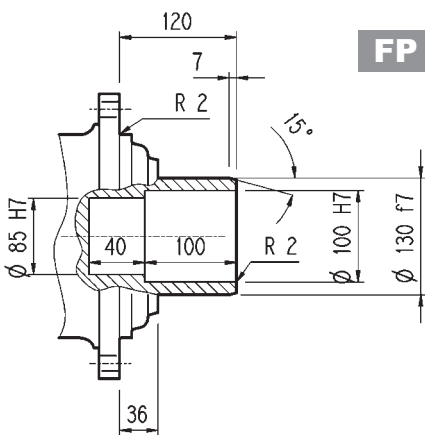
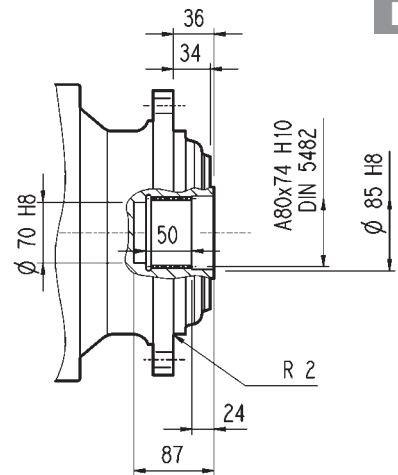
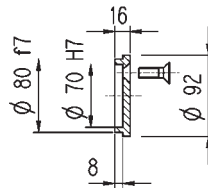
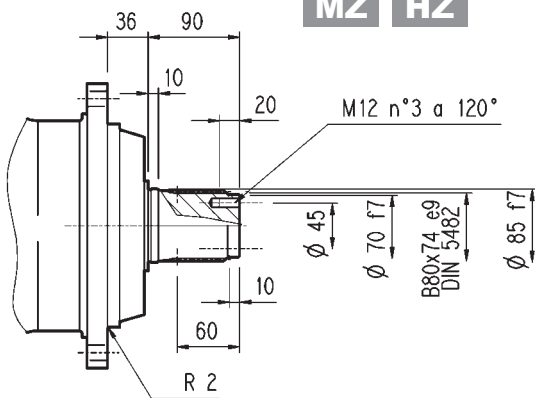
MC HC

PC

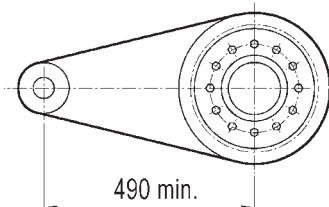
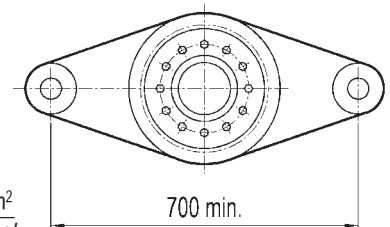


MZ HZ

FZ

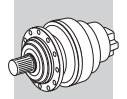
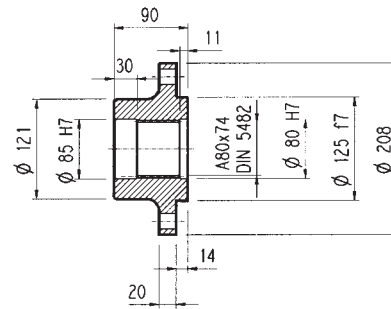
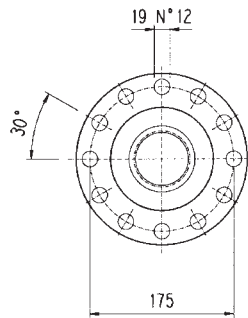
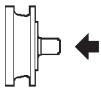


$R \ge 60 \text{ daN/mm}^2$
Acciaio / Steel
Stahl / Acier

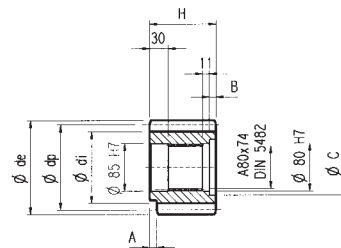
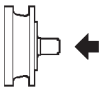


FP

$M_{2max} = 18200 \text{ Nm}$

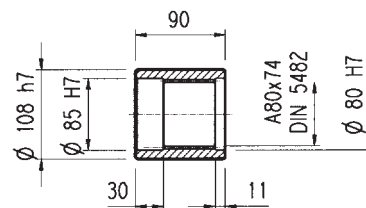
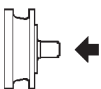
307 L**307 R****3/V 07 L3****3/A 07 L2**
Flangia / Flange
Flansch / Brides
W0A

Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

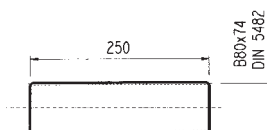
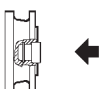
Pignoni / Pinion gears
Ritzel / Pignons
P...

	m	z	x	dp	di	de	H	A	B	C	☆
PFG	8	16	0.500	128	117	149.5	90	0	0	0	□
PHC	10	12	0.450	120	104	145	90	0	0	0	□
PHE	10	14	0.320	140	121	165	116	13	26	95	□
PHF	10	15	0.150	150	130	171.5	107	20	17	100	□
PHG	10	16	0.500	160	145	186	90	0	0	0	■
PHH1	10	17	0	170	145	189	90	0	0	0	■
PHH2	10	17	0.500	170	154	198	90	0	0	0	■
PLD	12	13	0.500	156	138	192	102	0	12	95	□
PLE	12	14	0.500	168	150	199.2	90	0	0	0	□
PLI	12	18	0.500	216	198	249.6	107	7	17	95	□
PLT	12	26	0	312	282	336	90	10	0	0	■

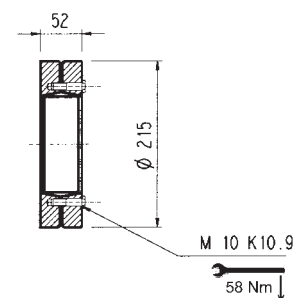
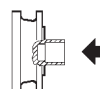
☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifiée 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cimenté et tempré 18NiCrMo5

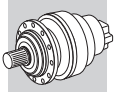
Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure
MOA

Materiale : Acciaio 16CrNi4
 Material : Steel 16CrNi4
 Material : Stahl 16CrNi4
 Matière : Acier 16CrNi4

Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée
B0A

Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
 Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
 Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
 Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

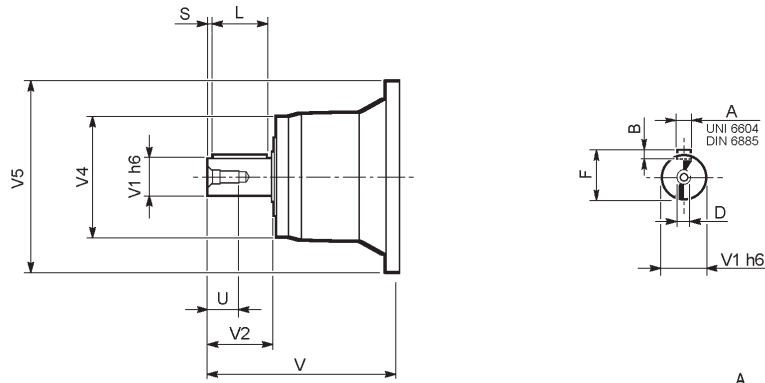
Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage
G0A



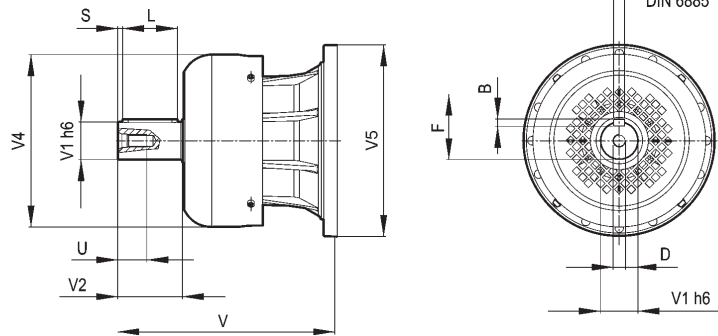
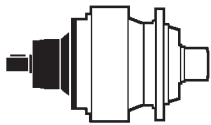
307 L

307 R

V

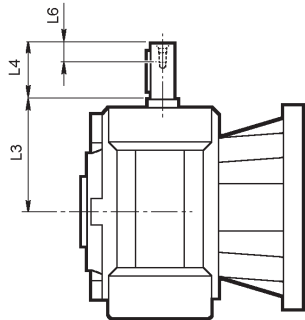
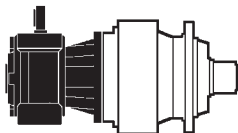
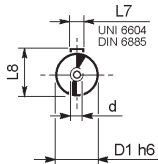


FV

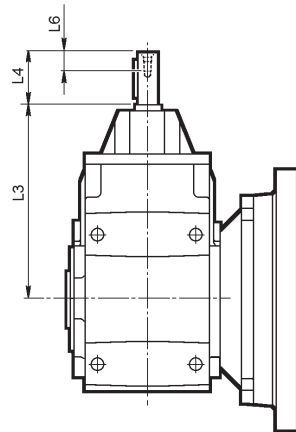
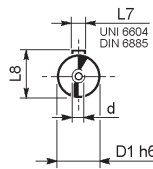


	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
307 L1	V07B	315	80	130	200	345	22	14	85	110	10	M16	36
	FV07B	375	80	130	347.5	348	22	14	85	110	10	M16	36
	V07A	313	60	105	155	345	18	11	64	90	7.5	M16	36
	FV07A	363	60	105	309	348	18	11	64	90	7.5	M16	36
307 L2	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
307 L3	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
307 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
307 R2	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
307 R3-R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

3/V 07 L3

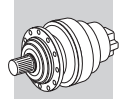


3/A 07 L2



	D1 h6	L3	L4	L6	L7	L8	d
3/V 07 L3_HS	25	168	60	19	8	28	M8

	D1 h6	L3	L4	L6	L7	L8	d
3/A 07 L2_HS	28	409	60	22	8	31	M10

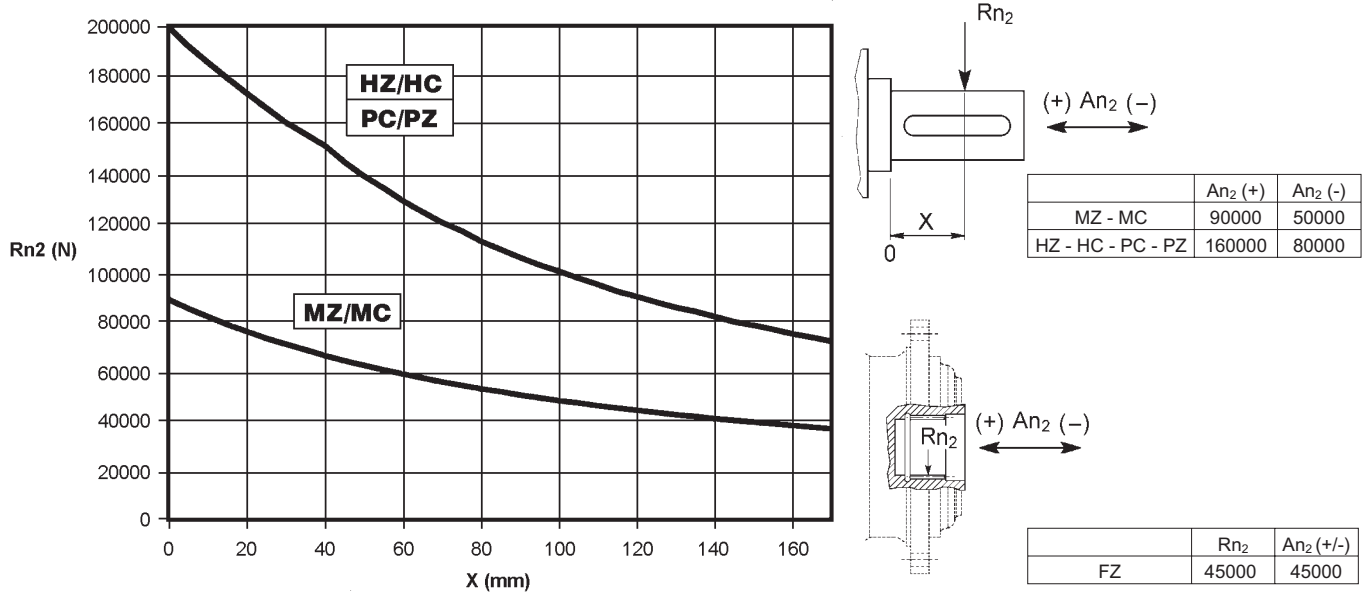


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $Fh_2 : n_2 \cdot h = 10000$

Permissible radial and axial loads on output shaft with $Fh_2 : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $Fh_2 : n_2 \cdot h = 10000$

Charges radiales et axiales admises sur l'arbre lent pour une valeur de $Fh_2 : n_2 \cdot h = 10000$



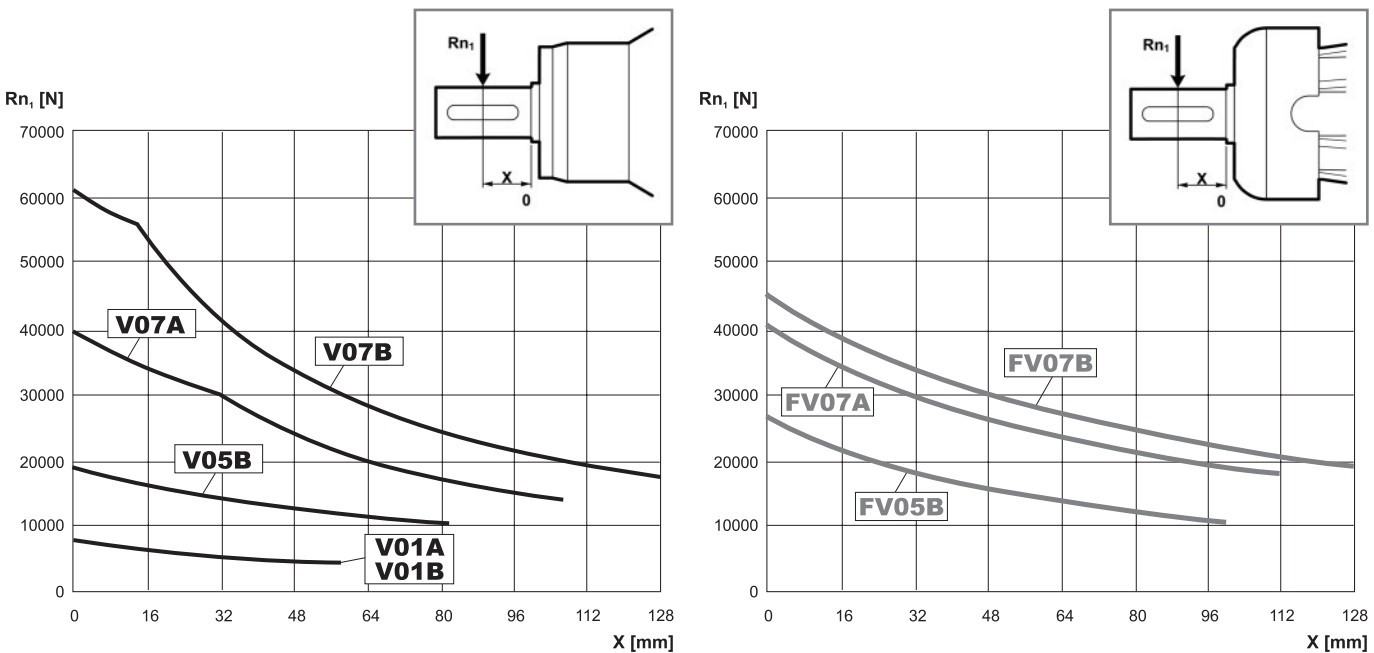
Fattore fh_2 correttivo per carichi sugli alberi Load corrective factor fh_2 on shafts Korrektionsfaktor fh_2 für wellenbelastungen Facteur de correction fh_2 pour charges sur les arbres	$Fh_2 = n_2 \cdot h$							
		10000	25000	50000	100000	500000	1000000	
fh_2	MZ - MC - FZ	1	0.74	0.58	0.46	0.27	0.21	
	HZ - HC - PC - PZ	1	0.76	0.61	0.50	0.31	0.25	

Carichi radiali ammissibili sull'albero veloce per un valore di $Fh_1 : n_1 \cdot h = 250000$

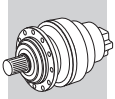
Permissible radial loads on input shaft with $Fh_1 : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $Fh_1 : n_1 \cdot h = 250000$

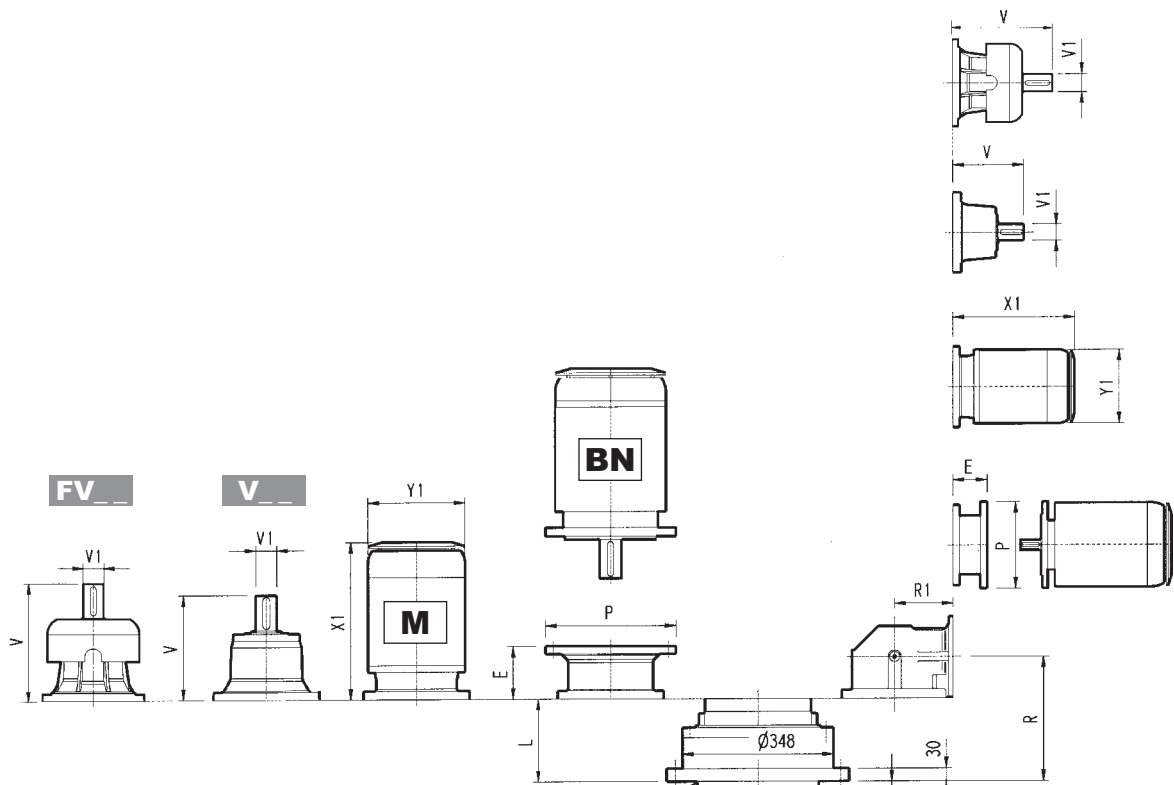
Charges radiales admises sur l'arbre d'entrée pour une valeur de $Fh_1 : n_1 \cdot h = 250000$



Fattore fh_1 correttivo per carichi sugli alberi Load corrective factor fh_1 on shafts Korrektionsfaktor fh_1 für wellenbelastungen Facteur de correction fh_1 pour charges sur les arbres	$Fh_1 = n_1 \cdot h$						
		250000	500000	1000000	2000000	5000000	10000000
fh_1	1	0.79	0.63	0.50	0.37	0.29	



307_VK



307 L_VK

307 R_VK

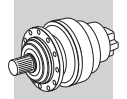
LINGUETTA / KEY A 32x18x200
UNI 6604-69 / DIN 6885

	L													P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250			
		Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P					
307 L1	80	145	315	80	35	313	60	28	375	80	48	363	60	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
307 L2	169	160	239	48	15	-	-	-	276	48	17	-	-	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-	-	
307 L3	234	170	137.5	24	6	158	38	7	-	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-	
307 L4	287	175	137.5	24	6	158	38	7	-	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-	-

	R	R1													P71		P80		P90		P100		P112		P132		P160		P180		P200				
			Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	E	P	E	P	E	P	E	P	E	P	E	P	E	P				
307 R2	199	225	180	239	48	15	-	-	-	276	48	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	
307 R3	261	140	170	137.5	24	6	158	38	7	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	
307 R4	326	122	175	137.5	24	6	158	38	7	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-

	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
307 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
307 L2	-	-	-	-	-	-	-	-	-	-	-	-	460	571	258	552	692	310	596	736	310
307 L3	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
307 L4	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-

	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
307 R2	-	-	-	-	-	-	-	-	-	-	-	-	508	619	258	552	692	310	596	736	310
307 R3	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258	-	-	-	-	-	-
307 R4	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258	-	-	-	-	-	-



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 307_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 307_VK, with radial force applying at a distance x from shaft shoulder.

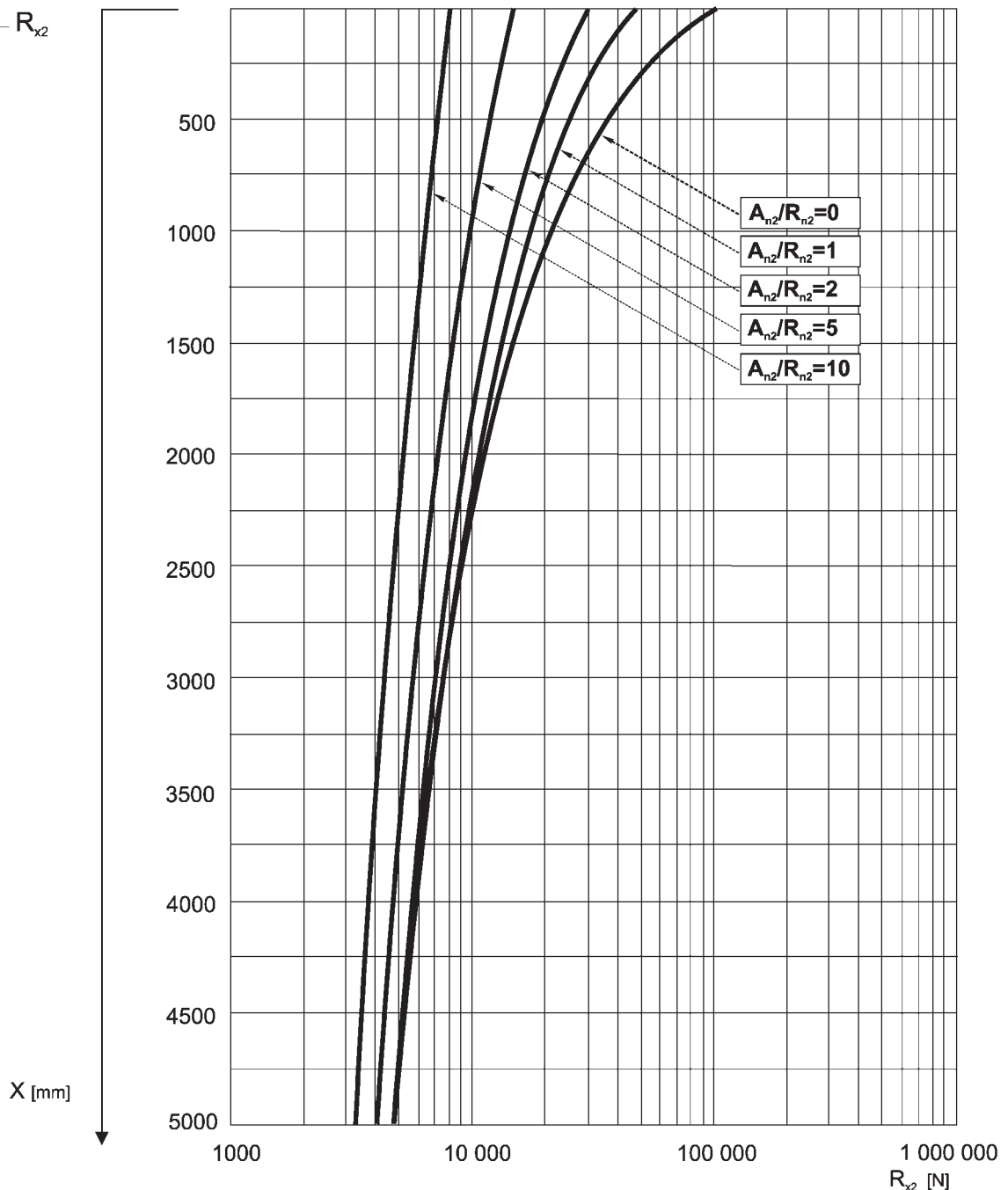
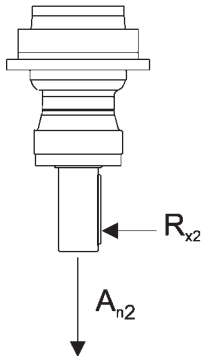
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

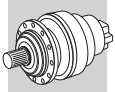
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 307_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

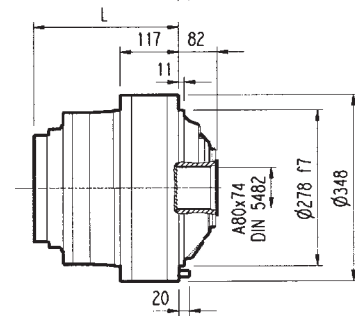
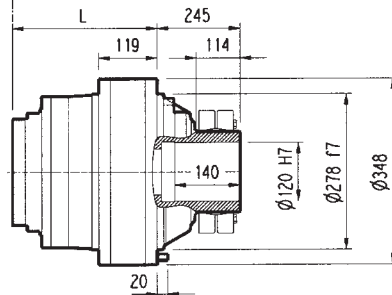
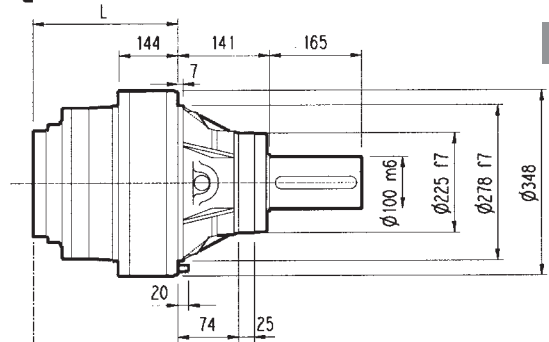
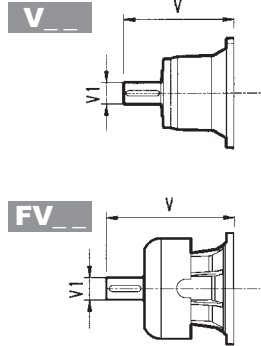
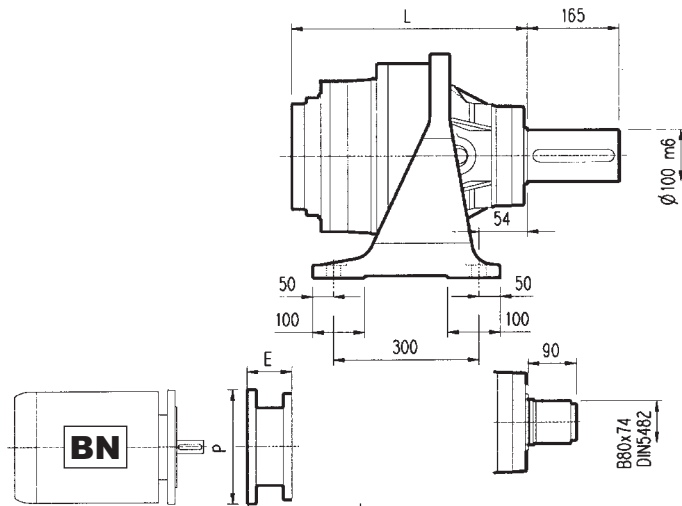
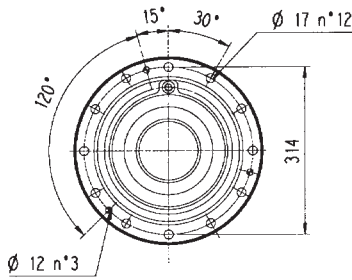
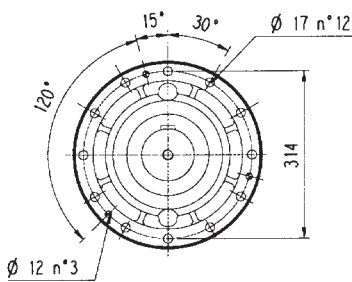
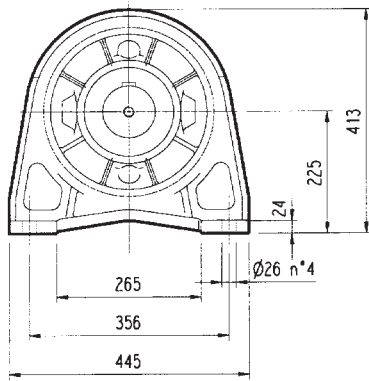
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 307_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.





309 L



PC

HZ PZ

HC

FP

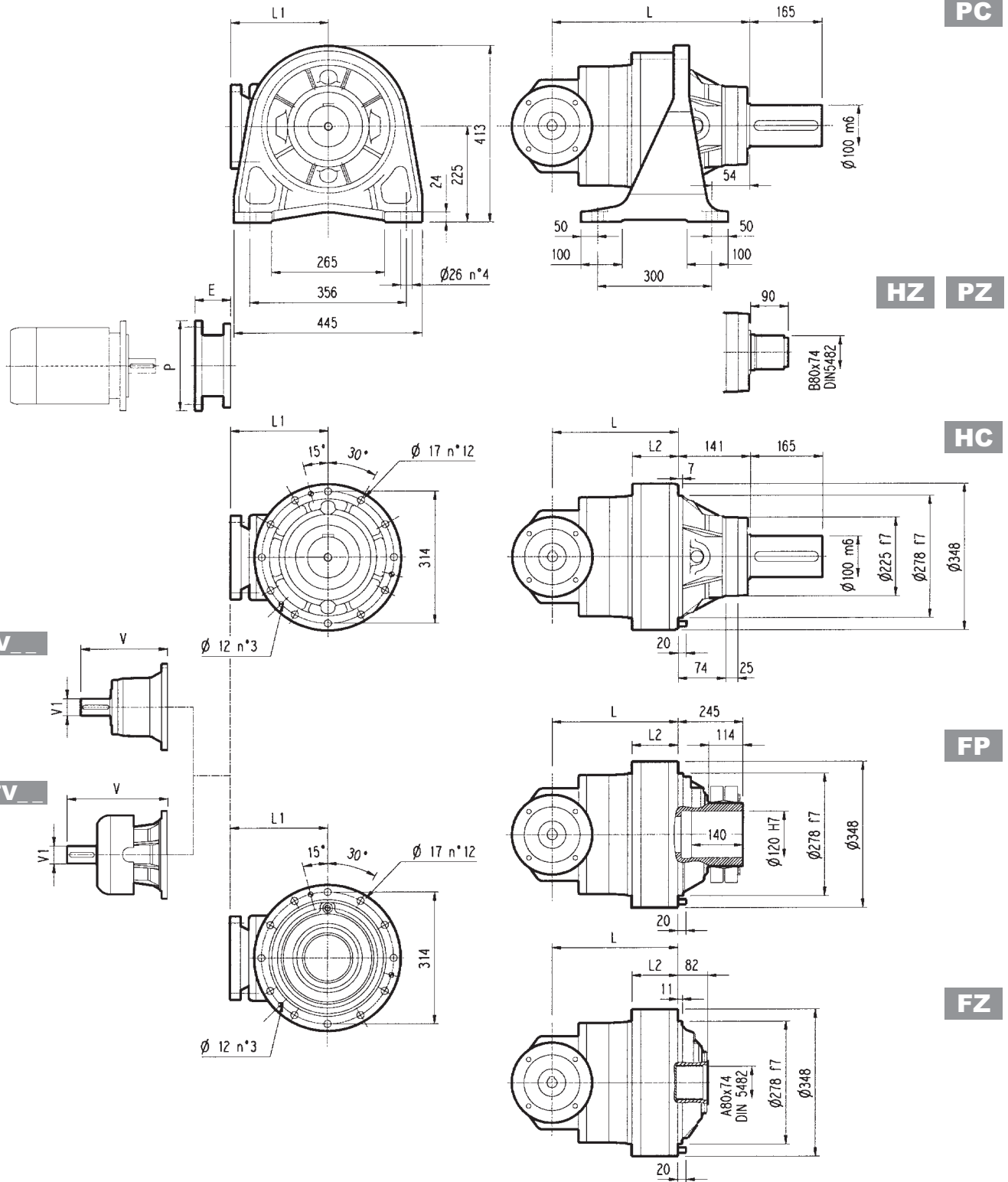
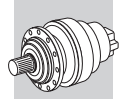
FZ

FP

$M_{2max} = 29000 \text{ Nm}$

	L				Kg				Kg						Kg					
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
309 L1	267	126	99	101	130	115	95	100	315	80	35	313	60	28	375	80	48	363	60	34
309 L2	356	215	188	190	142	127	107	112	239	48	15	-	-	-	276	48	17	-	-	-
309 L3	421	280	253	255	149	134	114	119	137.5	24	6	158	38	7	-	-	-	-	-	-
309 L4	474	333	306	308	153	138	118	123	137.5	24	6	158	38	7	-	-	-	-	-	-

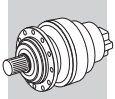
	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
309 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	195	350	186	400	216	450	216	550
309 L2	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
309 L3	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-
309 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-



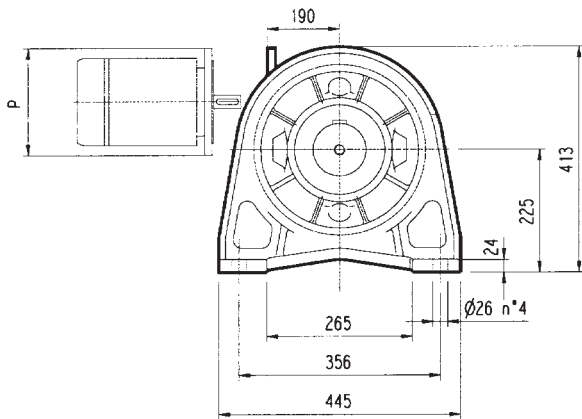
FP $M_{2max} = 29000 \text{ Nm}$

	L				L1	L2			Kg				Kg				Kg							
	PC-PZ	HC-HZ	FZ	FP		HC-HZ	FZ	FP	PC-PZ	HC-HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
309 R2	386	245	218	220	225	168	141	143	180	165	145	150	239	48	15	-	-	-	276	48	17	-	-	-
309 R3	448	307	280	282	140	144	117	119	162	147	127	132	137.5	24	6	158	38	7	-	-	-	-	-	-
309 R4	513	372	345	347	122	144	117	119	163	148	128	133	137.5	24	6	158	38	7	-	-	-	-	-	-

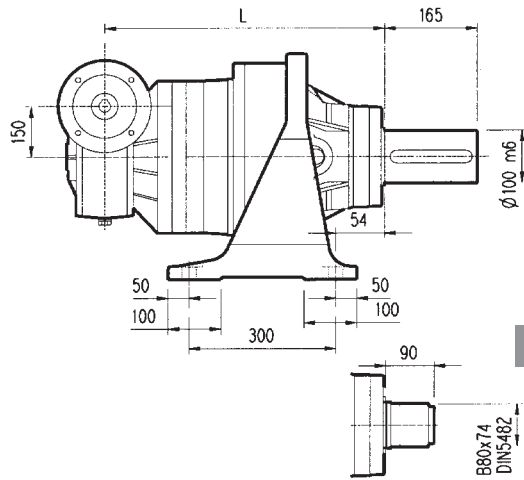
	P71		P80		P90		P100		P112		P132		P160		P180		P200	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
309 R2	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400
309 R3	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-
309 R4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-



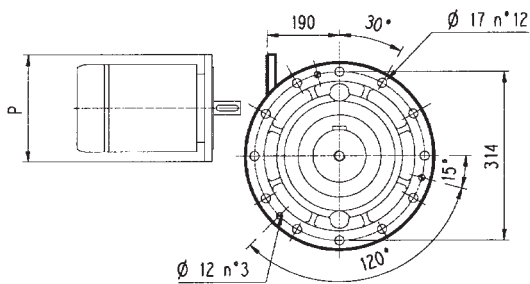
3/V 09 L3



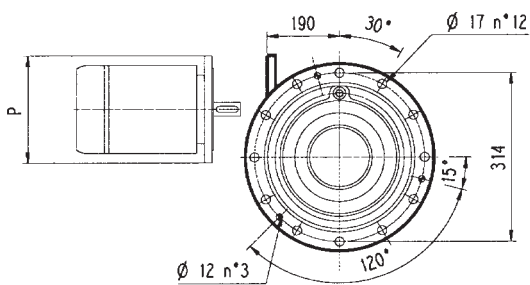
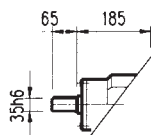
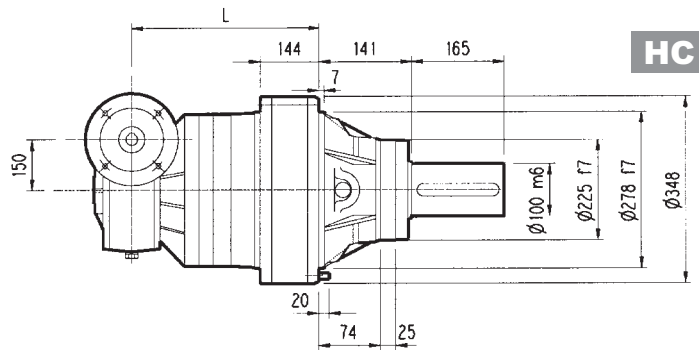
PC



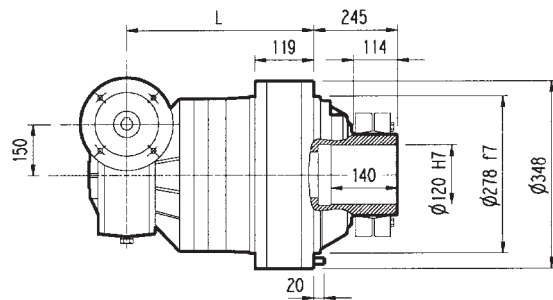
HZ PZ



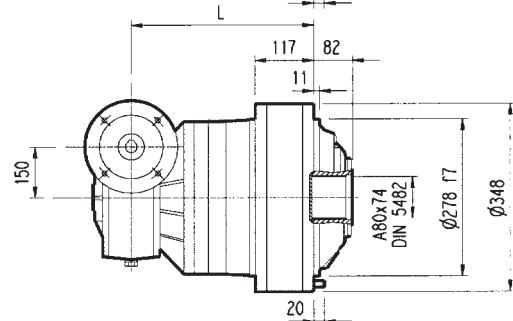
HC



FP

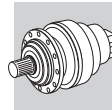


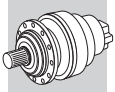
FZ



FP $M_{2max} = 29000 \text{ Nm}$

3/V 09 L3	L				Kg				P100	P112	P132	P160
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	P	P	P	P
	530	389	362	364	202	187	167	172	250	250	300	350

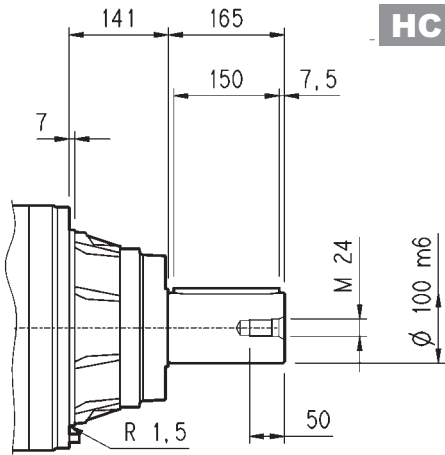




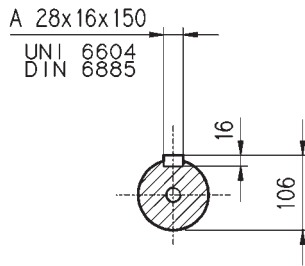
309 L

309 R

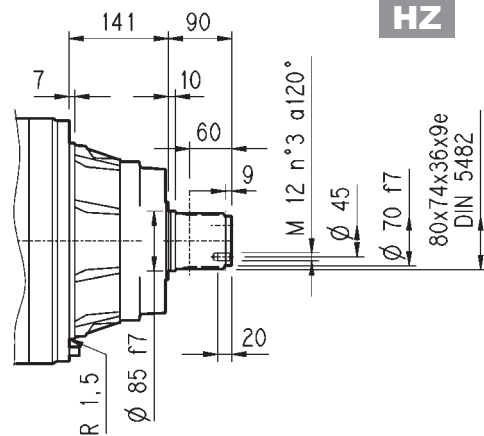
3/V 09 L3



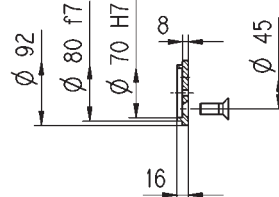
HC



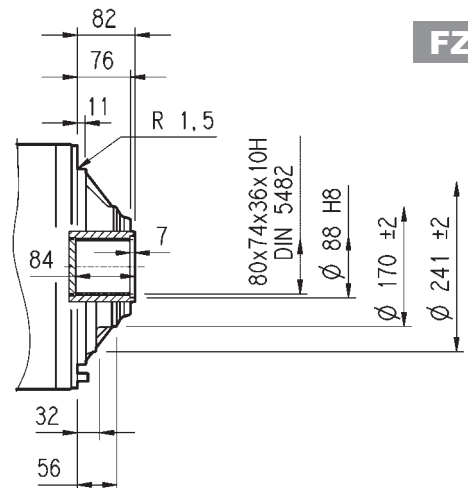
PC



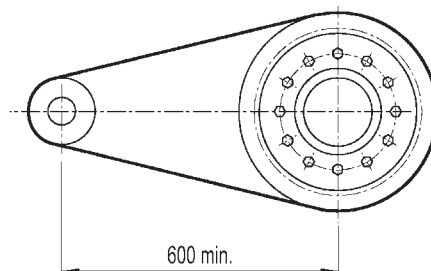
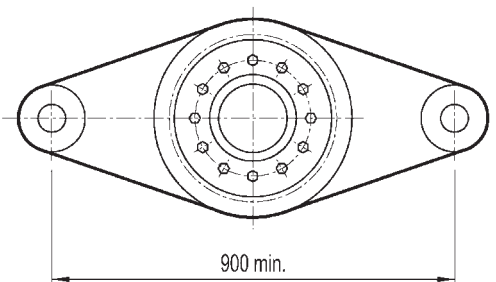
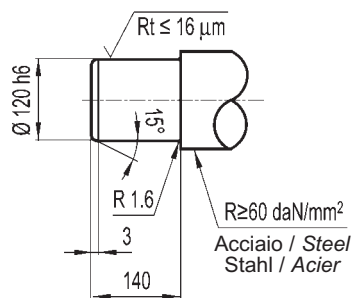
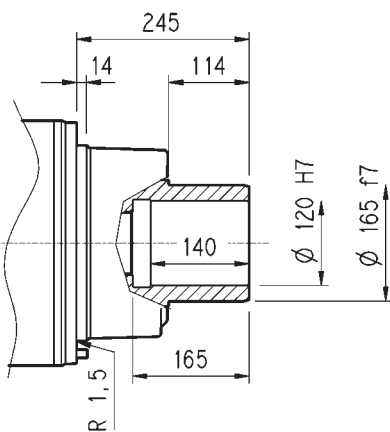
HZ



FZ

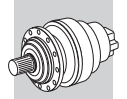


FP

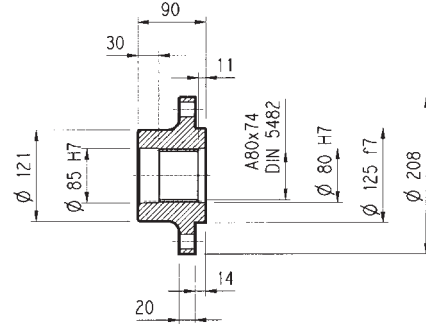
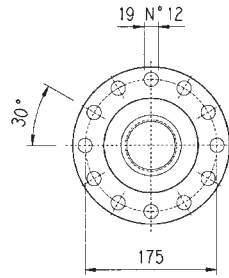
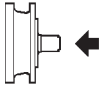


FP

$M_{2max} = 29000\text{ Nm}$


Flangia / Flange
Flansch / Brides

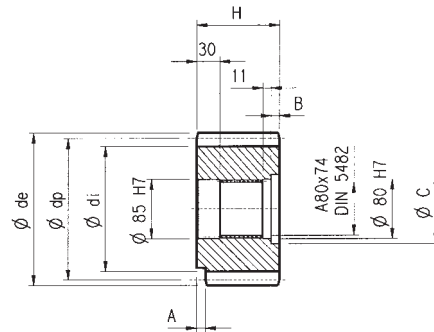
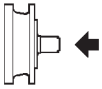
W0A



Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

Pignoni / Pinion gears
Ritzel / Pignons

P...

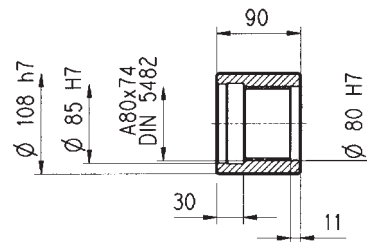
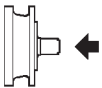


	m	z	x	dp	di	de	H	A	B	C	☆
PFG	8	16	0.500	128	117	149.5	90	0	0	0	□
PHC	10	12	0.450	120	104	145	90	0	0	0	□
PHE	10	14	0.320	140	121	165	116	13	26	95	□
PHF	10	15	0.150	150	130	171.5	107	20	17	100	□
PHG	10	16	0.500	160	145	186	90	0	0	0	■
PHH1	10	17	0	170	145	189	90	0	0	0	■
PHH2	10	17	0.500	170	154	198	90	0	0	0	■
PLD	12	13	0.500	156	138	192	102	0	12	95	□
PLE	12	14	0.500	168	150	199.2	90	0	0	0	□
PLI	12	18	0.500	216	198	249.6	107	7	17	95	□
PLT	12	26	0	312	282	336	90	10	0	0	■

☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifié 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cimenté et trempé 18NiCrMo5

Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure

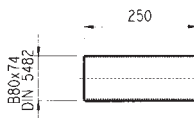
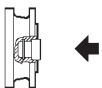
MOA



Materiale : Acciaio 16CrNi4
 Material : Steel 16CrNi4
 Material : Stahl 16CrNi4
 Matière : Acier 16CrNi4

Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée

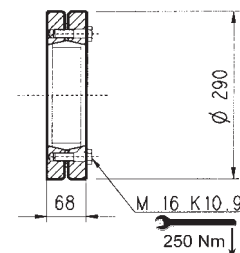
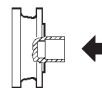
B0A

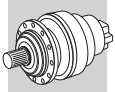


Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
 Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
 Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
 Acier 18 NiCrMo5 UNI 5331 doit être cimenté trempé 50-55 HRC

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

GOA

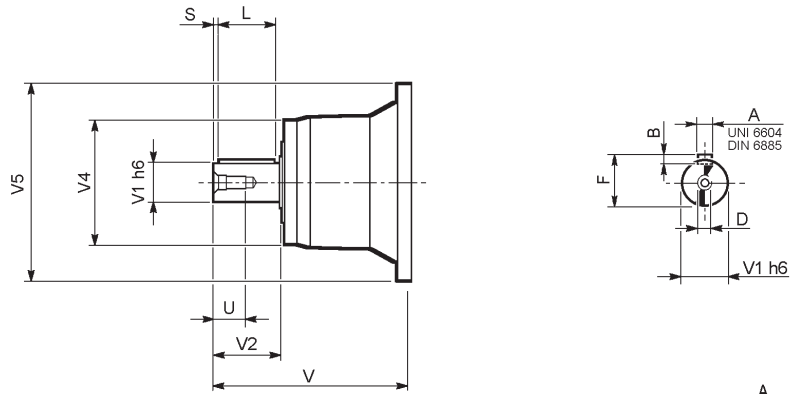




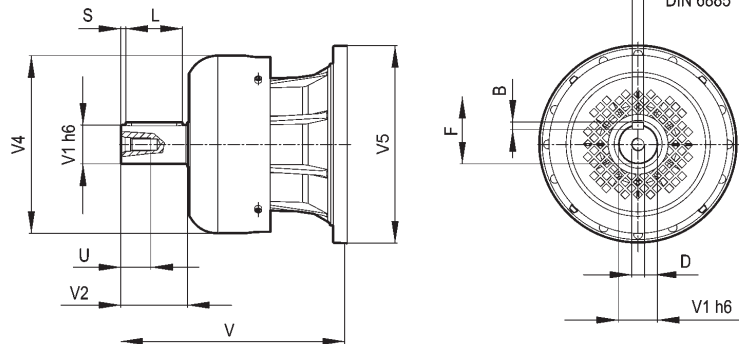
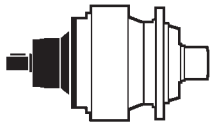
309 L

309 R

V _ _

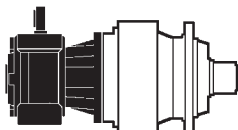
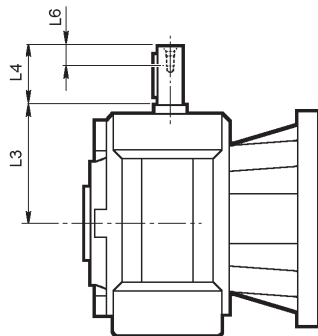
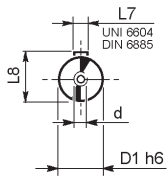


FV _ _

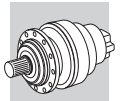


	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
309 L1	V07B	315	80	130	200	345	22	14	85	110	10	M16	36
	FV07B	375	80	130	347.5	348	22	14	85	110	10	M16	36
	V07A	313	60	105	155	345	18	11	64	90	7.5	M16	36
	FV07A	363	60	105	309	348	18	11	64	90	7.5	M16	36
309 L2	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
309 L3	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
309 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
309 R2	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
309 R3-R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

3/V 09 L3



	D1 h6	L3	L4	L6	L7	L8	d
3/V 09 L3_HS	35	185	65	20	10	38	M8

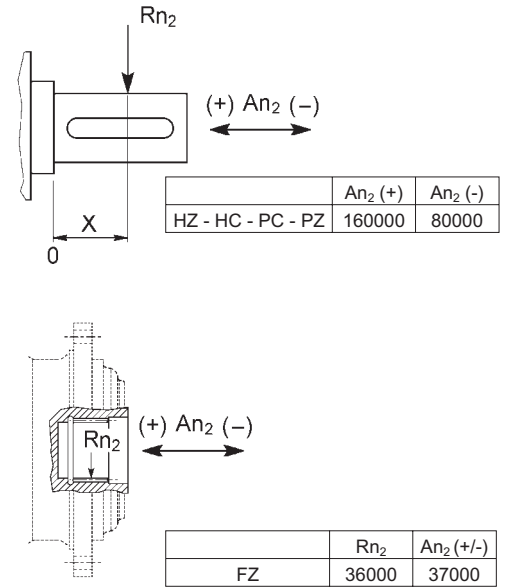
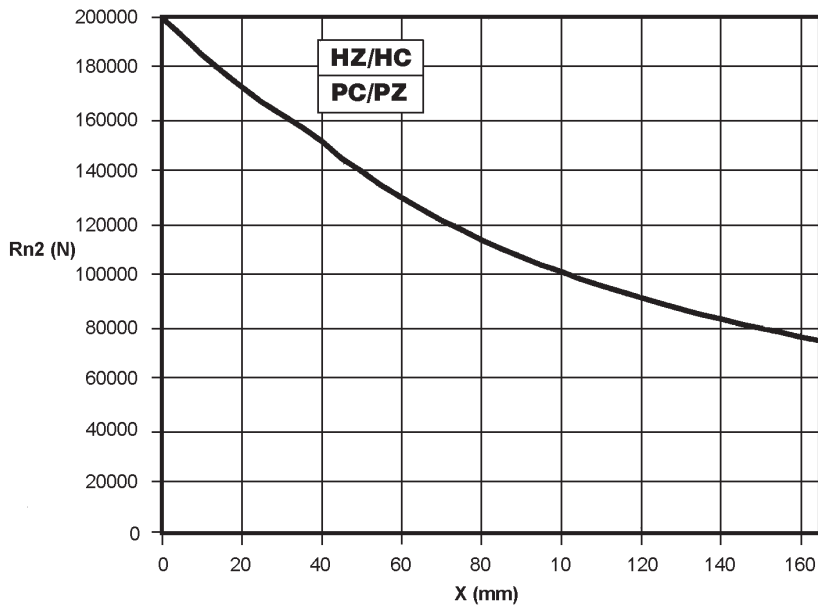


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $Fh_2 : n_2 \cdot h = 10000$

Permissible radial and axial loads on output shaft with $Fh_2 : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $Fh_2 : n_2 \cdot h = 10000$

Charges radiales et axiales admises sur l'arbre lent pour une valeur de $Fh_2 : n_2 \cdot h = 10000$



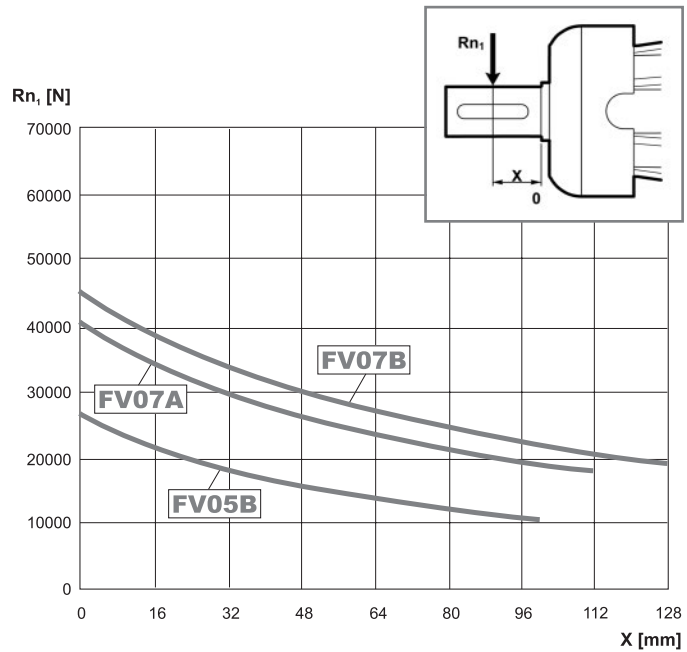
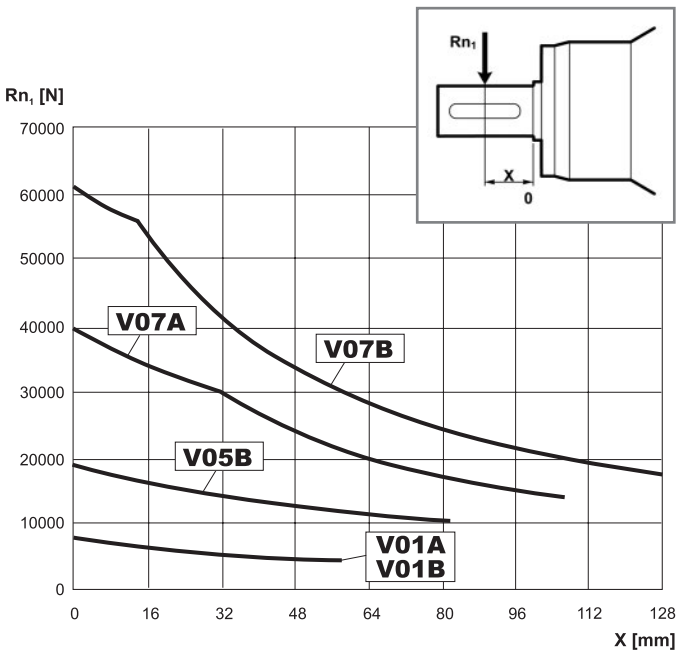
Fattore fh_2 correttivo per carichi sugli alberi Load corrective factor fh_2 on shafts Korrektionsfaktor fh_2 für wellenbelastungen Facteur de correction fh_2 pour charges sur les arbres		$Fh_2 = n_2 \cdot h$	10000	25000	50000	100000	500000	1000000
	fh_2	MZ - MC - FZ	1	0.74	0.58	0.46	0.27	0.21
		HZ - HC - PC - PZ	1	0.76	0.61	0.50	0.31	0.25

Carichi radiali ammissibili sull'albero veloce per un valore di $Fh_1 : n_1 \cdot h = 250000$

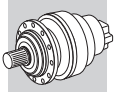
Permissible radial loads on input shaft with $Fh_1 : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $Fh_1 : n_1 \cdot h = 250000$

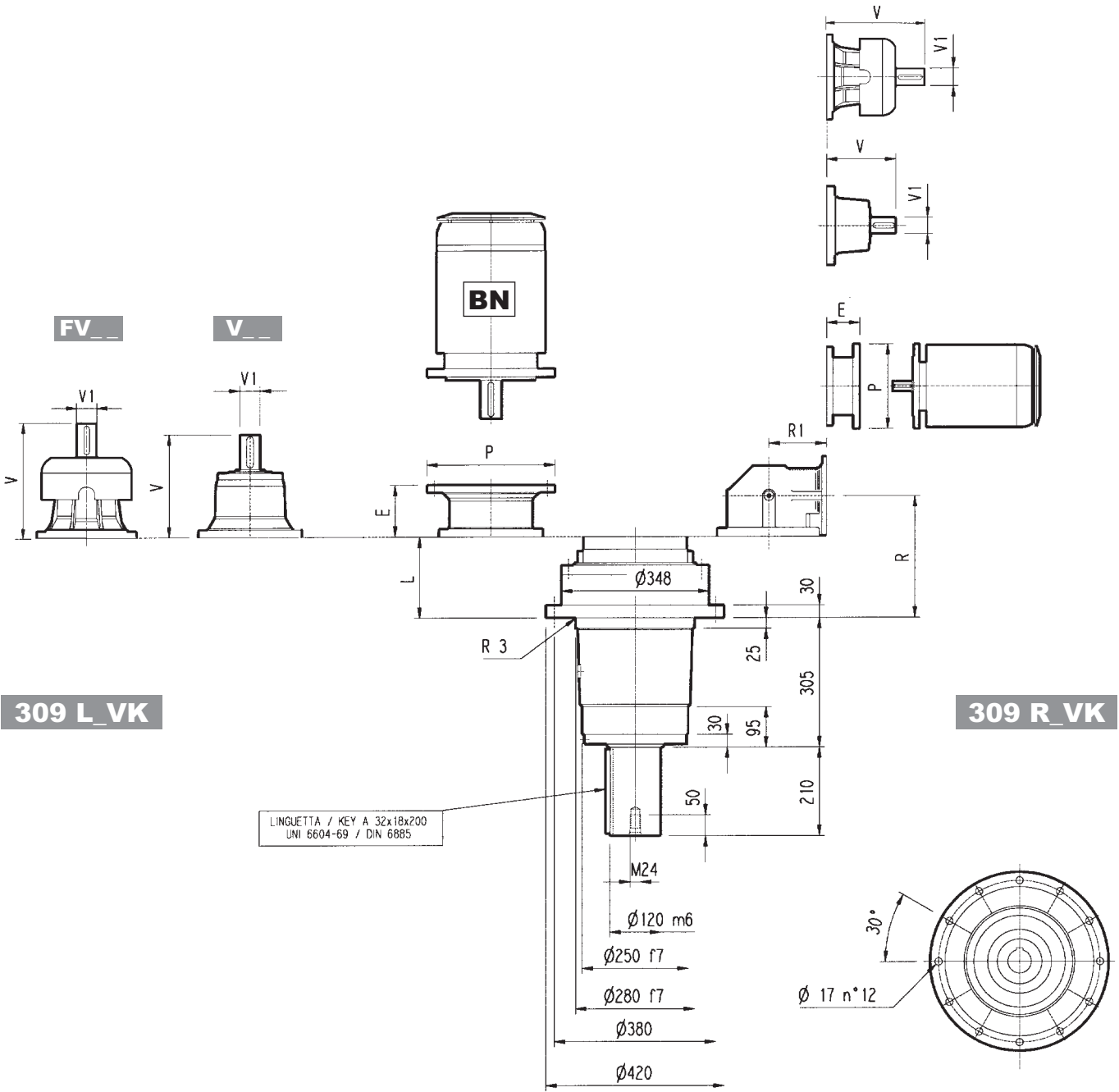
Charges radiales admises sur l'arbre d'entrée pour une valeur de $Fh_1 : n_1 \cdot h = 250000$



Fattore fh_1 correttivo per carichi sugli alberi Load corrective factor fh_1 on shafts Korrektionsfaktor fh_1 für wellenbelastungen Facteur de correction fh_1 pour charges sur les arbres		$Fh_1 = n_1 \cdot h$	250000	500000	1000000	2000000	5000000	10000000
	fh_1	1	0.79	0.63	0.50	0.37	0.29	



309_VK



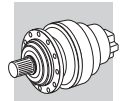
309 L_VK

309 R_VK

	L														
		kg		V	V1	kg	V	V1	kg	V	V1	kg	V	V1	kg
309 L1	102	165		315	80	35	313	60	28	375	80	48	363	60	34
309 L2	191	180		239	48	15	-	-	-	276	48	-	-	-	-
309 L3	256	190		137.5	24	6	158	38	7	-	-	-	-	-	-
309 L4	309	195		137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
309 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	195	350	186	400	216	450	216	450
309 L2	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
309 L3	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-
309 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-

	R	R1										P71		P80		P90		P100		P112		P132		P160		P180		P200		
			kg	V	V1	kg	V	V1	kg	V	V1	kg	V	V1	kg	V	V1	kg	V	V1	kg	V	V1	kg	V	V1	kg	V	V1	kg
309 R2	221	225	200	239	48	15	-	-	-	276	48	17	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400
309 R3	283	140	190	137.5	24	6	158	38	7	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-
309 R4	348	122	195	137.5	24	6	158	38	7	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 309_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 309_VK, with radial force applying at a distance x from shaft shoulder.

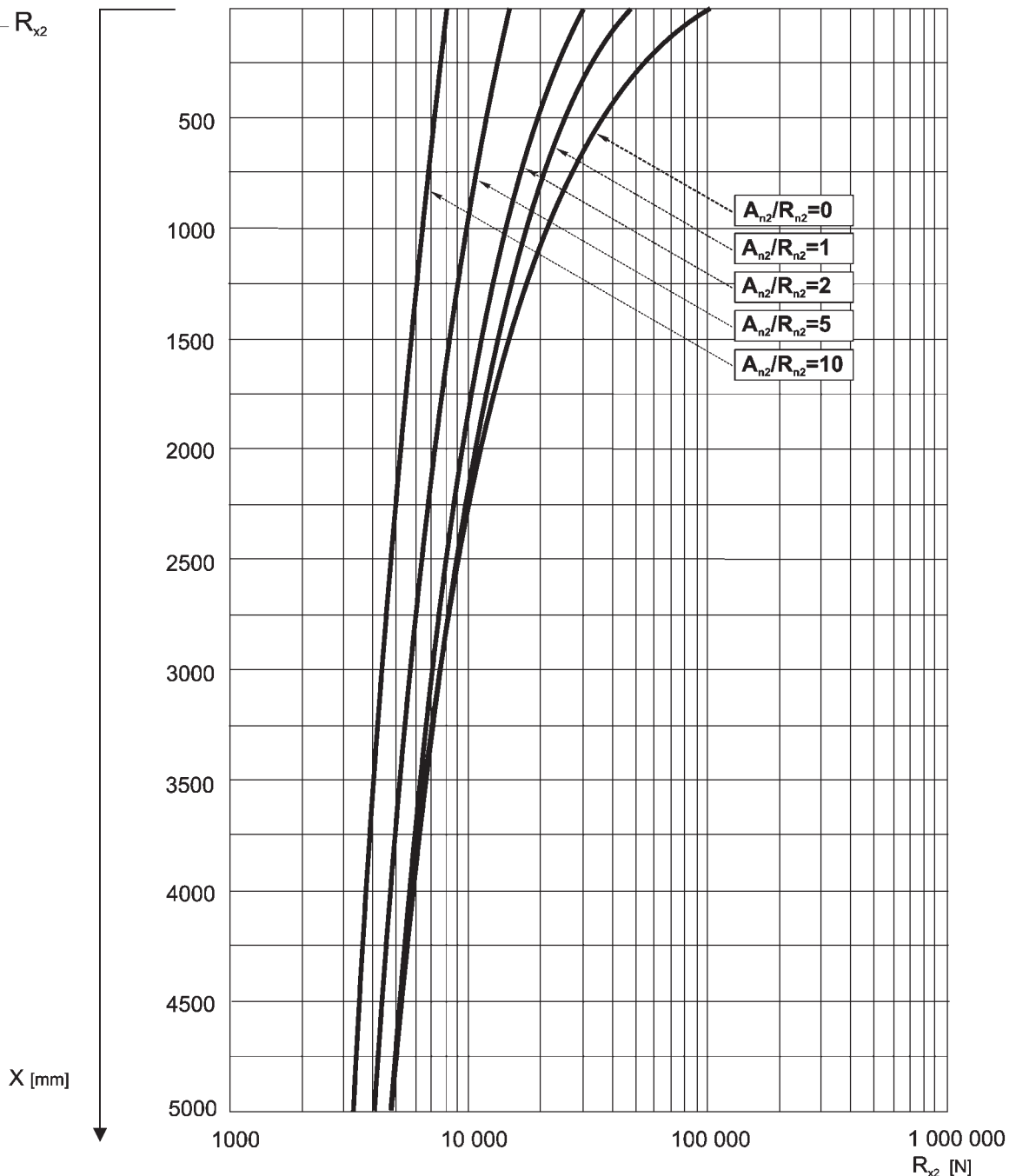
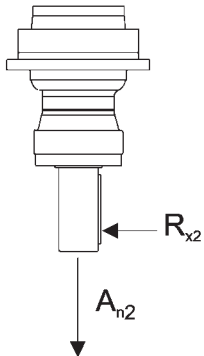
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

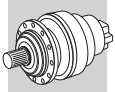
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 309_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

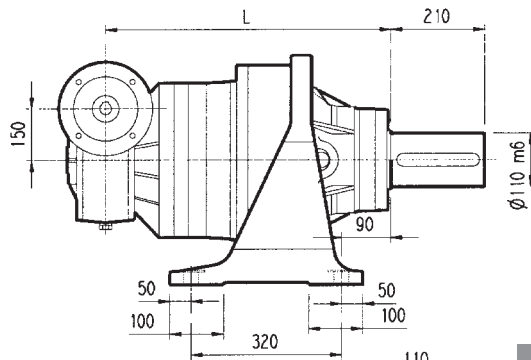
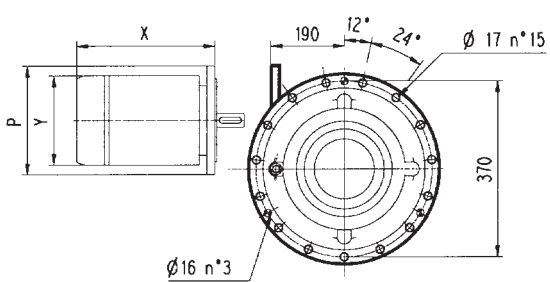
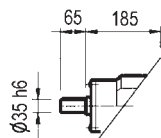
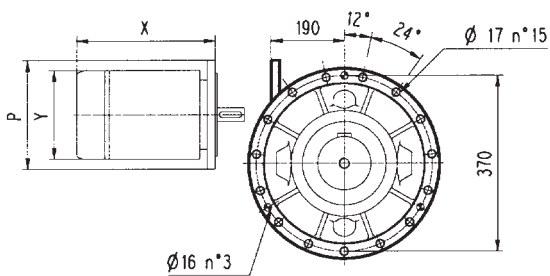
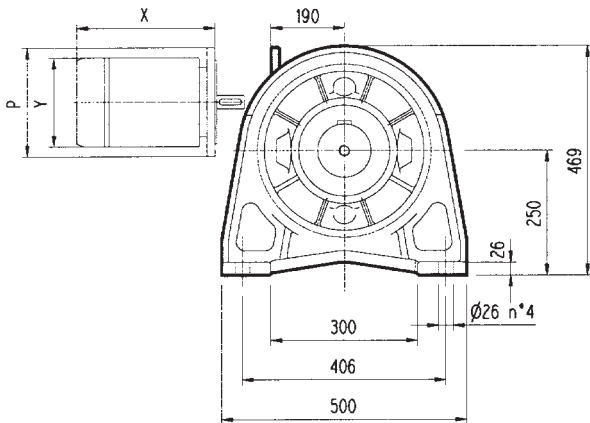
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 309_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.

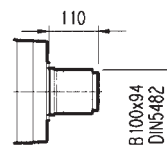




3/V 10 L3

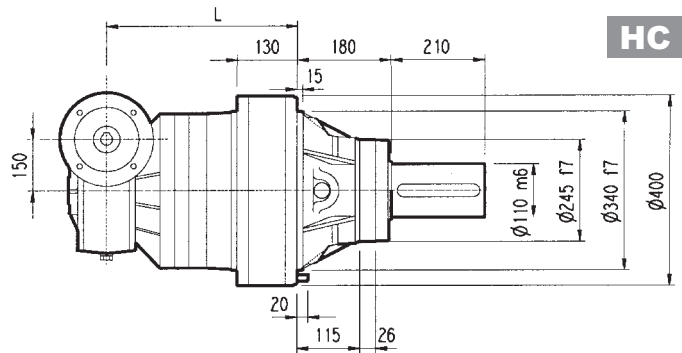


PC

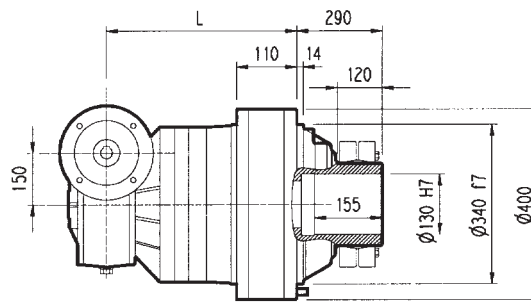


HZ

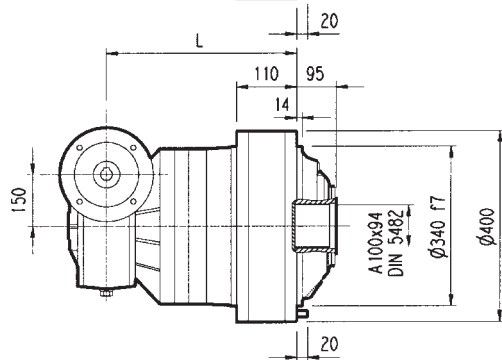
PZ



HC



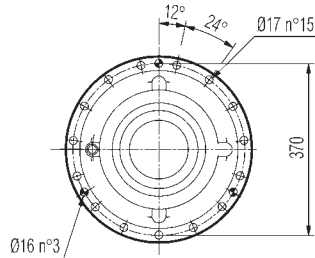
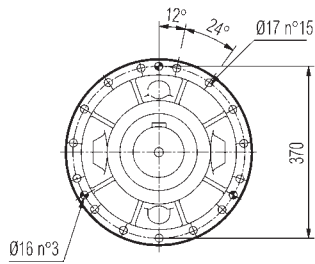
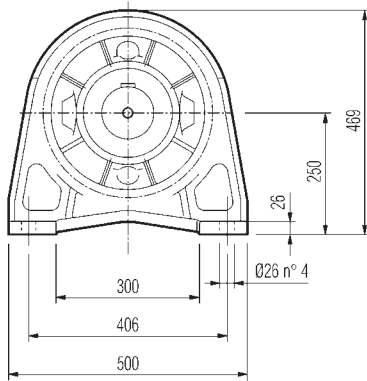
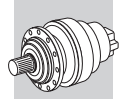
FP



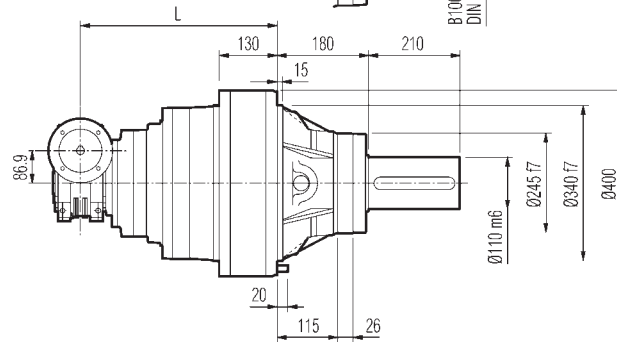
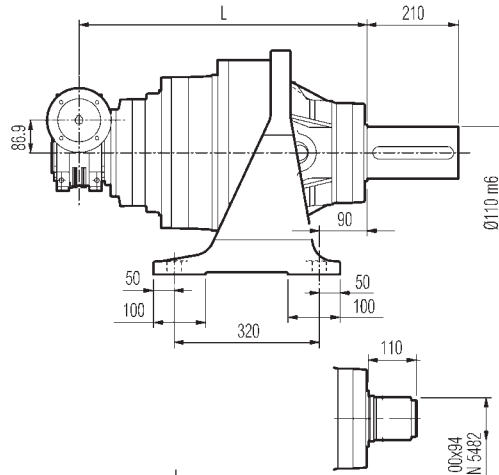
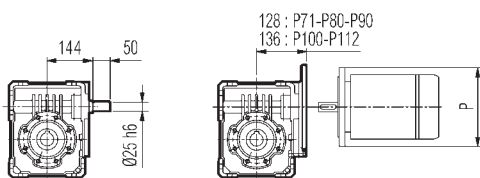
FZ

FP $M_{2max} = 44000 \text{ Nm}$

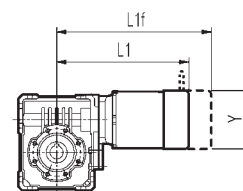
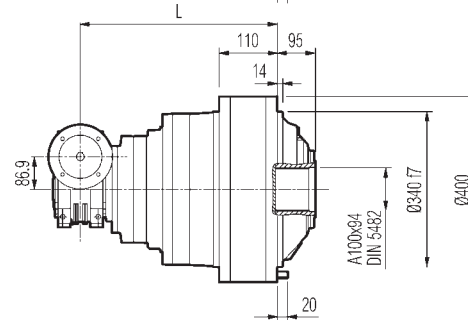
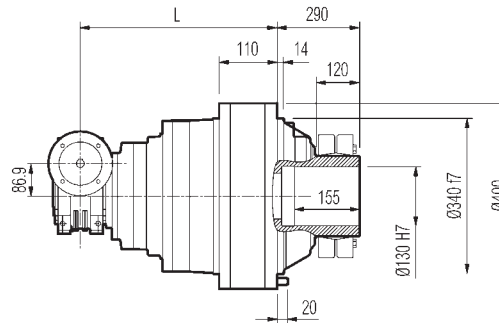
3/V 10 L3	L				$\overset{\circ}{\text{Kg}}$				P71	P80	P90	P100	P112	P132	P160
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	P	P	P	P	P	P	P
	608	428	408	408	245	225	200	205	-	-	-	250	250	300	300



Vista da A
View from A



A →



PC

HZ PZ

HC

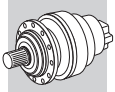
FP

FZ

FP

$M_{2max} = 44000 \text{ Nm}$

3/V 10 L4	L					Kg											
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP									
	634	454	434	434	210	190	165	170									
3/V 10 L4	P71	P80	P90	P100	P112	S1 + M1			S2 + M2S			S3 + M3S			S3 + M3L		
	P	P	P	P	P	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
	160	200	200	250	250	324	385	138	349	425	156	392	477	193	424	515	193



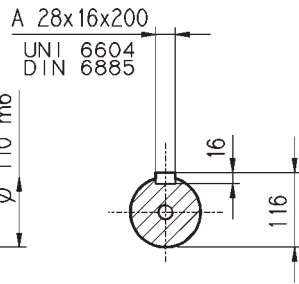
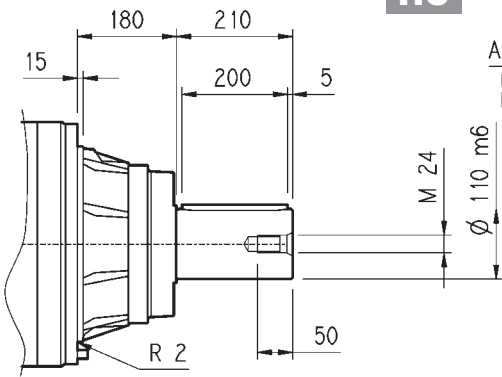
310 L

310 R

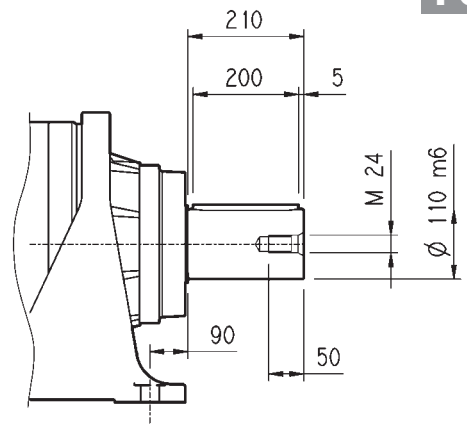
3/V 10 L3

3/V 10 L4

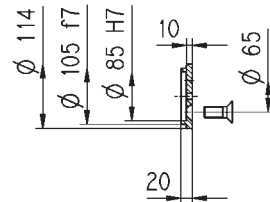
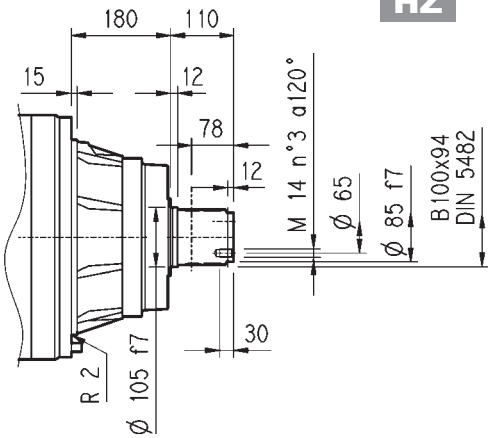
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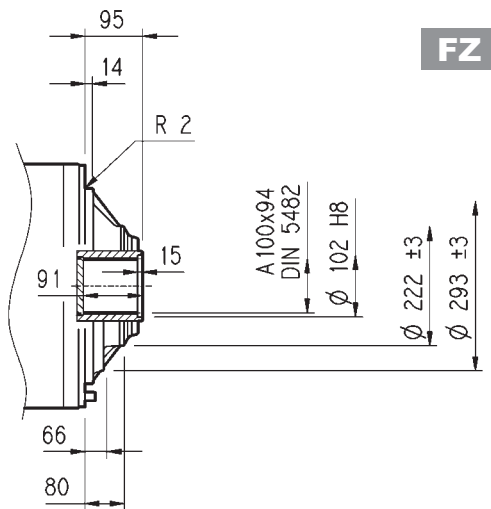
PC



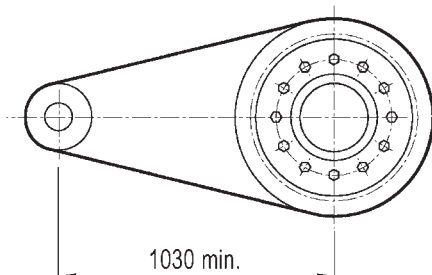
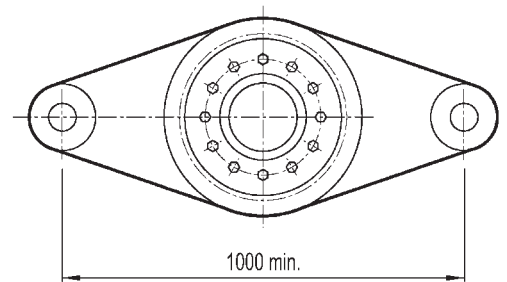
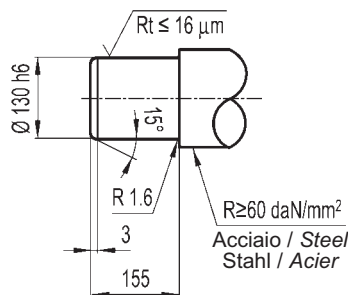
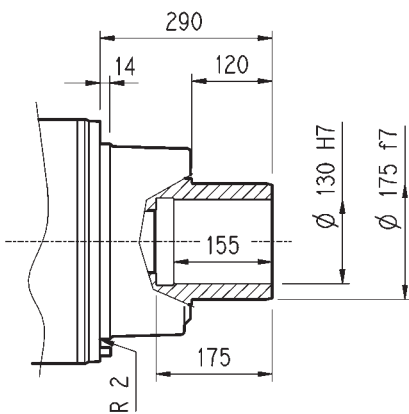
HZ



FZ

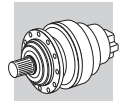


FP

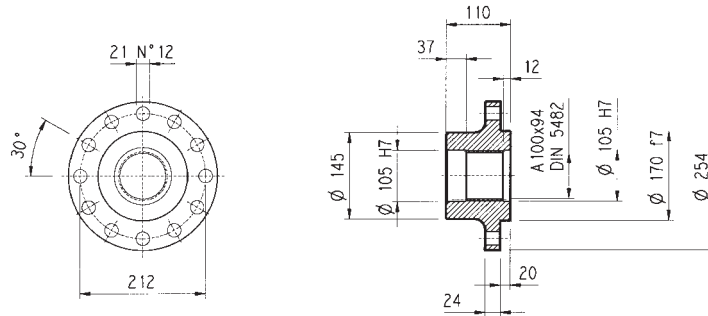
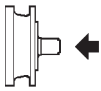


FP

$M_{2max} = 44000\ Nm$


Flangia / Flange
Flansch / Brides

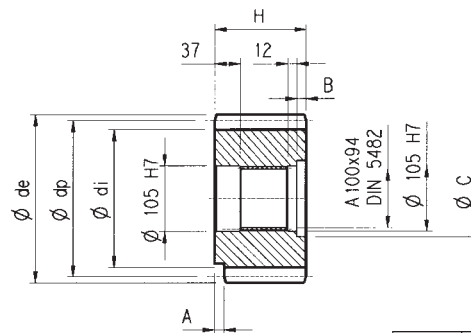
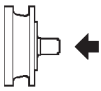
W0A



Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

Pignone / Pinion gears
Ritzel / Pignons

P...

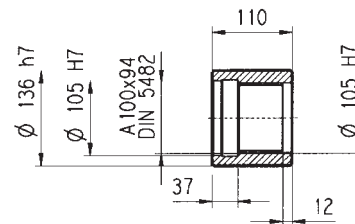
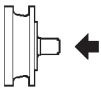


	m	z	x	dp	di	de	H	A	B	C	☆
PLQ	12	23	0	276	246	300	110	0	0	0	■
PPD	16	13	0.500	208	184	252.5	145	0	35	116	□
PPF	16	15	0.450	240	215	280	125	0	15	120	□

☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifié 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cémenté et tempré 18NiCrMo5

Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure

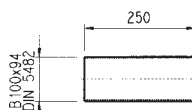
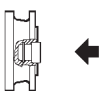
MOA



Materiale : Acciaio 16CrNi4
 Material : Steel 16CrNi4
 Material : Stahl 16CrNi4
 Matière : Acier 16CrNi4

Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée

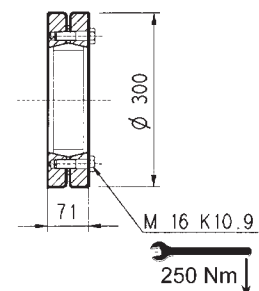
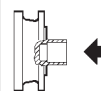
B0A

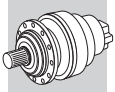


Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
 Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
 Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
 Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

GOA

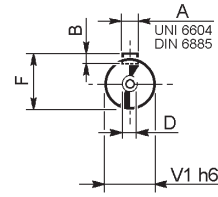
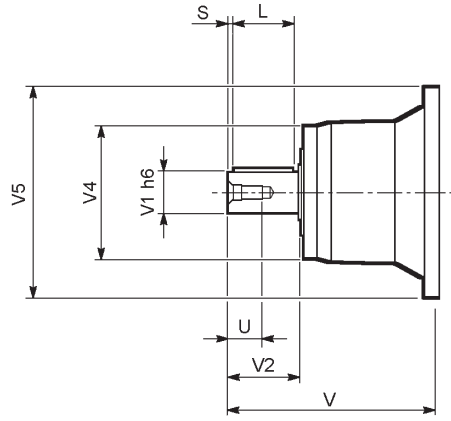




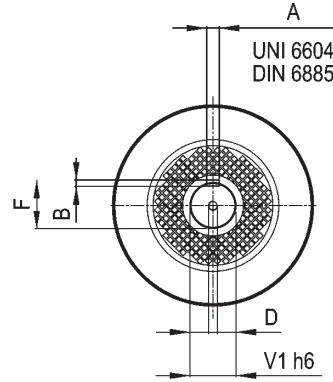
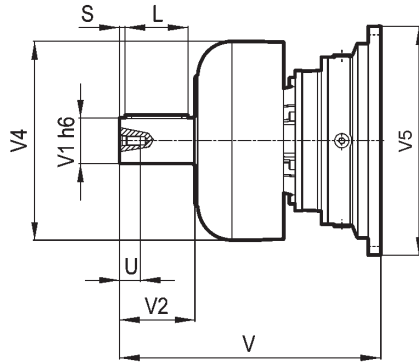
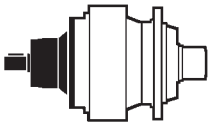
310 L

310 R

V



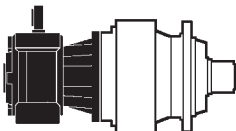
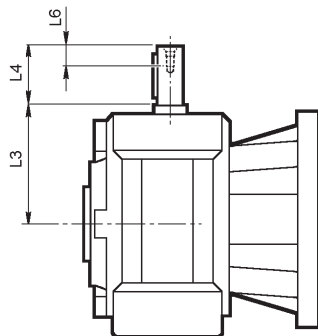
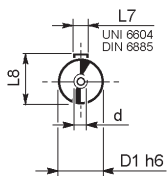
FV



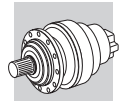
	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
310 L1	V10B	377	80	130	200	400	22	14	85	110	10	M16	36
	FV10B	457	80	130	347.5	400	22	14	85	110	10	M16	36
310 L2	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36
310 L3	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
310 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
310 R2 (B) (C)	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36
310 R3-R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

3/V 10 L3

3/V 10 L4



	D1 h6	L3	L4	L6	L7	L8	d
3/V 10 L3_HS	35	185	65	20	10	38	M8
3/V 10 L4_HS	25	144	50	19	8	28	M8

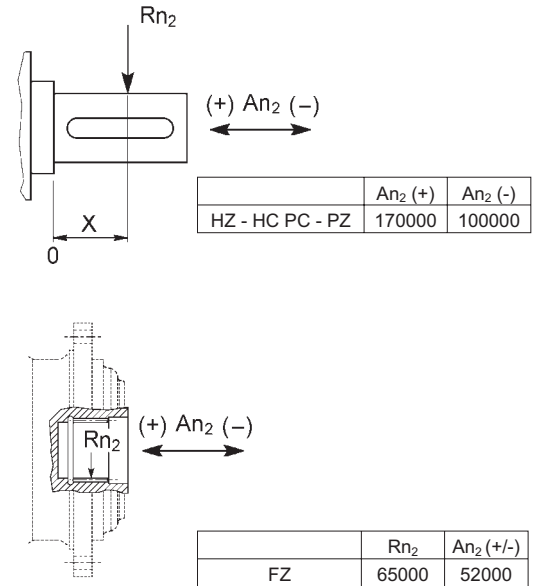
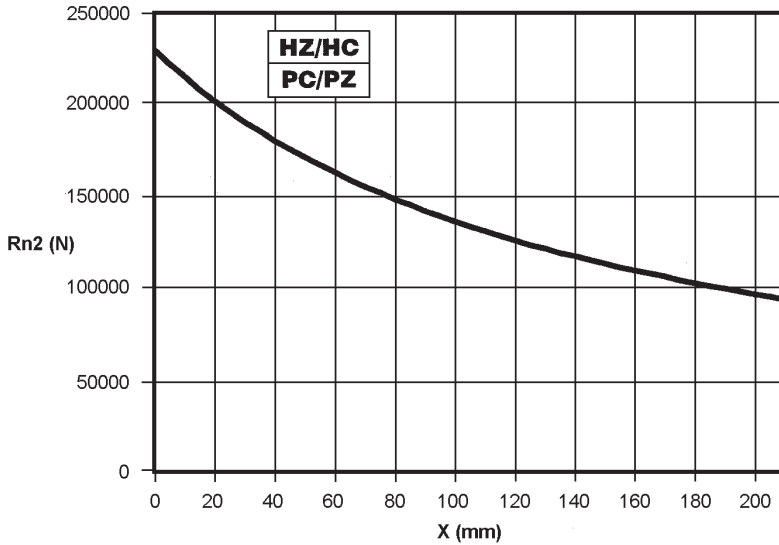


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $Fh_2 : n_2 \cdot h = 10000$

Permissible radial and axial loads on output shaft with $Fh_2 : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $Fh_2 : n_2 \cdot h = 10000$

Charges radiales et axiales admises sur l'arbre lent pour une valeur de $Fh_2 : n_2 \cdot h = 10000$



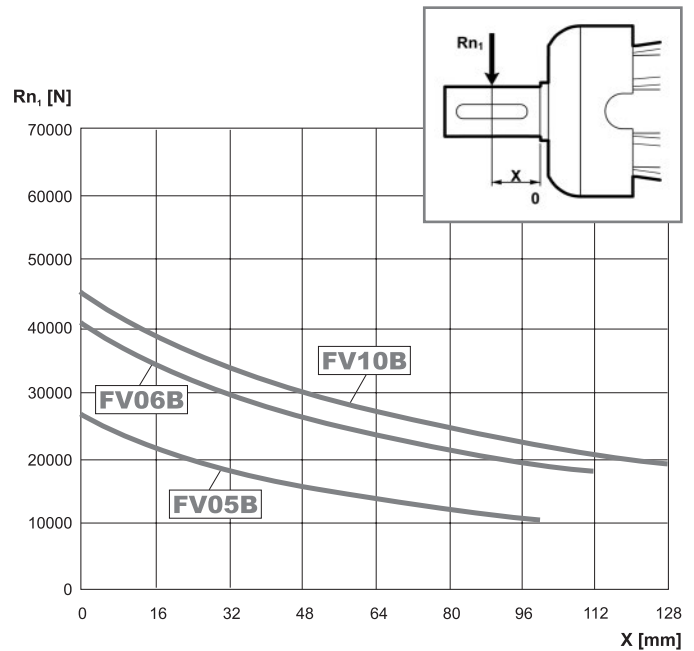
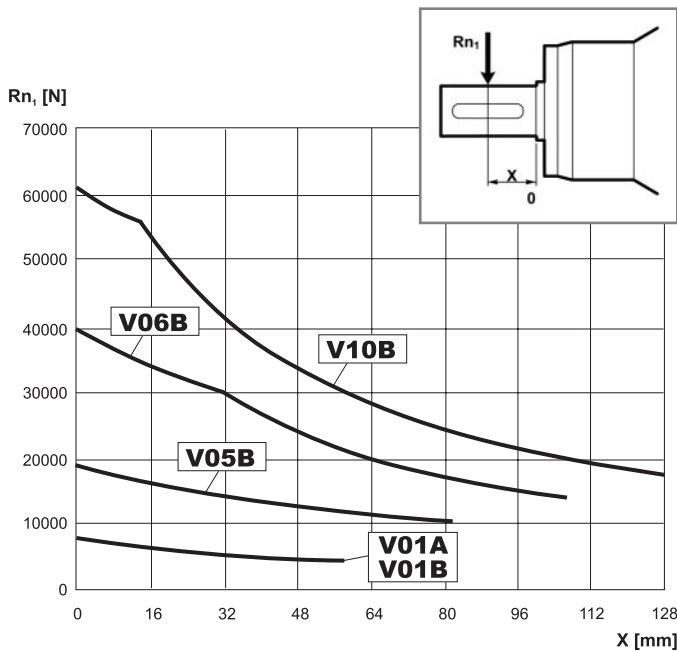
Fattore fh_2 correttivo per carichi sugli alberi Load corrective factor fh_2 on shafts Korrektionsfaktor fh_2 für wellenbelastungen Facteur de correction fh_2 pour charges sur les arbres	fh_2	$Fh_2 = n_2 \cdot h$	10000	25000	50000	100000	500000	1000000
		FZ	1	0.74	0.58	0.46	0.27	0.21
		HZ - HC - PC - PZ	1	0.76	0.61	0.50	0.31	0.25

Carichi radiali ammissibili sull'albero veloce per un valore di $Fh_1 : n_1 \cdot h = 250000$

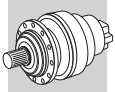
Permissible radial loads on input shaft with $Fh_1 : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $Fh_1 : n_1 \cdot h = 250000$

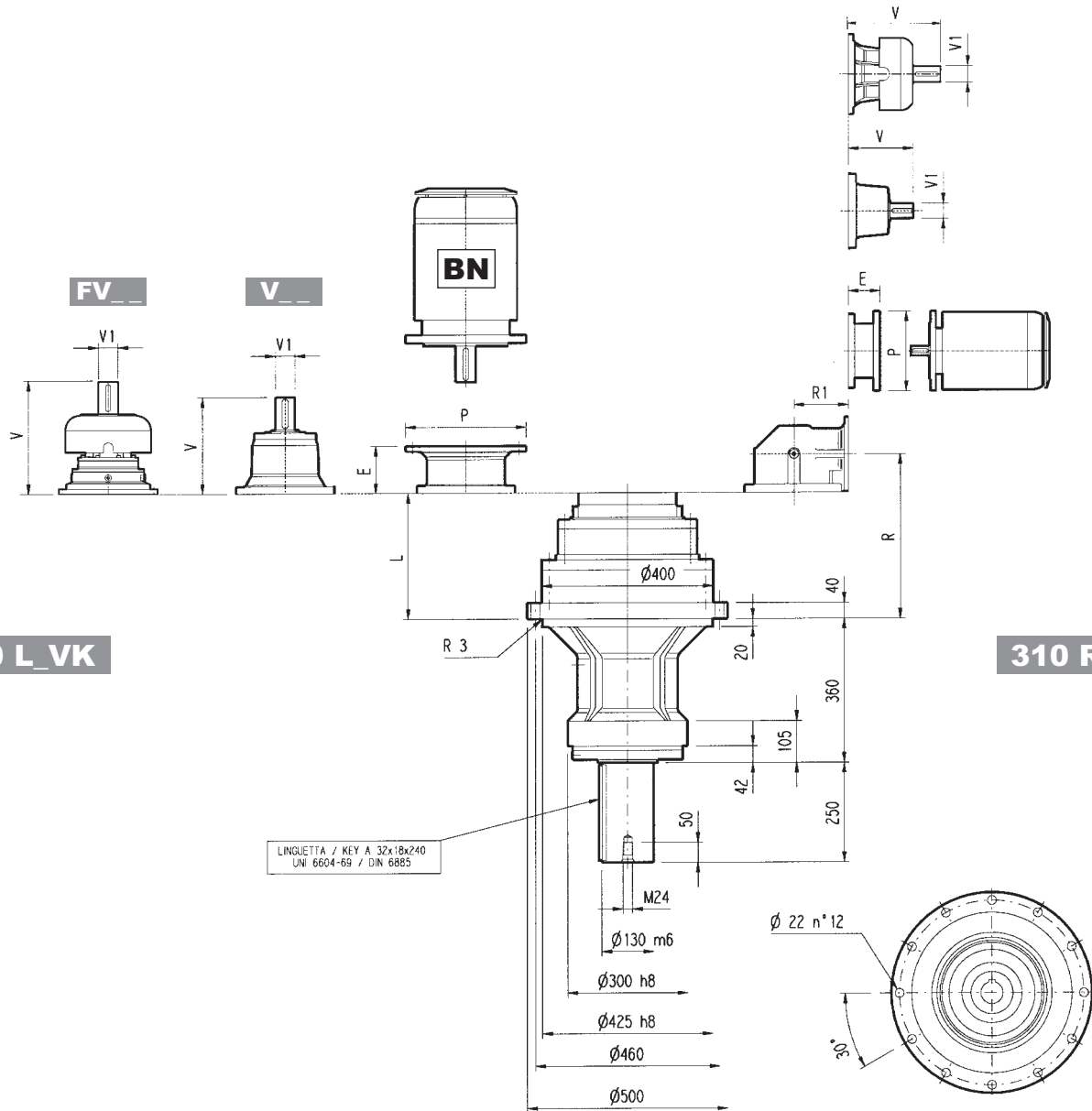
Charges radiales admises sur l'arbre d'entrée pour une valeur de $Fh_1 : n_1 \cdot h = 250000$



Fattore fh_1 correttivo per carichi sugli alberi Load corrective factor fh_1 on shafts Korrektionsfaktor fh_1 für wellenbelastungen Facteur de correction fh_1 pour charges sur les arbres	$Fh_1 = n_1 \cdot h$	250000	500000	1000000	2000000	5000000	10000000
	fh_1	1	0.79	0.63	0.50	0.37	0.29



310_VK



310 L_VK

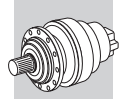
310 R_VK

	L	Kg	L						R					
			V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
310 L1	107	200	377	80	50	-	-	-	457	80	63	-	-	-
310 L2	243	230	307	60	23	-	-	-	357	60	28	-	-	-
310 L3	308	240	239	48	15	-	-	-	276	48	17	-	-	-
310 L4	361	245	137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
310 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	271	400	301	450	281	550
310 L2	-	-	-	-	-	-	-	-	-	-	-	-	152	350	153	350	183	400	212	450	193	550
310 L3	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
310 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-

	R	R1	Kg	L						R					
				V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
310 R2 (B)	315	345	320	307	60	23	-	-	-	357	60	28	-	-	-
310 R2 (C)	333	390	340	307	60	23	-	-	-	357	60	28	-	-	-
310 R3	380	140	250	137.5	24	6	158	38	7	-	-	-	-	-	-
310 R4	400	140	260	137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
310 R2 (B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450
310 R2 (C)	-	-	-	-	-	-	-	-	-	-	114	300	152	350	152	350	182	400	212	450
310 R3	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-
310 R4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 310_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 310_VK, with radial force applying at a distance x from shaft shoulder.

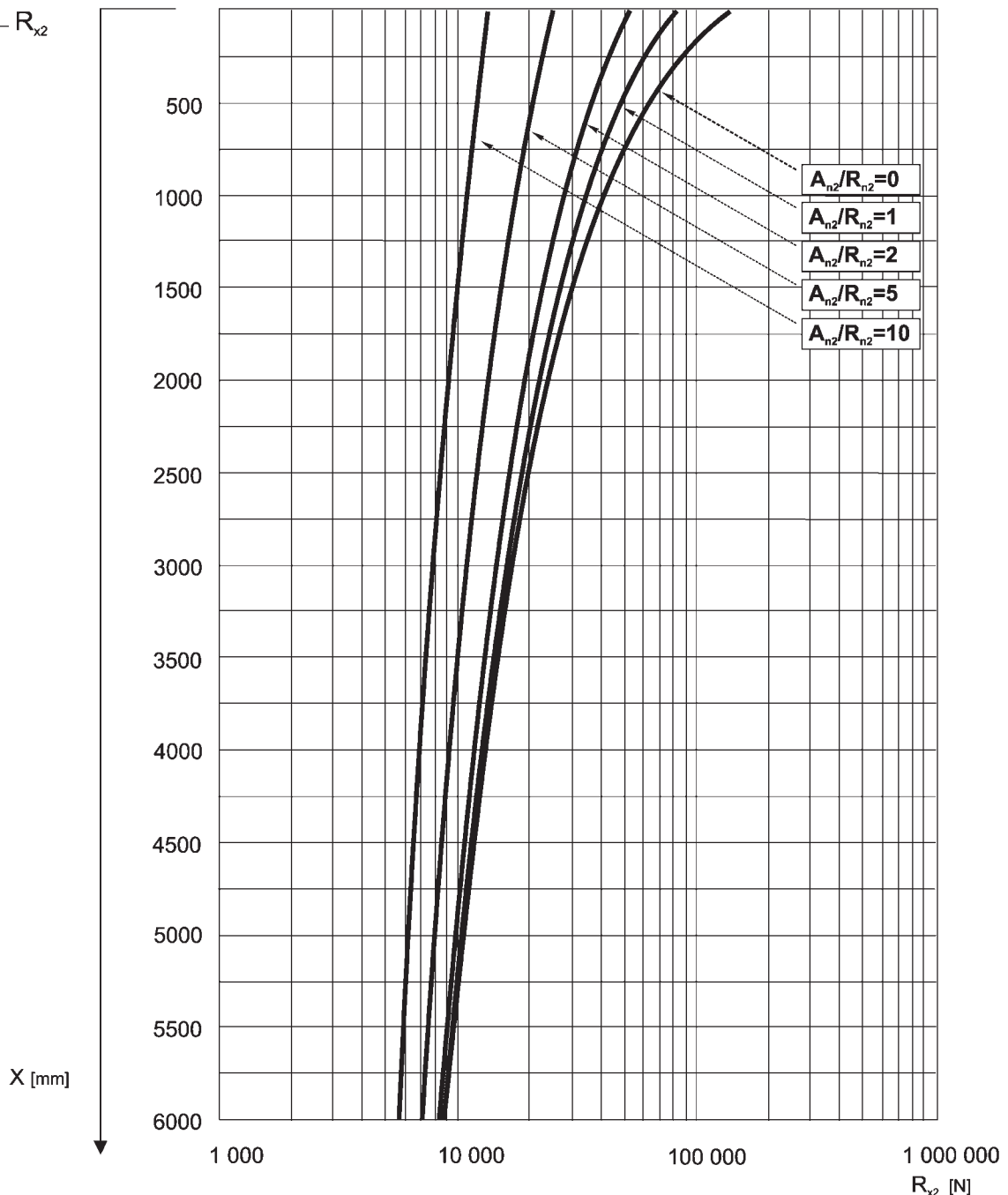
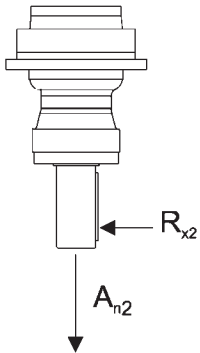
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

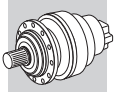
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 310_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

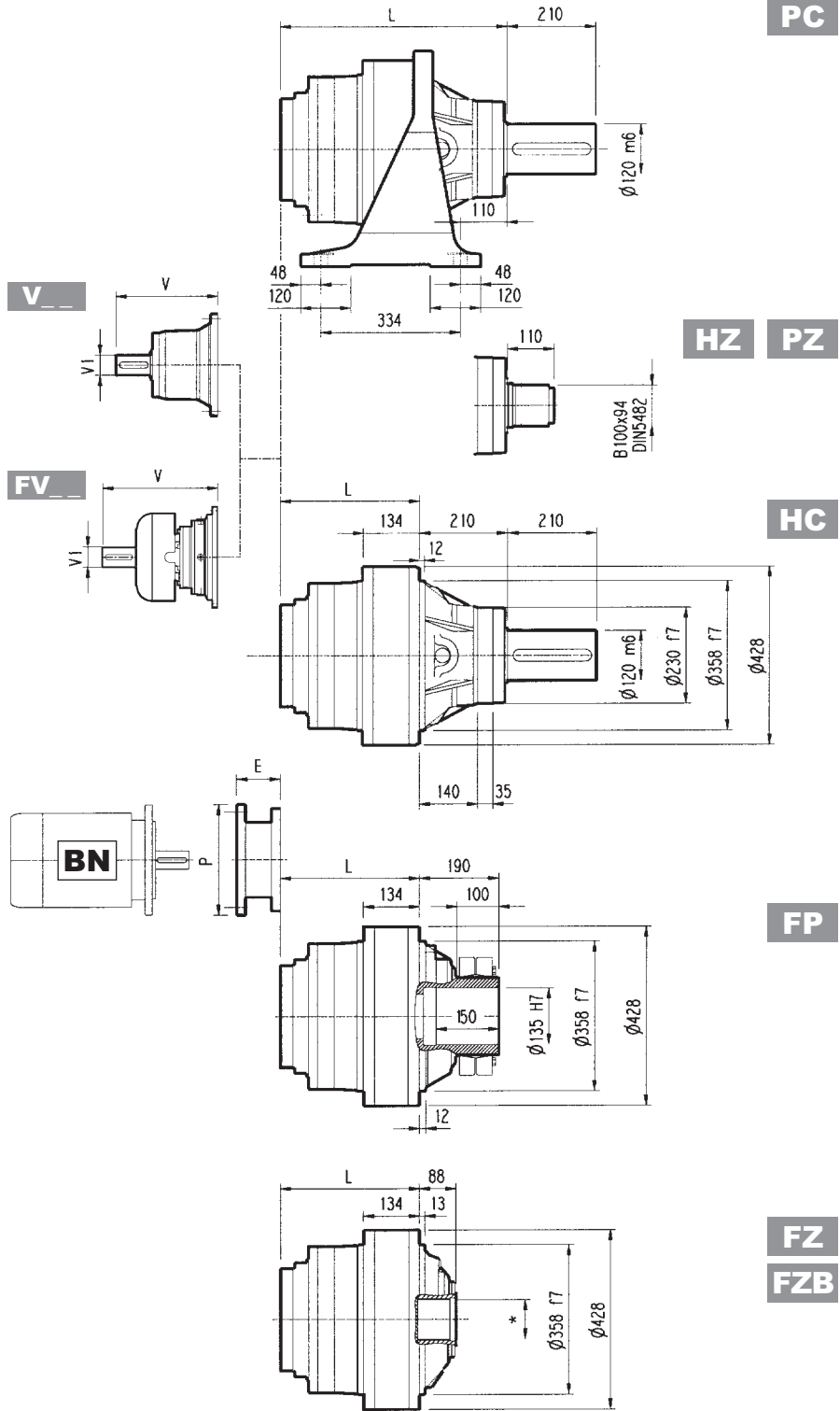
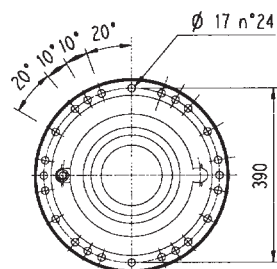
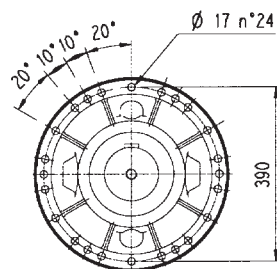
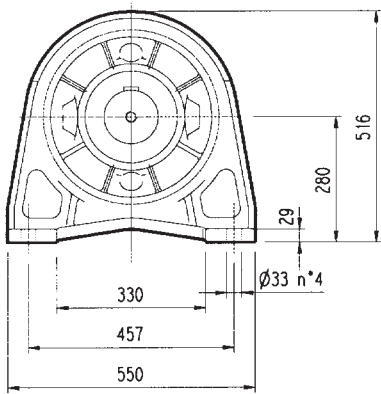
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 310_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.





311 L



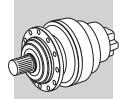
FZB	$M_{2max} = 66900 \text{ Nm}$
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FP	$M_{2max} = 55000 \text{ Nm}$
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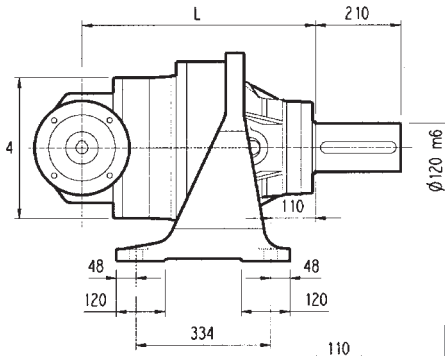
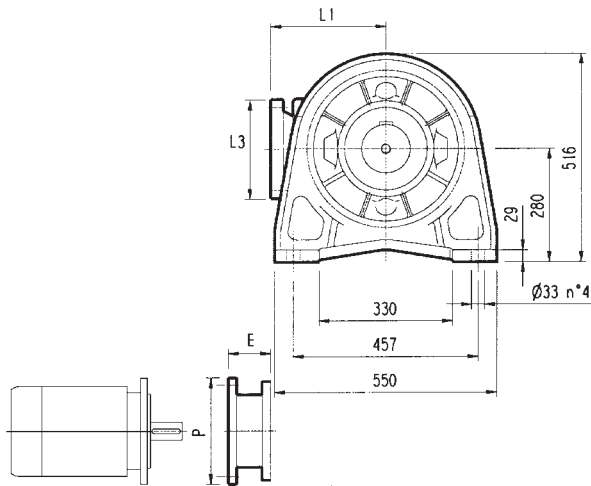
* Per dimensioni vedere pag. 304
 For dimensions, refer to page 304
 Für Abmessungen finden Sie auf Seite 304
 Pour les dimensions, se référer à la page 304

	L				Kg				Kg				Kg							
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
311 L1	325	115	115	115	250	180	160	170	348	80	55	-	-	-	456	80	85	-	-	-
311 L2	458	248	248	248	295	225	205	215	315	80	35	313	60	28	375	80	48	363	60	34
311 L3	547	337	337	337	307	237	217	227	239	48	15	-	-	-	276	48	17	-	-	-
311 L4	612	402	402	402	314	244	224	234	137.5	24	6	158	38	7	-	-	-	-	-	-

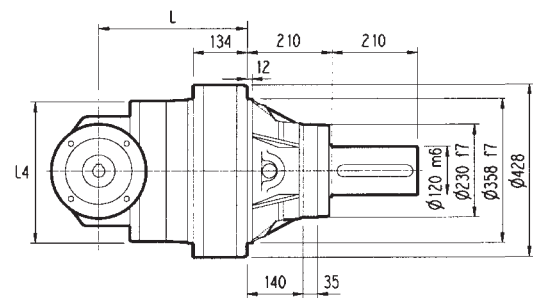
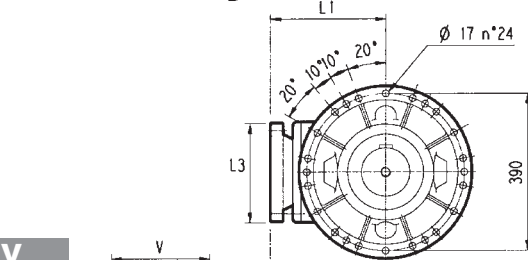
	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
311 L2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	195	350	186	400	216	450	216	550
311 L3	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
311 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-



PC

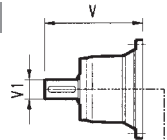


HZ PZ

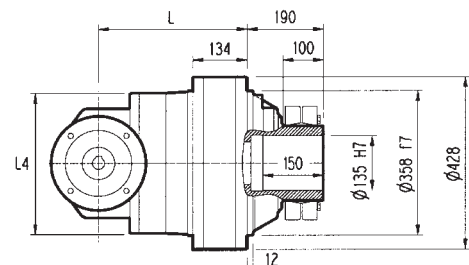
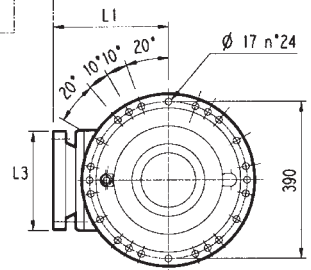
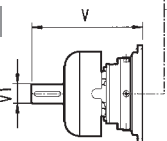


HC

V

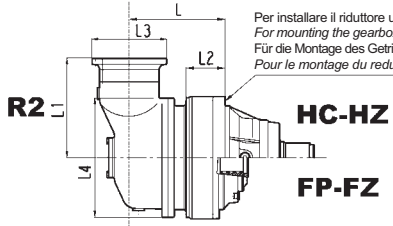


FV

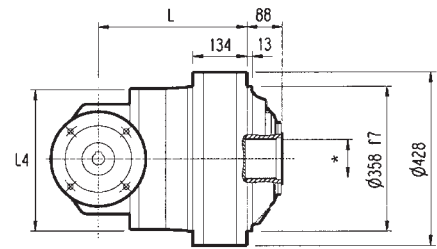


FP

Solo per esecuzione:
Only for configuration:
Nur für die Konfiguration:
Uniquement pour la configuration:



Per installare il riduttore usare viti prigioniere
For mounting the gearbox only use stud bolts
Für die Montage des Getriebes nur Schraubbolzen nutzen
Pour le montage du reducteur utiliser des goujons



FZ

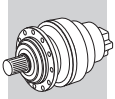
FZB

* Per dimensioni vedere pag. 304
For dimensions, refer to page 304
Für Abmessungen finden Sie auf Seite 304
Pour les dimensions, se référer à la page 304

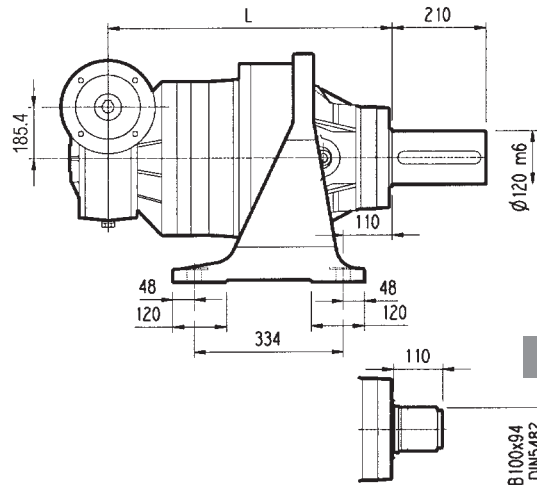
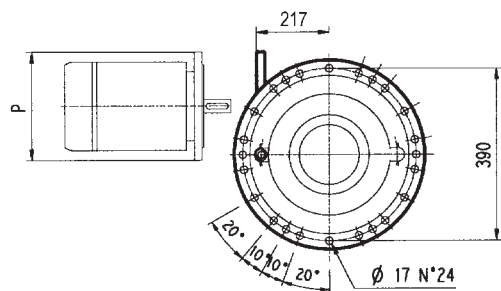
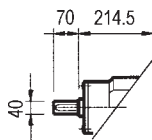
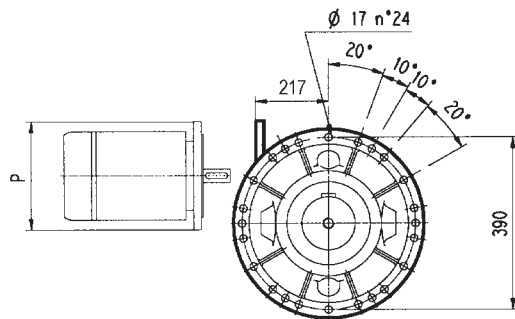
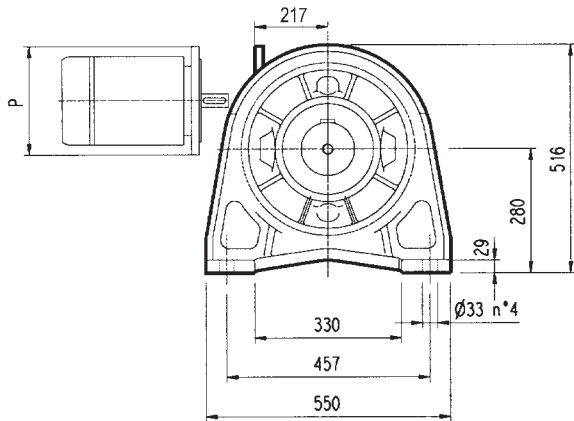
FZB	$M_{2max} = 66900 \text{ Nm}$	FP	$M_{2max} = 55000 \text{ Nm}$
------------	-------------------------------	-----------	-------------------------------

	L			L1	L3	L4	Kg				Kg				Kg								
	PC-PZ	HC-HZ	FZ				FP	PC-PZ	HC-HZ	FZ	FP	V	V1	V	V1	V	V1	V	V1				
311 R2 (B)	550	340	340	340	345	292	400	380	310	290	300	307	60	23	-	-	-	357	60	28	-	-	-
311 R2 (C)	550	340	340	340	390	292	480	390	320	300	310	307	60	23	-	-	-	357	60	28	-	-	-
311 R3	577	367	367	367	225	245	375	345	275	255	265	239	48	15	-	-	-	276	48	17	-	-	-
311 R4	639	429	429	429	140	186	244	327	257	237	247	137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
311 R2 (B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
311 R2 (C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
311 R3	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
311 R4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-



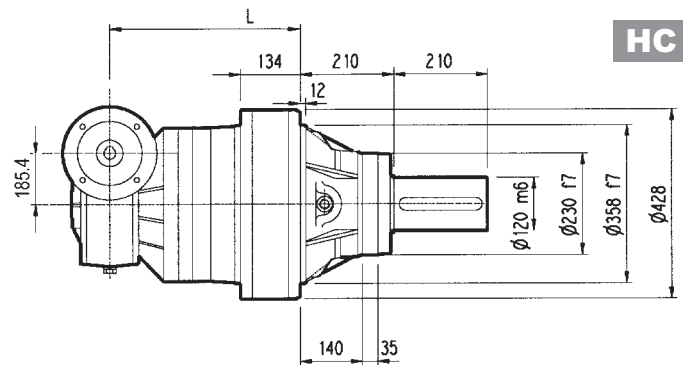
3V 11 L3



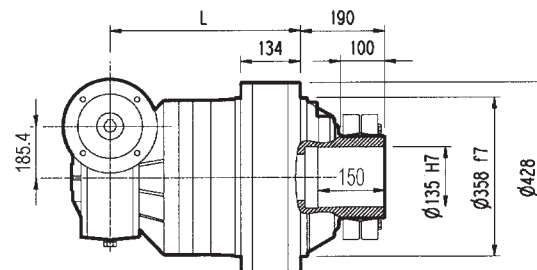
PC

HZ PZ

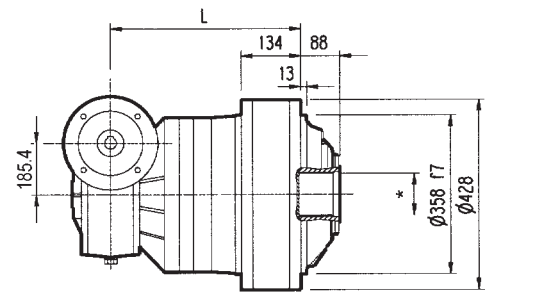
B100x84
DIN5482



HC



FP



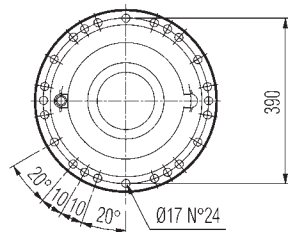
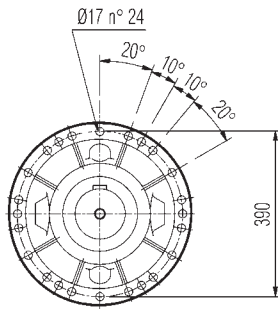
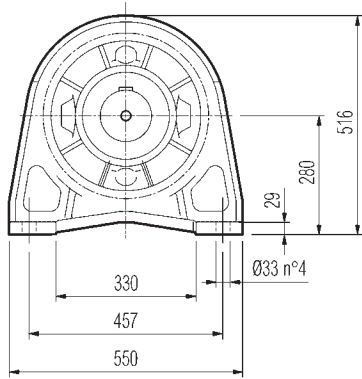
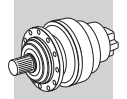
FZ

FZB

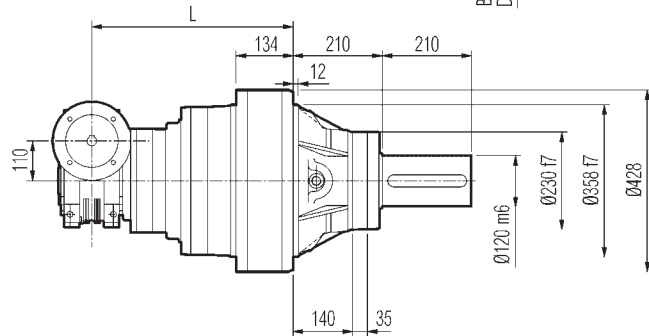
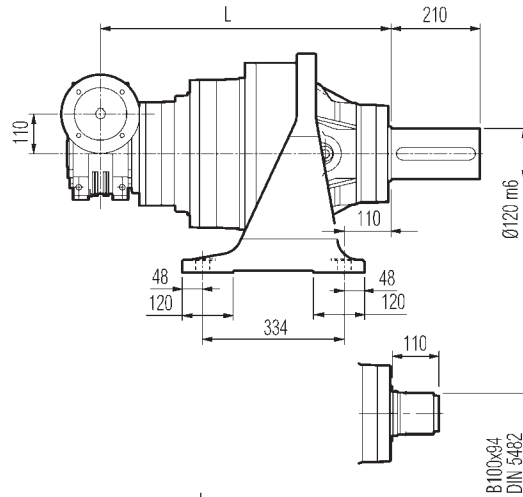
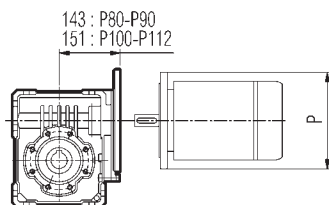
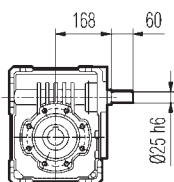
FZB	$M_{2max} = 66900 \text{ Nm}$
FP	$M_{2max} = 55000 \text{ Nm}$

* Per dimensioni vedere pag. 304
For dimensions, refer to page 304
Für Abmessungen finden Sie auf Seite 304
Pour les dimensions, se référer à la page 304

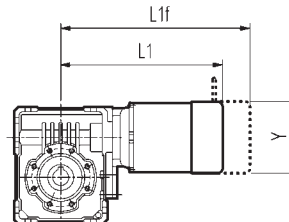
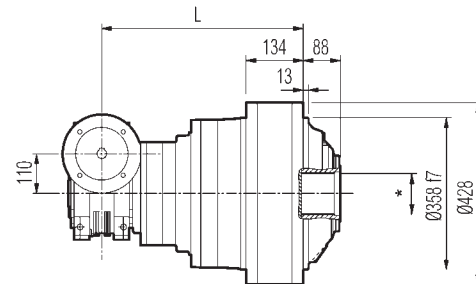
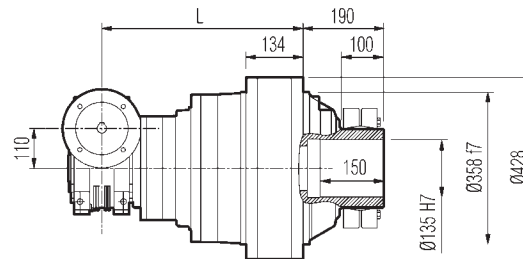
	L				Kg				P80	P90	P100	P112	P132	P160	P180
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	P	P	P	P	P	P	P
3V 11 L3	659	449	449	449	390	320	300	310	-	-	250	250	300	350	350



Vista da
View from **A**



A →



PC

HZ PZ

HC

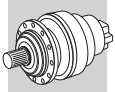
FP

FZ

FZB

* Per dimensioni vedere pag. 304
For dimensions, refer to page 304
Für Abmessungen finden Sie auf Seite 304
Pour les dimensions, se référer à la page 304

FZB	$M_{2max} = 66900 \text{ Nm}$				FP	$M_{2max} = 55000 \text{ Nm}$							
	L								kg				
	PC - PZ		HC - HZ		FZ	FP	PC - PZ		HC - HZ		FZ	FP	
3/V 11 L4	707		497		497	497	340		270		250	260	
	P80	P90	P100	P112	S2 + M2S			S3 + M3S			S3 + M3L		
	P	P	P	P	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
3/V 11 L4	200	200	250	250	364	440	156	407	503	193	439	530	193



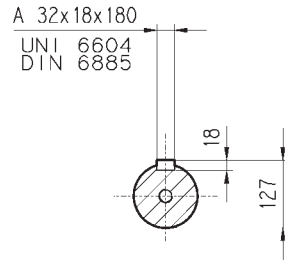
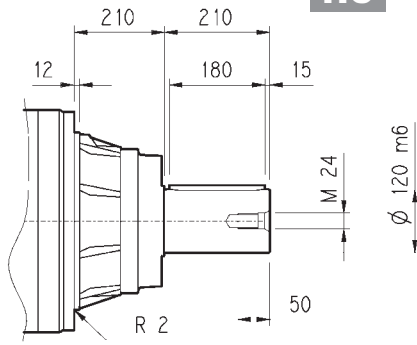
311 L

311 R

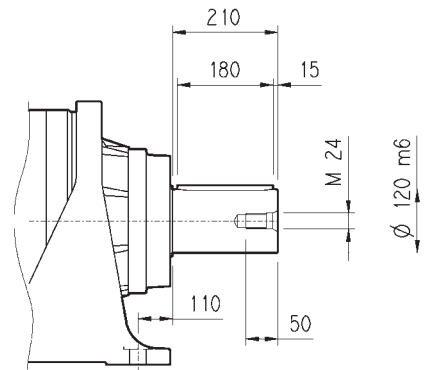
3/V 11 L3

3/V 11 L4

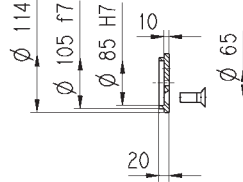
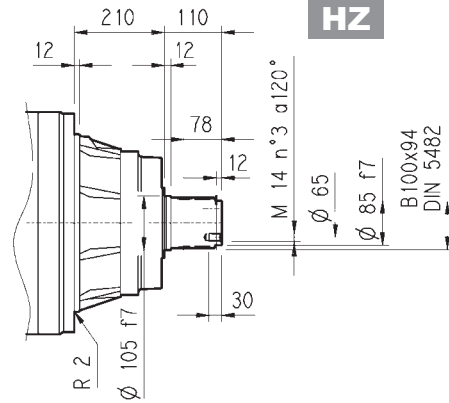
HC



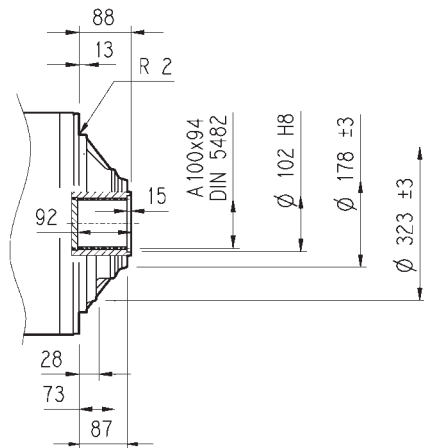
PC



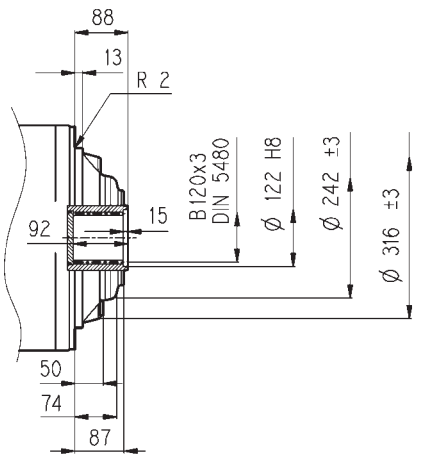
HZ



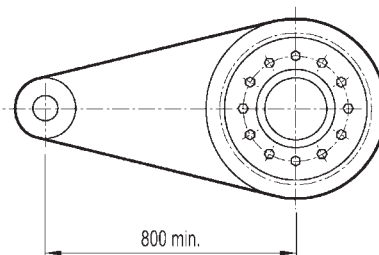
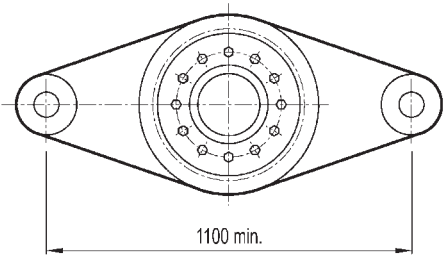
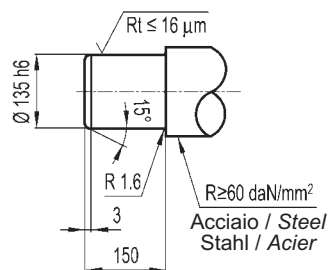
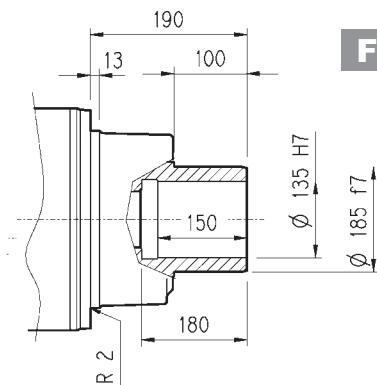
FZ



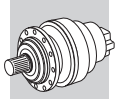
FZB



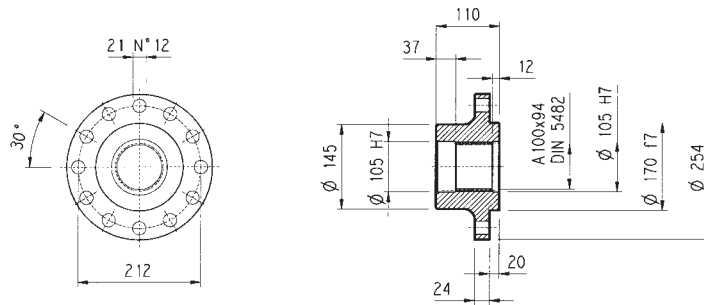
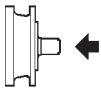
FP



FZB	$M_{2max} = 66900 \text{ Nm}$
FP	$M_{2max} = 55000 \text{ Nm}$


Flangia / Flange
Flansch / Brides

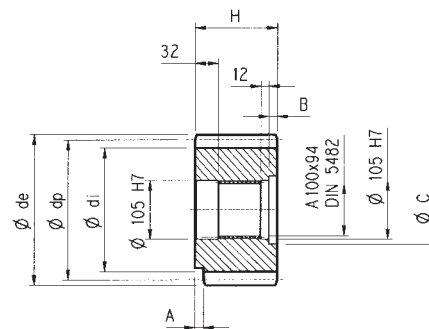
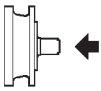
W0A



Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

Pignoni / Pinion gears
Ritzel / Pignons

P...

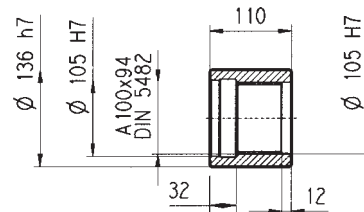
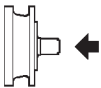


	m	z	x	dp	di	de	H	A	B	C	☆
PLQ	12	23	0	276	246	300	110	0	0	0	■
PPD	16	13	0.500	208	184	252.5	145	0	35	116	□
PPF	16	15	0.450	240	215	280	125	0	15	120	□

☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifiée 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cémenté et tempré 18NiCrMo5

Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure

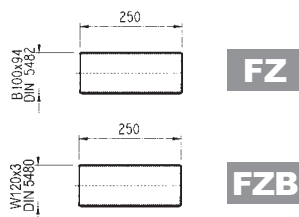
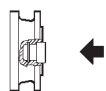
MOA



Materiale : Acciaio 16CrNi4
 Material : Steel 16CrNi4
 Material : Stahl 16CrNi4
 Matière : Acier 16CrNi4

Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée

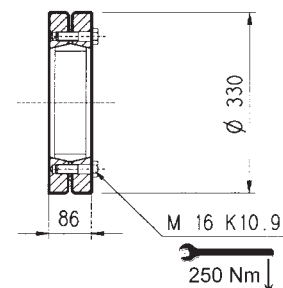
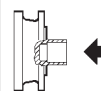
B0A

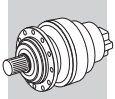


Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
 Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
 Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
 Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

GOA

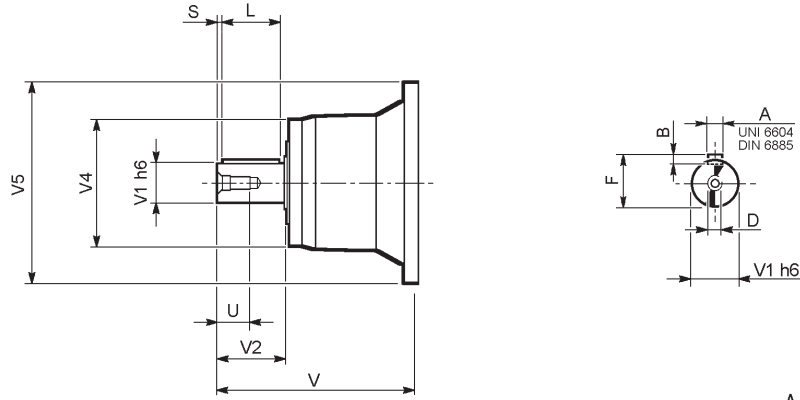




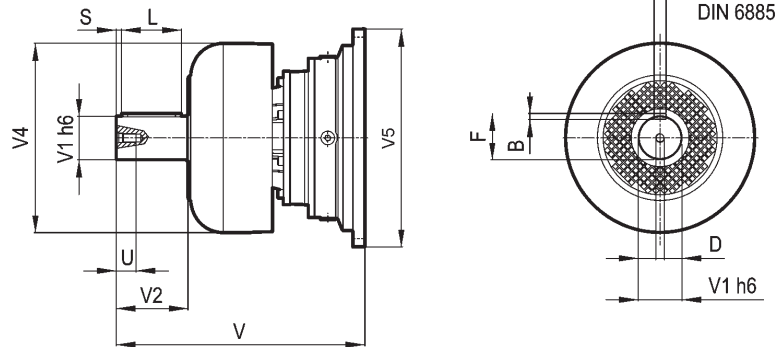
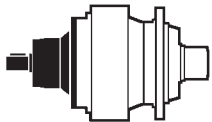
311 L

311 R

V



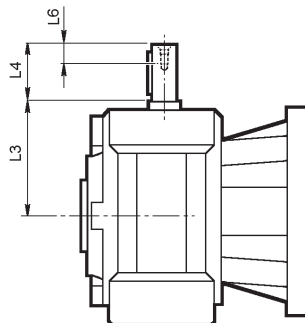
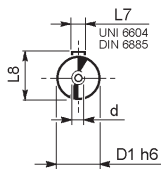
FV



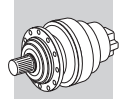
	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
311 L1	V11B	348	80	130	200	428	22	14	85	110	10	M16	36
	FV11B	456	80	130	347.5	428	22	14	85	110	10	M16	36
311 L2	V07B	315	80	130	200	345	22	14	85	110	10	M16	36
	FV07B	375	80	130	347.5	348	22	14	85	110	10	M16	36
	V07A	313	60	105	155	345	18	11	64	90	7.5	M16	36
311 L3	FV07A	363	60	105	309	348	18	11	64	90	7.5	M16	36
	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
311 L4	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
311 R2 (B)(C)	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
	FV06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
311 R3	V05B	357	60	105	309	292	18	11	64	90	7.5	M16	36
	FV05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
311 R4	V01A	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

3/V 11 L3

3/V 11 L4



	D1 h6	L3	L4	L6	L7	L8	d
3/V 11 L3_HS	40	214.5	70	20	12	43	M8
3/V 11 L4_HS	25	168	60	19	8	28	M8

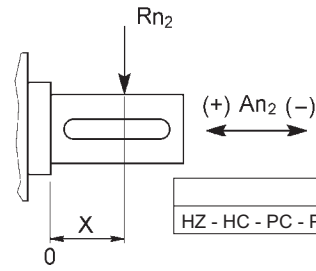
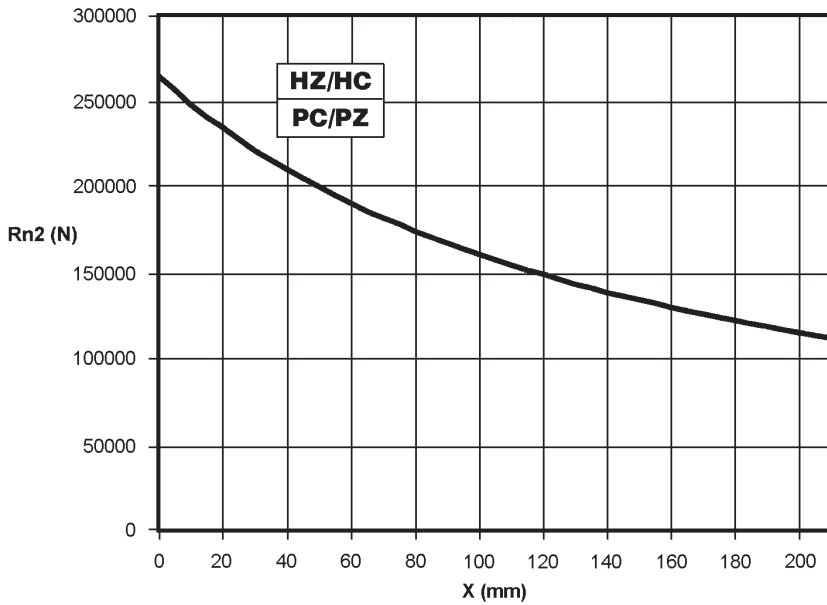


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $Fh_2 : n_2 \cdot h = 10000$

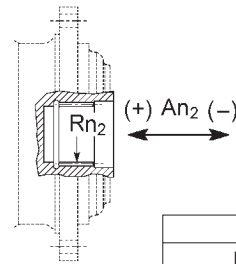
Permissible radial and axial loads on output shaft with $Fh_2 : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $Fh_2 : n_2 \cdot h = 10000$

Charges radiales et axiales admissibles sur l'arbre lent pour une valeur de $Fh_2 : n_2 \cdot h = 10000$



	An ₂ (+)	An ₂ (-)
HZ - HC - PC - PZ	200000	140000



	Rn ₂	An ₂ (+/-)
FZ	65000	60000

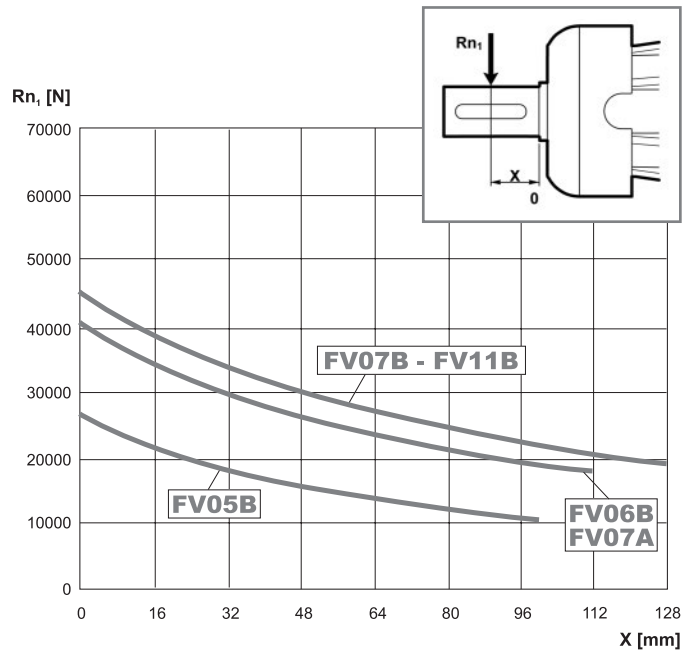
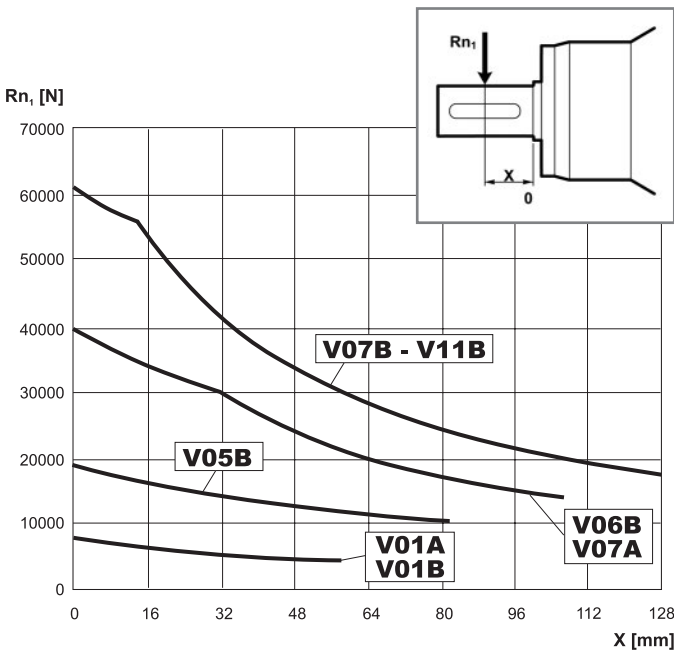
Fattore fh_2 correttivo per carichi sugli alberi Load corrective factor fh_2 on shafts Korrektionsfaktor fh_2 für wellenbelastungen Facteur de correction fh_2 pour charges sur les arbres	$Fh_2 = n_2 \cdot h$						
		10000	25000	50000	100000	500000	1000000
fh_2	FZ	1	0.74	0.58	0.46	0.27	0.21
	HZ - HC - PC - PZ	1	0.76	0.61	0.50	0.31	0.25

Carichi radiali ammissibili sull'albero veloce per un valore di $Fh_1 : n_1 \cdot h = 250000$

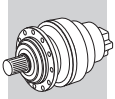
Permissible radial loads on input shaft with $Fh_1 : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $Fh_1 : n_1 \cdot h = 250000$

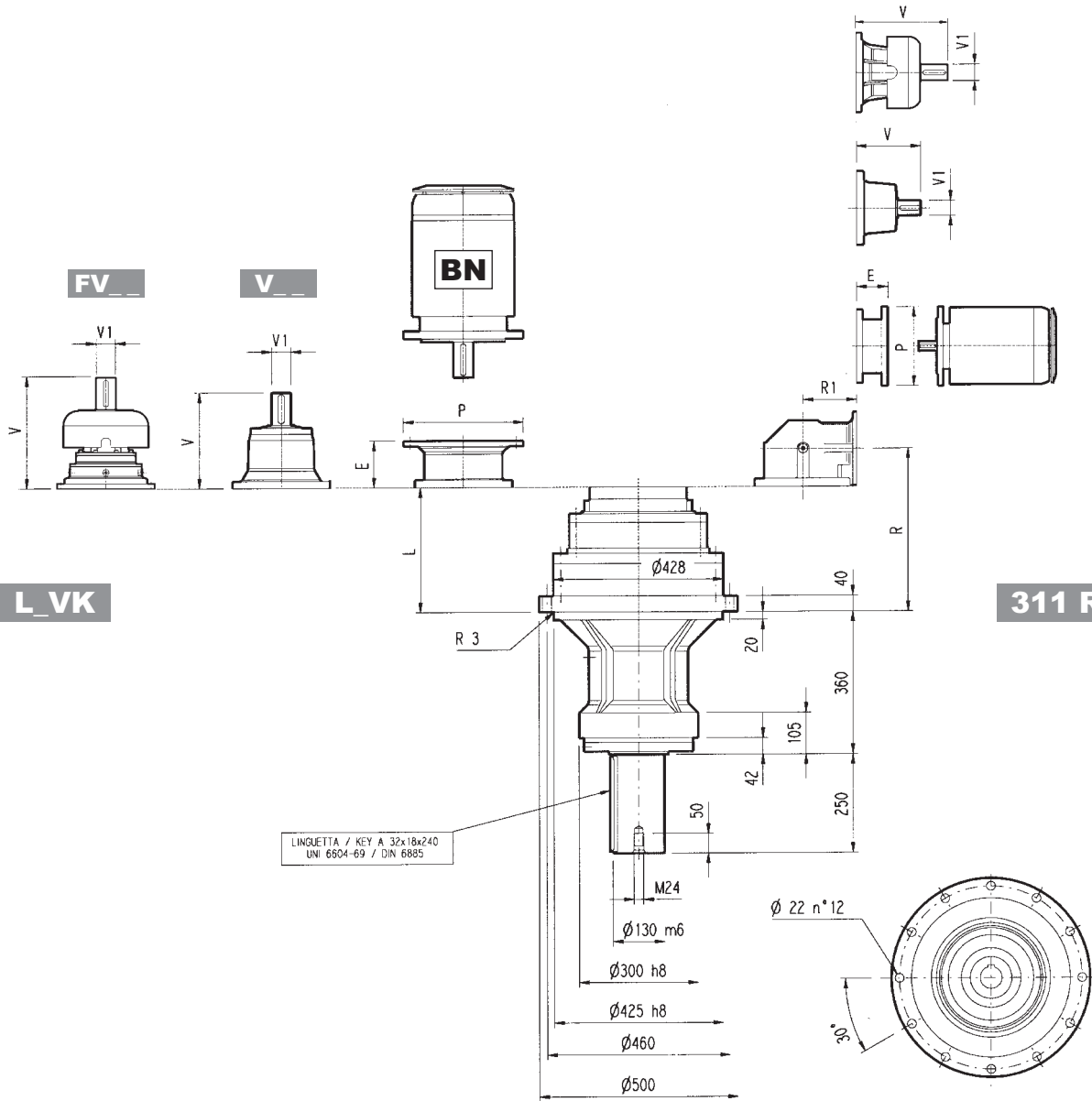
Charges radiales admises sur l'arbre d'entrée pour une valeur de $Fh_1 : n_1 \cdot h = 250000$



Fattore fh_1 correttivo per carichi sugli alberi Load corrective factor fh_1 on shafts Korrektionsfaktor fh_1 für wellenbelastungen Facteur de correction fh_1 pour charges sur les arbres	$Fh_1 = n_1 \cdot h$						
		250000	500000	1000000	2000000	5000000	10000000
fh_1	1	0.79	0.63	0.50	0.37	0.29	



311_VK



311 L_VK

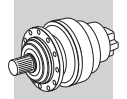
311 R_VK

	L				V				R							
	E	P	V	V1	kg	E	P	V	V1	kg	E	P	V	V1	kg	
311 L1	129	295	348	80	55	-	-	-	-	-	456	80	85	-	-	
311 L2	262	340	315	80	35	313	60	28	-	-	375	80	48	363	60	34
311 L3	351	350	239	48	15	-	-	-	-	-	276	48	17	-	-	-
311 L4	416	360	137.5	24	6	158	38	7	-	-	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
311 L2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	195	350	186	400	216	450	216	550
311 L3	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
311 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-

	R		V		R		V		R		V		R		V		R		V		R	
	E	P	V	V1	kg	E	P	V	V1	kg	E	P	V	V1	kg	E	P	V	V1	kg	E	P
311 R2 (B)	354	345	420	307	60	23	-	-	-	-	357	60	28	-	-	-	-	-	-	-	-	-
311 R2 (C)	354	390	430	307	60	23	-	-	-	-	357	60	28	-	-	-	-	-	-	-	-	-
311 R3	381	225	385	239	48	15	-	-	-	-	276	48	17	-	-	-	-	-	-	-	-	-
311 R4	443	140	360	137.5	24	6	158	38	7	-	-	-	-	-	-	-	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
311 R2 (B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
311 R2 (C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
311 R3	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
311 R4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 311_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 311_VK, with radial force applying at a distance x from shaft shoulder.

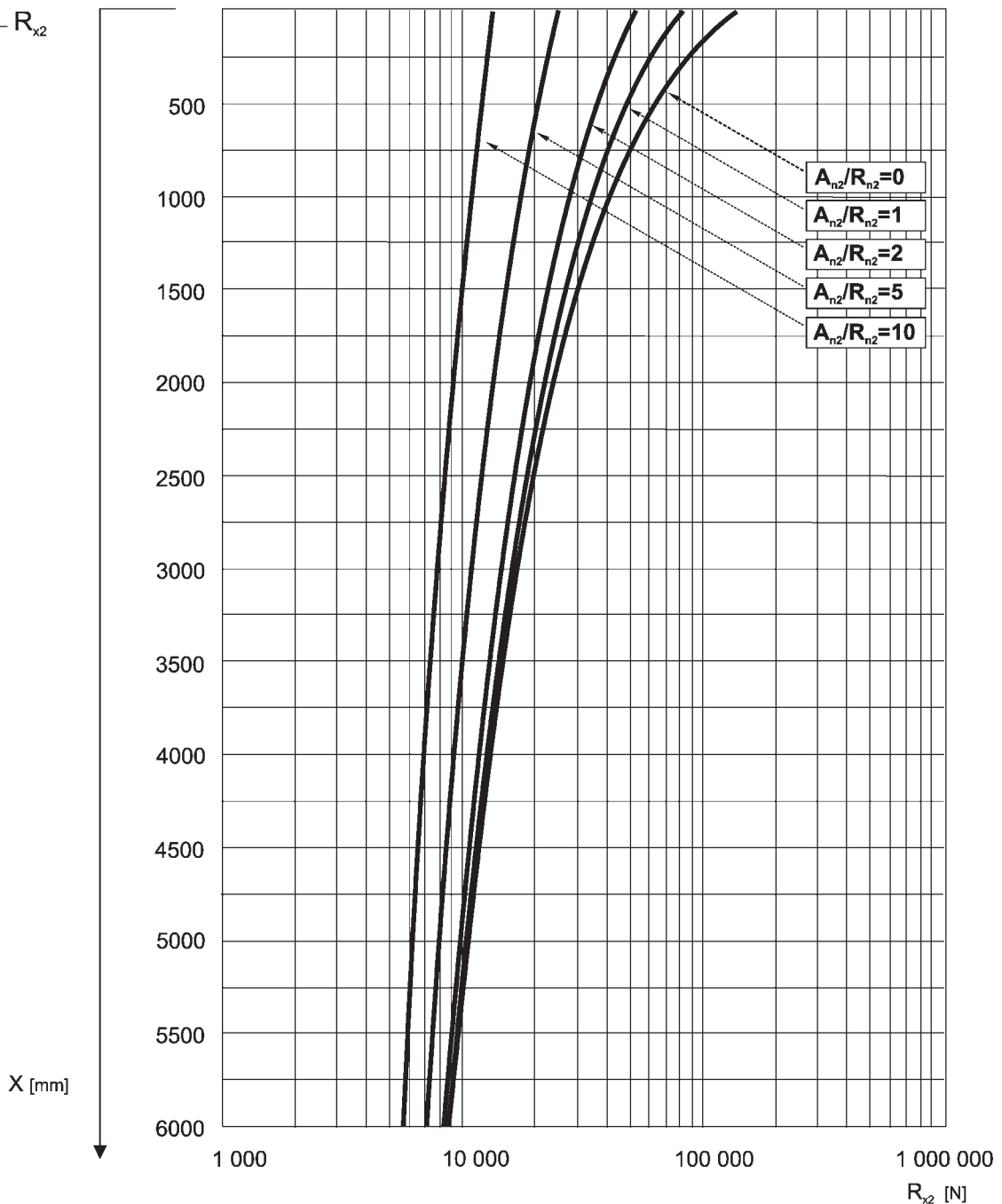
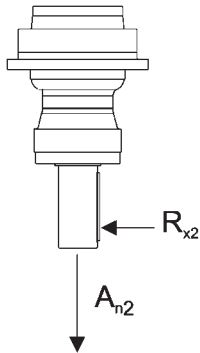
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

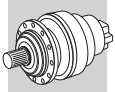
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 311_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

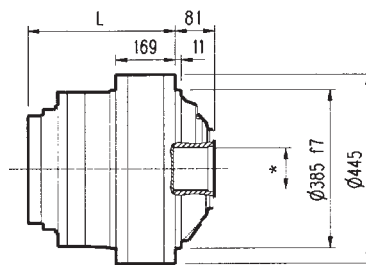
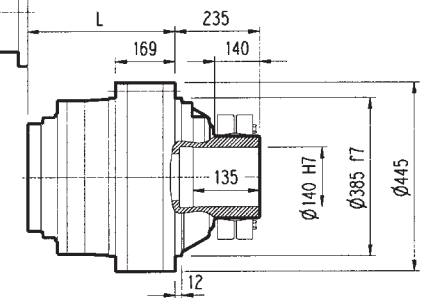
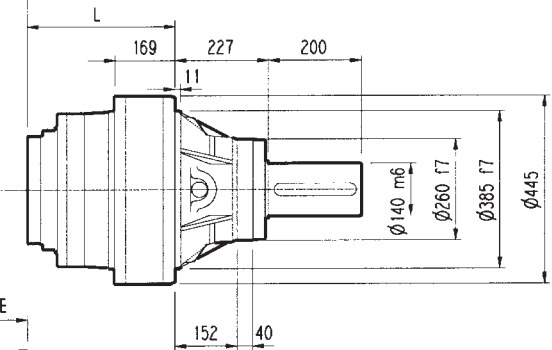
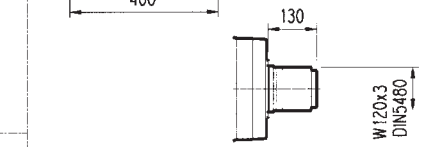
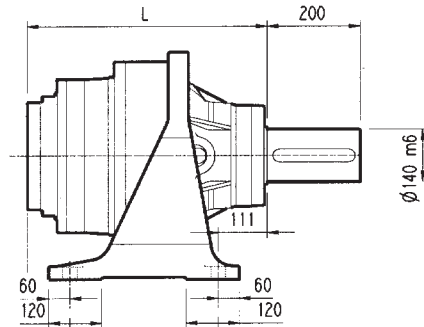
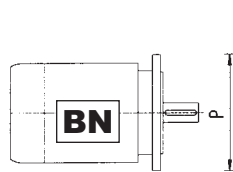
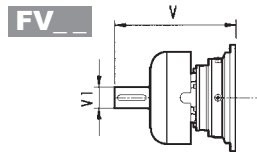
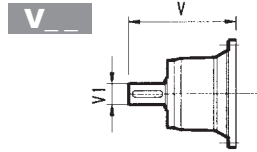
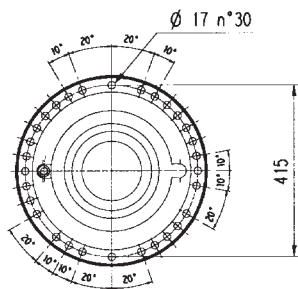
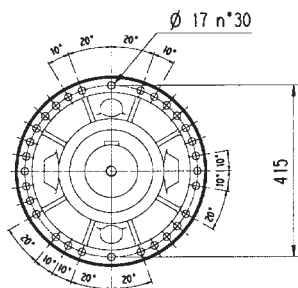
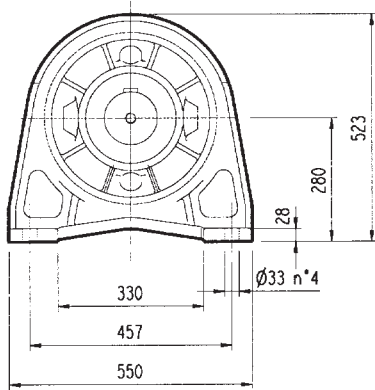
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 311_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.





313 L



PC

HZ PZ

HC

FP

FZ

FZB

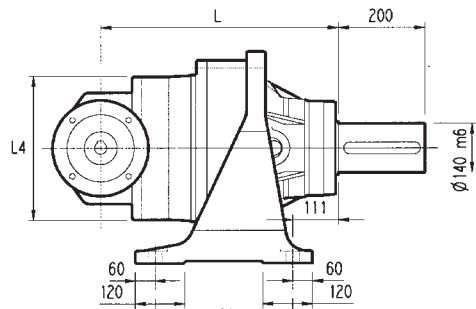
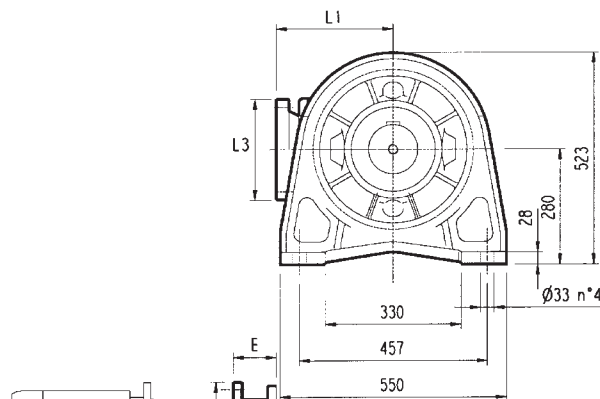
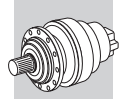
FP $M_{2max} = 79000 \text{ Nm}$

* Per dimensioni vedere pag. 314
For dimensions, refer to page 314
Für Abmessungen finden Sie auf Seite 314
Pour les dimensions, se référer à la page 314

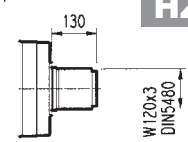
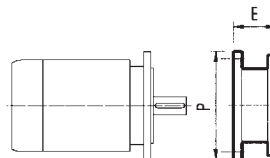
	L				Kg				Kg				Kg							
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
313 L1	381	154	154	154	320	230	200	200	343	80	55	-	-	-	451	80	71	-	-	-
313 L2	531	304	304	304	380	290	260	280	315	80	35	313	60	28	375	80	48	363	60	34
313 L3	620	393	393	393	392	302	272	292	239	48	15	-	-	-	276	48	17	-	-	-
313 L4	685	458	458	458	399	309	279	299	137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
313 L2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	195	350	186	400	216	450	216	550
313 L3	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
313 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-

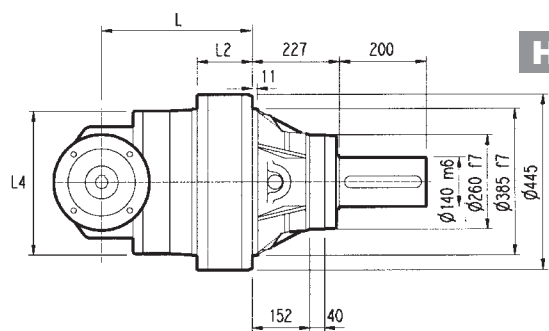
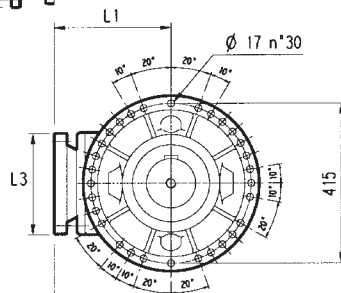
313 R



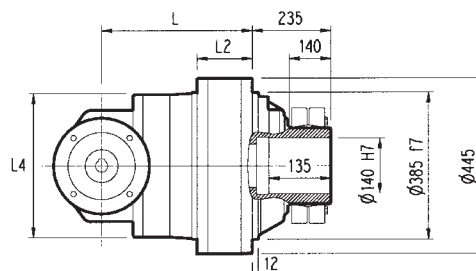
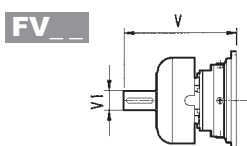
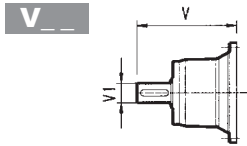
PC



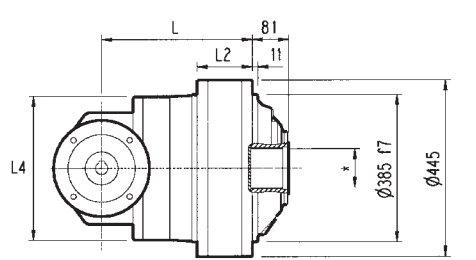
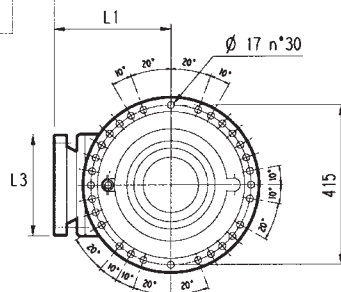
HZ PZ



HC



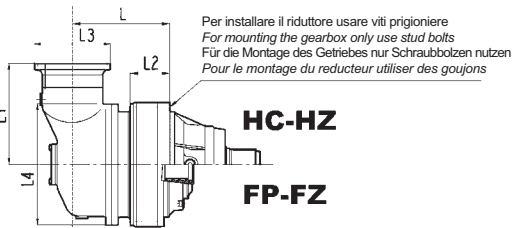
FP



FZ

FZB

Solo per esecuzione:
Only for configuration:
Nur für die Konfiguration:
Uniquement pour la configuration:



HC-HZ

FP-FZ

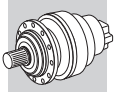
* Per dimensioni vedere pag. 314
For dimensions, refer to page 314
Für Abmessungen finden Sie auf Seite 314
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FP

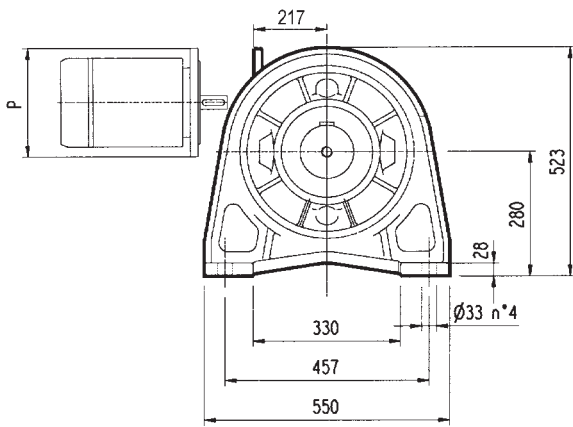
M_{2max} = 79000 Nm

	L				L1	L2				L3	L4	Kg				Kg				Kg						
	PC-PZ	HC-HZ	FZ	FP		HZ-HC	FZ	FP				PC-PZ	HC-HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1
313 R2 (B)	611	384	384	384	345	199	199	199	292	400	450	360	330	350	307	60	23	-	-	-	357	60	28	-	-	-
313 R2 (C)	611	384	384	384	390	168	168	168	292	480	460	370	340	360	307	60	23	-	-	-	357	60	28	-	-	-
313 R3	650	423	423	423	225	169	169	169	245	345	430	340	310	330	239	48	15	-	-	-	276	48	17	-	-	-
313 R4	712	485	485	485	140	169	169	169	186	244	412	322	292	312	137.5	24	6	158	38	7	-	-	-	-	-	

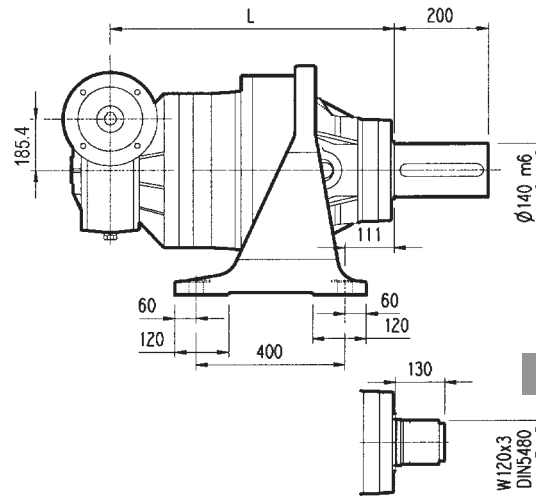
	P 71		P 80		P 90		P 100		P 112		P 132		P 160		P 180		P 200		P 225		P 250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
313 R2 (B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
313 R2 (C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
313 R3	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
313 R4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-



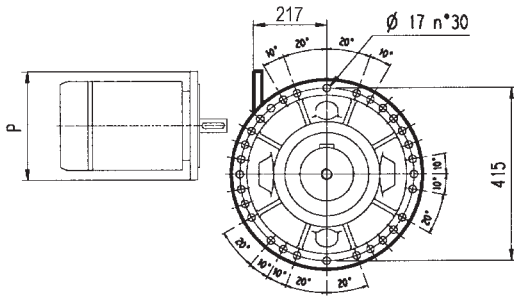
3/V 13 L3



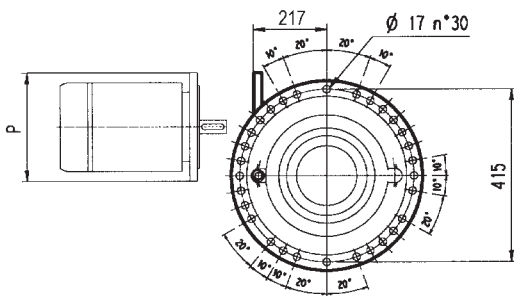
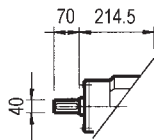
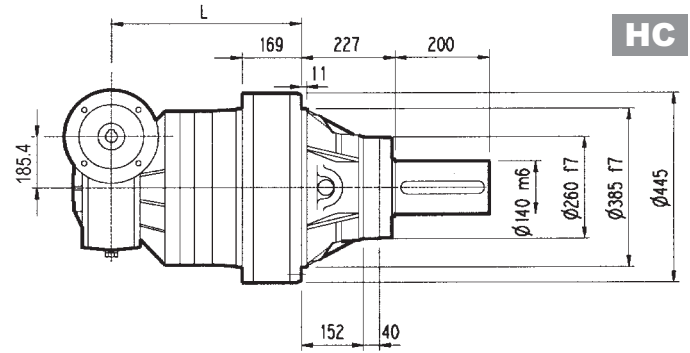
PC



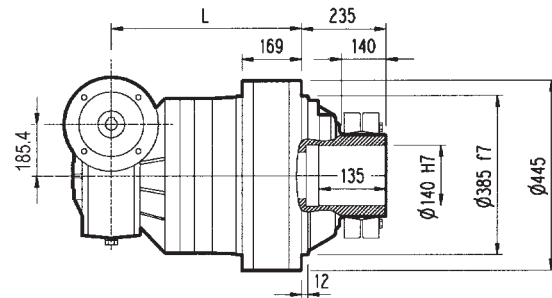
HZ PZ



HC

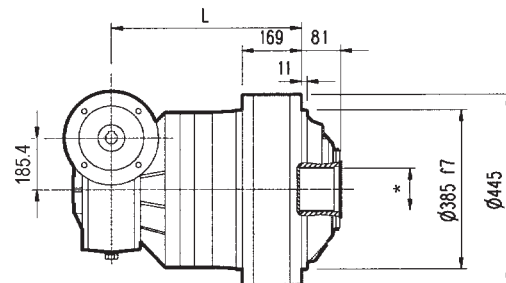


FP



FZ

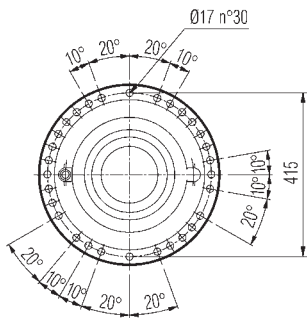
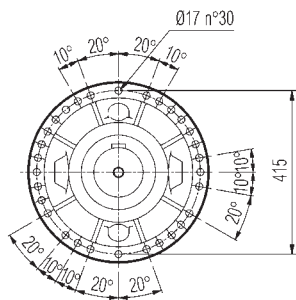
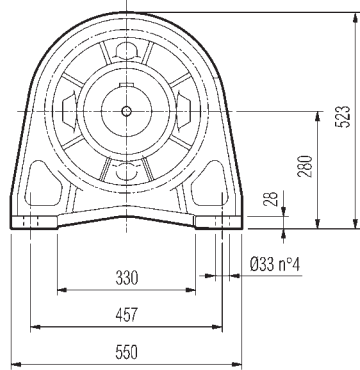
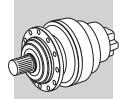
FZB



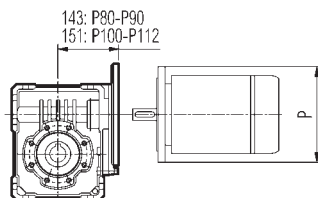
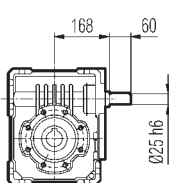
FP	$M_{2max} = 79000 \text{ Nm}$
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3/V 13 L3	L				K_g				P80	P90	P100	P112	P132	P160	P180
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	P	P	P	P	P	P	P
	732	505	505	505	475	385	355	375	-	-	250	250	300	350	350

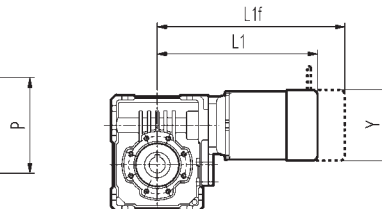
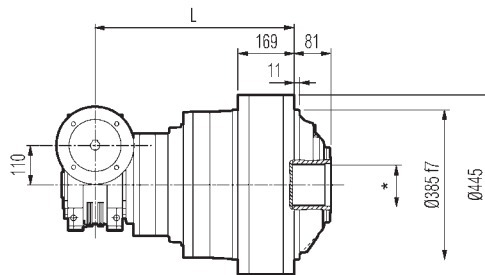
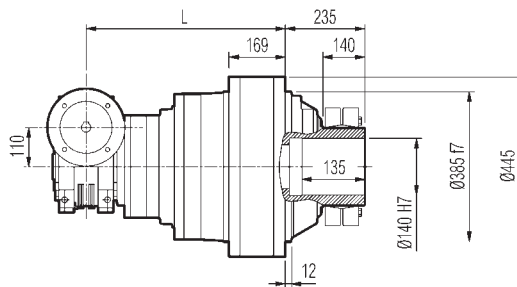
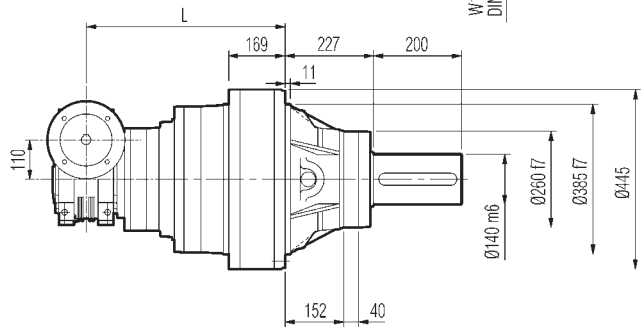
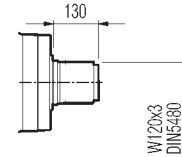
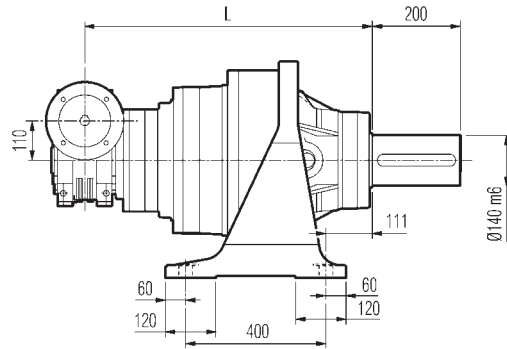
* Per dimensioni vedere pag. 314
 For dimensions, refer to page 314
 Für Abmessungen finden Sie auf Seite 314
 Pour les dimensions, se référer à la page 314



Vista da
View from **A**



A →



PC

HZ PZ

HC

FP

FZ

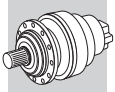
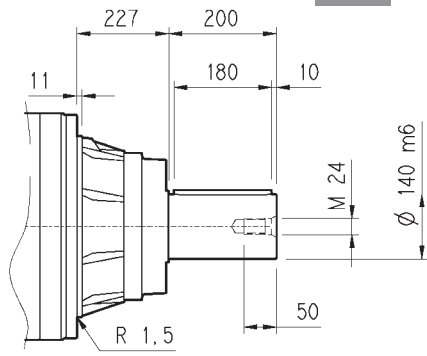
FZB

FP

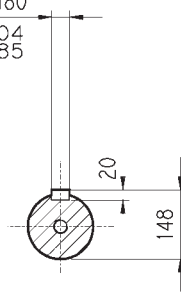
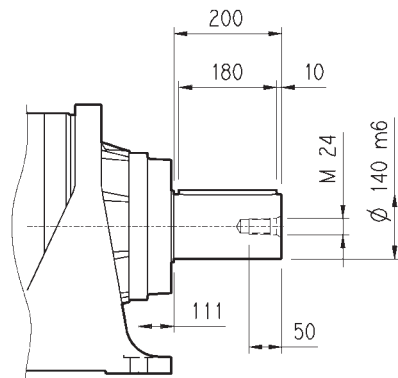
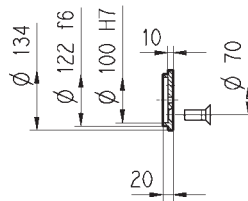
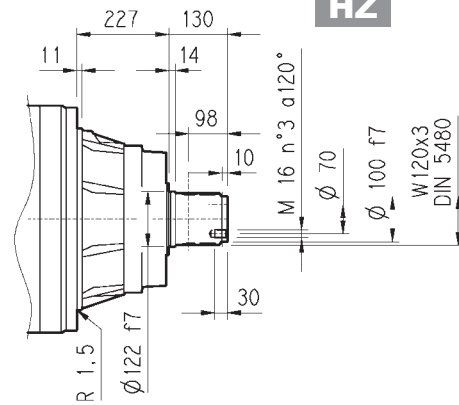
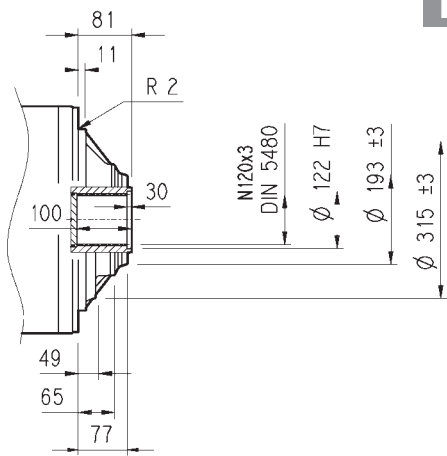
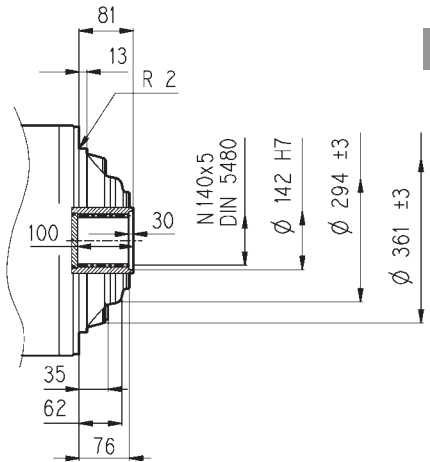
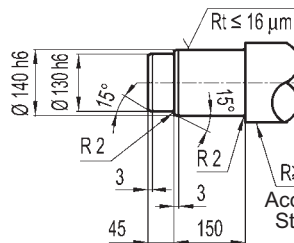
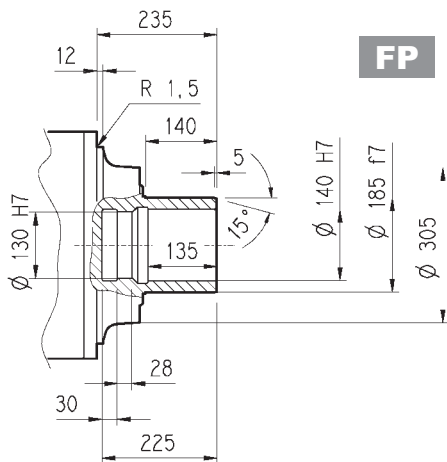
$M_{2max} = 79000 \text{ Nm}$

* Per dimensioni vedere pag. 314
For dimensions, refer to page 314
Für Abmessungen finden Sie auf Seite 314
Pour les dimensions, se référer à la page 314

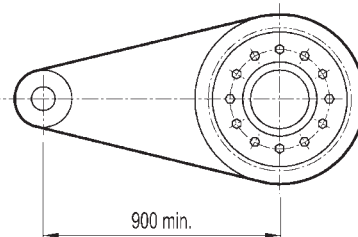
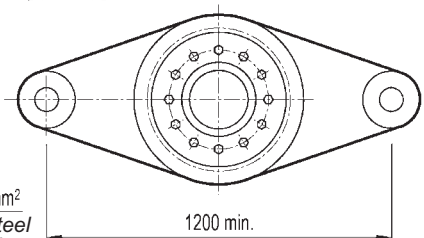
	L				L1	L2	L3	L4	L5	Kg			
	PC - PZ	HC - HZ	FZ	FP						PC - PZ	HC - HZ	FZ	FP
3/V 13 L4	780	553	553	553	110.1	153	25	138	60	425	335	305	325
	P80	P90	P 100	P112	S2 + M2S			S3 + M3S			S3 + M3L		
	P	P	P	P	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
3/V 13 L4	200	200	250	250	364	440	156	407	503	193	439	530	193

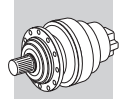
**313 L****313 R****3/V 13 L3****3/V 13 L4****HC**

A 36x20x180
 UNI 6604
 DIN 6885

**PC****HZ****FZ****FZB****FP**

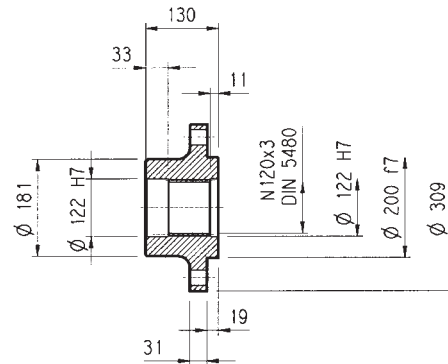
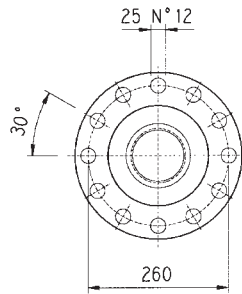
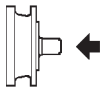
$R \geq 60 \text{ daN/mm}^2$
 Acciaio / Steel
 Stahl / Acier

**FP** $M_{2\text{max}} = 79000 \text{ Nm}$



Flangia / Flange
Flansch / Brides

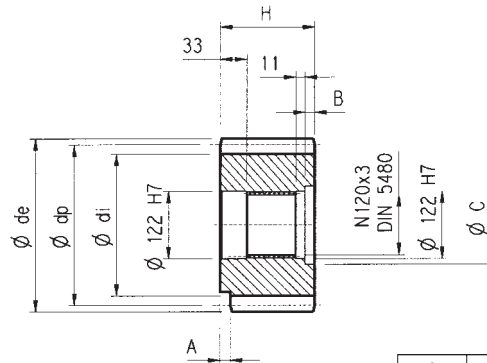
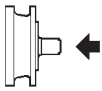
W0A



Materiale : Acciaio C40
Material : Steel C40
Material : Stahl C40
Màterial : Acier C40

Pignoni / Pinion gears
Ritzel / Pignons

P...

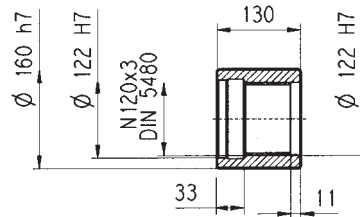
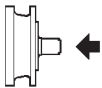


	m	z	x	dp	di	de	H	A	B	C	☆
PPH	16	17	0.500	272	247	315	135	0	5	136	□
PRI	18	18	0.333	324	294	365	140	0	10	140	□

☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifiée 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cémenté et tempré 18NiCrMo5

Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure

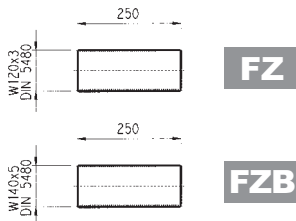
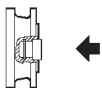
MOA



Materiale : Acciaio 16CrNi4
Material : Steel 16CrNi4
Material : Stahl 16CrNi4
Màterial : Acier 16CrNi4

Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée

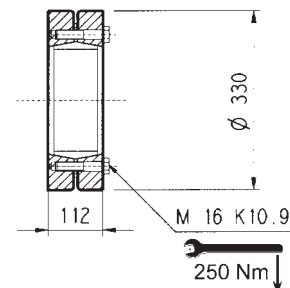
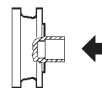
B0A

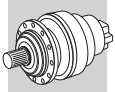


Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

G0A

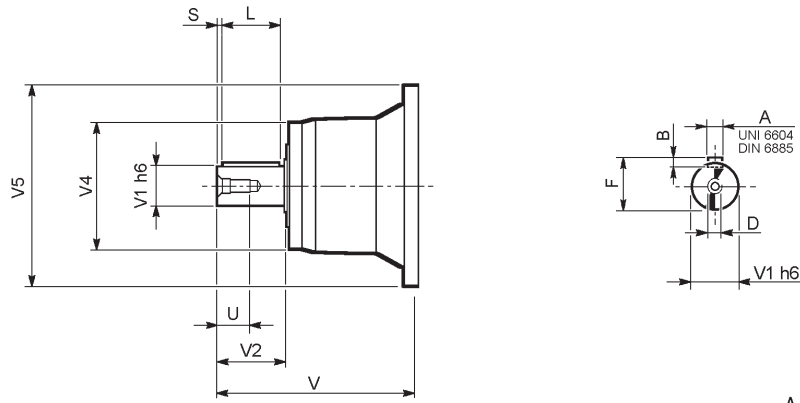




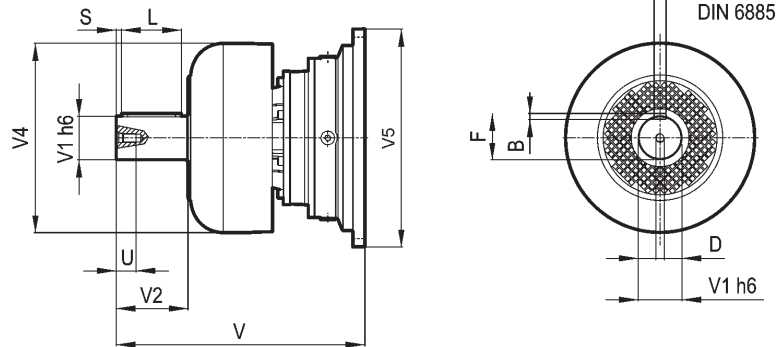
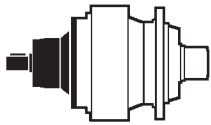
313 L

313 R

V



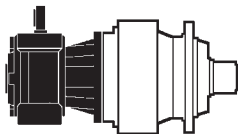
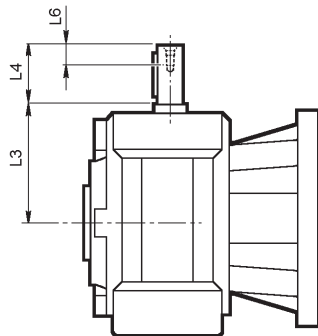
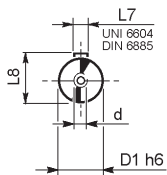
FV



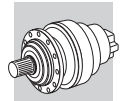
	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
313 L1	V11B	343	80	130	200	445	22	14	85	110	10	M16	36
	FV11B	451	80	130	347.5	445	22	14	85	110	10	M16	36
313 L2	V07B	315	80	130	200	345	22	14	85	110	10	M16	36
	FV07B	375	80	130	347.5	348	22	14	85	110	10	M16	36
	V07A	313	60	105	155	345	18	11	64	90	7.5	M16	36
	FV07A	363	60	105	309	348	18	11	64	90	7.5	M16	36
313 L3	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
313 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
313 R2 (B) (C)	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36
313 R3	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
313 R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

3/V 13 L3

3/V 13 L4



	D1 h6	L3	L4	L6	L7	L8	d
3/V 13 L3_HS	40	214.5	70	20	12	43	M8
3/V 13 L4_HS	25	168	60	19	8	28	M8

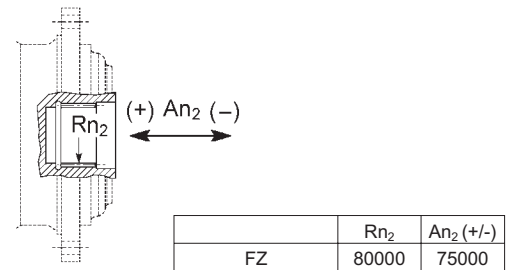
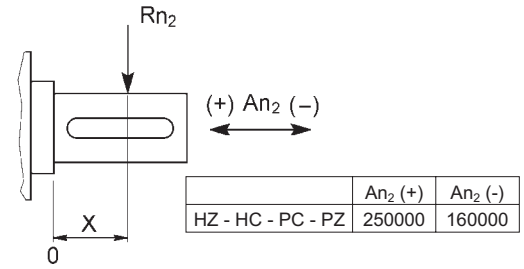
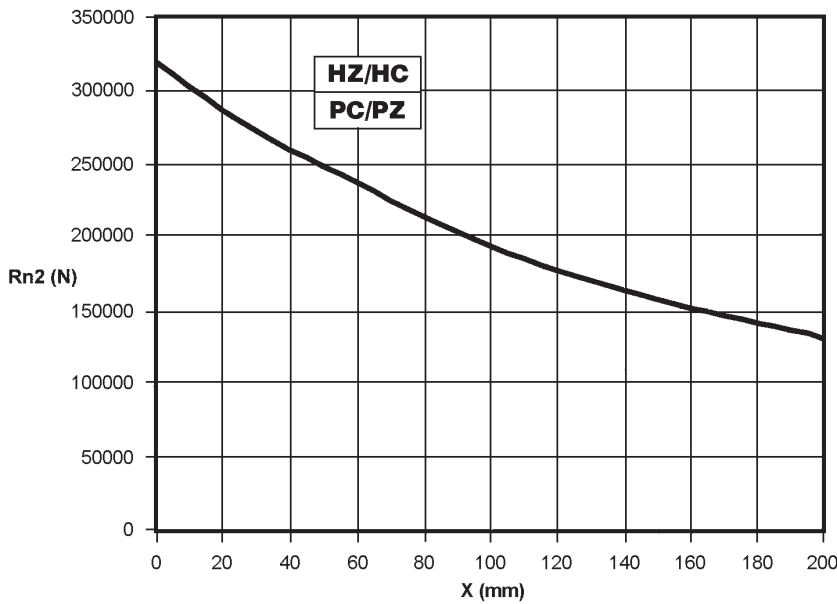


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $Fh_2 : n_2 \cdot h = 10000$

Permissible radial and axial loads on output shaft with $Fh_2 : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $Fh_2 : n_2 \cdot h = 10000$

Charges radiales et axiales admises sur l'arbre lent pour une valeur de $Fh_2 : n_2 \cdot h = 10000$



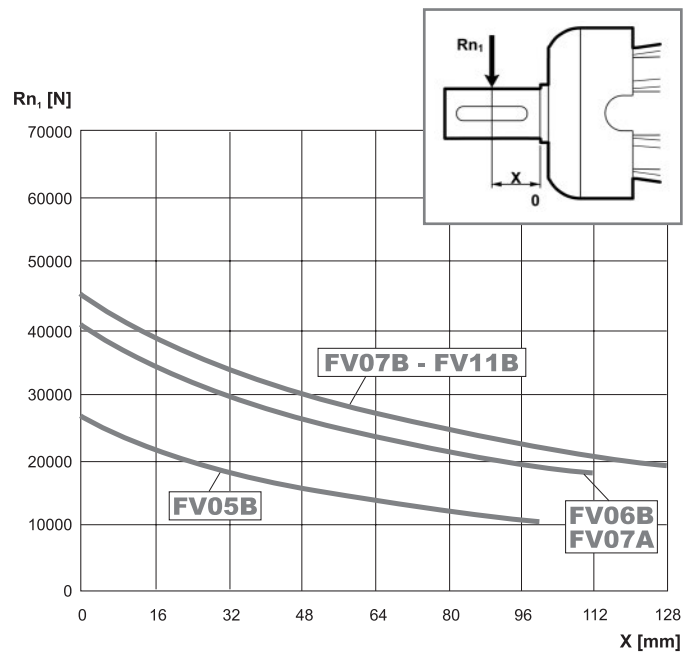
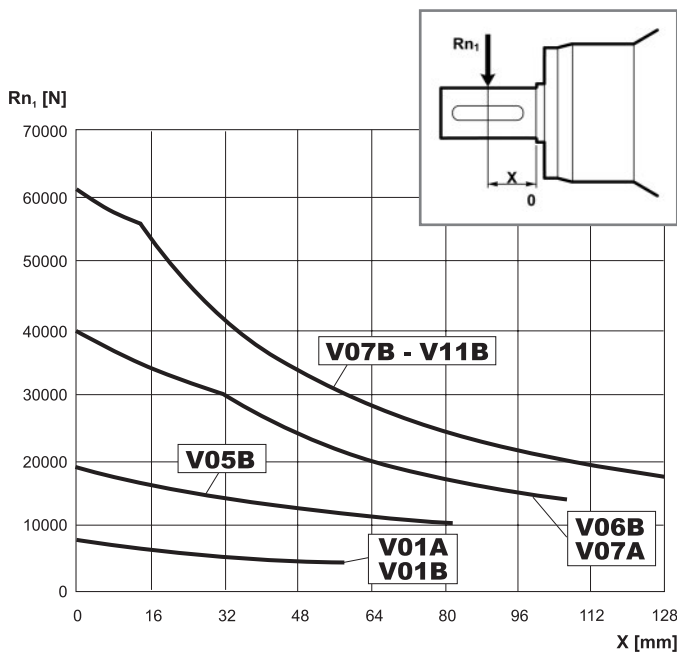
Fattore fh_2 correttivo per carichi sugli alberi Load corrective factor fh_2 on shafts Korrektionsfaktor fh_2 für wellenbelastungen Facteur de correction fh_2 pour charges sur les arbres	$Fh_2 = n_2 \cdot h$		10000	25000	50000	100000	500000	1000000
	fh_2	FZ	1	0.74	0.58	0.46	0.27	0.21
HZ - HC - PC - PZ		1	0.76	0.61	0.50	0.31	0.25	

Carichi radiali ammissibili sull'albero veloce per un valore di $Fh_1 : n_1 \cdot h = 250000$

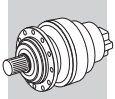
Permissible radial loads on input shaft with $Fh_1 : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $Fh_1 : n_1 \cdot h = 250000$

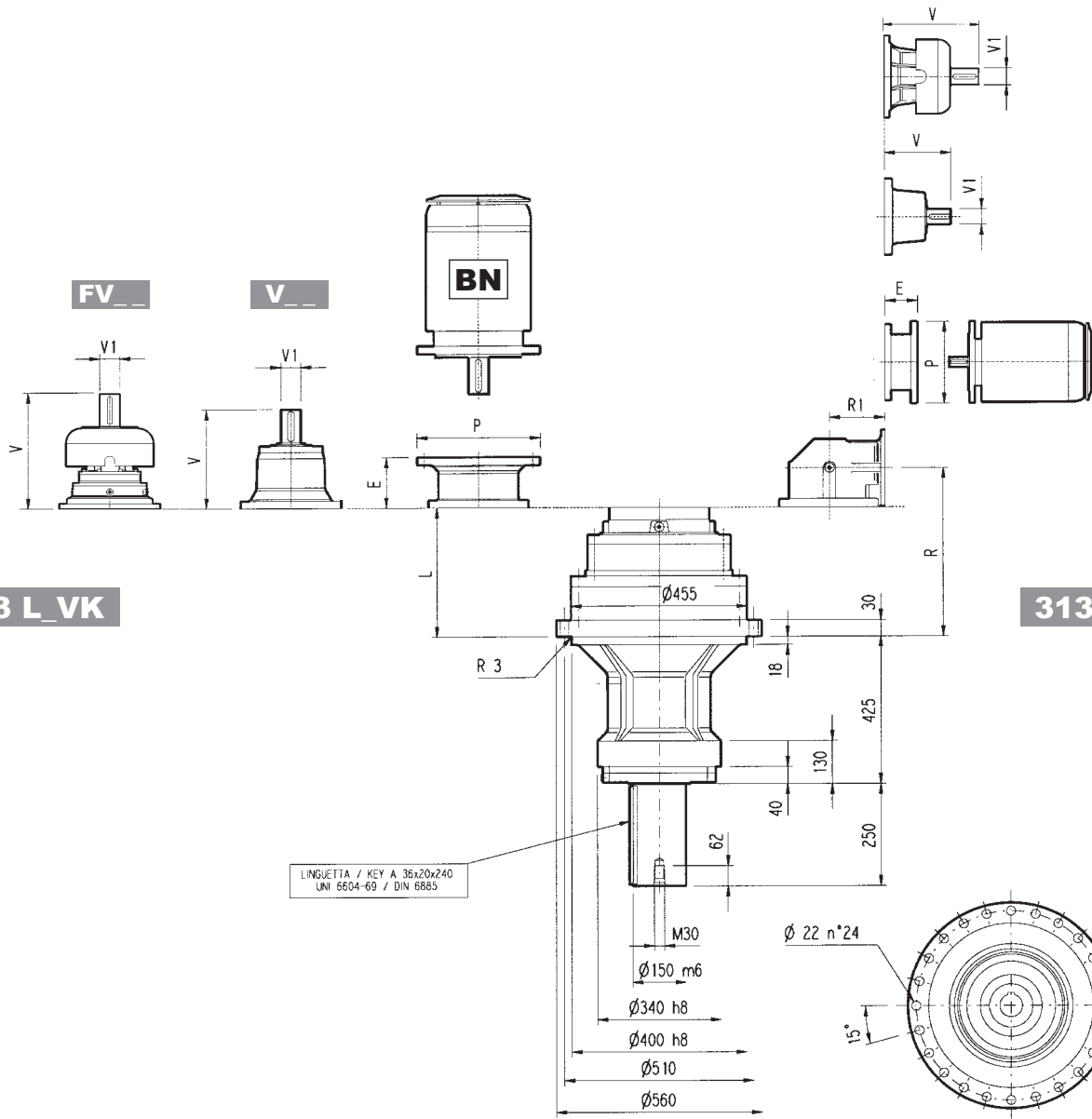
Charges radiales admises sur l'arbre d'entrée pour une valeur de $Fh_1 : n_1 \cdot h = 250000$



Fattore fh_1 correttivo per carichi sugli alberi Load corrective factor fh_1 on shafts Korrektionsfaktor fh_1 für wellenbelastungen Facteur de correction fh_1 pour charges sur les arbres	$Fh_1 = n_1 \cdot h$		250000	500000	1000000	2000000	5000000	10000000
	fh_1	1	0.79	0.63	0.50	0.37	0.29	



313_VK



313 L_VK

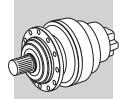
313 R_VK

	L	Kg	L						R					
			V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
313 L1	158	380	343	80	55	-	-	-	451	80	71	-	-	-
313 L2	308	440	315	80	35	313	60	28	375	80	48	363	60	34
313 L3	397	450	239	48	15	-	-	-	276	48	17	-	-	-
313 L4	462	460	137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
313 L2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	195	350	186	400	216	450	216	550
313 L3	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
313 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-

	R	R1	Kg	L						R					
				V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
313 R2 (B)	388	345	510	307	60	23	-	-	-	357	60	28	-	-	-
313 R2 (C)	388	390	520	307	60	23	-	-	-	357	60	28	-	-	-
313 R3	427	225	490	239	48	15	-	-	-	-	-	-	-	-	-
313 R4	489	140	470	137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
313 R2 (B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
313 R2 (C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
313 R3	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
313 R4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 313_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 313_VK, with radial force applying at a distance x from shaft shoulder.

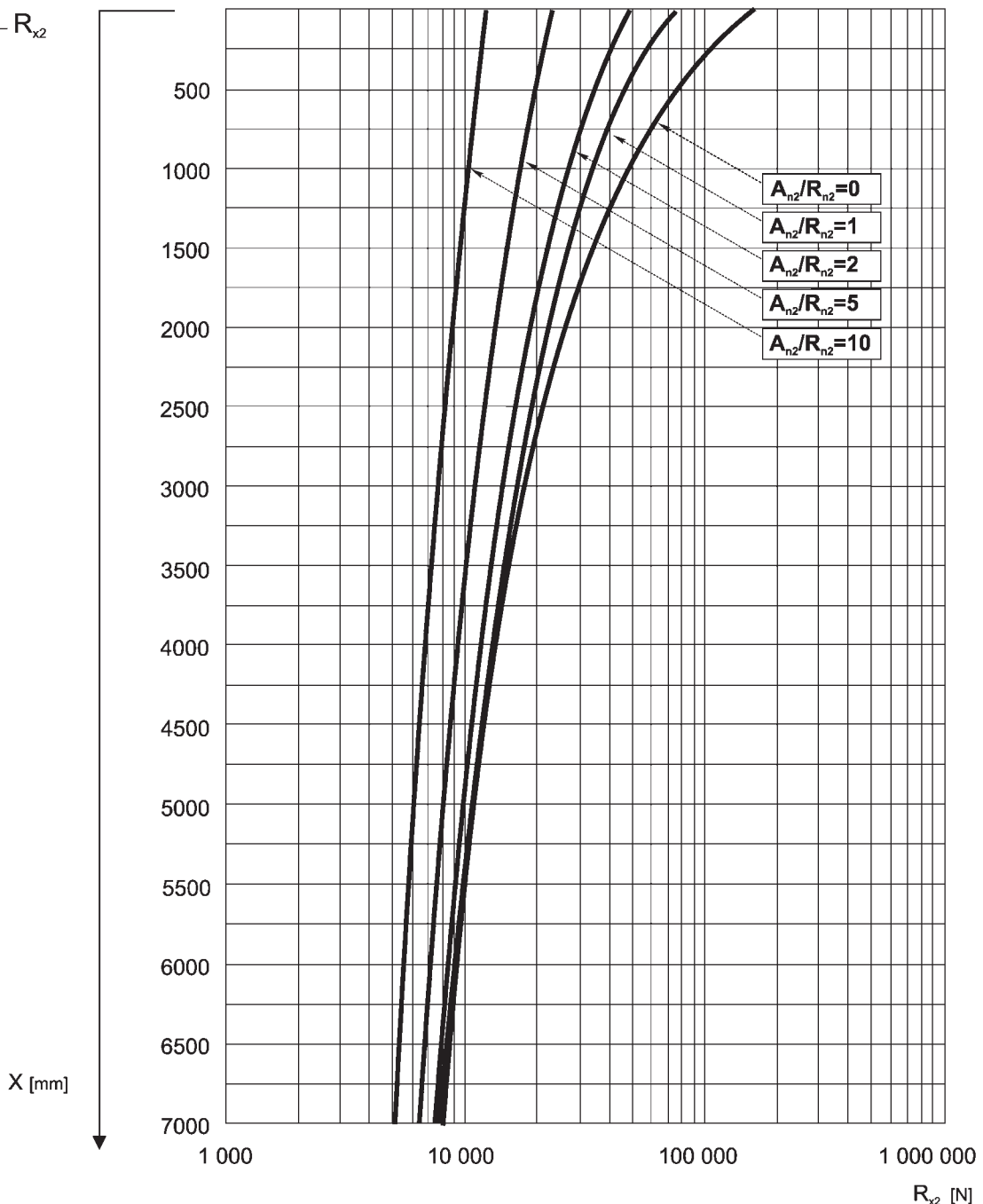
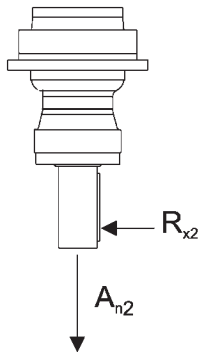
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

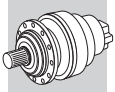
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 313_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

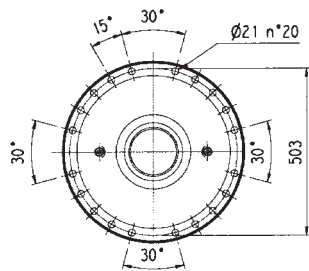
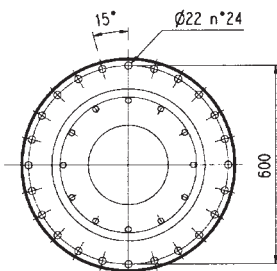
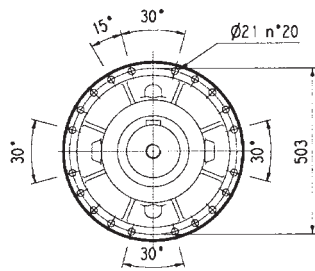
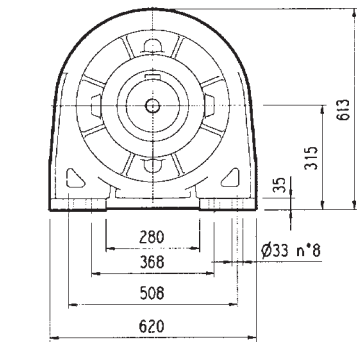
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 313_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.

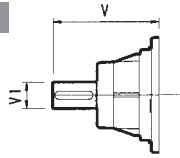




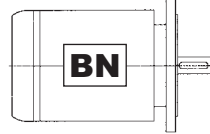
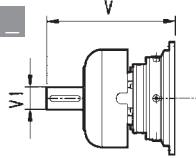
314 L



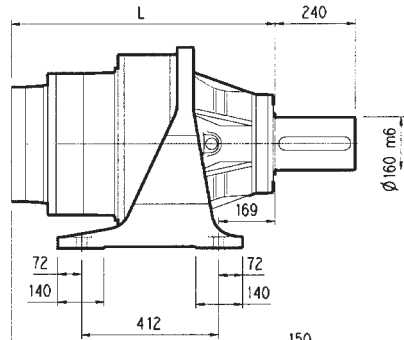
V



FV

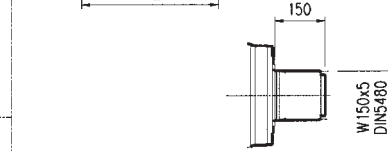


PC

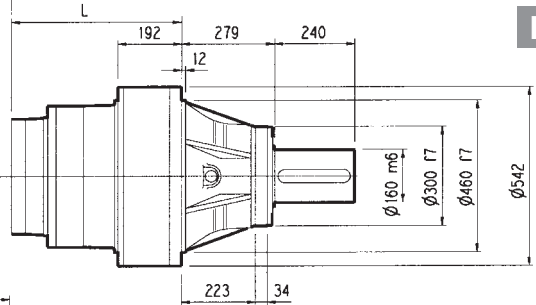


HZ

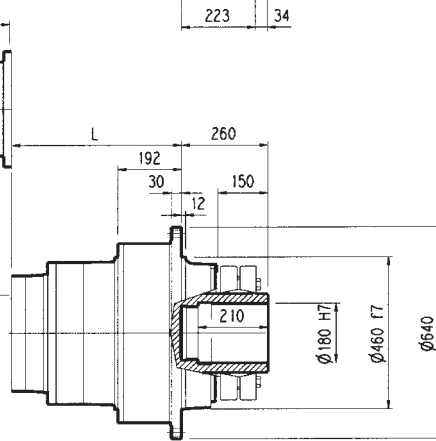
PZ



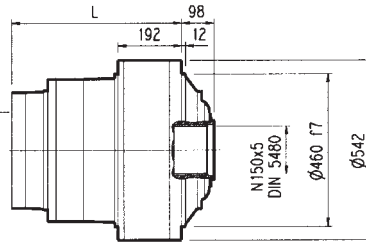
HC



FP



FZ



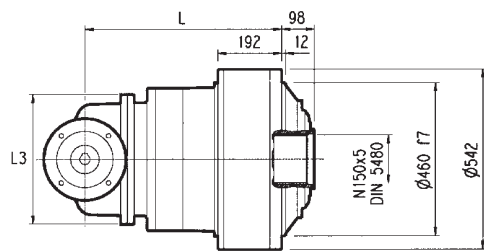
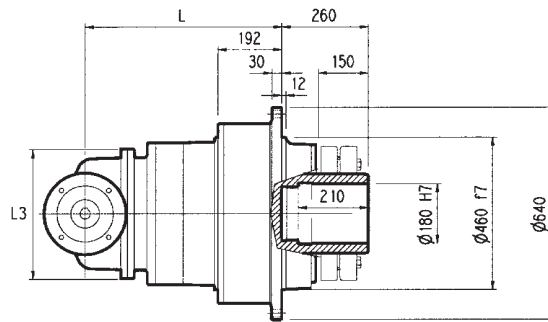
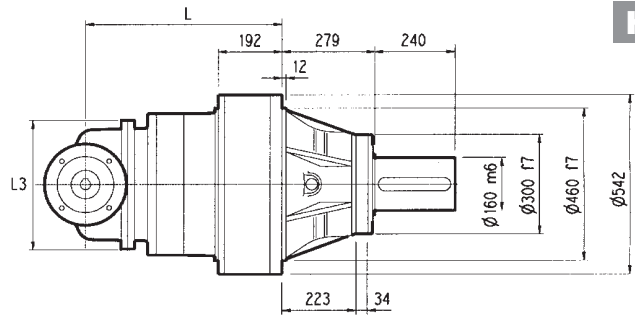
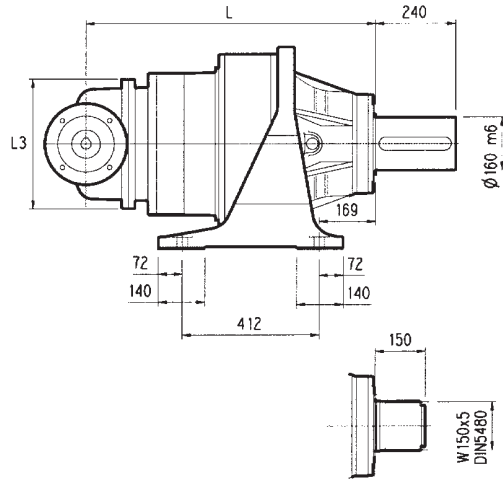
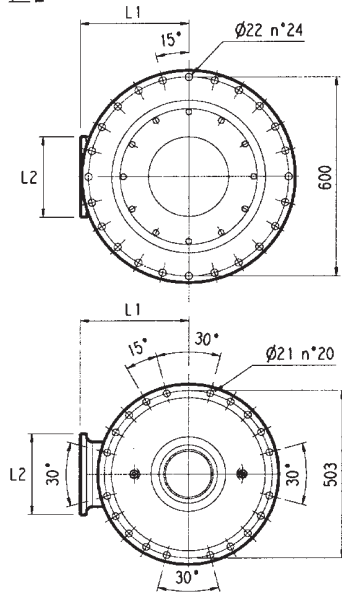
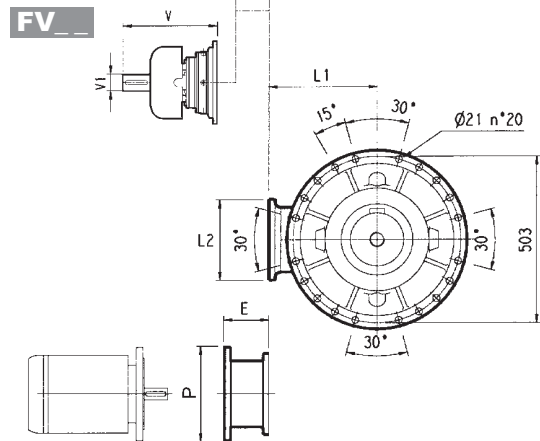
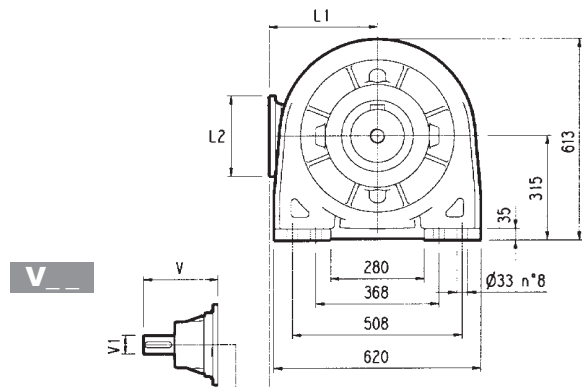
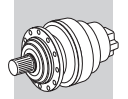
FP

$M_{2max} = 115000 \text{ Nm}$

	L				Kg				Kg				Kg							
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
314 L2	641	362	362	362	545	415	325	375	377	80	50	-	-	-	457	80	63	-	-	-
314 L3	777	498	498	498	590	460	370	420	307	60	23	-	-	-	357	60	28	-	-	-
314 L4	842	563	563	563	600	470	380	430	239	48	15	-	-	-	276	48	17	-	-	-

	P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P
314 L2	-	-	-	-	-	-	271	400	301	450	281	550
314 L3	-	-	153	350	153	350	183	400	213	450	193	550
314 L4	114	300	144	350	144	350	174	400	-	-	-	-

314 R



PC

HZ PZ

HC

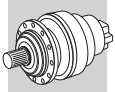
FP

FZ

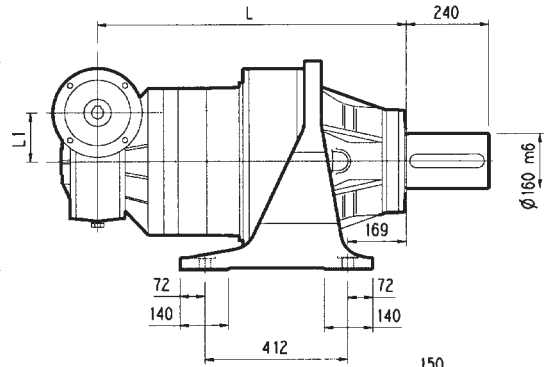
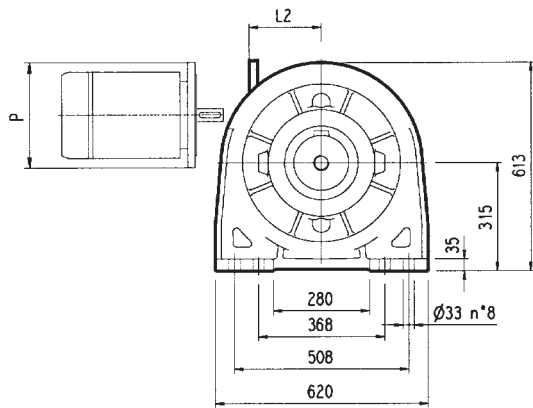
FP $M_{2max} = 115000 \text{ Nm}$

	L				L1	L2	L3	Kg				Kg				Kg							
	PC-PZ	HC-HZ	FZ	FP				PC-PZ	HC-HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
314 R3 (B)	848	569	569	569	345	292	400	720	590	500	550	307	60	23	-	-	-	357	60	28	-	-	-
314 R3 (C)	856	587	587	587	390	292	480	730	600	510	560	307	60	23	-	-	-	357	60	28	-	-	-
314 R4	914	635	635	635	225	245	345	680	550	460	510	137.5	24	6	158	38	7	-	-	-	-	-	-

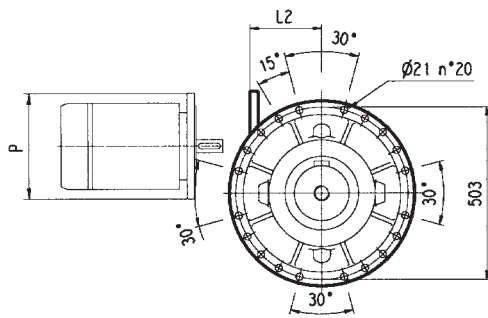
	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
314 R3 (B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
314 R3 (C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
314 R4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-



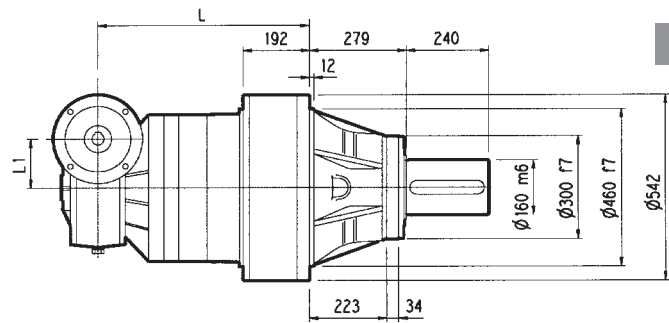
3/V 14 L3



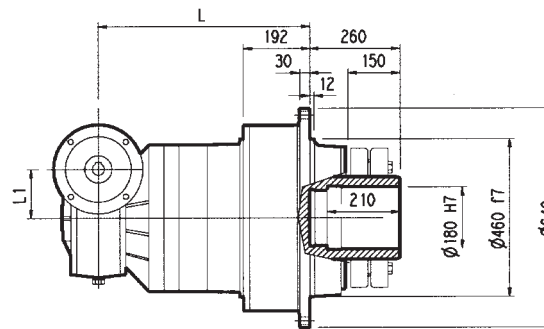
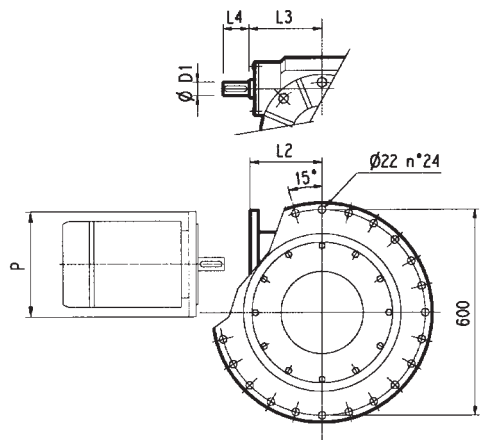
PC



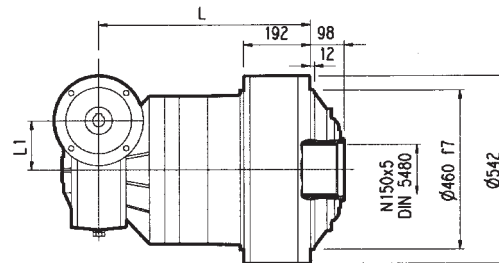
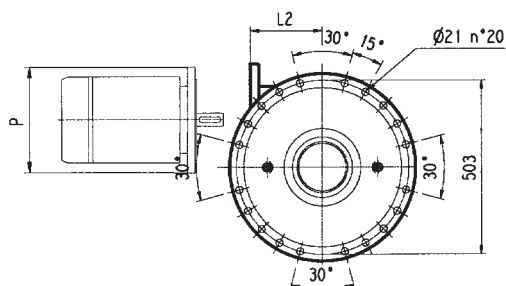
HZ PZ



HC



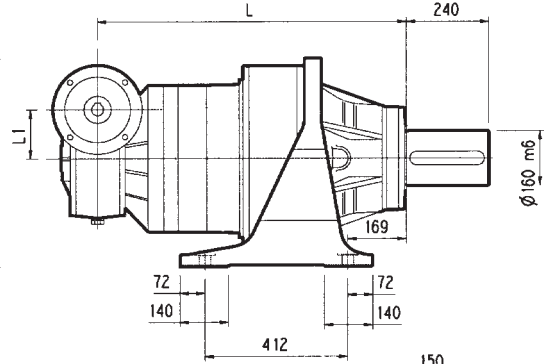
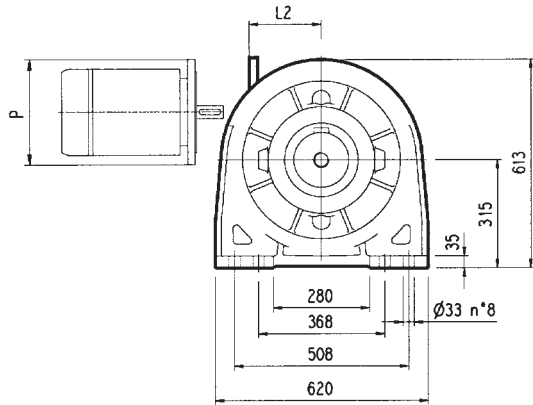
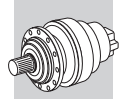
FP



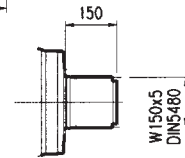
FZ

FP $M_{2max} = 115000 \text{ Nm}$

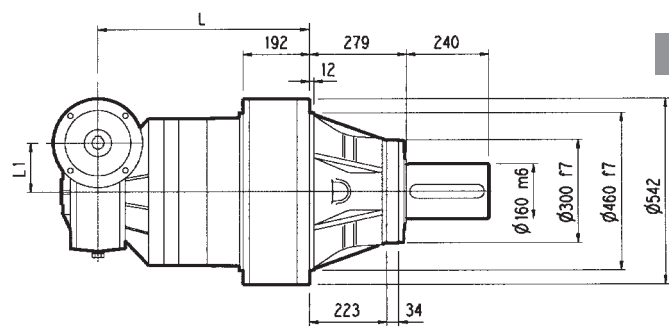
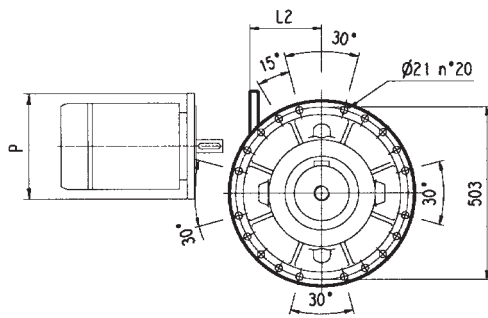
	L				L1	L2	D1	L3	L4	Kg				
	PC - PZ	HC - HZ	FZ	FP							PC - PZ	HC - HZ	FZ	FP
3/V 14 L3	920	641	641	641	185	217	40	214.5	70		665	535	445	495
3/V 14 L3	P100		P112		P132		P160		P180					
	P	P	L2	P	L2	P	L2	P	L2	P				
	250	250	-	300	-	350	-	350	-	350				



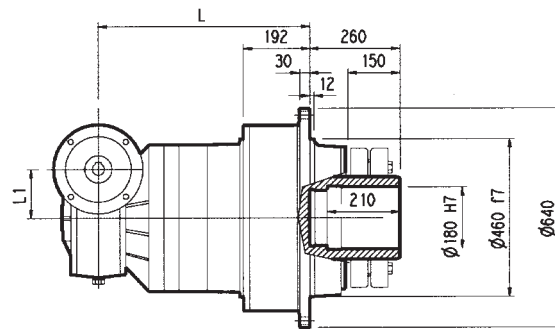
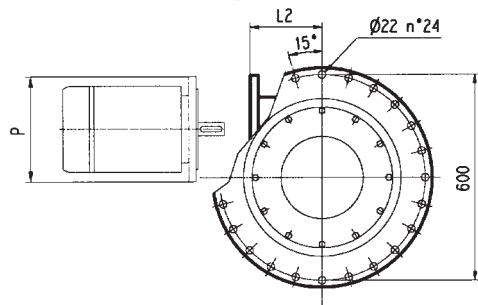
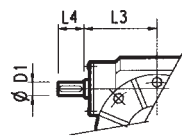
PC



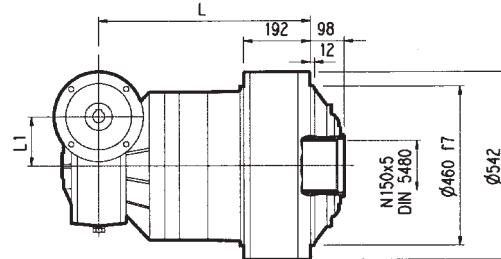
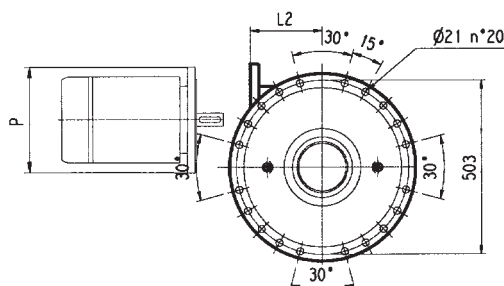
HZ PZ



HC



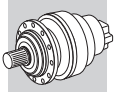
FP



FZ

FP $M_{2max} = 115000 \text{ Nm}$

	L				L1	L2	D1	L3	L4	Kg				
	PC - PZ	HC - HZ	FZ	FP							PC - PZ	HC - HZ	FZ	FP
3/V 14 L4	961	682	682	682	150	190	35	185	65		690	560	470	520
3/V 14 L4	P100		P112		P132		P160		P180					
	P	P	L2	P	L2	P	L2	P	L2	P	L2	P	P	
	250	250	-	300	-	350	-	-	-	-	-	-	-	



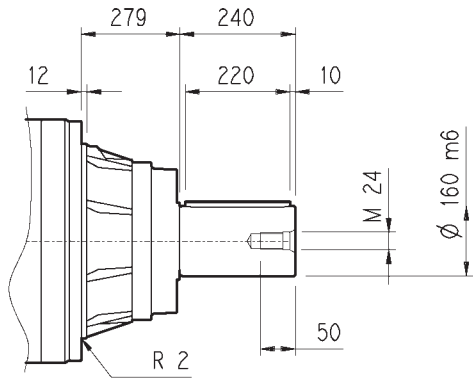
314 L

314 R

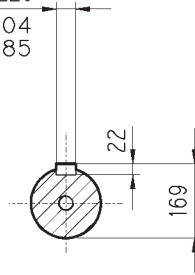
3/V 14 L3

3/V 14 L4

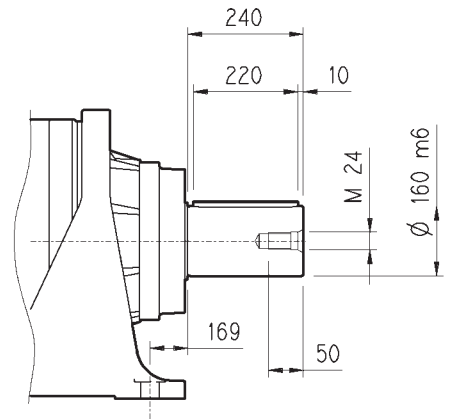
HC



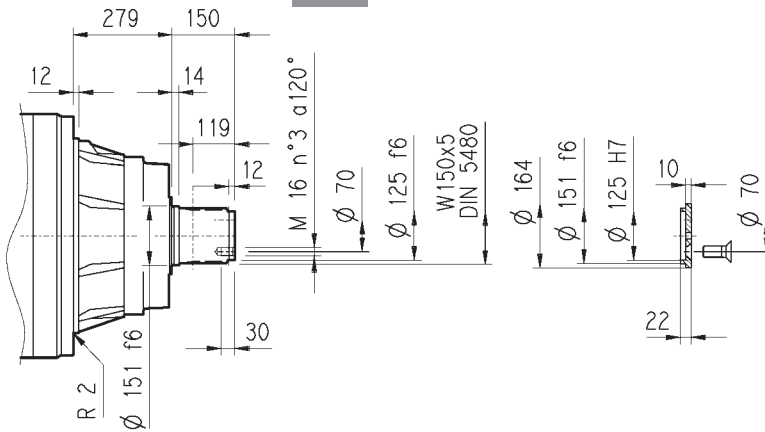
A 40x22x220
UNI 6604
DIN 6885



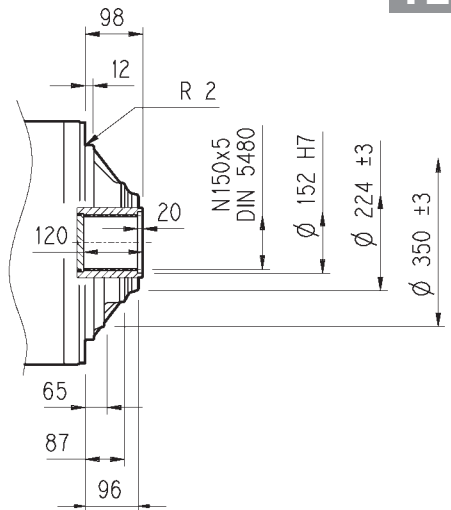
PC



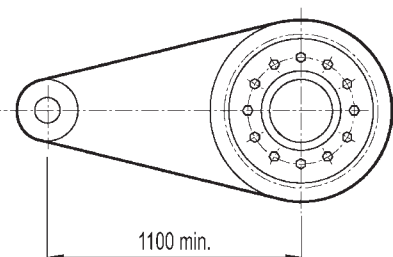
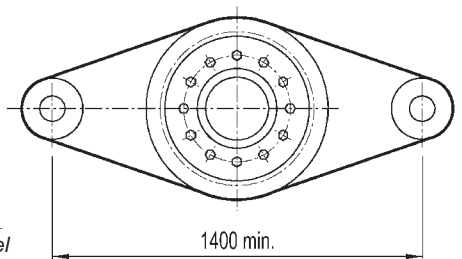
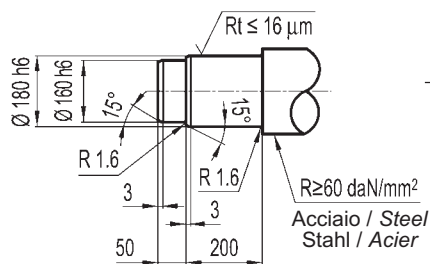
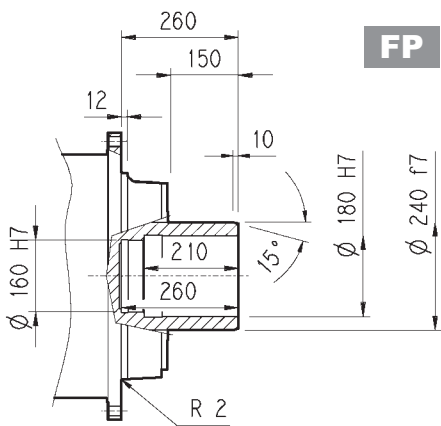
HZ



FZ



FP



FP

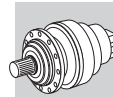
M_{2max} = 115000 Nm

314 L

314 R

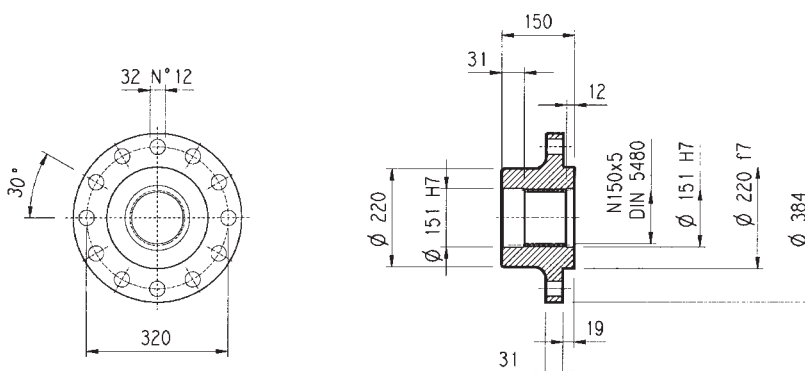
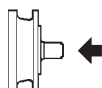
3/V 14 L3

3/V 14 L4



Flangia / Flange
Flansch / Brides

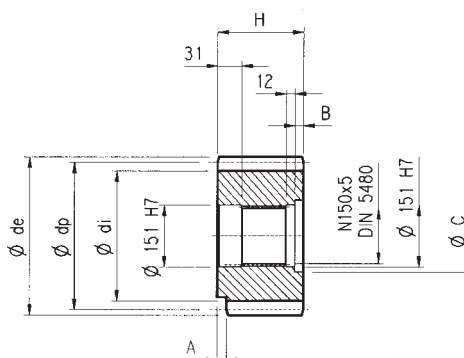
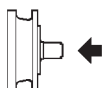
WOA



Materiale : Acciaio C40
Material : Steel C40
Material : Stahl C40
Màterial : Acier C40

Pignoni / Pinion gears
Ritzel / Pignons

P...

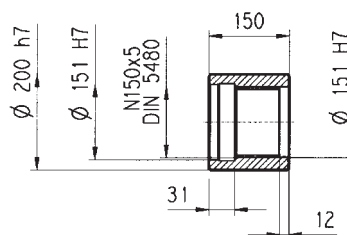


	m	z	x	dp	di	de	H	A	B	C	☆
PRG1	18	16	0.500	288	261	342	160	0	10	166	■
PRG2	18	16	0.617	288	271	339	150	30	0	0	□

☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifiée 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cimenté et tempré 18NiCrMo5

Manicotti lisci / Sleeve couplings
Nabens / Manchons lisses a cannelure interieure

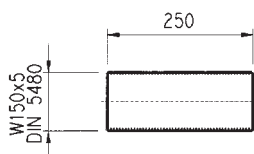
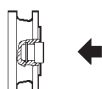
MOA



Materiale : Acciaio 16CrNi4
Material : Steel 16CrNi4
Material : Stahl 16CrNi4
Màterial : Acier 16CrNi4

Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée

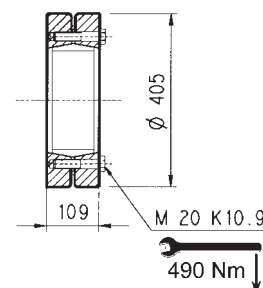
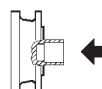
B0A

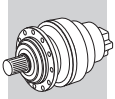


Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
Acier 18 NiCrMo5 UNI 5331 doit être cimenté trempé 50-55 HRC

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

GOA

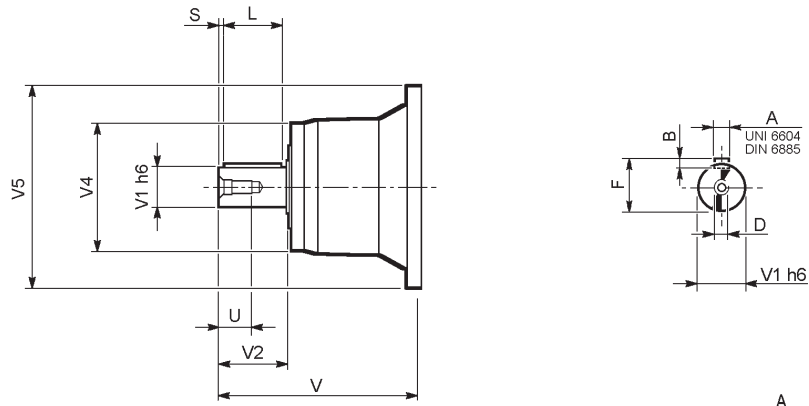




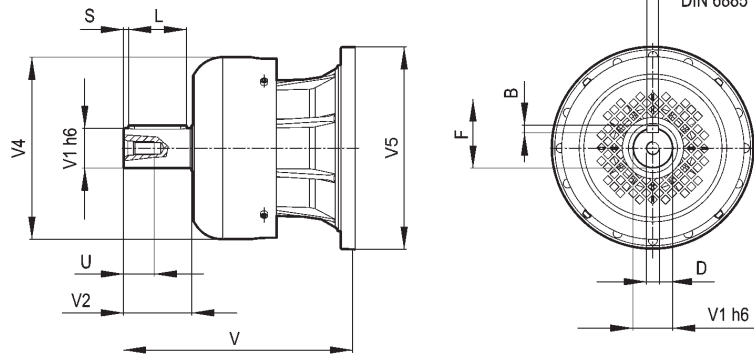
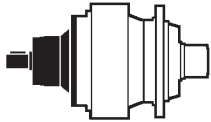
314 L

314 R

V



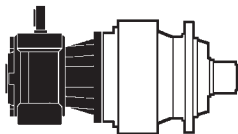
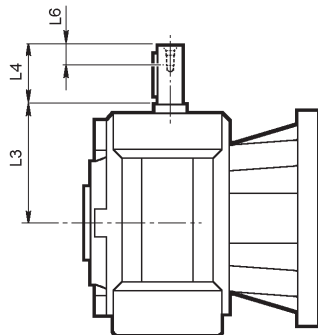
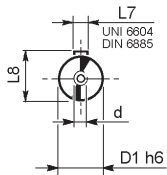
FV



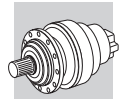
	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
314 L2	V10B	377	80	130	200	400	22	14	85	110	10	M16	36
	FV10B	457	80	130	347.5	400	22	14	85	110	10	M16	36
314 L3	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36
314 L4	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
314 R3 (B) (C)	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36
314 R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

3/V 14 L3

3/V 14 L4



	D1 h6	L3	L4	L6	L7	L8	d
3/V 14 L3 HS	40	214.5	70	20	12	43	M8
3/V 14 L4 HS	35	185	65	20	10	38	M8

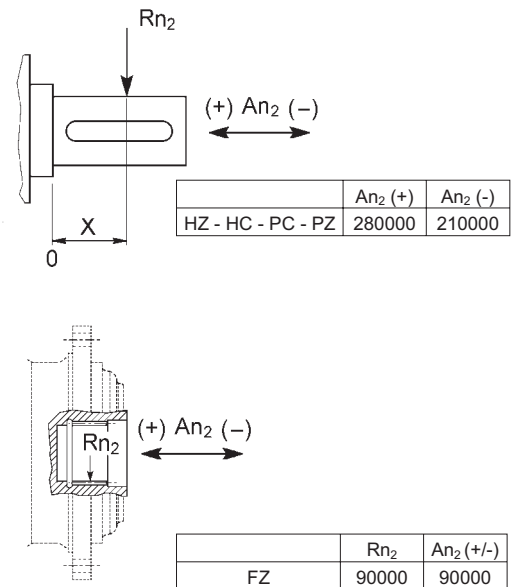
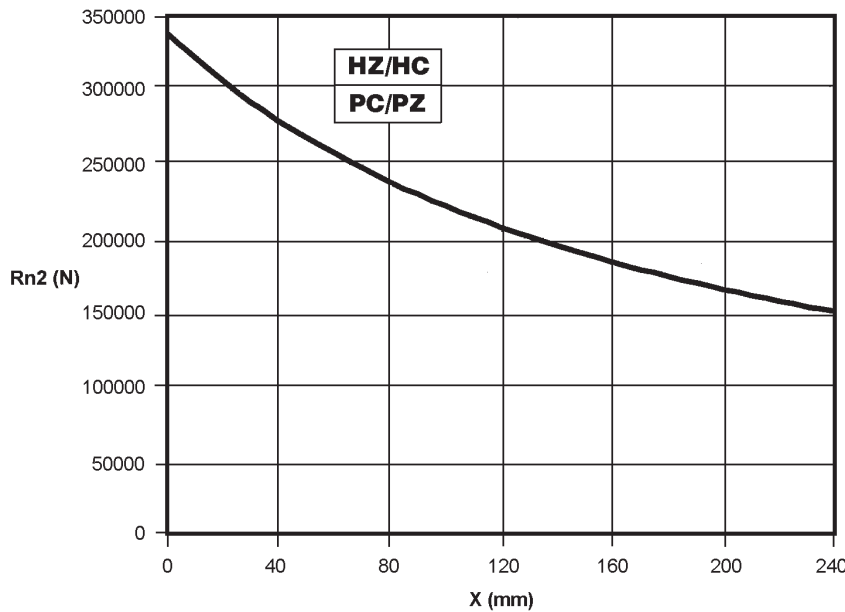


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $Fh_2 : n_2 \cdot h = 10000$

Permissible radial and axial loads on output shaft with $Fh_2 : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $Fh_2 : n_2 \cdot h = 10000$

Charges radiales et axiales admises sur l'arbre lent pour une valeur de $Fh_2 : n_2 \cdot h = 10000$



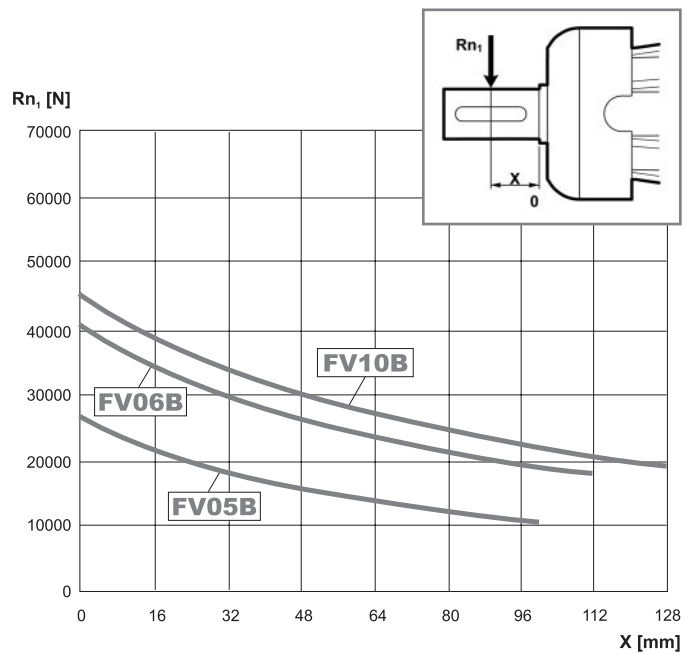
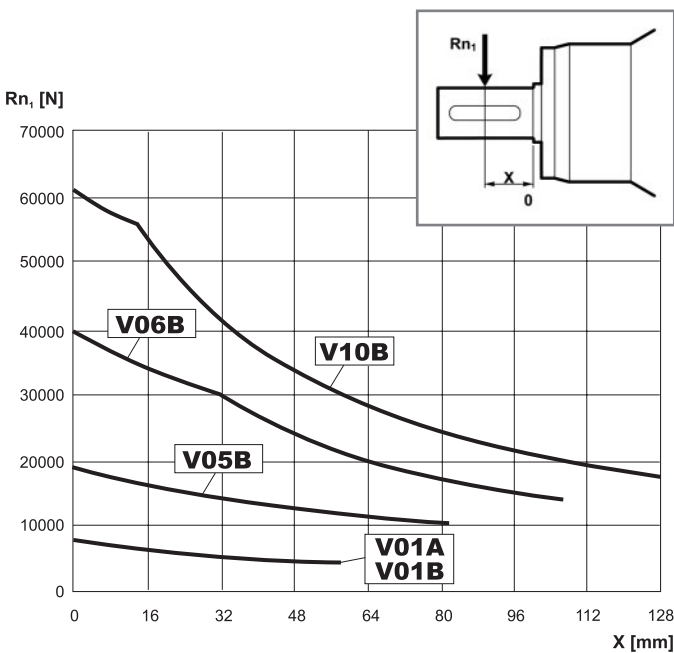
Fattore fh_2 correttivo per carichi sugli alberi Load corrective factor fh_2 on shafts Korrektionsfaktor fh_2 für wellenbelastungen Facteur de correction fh_2 pour charges sur les arbres	$Fh_2 = n_2 \cdot h$		10000	25000	50000	100000	500000	1000000
	fh_2	FZ	1	0.74	0.58	0.46	0.27	0.21
		HZ - HC - PC - PZ	1	0.76	0.61	0.50	0.31	0.25

Carichi radiali ammissibili sull'albero veloce per un valore di $Fh_1 : n_1 \cdot h = 250000$

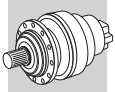
Permissible radial loads on input shaft with $Fh_1 : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $Fh_1 : n_1 \cdot h = 250000$

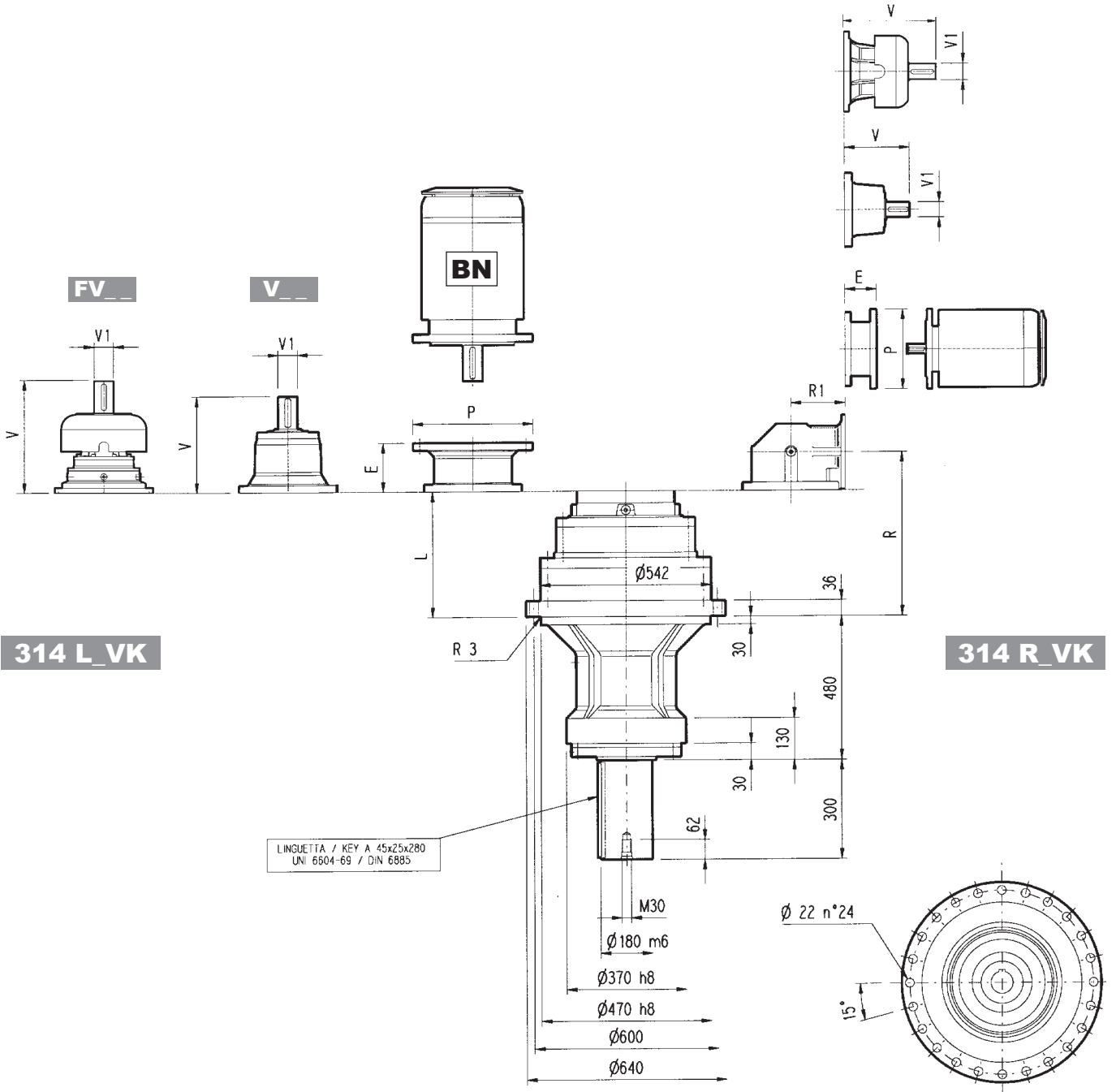
Charges radiales admises sur l'arbre d'entrée pour une valeur de $Fh_1 : n_1 \cdot h = 250000$



Fattore fh_1 correttivo per carichi sugli alberi Load corrective factor fh_1 on shafts Korrektionsfaktor fh_1 für wellenbelastungen Facteur de correction fh_1 pour charges sur les arbres	$Fh_1 = n_1 \cdot h$	250000	500000	1000000	2000000	5000000	10000000
	fh_1	1	0.79	0.63	0.50	0.37	0.29



314_VK



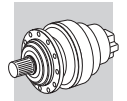
314 L_VK

314 R_VK

	L	Kg													P132		P160		P180		P200		P225		P250	
			V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg	E	P	E	P	E	P	E	P	E	P	E	P
314 L2	386	650	348	80	55	-	-	-	457	80	63	-	-	-	-	-	-	-	-	271	400	301	450	281	550	
314 L3	519	700	315	80	35	313	60	28	357	60	28	-	-	-	-	153	350	153	350	183	400	213	450	193	550	
314 L4	608	710	239	48	15	-	-	-	276	48	17	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-

	R	R1	Kg														
				V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg		
314 R3 (B)	611	345	720	307	60	23	-	-	-	-	-	357	60	28	-	-	-
314 R3 (C)	611	390	730	307	60	23	-	-	-	-	-	357	60	28	-	-	-
314 R4	638	225	690	137.5	24	6	158	38	7	-	-	-	-	-	-	-	

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
314 R3 (B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
314 R3 (C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
314 R4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 314_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 314_VK, with radial force applying at a distance x from shaft shoulder.

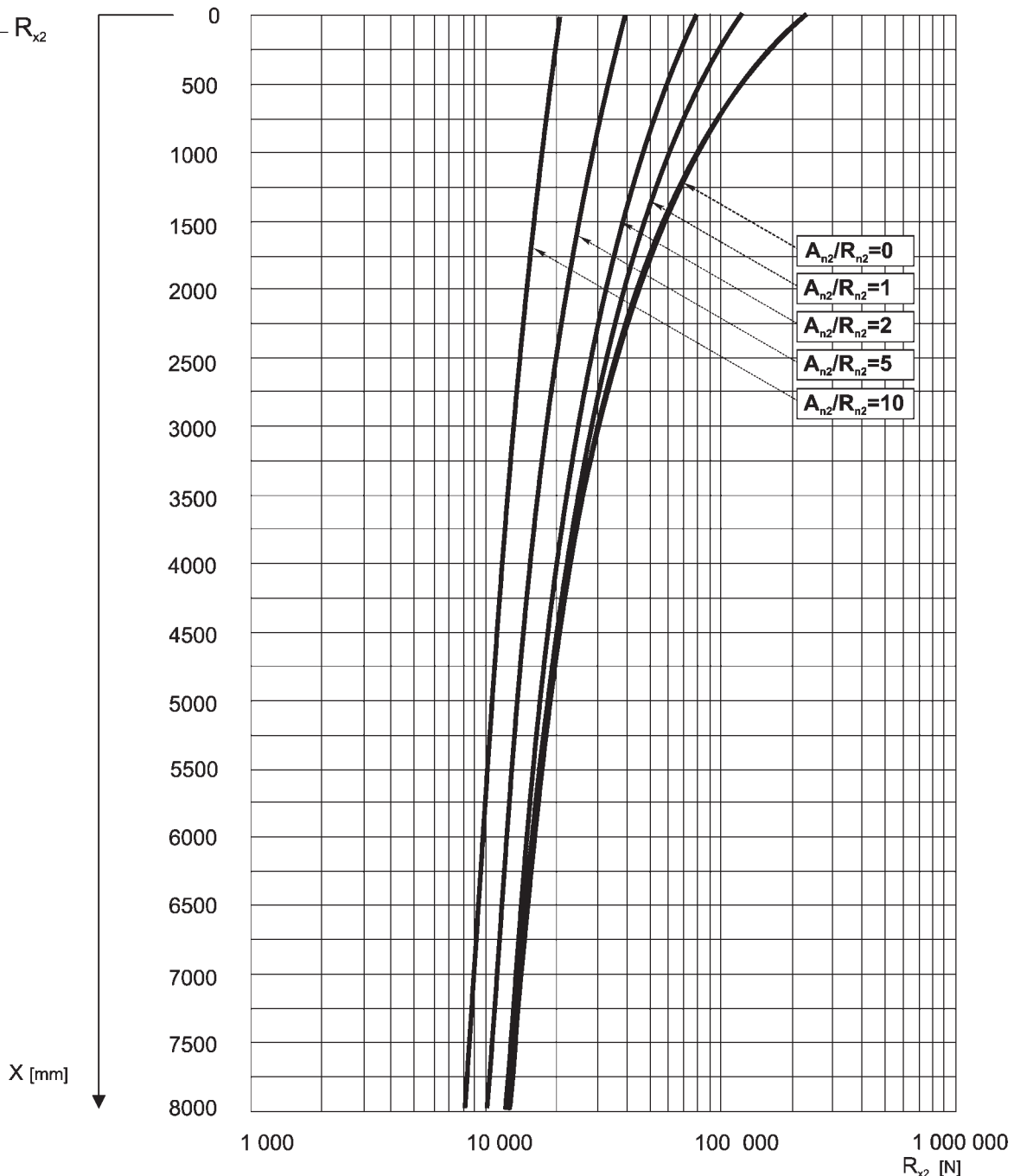
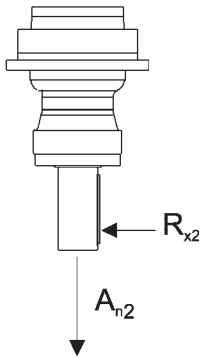
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

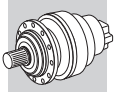
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 314_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

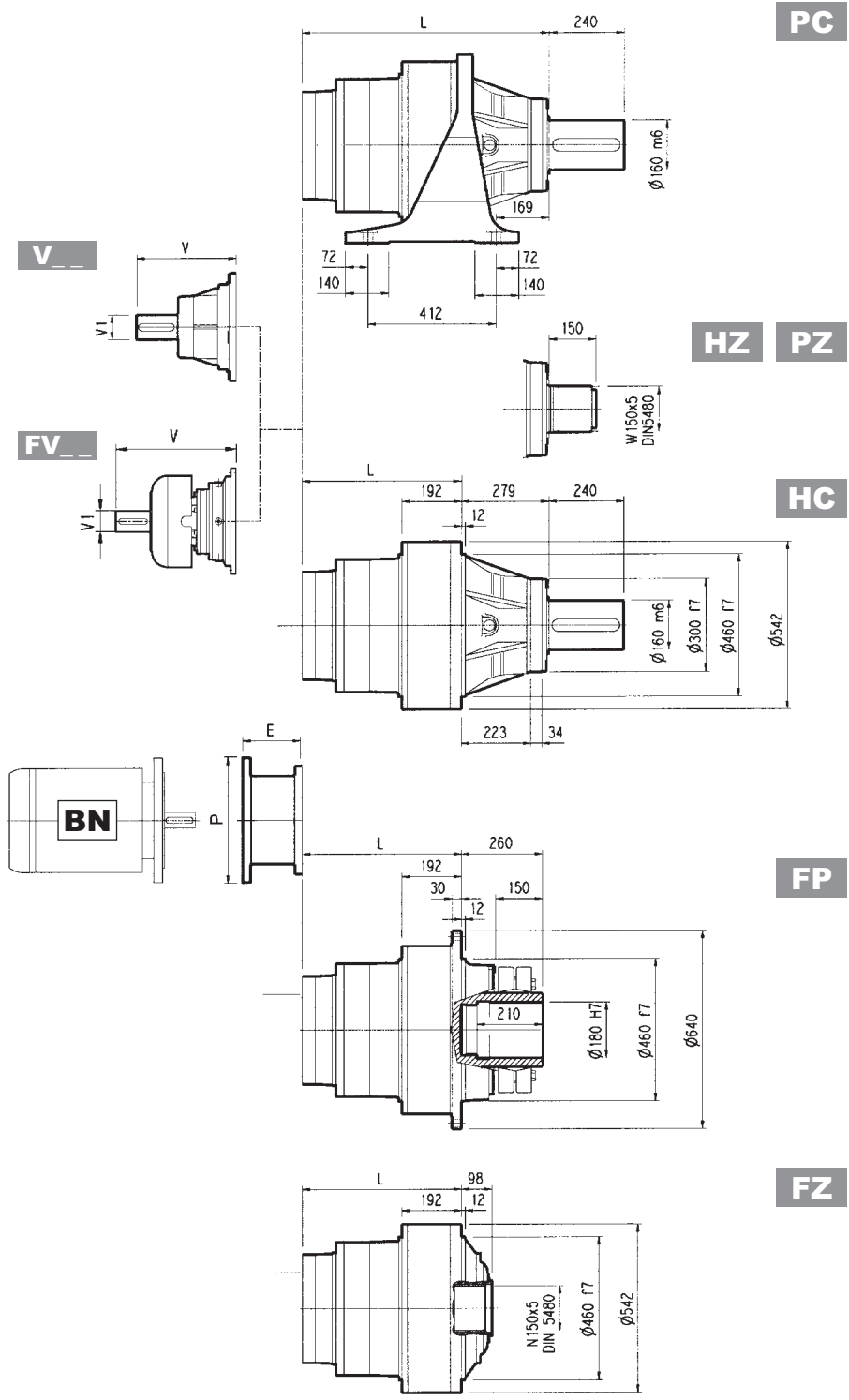
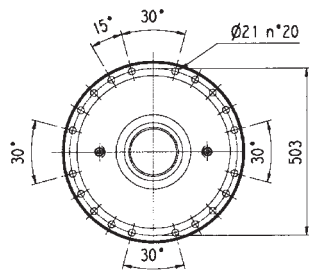
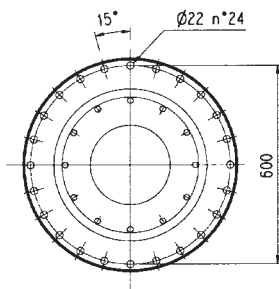
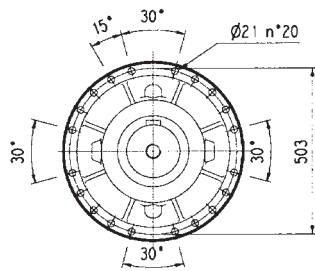
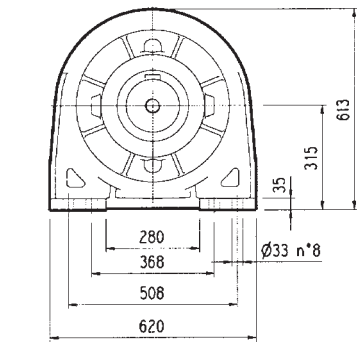
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 314_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.





315 L



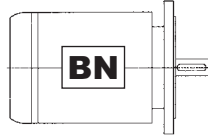
PC

HZ PZ

HC

FP

FZ

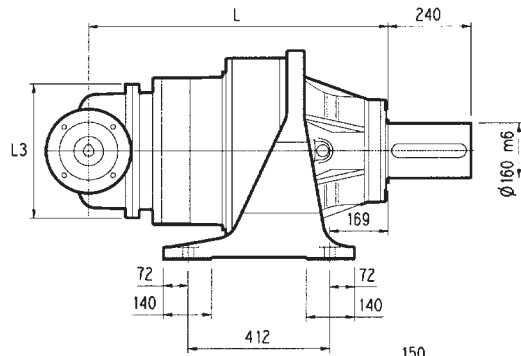
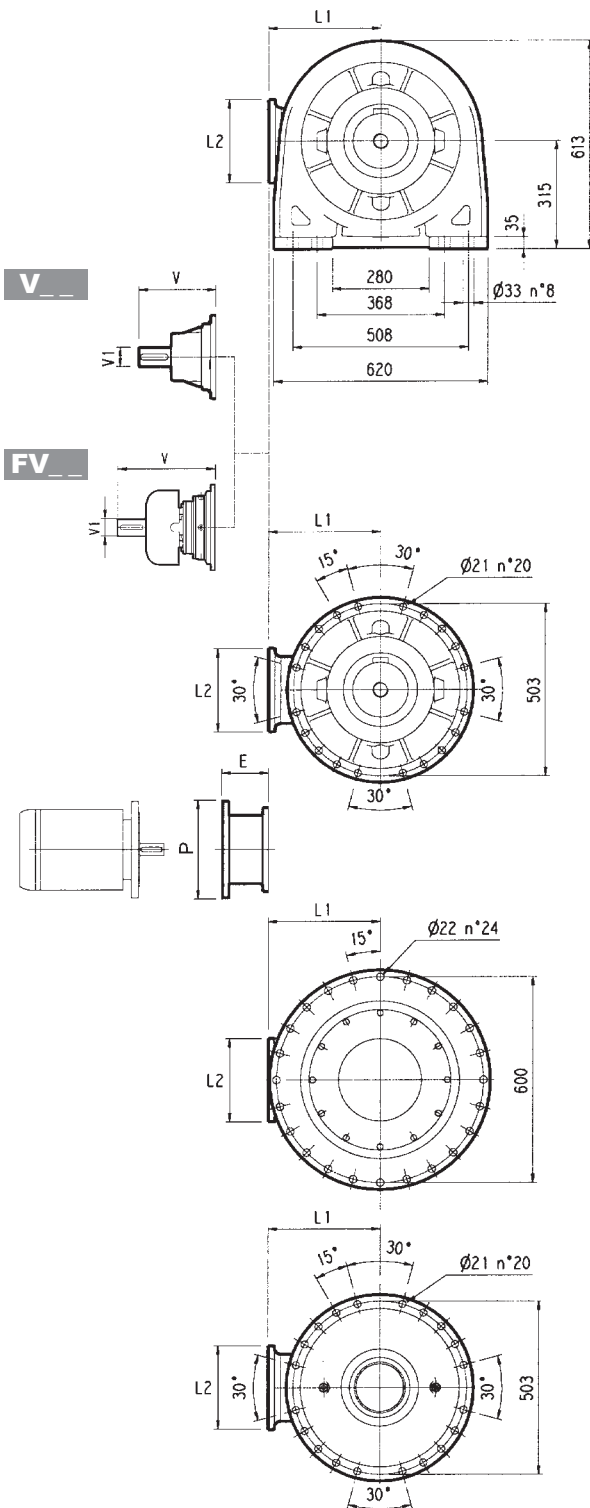
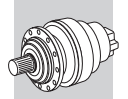


FP $M_{2max} = 135000 \text{ Nm}$

	L				Kg				Kg				Kg							
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
315 L1	453	174	174	174	500	370	280	330	556	120	125	-	-	-	-	-	-	-	-	-
315 L2	665	386	386	386	585	455	365	415	348	80	55	-	-	-	456	80	85	-	-	-
315 L3	798	519	519	519	630	500	410	460	315	80	35	313	60	28	375	80	48	363	60	34
315 L4	887	608	608	608	642	512	422	472	239	48	15	-	-	-	276	48	17	-	-	-

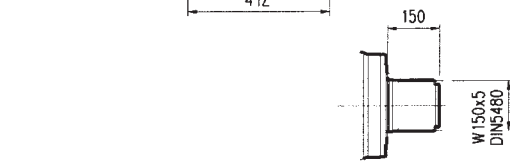
	P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P
315 L3	-	-	-	-	195	350	186	400	216	450	215	550
315 L4	114	300	144	350	144	350	174	400	-	-	-	-

315 R

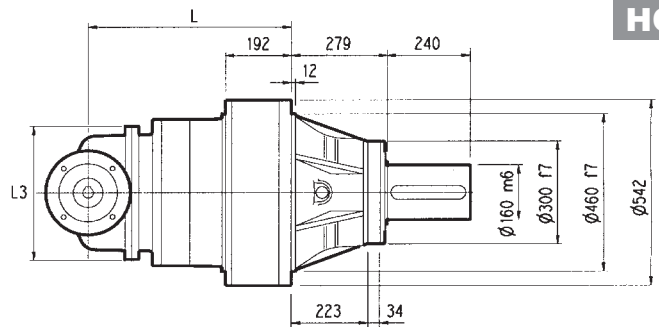


PC

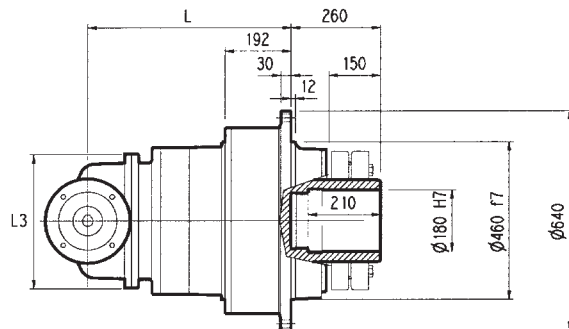
HZ PZ



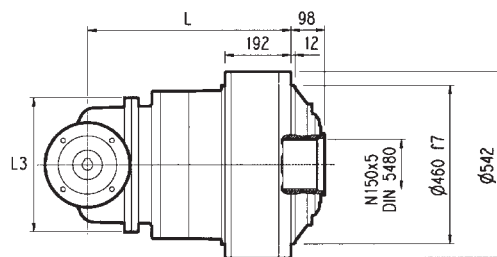
HC



FP



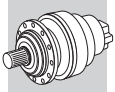
FZ



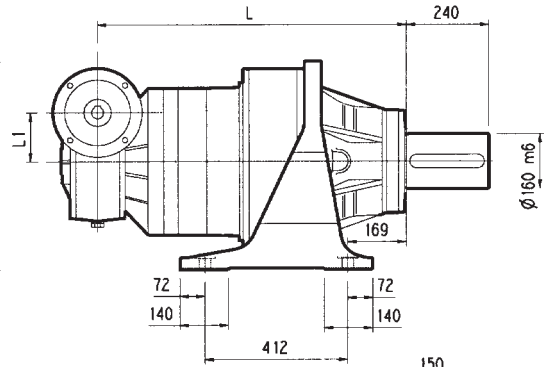
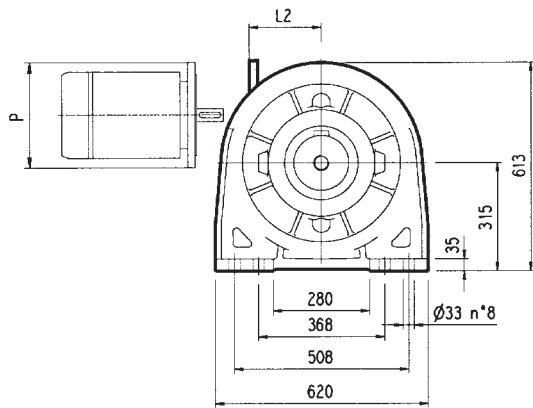
FP $M_{2max} = 135000 \text{ Nm}$

	L					L1	L2	L3	Kg					V									
	PC-PZ	HC-HZ	FZ	FP					PC-PZ	HC-HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1
315 R3 (B)	890	611	611	611	345	292	400	720	590	500	550	307	60	23	-	-	-	357	60	28	-	-	-
315 R3 (C)	890	611	611	611	390	292	480	730	600	510	560	307	60	23	-	-	-	357	60	28	-	-	-
315 R4	917	638	638	638	225	245	345	680	550	460	510	239	48	15	-	-	-	276	48	17	-	-	-

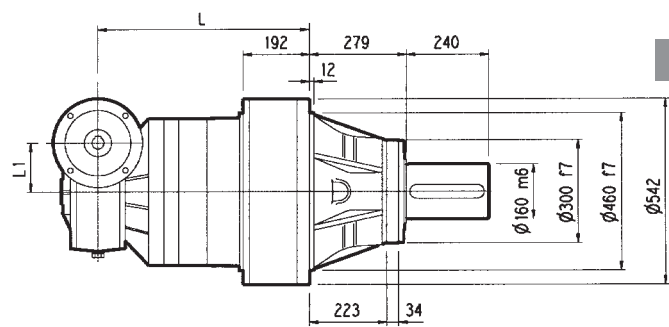
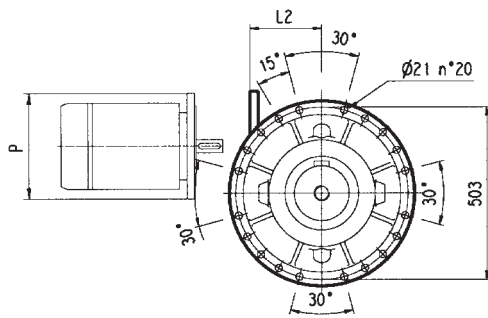
	P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P
315 R3 (B)	-	-	-	-	152	350	182	400	212	450	193	550
315 R3 (C)	-	-	-	-	152	350	182	400	212	450	193	550
315 R4	114	300	144	350	144	350	174	400	-	-	-	-



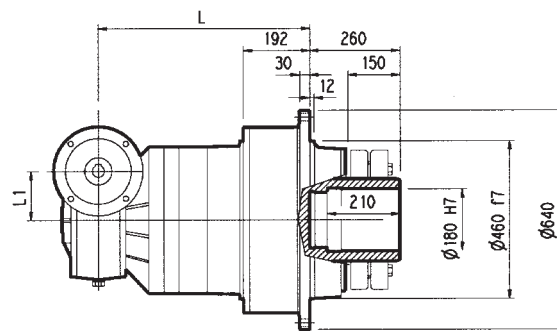
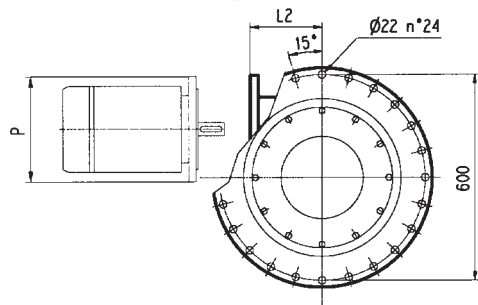
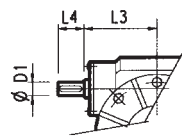
3/V 15 L3



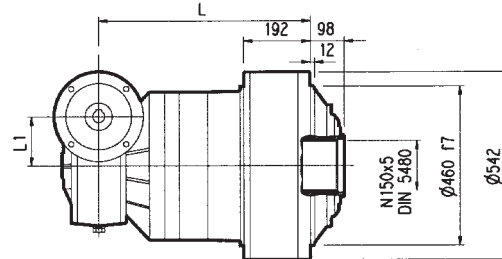
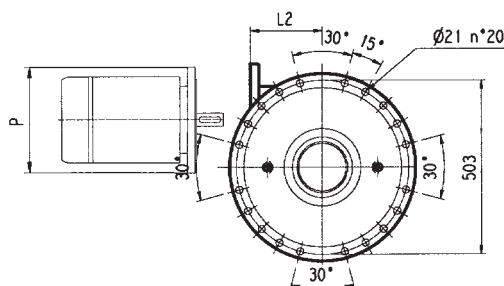
PC



HC



FP

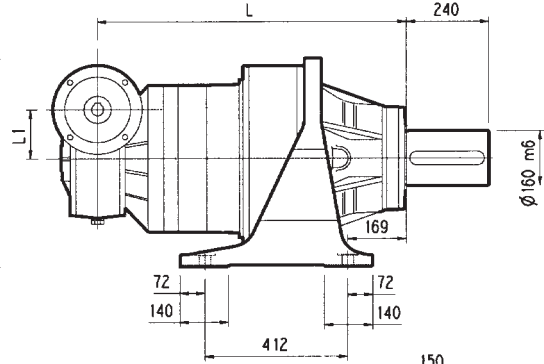
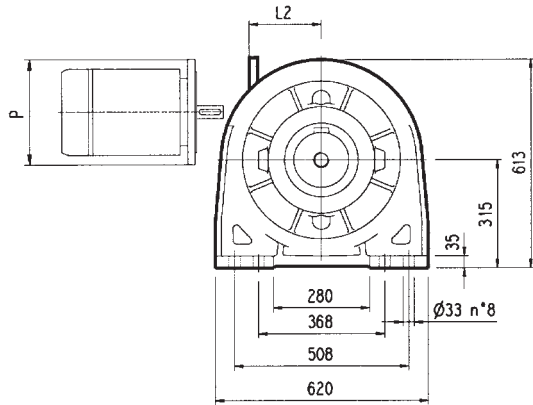
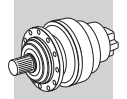


FZ

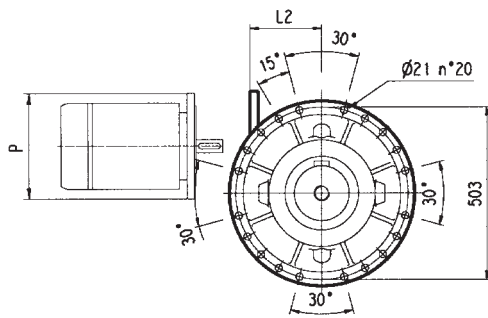
FP

$M_{2max} = 135000 \text{ Nm}$

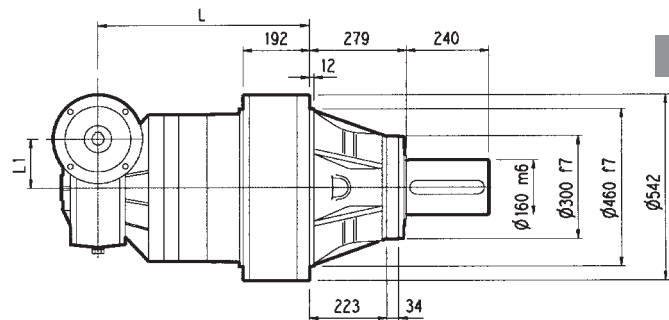
	L				L1	L2	D1	L3	L4	Kg				
	PC - PZ	HC - HZ	FZ	FP							PC - PZ	HC - HZ	FZ	FP
3/V 15 L3	885	606	606	606	210	-	48	230	110		800	670	575	625
	P100	P112	P132		P160		P180		P200		P225			
	P	P	L2	P	L2	P	L2	P	L2	P	L2	P		
3/V 15 L3	-	-	485	300	460	350	460	350	485	400	490	450		



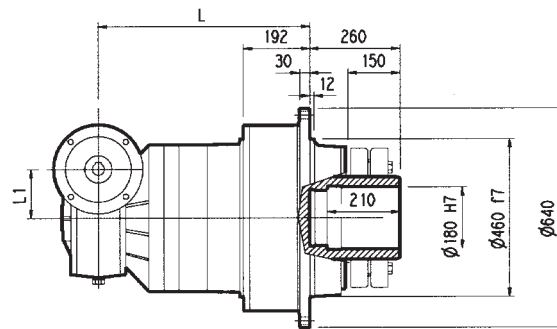
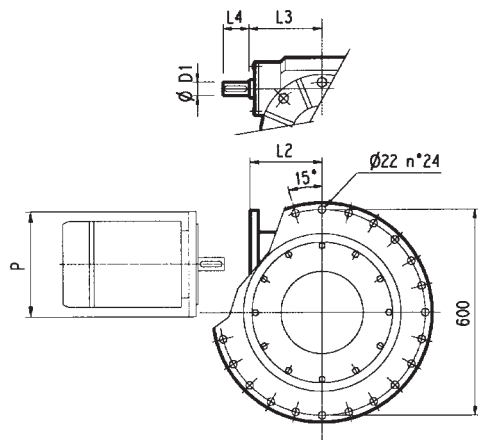
PC



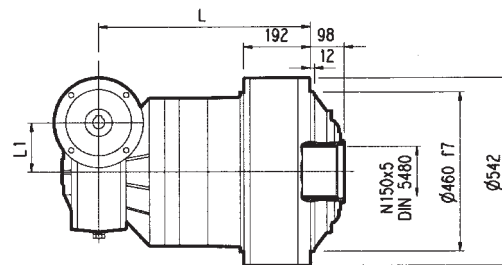
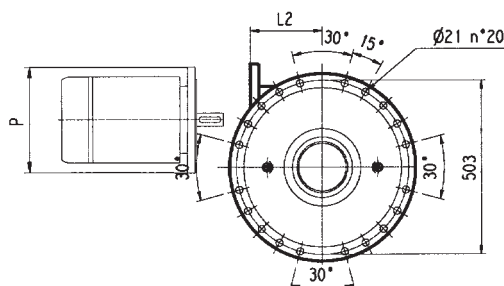
HZ PZ



HC



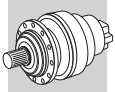
FP



FZ

FP $M_{2max} = 135000 \text{ Nm}$

	L				L1	L2	D1	L3	L4	Kg				
	PC - PZ	HC - HZ	FZ	FP							PC - PZ	HC - HZ	FZ	FP
3/V 15 L4	989	710	710	710	150	190	35	185	65		690	560	470	520
3/V 15 L4	P100	P112	P132		P160		P180		P200		P225			
	P	P	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P
	250	250	-	300	-	350	-	-	-	-	-	-	-	-



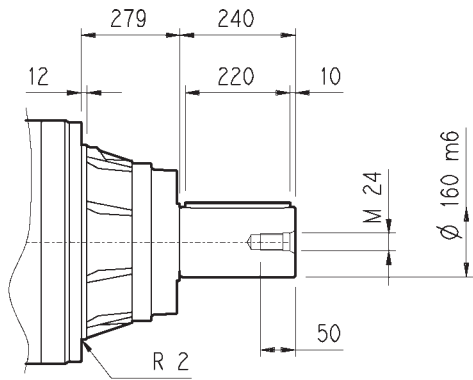
315 L

315 R

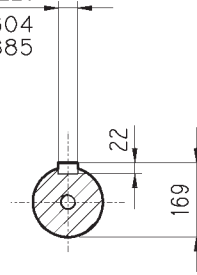
3/V 15 L3

3/V 15 L4

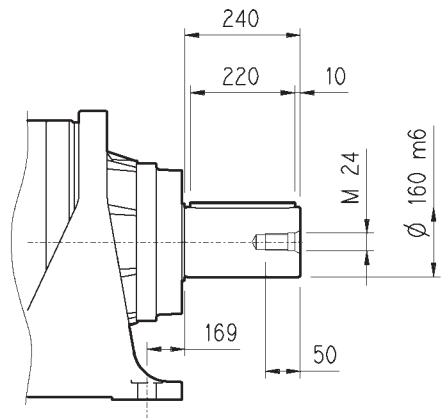
HC



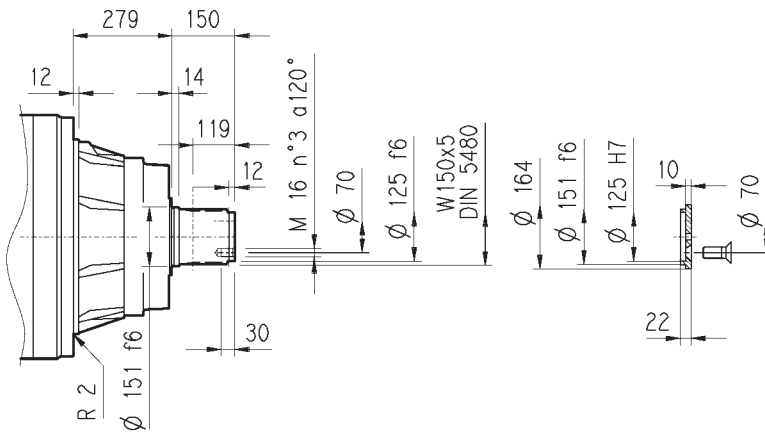
A 40x22x220
UNI 6604
DIN 6885



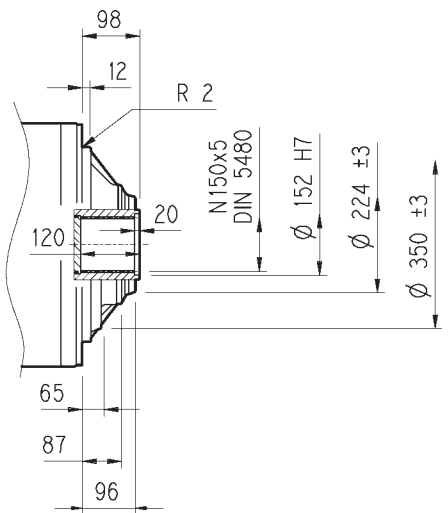
PC



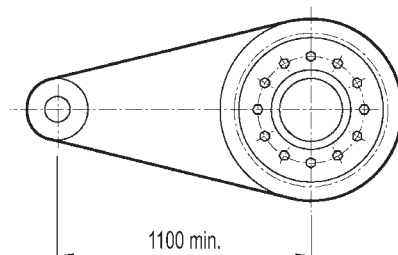
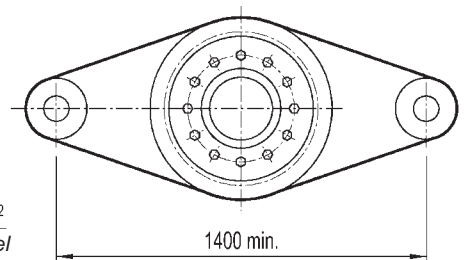
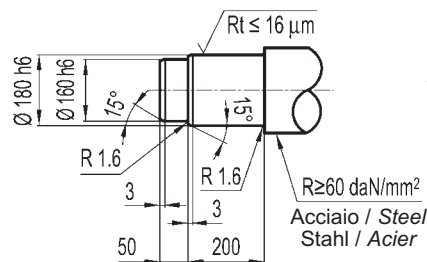
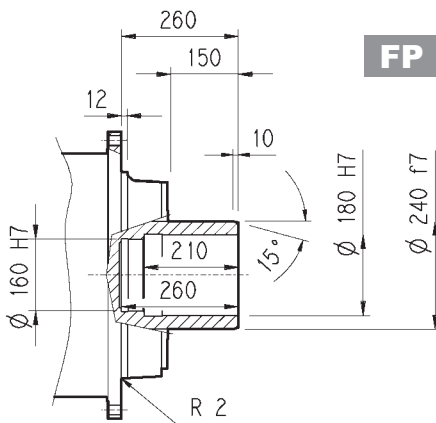
HZ



FZ

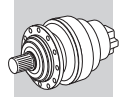
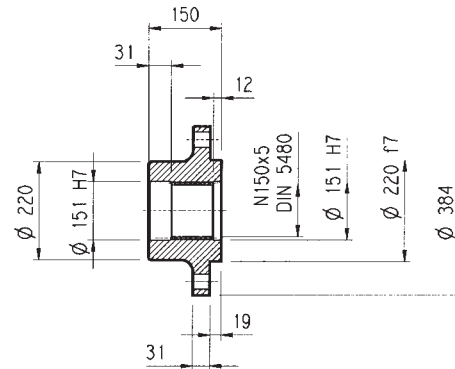
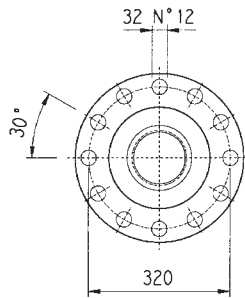
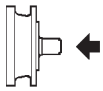


FP

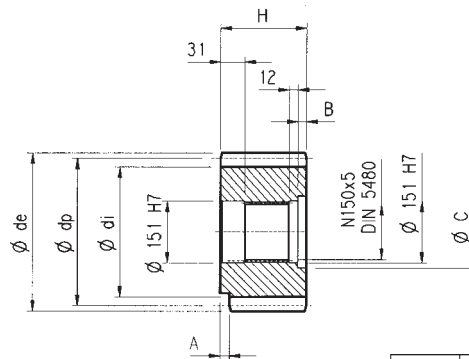
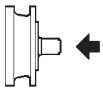


FP

M_{2max} = 135000 Nm

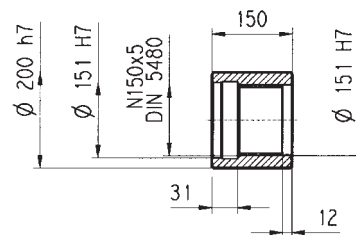
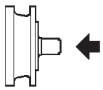
315 L**315 R****3/V 15 L3****3/V 15 L4****Flangia / Flange
Flansch / Brides****W0A**

Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

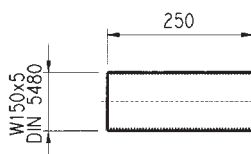
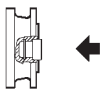
**Pignoni / Pinion gears
Ritzel / Pignons****P...**

	m	z	x	dp	di	de	H	A	B	C	☆
PRG1	18	16	0.500	288	261	342	160	0	10	166	■
PRG2	18	16	0.617	288	271	339	150	30	0	0	□

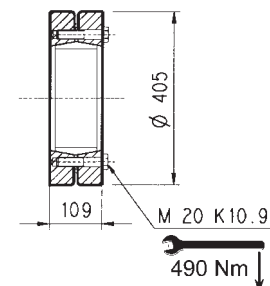
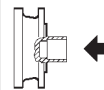
☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifiée 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cémenté et tempré 18NiCrMo5

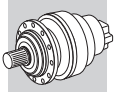
**Manicotti lisci / Sleeve couplings
Nabens / Manchons lisses a cannelure interieure****MOA**

Materiale : Acciaio 16CrNi4
 Material : Steel 16CrNi4
 Material : Stahl 16CrNi4
 Matière : Acier 16CrNi4

**Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée****B0A**

Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
 Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
 Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
 Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

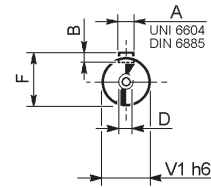
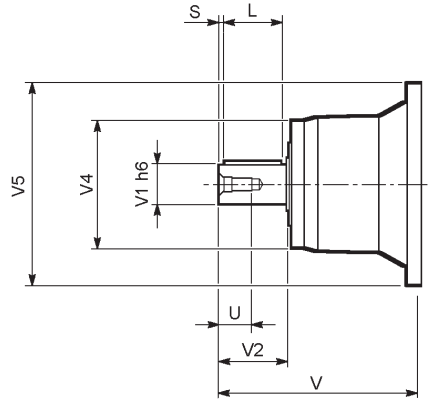
**Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage****GOA**



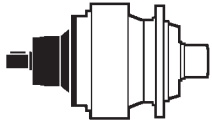
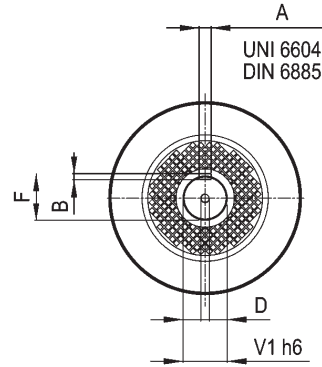
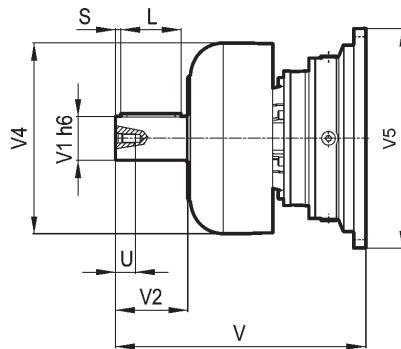
315 L

315 R

V



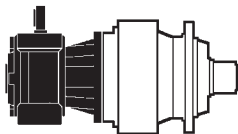
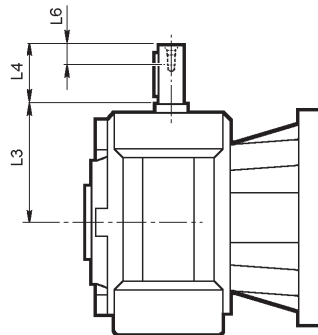
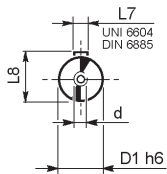
FV



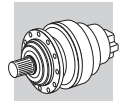
	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
315 L1	V15B	523	120	210	320	542	32	18	127	180	15	M24	50
	V11B	348	80	130	200	418	22	14	85	110	10	M16	36
315 L2	FV11B	456	80	130	347.5	428	22	14	85	110	10	M16	36
	V07B	315	80	130	200	345	22	14	85	110	10	M16	36
315 L3	FV07B	375	80	130	347.5	348	22	14	85	110	10	M16	36
	V07A	313	60	105	155	345	18	11	64	90	7.5	M16	36
	FV07A	363	60	105	309	348	18	11	64	90	7.5	M16	36
315 L4	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
315 R3 (B) (C)	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36
315 R4	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36

3/V 15 L3

3/V 15 L4



	D1 h6	L3	L4	L6	L7	L8	d
3/V 15 L3 HS	48	230	110	40	14	51.5	M16
3/V 15 L4 HS	35	185	65	20	10	38	M8

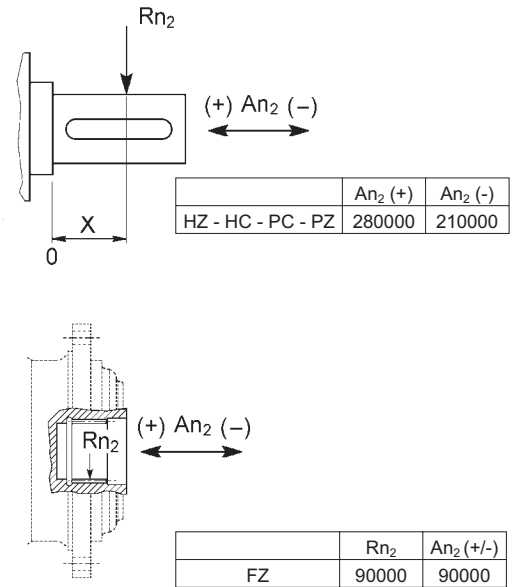
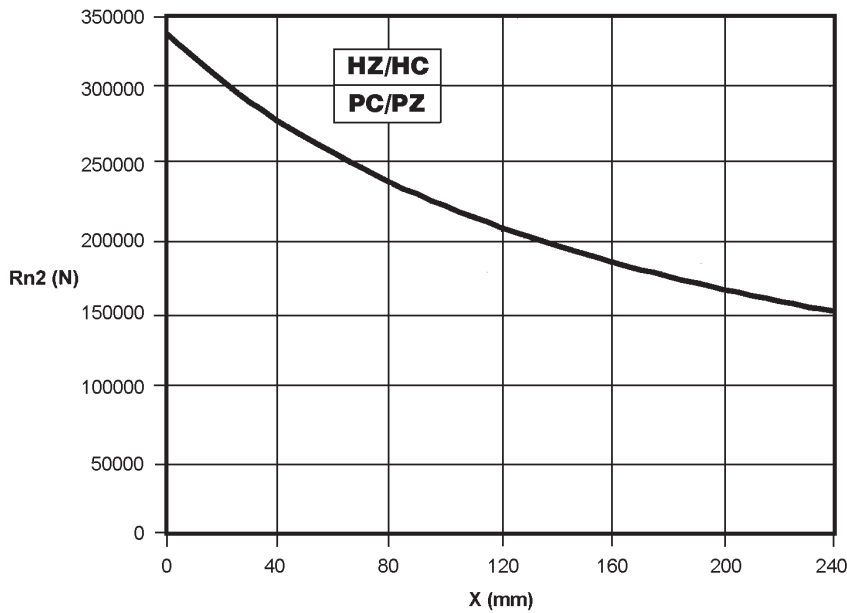


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $Fh_2 : n_2 \cdot h = 10000$

Permissible radial and axial loads on output shaft with $Fh_2 : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $Fh_2 : n_2 \cdot h = 10000$

Charges radiales et axiales admises sur l'arbre lent pour une valeur de $Fh_2 : n_2 \cdot h = 10000$



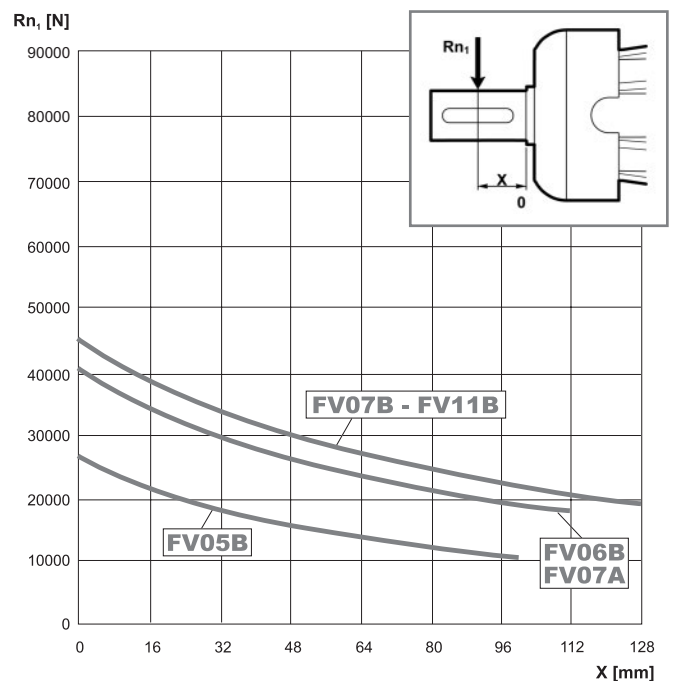
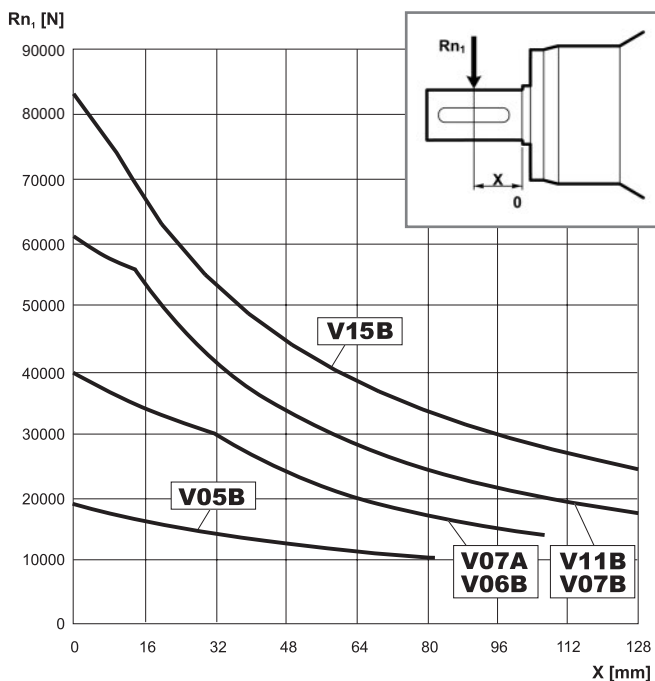
Fattore fh_2 correttivo per carichi sugli alberi Load corrective factor fh_2 on shafts Korrektionsfaktor fh_2 für wellenbelastungen Facteur de correction fh_2 pour charges sur les arbres	$Fh_2 = n_2 \cdot h$		10000	25000	50000	100000	500000	1000000
	fh_2	FZ	1	0.74	0.58	0.46	0.27	0.21
		HZ - HC - PC - PZ	1	0.76	0.61	0.50	0.31	0.25

Carichi radiali ammissibili sull'albero veloce per un valore di $Fh_1 : n_1 \cdot h = 250000$

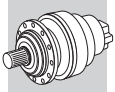
Permissible radial loads on input shaft with $Fh_1 : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $Fh_1 : n_1 \cdot h = 250000$

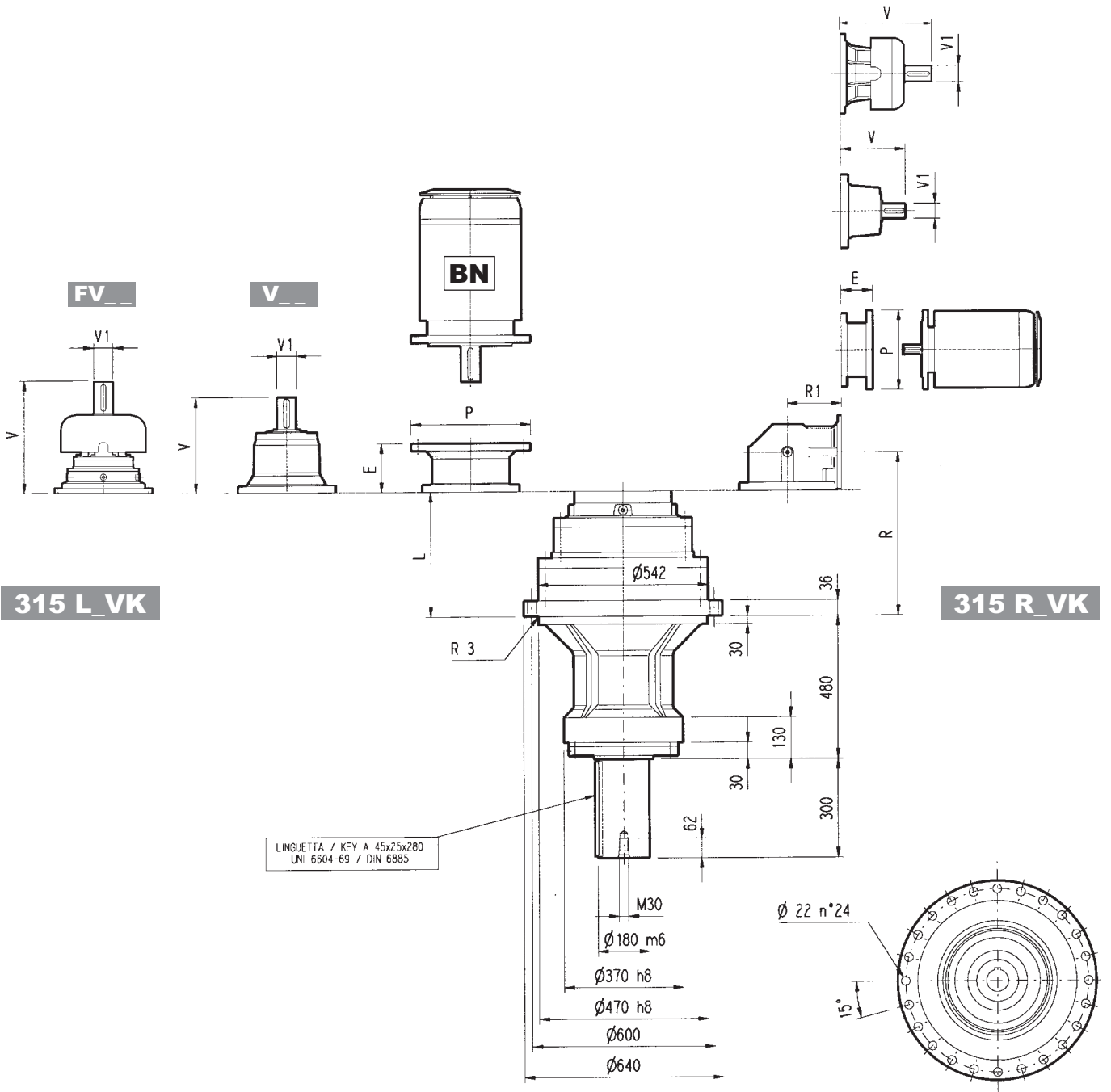
Charges radiales admises sur l'arbre d'entrée pour une valeur de $Fh_1 : n_1 \cdot h = 250000$



Fattore fh_1 correttivo per carichi sugli alberi Load corrective factor fh_1 on shafts Korrektionsfaktor fh_1 für wellenbelastungen Facteur de correction fh_1 pour charges sur les arbres	$Fh_1 = n_1 \cdot h$		250000	500000	1000000	2000000	5000000	10000000
	fh_1		1	0.79	0.63	0.50	0.37	0.29



315_VK

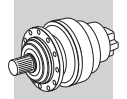


315 L_VK

315 R_VK

	L	Kg													P132		P160		P180		P200		P225		P250	
			V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg	E	P	E	P	E	P	E	P	E	P		
315 L2	386	650	348	80	55	-	-	-	456	80	85	-	-	-	-	-	-	-	-	-	-	-	-	-		
315 L3	519	700	315	80	35	313	60	28	375	80	48	363	60	34	-	-	195	350	186	400	216	450	215	550		
315 L4	608	710	239	48	15	-	-	-	276	48	17	-	-	-	114	300	144	350	144	350	174	400	-	-	-	

	R	R1	Kg													P132		P160		P180		P200		P225		P250	
				V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg	E	P	E	P	E	P	E	P	E	P		
315 R3 (B)	611	345	720	307	60	23	-	-	-	357	60	28	-	-	-	-	-	152	350	182	400	212	450	193	550		
315 R3 (C)	611	390	730	307	60	23	-	-	-	357	60	28	-	-	-	-	-	152	350	182	400	212	450	193	550		
315 R4	638	225	690	239	48	15	-	-	-	276	48	17	-	-	-	114	300	144	350	144	350	174	400	-	-		



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 315_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 315_VK, with radial force applying at a distance x from shaft shoulder.

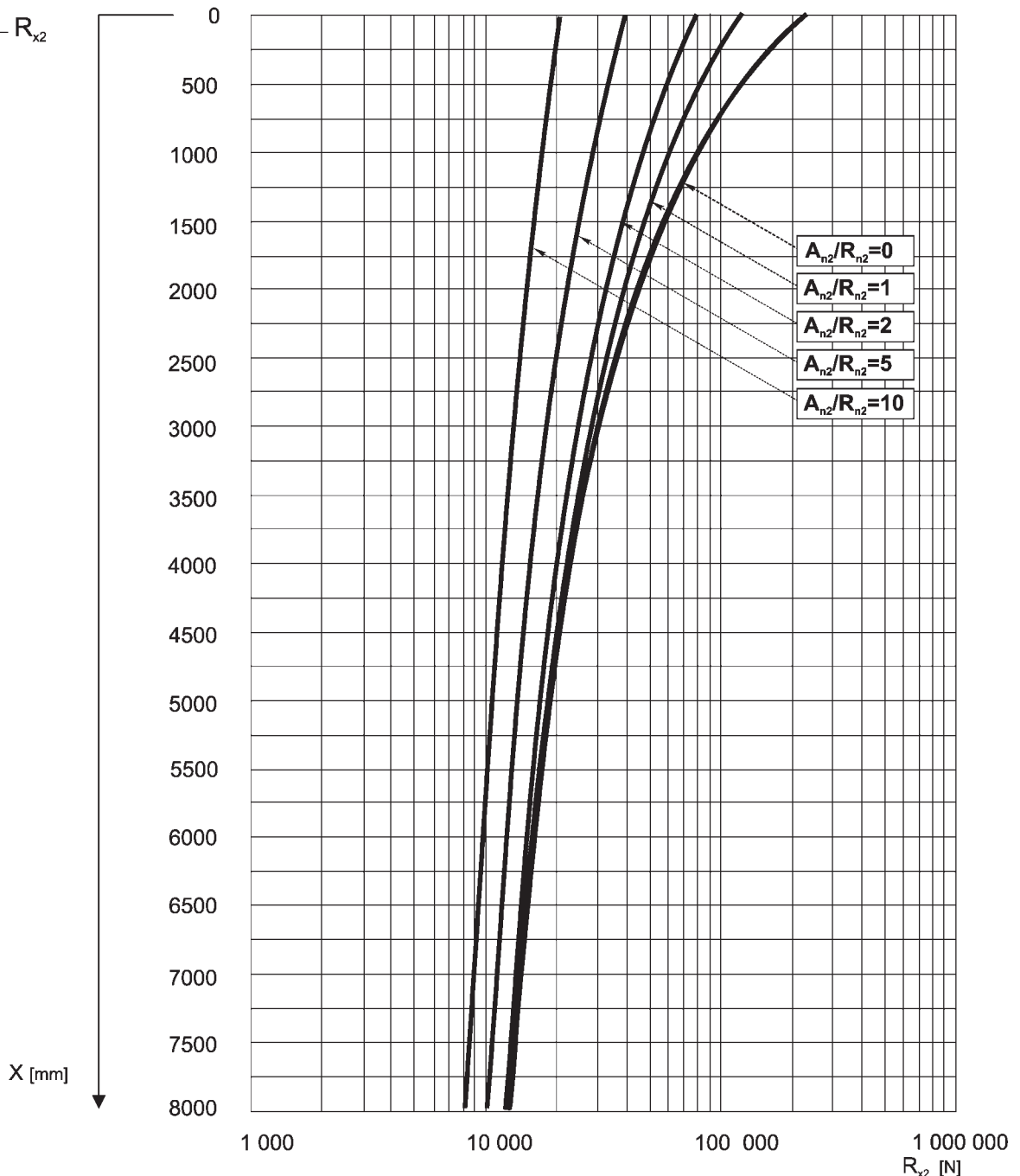
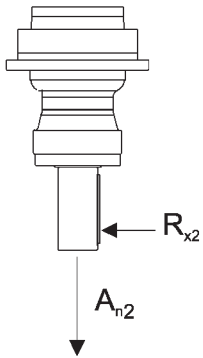
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

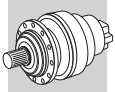
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 315_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

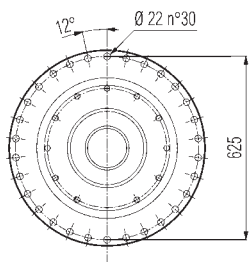
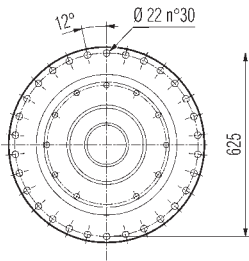
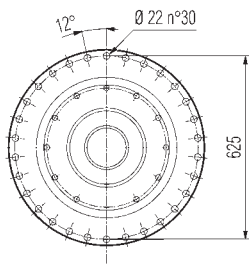
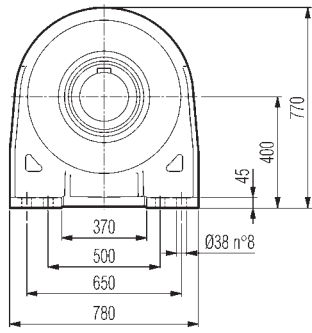
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 315_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.

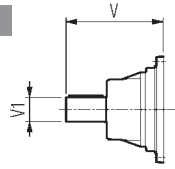




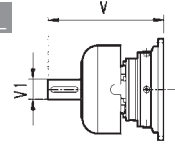
316 L



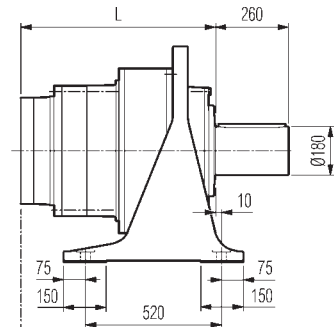
V



FV

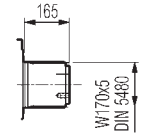


PC

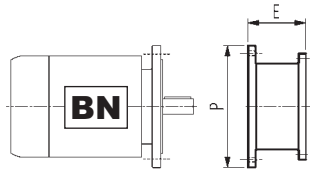
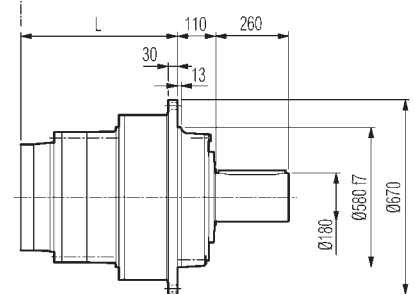


HZ

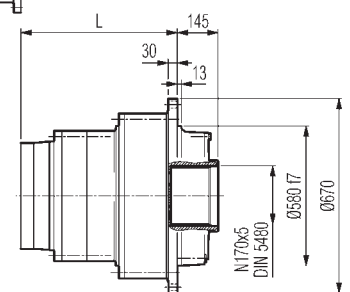
PZ



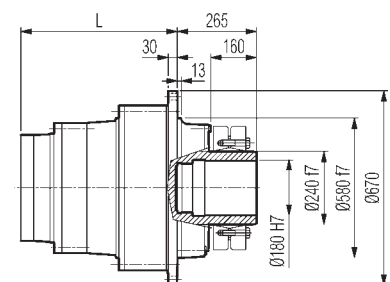
HC



FZ



FP

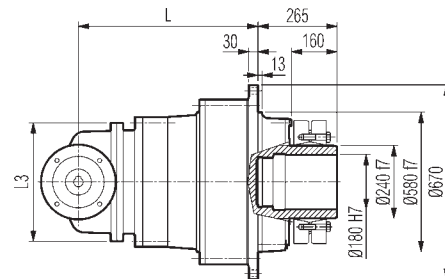
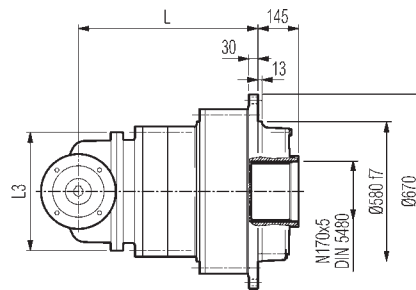
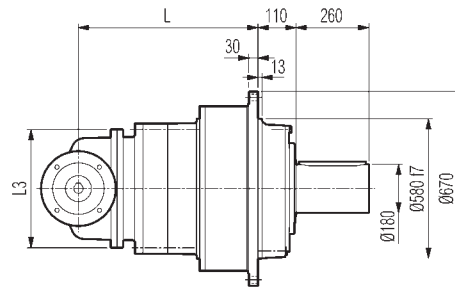
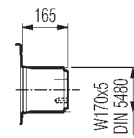
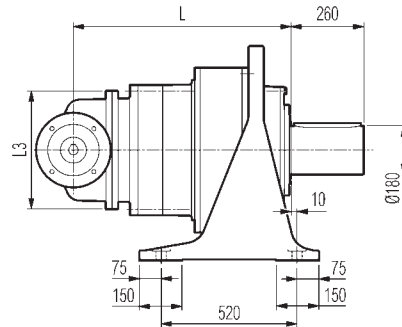
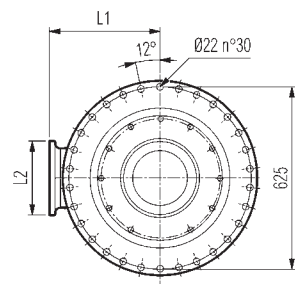
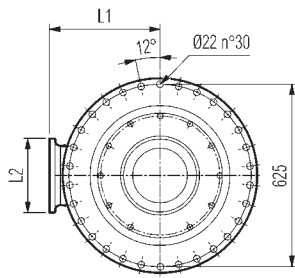
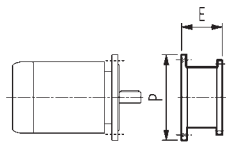
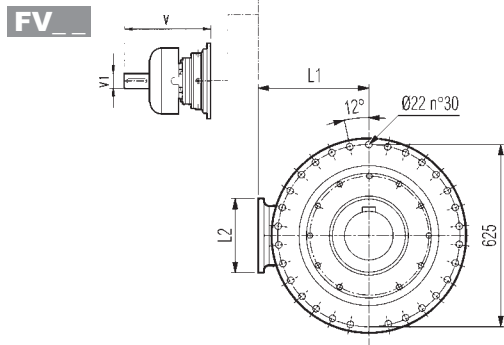
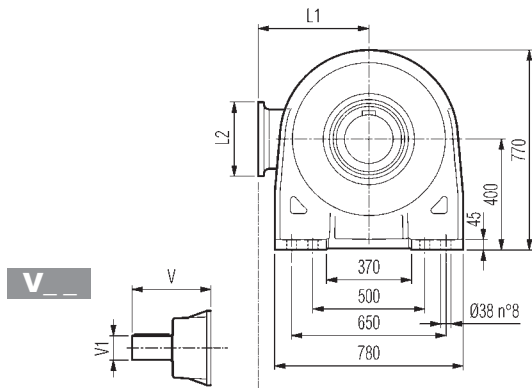
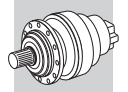


FP

M_{2max} = 178000 Nm

	L				Kg				Kg				Kg							
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
316 L2	541	431	431	431	790	590	520	540	348	80	55	-	-	-	456	80	85	-	-	-
316 L3	674	564	564	564	840	640	570	590	315	80	35	313	60	28	375	80	48	363	60	34
316 L4	763	653	653	653	860	660	590	610	239	48	15	-	-	-	276	48	17	-	-	-

	P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P
316 L3	-	-	-	-	195	350	186	400	216	450	215	550
316 L4	114	300	144	350	144	350	174	400	-	-	-	-



PC

HZ PZ

HC

FZ

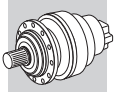
FP

FP

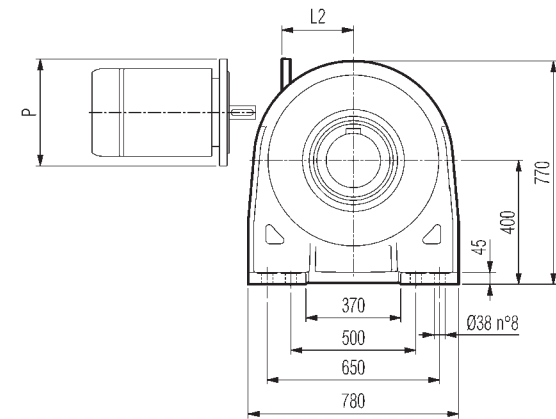
$M_{2max} = 178000 \text{ Nm}$

	L				L1	L2	L3	Kg				V				V1							
	PC-PZ	HC-HZ	FZ	FP				PC-PZ	HC-HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg			
316 R3 (B)	766	656	656	656	345	292	400	910	710	640	660	307	60	23	-	-	-	357	60	28	-	-	-
316 R3 (C)	766	656	656	656	390	292	480	920	720	650	670	307	60	23	-	-	-	357	60	28	-	-	-
316 R4	793	683	683	683	225	245	345	890	690	620	640	239	48	15	-	-	-	276	48	17	-	-	-

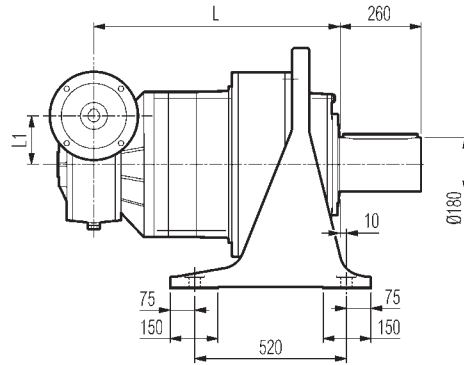
	P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P
316 R3 (B)	-	-	-	-	152	350	182	400	212	450	193	550
316 R3 (C)	-	-	-	-	152	350	182	400	212	450	193	550
316 R4	114	300	144	350	144	350	174	400	-	-	-	-



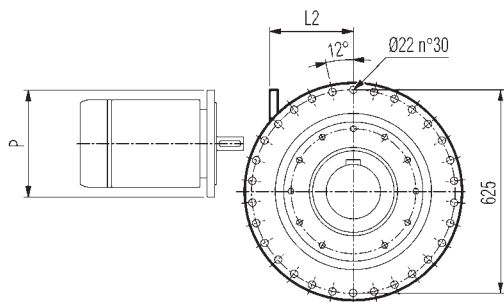
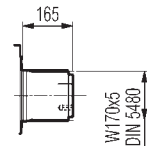
3/V 16 L3



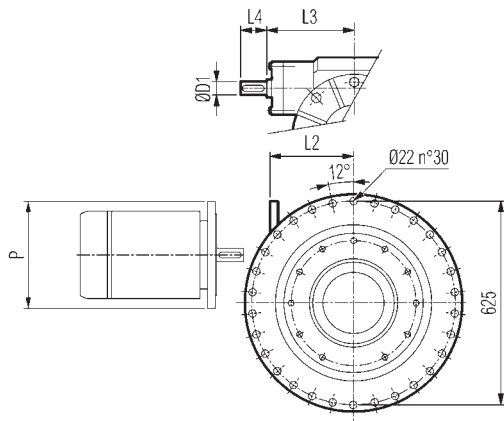
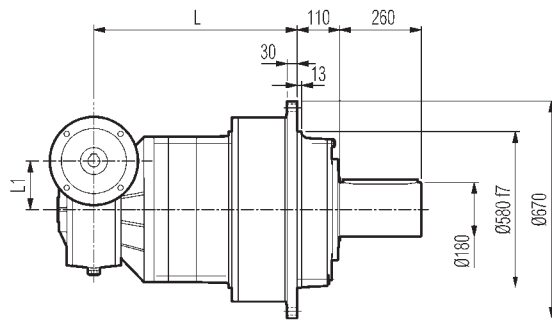
PC



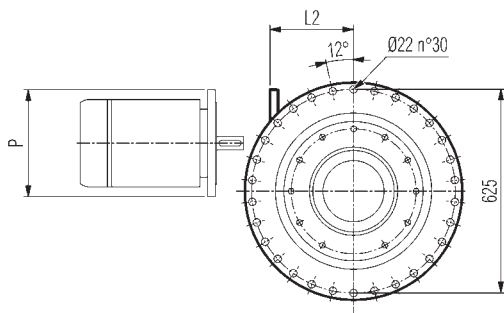
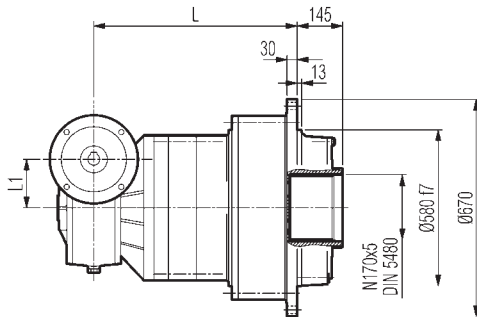
HZ PZ



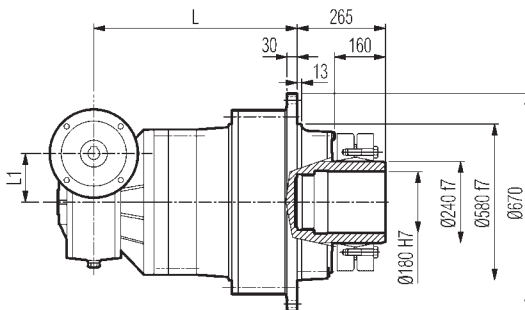
HC



FZ

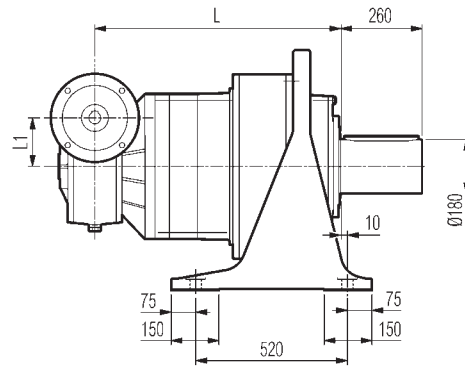
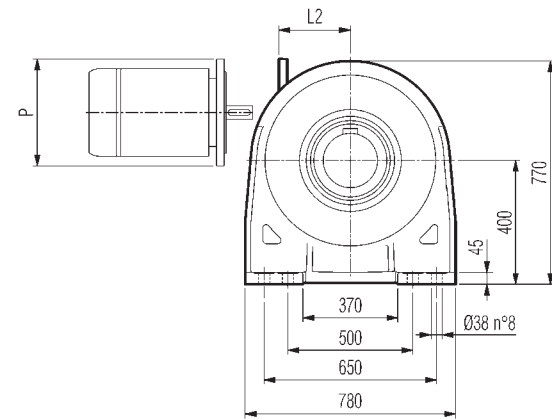
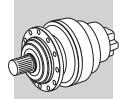


FP

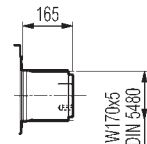


FP $M_{2max} = 178000 \text{ Nm}$

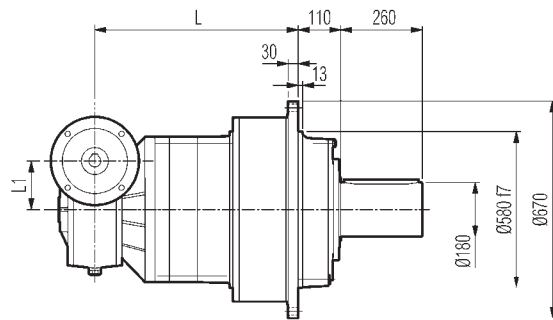
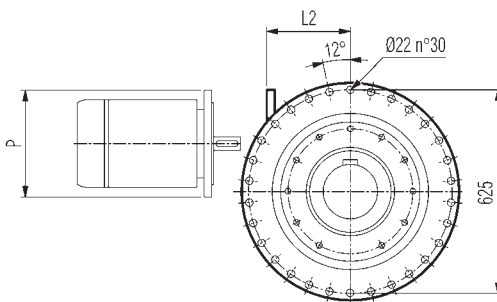
	L				L1	D1	L3	L4	Kg			
	PC - PZ	HC - HZ	FZ	FP					PC - PZ	HC - HZ	FZ	FP
3/V 16 L3	812	702	702	702	250	55	274	110	1100	900	830	850
	P132		P160		P180		P200		P225			
	L2	P	L2	P	L2	P	L2	P	L2	P		
3/V 16 L3	531	300	506	350	506	350	531	400	536	450		



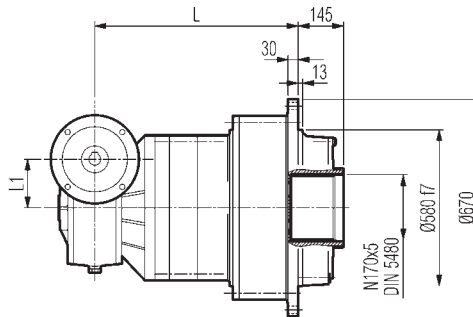
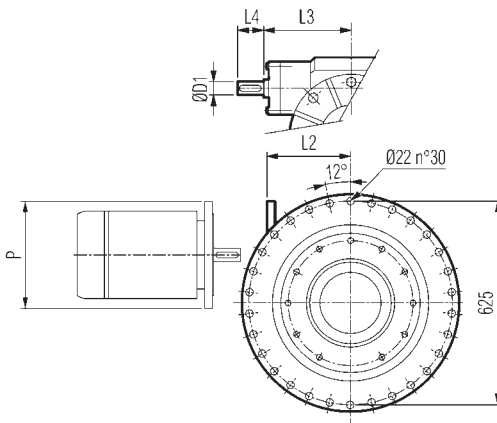
PC



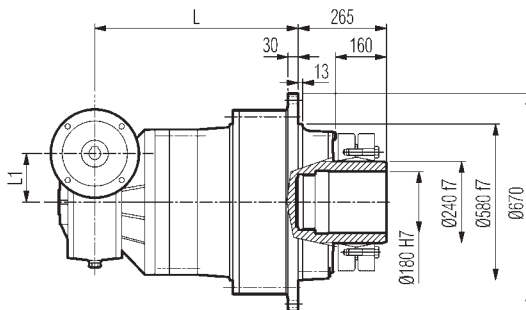
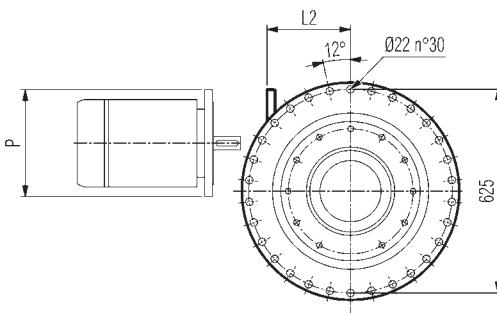
HZ PZ



HC



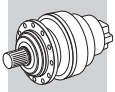
FZ



FP

FP $M_{2max} = 178000 \text{ Nm}$

	L				L1	D1	L3	L4	Kg			
	PC - PZ	HC - HZ	FZ	FP					PC - PZ	HC - HZ	FZ	FP
3/V 16 L4	865	755	755	755	150	35	185	65	900	700	630	650
3/V 16 L4	P100		P112			P132		P160				
	L2	P	L2	P	L2	P	L2	P	L2	P		
	190	250	190	250	190	300	190	350				



316 L

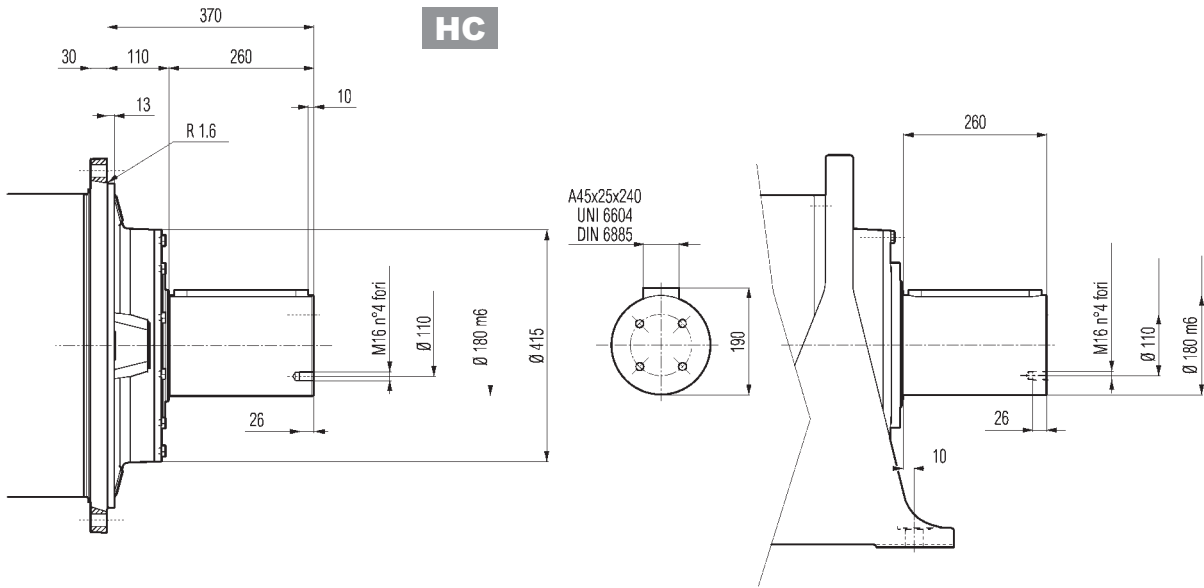
316 R

3/V 16 L3

3/V 16 L4

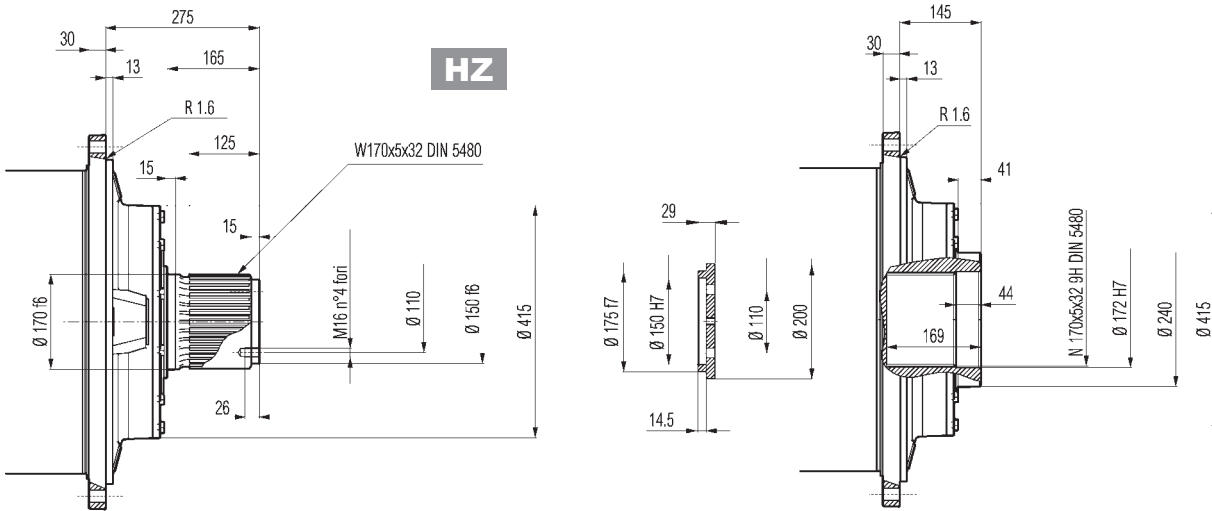
HC

PC

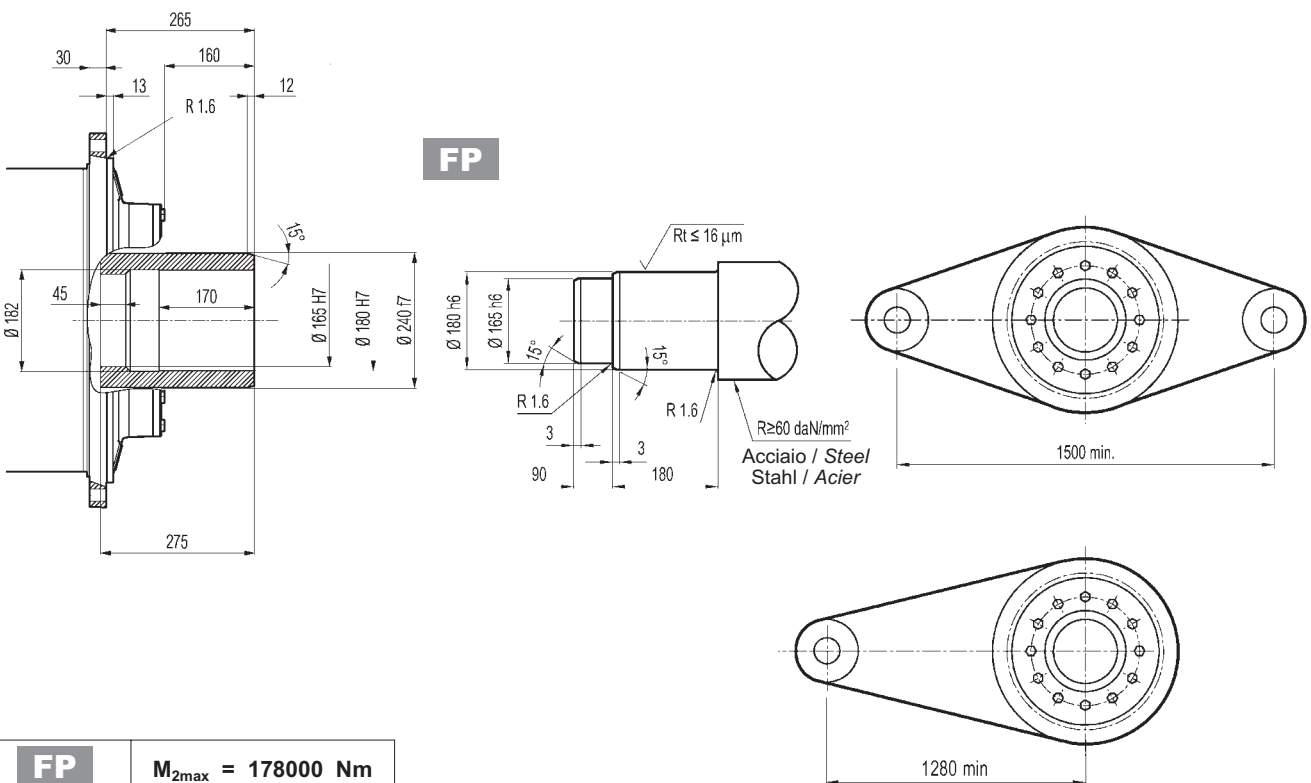


HZ

FZ

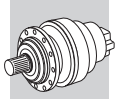


FP

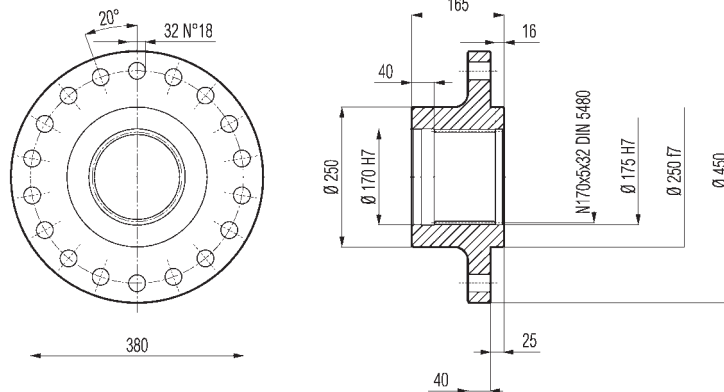
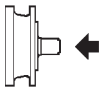


FP

$M_{2max} = 178000 \text{ Nm}$

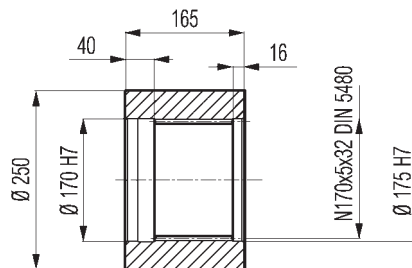
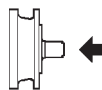
316 L**316 R****3/V 16 L3****3/V 16 L4**

Flangia / Flange
Flansch / Brides

W0A

Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a canneleure interieure

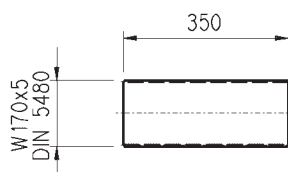
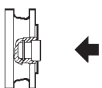
MOA

Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

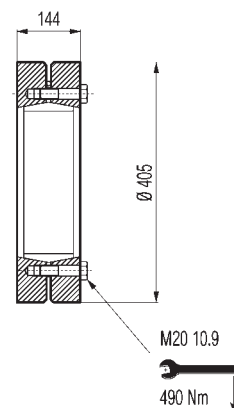
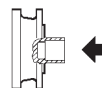
Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée

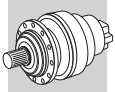
B0A

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

G0A

Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e
 temperare 50-55 HRC
 Case hardening steel 18NiCrMo5 UNI 5331 must be case
 hardened to 50-55 HRC
 Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet
 werden 50-55 HRC
 Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

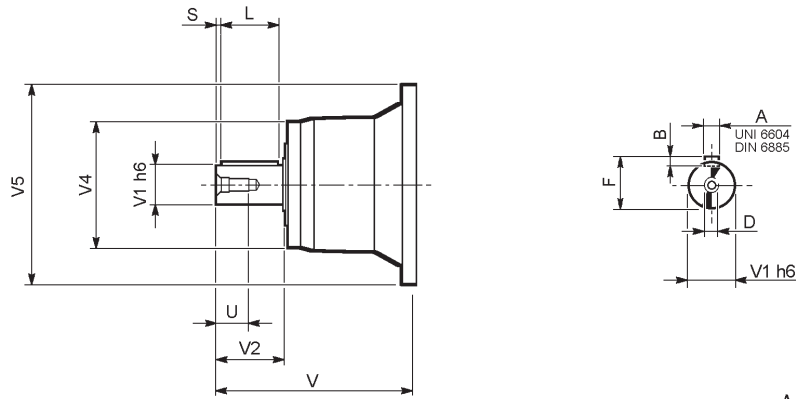




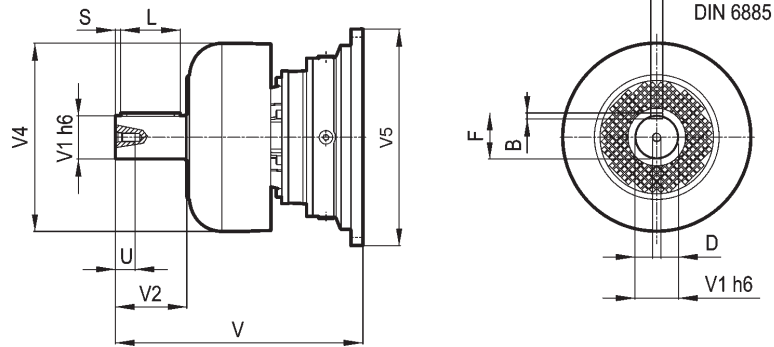
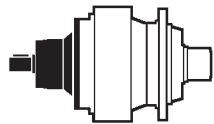
316 L

316 R

V



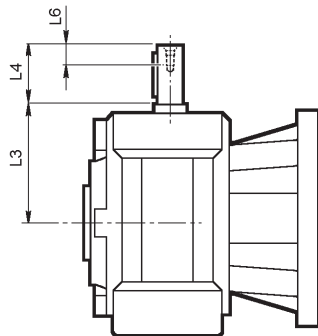
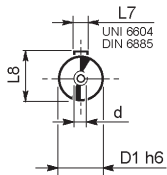
FV



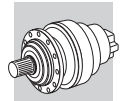
	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
316 L2	V11B	348	80	130	200	418	22	14	85	110	10	M16	36
	FV11B	456	80	130	347.5	428	22	14	85	110	10	M16	36
316 L3	V07B	315	80	130	200	345	22	14	85	110	10	M16	36
	FV07B	375	80	130	347.5	348	22	14	85	110	10	M16	36
	V07A	313	60	105	155	345	18	11	64	90	7.5	M16	36
	FV07A	363	60	105	309	348	18	11	64	90	7.5	M16	36
316 L4	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
316 R3 (B) (C)	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36
316 R4	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36

3/V 16 L3

3/V 16 L4



	D1 h6	L3	L4	L6	L7	L8	d
3/V 16 L3 HS	55	274	110	40	16	59	M16
3/V 16 L4 HS	35	185	65	20	10	38	M8

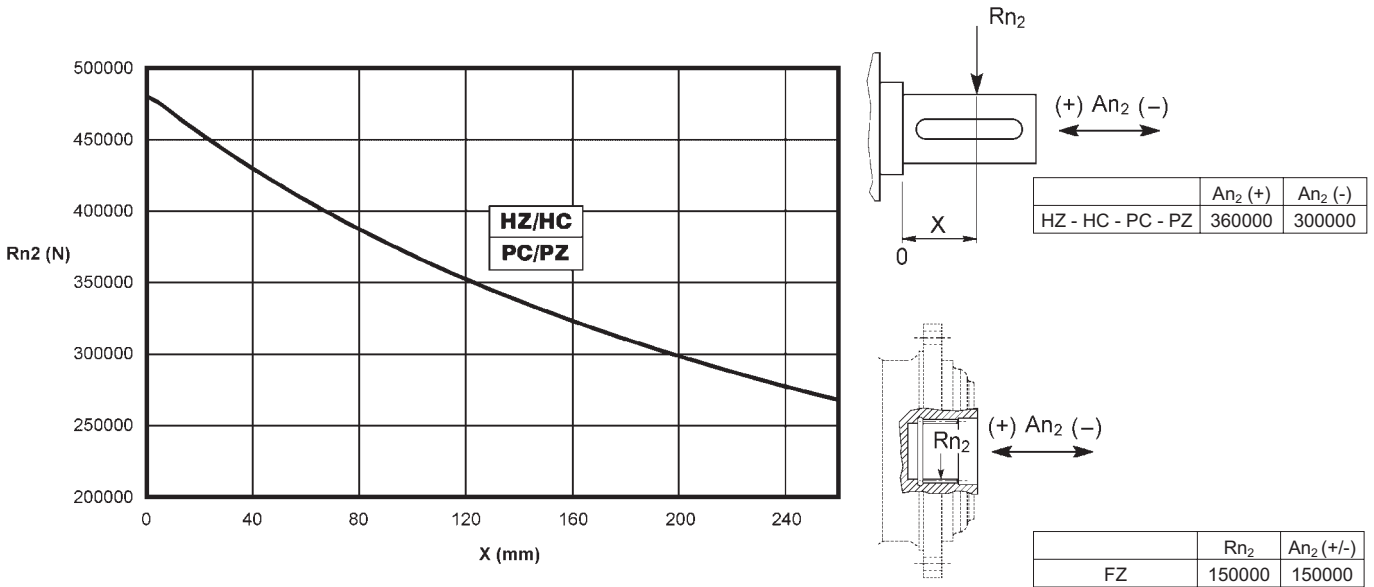


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $Fh_2 : n_2 \cdot h = 10000$

Permissible radial and axial loads on output shaft with $Fh_2 : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $Fh_2 : n_2 \cdot h = 10000$

Charges radiales et axiales admises sur l'arbre lent pour une valeur de $Fh_2 : n_2 \cdot h = 10000$



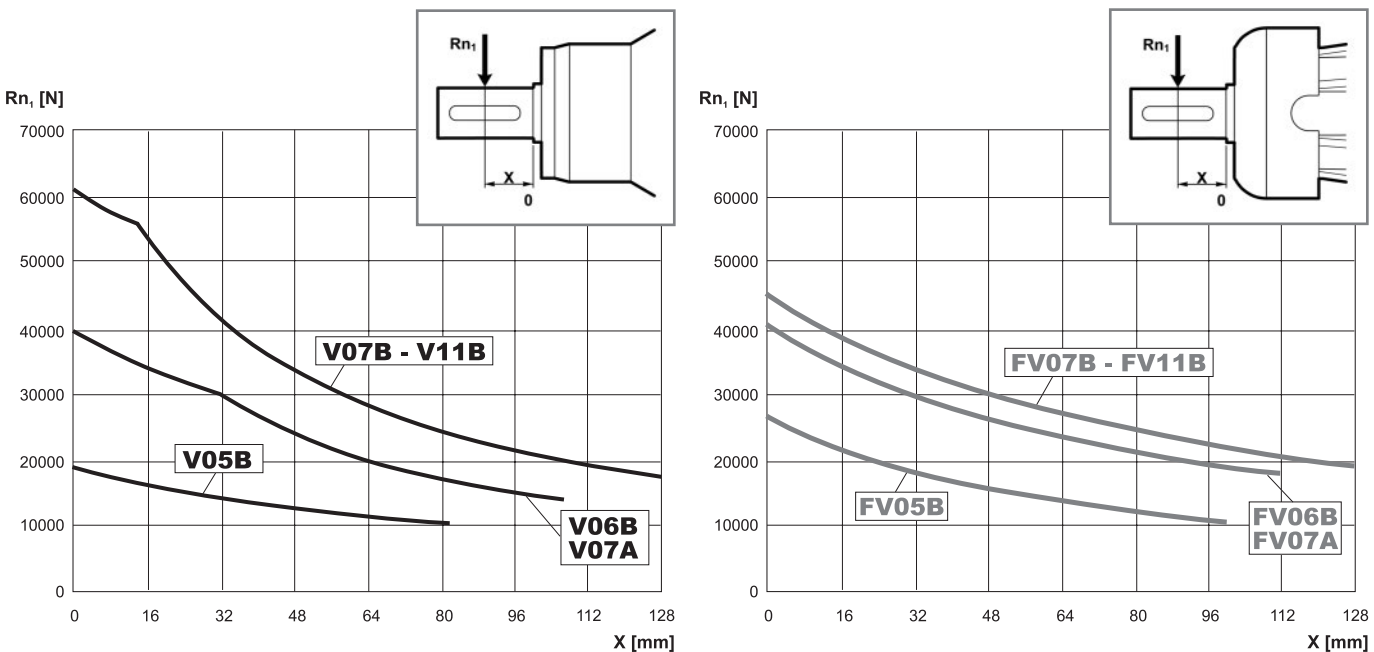
Fattore fh_2 correttivo per carichi sugli alberi Load corrective factor fh_2 on shafts Korrektionsfaktor fh_2 für wellenbelastungen Facteur de correction fh_2 pour charges sur les arbres	$Fh_2 = n_2 \cdot h$							
		10000	25000	50000	100000	500000	1000000	
fh_2	FZ	1	0.74	0.58	0.46	0.27	0.21	
	HZ - HC - PC - PZ	1	0.76	0.61	0.50	0.31	0.25	

Carichi radiali ammissibili sull'albero veloce per un valore di $Fh_1 : n_1 \cdot h = 250000$

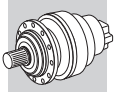
Permissible radial loads on input shaft with $Fh_1 : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $Fh_1 : n_1 \cdot h = 250000$

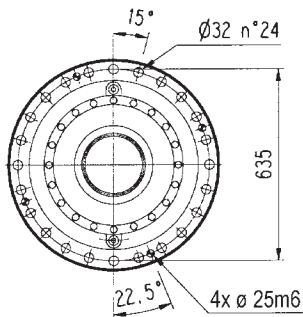
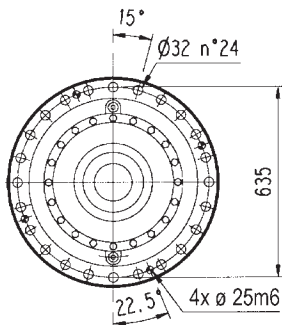
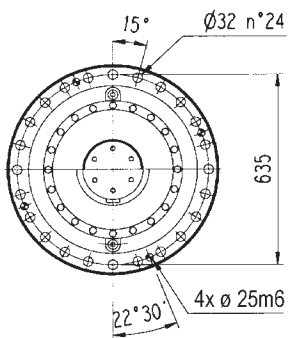
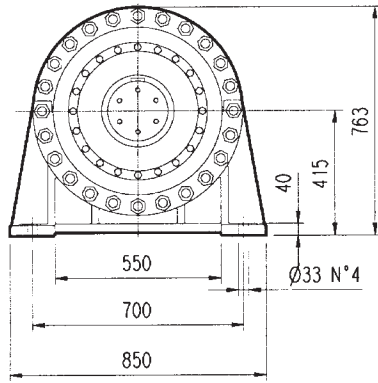
Charges radiales admises sur l'arbre d'entrée pour une valeur de $Fh_1 : n_1 \cdot h = 250000$



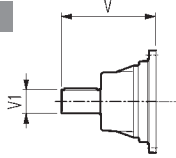
Fattore fh_1 correttivo per carichi sugli alberi Load corrective factor fh_1 on shafts Korrektionsfaktor fh_1 für wellenbelastungen Facteur de correction fh_1 pour charges sur les arbres	$Fh_1 = n_1 \cdot h$						
		250000	500000	1000000	2000000	5000000	10000000
fh_1	1	0.79	0.63	0.50	0.37	0.29	



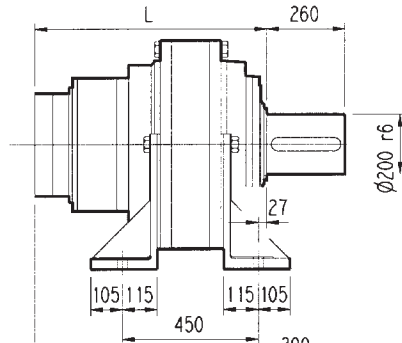
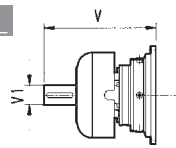
317 L



V

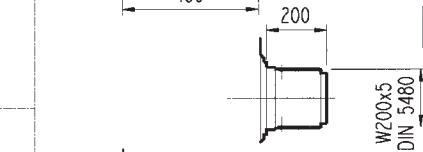


FV

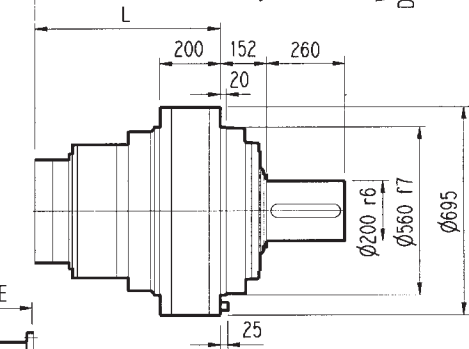


PC

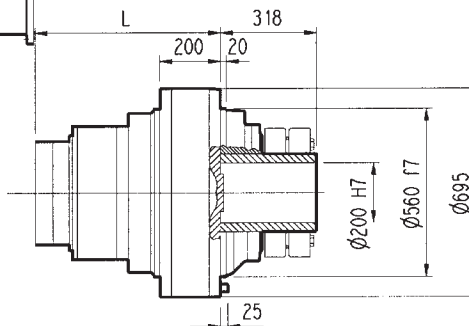
HZ PZ



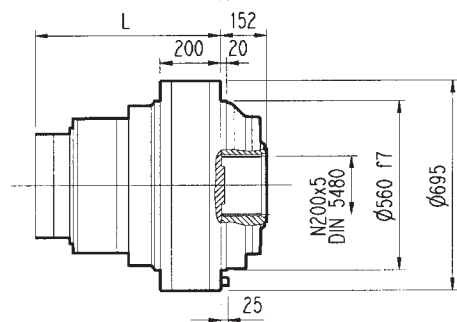
HC



FP



FZ

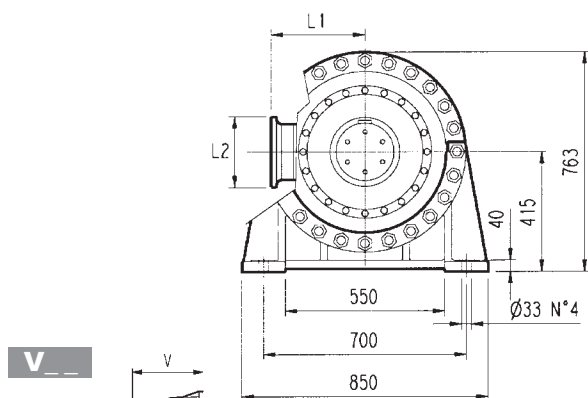
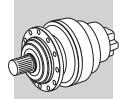


FP

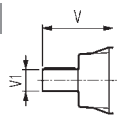
$M_{2max} = 242000 \text{ Nm}$

	L				Kg				Kg				Kg							
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
317 L2	624	472	472	472	1080	930	880	930	343	80	55	-	-	-	451	80	71	-	-	-
317 L3	774	622	622	622	1140	990	940	990	315	80	35	313	60	28	375	80	48	363	60	34
317 L4	862	710	710	710	1152	1000	952	1000	239	48	15	-	-	-	276	48	17	-	-	-

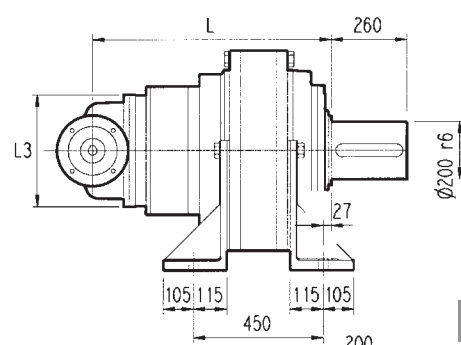
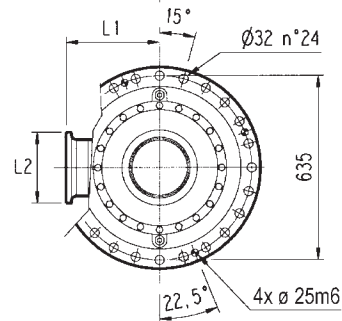
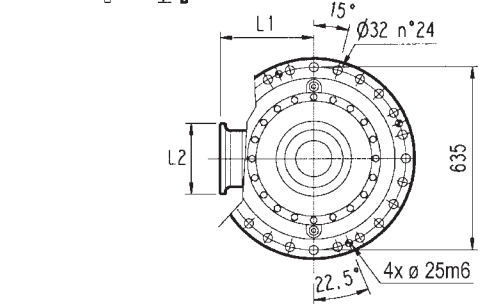
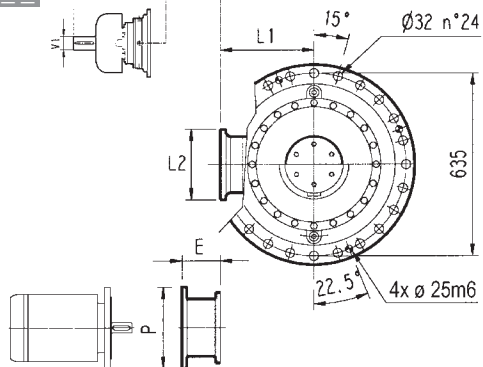
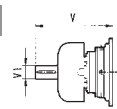
	P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P
317 L3	-	-	-	-	196	350	186	400	216	450	216	550
317 L4	114	300	144	350	144	350	174	400	-	-	-	-



V _ _

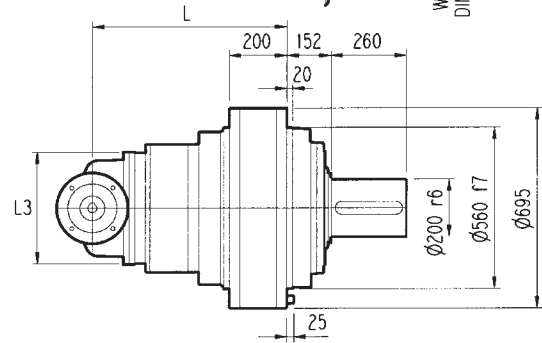
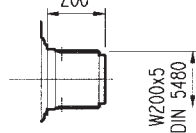


FV _ _

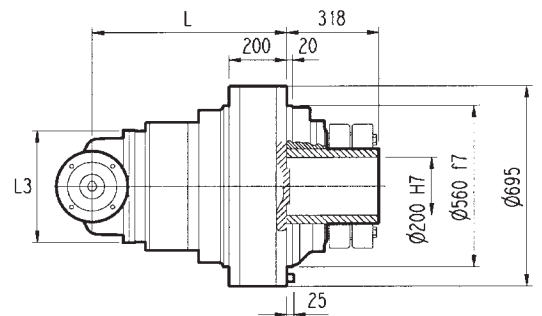


PC

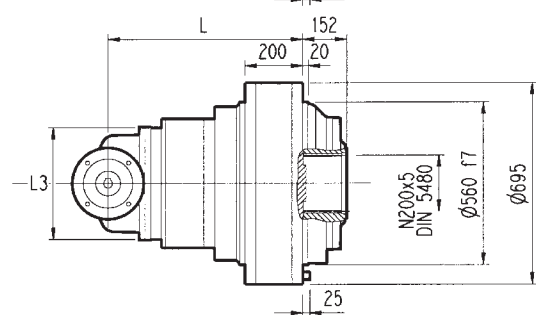
HZ PZ



HC



FP



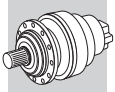
FZ

FP

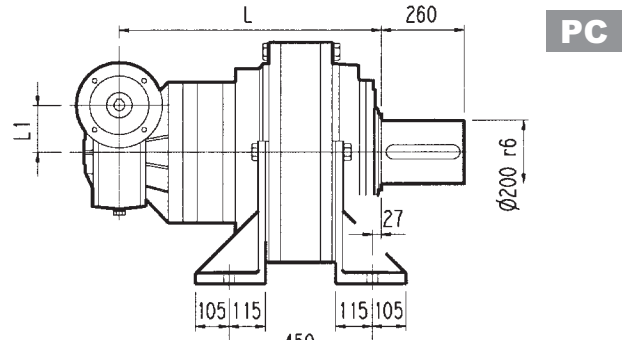
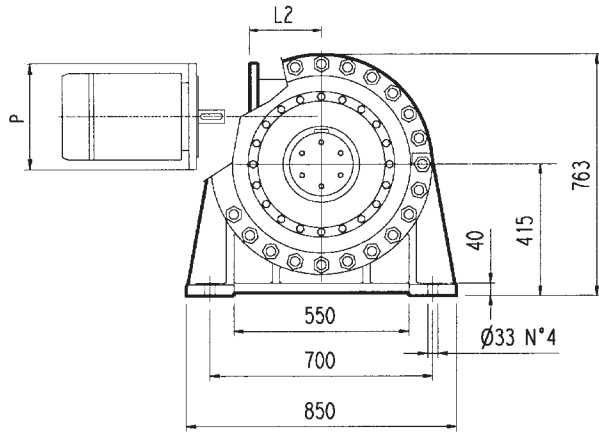
$M_{2max} = 242000 \text{ Nm}$

	L					L1	L2	L3	Kg					V					Kg					
	PC-PZ	HC-HZ	FZ	FP	FP				PC-PZ	HC-HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
317 R3 (B)	853	701	701	701	701	345	292	400	1210	1060	1010	1060	307	60	23	-	-	-	357	60	28	-	-	-
317 R3 (C)	853	701	701	701	701	390	292	480	1220	1070	1020	1070	307	60	23	-	-	-	357	60	28	-	-	-
317 R4	892	740	740	740	740	225	245	345	1190	1040	990	1040	239	48	15	-	-	-	276	48	17	-	-	-

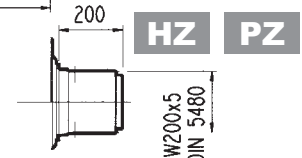
	P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P
317 R3 (B)	-	-	-	-	152	350	182	400	212	450	193	550
317 R3 (C)	-	-	-	-	152	350	182	400	212	450	193	550
317 R4	114	300	144	350	144	350	174	400	-	-	-	-



3/V 17 L3

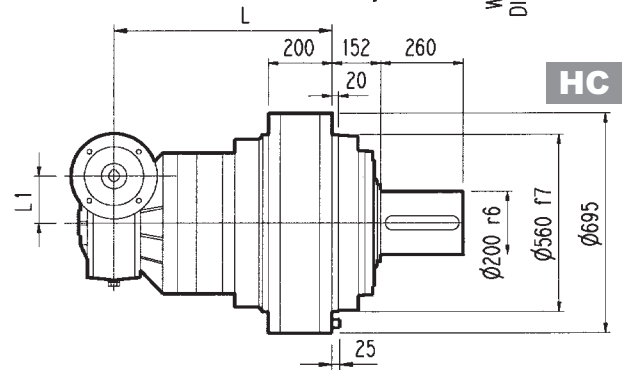
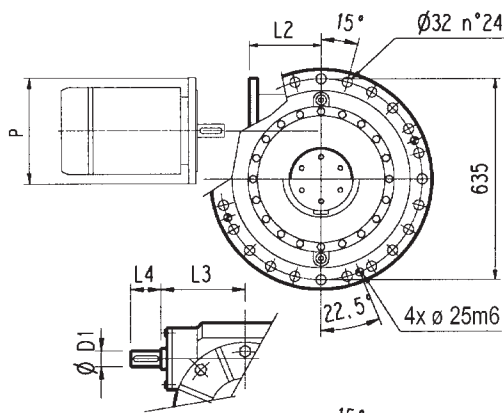


PC

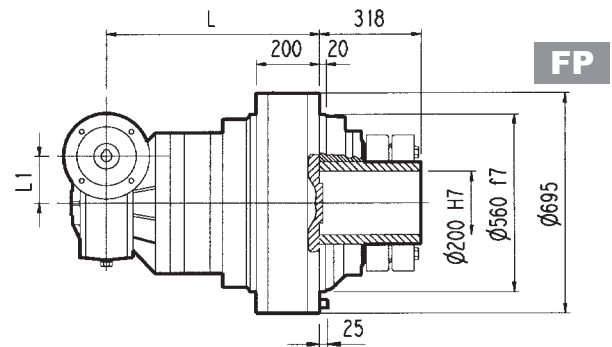
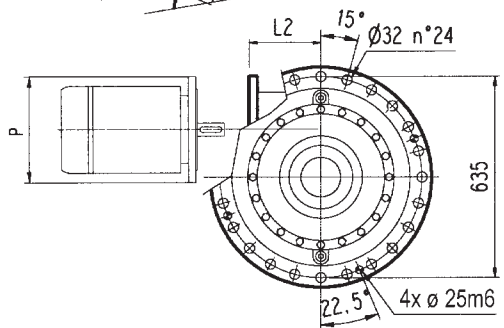


HZ

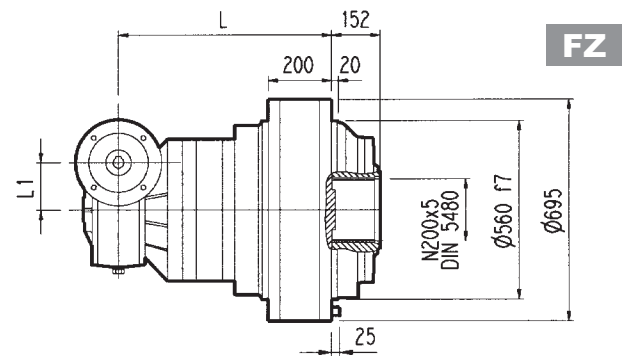
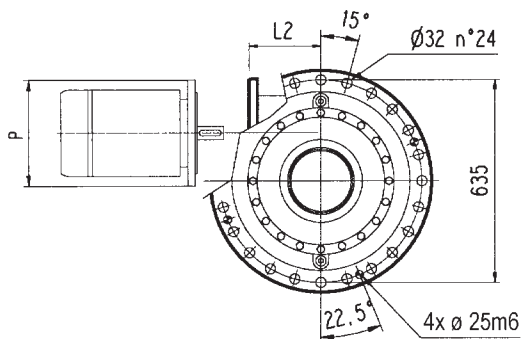
PZ



HC



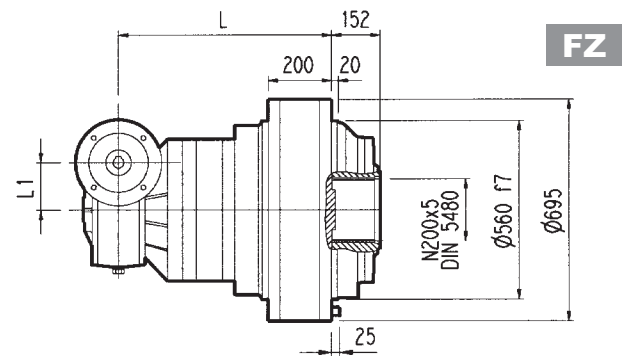
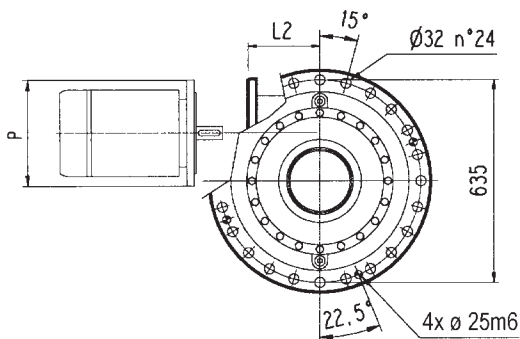
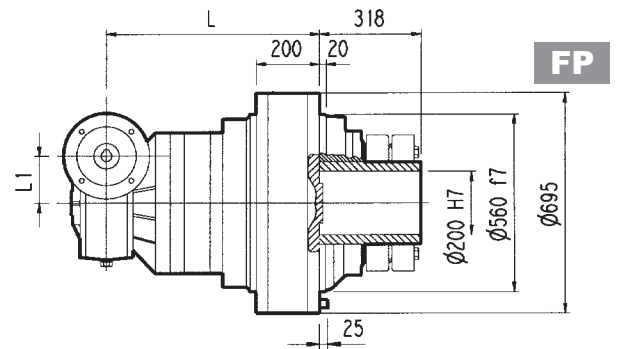
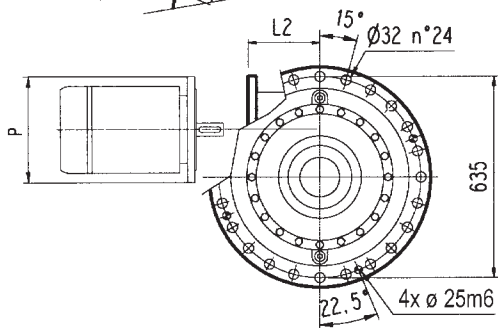
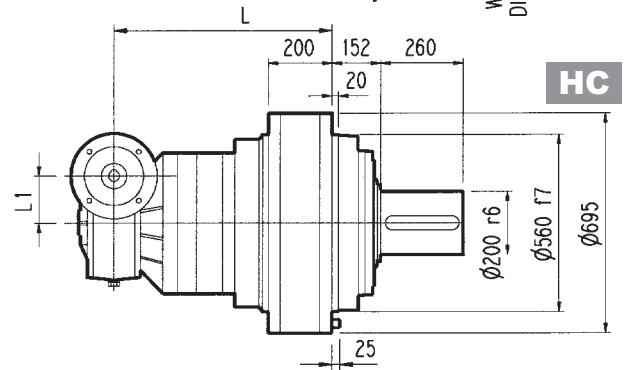
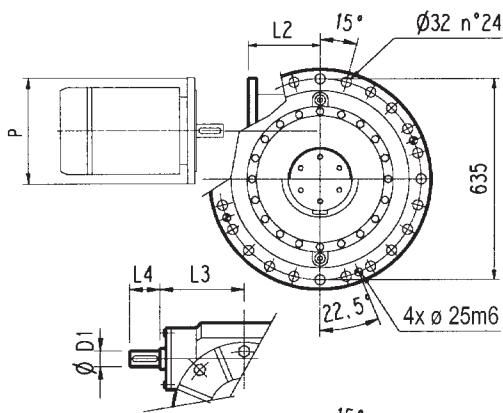
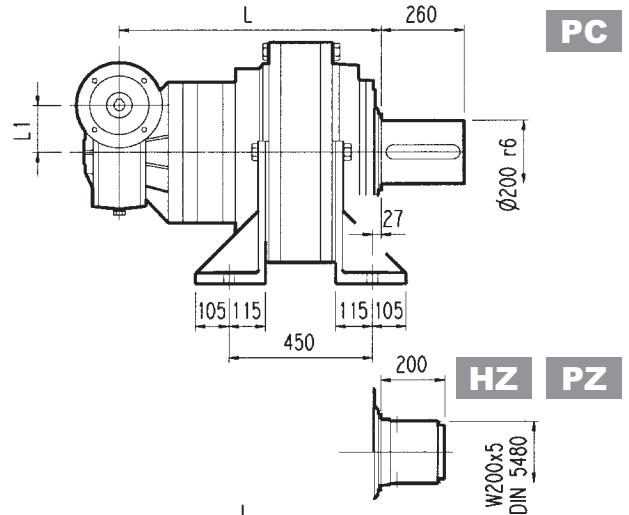
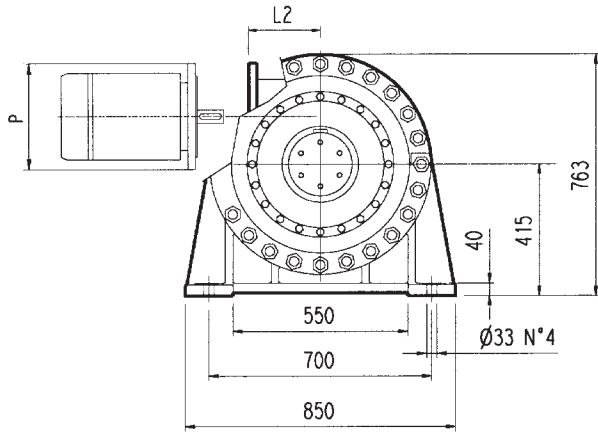
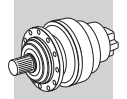
FP



FZ

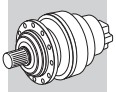
FP $M_{2max} = 242000 \text{ Nm}$

3/V 17 L3	L				L1	D1	L3	L4	Kg				
	PC - PZ	HC - HZ	FZ	FP						PC - PZ	HC - HZ	FZ	FP
	894	745	745	745	250	55	276	110		1400	1250	1200	1250
3/V 17 L3	P132		P160		P180		P200		P225				
	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P	
	531	300	506	350	506	350	531	400	536	450			



FP $M_{2max} = 242000 \text{ Nm}$

3/V 17 L4	L				L1	D1	L3	L4	Kg				
	PC - PZ	HC - HZ	FZ	FP						PC - PZ	HC - HZ	FZ	FP
	975	823	823	823	185.4	40	214.5	70		1250	1090	1040	1090
3/V 17 L4	P100		P112		P132		P160		P180				
	P	P	L2	P	L2	P	L2	P	L2	P	L2	P	
	250	250	217	300	217	350	217	350	217	350	217	350	



317 L

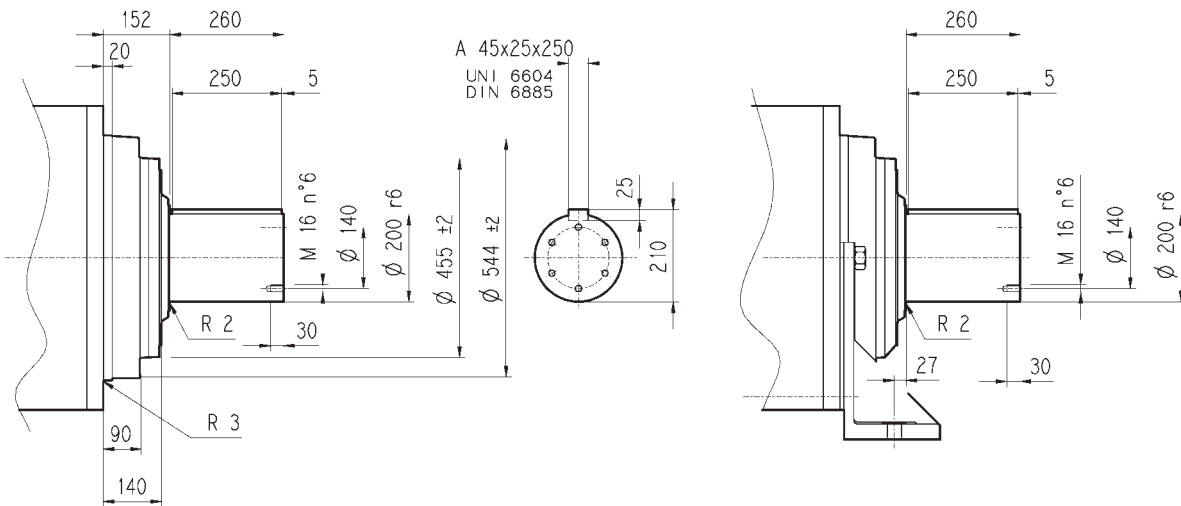
317 R

3/V 17 L3

3/V 17 L4

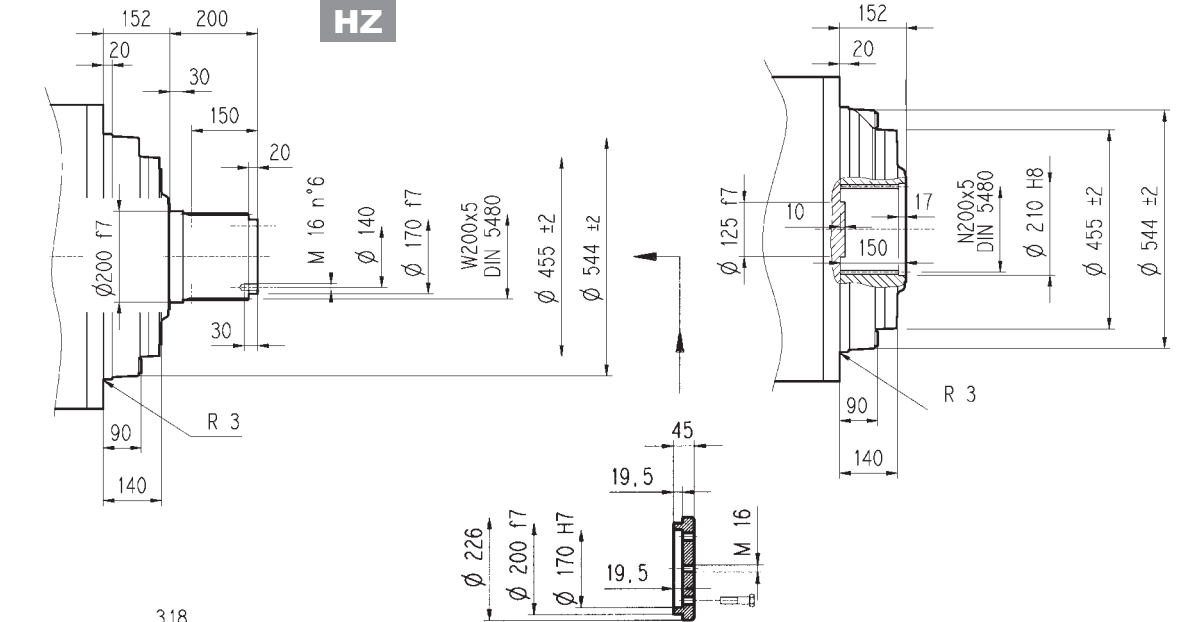
HC

PC

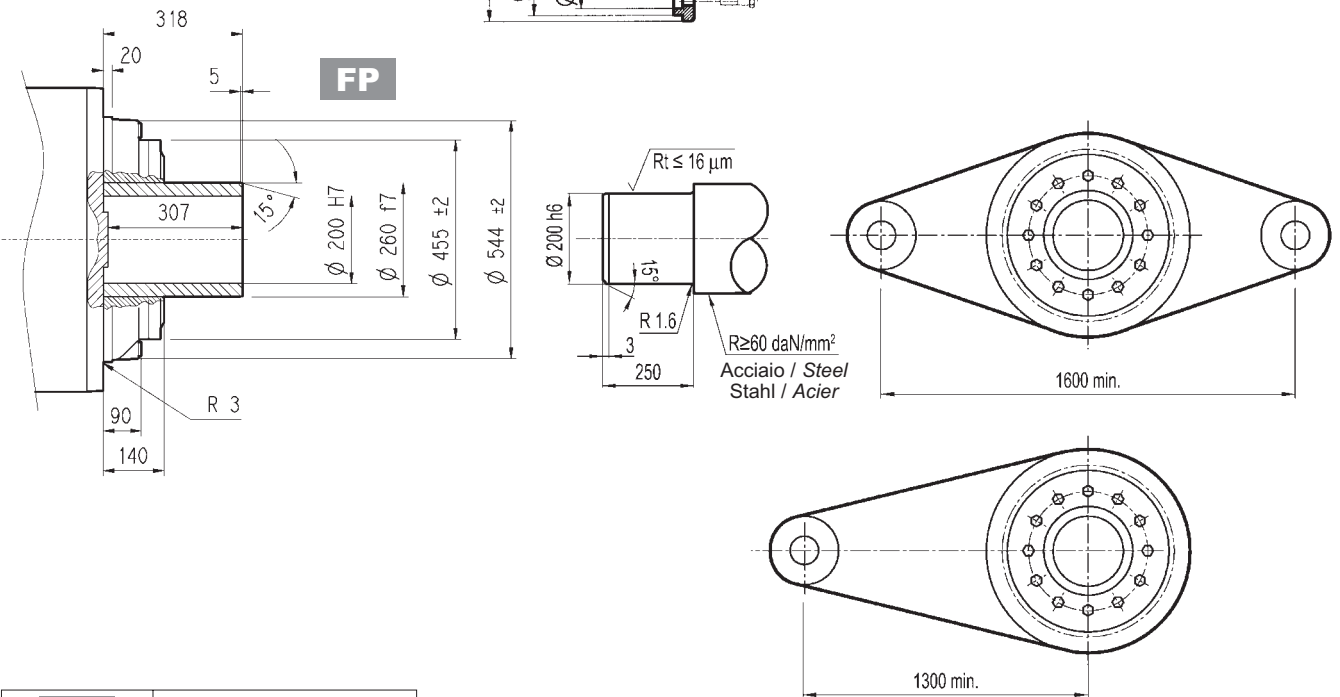


HZ

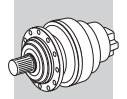
FZ



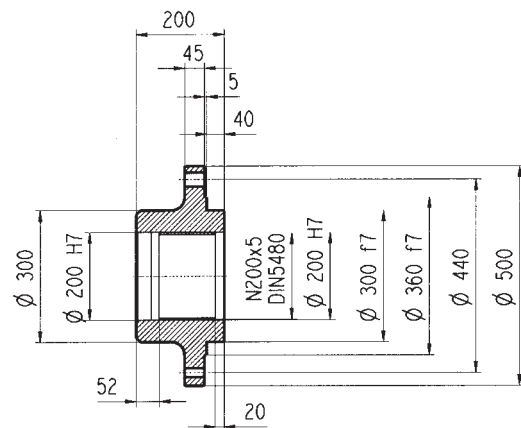
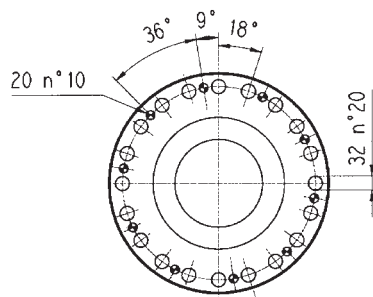
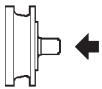
FP



FP	$M_{2max} = 242000 \text{ Nm}$
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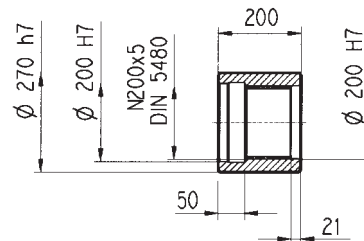
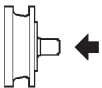
317 L**317 R****3/V 17 L3****3/V 17 L4**

Flangia / Flange
Flansch / Brides

WOA

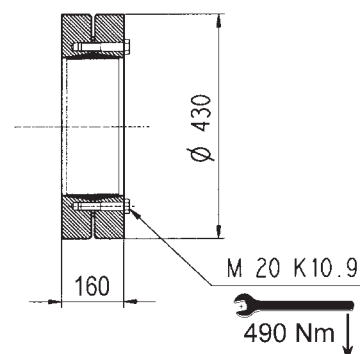
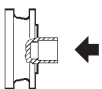
Materiale : Acciaio C40
Material : Steel C40
Material : Stahl C40
Màterial : Acier C40

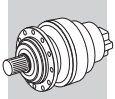
Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure

MOA

Materiale : Acciaio 16CrNi4
Material : Steel 16CrNi4
Material : Stahl 16CrNi4
Màterial : Acier 16CrNi4

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

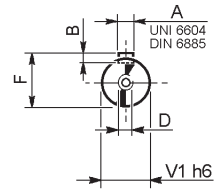
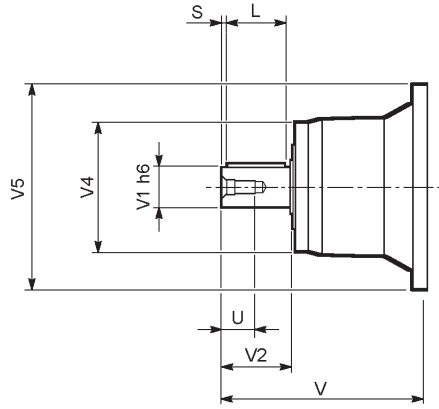
GOA



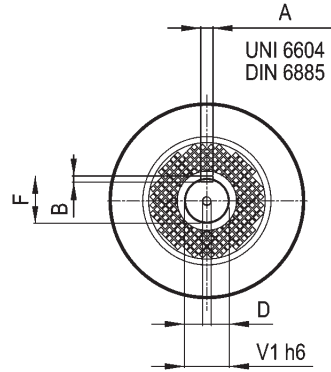
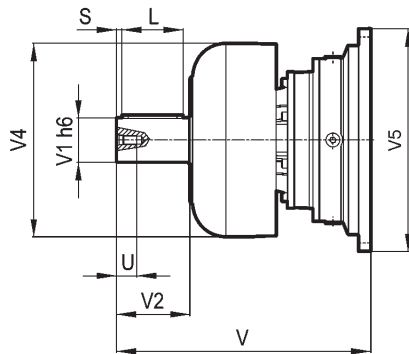
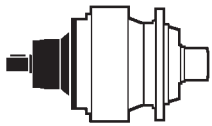
317 L

317 R

V _ _



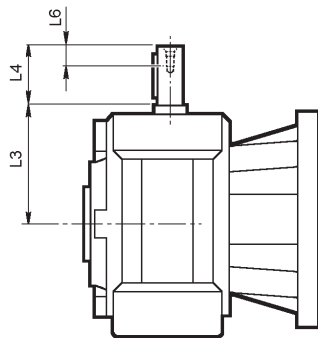
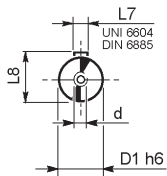
FV _ _



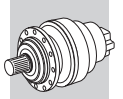
	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
317 L2	V11B	343	80	130	200	445	22	14	85	110	10	M16	36
	FV11B	451	80	130	347.5	445	22	14	85	110	10	M16	36
317 L3	V07B	315	80	130	200	345	22	14	85	110	10	M16	36
	FV07B	375	80	130	347.5	348	22	14	85	110	10	M16	36
	V07A	313	60	105	155	345	18	11	64	90	7.5	M16	36
	FV07A	363	60	105	309	348	18	11	64	90	7.5	M16	36
317 L4	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
317 R3 (B) (C)	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	40
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36
317 R4	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36

3/V 17 L3

3/V 17 L4



	D1 h6	L3	L4	L6	L7	L8	d
3/V 17 L3 HS	55	276	110	40	16	59	M16
3/V 17 L4 HS	40	214.5	70	20	12	43	M8

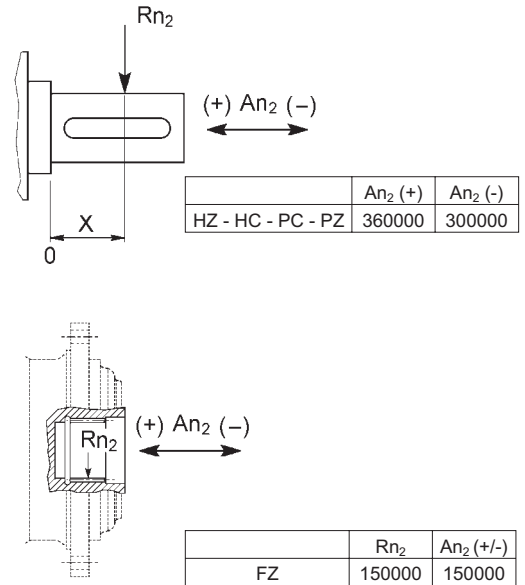
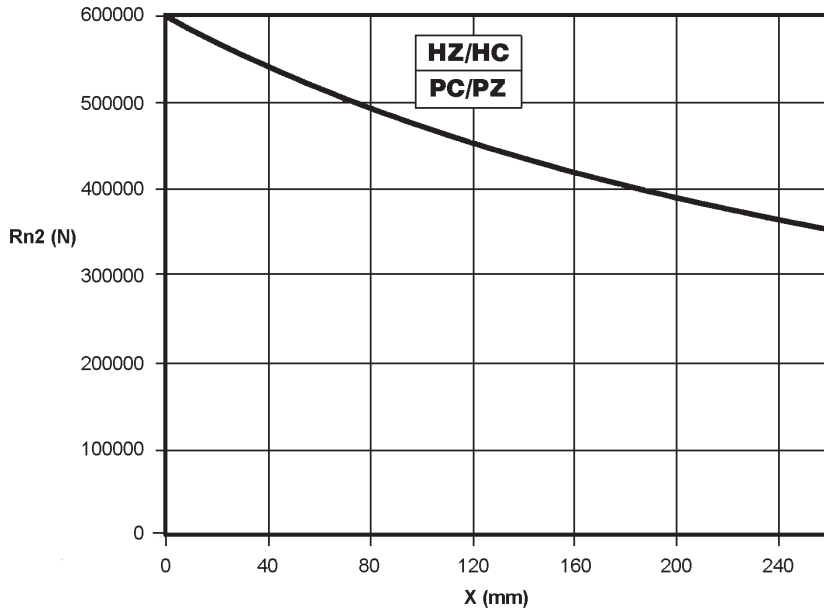


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $F_{h2} : n_2 \cdot h = 10000$

Permissible radial and axial loads on output shaft with $F_{h2} : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $F_{h2} : n_2 \cdot h = 10000$

Charges radiales et axiales admises sur l'arbre lent pour une valeur de $F_{h2} : n_2 \cdot h = 10000$



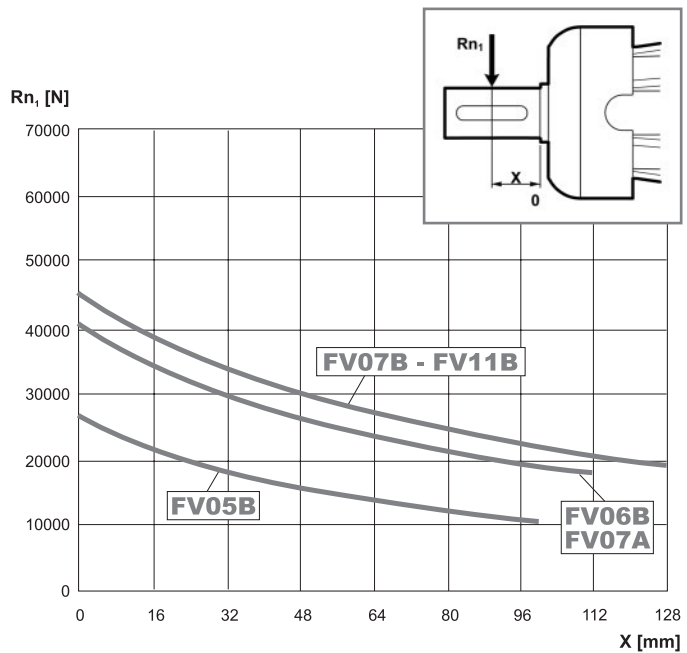
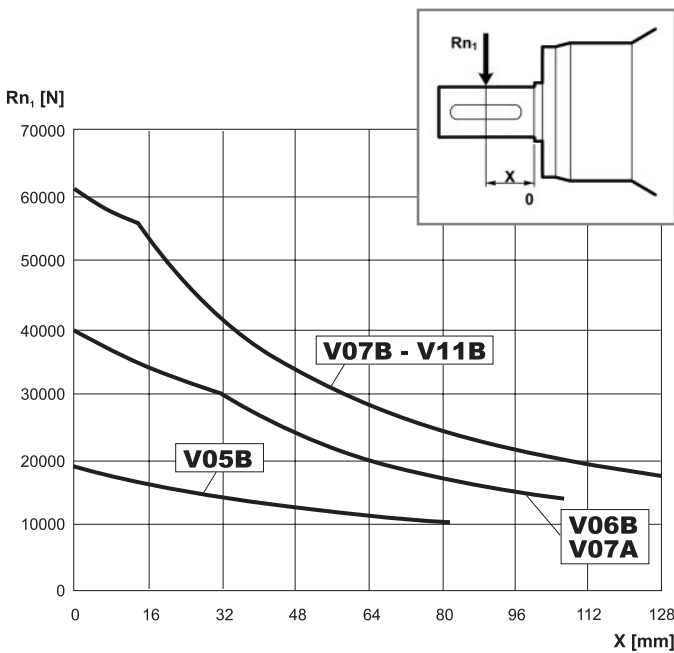
Fattore f_{h2} correttivo per carichi sugli alberi Load corrective factor f_{h2} on shafts Korrektionsfaktor f_{h2} für wellenbelastungen Facteur de correction f_{h2} pour charges sur les arbres	$F_{h2} = n_2 \cdot h$		10000	25000	50000	100000	500000	1000000
	f_{h2}	FZ	1	0.74	0.58	0.46	0.27	0.21
		HZ - HC - PC - PZ	1	0.76	0.61	0.50	0.31	0.25

Carichi radiali ammissibili sull'albero veloce per un valore di $F_{h1} : n_1 \cdot h = 250000$

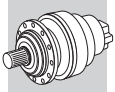
Permissible radial loads on input shaft with $F_{h1} : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $F_{h1} : n_1 \cdot h = 250000$

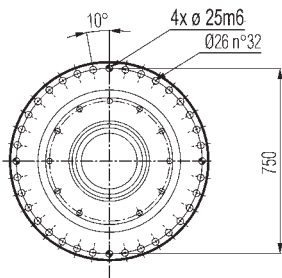
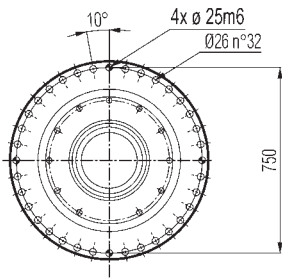
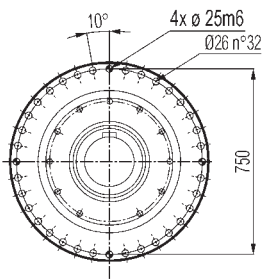
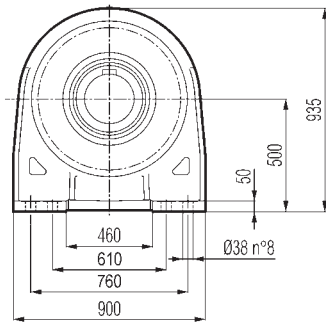
Charges radiales admises sur l'arbre d'entrée pour une valeur de $F_{h1} : n_1 \cdot h = 250000$



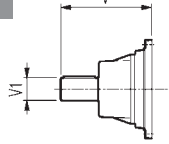
Fattore f_{h1} correttivo per carichi sugli alberi Load corrective factor f_{h1} on shafts Korrektionsfaktor f_{h1} für wellenbelastungen Facteur de correction f_{h1} pour charges sur les arbres	$F_{h1} = n_1 \cdot h$		250000	500000	1000000	2000000	5000000	10000000
	f_{h1}		1	0.79	0.63	0.50	0.37	0.29



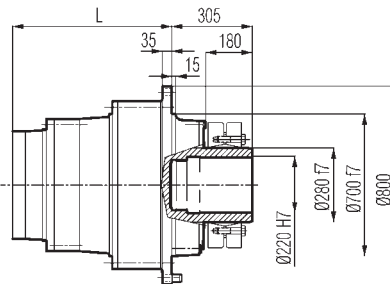
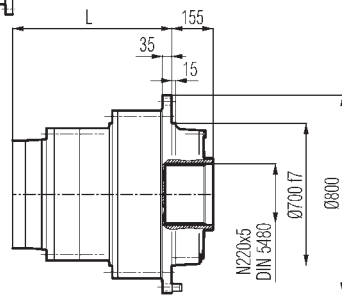
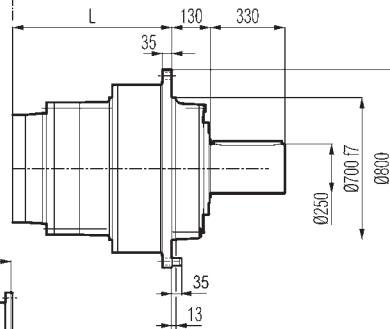
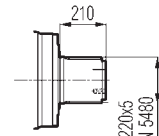
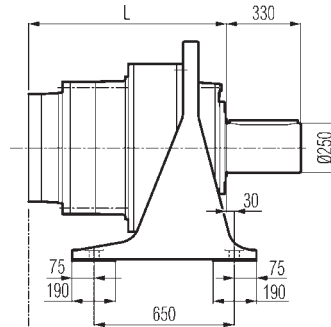
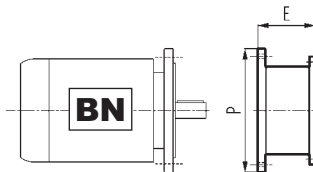
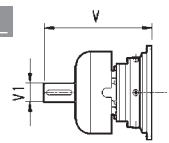
318 L



V _ _



FV _ _



PC

HZ PZ

HC

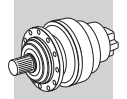
FZ

FP

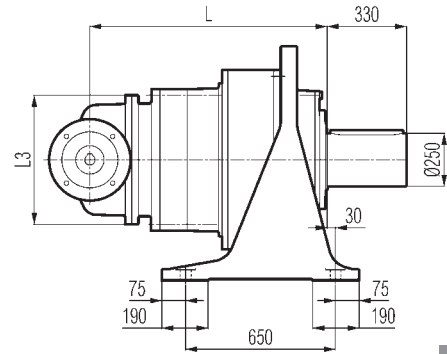
FP $M_{2max} = 322000 \text{ Nm}$

	L				Kg								Kg							
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
318 L2	332	202	202	202	1250	950	800	830	556	120	125	-	-	-	-	-	-	-	-	-
318 L3	889	759	759	759	1600	1300	1150	1180	348	80	55	-	-	-	456	80	85	-	-	-
318 L4	1022	892	892	892	1650	1350	1200	1230	315	80	35	313	60	28	375	80	48	363	60	34

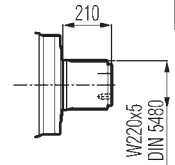
318 L4	P180		P200		P225		P250	
	E	P	E	P	E	P	E	P
318 L4	195	350	186	400	216	450	215	550



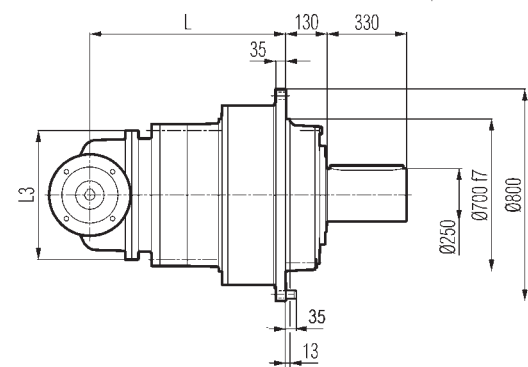
PC



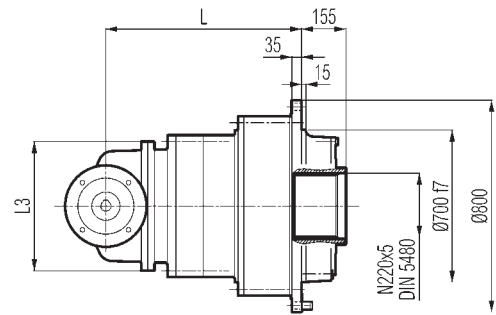
HZ PZ



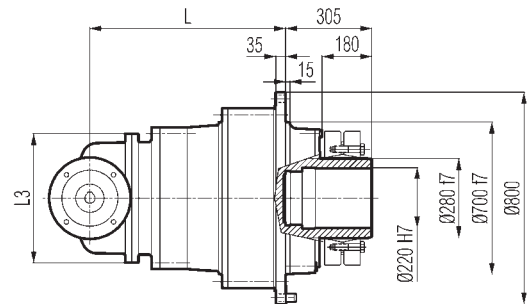
HC



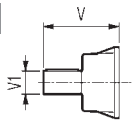
FZ



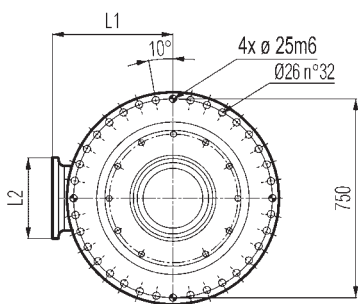
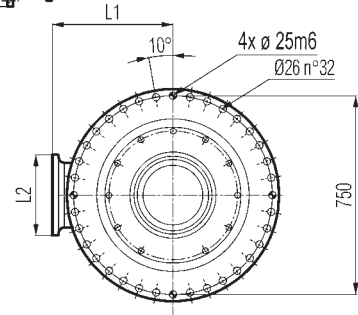
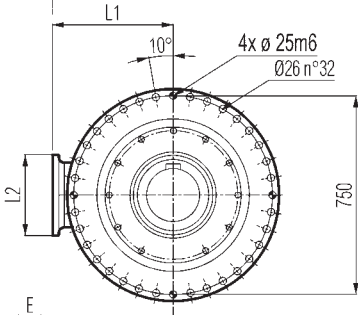
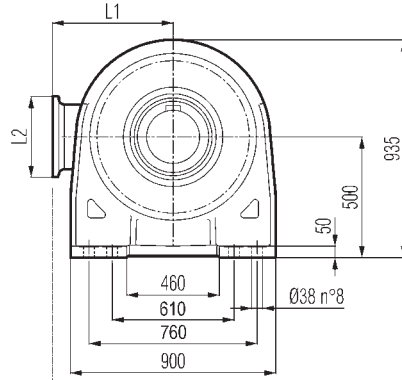
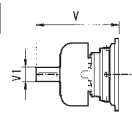
FP



V



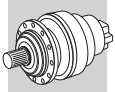
FV



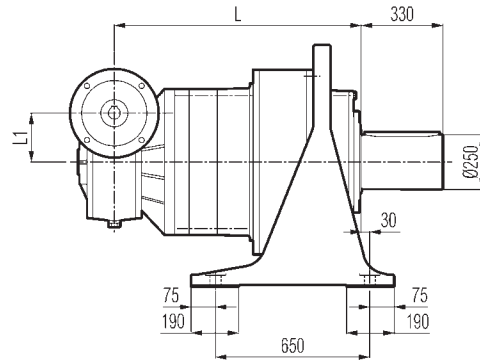
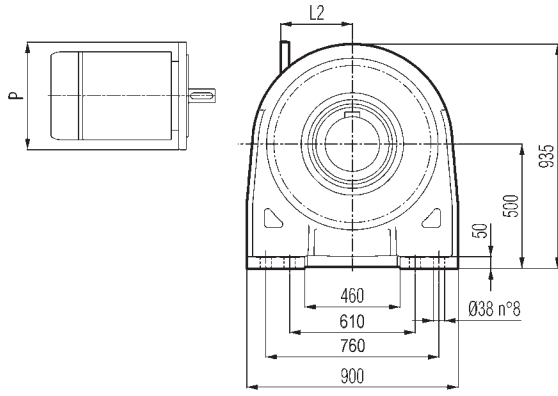
FP

$M_{2max} = 322000 \text{ Nm}$

	L				L1	L2	L3	Kg				Kg				Kg							
	PC-PZ	HC-HZ	FZ	FP				PC-PZ	HC-HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg			
318 R4 (B)	1115	985	985	985	345	292	400	1720	1420	1270	1300	307	60	23	-	-	-	357	60	28	-	-	-
318 R4 (C)	1115	985	985	985	390	292	480	1730	1430	1280	1310	307	60	23	-	-	-	357	60	28	-	-	-
	P132		P160		P180		P200		P225		P250												
	E	P	E	P	E	P	E	P	E	P	E	P											
318 R4 (B)	-	-	-	-	152	350	182	400	212	450	193	550											
318 R4 (C)	-	-	-	-	152	350	182	400	212	450	193	550											

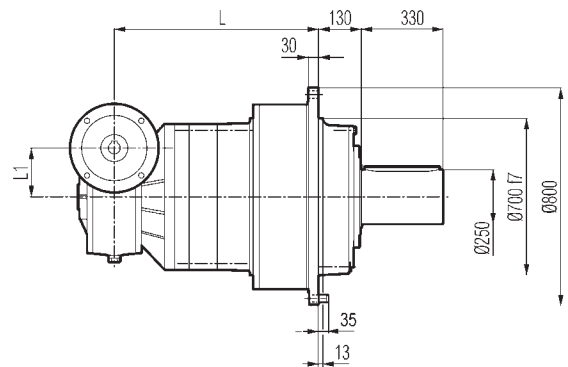
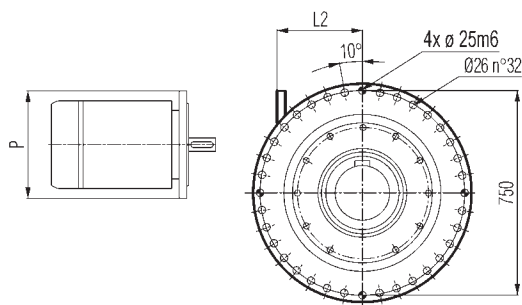
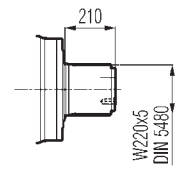


3/V 18 L4

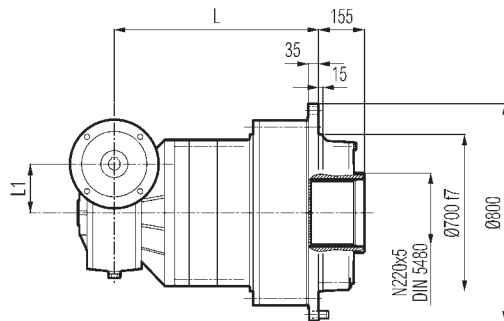
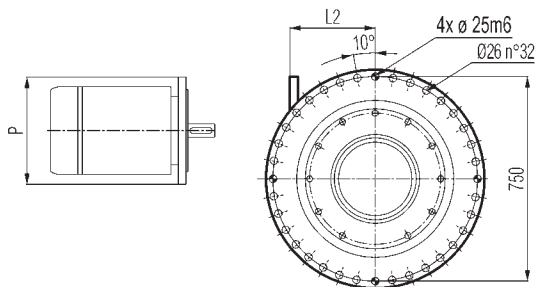
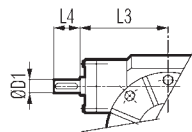


PC

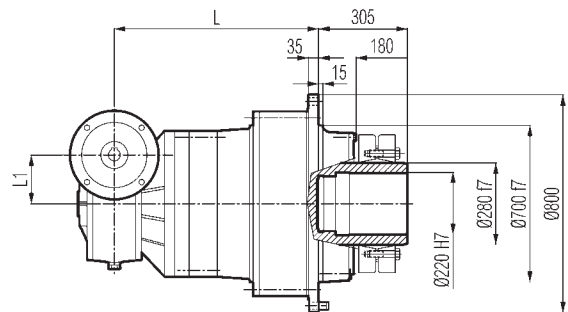
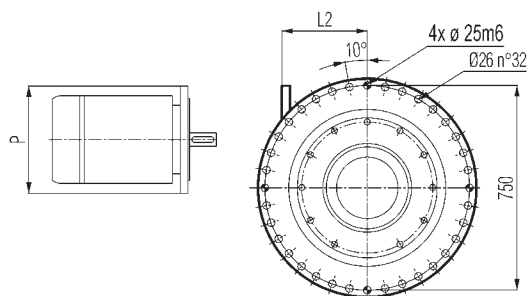
HZ PZ



HC



FZ

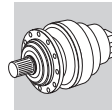


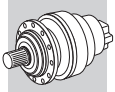
FP

FP $M_{2max} = 322000 \text{ Nm}$

	L				L1	D1	L3	L4	Kg			
	PC - PZ	HC - HZ	FZ	FP					PC - PZ	HC - HZ	FZ	FP
3/V 18 L4	1114	984	984	984	210	48	230	110	1810	1510	1360	1390

	P132		P160		P180		P200		P225	
	L2	P	L2	P	L2	P	L2	P	L2	P
3/V 18 L4	485	300	460	350	460	350	485	400	490	450





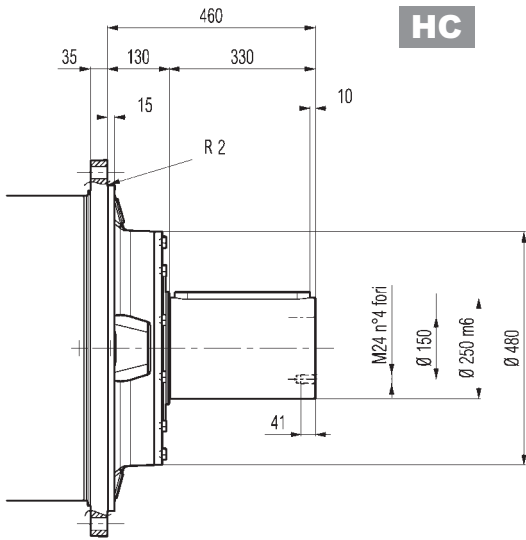
318 L

318 R

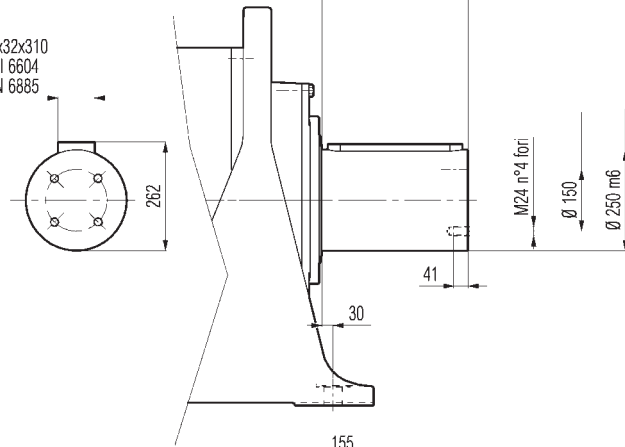
3/V 18 L4

HC

PC

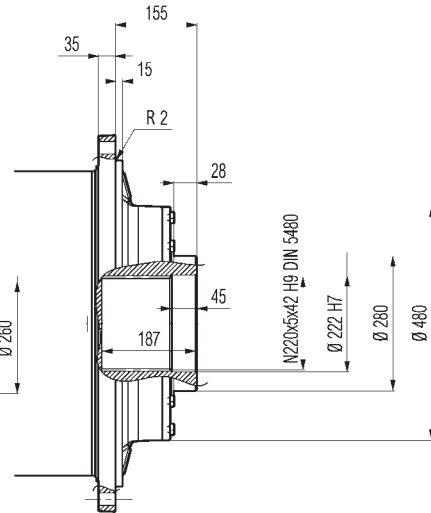
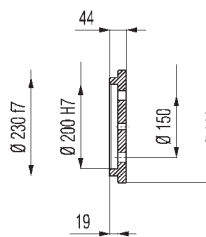
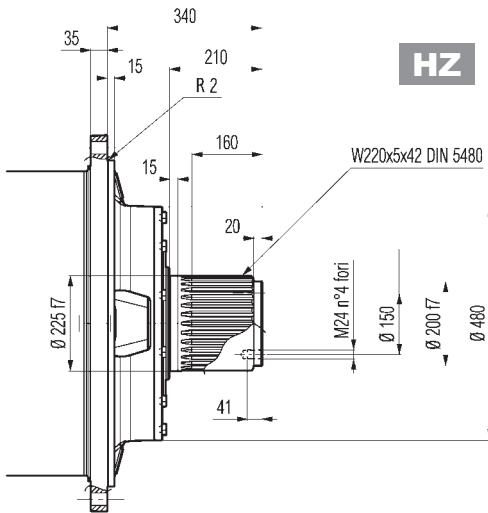


A56x32x310
UNI 6604
DIN 6885

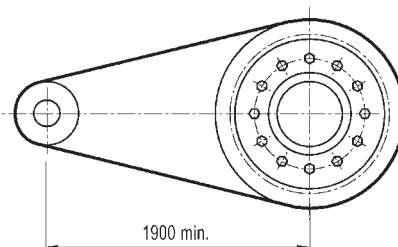
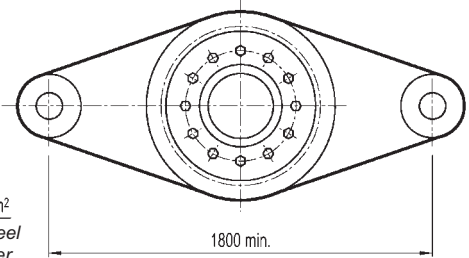
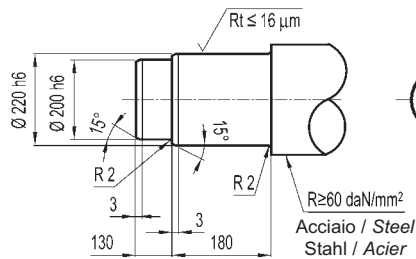
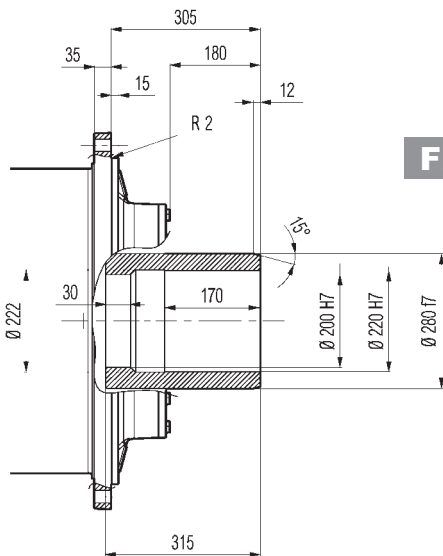


HZ

FZ

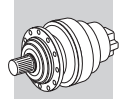


FP

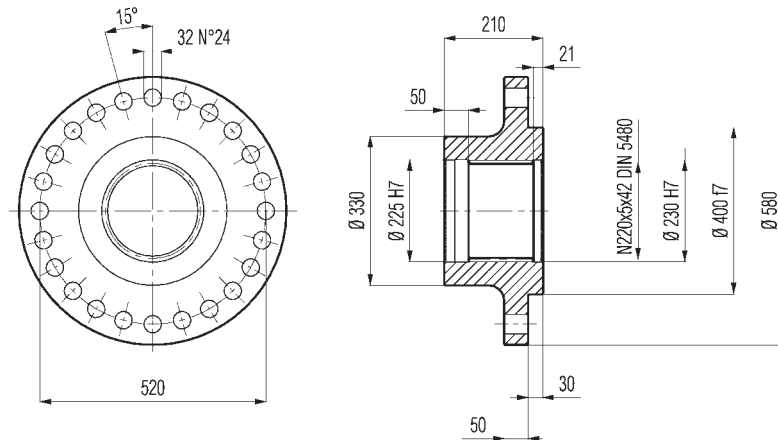
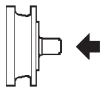


FP

M_{2max} = 322000 Nm

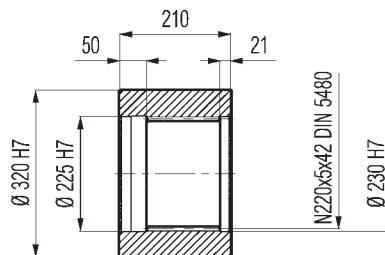
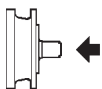
318 L**318 R****3/V 18 L4**

Flangia / Flange
Flansch / Brides

WOA

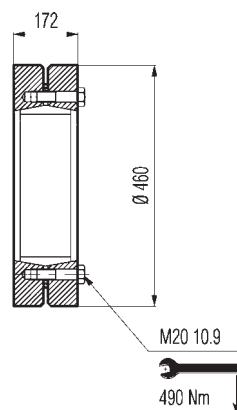
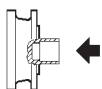
Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

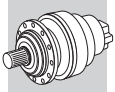
Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure

MOA

Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

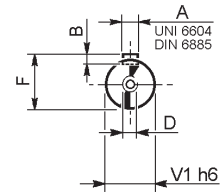
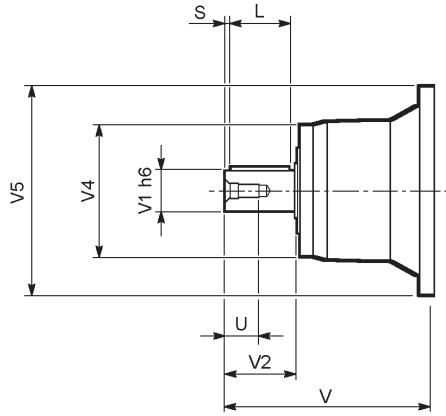
GOA



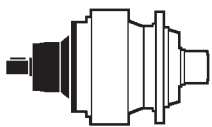
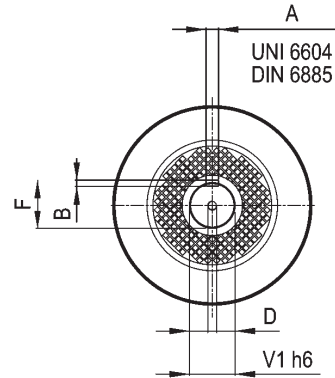
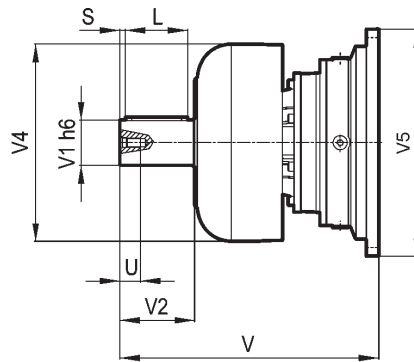
318 L

318 R

V _ _

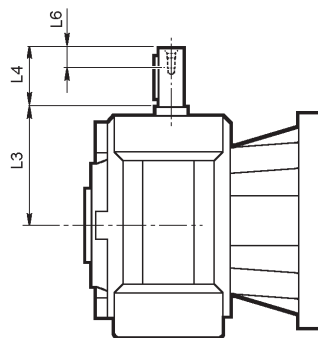
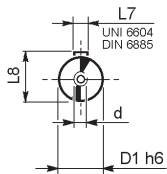


FV _ _

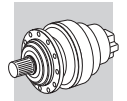


	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
318 L2	V15B	523	120	210	320	542	32	18	127	180	15	M24	50
318 L3	V11B	348	80	130	200	428	22	14	85	110	10	M16	36
	FV11B	456	80	130	347.5	428	22	14	85	110	10	M16	36
318 L4	V07B	315	80	130	200	345	22	14	85	110	10	M16	36
	FV07B	375	80	130	347.5	348	22	14	85	110	10	M16	36
	V07A	313	60	105	155	345	18	11	64	90	7.5	M16	36
	FV07A	363	60	105	309	348	18	11	64	90	7.5	M16	36
318 R4 (B) (C)	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36

3/V 18 L4



	D1 h6	L3	L4	L6	L7	L8	d
3/V 18 L4 HS	48	230	110	40	14	51.5	M16

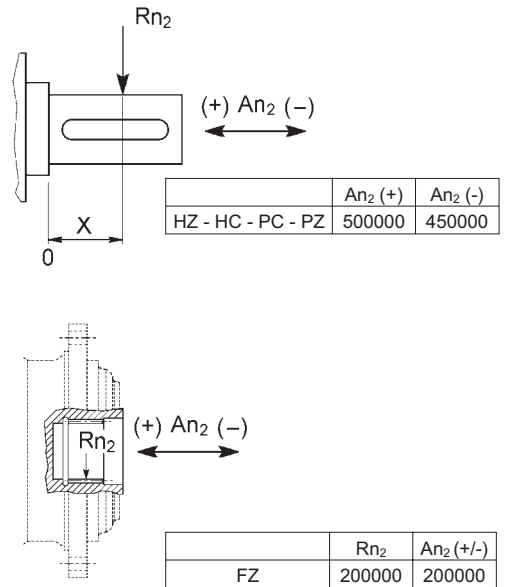
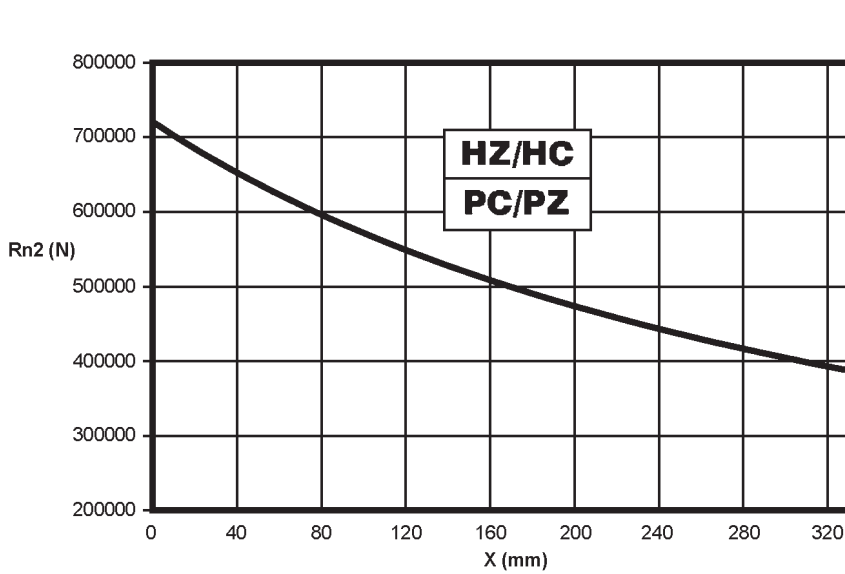


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $Fh_2 : n_2 \cdot h = 10000$

Permissible radial and axial loads on output shaft with $Fh_2 : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $Fh_2 : n_2 \cdot h = 10000$

Charges radiales et axiales admises sur l'arbre lent pour une valeur de $Fh_2 : n_2 \cdot h = 10000$



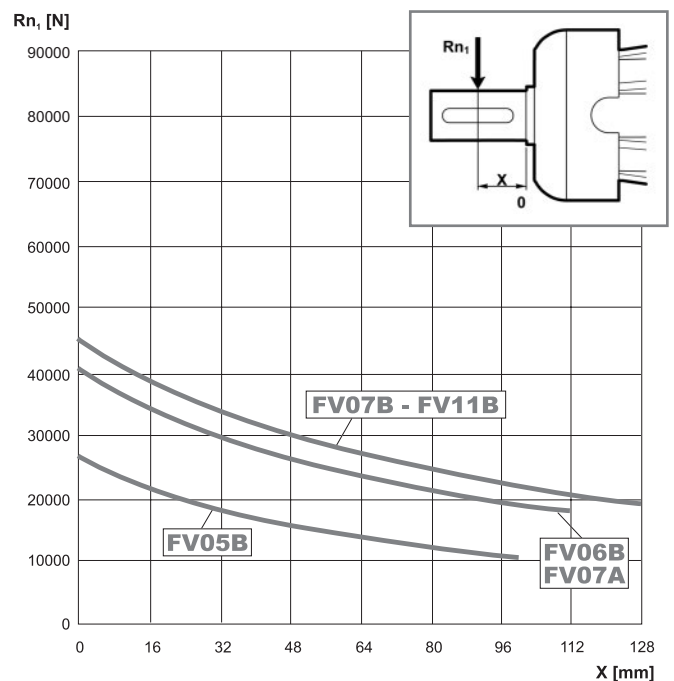
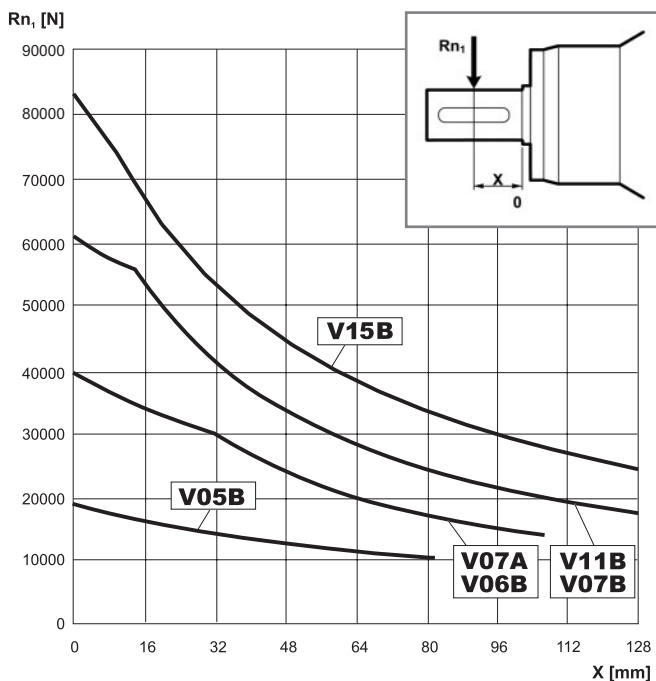
Fattore fh_2 correttivo per carichi sugli alberi Load corrective factor fh_2 on shafts Korrektionsfaktor fh_2 für wellenbelastungen Facteur de correction fh_2 pour charges sur les arbres	$Fh_2 = n_2 \cdot h$	10000	25000	50000	100000	500000	1000000
		fh_2	FZ	1	0.74	0.58	0.46
	HZ - HC - PC - PZ	1	0.76	0.61	0.50	0.31	0.25

Carichi radiali ammissibili sull'albero veloce per un valore di $Fh_1 : n_1 \cdot h = 250000$

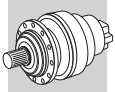
Permissible radial loads on input shaft with $Fh_1 : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $Fh_1 : n_1 \cdot h = 250000$

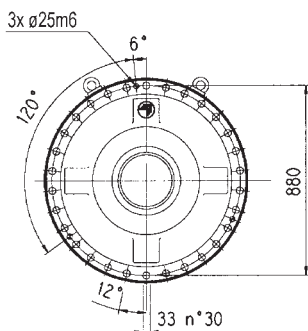
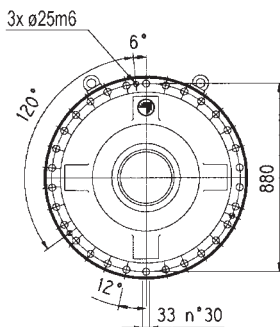
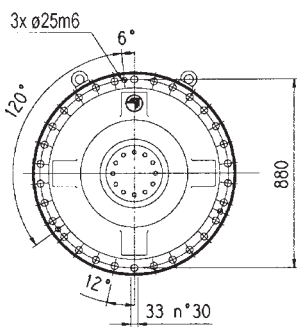
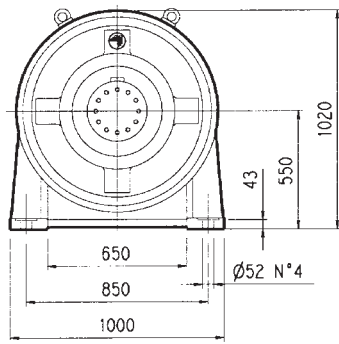
Charges radiales admises sur l'arbre d'entrée pour une valeur de $Fh_1 : n_1 \cdot h = 250000$



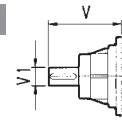
Fattore fh_1 correttivo per carichi sugli alberi Load corrective factor fh_1 on shafts Korrektionsfaktor fh_1 für wellenbelastungen Facteur de correction fh_1 pour charges sur les arbres	$Fh_1 = n_1 \cdot h$	250000	500000	1000000	2000000	5000000	10000000
		fh_1	1	0.79	0.63	0.50	0.37



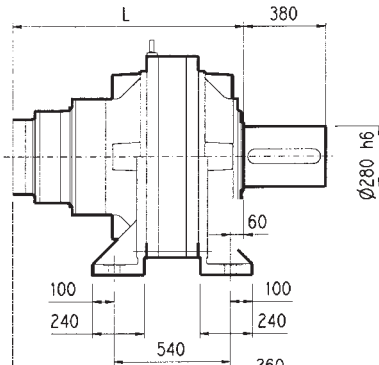
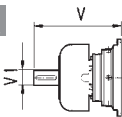
319 L



V



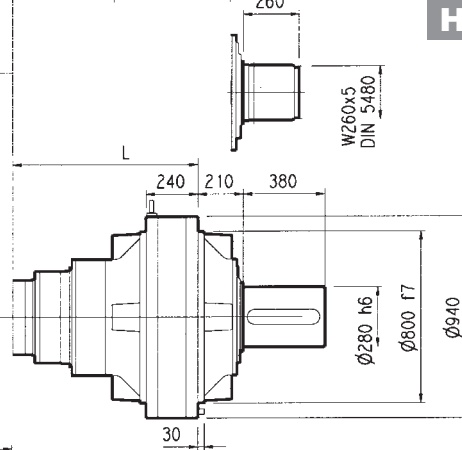
FV



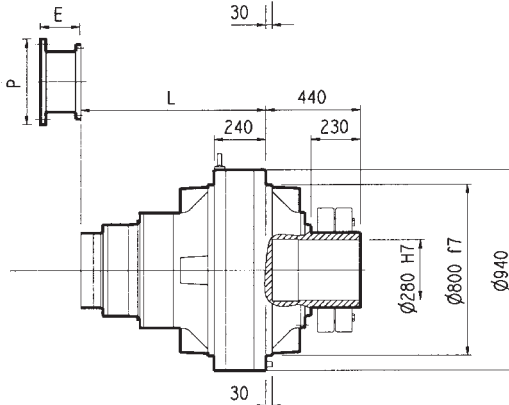
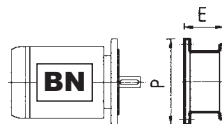
PC

HZ

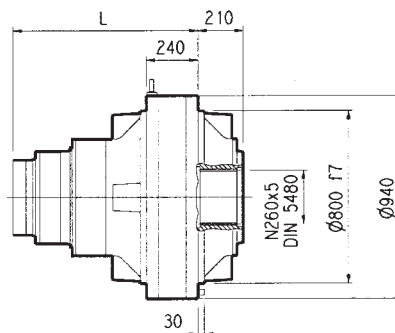
PZ



HC



FP



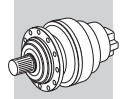
FZ

FP

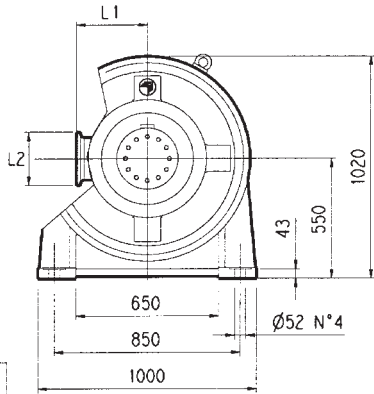
M_{2max} = 480000 Nm

	L				Kg				Kg				Kg							
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
319 L2	395	185	185	185	2100	1800	1700	1700	556	120	125	-	-	-	-	-	-	-	-	-
319 L3	990	780	780	780	2435	2135	2035	2035	348	80	55	-	-	-	456	80	85	-	-	-
319 L4	1123	913	913	913	2480	2180	2080	2080	315	80	35	313	60	28	375	80	48	363	60	34

	P180		P200		P225		P250	
	E	P	E	P	E	P	E	P
319 L4	195	350	186	400	216	450	216	550



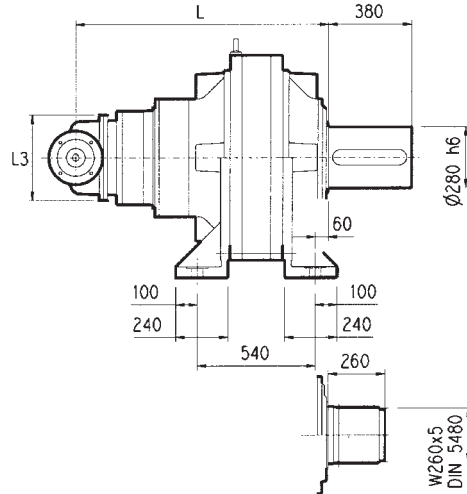
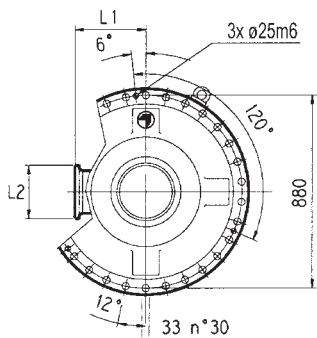
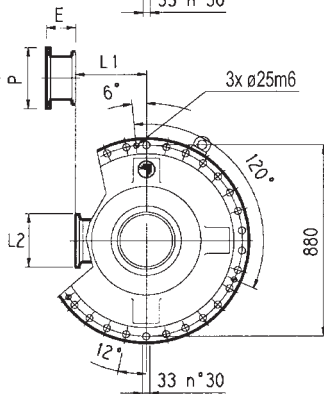
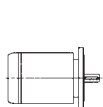
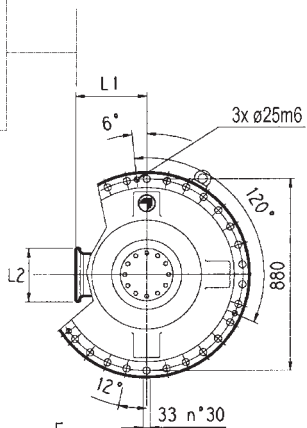
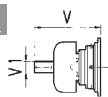
PC



V



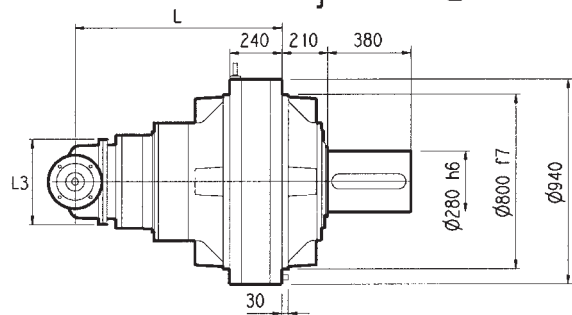
FV



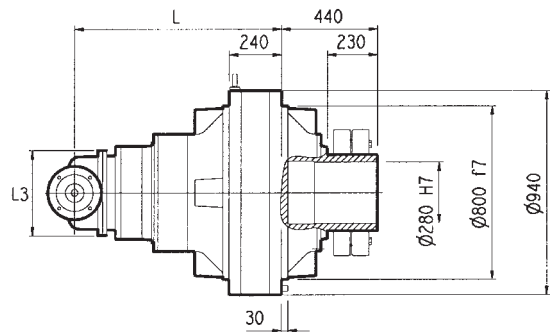
HZ

PZ

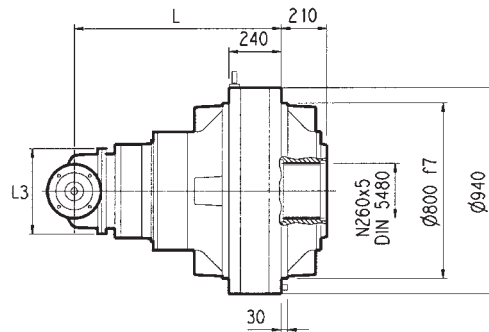
HC



FP



FZ

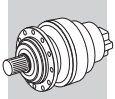


FP

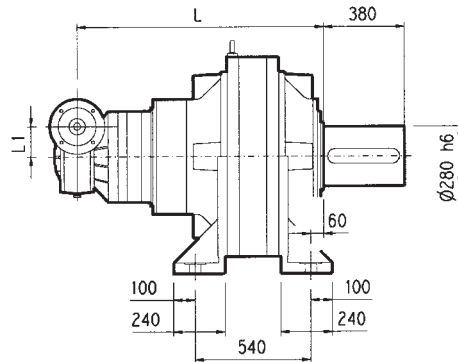
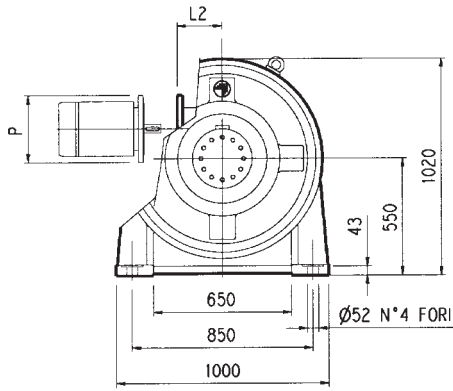
$M_{2max} = 480000 \text{ Nm}$

	L				L1	L2	L3	Kg				V			V1			Kg					
	PC-PZ	HC-HZ	FZ	FP				PC-PZ	HC-HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg			
319 R4 (B)	1215	1005	1005	1005	345	292	400	2560	2260	2160	2160	307	60	23	-	-	-	357	60	28	-	-	-
319 R4 (C)	1215	1005	1005	1005	390	292	480	2580	2280	2180	2180	307	60	23	-	-	-	357	60	28	-	-	-

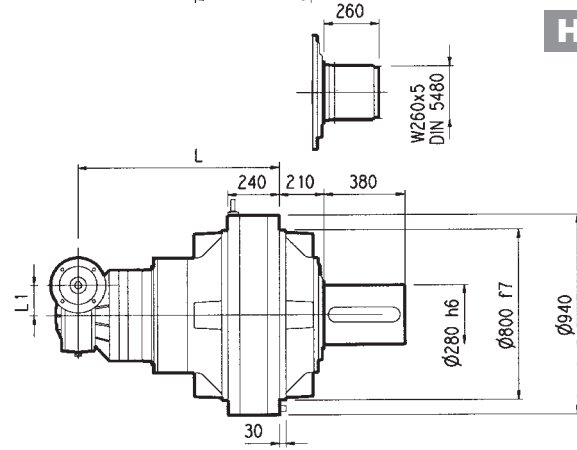
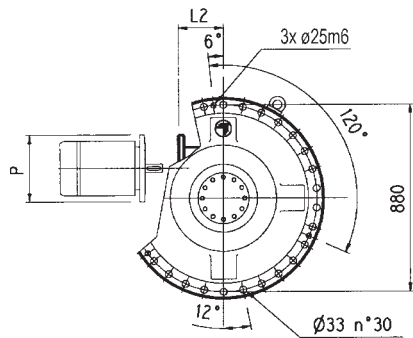
	P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P
319 R4 (B)	-	-	-	-	152	350	182	400	212	450	193	550
319 R4 (C)	-	-	-	-	152	350	182	400	212	450	193	550



3/V 19 L4

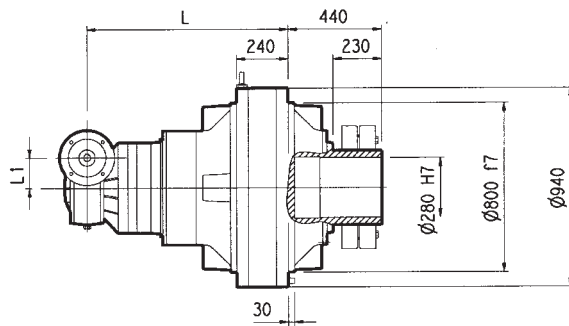
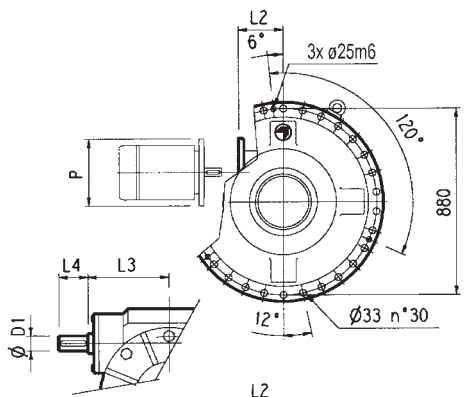


PC

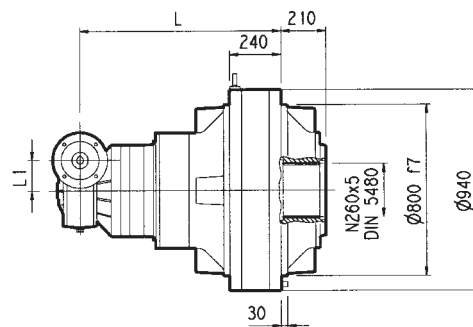
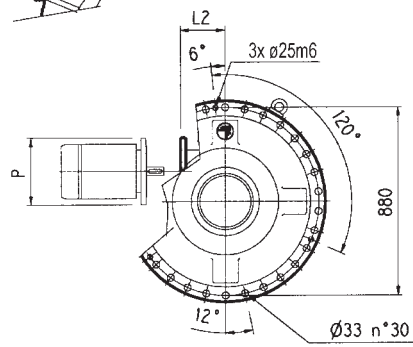


HZ PZ

HC



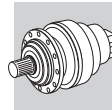
FP

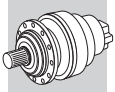
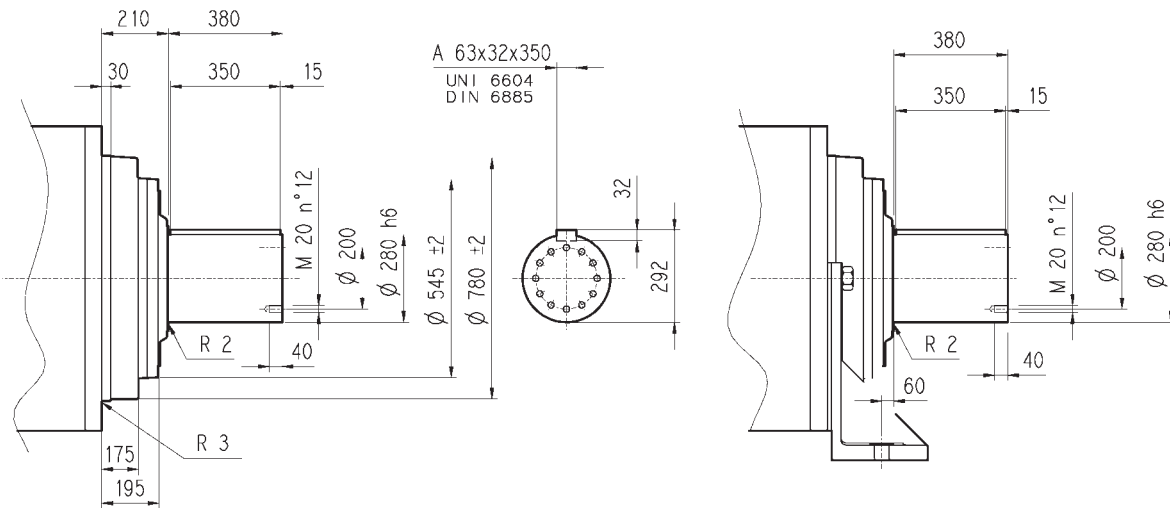
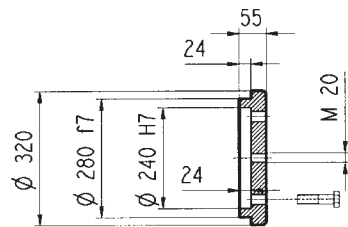
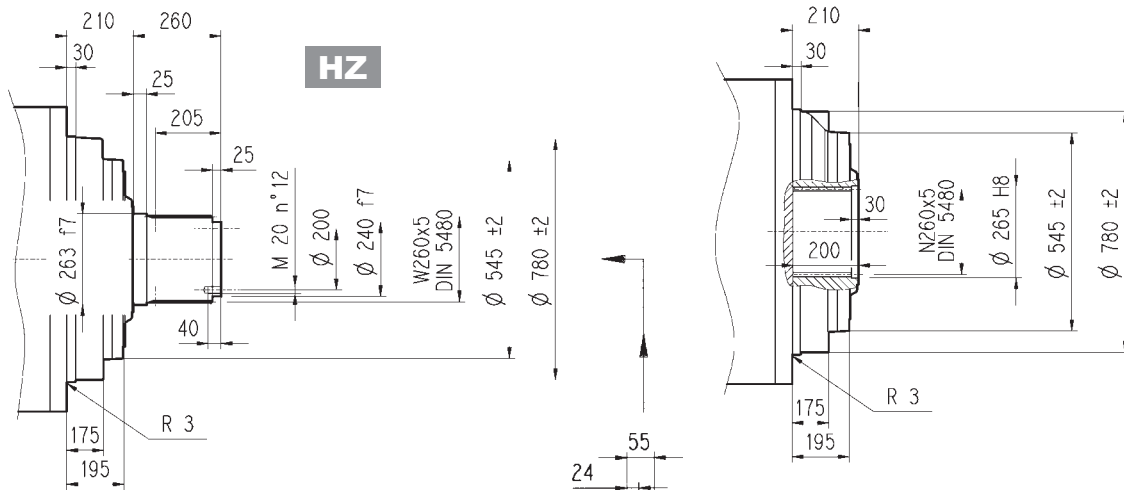
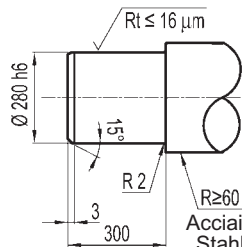
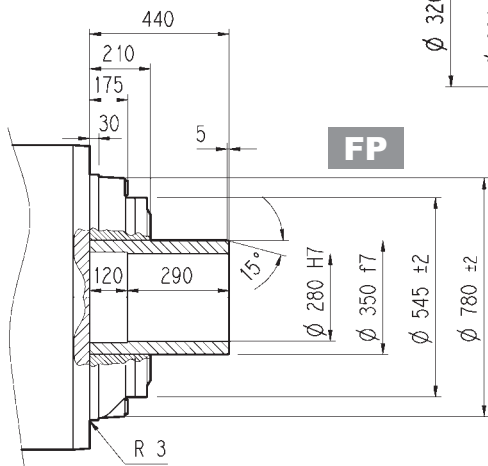


FZ

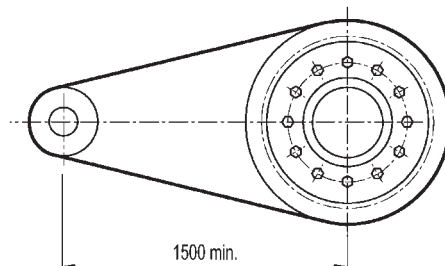
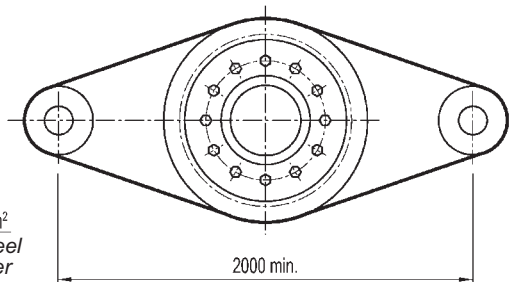
FP $M_{2max} = 480000 \text{ Nm}$

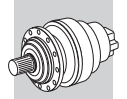
	L				L1	D1	L3	L4	Kg			
	PC - PZ	HC - HZ	FZ	FP					PC - PZ	HC - HZ	FZ	FP
3/V 19 L4	1210	1000	1000	1000	210	48	230	110	2650	2350	2250	2250
3/V 19 L4	P132		P160		P180		P200		P225			
	L2	P	L2	P	L2	P	L2	P	L2	P		
	485	300	460	350	460	350	485	400	490	450		



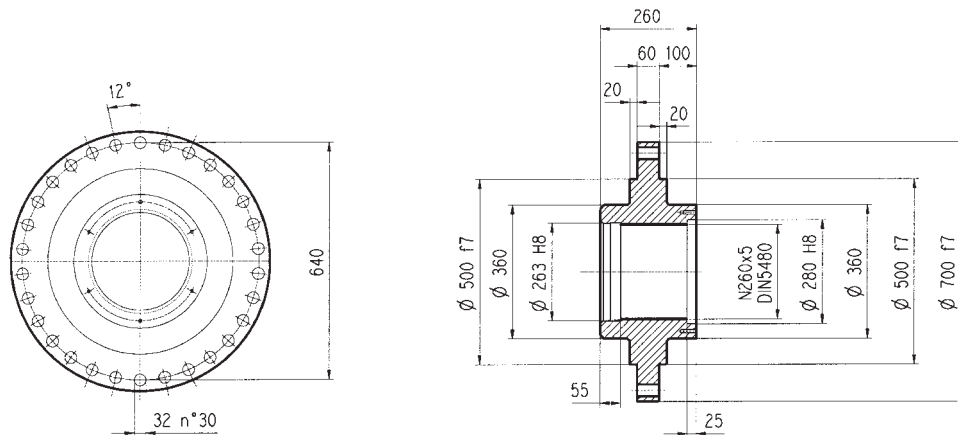
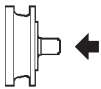
**319 L****319 R****3/V 19 L4****HC****PC****HZ****FZ****FP**

$R \geq 60 \text{ daN/mm}^2$
Acciaio / Steel
Stahl / Acier

**FP** $M_{2max} = 480000 \text{ Nm}$

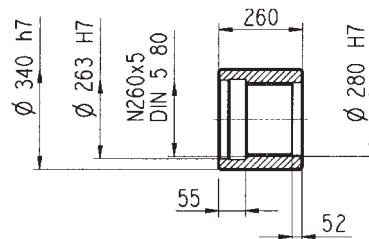
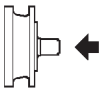
319 L**319 R****3/V 19 L4**

Flangia / Flange
Flansch / Brides

WOA

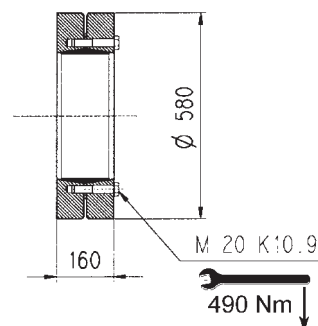
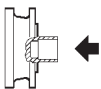
Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

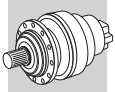
Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure

MOA

Materiale : Acciaio 16CrNi4
 Material : Steel 16CrNi4
 Material : Stahl 16CrNi4
 Matière : Acier 16CrNi4

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

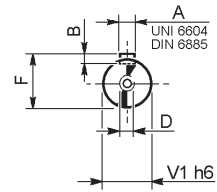
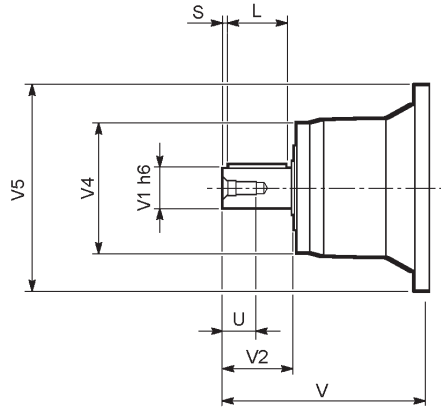
G0A



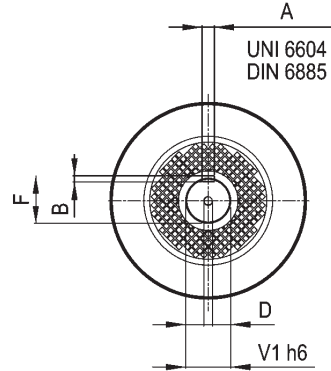
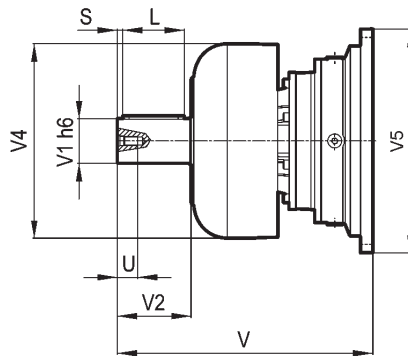
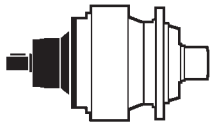
319 L

319 R

V

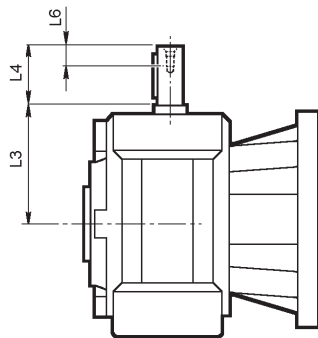
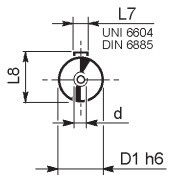


FV

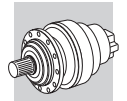


	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
319 L2	V15B	523	120	210	320	542	32	18	127	180	15	M24	50
319 L3	V11B	348	80	130	200	428	22	14	85	110	10	M16	36
	FV11B	456	80	130	347.5	428	22	14	85	110	10	M16	36
319 L4	V07B	315	80	130	200	345	22	14	85	110	10	M16	36
	FV07B	375	80	130	347.5	348	22	14	85	110	10	M16	36
	V07A	313	60	105	155	345	18	11	64	90	7.5	M16	36
	FV07A	363	60	105	309	348	18	11	64	90	7.5	M16	36
319 R4 (B) (C)	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36

3/V 19 L4



	D1 h6	L3	L4	L6	L7	L8	d
3/V 19 L4 HS	48	230	110	40	14	51.5	M16

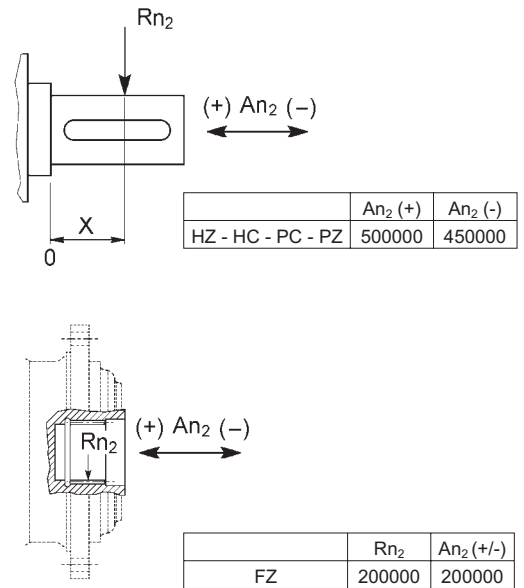
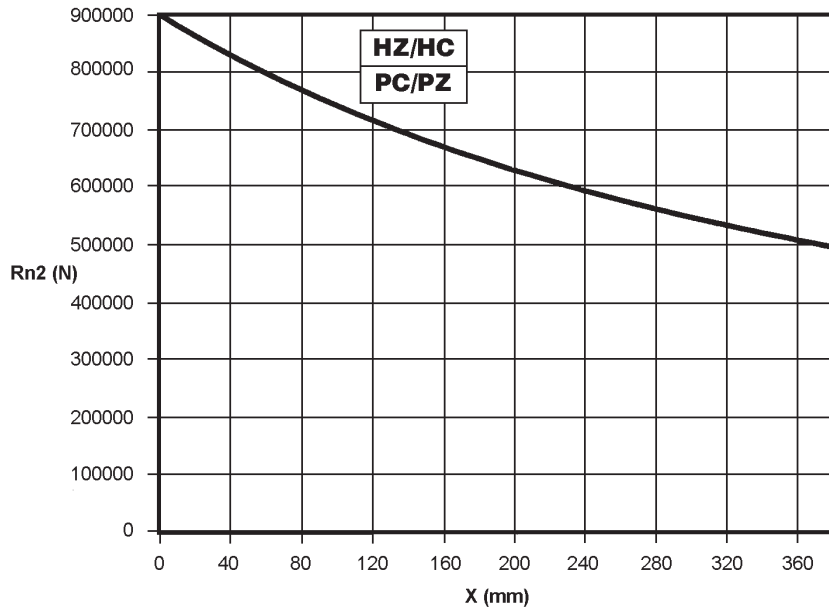


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $Fh_2 : n_2 \cdot h = 10000$

Permissible radial and axial loads on output shaft with $Fh_2 : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $Fh_2 : n_2 \cdot h = 10000$

Charges radiales et axiales admises sur l'arbre lent pour une valeur de $Fh_2 : n_2 \cdot h = 10000$



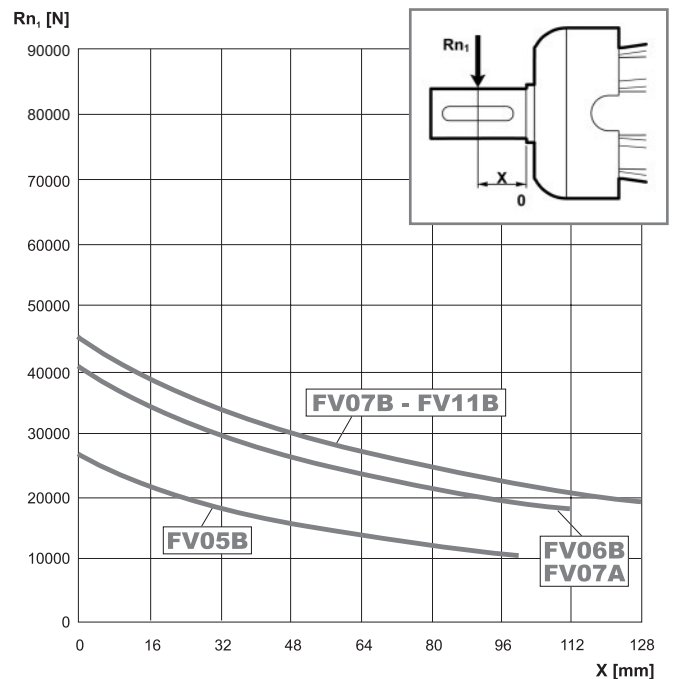
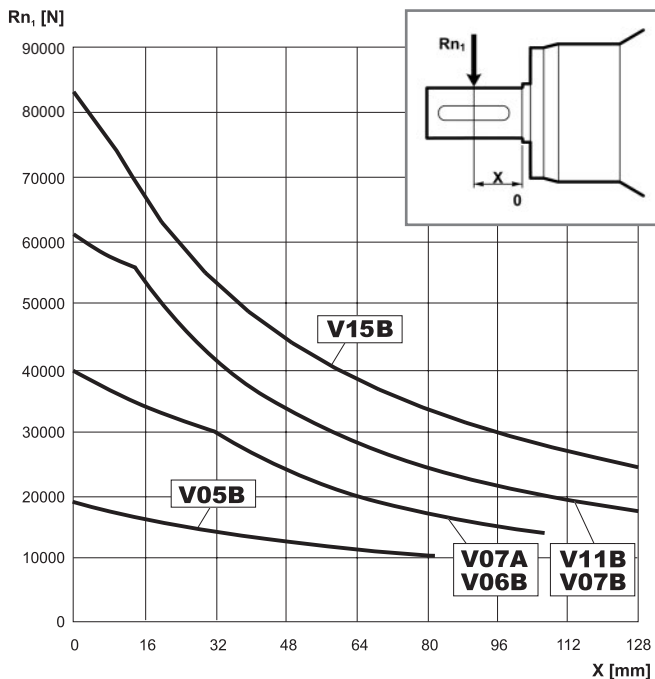
Fattore fh_2 correttivo per carichi sugli alberi Load corrective factor fh_2 on shafts Korrektionsfaktor fh_2 für wellenbelastungen Facteur de correction fh_2 pour charges sur les arbres	$Fh_2 = n_2 \cdot h$		10000	25000	50000	100000	500000	1000000
	fh_2	FZ	1	0.74	0.58	0.46	0.27	0.21
		HZ - HC - PC - PZ	1	0.76	0.61	0.50	0.31	0.25

Carichi radiali ammissibili sull'albero veloce per un valore di $Fh_1 : n_1 \cdot h = 250000$

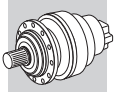
Permissible radial loads on input shaft with $Fh_1 : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $Fh_1 : n_1 \cdot h = 250000$

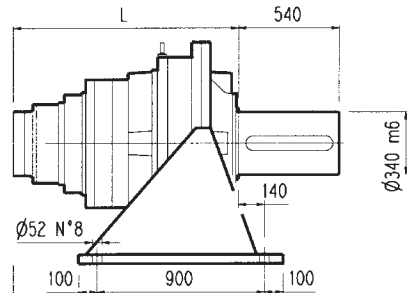
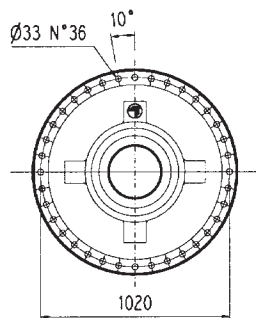
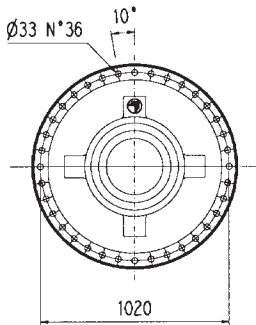
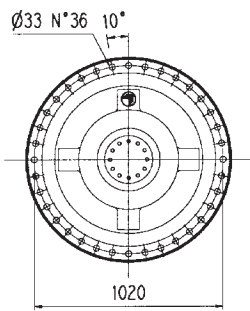
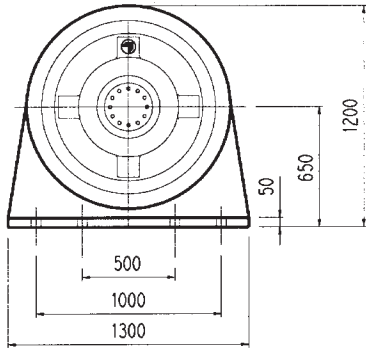
Charges radiales admises sur l'arbre d'entrée pour une valeur de $Fh_1 : n_1 \cdot h = 250000$



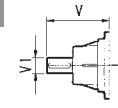
Fattore fh_1 correttivo per carichi sugli alberi Load corrective factor fh_1 on shafts Korrektionsfaktor fh_1 für wellenbelastungen Facteur de correction fh_1 pour charges sur les arbres	$Fh_1 = n_1 \cdot h$	250000	500000	1000000	2000000	5000000	10000000
	fh_1	1	0.79	0.63	0.50	0.37	0.29



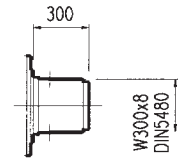
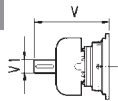
321 L



V

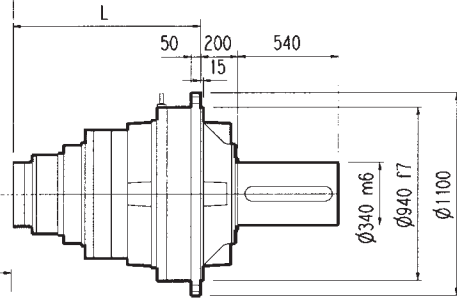


FV

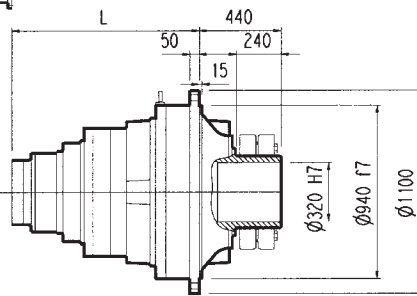
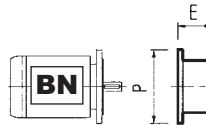


PC

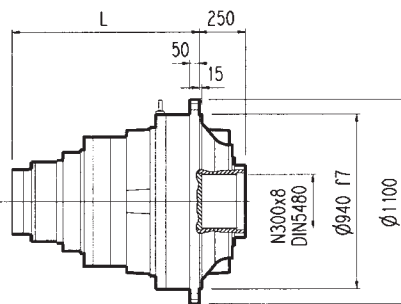
HZ PZ



HC



FP



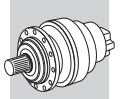
FZ

FP

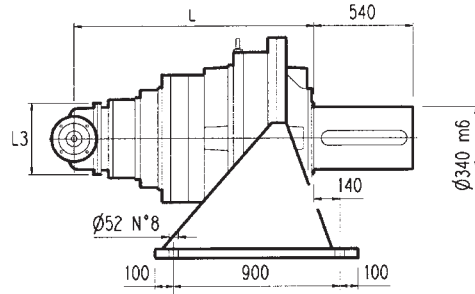
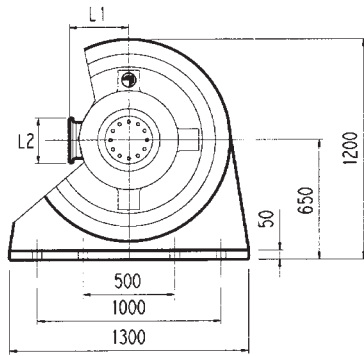
$M_{2max} = 720000 \text{ Nm}$

	L				Kg				Kg				Kg							
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
321 L3	1104	904	904	904	3120	2820	2720	2720	343	80	55	-	-	-	451	80	71	-	-	-
321 L4	1253	1053	1053	1053	3180	2880	2780	2780	315	80	35	313	60	28	375	80	48	363	60	34

321 L4	P180		P200		P225		P250	
	E	P	E	P	E	P	E	P
	195	350	186	400	216	450	216	550



PC

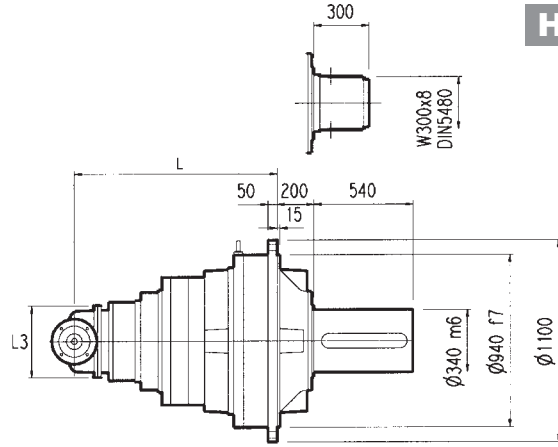
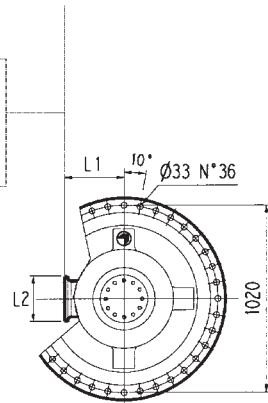


HZ PZ

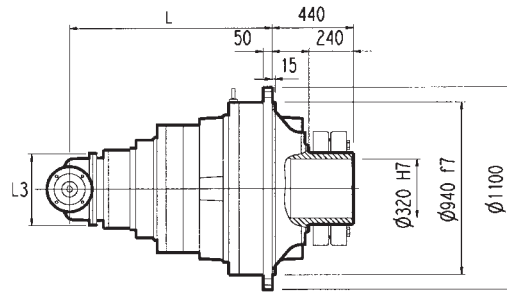
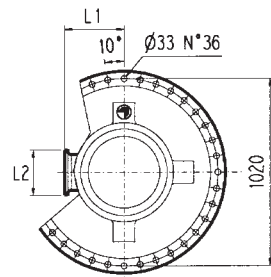
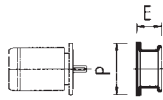
V



FV

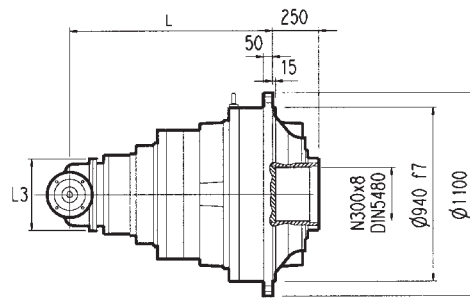
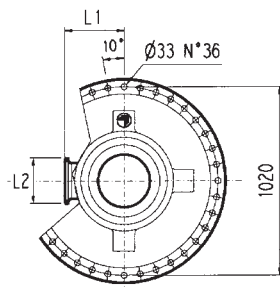


HC



FP

FZ

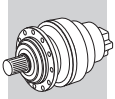


FP

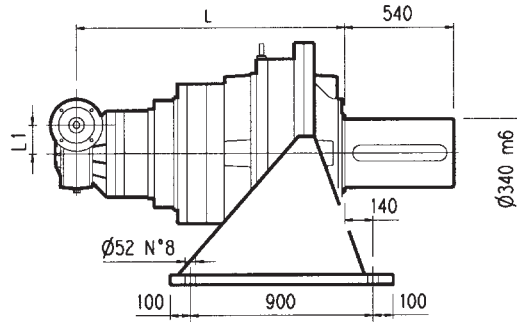
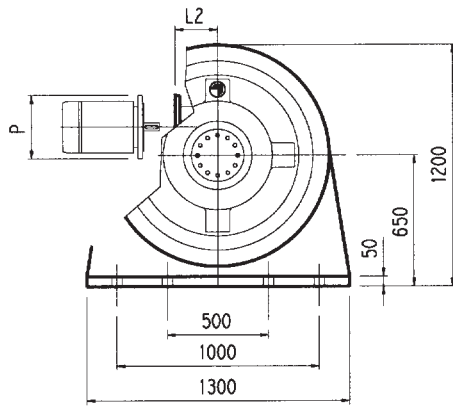
$M_{2max} = 720000 \text{ Nm}$

	L				L1	L2	L3	Kg				Kg				Kg							
	PC-PZ	HC-HZ	FZ	FP				PC-PZ	HC-HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg			
321 R4 (B)	1334	1134	1134	1134	345	292	400	3250	2950	2850	2850	307	60	23	-	-	-	357	60	28	-	-	-
321 R4 (C)	1334	1134	1134	1134	390	292	480	3260	2960	2860	2860	307	60	23	-	-	-	357	60	28	-	-	-

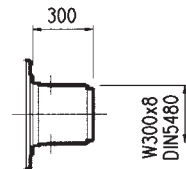
	P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P
321 R4 (B)	-	-	-	-	152	350	182	400	212	450	193	550
321 R4 (C)	-	-	-	-	152	350	182	400	212	450	193	550



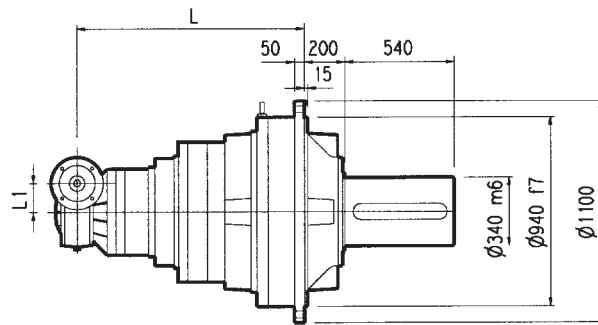
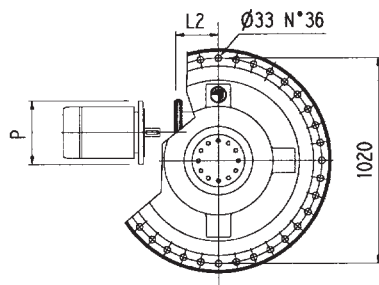
3/V 21 L4



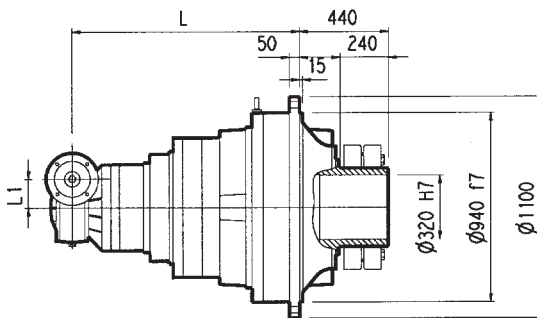
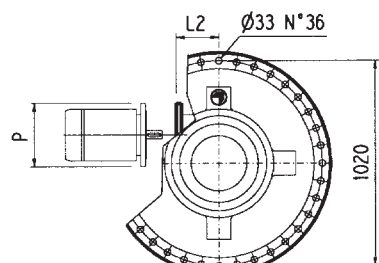
PC



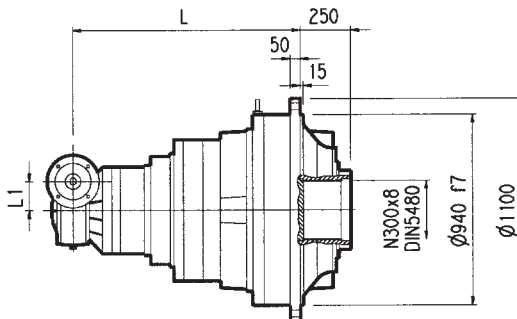
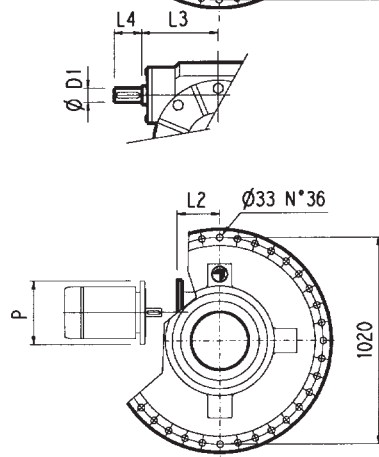
HZ PZ



HC



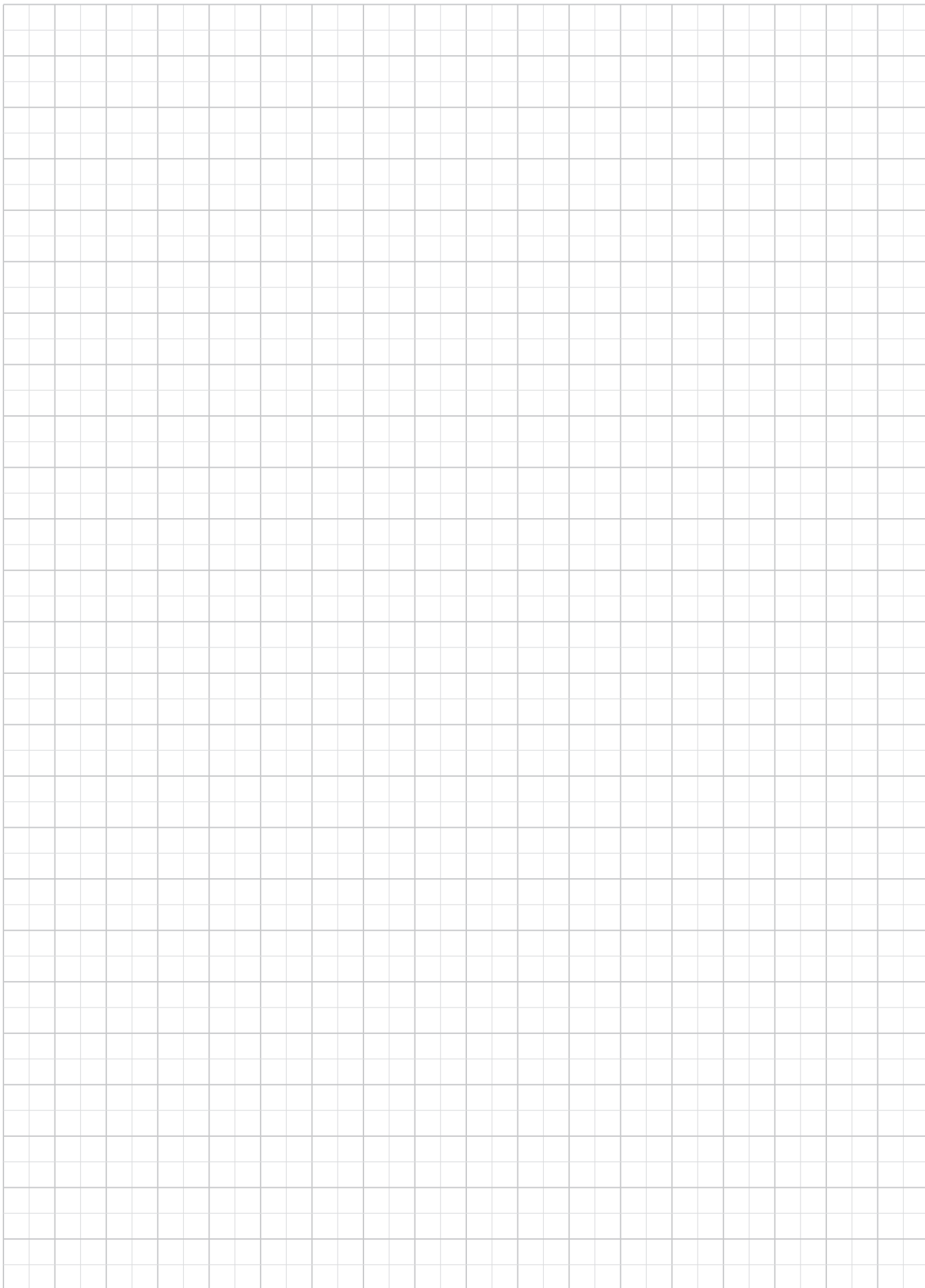
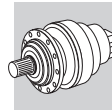
FP

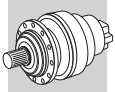
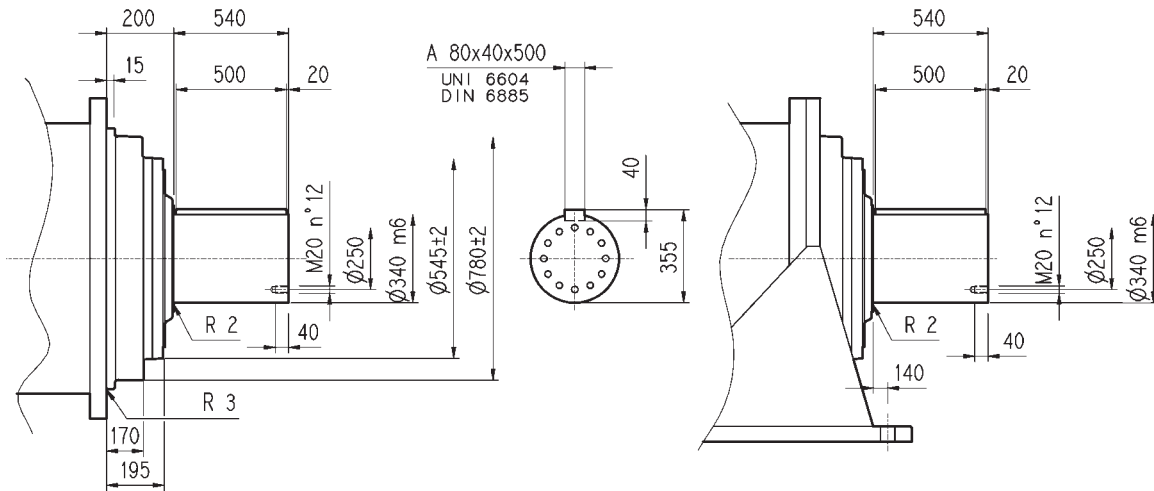
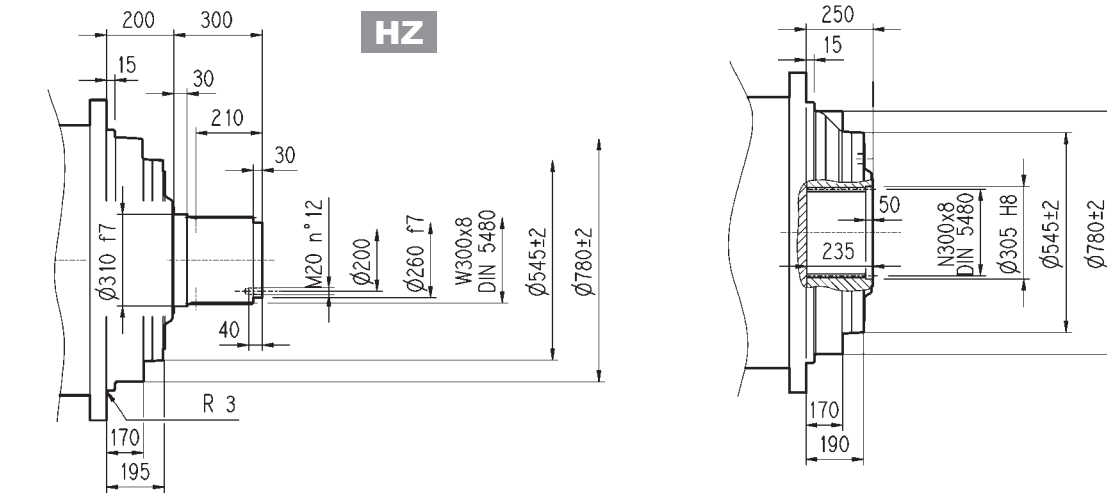
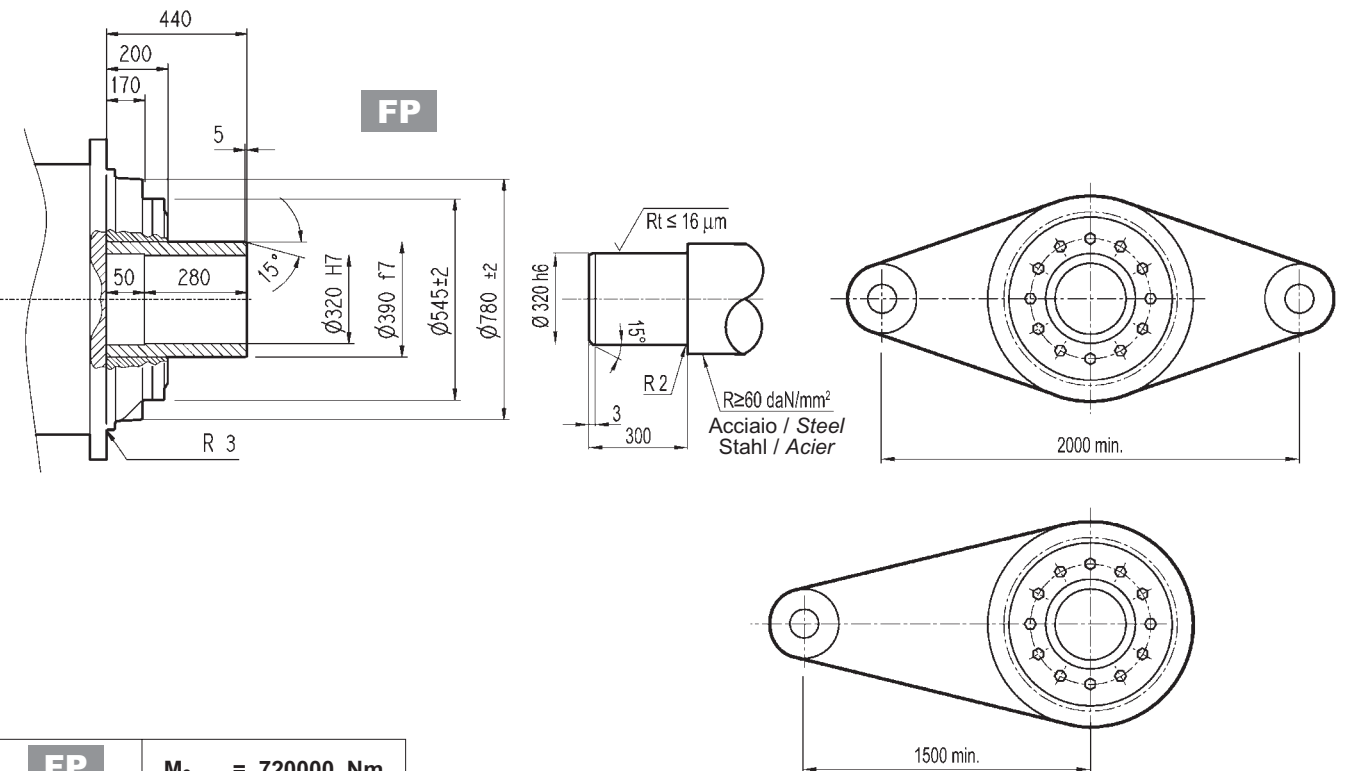


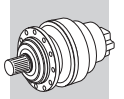
FZ

FP $M_{2max} = 720000 \text{ Nm}$

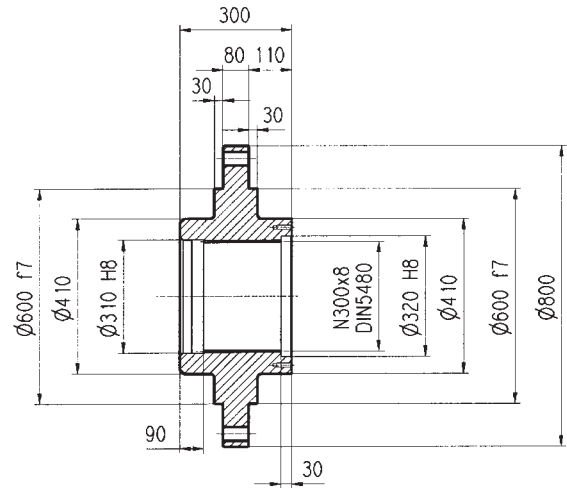
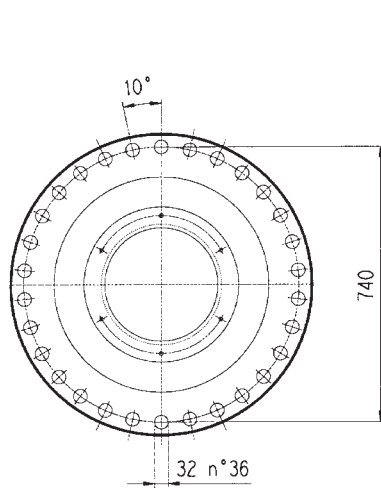
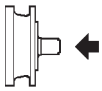
	L				L1	L2	D1	L3	L4	Kg			
	PC - PZ	HC - HZ	FZ	FP						PC - PZ	HC - HZ	FZ	FP
3/V 21 L4	1374	1174	1174	1174	250	-	55	276	110	3430	3130	3030	3030
3/V 21 L4	P132		P160		P180		P200		P225				
	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P	
	531	300	506	350	506	350	531	400	536	450			



**321 L****321 R****3/V 21 L4****HC****PC****HZ****FZ****FP****FP** $M_{2\text{max}} = 720000 \text{ Nm}$

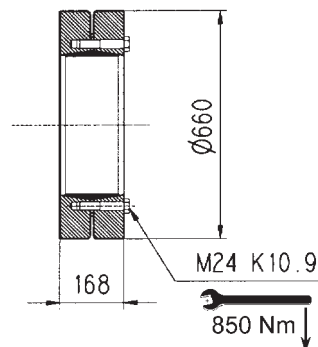
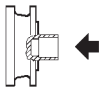
321 L**321 R****3/V 21 L4**

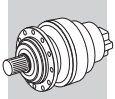
Flangia / Flange
Flansch / Brides

W0A

Materiale : Acciaio C40
Material : Steel C40
Material : Stahl C40
Materia : Acier C40

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

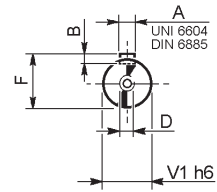
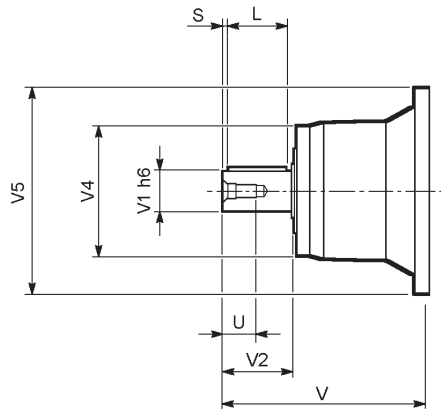
G0A



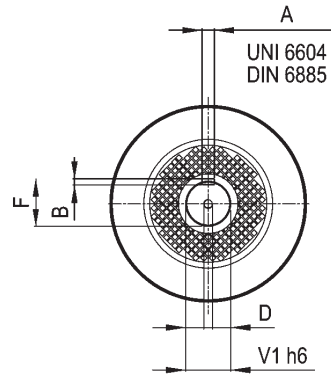
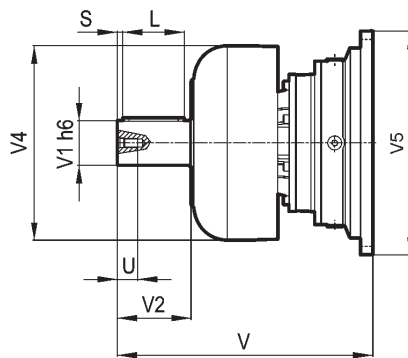
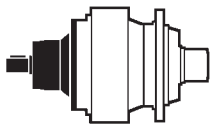
321 L

321 R

V

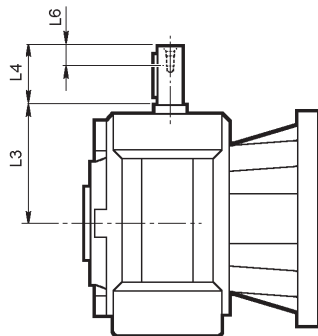
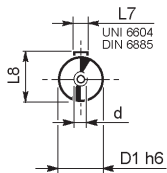


FV

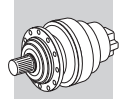


	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
321 L3	V11B	343	80	130	200	445	22	14	85	110	10	M16	36
	FV11B	451	80	130	347.5	445	22	14	85	110	10	M16	36
321 L4	V07B	315	80	130	200	345	22	14	85	110	10	M16	36
	FV07B	375	80	130	347.5	348	22	14	85	110	10	M16	36
	V07A	313	60	105	155	345	18	11	64	90	7.5	M16	36
	FV07A	363	60	105	309	348	18	11	64	90	7.5	M16	36
321 R4 (B) (C)	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36

3/V 21 L4



	D1 h6	L3	L4	L6	L7	L8	d
3/V 21 L4_HS	55	276	110	40	16	59	M16

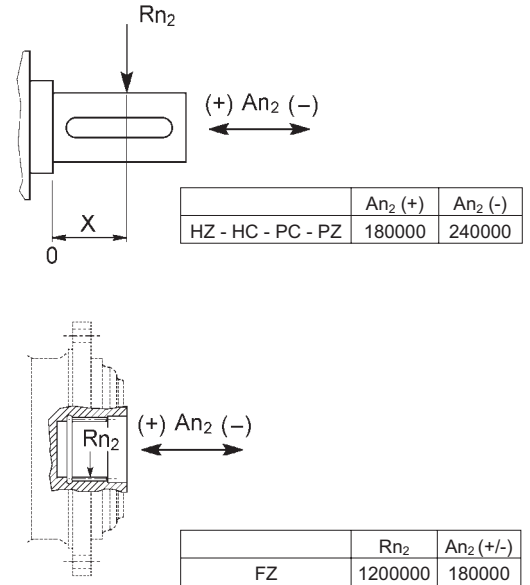
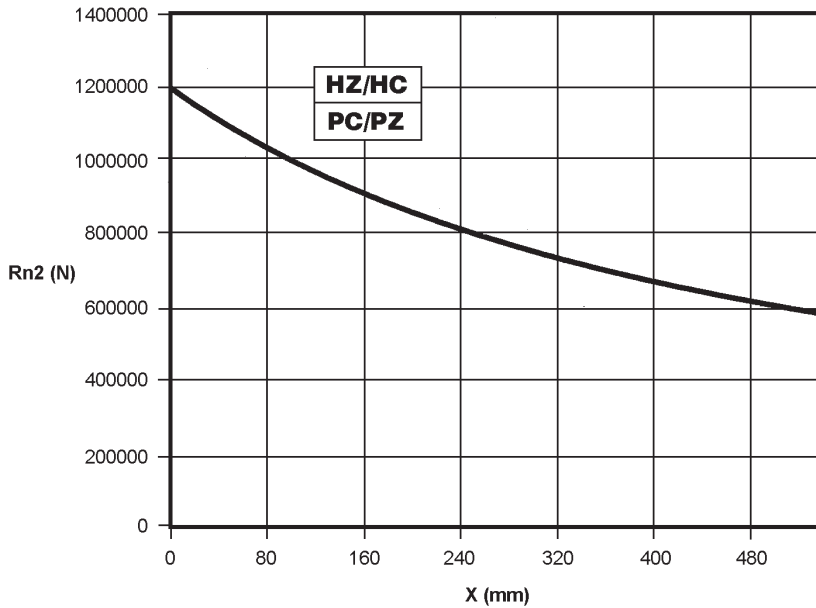


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $Fh_2 : n_2 \cdot h = 10000$

Permissible radial and axial loads on output shaft with $Fh_2 : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $Fh_2 : n_2 \cdot h = 10000$

Charges radiales et axiales admises sur l'arbre lent pour une valeur de $Fh_2 : n_2 \cdot h = 10000$



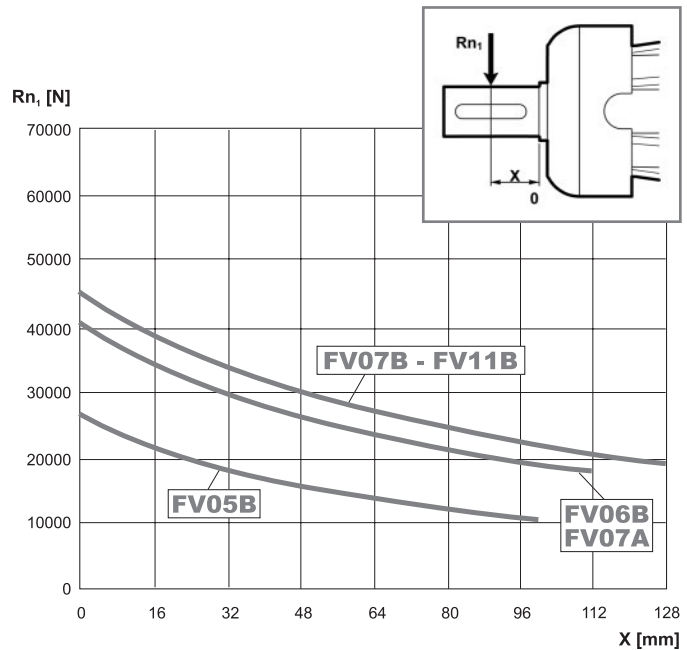
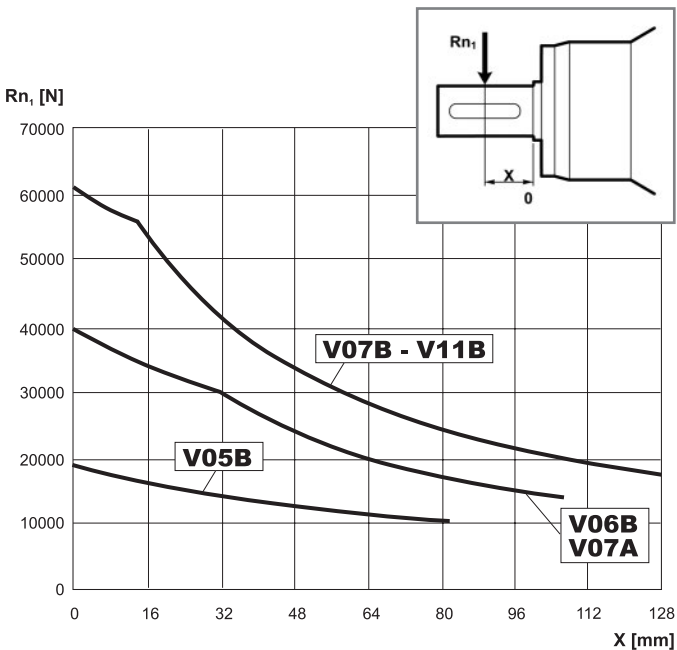
Fattore fh_2 correttivo per carichi sugli alberi Load corrective factor fh_2 on shafts Korrektionsfaktor fh_2 für wellenbelastungen Facteur de correction fh_2 pour charges sur les arbres	$Fh_2 = n_2 \cdot h$		10000	25000	50000	100000	500000	1000000
	fh_2	FZ	1	0.74	0.58	0.46	0.27	0.21
		HZ - HC - PC - PZ	1	0.76	0.61	0.50	0.31	0.25

Carichi radiali ammissibili sull'albero veloce per un valore di $Fh_1 : n_1 \cdot h = 250000$

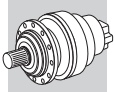
Permissible radial loads on input shaft with $Fh_1 : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $Fh_1 : n_1 \cdot h = 250000$

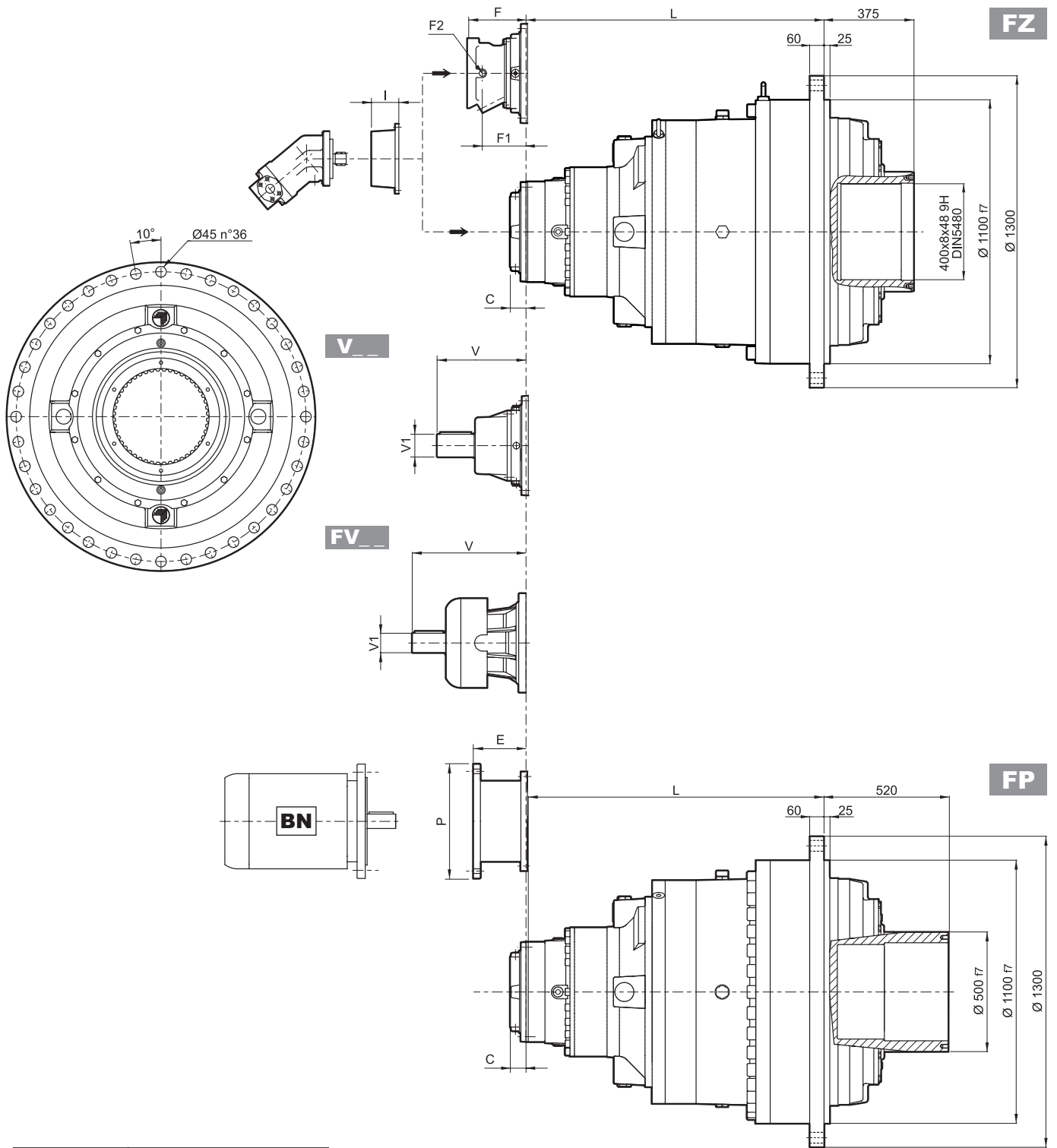
Charges radiales admises sur l'arbre d'entrée pour une valeur de $Fh_1 : n_1 \cdot h = 250000$



Fattore fh_1 correttivo per carichi sugli alberi Load corrective factor fh_1 on shafts Korrektionsfaktor fh_1 für wellenbelastungen Facteur de correction fh_1 pour charges sur les arbres	$Fh_1 = n_1 \cdot h$		250000	500000	1000000	2000000	5000000	10000000
	fh_1		1	0.79	0.63	0.50	0.37	0.29



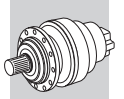
323 L



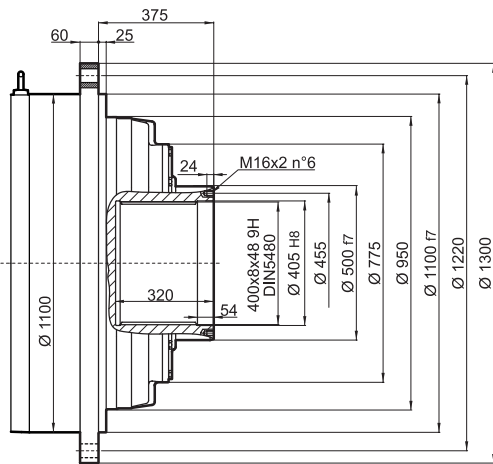
FP $M_{2max} = 158000 \text{ Nm}$

	L		Kg		V		Kg	V		Kg
	FZ	FP	FZ	FP	V	V1		V	V1	
323 L1	Consultare il Servizio Tecnico Bonfiglioli / Please consult Bonfiglioli Technical Service Wenden Sie sich an den Technischen Kundendienst Bonfiglioli / Consulter le service technique Bonfiglioli									
323 L2	666	666	4450	4550	-	-	-	-	-	-
323 L3	1049	1049	4750	4850	556	120	125	-	-	-
323 L4	1261	1261	4900	5000	315	80	35	456	80	85

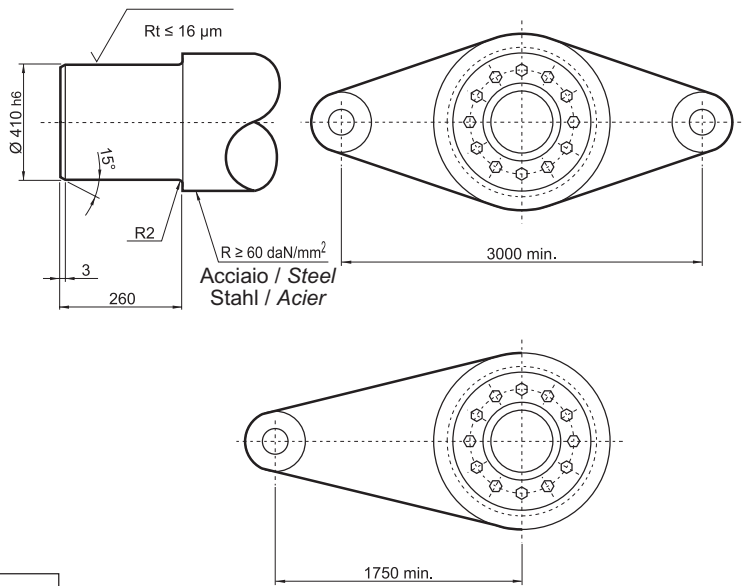
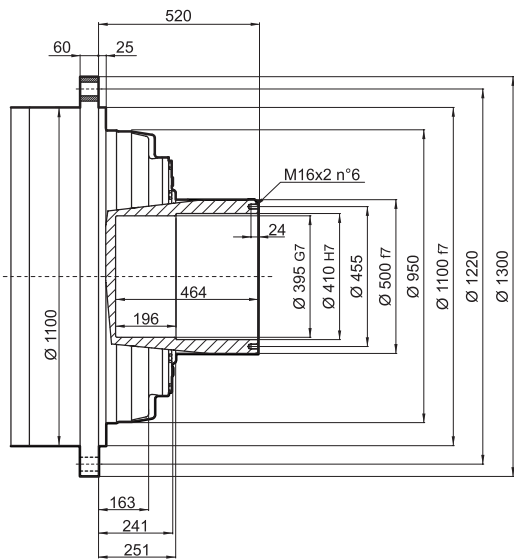
	P180		P200		P225		P250	
	E	P	E	P	E	P	E	P
323 L1	-	-	-	-	-	-	-	-
323 L2	-	-	-	-	-	-	-	-
323 L3	-	-	-	-	-	-	-	-
323 L4	195	350	186	400	216	450	216	550



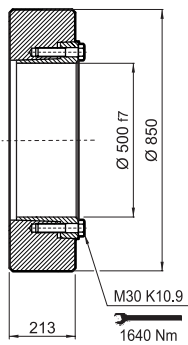
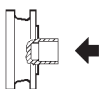
FZ



FP

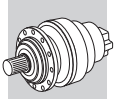


Giunto ad attrito
Shrink disc
Schrumpfscheibe
Frette de serrage



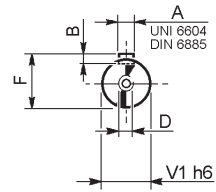
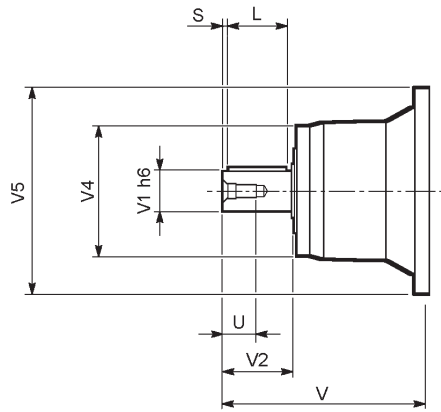
G0A

FP	$M_{2max} = 1580000 \text{ Nm}$
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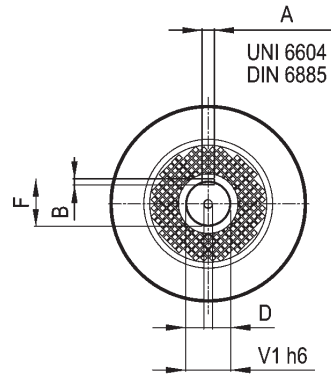
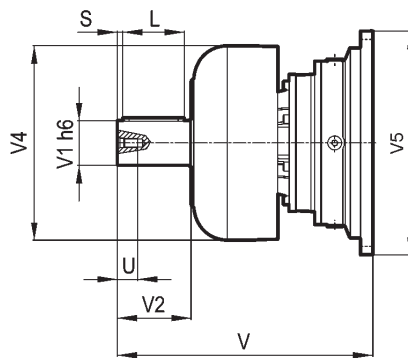
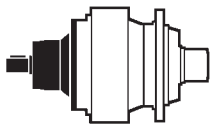


323 L

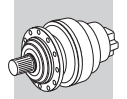
V _ _



FV _ _



	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
323 L3	V15B	556	120	210	310	542	32	18	127	180	15	M24	50
323 L4	V11B	343	80	130	200	445	22	14	85	110	10	M16	36
	FV11B	451	80	130	347.5	445	22	14	85	110	10	M16	36

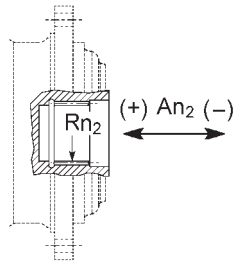


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $F_{h_2} : n_2 \cdot h = 10000$

Permissible radial and axial loads on output shaft with $F_{h_2} : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $F_{h_2} : n_2 \cdot h = 10000$

Charges radiales et axiales admises sur l'arbre lent pour une valeur de $F_{h_2} : n_2 \cdot h = 10000$



	R_{n_2}	$A_{n_2}(+)$	$A_{n_2}(-)$
FZ	1100000	375000	150000

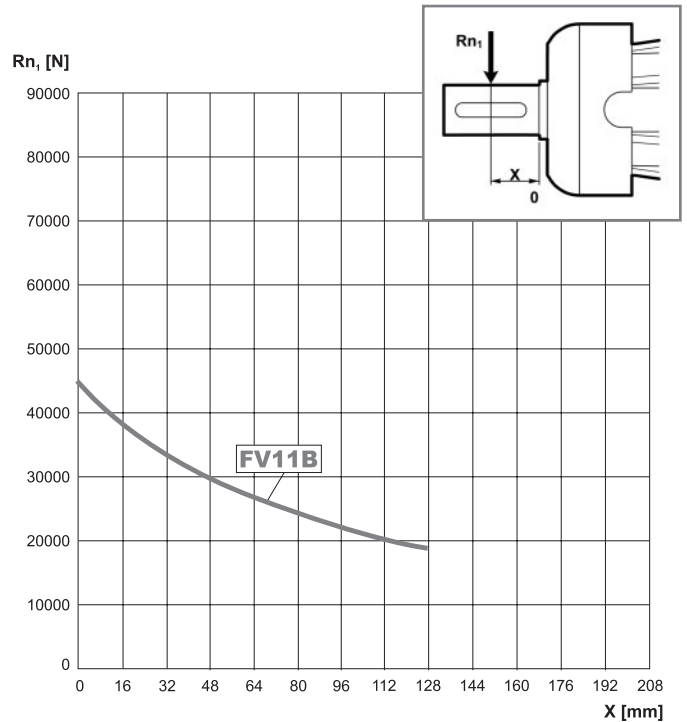
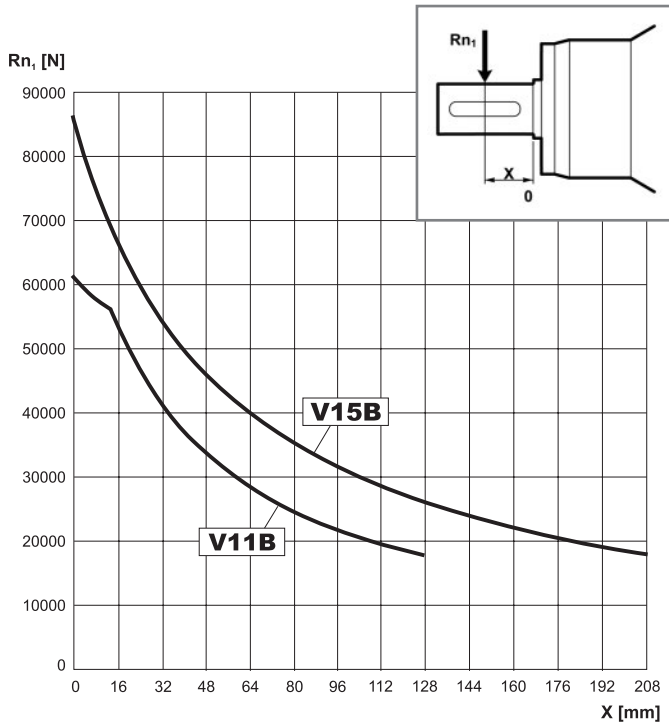
Fattore f_{h_2} correttivo per carichi sugli alberi Load corrective factor f_{h_2} on shafts Korrektionsfaktor f_{h_2} für wellenbelastungen Facteur de correction f_{h_2} pour charges sur les arbres	$F_{h_2} = n_2 \cdot h$		10000	25000	50000	100000	500000	1000000
	f_{h_2}	FZ	1	0.74	0.58	0.46	0.27	0.21

Carichi radiali ammissibili sull'albero veloce per un valore di $F_{h_1} : n_1 \cdot h = 250000$

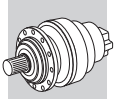
Permissible radial loads on input shaft with $F_{h_1} : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $F_{h_1} : n_1 \cdot h = 250000$

Charges radiales admises sur l'arbre d'entrée pour une valeur de $F_{h_1} : n_1 \cdot h = 250000$

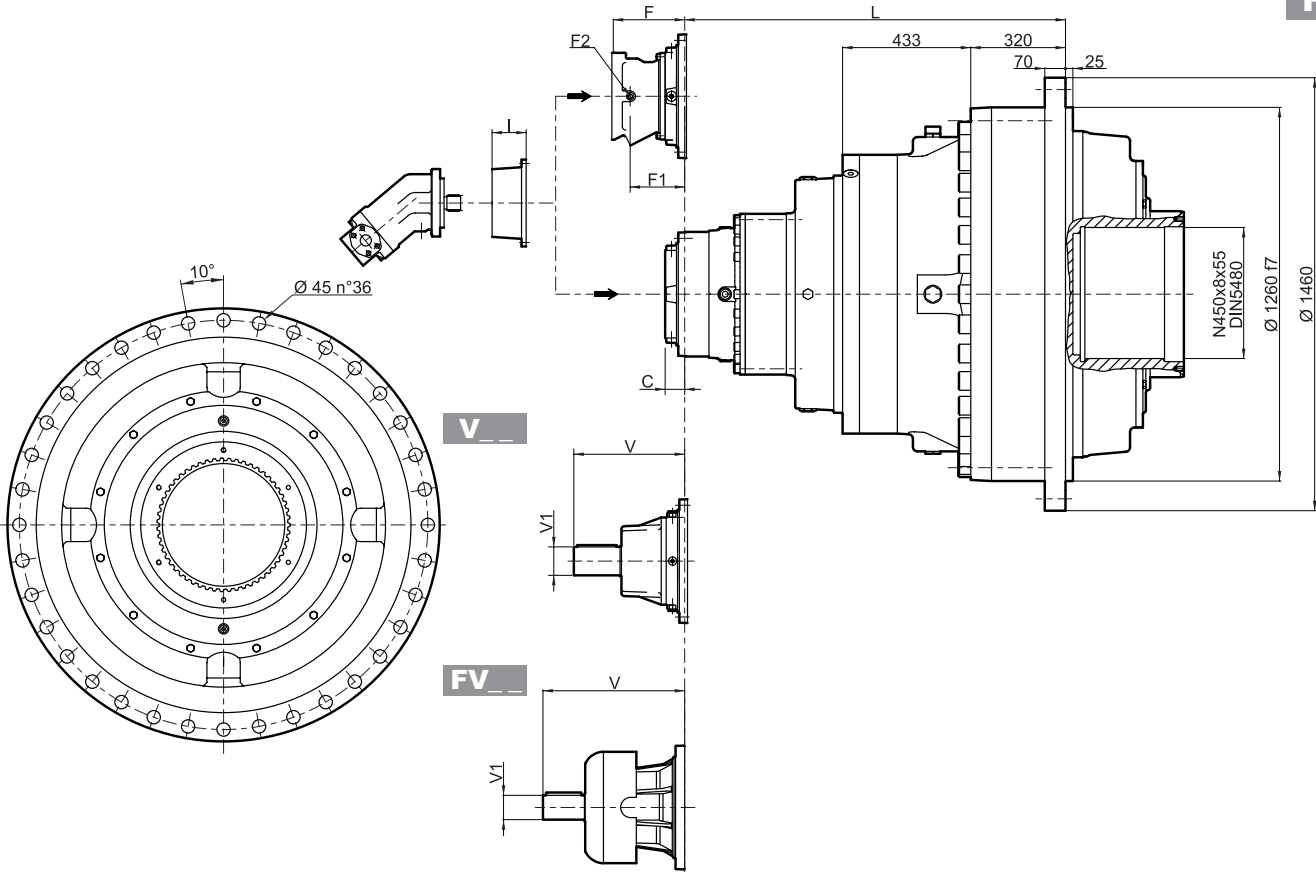


Fattore f_{h_1} correttivo per carichi sugli alberi Load corrective factor f_{h_1} on shafts Korrektionsfaktor f_{h_1} für wellenbelastungen Facteur de correction f_{h_1} pour charges sur les arbres	$F_{h_1} = n_1 \cdot h$		250000	500000	1000000	2000000	5000000	10000000
	f_{h_1}	FZ	1	0.79	0.63	0.50	0.37	0.29

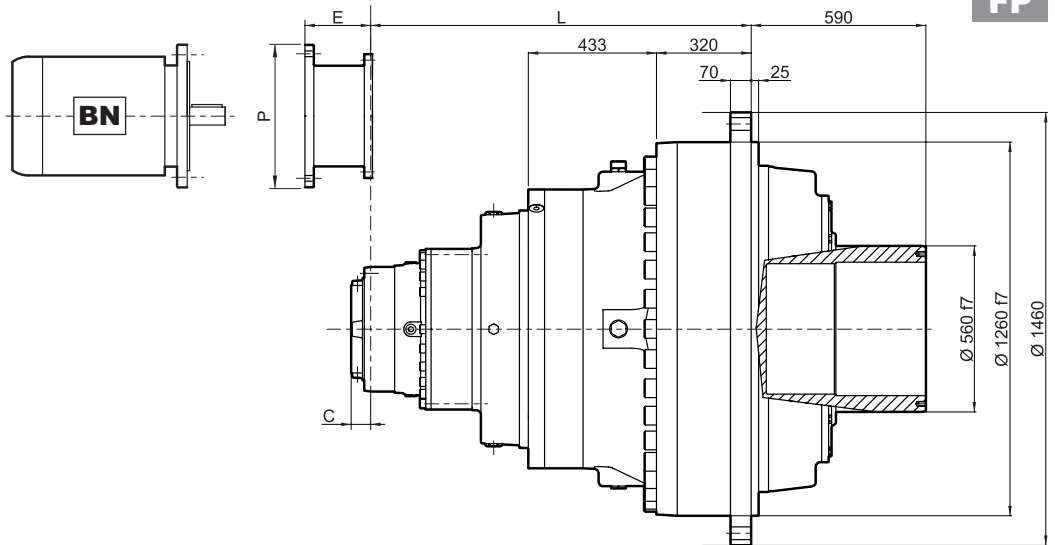


325 L

FZ



FP

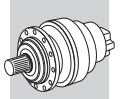


FP

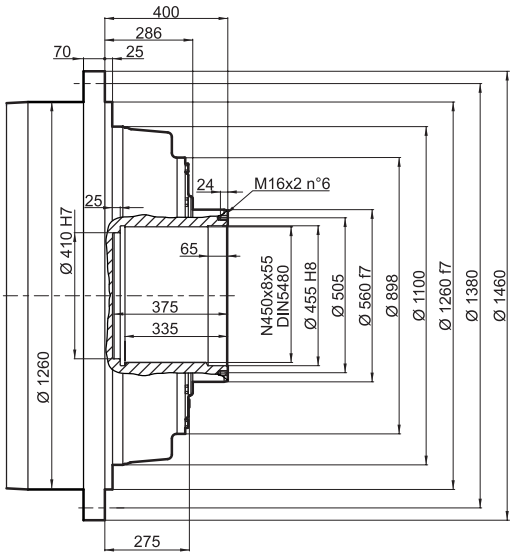
$M_{2max} = 200000 \text{ Nm}$

	L		Kg		V		V1		Kg	
	FZ	FP	FZ	FP	V	V1	Kg	V	V1	Kg
325 L1	Consultare il Servizio Tecnico Bonfiglioli / Please consult Bonfiglioli Technical Service Wenden Sie sich an den Technischen Kundendienst Bonfiglioli / Consulter le service technique Bonfiglioli									
325 L2	698	698	5700	5900	-	-	-	-	-	-
325 L3	1081	1081	6000	6200	556	120	125	-	-	-
325 L4	1293	1293	6150	6350	315	80	35	456	80	85

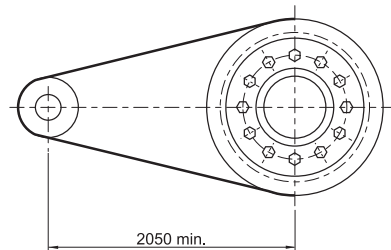
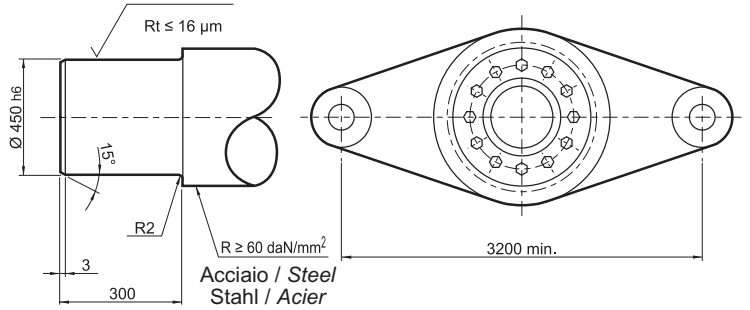
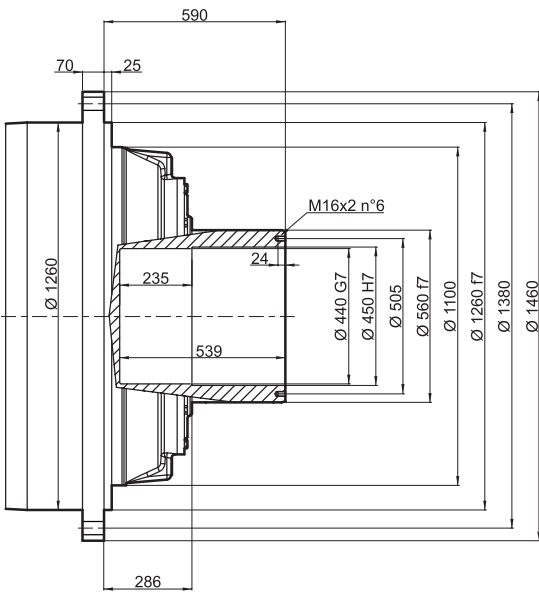
	P180		P200		P225		P250	
	E	P	E	P	E	P	E	P
325 L1	-	-	-	-	-	-	-	-
325 L2	-	-	-	-	-	-	-	-
325 L3	-	-	-	-	-	-	-	-
325 L4	195	350	186	400	216	450	216	550



FZ

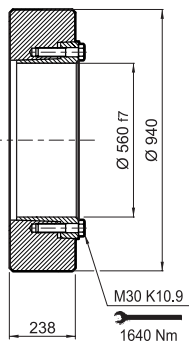


FP



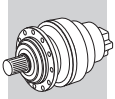
Giunto ad attrito
Shrink disc
Schrumpfscheibe
Frette de serrage

G0A



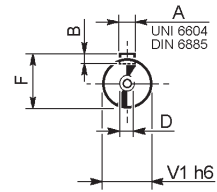
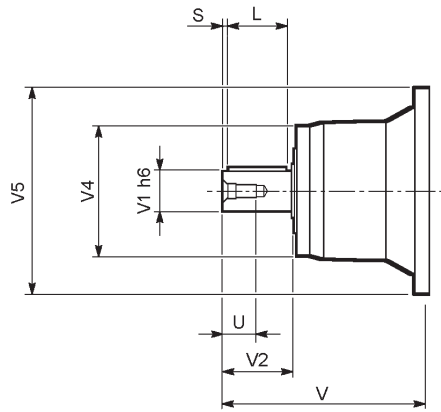
FP

$M_{2max} = 2000000 \text{ Nm}$

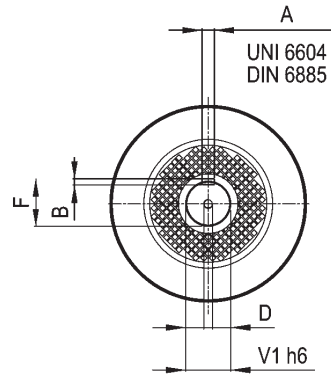
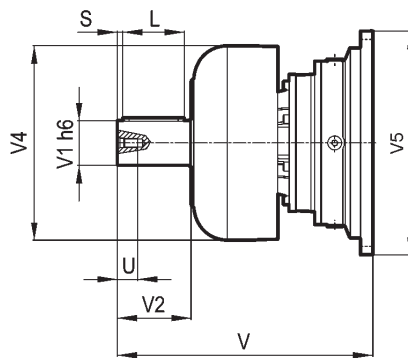
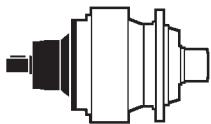


325 L

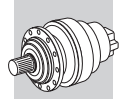
V _ _



FV _ _



	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
325 L3	V15B	556	120	210	310	542	32	18	127	180	15	M24	50
325 L4	V11B	343	80	130	200	445	22	14	85	110	10	M16	36
	FV11B	451	80	130	347.5	445	22	14	85	110	10	M16	36

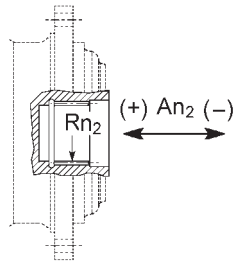


Carichi radiali ed assiali ammissibili sull'albero lento per un valore di $F_{h_2} : n_2 \cdot h = 10000$

Permissible radial and axial loads on output shaft with $F_{h_2} : n_2 \cdot h = 10000$

An der Ausgangswelle zulässige Radiallasten und Axialkräfte für einen Wert von $F_{h_2} : n_2 \cdot h = 10000$

Charges radiales et axiales admises sur l'arbre lent pour une valeur de $F_{h_2} : n_2 \cdot h = 10000$



	R_{n_2}	$A_{n_2}(+)$	$A_{n_2}(-)$
FZ	1100000	375000	150000

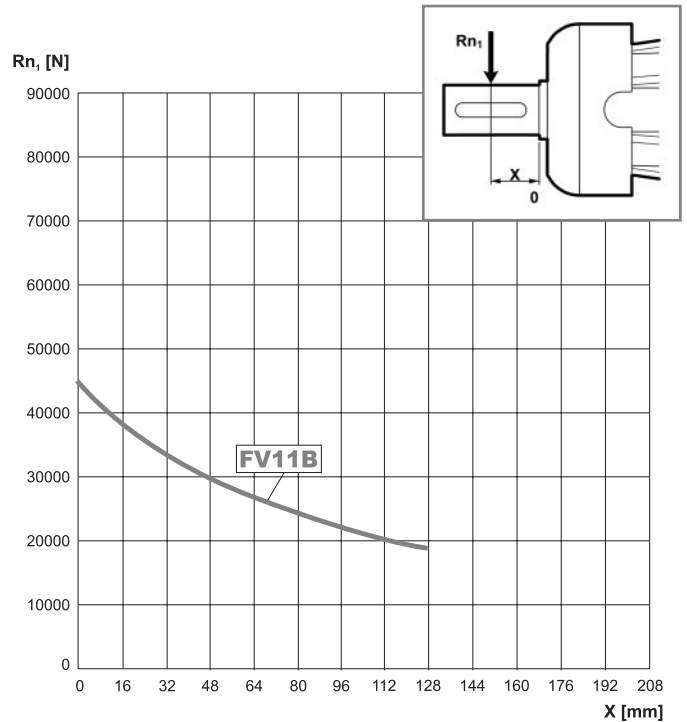
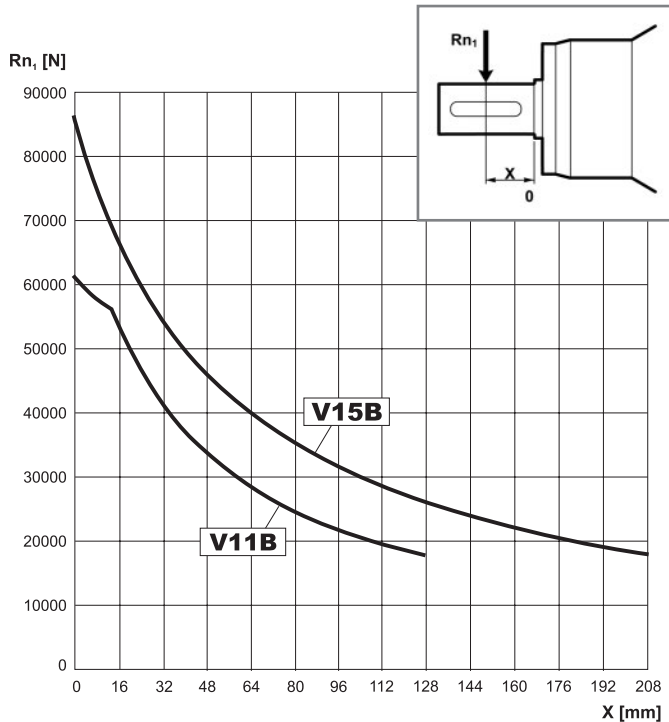
Fattore f_{h_2} correttivo per carichi sugli alberi Load corrective factor f_{h_2} on shafts Korrektionsfaktor f_{h_2} für wellenbelastungen Facteur de correction f_{h_2} pour charges sur les arbres	$F_{h_2} = n_2 \cdot h$		10000	25000	50000	100000	500000	1000000
	f_{h_2}	FZ	1	0.74	0.58	0.46	0.27	0.21

Carichi radiali ammissibili sull'albero veloce per un valore di $F_{h_1} : n_1 \cdot h = 250000$

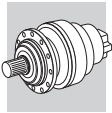
Permissible radial loads on input shaft with $F_{h_1} : n_1 \cdot h = 250000$

An der Antriebswelle zulässige Radiallasten für einen Wert von $F_{h_1} : n_1 \cdot h = 250000$

Charges radiales admises sur l'arbre d'entrée pour une valeur de $F_{h_1} : n_1 \cdot h = 250000$



Fattore f_{h_1} correttivo per carichi sugli alberi Load corrective factor f_{h_1} on shafts Korrektionsfaktor f_{h_1} für wellenbelastungen Facteur de correction f_{h_1} pour charges sur les arbres	$F_{h_1} = n_1 \cdot h$		250000	500000	1000000	2000000	5000000	10000000
	f_{h_1}	FZ	1	0.79	0.63	0.50	0.37	0.29



29.0 - SISTEMI AUSILIARI DI RAFFREDDAMENTO

Qualora la potenza meccanica trasmessa sia superiore a quella termica trasmissibile (vedi tabelle dati tecnici motoriduttori e riduttori), è possibile fornire il riduttore corredato di centralina di raffreddamento.

29.0 - SUPPLEMENTARY COOLING SYSTEMS

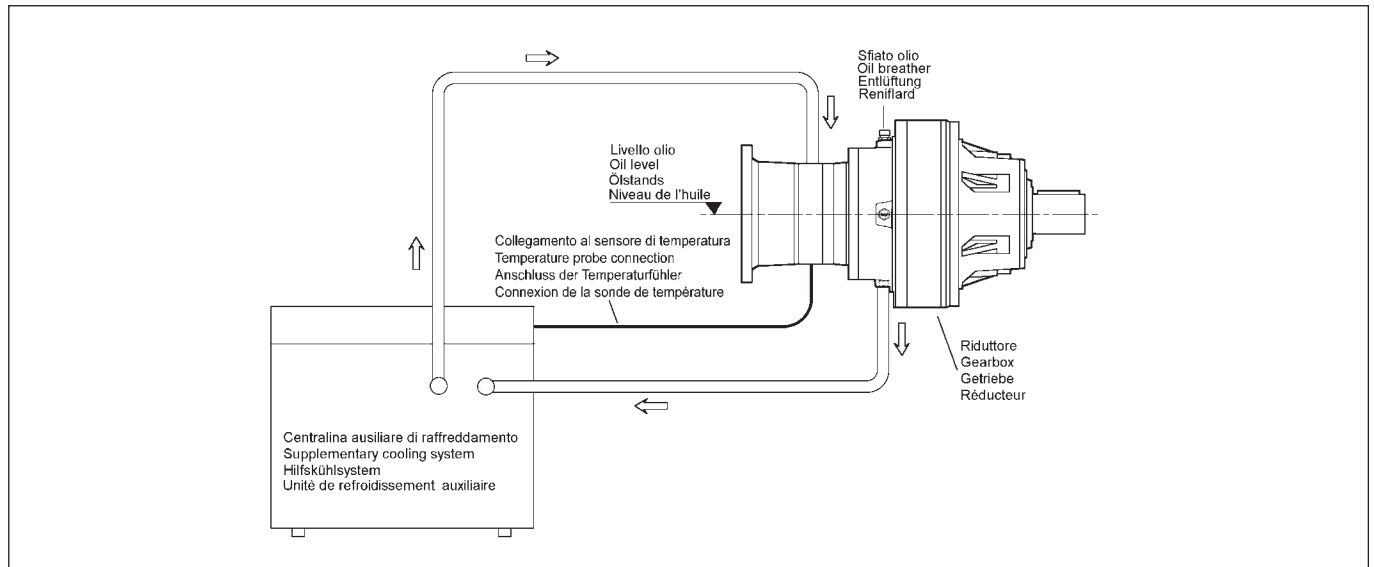
Should the transmitted mechanical power be greater than the thermal capacity the unit is rated for, supplementary cooling systems can be specified.

29.0 - HILFSKÜHLSYSTEME

Sollte die übertragende mechanische Leistung über der übertragbaren Wärmeleistung liegen (siehe Tabelle mit technischen Getriebedaten), ist die Lieferung eines, mit einem Kühlsystem ausgestatteten Getriebe möglich.

29.0 - SYSTEMES AUXILIAIRES DE REFROIDISSEMENT

Au cas où la puissance mécanique transmise serait supérieure à celle thermique transmissible (confronter tableaux données techniques réducteurs), il est possible de d'équiper le réducteur d'une unité de refroidissement.



Le centraline autonome di raffreddamento sono unità composte da uno scambiatore di calore aria-olio, una motopompa, un filtro dell'olio da raffreddare, un elettroventilatore ed un impianto elettrico comprendente la protezione termica dei motori elettrici. Caratteristica delle centraline è il basso livello di rumorosità.

Independent cooling systems are made up of an air-oil heat exchanger, a motor pump, a filter and an electric system that incorporates a thermostatic sensor that protects the electric motor. Cooling units are particularly quiet in operation.

Die autonomen Kühlsysteme sind Einheiten, die sich aus einem Luft-Öl-Wärmeaustauscher, einer Motorpumpe, einem Filter für das zu kühlende Öl, einem Elektroventilator und einer elektrischen Anlage, welche den Wärmeschutz der Elektromotoren enthält, zusammensetzen.

Les unités indépendantes de refroidissement sont des sous-ensembles se composant d'un échangeur de chaleur air/huile, d'une motopompe, d'un filtre pour l'huile à refroidir, d'un électroventilateur et d'un système électrique incluant une protection thermique des moteurs électriques. Cette unité est caractérisée par un bas niveau de nuisance sonore.

29.1 Dati tecnici

29.1 Technical data

29.1 Technische daten

29.1 Donnée techniques

		CR1	CR2	CR3
Potenza assorbita / Absorbed power Leistungsaufn / Puissance absorbée	[kW]	0.55	0.75	1.1
Portata pompa / Oil flow rate Pumpeausflussmenge / Débit de pompe	[l/min]	13	22	34
Portata aria / Air flow rate Luftausflussmenge / Débit d'air	[m³/h]	850	1500	2000
Livello di rumorosità a 1 metro / Noise level at 1m Geräuschpegel / Niveau sonore à 1 mètre	[dB(A)]	68	70	75
Peso / Weight Gewicht / Poids	[Kg]	24	36	58

29.2 Criteri di scelta

Nota la potenza da trasmettere P e verificato che questa sia superiore alla potenza termica Pt, calcolare la potenza da smaltire Ps con la formula:

29.2 Selection criteria

If the mechanical power P is greater than the thermal rating Pt, the heating to be dissipated [Ps] can be calculated through the following equation:

29.2 Auswahlkriterien

Hat man einmal die Date der zu übertragenden Leistung P zur Verfügung stehen und überprüft, ob diese über der Wärmeleistung Pt liegt, muß man die Überleistung Ps unter Anwendung der folgenden Formel berechnen:

29.2 Critères de sélection

La puissance P à transmettre connue, et une fois vérifié que celle-ci est supérieure à la puissance thermique Pt, calculer la puissance à éliminer Ps par la formule :

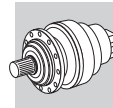
$$P_s = 0.1 \times (P_{r1} - P_t) \quad (28)$$

Selezionare la grandezza della centralina sul diagramma (D01)

Select cooling system size in chart (D01) according to ambi-

Die Größe des Systems auf dem Diagramm (D01) in Anbetracht

Sélectionner la taille de l'unité sur le diagramme (D01), se rap-



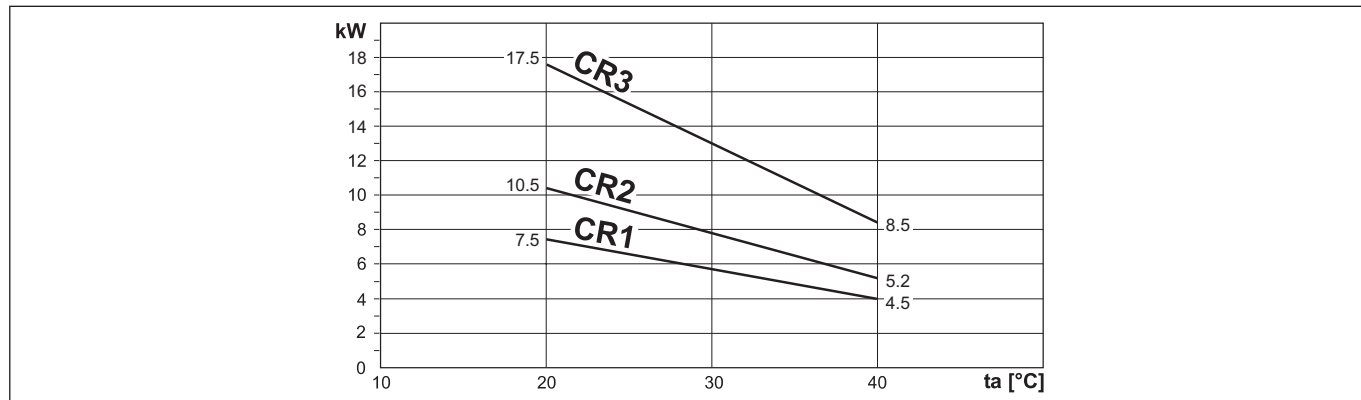
in funzione della temperatura ambiente t_a (20° - 40°C). Verificare che la centralina sia installabile sul riduttore selezionato (vedi tabella D02). In caso contrario, contattare la ns. Organizzazione di vendita.

ent temperature t_a (20° - 40°C). Check that the cooling system you have selected will fit the gearbox (see table D02). If this is not the case, contact our sales organization.

der Umgebungstemperatur t_a (20° - 40°C) auswählen. Überprüfen, ob die Zentrale auch auf dem ausgewählten Getriebe installierbar ist (siehe Tabelle D02). Ist dies nicht der Fall, müssen Sie sich mit unserem Verkaufsnetz in Verbindung setzen.

portant à la température ambiante (20° - 40°C). Veiller à ce que l'unité puisse être installée sur le réducteur sélectionné (voir tableau D02). Vice versa, contacter notre réseau de vente.

(D01)



(D02)

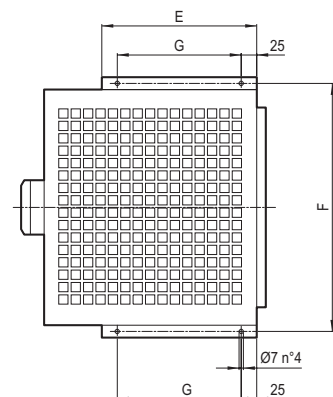
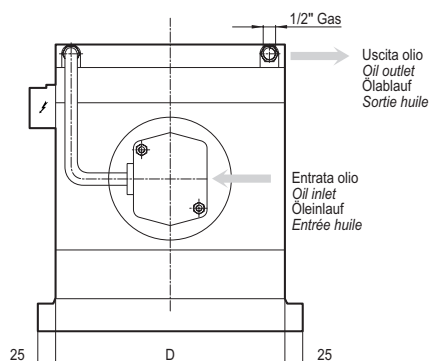
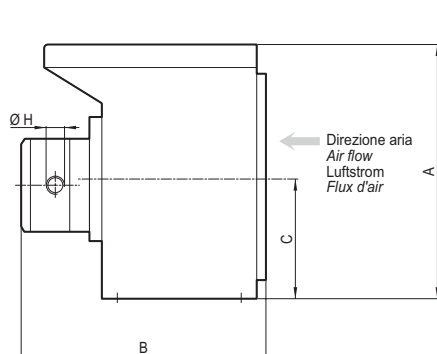
Riduttore / Gearbox / Getriebe / Réducteur	L1	L2	L3	L4	R2	R3	R4
306	CR1	CR1	—	—	—	—	—
307	CR1	CR1	—	—	CR1	—	—
309	CR1	CR1	CR1	—	CR1	—	—
310	CR2	CR1	CR1	—	—	CR1	—
311	CR2	CR1	CR1	—	CR1	CR1	—
313	CR2	CR1	CR1	—	CR1	CR1	—
314	CR3	CR2	CR1	—	—	CR1	—
315	CR3	CR2	CR1	—	—	CR1	—
316	CR3	CR2	CR1	—	—	CR1	—
317	CR3	CR2	CR2	CR1	—	—	—
318	CR3	CR2	CR2	CR1	—	—	—
319	CR3	CR2	CR2	CR1	—	—	—
321	CR3	CR2	CR2	CR2	—	—	—

29.3 Dimensioni

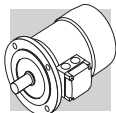
29.3 Dimensions

29.3 Abmessungen

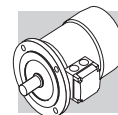
29.3 Dimensions



	A	B	C	D	E	F	G	H
CR1	410	395	193	370	250	400	200	1/2" Gas
CR2	450	405	203	470	250	500	200	3/4" Gas
CR3	495	455	225	520	290	550	240	3/4" Gas


MOTORI ELETTRICI
ELECTRIC MOTORS
ELEKTROMOTOREN
**MOTEURS
ELECTRIQUES**
**M1 - SIMBOLOGIA E
UNITÀ DI MISURA**
**M1 - SYMBOLS AND UNITS
OF MEASUREMENT**
**M1 - SYMBOLE UND
MAßEINHEITEN**
**M1 - SYMBOLES ET UNITES
DE MESURE**

Simb. Symb.	U.m. Einheit	Descrizione	Description	Beschreibung	Description
$\cos\varphi$	–	Fattore di potenza	Power factor	Leistungsfaktor	Facteur de puissance
η	–	Rendimento	Efficiency	Wirkungsgrad	Rendement
f_m	–	Fattore correttivo della potenza	Power adjusting factor	Leistungskorrekturfaktor	Facteur de correction de la puissance
I	–	Rapporto di intermittenza	Cyclic duration factor	Relative Einschaltdauer	Rapport d'intermittence
I_N	[A]	Corrente nominale	Rated current	Nennstrom	Courant nominal
I_S	[A]	Corrente di spunto	Locked rotor current	Kurzschlußstrom	Courant de démarrage
J_C	[Kgm ²]	Momento di inerzia del carico	Load moment of inertia	Massenträgheitsmoment der externen Massen	Moment d'inertie de la charge
J_M	[Kgm ²]	Momento di inerzia motore	Moment of inertia	Trägheitsmoment	Moment d'inertie du moteur
K_C	–	Fattore di coppia	Torque factor	Drehmomentfaktor	Facteur de couple
K_d	–	Fattore di carico	Load factor	Lastfaktor	Facteur de charge
K_J	–	Fattore di inerzia	Inertia factor	Trägheitsfaktor	Facteur d'inertie
M_A	[Nm]	Coppia accelerante media	Mean breakaway torque	Losbrechmoment	Couple d'accélération moyen
M_B	[Nm]	Coppia frenante	Brake torque	Bremsemoment	Couple du frein
M_N	[Nm]	Coppia nominale	Rated torque	Nennmoment	Couple nominal
M_L	[Nm]	Coppia resistente media	Counter-torque during acceleration	Lastmoment	Couple résistant moyen
M_S	[Nm]	Coppia di spunto	Starting torque	Startmoment	Couple de démarrage
n	[min ⁻¹]	Velocità nominale	Rated speed	Nenndrehzahl	Vitesse nominale
P_B	[W]	Potenza assorbita dal freno a 20°C	Power drawn by the brake at 20°C	Leistungsaufnahme der Bremse bei 20°C	Puissance absorbée par le frein à 20°C
P_n	[kW]	Potenza nominale	Motor rated power	Nennleistung	Puissance nominale
P_r	[kW]	Potenza richiesta	Required power	Benötigte Leistung	Puissance nécessaire
t_1	[ms]	Ritardo di sblocco del freno con alimentatore a semionda	Brake response time with one-way rectifier	Ansprechzeit Bremse mit Einweg-Gleichrichter	Temps de déblocage du frein avec alimentation à demi-onde
t_{1s}	[ms]	Tempo di sblocco del freno con alimentatore a controllo elettronico	Brake response time with electronic-controlled rectifier	Ansprechzeit Bremse mit elektronisch gesteuertem Gleichrichter	Temps de déblocage du frein avec alimentation à contrôle électronique
t_2	[ms]	Ritardo di frenatura con disgiunzione lato c.a.	Brake reaction time with a.c. disconnect	Einfallzeit Bremse bei Unterbrechung der Stromversorgung WS	Retard de freinage avec coupure coté c.a.
t_{2c}	[ms]	Ritardo di frenatura con disgiunzione circuito c.a. e c.c.	Brake reaction time with a.c. and d.c. disconnect	Einfallzeit Bremse bei Unterbrechung der Stromversorgung WS und GS	Retard de freinage avec coupure coté c.a. et c.c.
t_a	[°C]	Temperatura ambiente	Ambient temperature	Umgebungstemperatur	Température ambiante
t_f	[min]	Tempo di funzionamento a carico costante	Work time at constant load	Betriebsdauer unter Nennbelastung	Temps de fonctionnement à charge constante
t_r	[min]	Tempo di riposo	Rest time	Aussetzzeit	Temps de repos
W	[J]	Lavoro di frenatura accumulato tra due regolazioni del traferro	Braking work between service interval	Bremsenergie zwischen zwei Einstellungen	Energie de freinage accumulée entre deux réglages de l'entrefer
W_{max}	[J]	Energia massima per singola frenatura	Maximum brake work for each braking	Max. Bremsarbeit pro Bremsvorgang	Energie maxi par freinage
Z	[1/h]	N° di avviamenti ammissibili, a carico	Permissible starting frequency, loaded	Schalhäufigkeit Nennbetrieb	Nombre de démarrages admissibles en charge
Z_0	[1/h]	N° di avviamenti ammissibili a vuoto (I = 50%)	Max. permissible unloaded starting frequency (I = 50%)	Max. Schalhäufigkeit im Leerlauf (relative Einschalt-dauer I = 50%)	Nombre de démarrages admissible à vide (I = 50%)



M2 - CARATTERISTICHE GENERALI

Programma di produzione

I motori elettrici asincroni trifase del programma di produzione della BONFIGLIOLI RIDUTTORI sono previsti nelle forme costruttive base IMB5, IMB14 e loro derivate con le seguenti polarità: 2, 4, 6, 2/4, 2/6, 2/8, 2/12. Nel presente catalogo sono evidenziate inoltre, le caratteristiche tecniche dei motori in versione integrata, tipo M.

M2 - GENERAL CHARACTERISTICS

Production range

The asynchronous three-phase electric motors of BONFIGLIOLI RIDUTTORI's production, are available in basic designs IMB5 and IMB14 and derived versions, with the following polarities: 2, 4, 6, 2/4, 2/6, 2/8, 2/12. The technical characteristics of compact motors, M type, are also supplied in this manual.

M2 - ALLGEMEINE EIGENSCHAFTEN

Produktprogramm

Die Dreiphasen-Asynchronmotoren aus dem Produktprogramm von BONFIGLIOLI RIDUTTORI gibt es in den Grundbauformen IMB5, IMB14 und deren Ableitungen mit folgenden Polzahlen: 2, 4, 6, 2/4, 2/6, 2/8 und 2/12. Im vorliegenden Katalog sind außerdem die technischen Eigenschaften der Motoren in Kompaktausführung hervorgehoben.

M2 - CARACTERISTIQUES GENERALES

Programme de production

Les moteurs électriques asynchrones triphasés du programme de production de BONFIGLIOLI RIDUTTORI sont prévus dans les formes de construction de base IMB5, IMB14 et leur dérivés avec les polarités suivantes: 2, 4, 6, 2/4, 2/6, 2/8, 2/12. Dans le présent catalogue sont également mises en évidence les caractéristiques techniques des moteurs en version compacte, type M.

Normative

I motori descritti in questo catalogo sono costruiti in accordo alle Norme ed unificazioni applicabili evidenziate nella tabella seguente.

Standards

The motors described in this catalogue are manufactured to the applicable standards shown in the following table.

Normen

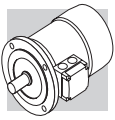
Die in diesem Katalog beschriebenen Motoren sind in Übereinstimmung mit den in der folgenden Tabelle angegebenen einschlägigen Normen und Vereinheitlichungsrichtlinien konstruiert worden.

Réglementations

Les moteurs décrits dans ce catalogue sont construits en accord avec les Normes et standardisations applicables mises en évidence dans le tableau ci-dessous.

(A26)

Titolo / Title / Titel / Titre	CEI	IEC
Prescrizioni generali per macchine elettriche rotanti <i>General requirements for rotating electrical machines</i> Allgemeine Vorschriften für umlaufende elektrische Maschinen <i>Prescriptions générales pour machines électriques tournantes</i>	CEI EN 60034-1	IEC 60034-1
Marcatura dei terminali e senso di rotazione per macchine elettriche rotanti <i>Terminal markings and direction of rotation of rotating machines</i> Kennzeichnung der Anschlußklemmen und Drehrichtung von umlaufenden elektrischen Maschinen <i>Définitions des bornes et sens de rotation pour machines électriques tournantes</i>	CEI 2-8	IEC 60034-8
Metodi di raffreddamento delle macchine elettriche <i>Methods of cooling for electrical machines</i> Verfahren zur Kühlung von elektrischen Maschinen <i>Méthodes de refroidissement des machines électriques</i>	CEI EN 60034-6	IEC 60034-6
Dimensioni e potenze nominali per macchine elettriche rotanti <i>Dimensions and output ratings for rotating electrical machines</i> Auslegung der Nennleistung von umlaufenden elektrischen Maschinen <i>Dimensions, puissances nominales pour machines électriques tournantes</i>	EN 50347	IEC 60072
Classificazione dei gradi di protezione delle macchine elettriche rotanti <i>Classification of degree of protection provided by enclosures for rotating machines</i> Klassifizierung der Schutzart von umlaufenden elektrischen Maschinen <i>Classification des degrés de protection des machines électriques tournantes</i>	CEI EN 60034-5	IEC 60034-5
Limiti di rumorosità <i>Noise limits</i> Geräuschgrenzwerte <i>Limites de bruit</i>	CEI EN 60034-9	IEC 60034-9
Segle di designazione delle forme costruttive e dei tipi di installazione <i>Classification of type of construction and mounting arrangements</i> Abkürzungen zur Kennzeichnung der Bauform und der Einbaulagen <i>Sigles de dénomination des formes de construction et des types d'installation</i>	CEI EN 60034-7	IEC 60034-7
Tensione nominale per i sistemi di distribuzione pubblica dell'energia elettrica a bassa tensione <i>Rated voltage for low voltage mains power</i> Nennspannung für öffentliche NS-Stromverteilungssysteme <i>Tension nominale pour les systèmes de distribution publique de l'énergie électrique en basse tension</i>	CEI 8-6	IEC 60038
Grado di vibrazione delle macchine elettriche <i>Vibration level of electric machines</i> Schwingstärke bei elektrischen Maschinen <i>Degré de vibration des machines électriques</i>	CEI EN 60034-14	IEC 60034-14



I motori corrispondono inoltre alle Norme straniere adeguate alle IEC 60034-1 e qui riportate.

The motors also comply with foreign standards adapted to IEC 60034-1 as shown here below.

Die Motoren entsprechen außerdem den an die IEC-Norm 60034-1 angepaßten ausländischen Normen, die in der folgenden Tabelle genannt werden.

En outre, les moteurs correspondent aux Normes étrangères adaptées aux IEC 60034-1 indiquées dans le tableau ci-dessous.

(A27)

DIN VDE 0530	Germania	Germany	Deutschland	Allemagne
BS5000 / BS4999	Gran Bretagna	Great Britain	Großbritannien	Grande Bretagne
AS 1359	Australia	Australia	Australien	Australie
NBNC 51 - 101	Belgio	Belgium	Belgien	Belgique
NEK - IEC 34	Norvegia	Norway	Norwegen	Norvège
NF C 51	Francia	France	Frankreich	France
OEVE M 10	Austria	Austria	Österreich	Autriche
SEV 3009	Svizzera	Switzerland	Schweiz	Suisse
NEN 3173	Paesi Bassi	Netherlands	Niederlande	Pays Bas
SS 426 01 01	Svezia	Sweden	Schweden	Suède

CUS

MOTORI PER USA E CANADA

MOTORS FOR USA AND CANADA

MOTOREN FÜR DIE USA UND KANADA

MOTEURS POUR ETATS-UNIS ET CANADA

I motori BN ed M sono disponibili in esecuzione NEMA Design C (per le caratteristiche elettriche), certificata in conformità alle norme CSA (Canadian Standard) C22.2 N° 100 e UL (Underwriters Laboratory) UL 1004 con targhetta riportante entrambi i marchi sotto illustrati, specificare in questo caso l'opzione CUS.

BN and M motors are available in NEMA Design C configuration (concerning electrical characteristics), certified to CSA (Canadian standard) C22.2 No. 100 and UL (Underwriters Laboratory) UL 1004. By specifying the option CUS the name plate is marked with both symbols shown here below.

Die BN/M-Motoren sind in der Ausführung NEMA, Design C (aufgrund der elektrischen Eigenschaften), den Normen CSA (Canadian Standard) C22.2 Nr 100 und UL (Underwriters Laboratory) UL 1004 gemäß zertifiziert. Durch Spezifizieren der Option CUS wird das Typenschild mit den nachstehend aufgeführten Symbolen gekennzeichnet.

Les moteurs BN et M sont disponibles en exécution NEMA Design C (pour les caractéristiques électriques), certifiée conforme aux normes CSA (Canadian Standard) C22.2 N°100 et UL (Underwriters Laboratory) UL 1004 avec une plaque signalétique indiquant chacun des symboles ci-dessous, dans ce cas, spécifier l'option CUS.



Le tensioni delle reti di distribuzione americane e le corrispondenti tensioni nominali da specificare per il motore sono indicate nella tabella seguente:

US power mains voltages and the corresponding rated voltages to be specified for the motor are indicated in the following table:

Die Spannungen der amerikanischen Verteilernetze und die entsprechenden tens-Nennspannungen, die bei den Motoren angegeben werden müssen, können der folgenden Tabelle entnommen werden:

Les tensions des réseaux de distribution américains ainsi que les tensions nominales à spécifier pour le moteur sont indiquées dans le tableau suivant :

(A28)

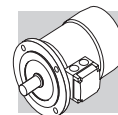
Frequenza / Frequency Frequenz / Fréquence	Tensione di rete / Mains voltage Netzspannung / Tension de réseau	V _{mot}
60 Hz	208 V	200 V
	240 V	230 V
	480 V	460 V
	600 V	575 V

I motori dotati di collegamento YY/Y (es. 230/460-60; 220/440-60) presentano di serie una morsettiera a 9 terminali.

Motors with YY/Y connection (e.g. 230/460-60; 220/440-60) feature, as standard, a 9-stud terminal board. For same exe-

Motoren mit YY/Y-Anschluss (z.B. 230/460-60; 220/440-60) sind standardmäßig mit 9 Pins auf dem Klemmbrett ausgeführt. Für glei-

Les moteurs avec connexion YY/Y (ex. 230/460-60; 220/440-60) présentent, en standard, une plaque à borne avec 9 bornes. Pour les me-



Per le stesse esecuzioni, e inoltre per l'alimentazione 575V-60Hz, la potenza di targa corrisponde a quella normalizzata a 50Hz.

Per i motori autofrenanti con freno in c.c. tipo BN_FD l'alimentazione del raddrizzatore è da morsetteria motore con tensione 230V a.c. monofase.

Per i motori autofrenanti l'alimentazione del freno è così predisposta:

cutions, as well as for 575V-60Hz supply, the nominal rating is coincident with the correspondent 50Hz rating.

For DC brake motors type BN_FD, the rectifier is connected to a single-phase 230 VAC supply voltage in the motor terminal box.

Brake power supply for brake motors is as follows:

che Ausführungen, ebenso wie für 575V-60Hz, die Nennleistung ist gleich mit der entsprechenden 50 Hz-Leistung. Für Bremsmotoren mit Gleichstrombremse vom Typ BN_FD erfolgt die Versorgung des Gleichrichters über den Motor-klemmenkasten mit einer Spannung von 230V (einphasiger Wechselstrom). Bei Bremsmotoren stellt sich die **Versorgung der Bremse** wie folgt dar:

mes executions, et aussi pour l'alimentation 575V-60Hz, la puissance de plaque correspond à celle normalisé à 50Hz.

Pour les moteurs frein avec frein en c.c. type BN_FD, l'alimentation du redresseur provient de la boîte à bornes moteur avec une tension 230V c.a. monophasée. Pour les moteurs frein l'alimentation du frein est la suivante :

BN_FD M_FD	BN_FA ; BN_BA M_FA	Specificare / Specify Bitte angeben / Spécifier
Da morsetteria motore 1~230V c.a. Wired to terminal box 1~230V a.c.	Alimentazione separata / Separate power supply Fremdversorgung / Alimentation séparée 230V Δ - 60Hz	230SA
Vom Motorklemmenkasten 1~230V W.S. Depuis boîte à bornes moteur 1~230V c.a.	Alimentazione separata / Separate power supply Fremdversorgung / Alimentation séparée 460V Y - 60Hz	460SA

L'opzione CUS non è applicabile ai motori dotati di servoventilazione.

The option CUS does not apply to servo-ventilated motors.

Die CUS-Option ist für die Fremdlüftermotoren nicht anwendbar.

L'option CUS n'est pas applicable aux moteurs doués de ventilation forcée.

CCC

CHINA COMPULSORY CERTIFICATION

I motori elettrici destinati ad essere commercializzati nella Repubblica Popolare Cinese rientrano nell'applicabilità del sistema di certificazione CCC (China Compulsory Certification). I motori BN con coppia nominale fino a 7Nm sono disponibili con certificazione CCC e targhetta speciale riportante il marchio sotto illustrato:

CHINA COMPULSORY CERTIFICATION

Electric motors destined for sale in the People's Republic of China have to be certified under the CCC (China Compulsory Certification) system. BN motors of up to 7 Nm in rated torque are available with CCC certification and a special nameplate bearing the mark shown below:

CHINA COMPULSORY CERTIFICATION

Die für den Vertrieb in der Volksrepublik China vorgesehenen Elektromotoren fallen unter den Geltungsbereich des Zertifizierungssystems CCC (China Compulsory Certification). Die Motoren der Serie BN mit Nenndrehmoment bis 7 Nm sind mit CCC-Zertifizierung und Sondertypenschild mit der unten dargestellten Marke erhältlich:

CHINA COMPULSORY CERTIFICATION

Les moteurs électriques destinés à être commercialisés dans la République Populaire de Chine rentrent dans le cadre du système de certification CCC (China Compulsory Certification). Les moteurs BN ayant un couple nominal pouvant atteindre 7 Nm sont disponibles avec une certification CCC et une plaque spéciale sur laquelle figure la marque illustrée ci-dessous :



Direttive 2006/95/CE (LVD) e 2004/108/CE (EMC)

I motori delle serie BN ed M sono conformi ai requisiti delle Direttive 2006/95/CE (Direttiva Bassa Tensione) e 2004/108/CE (Direttiva Compatibilità Elettromagnetica), e riportano in targa la marcatura CE.

Per quanto riguarda la Direttiva EMC, la costruzione è in accordo alle Norme CEI EN 60034-1, EN 61000-6-2, EN 61000-6-4.

I motori con freno in c.c. tipo FD, se corredati dell'opportuno filtro capacitivo in ingresso al raddrizzatore (opzione CF), rientrano nei limiti di emissione previsti dalla Norma EN 61000-6-3 "Compa-

Directives 2006/95/EC (LVD) and 2004/108/EC (EMC)

BN and M motors meet the requirements of Directives 2006/95/EC (Low Voltage Directive) and 2004/108/EC (Electromagnetic Compatibility Directive) and their name plates bear the CE mark.

As for the EMC Directive, construction is in accordance with standards CEI EN 60034-1, EN 61000-6-2, EN 61000-6-4.

Motors with FD brakes, when fitted with the suitable capacitive filter at rectifier input (option CF), meet the emission limits required by Standard EN 61000-6-3 "Elec-tromagnetic compatibility - Ge-neric Emission Standard - Part 1:

Richtlinien 2006/95/EG (LVD) und 2004/108/EG (EMC)

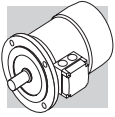
Die Motoren der Serie BN und M entsprechen den Anforderungen der Richtlinien 2006/95/EG (Richtlinie - Niederspannung) und 2004/108/EG (Richtlinie - elektromagnetische Kompatibilität) und sind mit dem CE-Zeichen ausgestattet. Im Hinblick auf die Richtlinie EMC entspricht die Konstruktion den Normen CEI EN 60034-1, EN 61000-6-2, EN 61000-6-4.

Die Motoren mit dem Bremstyp FD fallen, falls mit dem entsprechenden kapazitiven Filter am Eingang des Gleichrichters ausgestattet (Option CF), unter die Emissionsgrenzwerte, die von der

Directives 2006/95/CE (LVD) et 2004/108/CE (EMC)

Les moteurs de la série BN et M sont conformes aux conditions requises par les Directives 2006/95/CE (Directive Basse Tension) et 2004/108/CE (Directive Compatibilité Electromagnétique), et le marquage CE est indiqué sur la plaquette signalétique. En ce qui concerne la Directive EMC, la fabrication répond aux Normes CEI EN 60034-1, EN 61000-6-2, EN 61000-6-4.

Les moteurs avec frein FD, s'ils sont équipés du frein capacitif approprié en entrée du redresseur (option CF), rentrent dans les limites d'émission prévues par la



bilità elettromagnetica - Norma Generica sull'emissione - Parte 1: Ambienti residenziali, commerciali e dell'industria leggera". I motori soddisfano inoltre le prescrizioni della Norma CEI EN 60204-1 "Equipaggiamento elettrico delle macchine". È responsabilità del costruttore o dell'assemblatore dell'apparecchiatura che incorpora i motori come componenti garantire la sicurezza e la conformità alle direttive del prodotto finale.

Residential, commercial and light industrial environment". Motors also meet the requirements of standard CEI EN 60204-1 "Electrical equipment of machines". The responsibility for final product safety and compliance with applicable directives rests with the manufacturer or the assembler who incorporate the motors as component parts.

Norm EN 61000-6-3 "Elektromagnetische Kompatibilität - Allgemeine Norm für Emissionen - Teil 1: Wohngebiete, Handels- und Leichtinduszriezonen" vorgesehen werden. Die Motoren entsprechen darüber hinaus den von der Norm CEI EN 60204-1 "Elektrische Maschinenausstattung" gegebenen Vorschriften. Es liegt in der Verantwortung des Herstellers oder es Monteurs der Ausrüstung, in der die Motoren als Komponenten montiert werden, die Sicherheit und die Übereinstimmung mit den Richtlinien des Endprodukts zu gewährleisten.

Norme EN 61000-6-3 "Compatibilità elettromagnetica - Norme Générale sur l'émission - Partie 1 : Milieux résidentiels, commerciaux et de l'industrie légère". Les moteurs répondent aussi aux prescriptions de la Norme CEI EN 60204-1 "Equipement électrique des machines". Le fabricant ou le monteur de la machine qui comprend les moteurs comme composant est responsable et doit se charger de garantir la sécurité et la conformité aux directives du produit final.

Tolleranze

Secondo le Norme sono ammesse le tolleranze indicate nella tabella seguente sulle grandezze garantite.

Tolerances

As per the Norms applicable the tolerances here below apply to the following quantities.

Toleranzen

Die Normen lassen die in folgenden Tabelle genannten Toleranzen bei den garantierten Größen zu.

Tolérances

Selon les Normes, les tolérances indiquées dans le tableau ci-dessous sont admises sur les tailles garanties.

(A29)

-0.15 (1 - η) P ≤ 50kW	Rendimento	Efficiency	Wirkungsgrad	Rendement
$-(1 - \cos\phi)/6$ min 0.02 max 0.07	Fattore di potenza	Power factor	Leistungsfaktor	Facteur de puissance
±20% *	Scorrimento	Slip	Schlupf	Glissement
+20%	Corrente a rotore bloccato	Locked rotor current	Strom bei blockiertem Läufer	Courant à rotor bloqué
-15% +25%	Coppia a rotore bloccato	Locked rotor torque	Drehmoment bei blockiertem Läufer	Couple à rotor bloqué
-10%	Coppia max	Max. torque	Max. Drehmoment	Couple max

* ± 30% per motori con Pn < 1 kW

** ± 30% for motors with Pn < 1 kW*

* ± 30% für Motoren mit Pn < 1 kW

** ± 30% pour moteurs avec Pn < 1 kW*

M3 - CARATTERISTICHE MECCANICHE

Forme costruttive

I motori serie BN sono previsti nelle forme costruttive indicate in tabella (A30) secondo le Norme CEI EN 60034-14.

Le forme costruttive sono le seguenti:

IM B5 (base)
IM V1, IM V3 (derivate)

IM B14 (base)
IM V18, IM V19 (derivate)

I motori in forma costruttiva IM B5 possono essere installati nelle posizioni IM V1 e IM V3; i motori in forma costruttiva IM B14 possono essere installati nelle posizioni IM V18 e IM V19. In questi casi, sulla targa del motore sarà indicata la forma co-

M3 - MECHANICAL FEATURES

Versions

IEC-normalised BN motors are available in the design versions indicated in table (A30) as per Standards CEI EN 60034-14.

Mounting versions are:

IM B5 (basic)
IM V1, IM V3 (derived)

IM B14 (basic)
IM V18, IM V19 (derived)

IM B5 design motors can be installed in positions IM V1 and IM V3; IM B14 design motors can be installed in positions IM V18 and IM V19. In such cases, the basic design IM B5 or IM B14 is indicated on the motor name plate.

M3 - MECHANISCHE EIGENSCHAFTEN

Bauformen

Die Motoren der Serie BN weisen die in der Abbildung (A30) angegebene Bauform gemäß den Normen CEI EN 60034-14 auf.

Die Bauformen sind:

IM B5 (Grundmodell)
IM V1, IM V3 (Ableitungen)

IM B14 (Grundmodell)
IM V18, IM V19 (Ableitungen)

Die Motoren mit der Bauform IM B5 können mit den Einbaulagen IM V1 und IM V3 eingebaut werden; die Motoren mit der Bauform IM B14 können mit den Einbaulagen IM V18 und IM V19 eingebaut werden. In diesen Fällen ist auf dem Lei-

M3 - CARACTERISTIQUES MECANIKUES

Formes de construction

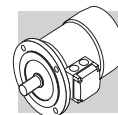
Les moteurs série BN sont prévus dans les formes de construction indiquées sur le tableau (A30) selon les normes CEI EN 60034-14.

Les formes de construction sont les suivantes:

IM B5 (base)
IM V1, IM V3 (dérivées)

IM B14 (base)
IM V18, IM V19 (dérivées)

Les moteurs en forme de construction IM B5 peuvent être installés dans les positions IM V1 et IM V3; les moteurs en forme de construction IM B14 peuvent être installés dans les positions IM V18 et IM V19. Dans ces cas, la forme de cons-



struttiva base IM B5 o IM B14. Nelle forme costruttive dove il motore assume una posizione verticale con albero in basso, si consiglia di richiedere l'esecuzione con tettuccio parapioggia (da prevedere sempre nel caso di motori autofrenanti). Tale esecuzione, pressente nelle opzioni, va richiesta espressamente in fase di ordine in quanto non è prevista nella versione base.

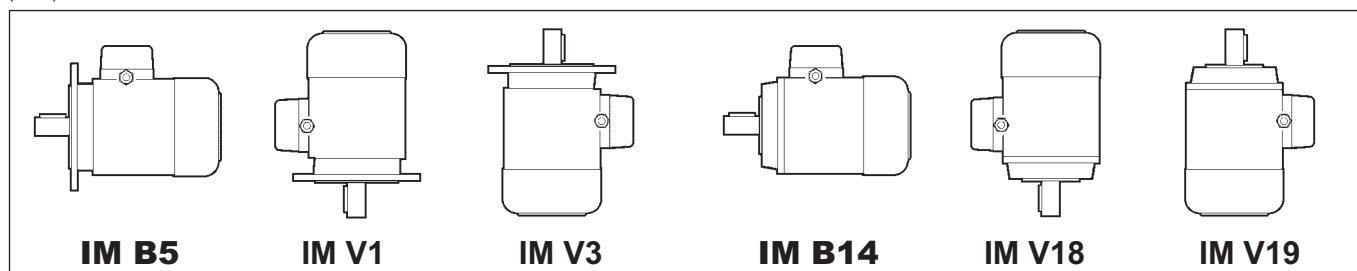
In design versions with a vertically located motor and shaft downwards, it is recommended to request the drip cover (always necessary for brake motors). This facility, included in the option list should be specified when ordering as it does not come as a standard device.

stungsschild des Motors die Bauform IM B5 oder IM B 14 angeben.

Bei Bauformen mit vertikaler Lage des Motors und nach unten gerichteter Welle wird die Ausführung mit Regenschutzabdeckung empfohlen (bei Bremsmotoren stets vorzusehen). Dieses wahlweise Zubehör muß ausdrücklich zum Zeitpunkt der Bestellung verlangt werden, da es bei der Grundausführung nicht vorgesehen ist.

struction base IM B5 ou IM B14 sera indiquée sur la plaque du moteur. Dans les formes de construction où le moteur présente une position verticale avec arbre vers le bas, nous conseillons de demander l'exécution avec capot de protection contre la pluie (à prévoir toujours dans le cas de moteurs freins). Cette exécution, prévue dans les options, doit être expressément demandée en phase de commande étant donné qu'elle n'est pas prévue dans la version de base.

(A30)



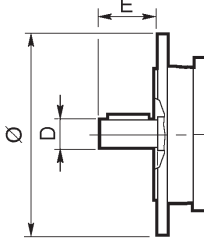
I motori in forma flangiata possono essere forniti con dimensioni di accoppiamento ridotte, come riportato in tabella (A31) - esecuzioni **B5R**, **B14R**.

Flanged motors can be supplied with a reduced mounting interface, as shown in chart (A31) below.

Die Motoren in der Auslegung mit Flansch können mit reduzierten Passmassen gemäß Tabelle (A31) - Versionen **B5R**, **B14R** geliefert werden.

*Les moteurs avec forme à bride peuvent être fournis avec des tailles d'accouplement réduites, comme indiqué dans le tableau (A31) - exécutions **B5R**, **B14R**.*

(A31)



	BN 71	BN 80	BN 90	BN 100	BN 112	BN 132
	DxE - Ø					
B5R ⁽¹⁾	11x23 - 140	14x30 - 160	19x40 - 200	24x50 - 200	24x50 - 200	28x60 - 250
B14R ⁽²⁾	11x23 - 90	14x30 - 105	19x40 - 120	24x50 - 140	—	—

⁽¹⁾ flangia con fori passanti

⁽¹⁾ flange with through holes

⁽¹⁾ Flansch mit durchgehenden Bohrungen

⁽¹⁾ bride avec orifices passants

⁽²⁾ flangia con fori filettati

⁽²⁾ flange with threaded holes

⁽²⁾ Flansch mit Gewindebohrungen

⁽²⁾ bride avec orifices filetés

IP..

Grado di protezione

Degree of protection

Schutzart

Degré de protection

La tabella sottostante riassume la disponibilità dei vari gradi di protezione.

Indipendentemente dal grado di protezione specificato, per installazione all'aperto i motori devono essere protetti dall'irraggiamento diretto e, nel caso d'installazione con albero rivolto verso il basso, è necessario

The following chart provides an overview of the degrees of protection available.

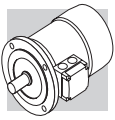
In addition to the degree of protection specified when ordering, motors to be installed outdoors require protection against direct sunlight and also – when they are to be installed vertically down – a drip cover to prevent

In der nachstehenden Tabelle werden die jeweils zur Verfügung stehenden Schutzarten zusammengefasst.

Unabhängig von der spezifischen Schutzart müssen die im Freien installierten Motoren vor direkten Strahlungen geschützt werden. Im Fall einer senkrechten Montage, in der die Welle nach unten

Le tableau ci-dessous résume la disponibilité des différents degrés de protection.

Indépendamment du degré de protection spécifié, en cas d'installation en plein air, les moteurs doivent être protégés des rayons directs du soleil et, en cas d'installation avec l'arbre dirigé vers le bas, il est nécessaire











specificare ulteriormente il tettuccio di protezione contro l'ingresso di acqua e corpi solidi (opzione **RC**).

*the ingress of water and solid particles (option **RC**).*

gerichtet ist, sollte darüber hinaus das Schutzdach bestellt werden, das vor dem Eindringen von Wasser und festen Fremdkörpern schützt (Option **RC**).

*de spécifier ultérieurement le capot de protection contre la pénétration de l'eau et des corps solides (option **RC**).*

(A32)

		IP 54	IP 55	IP 56
BN	M		standard	
BN_FD BN_FA	M_FD M_FA	standard		
BN_BA	–		standard	

Ventilazione

I motori sono raffreddati mediante ventilazione esterna (IC 411 secondo CEI EN 60034-6) e sono provvisti di ventola radiale in plastica che funziona in entrambi i sensi di rotazione. L'installazione deve assicurare una distanza minima dalla calotta copriventola alla parete in modo da non avere impedimenti all'ingresso aria e permettere la possibilità di eseguire l'opportuna manutenzione del motore e, se previsto, del freno. Su richiesta è possibile prevedere una ventilazione forzata indipendente (opzione U1). Questa soluzione consente di aumentare il fattore di utilizzo del motore nel caso di alimentazione da inverter e funzionamento a giri ridotti.

Cooling

The motors are externally ventilated (IC 411 to CEI EN 60034-6) and are equipped with a plastic fan working in both directions. The motors must be installed allowing sufficient space between fan cowl and the nearest wall to ensure free air intake and allow access for maintenance purposes on motor and brake, if supplied. Independent, forced air ventilation (IC 416) can be supplied on request (option U1). This solution enables to increase the motor duty factor when driven by an inverter and operating at reduced speed.

Lüftung

Die Motoren sind eigenbelüftet (IC 411 gemäß CEI EN 60034-6) und verfügen über ein Radiallüfterrad aus Kunststoff, das in beiden Drehrichtungen arbeiten kann. Bei der Installation muß sichergestellt werden, daß die Lüfterradabdeckung soweit von der Wand entfernt ist, daß der Lufttritt nicht behindert wird, und daß der Motor und (falls vorhanden) die Bremse problemlos gewartet werden können. Auf Wunsch können die Motoren mit Fremdbelüftung geliefert werden (Option U1). Diese Lösung ermöglicht das Motorbetriebsfaktor zu erhöhen, wenn vom Frequenzrichter gesteuert und zu niedrigen Geschwindigkeit betrieben.

Ventilation

Les moteurs sont refroidis à l'aide d'une ventilation extérieure (IC 411 selon CEI EN 60034-6) et sont dotés d'un ventilateur à ailettes en plastique qui fonctionne dans les deux sens de rotation. L'installation doit assurer une distance minimum entre le capot de protection du ventilateur et la paroi afin de permettre une bonne circulation de l'air et rendre plus aisé l'entretien du moteur et si prévu, du frein. Sur demande, il est possible de prévoir une ventilation forcée indépendante (option U1). Cette solution permet d'augmenter le facteur d'utilisation du moteur en cas d'alimentation, via un variateur de fréquence, et pour un fonctionnement à faible vitesse.

Senso di rotazione

È possibile il funzionamento in entrambi i sensi di rotazione. Con collegamento dei morsetti U1,V1,W1 alle fasi di linea L1,L2,L3 si ha rotazione oraria vista dal lato accoppiamento, mentre la marcia antioraria si ottiene scambiando fra loro due fasi.

Direction of rotation

Rotation is possible in both directions. If terminals U1, V1, and W1 are connected to line phases L1, L2 and L3, clockwise rotation (looking from drive end) is obtained. For counterclockwise rotation, switch two phases.

Drehrichtung

Der Betrieb in beiden Drehrichtungen ist möglich. Schließt man die Klemmen U1, V1, W1 an die Phasen L1, L2, L3 an, dreht sich der Motor im Uhrzeigersinn (von der Verbindungsseite her betrachtet); die Drehung im Gegenuhrzeigersinn erhält man, indem man zwei Phasen vertauscht.

Sens de rotation

Un fonctionnement dans les deux sens de rotation est possible. Avec raccordement des bornes U1, V1, W1 aux phases de ligne L1, L2, L3, on a la rotation dans le sens des aiguilles d'une montre vue du côté liaison alors que le sens inverse s'obtient en intervertissant les deux phases entre elles.

Rumorosità

I valori di rumorosità, rilevati secondo il metodo previsto dalle Norme ISO 1680, sono contenuti entro i livelli massimi previsti dalle Norme CEI EN 60034-9.

Noise

Noise levels, measured using the method prescribed by ISO 1680 Standards, are within the maximum levels specified by Standards CEI EN 60034-9.

Geräuschpegel

Die mit der von der ISO-Norm 1680 vorgesehenen Methoden gemessenen Lärmstärkewerte liegen innerhalb der gemäß den Normen CEI EN 60034-9 zulässigen Höchstgrenzen.

Niveau de bruit

Les valeurs relevées selon la méthode prévue par les normes ISO 1680 sont situées sous les niveaux maximums prévus par les normes CEI EN 60034-9.

Vibrazioni ed equilibratura

Tutti i rotor sono equilibrati con mezza linguetta e rientrano nei limiti di intensità di vibrazione previsti dalle Norme CEI EN 60034-14. Per particolari esigenze di silenzio-

Vibrations and balancing

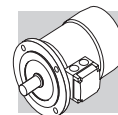
Rotor shafts are balanced with half key fitted and fall within the vibration class N, as per Standard CEI EN 60034-14. If a further reduced noise level is

Schwingungen und Ausgleich

Alle Rotoren werden durch einen halben Federkeil ausgeglichen und fallen somit unter die, von den Normen CEI EN 60034-14 vorgesehene Schwingungsgradgrenzen.

Vibrations et équilibrage

Tous les rotors sont équilibrés avec une demi languette et rentrent dans les limites d'intensité de vibration prévues par les Normes CEI EN 60034-14.



sità potrà essere previsto, a richiesta, un'esecuzione antivibrante in grado ridotto B. La tabella seguente riporta i valori della velocità efficace di vibrazione per equilibratura standard (A) e incrementata (B).

required improved balancing can be optionally requested (class B). Table below shows the value for the vibration velocity for standard (A) and improved (B) balancing.

Bei besonderen Anforderungen an die Laufruhe kann auf Anfrage eine schwingungsdämpfende Ausführung in der reduzierten Klasse (B) geliefert werden. Die folgende Tabelle führt die Werte der Ist-Schwingungsgeschwindigkeit für einen normalen (A) und verbesserten (B) Ausgleich auf.

En cas d'exigences particulière concernant le niveau de bruit, sur demande, il est possible de réaliser une exécution anti-vibrante, de degré réduit (B). Le tableau ci-dessous indique les valeurs de la vitesse efficace de vibration pour un équilibrage standard (A) et améliorée (B).

(A33)

Grado di vibrazione <i>Vibration class</i> Schwingungsklasse <i>Degré de vibration</i>	Velocità di rotazione <i>Angular velocity</i> Drehungsgeschwindigkeit <i>Viitesse de rotation</i>	Limiti della velocità di vibrazione <i>Limits of the vibration velocity</i> Grenzen der Schwingungsgeschwindigkeit <i>Limites de la vitesse de vibration</i> [mm/s]
	n [min ⁻¹]	BN 56 ≤ H ≤ BN 200 M05 ≤ H ≤ M5
A	600 ≤ n ≤ 3600	1.6
B	600 ≤ n ≤ 3600	0.70

I valori si riferiscono a misure con motore liberamente sospeso e funzionamento a vuoto.

Values refer to measures with freely suspended motor in unloaded conditions.

Die Werte beziehen sich auf die Abmessungen mit stehendem Motor, ohne Getriebe und Leerlauf.

Les valeurs se réfèrent à des mesures avec moteur librement suspendu et fonctionnement à vide.

Morsettiera motore

Terminal box

Motorklemmenkasten

Bornier moteur

La morsettiera principale è a sei morsetti per collegamento con capicorda. All'interno della scatola è previsto un morsetto per il conduttore di terra.

Terminal board features 6 studs for eyelet terminal connection. A ground terminal is also supplied for earthing of the equipment.

Die Hauptklemmleiste hat 6 Klemmen für den Anschluß mit Kabelschuhen. Im Innern des Klemmenkastens befindet sich eine Klemme für den Erdleiter.

Le bornier principal prévoit six bornes pour raccordement avec cosses. Dans le boîtier se trouve une borne pour le conducteur de terre.

Le dimensioni dei perni di attacco sono riportate nella tabella seguente.

Terminals number and type are shown in the following table.

Die Abmessungen der Auschüsse sind in der folgenden Tabelle angegeben.

Les dimensions des axes de fixation sont reportées dans le tableau ci-dessous.

Nel caso di motori autofrenanti, il raddrizzatore per l'alimentazione del freno è fissato all'interno della scatola e provvisto di adeguati morsetti di collegamento.

Brakemotors house the a.c./d.c. rectifier (factory pre-wired) inside the terminal box.

Bei den Bremsmotoren befindet sich auch der mit den erforderlichen Anschlußklemmen ausgestattete Gleichrichter für die Stromversorgung der Bremse im Klemmenkasten.

Dans le cas de moteurs freins, le redresseur pour l'alimentation du frein est fixé à l'intérieur du boîtier et est doté de bornes de raccordement.


Eseguire i collegamenti secondo gli schemi riportati all'interno della scatola coprimorsetti o nei manuali d'uso.

Wiring instructions are provided either in the box or in the user manual.

Die Anschlüsse müssen gemäß den Diagrammen im Klemmkasten oder in den Betriebsanweisungen durchgeführt werden.

Effectuer les connexions selon les schémas indiqués à l'intérieur du bornier, ou dans les manuels d'utilisation.

(A34)

		N° terminali <i>No. of terminals</i> Klemmen <i>N° bornes</i>	Filettatura terminali <i>Terminal threads</i> Gewinde <i>Filetage bornes</i>	Sezione max del conduttore <i>Wire max cross section area</i> Max. leiterquerschnitt <i>Section max du conducteur</i> mm ²
BN 56...BN 71	M05, M1	6	M4	2.5
BN 80, BN 90	M2	6	M4	2.5
BN 100...BN 112	M3	6	M5	6
BN 132...BN 160MR	M4	6	M5	6
BN 160M...BN 180M	M5	6	M6	16
BN 180L...BN 200L	–	6	M8	25

Ingresso cavi

Cable entry

Kabeleingang

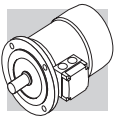
Entrée câbles

Nel rispetto della Norma EN 50262, i fori di ingresso cavi nelle scatole morsettiera presentano filettature metriche della misura indicata nella tabella seguente.



The holes used to bring cables to terminal boxes use metric threads in accordance with standard EN 50262 as indicated in the table here after.

Unter Berücksichtigung der Norm EN 50262 verfügen die Kabeleingänge in die Klemmenkästen über metrische Gewinde, deren Maße, der nachstehenden Tabelle entnommen werden können.

Dans le respect de la Norme EN 50262, les orifices d'entrée câbles dans les boîtes à bornes présentent des filetages métriques de la taille indiquée dans le tableau ci-dessous.



(A35)

		Ingresso cavi / Cable entry kabeldurchführung / Entrée câbles	Diametro max. cavo allacciabile / Max. cable diameter allowed Max. zulässiger Kabeldurchmesser / Diam. maxi câble
			[mm]
BN 63	M05	2 x M20 x 1.5	13
BN 71	M1	2 x M25 x 1.5	17
BN 80 - BN 90	M2	2 x M25 x 1.5	17
BN 100	M3	2 x M32 x 1.5	21
		2 x M25 x 1.5	17
BN 112	—	2 x M32 x 1.5 4 x M25 x 1.5	17
BN 132...BN 160MR	M4	4 x M32 x 1.5	21
BN 160M...BN 200L	M5	2 x M40 x 1.5	29

Cuscinetti

I cuscinetti previsti sono del tipo radiale a sfere con lubrificazione permanente precaricati assialmente.

I tipi utilizzati sono indicati nelle tabelle seguenti. La durata nominale a fatica L_{10h} dei cuscinetti, in assenza di carichi esterni applicati è superiore a 40.000 ore, calcolata secondo ISO 281.

DE = lato comando

NDE = lato opposto comando

Bearings

Life lubricated preloaded radial ball bearings are used, types are shown in the chart here under. Calculated endurance lifetime L_{10h} , as per ISO 281, in unloaded condition, exceeds 40000 hrs.

DE = drive end

NDE = non drive end

Lager

Bei den Lagern handelt es sich um Radialkugellager mit Dauerschmierung.

Die verwendeten Typen sind in den folgenden Tabellen angegeben.

Die Lebensdauer der Lager bei einer Beanspruchung L_{10h} ist, sofern keine externen Kräfte wirken, über 40.000 Stunden (Berechnung gemäß ISO 281).

DE = Wellenseite

NDE = Lüfterseite

Roulements

Les roulements prévus sont du type radial à billes avec lubrification permanente.


Les types utilisés sont indiqués dans les tableaux ci-dessous.

La résistance à la déformation L_{10h} des roulements en absence de charges extérieures appliquées est supérieure à 40.000 heures calculée selon ISO 281.


DE = sortie arbre

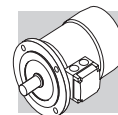
NDE = côté ventilateur

(A36)

	DE	NDE	
	M, M_FD, M_FA	M	M_FD; M_FA
M05	6004 2Z C3	6201 2Z C3	6201 2RS C3
M1	6004 2Z C3	6202 2Z C3	6202 2RS C3
M2	6007 2Z C3	6204 2Z C3	6204 2RS C3
M3	6207 2Z C3	6206 2Z C3	6206 2RS C3
M4	6309 2Z C3	6308 2Z C3	6308 2RS C3
M5	6309 2Z C3	6309 2Z C3	6309 2RS C3

(A37)

	DE	NDE	
	BN, BN_FD, BN_FA, BN_BA	BN, BN_BA	BN_FD; BN_FA
BN 56	6201 2Z C3	6201 2Z C3	—
BN 63	6201 2Z C3	6201 2Z C3	6201 2RS C3
BN 71	6202 2Z C3	6202 2Z C3	6202 2RS C3
BN 80	6204 2Z C3	6204 2Z C3	6204 2RS C3
BN 90	6205 2Z C3	6205 2Z C3	6305 2RS C3
BN 100	6206 2Z C3	6206 2Z C3	6206 2RS C3
BN 112	6306 2Z C3	6306 2Z C3	6306 2RS C3
BN 132	6308 2Z C3	6308 2Z C3	6308 2RS C3
BN 160MR	6309 2Z C3	6308 2Z C3	6308 2RS C3
BN 160M/L	6309 2Z C3	6309 2Z C3	6309 2RS C3
BN 180M	6310 2Z C3	6309 2Z C3	6309 2RS C3
BN 180L	6310 2Z C3	6310 2Z C3	6310 2RS C3
BN 200L	6312 2Z C3	6310 2Z C3	6310 2RS C3



M4 - CARATTERISTICHE ELETTRICHE

M4 - ELECTRICAL CHARACTERISTICS

M4 - ELEKTRISCHE EIGENSCHAFTEN

M4 - CARACTERISTIQUES ELECTRIQUES

Tensione

I motori a una velocità sono previsti nell'esecuzione normale per tensione nominale 230V Δ / 400V Y, 50 Hz con tolleranza di tensione ± 10% (escluso i tipi M3LC4 e M3LC6).

In targa sono indicati oltre alla tensione nominale i campi di funzionamento consentiti, p.e.:

220 - 240V Δ

280 - 415V Y / 50 Hz.

In accordo alle Norme CEI EN 60034-1 i motori possono funzionare alle tensioni sopra indicate con tolleranza del ± 5%.

Per funzionamento ai limiti di tolleranza la temperatura può superare di 10 K il limite previsto dalla classe di isolamento adottata.

Ad eccezione dei motori autofrenanti tipo BN_FD in targa vengono indicati anche i valori corrispondenti al funzionamento a 60 Hz (p.e. 460Y, 60 Hz) ed il relativo campo di tensione:

440 - 480VY, 60 Hz.

Per i motori autofrenanti con freno tipo FD le tensioni standard sono:

220V - 240V Δ - 50 Hz

380V - 415V Y - 50 Hz

con tensione di alimentazione freno 230V ± 10%.

La tabella seguente riporta le tensioni previste per i motori.

Voltage

Single speed motors are rated for 230/400 V - 50 Hz.

A tolerance of ±10% applies to nominal voltage, with the exception of motors type M3LC4 and M3LC6.

In addition to nominal voltage-frequency values the name plate also shows voltage ranges the motor can operate under, e.g.:

220-240V Δ - 50 Hz

380-415V Y - 50 Hz

As per Norms CEI EN 60034-1 on above voltage values the ±5% tolerance applies.

When operating close to the tolerance limit values the winding temperature can exceed by 10 K the rated temperature for the given insulation class.

With the exception of BN_FD brakemotors, the rated voltage values for operation under 60 Hz mains are also shown on the nameplate, e.g. 460Y-60 Hz along with related tolerance field, e.g. 440-480V Y-60 Hz.

For brakemotors, FD type, rated voltage is:

220-240V Δ - 50 Hz

380-415V Y - 50 Hz

Brake supply is a.c. 230V ±10% single phase.

Chart below shows standard and optional wiring of motors.

Spannung

Die eintourigen Motoren müssen in der Standardausführung mit einer Spannung von 230 V Δ / 400 V Y, 50 Hz mit einer Toleranz von ± 10% gespeist werden (Type M3LC4 und M3LC6 ausgenommen).

Auf dem Schild werden die Nennspannung hinaus, auch die zulässigen Ansprechbereiche angegeben, z.B.:

220-240V Δ

380-415V Y/50 Hz.

Gemäß den Normen CEI EN 60034-1 können die Motoren auf die oben genannten Spannungen mit Toleranzen von ± 5% arbeiten.

Bei Betrieb an den Spannungsgrenzen, kann die Temperatur bis zum 10K die für die verwendeten Isolierstoffklasse angegebenen Grenze überschreiten.

Darüber hinaus wird auf den Typenschild die dem 60 Hz-Betrieb entsprechenden Werte angegeben (d.h. 460 Y, 60 Hz) und das entsprechende Spannungsfeld, 440-480VY, 60 Hz.

Für die selbstbremsenden Motoren mit dem Bremstyp FD sind die Standardspannungen folgende:

220V - 240V Δ - 50 Hz

380V - 415V Y - 50 Hz

mit Bremsspannungsversorgung von 230V ± 10%.

Die folgende Tabelle für die für die Motoren vorgesehenen Spannungen auf.

Tension

Les moteurs à polarité unique sont prévus dans l'exécution normale pour tension 230V Δ / 400V Y, 50 Hz avec tolérance de tension ± 10% (sauf les types M3LC4 et M3LC6).

Outre la tension nominale, les plages de fonctionnement permises sont indiquées sur la plaquette signalétique, à savoir:

220-240V Δ

380-415V Y/50 Hz.

Selon les normes CEI EN 60034-1 les moteurs peuvent fonctionner aux tension indiquées ci-dessus avec une tolérance de ± 5%.

Pour un fonctionnement à la limite de tolérance, la température peut dépasser les 10K, la limite prévue de la classe d'isolation choisie.

Sur la plaque marque sont de plus indiqués les valeurs correspondantes au fonctionnement en 60 Hz (ex.460Y, 60 Hz) et la relative plage de tension: 440 - 480VY, 60 Hz.

En ce qui concerne les moteurs autofrenants avec frein de type FD, les tensions standard sont les suivantes :

220V - 240V Δ - 50 Hz

380V - 415V Y - 50 Hz

avec tension d'alimentation du frein 230V ± 10%.

La tableau ci-dessous indique les tensions prévues pour les moteurs.

(A38)

		BN M	BN_FD M_FD		BN_FA / BN_BA M_FA		Esecuzione Configuration Version Execution
		V _{mot} ± 10 % 3~	V _{mot} ± 10 % 3~	V _B ± 10 % 1~	V _{mot} ± 10 % 3~	V _B ± 10 % 3~	
BN 56 - BN 132	M05...M4	230/400 - 50Hz 460 - 60Hz	230/400V Δ/Y - 50 Hz	230V	230/400V Δ/Y - 50 Hz 460V Y - 60Hz	230/400V Δ/Y - 50 Hz 460V Y - 60Hz	Standard
BN 100 - BN 132	M3 - M4	400/690 - 50Hz 460 - 60Hz	400/690V Δ/Y - 50 Hz	400V	400/690V Δ/Y - 50 Hz 460V Y - 60Hz	400/690V Δ/Y - 50 Hz 460V Y - 60Hz	A richiesta, senza sovrapprezzo On request at no extra charge Auf Anfrage, ohne Aufpreis Sur demande, sans majoration de prix

I motori a due velocità 400V/50Hz, sono previsti per tensione nominale standard 400V; tolleranze applicabili secondo CEI EN 60034-1.

The only rated voltage for motors type 400V/50Hz and all double speed motors is 400V. Applicable tolerances as per CEI EN 60034-1.

Alle polumschaltbaren Motoren, die Typen 400V/50Hz, sind nicht umschaltbar, standard-mäßig nur für ein Spannung 400V vorgesehen; geltenden Toleranzen gemäß CEI EN 60034-1.

Tous les moteur à deux vitesses, les types 400V/50Hz, sont prévus pour une tension nominale standard de 400V; tolérances applicables selon CEI EN 60034-1.

Nella tabella seguente sono indicati i vari tipi di collegamenti previsti per i motori in funzione della polarità.

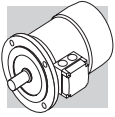
The table below shows the wiring options available.

Auf die folgende Tabelle werden die verschiedenen für die Motoren vorgesehenen Anschlußtypen angegeben.

Dans le tableau ci-dessous sont indiqués les différents types de connexion prévus pour les moteurs.

(A39)

		Poli / Pole / Polig / Pôles	Collegamento avvolgimento / Wiring options Wicklungsanschluß / Connexion du bobinage
		BN 56...BN 200	M05...M5



Frequenza

I motori ad una velocità nell'esecuzione standard riportano in targa oltre alle tensioni di funzionamento a 50 Hz il campo di tensione 440 - 480V 60 Hz (escluso motori autofrenanti con freno FD) con potenza aumentata di circa il 20%

La potenza di targa dei motori a 60Hz corrisponde a quanto riportato nella tabella (A40) seguente:

Frequency

With the exception of brakemotors, name plate of standard single speed motors shows, besides the 50 Hz voltage ratings, also the rated power output for 60 Hz operation in the 440-480 V range.

Power output is increased by approx 20%.

Rated output power for 60 Hz operation is shown in the following diagram.

Frequenz

Bei eintourigen Motoren in der Standardausführung wird außer den 50 Hz-Betriebsspannungen auch den Spannungsfeld 440 - 480V 60 Hz angegeben (mit Ausnahme von Bremsmotoren mit Bremsentyp FD) mit einer erhöhten Leistung von ungefähr 20%.



Die Leistung auf das Namensschild von 60 Hz-Motoren entspricht den Daten aus der folgenden Tabelle (A40):

Fréquence

Les moteurs à une vitesse en exécution standard reportent sur la plaque marque en plus des tension du fonctionnement à 50 Hz la plage de tension 440 - 480V 60 Hz (moteurs freins avec frein FD exclus) avec puissance augmentée de 20% env.

La puissance sur la plaque marque des moteurs à 60 Hz correspond à celle indiquée au tableau (A40) suivant :

(A40)

		2P	4P	6P
		P _n [kW]		
BN 56A	–	–	0.06	–
BN 56B	M0B	–	0.10	–
BN 63A	M05A	0.21	0.14	0.10
BN 63B	M05B	0.30	0.21	0.14
BN 71A	M05C	0.45	0.30	0.21
BN 71B	M1SD	0.65	0.45	0.30
BN 80A	M1LA	0.90	0.65	0.45
BN 80B	M2SA	1.30	0.90	0.65
BN 90S	M2SB	–	1.30	0.90
BN 90SA	M2SB	1.8	–	–
BN 90L	M3SA	2.5	–	1.3
BN 90LA	M3SA	–	1.8	–
BN 100L	M3LA	3.5	–	–
BN 100LA	M3LA	–	2.5	1.8
BN 100LB	M3LB	4.7	3.5	2.2
BN 112M	M3LB	4.7	4.7	2.5
	M3LC	–	4.7	2.5
BN 132S	M4SA	–	6.5	3.5
BN 132SA	M4SA	6.3	–	–
BN 132SB	M4SB	8.7	–	–
BN 132M	M4LA	11	–	–
BN 132MA	M4LA	–	8.7	4.6
BN 132MB	M4LB	–	11	6.5
BN 160MR	M4LC	12.5	12.5	–
BN 160MB	M5SB	17.5	–	–
BN 160M	M5SA	–	–	8.6
BN 160L	M5S	21.5	17.5	12.6
BN 180M	M5LA	24.5	21.5	–
BN 180L	–	–	25.3	17.5
BN 200L	–	34	34	22

Motori a doppia polarità alimentati a 60 Hz avranno un aumento della potenza nominale, riferita a 50 Hz, pari al 15%.

Qualora sulla targhetta di un motore destinato ad essere alimentato a 60 Hz sia richiesto un valore di potenza nominale pari a quello normalizzato a 50 Hz specificare in designazione l'opzione PN.

For two-speed motors operated under 60 Hz supply the rated power output is increased by 15% as compared to same motor with 50 Hz supply.

If same IEC-normalised 50 Hz power rating value is desired on name plate of a 60 Hz operated motor specify option PN in the ordering code.

Standard motors wound for 50

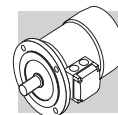
Für polumschaltbare Motoren mit 60 Hz Spannungsversorgung ist die vorgesehene Leistungserhöhung gemäß den Datenblätter von 15%.

Wenn die angefragte 60 Hz-Leistung der normierten 50 Hz-Leistung entspricht, geben bei der Bezeichnung das Option PN an. Die Motoren mit einer Wicklung für eine Frequenz von 50 Hz

Pour les moteurs à deux vitesses avec alimentation 60 Hz l'augmentation de puissance prévue per rapport aux valeurs indiquées dans les tableaux techniques, sera de 15%.

Si la puissance requise à 60 Hz correspond à la puissance normalisée à 50 Hz on devra indiquer l'option PN.

Les moteurs bobinés pour fré-



I motori normalmente avvolti per frequenza 50 Hz possono essere usati in reti a 60 Hz con i loro dati che saranno corretti come da tabella seguente.
I freni, se presenti, dovranno sempre essere alimentati alla tensione V_b , riportata in targa.

Hz supply can be operated under 60 Hz with main data corrected as per chart below: Brakes, if fitted, must be supplied with the voltage value V_b that is stated on the nameplate.

können entsprechend den Angaben von Tabelle (A41) an Netze mit 60 Hz angeschlossen werden.
Die Bremse muss, falls angebaut, mit der auf dem Typenschild angegebenen Spannung V_b betrieben werden.

quence 50 Hz peuvent être utilisés sur réseau à 60 Hz selon les indications du tableau (A41). Les freins, si présents, devront toujours être alimentés avec la tension V_b rapportée sur la plaque.

(A41)

50 Hz	60 Hz			
V - 50 Hz	V - 60 Hz	P _n - 60 Hz	M _n , M _a /M _n - 60 Hz	n [min ⁻¹] - 60 Hz
230/400 Δ/Y	220 - 240 Δ 380 - 415 Y	1	0.83	1.2
400/690 Δ/Y	380 - 415 Δ			
230/400 Δ/Y	265 - 280 Δ 440 - 480 Y	1.15	1	1.2
400/690 Δ/Y	440 - 480 Δ			

Potenza nominale

Le tabelle dei dati tecnici del catalogo riportano le caratteristiche funzionali a 50 Hz in condizioni ambientali standard secondo le Norme CEI EN 60034-1 (temperatura 40 °C e altitudine <1000 m s.l.m.).
I motori possono essere impiegati a temperature comprese tra 40 °C e 60 °C applicando i declassamenti di potenza indicati nelle tabelle seguenti.

Rated power

Catalogue rating values are calculated for 50 Hz operation and for standard ambient conditions (temperature 40 °C; elevation <1000 m a.s.l.) as per the CEI EN 60034-1 Standards. The motors can be used within the 40 - 60 °C temperature range with rated power output adjusted by factors given in the following charts.

Nennleistung

Die Betriebsdatentabellen des Katalogs enthalten die technischen Daten bei einer Frequenz von 50 Hz bei normalen Umgebungsbedingungen gemäß den Normen CEI EN 60034-1 (Temperatur 40°C und Höhe <1000 m ü.d.M.). Die Motoren können in größeren Temperaturen zwischen 40°C und 60°C betrieben werden, wenn man die in den Tabellen (A41) angegebenen Rückstufungen anwendet.

Puissance nominale

Les tableaux fonctionnels du catalogue présentent les caractéristiques techniques à 50 Hz dans des conditions ambiantes standard selon les normes CEI EN 60034-1 (température 40°C et altitude <1000 m). Les moteurs peuvent être employés à des températures comprises entre 40°C et 60°C en appliquant les déclassements de puissance indiqués dans les tableaux suivantes.

(A42)

Temperatura ambiente / Ambient temperature / Umgebungstemperatur / Température ambiante(°C)	40°	45°	50°	55°	60°
Potenza ammissibile in % della potenza nominale / Permitted power as a % of rated power Zulässige Leistung in % der Nennleistung / Puissance admissible en % de la puissance nominale	100%	95%	90%	85%	80%

Quando è richiesto un declassamento del motore superiore al 15%, contattare il ns. Servizio Tecnico.

Should a derating factor higher than 15% apply please consult factory.

Wenn eine Motordeklassierung höher als 15% gefragt ist, wir bitten um Rückfrage.

Si un déclassement du moteur supérieur à 15% est requis, on devra contacter notre Service Technique.

Classe d'isolamento

Insulation class

Isolationsklasse

Classes d'isolation

CL F

I motori di produzione Bonfiglioli impiegano, di serie, materiali isolanti (filo smaltato, isolanti, resine d'impregnazione) in classe F.

Bonfiglioli motors use class F insulating materials (enamelled wire, insulators, impregnation resins) as compare to the standard motor.

Die Motoren von Bonfiglioli sind serienmäßig mit Isolierstoffen (Emaildraht, Isolierstoffen, Imprägnierharzen) der Klasse F ausgestattet.

De série, les moteurs fabriqués par Bonfiglioli utilisent des matériaux isolants (fil émaillé, isolants, résines d'impregnation) en classe F.

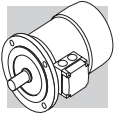
CL H

Su richiesta può venire specificata la classe di isolamento H.
In genere, per i motori in esecuzione standard la sovratemperatura dell'avvolgimento statore è contenuta entro il limite di 80 K, corrispondente alla sovratemperatura di classe B.

Motors manufactured in insulation class H are available at request. In standard motors, stator windings over temperature normally stays below the 80 K limit corresponding to class B over temperature.

Auf Anfrage können sie auch in der Klasse H geliefert werden.
Allgemein hält sich die Übertemperatur der Motoren in der Standardausführung innerhalb des Grenzwerts von 80 K, der einer Übertemperatur der Klasse B entspricht.

Sur demande, la classe d'isolation H peut être spécifiée. En général, pour les moteurs en exécution standard, l'échauffement de l'enroulement du stator se situe dans la limite de 80 K, correspondant à un échauffement de classe B.



L'accurata scelta dei componenti del sistema isolante consente l'impiego dei motori anche in climi tropicali ed in presenza di vibrazioni normali.

Per applicazioni in presenza di sostanze chimiche aggressive, o di elevata umidità, è consigliabile contattare il Servizio Tecnico Bonfiglioli per la selezione del prodotto più idoneo.

A careful selection of insulating components makes the motors compatible with tropical climates and normal vibration.

For applications involving the presence of aggressive chemicals or high humidity, contact Bonfiglioli Engineering for assistance with product selection.

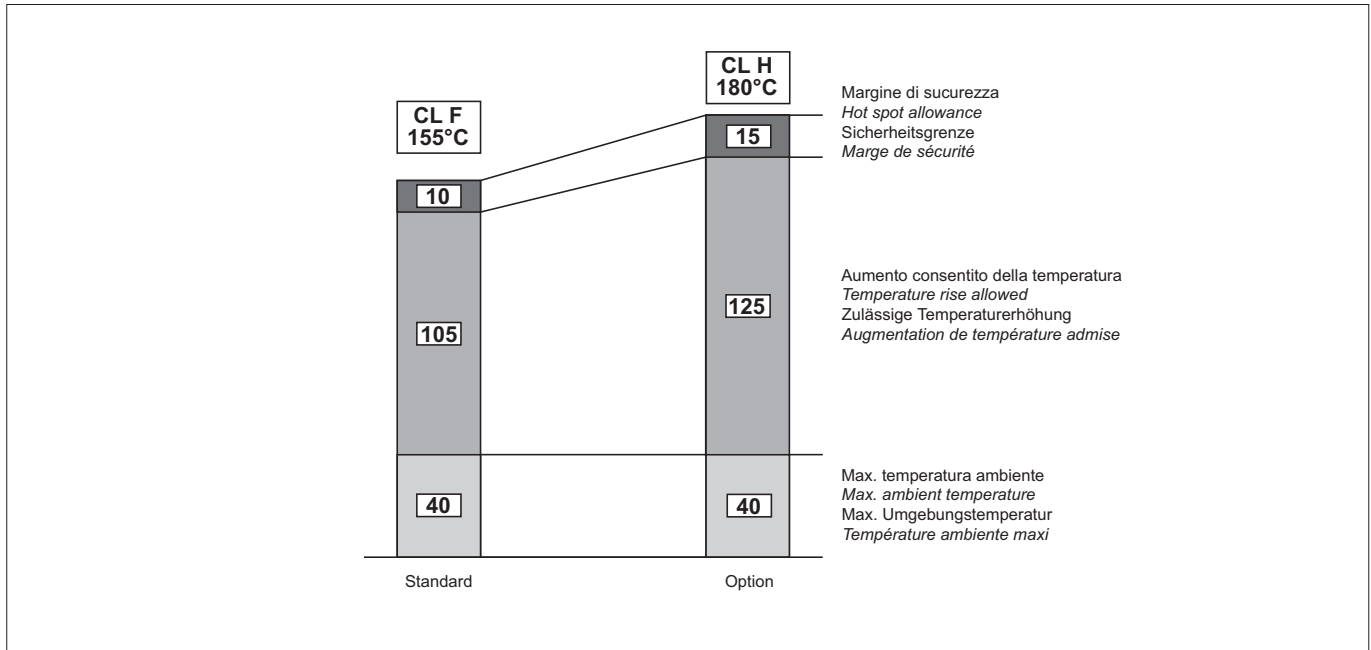
Die sorgfältig Wahl der Komponenten des Isoliersystem gestatten den Einsatz dieser Motoren auch unter tropischen Klimabedingungen und bei Vorliegen normaler Schwingungen.

Für den Einsatz in in der Nähe aggressiv wirkenden chemischen Substanzen oder bei hoher Luftfeuchtigkeit, wird empfohlen sich zur Wahl eines passenden Produktes mit unserem Technischen Kundendienst in Verbindung zu setzen.

Le choix soigné des composants du système d'isolation permet d'utiliser également les moteurs dans des climats tropicaux et en présence de vibrations normales.

Pour des applications en présence de substances chimiques agressives, ou d'humidité élevée, il est conseillé de contacter le Service Technique Bonfiglioli pour sélectionner le produit le plus adapté.

(A43)



Tipo di servizio

Se non indicato diversamente la potenza dei motori riportata a catalogo si riferisce al servizio continuo S1.

Per i motori utilizzati in condizioni diverse da S1 sarà necessario identificare il tipo di servizio previsto con riferimento alle Norme CEI EN 60034-1.

In particolare, per i servizi S2 ed S3, è possibile ottenere una maggiorazione della potenza termica rispetto a quella prevista per il servizio continuo secondo quanto indicato nella tabella (A44) valida per motori ad una velocità. Per motori a doppia polarità interpellare il nostro Servizio Tecnico.

Type of duty

Unless otherwise indicated, the power of motors specified in the catalogue refers to continuous duty S1.

For motors used under conditions other than S1, the type of duty required must be adjusted with reference to CEI EN 60034-1 Standards.

In particular, for duties S2 and S3, power can be adjusted with respect to continuous duty according to data in table (A44) applicable to single speed motors. For double speed motors, contact our Technical Service.

Betriebsart

Sofern nicht anders angegeben, bezieht sich die im Katalog angegebene Motorleistung auf den Dauerbetrieb S1.

Bei den Motoren, die für eine andere Betriebsart als S1 vorgesehen sind, muß man die Betriebsart unter Bezugnahme auf die Normen CEI EN 60034-1 identifizieren.

Insbesondere kann man für die Betriebsarten S2 und S3 nach der für Motoren mit einer Drehzahl. Gültigen Tabelle (A44) eine Überdimensionierung der Leistung für den Dauerbetrieb im Vergleich zur vorgesehenen Betriebsart erreichen. Für polumschaltbaren Motoren, bitte Rückfrage.

Type de service

sauf indication contraire, la puissance des moteurs reportée dans le catalogue se réfère au service continu S1.

Pour les moteurs utilisés dans des conditions différentes de S1, il sera nécessaire d'identifier le type de service prévu en se référant aux normes CEI EN 60034-1.

En particulier, pour les services S2 et S3, il est possible d'obtenir une majoration de la puissance par rapport à celle prévue pour le service continu selon ce qui est indiqué dans le tableau (A44) valable pour les moteurs à une vitesse. Pour les moteurs à double polarité, contacter notre Service Technique.

(A44)

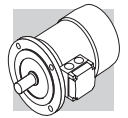
	Servizio / Duty / Betriebsart / Service						
	S2			S3 *			S4 - S9
	Durata del ciclo (min) / Cycle duration (min) Zyklusdauer (min) / Durée du cycle (min)			Rapporto di intermittenza (I) / Cyclic duration factor (I) Relative Einschaltdauer (I) / Rapport d'intermittence (I)			Interpellarci Consult factory Rückfrage Nous contacter
	10	30	60	25%	40%	60%	
f _m	1.35	1.15	1.05	1.25	1.15	1.1	

* La durata del ciclo dovrà comunque essere uguale o inferiore a 10 minuti; se superiore interpellare il nostro Servizio Tecnico.

** Cycle duration must, in any event, be equal to or less than 10 minutes; if this time is exceeded, please contact our Technical Service.*

* Die Zyklusdauer muß in jedem Fall kleiner oder gleich 10 Minuten sein. Wenn sie darüber liegt, unseren Technischen Kundendienst zu Rate ziehen.

** La durée du cycle devra être inférieure ou égale à 10 minutes. Si supérieure, contacter notre Service Technique.*



Rapporto di intermittenza:

Cyclic duration factor:

Relative Einschaltdauer:

Rapport d'intermittence:

$$I = \frac{t_f}{t_f + t_r} \cdot 100$$

(23)

t_f = tempo di funzionamento a carico costante
 t_r = tempo di riposo

t_f = work time under constant load
 t_r = rest time

t_f = Betriebszeit mit konstanter Last
 t_r = Aussetzzeit

t_f = temps de fonctionnement à charge constante
 t_r = temps de repos

Servizio di durata limitata S2

Limited duration duty S2

Kurzzeitbetrieb S2

Service de durée limitée S2

Caratterizzato da un funzionamento a carico costante per un periodo di tempo limitato, inferiore a quello richiesto per raggiungere l'equilibrio termico, seguito da un periodo di riposo di durata sufficiente a ristabilire, nel motore, la temperatura ambiente.

This type of duty is characterized by operation at constant load for a limited time, which is shorter than the time required to reach thermal equilibrium, followed by a rest period of sufficient duration to restore ambient temperature in the motor.

Betrieb mit konstanter Last für eine begrenzte Zeit, die unter der Zeit liegt, die zum Erreichen des thermischen Gleichgewichts benötigt wird, gefolgt von einer Aussetzzeit, die so lang ist, daß der Motor wieder auf die Umgebungstemperatur abkühlen kann.

Caractérisé par un fonctionnement à charge constante pour une période de temps limitée, inférieure à celle nécessaire pour atteindre l'équilibre thermique, suivie par une période de repos de durée suffisante pour rétablir, dans le moteur, la température ambiante.

Servizio intermittente periodico S3:

Periodical intermittent duty S3:

Periodische Einschaltsdauer S3:

Service intermittent périodique S3

Caratterizzato da una sequenza di cicli di funzionamento identici, ciascuno comprendente un periodo di funzionamento a carico costante ed un periodo di riposo. In questo servizio, la corrente di avviamento non influenza la sovratemperatura in modo significativo.

This type of duty is characterized by a sequence of identical operation cycles, each including a constant load operation period and a rest period. For this type of duty, the starting current does not significantly influence overtemperature.

Betrieb mit aufeinanderfolgenden identischen Betriebszyklen, die alle einen kurzzeitigen Betrieb mit konstanter Belastung und eine Aussetzzeit einschließen. Bei dieser Betriebsart beeinflusst der Anlaufstrom die Übertemperatur nicht in signifikanter Weise.

Caractérisé par une séquence de cycles de fonctionnement identiques, comprenant chacun une période de fonctionnement à charge constante et une période de repos. Dans ce service, le courant de démarrage n'influence pas l'excès de température de façon significative.

Funzionamento con alimentazione da inverter

Inverter-controlled motors

Betrieb mit Versorgung über Inverter

Fonctionnement avec alimentation par variateur de vitesse

I motori elettrici della serie BN ed M possono essere utilizzati con alimentazione da inverter PWM, e tensione nominale all'ingresso del convertitore fino a 500 V.

The electric motors of series BN and M may be used in combination with PWM inverters with rated voltage at transformer input up to 500 V. Standard motors use a phase insulating system with separators, class 2 enamelled wire and class H impregnation resins (1600V peak-to-peak voltage pulse capacity and rise edge $t_s > 0.1\mu s$ at motor terminals). Table (A54) shows the typical torque/speed curves referred to S1 duty for motors with base frequency $f_b = 50$ Hz.

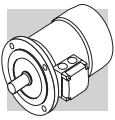
Die Elektromotoren der Serie BN und M können über einen Inverter PWM und mit einer Nennspannung am Wandlereingang bis zu 500 V versorgt werden. Das an den Serienmotoren angewendete System sieht eine Phasenisolierung mittels Trennvorrichtungen vor, ebenso wie einen Emailldraht mit Grad 2 und Imprägnierungsharze in der Klasse H vor (Abdichtungsgrenze bei Spannungsimpuls 1600V Spitze-Spitze und Anstiegsfront $t_s > 0.1\mu s$ an den Motorklemmen). Die typischen Merkmale von Drehmoment/Geschwindigkeit im Betrieb S1 für Motoren mit einer Grundfrequenz $f_b = 50$ Hz werden in der Tab. (A54) angegeben. Bei Betriebsfrequenzen unter ungefähr 30 Hz müssen die selbstlüftenden Standardmotoren (IC411) aufgrund der in diesem Fall abnehmenden Belüftung entsprechend paarweise deklassiert, oder in Alternative, mit unabhängigen Servoventilatoren ausgestattet werden. Bei über der Grundfrequenz liegenden Frequenzen arbeitet der Motor,

Les moteurs électriques de la série BN et M peuvent être utilisés avec alimentation par variateur PWM, et tension nominale en entrée du convertisseur jusqu'à 500V. Le système adopté sur les moteurs de série prévoit l'isolation de phase avec des séparateurs, l'utilisation de fil émaillé niveau 2 et résines d'imprégnation de classe H (limite de maintien à l'impulsion de tension 1600V pic-pic et front de montée $t_s > 0.1\mu s$ aux bornes moteur). Les caractéristiques typiques couple/vitesse en service S1 pour moteur avec fréquence de base $f_b = 50$ Hz sont indiquées dans le tab. (A54).

Il sistema isolante sui motori di serie prevede l'isolamento di fase con separatori, l'utilizzo di filo smaltato in grado 2 e resine d'impragnazione in classe H (limite di tenuta all'impulso di tensione 1600V picco-picco e fronte di salita $t_s > 0.1\mu s$ ai morsetti motore).

Because ventilation is somewhat impaired in operation at lower frequencies (about 30 Hz), standard motors with incorporated fan (IC411) require adequate torque derating or - alternately - the addition of a separate supply fan cooling. Above base frequency, upon reaching the maximum output voltage of the inverter, the motor enters a steady-power field of operation, and shaft torque drops with ratio (f/f_b) .

Pour des fréquences de fonctionnement inférieures à environ 30 Hz, à cause de la diminution de la ventilation, les moteurs standards autoventilés (IC411) doivent être opportunément déclassés au niveau du couple ou, en alternative, doivent être équipés de servoventilateur indépendant. Pour des fréquences supérieures à la fréquence de base, une fois



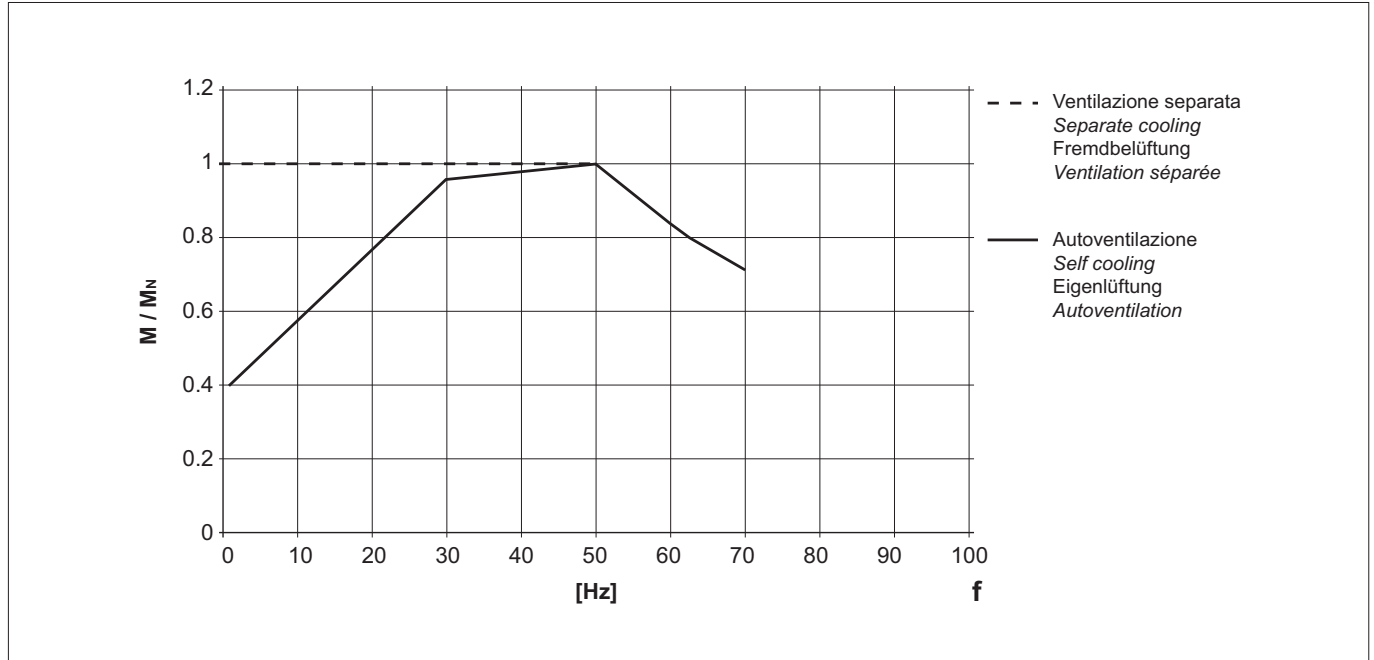
campo di funzionamento a potenza costante, con coppia all'albero che si riduce ca. con il rapporto (f/f_b) . Poiché la coppia massima del motore decresce ca. con $(f/f_b)^2$, il margine di sovraccarico ammesso dovrà essere progressivamente ridotto.

As motor maximum torque decreases with $(f/f_b)^2$, the allowed overloading must be reduced progressively.

nach Erreichen des max. Spannungswerts am Inverterausgang in einem Betriebsbereich unter konstanter Leistung mit einem Drehmoment an der Welle, der sich ungefähr im Verhältnis (f/f_b) reduziert. Da das max. Drehmoment des Motors mit ungefähr $(f/f_b)^2$ abnimmt, muss auch der zulässige Überbelastungsgrenzwert progressiv reduziert werden.

la valeur maximale de tension de sortie du variateur atteinte, le moteur fonctionne dans une plage de fonctionnement à puissance constante, avec couple à l'arbre qui se réduit avec le rapport (f/f_b) . Dans la mesure où le couple maximal du moteur diminue avec $(f/f_b)^2$, la marge de surcharge admise doit être progressivement réduite.

(A45)



Per funzionamento oltre la frequenza nominale, la velocità limite meccanica dei motori è riportata in tabella (A46):

Table (A46) reports the mechanical limit speed for motor operation above rated frequency:

Für einen Betrieb, der über die Nennfrequenz hinausgeht, wird die Geschwindigkeitsbegrenzung der Motoren in der Tabelle (A46) angegeben:

En cas de fonctionnement au-delà de la fréquence nominale, la vitesse limite mécanique des moteurs est indiquée dans le tableau (A46):

(A46)

		n [min ⁻¹]		
		2p	4p	6p
≤ BN 112	M05...M3	5200	4000	3000
BN 132...BN 200L	M4, M5	4500	4000	3000

A velocità superiori alla nominale i motori presentano maggiori vibrazioni meccaniche e rumorosità di ventilazione; è consigliabile, per queste applicazioni, un bilanciamento del rotore in grado B e l'eventuale montaggio del servoventilatore indipendente.

Above rated speed, motors generate increased mechanical vibration and fan noise. Class B rotor balancing is highly recommended in these applications. Installing a separate supply fan cooling may also be advisable.

Bei Geschwindigkeiten über die Nennwerte hinaus, weisen die Motoren höhere mechanische Schwingungen und mehr Funktionsgeräusche bei der Belüftung auf. Bei diesen Applikationen wird ein Auswuchten des Rotors im Grad B und eine eventuelle Montage des unabhängig funktionierenden Servoventilators empfohlen.

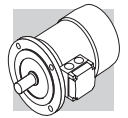
A des vitesses supérieures à la vitesse nominale, les moteurs présentent plus de vibrations mécaniques et de bruit de ventilation ; pour ces applications, il est conseillé d'effectuer un équilibrage du rotor en niveau B et de monter éventuellement un servoventilateur indépendant.

Il servoventilatore e, se presente, il freno elettromagnetico devono sempre essere alimentati direttamente da rete.

Remote-controlled fan and brake (if fitted) must always be connected direct to mains power supply.

Der Servoventilator und, falls vorhanden, die elektromagnetische Bremse müssen immer direkt über das Netz gespeist werden.

Le servoventilateur et, si présent, le frein électromagnétique doivent toujours être alimentés directement par le réseau.



Frequenza massima di avviamento Z

Nelle tabelle dei dati tecnici motori è indicata la max frequenza di inserzione a vuoto Z_0 con $I = 50\%$ riferita alla versione autofrenante. Questo valore definisce il numero max di avviamenti orari a vuoto che il motore può sopportare senza superare la max temperatura ammessa dalla classe di isolamento F. Nel caso pratico di motore accoppiato ad un carico esterno con potenza assorbita P_r , massa inerziale J_c e coppia resistente media durante l'avviamento M_L , il numero di avviamenti ammissibile si può calcolare in modo approssimato con la seguente formula:

Permissible starts per hour, Z

The rating charts of brakemotors lend the permitted number of starts Z_0 , based on 50% intermittence and for unloaded operation. The catalogue value represents the maximum number of starts per hour for the motor without exceeding the rated temperature for the insulation class F. To give a practical example for an application characterized by inertia J_c , drawing power P_r and requiring mean torque at start-up M_L the actual number of starts per hour for the motor can be calculated approximately through the following equation:

Maximale Schaltungshäufigkeit Z

In den Tabellen mit den Technischen Daten der Motoren ist die maximale Schaltungshäufigkeit im Leerlauf Z_0 bei relativer Einschaltdauer $I = 50\%$ bezüglich auf die Bremsausführung. Dieser Wert definiert die maximale Anzahl von Anfahrten im Leerlauf pro Stunde, die der Motor ertragen kann, ohne die durch die Isolierstoffklasse F festgelegte maximal zulässige Temperatur zu überschreiten. Im praktischen Fall eines mit einer externen Last verbundenen Motors mit einer Leistungsaufnahme von P_r , Trägheitsmasse J_c und mittlerem Gegenmoment während des Anfahrens von M_L kann die zulässige Anzahl Anfahrten mit folgender Formel approximativ berechnet werden:

Fréquence maximum de démarrage Z

Dans les tableaux des caractéristiques techniques des moteurs se trouve la fréquence maximum d'insertion à vide Z_0 avec intermittence $I = 50\%$ référée à la version frein. Cette valeur définit un nombre maximum de démarrages horaires à vide que le moteur peut supporter sans dépasser la température maximum admise par la classe d'isolation F. Dans le cas pratique de moteur accouplé à une charge extérieure avec puissance absorbée P_r , masse inertielle J_c et couple résistant moyen pendant le démarrage M_L , le nombre de démarrages admissible peut se calculer de façon approximative avec la formule suivante :

$$Z = \frac{Z_0 \cdot K_c \cdot K_d}{K_j}$$

dove:

$K_j = \frac{J_m + J_c}{J_m}$ = fattore di inerzia

$K_c = \frac{M_a - M_L}{M_a}$ = fattore di coppia

K_d = fattore di carico
vedi tabella (A47)

where:

$K_j = \frac{J_m + J_c}{J_m}$ = inertia factor

$K_c = \frac{M_a - M_L}{M_a}$ = torque factor

K_d = load factor
see table (A47)

wobei gilt:

$K_j = \frac{J_m + J_c}{J_m}$ = Trägheitsfaktor

$K_c = \frac{M_a - M_L}{M_a}$ = Drehmomentsfaktor

K_d = Lastfaktor
siehe Tabelle (A47)

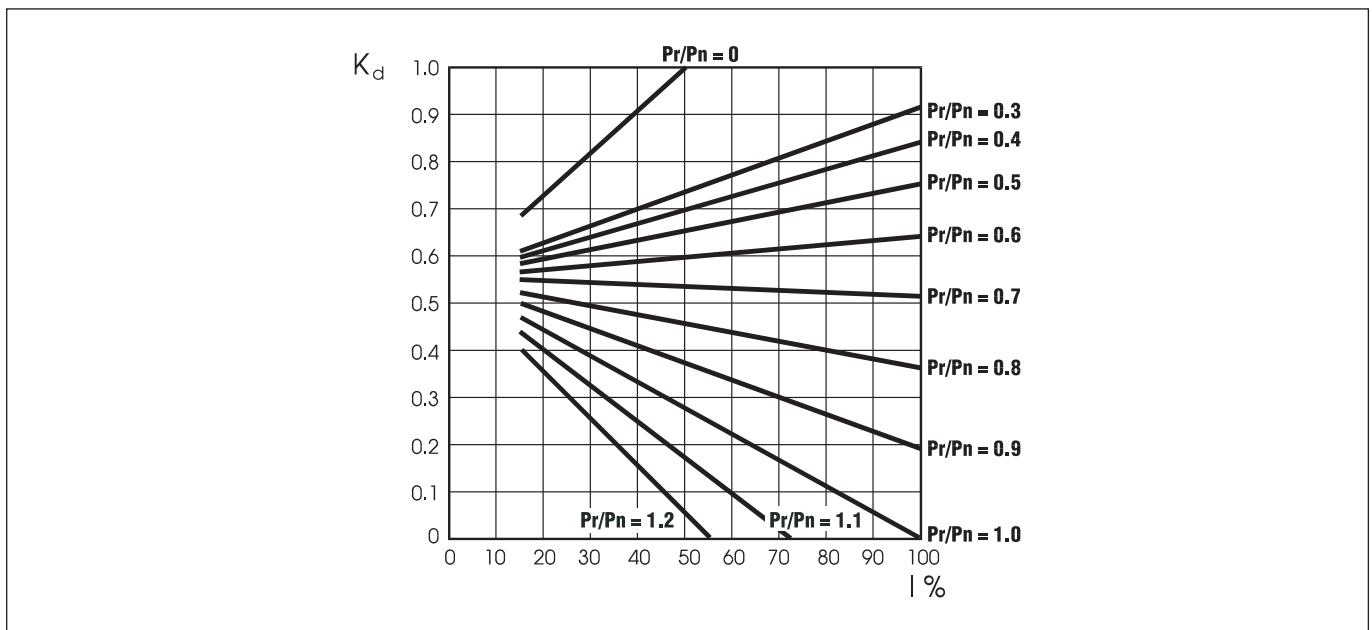
où:

$K_j = \frac{J_m + J_c}{J_m}$ = facteur d'inertie

$K_c = \frac{M_a - M_L}{M_a}$ = facteur de couple

K_d = facteur de charge
voir tableau (A47)

(A47)

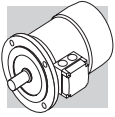


Con il numero di avviamenti così ottenuto si dovrà in seguito verificare che il massimo lavoro di frenatura sia compatibile con la capacità termica del freno W_{max} indicata nella tabella (A54).

If actual starts per hour is within permitted value (Z) it may be worth checking that braking work is compatible with brake (thermal) capacity W_{max} also given in table (A54) and dependent on the number of switches (c/h).

Auf Grundlage der so berechneten Anzahl Schaltungen muß man dann prüfen, ob die maximale Bremsarbeit mit der Wärmegrenzleistung der Bremse W_{max} kompatibel ist, die in die Tabelle (A54) angegeben ist.

Avec le nombre de démarrages ainsi obtenu, il faudra ensuite vérifier que le travail maximum de freinage soit compatible avec la capacité thermique du frein W_{max} indiquée dans le table (A54).



M5 - MOTORI ASINCRONI AUTOFRENANTI

Funzionamento

L'esecuzione autofrenante prevede l'impiego di freni a pressione di molle alimentati in c.c. (tipo FD) o in c.a. (tipo FA, BA). Tutti i freni funzionano secondo il principio di sicurezza, ossia intervengono in seguito alla pressione esercitata dalle molle, in mancanza di alimentazione.

M5 - ASYNCHRONOUS BRAKE MOTORS

Operation

Versions with incorporated brake use spring-applied DC (FD option) or AC (FA, BA options) brakes. All brakes are designed to provide fail-safe operation, meaning that they are applied by spring-action in the event of power failure.

M5 - DREHSTROMBREMSMOTOREN

Betriebsweise

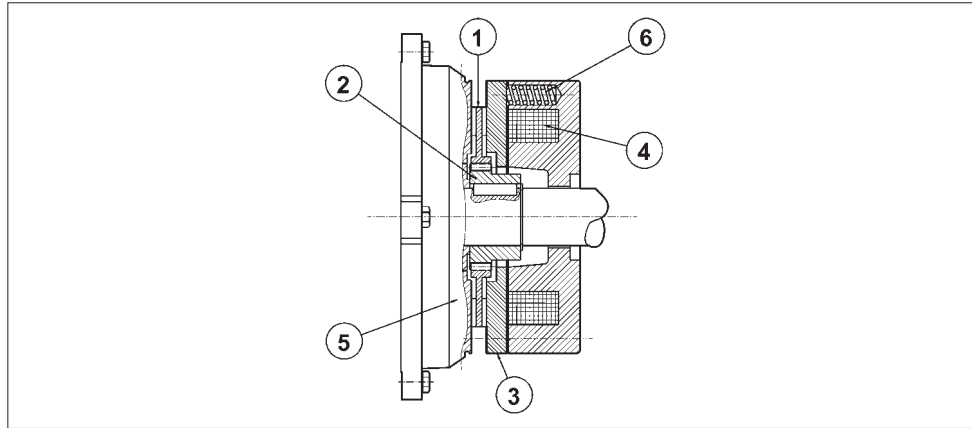
Die selbstbremsende Ausführung der Motoren sieht den Einsatz von Federdruckbremsen vor, die mit Gleichstrom (Typ FD) oder mit Wechselstrom (Typ FA, BA) gespeist werden. Alle Bremsen arbeiten gemäß dem Sicherheitsprinzip, d.h. sie greifen, im Fall eines Stromausfalls in Folge eines auf die Feder ausgeübten Drucks ein.

M5 - MOTEURS FREIN ASYNCHRONES

Fonctionnement

L'exécution avec frein prévoit l'utilisation de freins à pression de ressorts alimentés en c.c. (type FD) ou en c.a. (type FA, BA). Tous les freins fonctionnent selon le principe de sécurité, c'est-à-dire qu'ils interviennent suite à la pression exercée par les ressorts, en cas de coupure d'alimentation.

(A48)



Legenda:

- ① disco
- ② mozzo
- ③ áncora mobile
- ④ bobina
- ⑤ scudo post.motore
- ⑥ molle

Key:

- ① brake disc
- ② disc carrier
- ③ pressure plate
- ④ brake coil
- ⑤ motor rear shield
- ⑥ brake springs

Zeichenerklärung:

- ① Brems scheibe
- ② Nabe
- ③ Beweglicher Anker
- ④ Ringspule
- ⑤ Motorschild
- ⑥ Schußfedern

Légende:

- ① disque
- ② moyeu d'entraînement
- ③ disque de freinage
- ④ bobine de frein
- ⑤ flasque-frein
- ⑥ ressort de frein

In mancanza di tensione, l'ancora mobile spinta dalle molle di pressione blocca il disco freno tra la superficie dell'ancora stessa e lo scudo motore impedendo la rotazione dell'albero. Quando la bobina viene eccitata, l'attrazione magnetica esercitata sull'ancora mobile vince la reazione elastica delle molle e libera il disco freno, e conseguentemente l'albero motore con esso solidale.

When voltage is interrupted, pressure springs push the armature plate against the brake disc. The disc becomes trapped between the armature plate and motor shield and stops the shaft from rotation. When the coil is energized, a magnetic field strong enough to overcome spring action attracts the armature plate, so that the brake disc – which is integral with the motor shaft – is released.

Wenn die Spannungsversorgung abfällt, sorgt der bewegliche, von den Druckfedern geschobene Anker für die Blockierung der Bremsscheibe zwischen der Ankerfläche und dem Motorschild und blockiert damit den Rotor. Wird die Spule erregt, kommt es durch den magnetischen auf den beweglichen Anker wirkenden Anzug zur Überwindung der elastischen Federkraft und zum Lösen der Bremsscheibe, wodurch der rotor wieder freigegeben wird.

En cas de coupure de courant, l'armature mobile, poussée par les ressorts, bloque le disque de frein entre la surface de l'armature et le bouclier moteur en empêchant la rotation de l'arbre. Lorsque la bobine est excitée, l'attraction magnétique exercée sur l'armature mobile annule la réaction élastique des ressorts et libère le disque de frein, et par conséquent l'arbre moteur, qui est solidaire.

Caratteristiche generali

- Coppie frenanti elevate (generalmente $M_b \approx 2 M_n$) e regolabili.
- Disco freno con anima in acciaio a doppia guarnizione d'attrito (materiale a bassa usura, senza amianto).
- Cava esagonale sull'albero motore, lato ventola (N.D.E.), per rotazione manuale (non prevista quando sono presenti le opzioni PS, RC, TC, U1, U2, EN1, EN2, EN3).
- Sblocco meccanico manuale.
- Trattamento anticorrosivo di tutte la superfici del freno.
- Isolamento in classe F

Most significant features

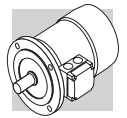
- High braking torques (normally $M_b \approx 2 M_n$), braking torque adjustment.
- Steel brake disc with double friction lining (low-wear, asbestos-free lining).
- Hexagonal seat on motor shaft fan end (N.D.E.) for manual rotation (not compatible with options PS, RC, TC, U1, U2, EN1, EN2, EN3).
- Manual release lever.
- Corrosion-proof treatment on all brake surfaces.
- Insulation class F

Allgemeine Eigenschaften

- Hohe und regulierbare Bremsmomente (allgemein $M_b \approx 2 M_n$).
- Bremsscheibe mit Stahlkern und doppeltem Bremsbelag (Material mit geringem Verschleiß, asbestfrei).
- Sechskant hinten an der Motorwelle, auf Lüfterradseite (N.D.E.), für eine manuelle Drehung des Rotors mit einem Inbusschlüssel. (nicht lieferbar, wenn die Optionen PS, RC, TC, U1, U2, EN1, EN2, EN3) bestellt wurden.
- Manuell zu betätigende, mechanische Bremslüftvorrichtung.
- Korrosionsschutzbehandlung an allen Flächen der Bremse.
- Isolierung in Klasse F

Caractéristiques générales

- Couples de freinage élevés (généralement $M_b \approx 2 M_n$) et réglables.
- Disque de frein avec structure en acier à double garniture de frottement (matière à faible usure, sans amiante).
- Empreinte hexagonale sur l'arbre moteur, côté ventilateur (N.D.E.), pour la rotation manuelle (non prévue en cas de présence des options PS, RC, TC, U1, U2, EN1, EN2, EN3).
- Déblocage mécanique manuel.
- Traitement anticorrosion sur toute la surface du frein.
- Isolation en classe F



**M6 - MOTORI AUTOFRENANTI
IN C.C., TIPO BN_FD**

**M6 - DC BRAKE MOTORS
TYPE BN_FD**

**M6 - DREHSTROMBREMSMO-
TOREN MIT GLEICH-
STROMBREMSE: TYP
BN_FD**

**M6 - MOTEURS FREIN EN C.C.,
TYPE BN_FD**

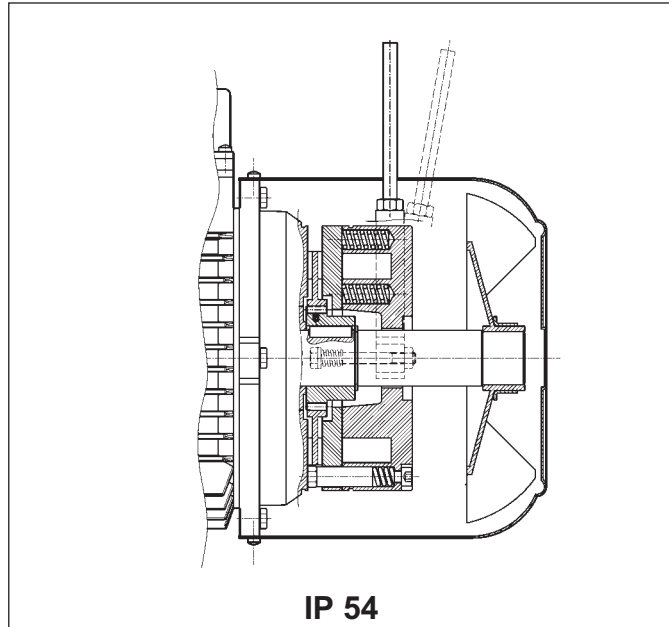
Grandezze: BN 63 ... BN 200L

Frame sizes: BN 63 ... BN 200L

Baugrößen: BN 63 ... BN 200L

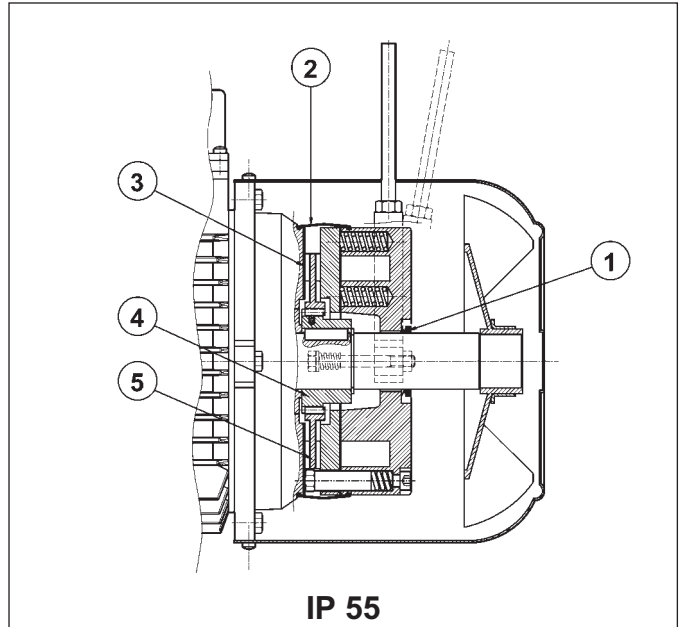
Tailles : BN 63 ... BN 200L

(A49)



IP 54

(A50)



IP 55

Freno elettromagnetico con bobina toroidale in **corrente continua** fissato con viti allo scudo motore; le molle di precarico realizzano il posizionamento assiale del corpo magnete.

Il disco freno è scorrevole sul mozzo trascinatore in acciaio calettato sull'albero e previsto di molla antivibrazione.

I motori sono forniti con freno tarato in fabbrica al valore di coppia riportato nelle tabelle dati tecnici; la coppia frenante può essere regolata modificando il tipo e/o il numero delle molle.

A richiesta, i motori possono essere previsti di leva per lo sblocco manuale con ritorno automatico (**R**) o con mantenimento della posizione di rilascio freno (**RM**); per la posizione angolare della leva di sblocco vedi descrizione della relativa variante alla pag. 420.

Il freno FD garantisce elevate prestazioni dinamiche e bassa rumorosità; le caratteristiche d'intervento del freno in corrente continua possono essere ottimizzate in funzione dell'applicazione, utilizzando i vari tipi di alimentatore disponibili e/o realizzando l'opportuno cablaggio.

Direct current toroidal-coil electromagnetic brake bolted onto motor shield. Preloading springs provide axial positioning of magnet body.

Brake disc slides axially on steel hub shrunk onto motor shaft with anti-vibration spring.

Brake torque factory setting is indicated in the corresponding motor rating charts. Braking torque may be modified by changing the type and/or number of springs.

At request, motors may be equipped with manual release lever with automatic return (**R**) or system for holding brake in the released position (**RM**). See variant at page 420 for available release lever locations.

FD brakes ensure excellent dynamic performance with low noise. DC brake operating characteristics may be optimized to meet application requirements by choosing from the various rectifier/power supply and wiring connection options available.

Elektromagnetische Bremse mit Ringwicklungsspule für **Gleichstromspannung**, die mittels Schrauben am hinteren Motorschild befestigt ist. Die Federn sorgen für die axiale Ausrichtung des Magnetkörpers.

Die Bremsscheibe gleitet axial auf der Mitnehmernabe aus Stahl, die über eine Paßfeder mit der Motorwelle verbunden und mit einer Schwingungsdämpfung ausgestattet ist.

Die Motoren werden vom Hersteller auf den in der Tabelle der technischen Daten angegebenen Bremsmoment eingestellt; das Bremsmoment kann durch das Ändern des Typs und/oder der Anzahl der Federn reguliert werden.

Auf Anfrage können die Motoren mit einem Bremslüfthebel für die manuelle Lüftung der Bremse mit selbstständiger Rückstellung (**R**) ohne Arretierung oder mit arretierbarem Lüfthebel (**RM**) geliefert werden. Die Festlegung der Position des Bremslüfthebel in Abhängigkeit von der Klemmkastenlage erfolgt durch die Option auf Seite 420.

Die Bremse vom Typ FD garantiert hohe dynamische Leistungen und niedrige Laufgeräusche. Die Ansprechigenschaften der Bremse unter Gleichstrom können in Abhängigkeit zur jeweiligen Anwendung durch den Einsatz der verschiedenen verfügbaren Gleichrichter oder durch eine entsprechenden Anschluß der Bremse optimiert werden.

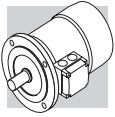
Frein électromagnétique avec bobine toroïdale en **courant continu**, fixé avec des vis au bouclier moteur; les ressorts de précharge réalisent le positionnement axial de la bobine.

Le disque frein coulisse de façon axiale sur le moyeu d'entraînement en acier calé sur l'arbre et doté de ressort antivibration.

Les moteurs sont fournis avec frein pré réglé en usine à la valeur de couple indiquée dans les tableaux des caractéristiques techniques; le couple de freinage peut être réglé en modifiant le type et/ou le nombre de ressorts.

Sur demande, les moteurs peuvent être équipés de levier pour le déblocage manuel avec retour automatique (**R**) ou avec maintien de la position de déblocage frein (**RM**); pour la position angulaire du levier de déblocage, voir description de la variante correspondante à la page 420.

Le frein FD garantit des performances dynamiques élevées et un faible niveau de bruit; les caractéristiques d'intervention du frein en courant continu peuvent être optimisées en fonction de l'application en utilisant les différents types de dispositifs d'alimentation disponibles et/ou en réalisant un câblage approprié.



Grado di protezione

L'esecuzione standard prevede il grado di protezione IP54. In opzione il motore autofrenante tipo FD viene fornito con grado di protezione **IP 55**, prevedendo le seguenti varianti costruttive:

- ① anello V-ring posizionato sull'albero motore N.D.E.
- ② fascia di protezione in gomma
- ③ anello in acciaio inox interposto tra scudo motore e disco freno
- ④ mozzo trascinatore in acciaio inox
- ⑤ disco freno in acciaio inox

Degree of protection

Standard protection class is IP54.

Brake motor FD is also available in protection class **IP 55**, which mandates the following variants:

- ① V-ring at N.D.E. of motor shaft
- ② dust and water-proof rubber boot
- ③ stainless steel ring placed between motor shield and brake disc
- ④ stainless steel hub
- ⑤ stainless steel brake disc

Schutzart

Die Standardausführung ist Schutzart IP54 vor. Optional kann der Bremsmotor vom Typ FD in der Schutzart **IP 55** geliefert werden, wobei sind folgende Komponenten eingesetzt werden:

- ① V-Ring an der Motorwelle N.D.E.
- ② Schutzring aus Gummi
- ③ Ring aus rostfreiem Stahl zwischen Motorschild und
- ④ Bremsscheibe Mitnehmer-nabe aus rostfreiem Stahl
- ⑤ Bremsscheibe aus rostfreiem Stahl

Degré de protection

L'exécution standard prévoit le degré de protection IP54.

En option, le moteur frein type FD est fourni avec degré de protection **IP 55**, en prévoyant les variantes de construction suivantes :

- ① bague V-ring positionnées sur l'arbre moteur N.D.E.
- ② bande de protection en caoutchouc
- ③ bague en acier inox interposée entre le bouclier moteur et le disque de frein
- ④ moyeu d'entraînement en acier inox
- ⑤ disque frein en acier inox

Alimentazione freno FD

L'alimentazione della bobina freno in c.c. è prevista per mezzo di opportuno raddrizzatore montato all'interno della scatola coprimorsetti e già cablato alla bobina del freno.

Per motori a singola polarità è inoltre previsto di serie il collegamento del raddrizzatore alla morsettiera motore.

Indipendentemente dalla frequenza di rete, la tensione standard di alimentazione del raddrizzatore V_B ha il valore indicato nella tabella (A51) qui di seguito:

FD brake power supply

A rectifier accommodated inside the terminal box feeds the DC brake coil. Wiring connection across rectifier and brake coil is performed at the factory.

On all single-pole motors, rectifier is connected to the motor terminal board.

Rectifier standard power supply voltage V_B is as indicated in the following table (A51), regardless of mains frequency:

Spannungsversorgung der Bremse FD

Die Versorgung der Gleichstrombremsspule erfolgt über einen Gleichrichter im Klemmenkasten der bei Lieferung, wenn nicht anders bestellt, bereits mit der Bremsspule verkabelt ist.

Bei den einpoligen Motoren ist serienmäßig der Anschluss des Gleichrichters an die Motorspannung vorgesehen. Unabhängig von der Netzfrequenz erfolgt die Versorgung des Gleichrichters V_B über die in der nachstehenden Tabelle (A51) angegebenen Standardspannung:



Alimentation frein FD

L'alimentation de la bobine de frein en c.c. est prévue au moyen d'un redresseur approprié monté à l'intérieur de la boîte à bornes et déjà câblé à la bobine de frein.

De plus, pour les moteurs à simple polarité, le raccordement du redresseur au bornier moteur est prévu de série.

Indépendamment de la fréquence du réseau, la tension standard d'alimentation du redresseur V_B correspond à la valeur indiquée dans le tableau (A51) ci-dessous :

(A51)

2, 4, 6 P				1 speed	
		BN_FD / M_FD		alimentazione freno da morsettiera brake connected to terminal board power supply Bremsversorgung über die Motorspannung Alimentation frein depuis boîte à bornes	alimentazione separata separate power supply Separate Versorgung Alimentation séparée
		$V_{mot} \pm 10\%$ 3 ~	$V_B \pm 10\%$ 1 ~		
BN 63...BN 132	M05...M4LB	230/400 V – 50 Hz	230 V	standard	specificare $V_B SA$ o $V_B SD$ specify $V_B SA$ or $V_B SD$ $V_B SA$ oder $V_B SD$ angeben spécifier $V_B SA$ ou $V_B SD$
BN 160...BN 200	M4LC...M5	400/690 V – 50 Hz	400 V	standard	specificare $V_B SA$ o $V_B SD$ specify $V_B SA$ or $V_B SD$ $V_B SA$ oder $V_B SD$ angeben spécifier $V_B SA$ ou $V_B SD$




Per i motori a doppia polarità l'alimentazione standard del freno è da linea separata con tensione d'ingresso al raddrizzatore V_B come indicato in tabella (A52):

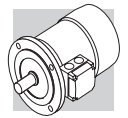
Switch-pole motors feature a separate power supply line for the brake with rectifier input voltage V_B as indicated in the table (A52):

Die polumschaltbaren Motoren müssen immer mit separater Bremsversorgungsspannung betrieben werden, deshalb erfolgt die Lieferung standardmäßig ohne Anschluß der Bremse an die Motorspannung, da diese mit einer am Eingang des Gleichrichters V_B anliegenden Spannung versorgt werden muß, entsprechend Werte in der nachstehenden Tabelle (A52):

Pour les moteurs à double polarité, l'alimentation standard du frein dérive d'une ligne séparée avec tension d'entrée au redresseur V_B comme indiqué dans le tableau (A52) :

(A52)

2/4, 2/6, 2/8, 2/12, 4/6, 4/8 P				2 speed	
		BN_FD / M_FD		alimentazione freno da morsettiera brake powered via terminal board Bremsversorgung über die Motorspannung Alimentation frein depuis boîte à bornes	alimentazione separata separate power supply Separate Versorgung Alimentation séparée
		$V_{mot} \pm 10\%$ 3 ~	$V_B \pm 10\%$ 1 ~		
BN 63...BN 132	M05...M4LB	400 V – 50 Hz	230 V		specificare $V_B SA$ o $V_B SD$ specify $V_B SA$ or $V_B SD$ $V_B SA$ oder $V_B SD$ angeben spécifier $V_B SA$ ou $V_B SD$



Il raddrizzatore è del tipo a diodi a semionda ($V_{c.c} \approx 0,45 \times V_{c.a.}$) ed è disponibile nelle versioni **NB**, **SB**, **NBR** e **SBR**, come dettagliato nella tabella (A53) seguente:

The diode half-wave rectifier ($V_{DC} \approx 0,45 \times V_{AC}$) is available in versions **NB**, **SB**, **NBR** e **SBR**, as detailed in the table (A53) below:

Bei dem Gleichrichter handelt es sich um einen Typ mit Halbwel-lendioden ($V_{c.c} \approx 0,45 V_{c.a.}$). Er ist in den Versionen **NB**, **SB**, **NBR** und **SBR**, gemäß den Details in der nachstehenden Tabelle (A53), verfügbar:

Le redresseur est du type à diodes à demi-onde ($V_{c.c} \approx 0,45 \times V_{c.a.}$) et il est disponible dans les versions **NB**, **SB**, **NBR** et **SBR**, comme indiqué de façon détaillée dans le tableau (A53) suivant :

(A53)

		freno brake Bremsse frein				
			standard	a richiesta at request auf Anfrage Sur demande		
BN 63	M05	FD 02				
BN 71	M1	FD 03				
		FD 53				
BN 80	M2	FD 04				
BN 90S	—	FD 14				
BN 90L	—	FD 05				
BN 100	M3	FD 15				
—		FD 55				
BN 112	—	FD 06S				
BN 132...160MR	M4	FD 56				
BN 160L - BN 180M	M5	FD 06				
BN 180L - NM 200L	—	FD 07				

(*) $t_{2c} < t_{2r} < t_2$

Il raddrizzatore **SB** a controllo elettronico dell'eccitazione, riduce i tempi di sblocco del freno sovraccitando l'elettromagnete nei primi istanti d'inserzione, per passare poi al normale funzionamento a semionda a distacco del freno avvenuto.

Rectifier **SB** with electronic energizing control over-energizes the electromagnet upon power-up to cut brake release response time and then switches to normal half-wave operation once the brake has been released.

Der Gleichrichter **SB** mit elektronischer Kontrolle der Erregung reduziert die Bremslösezeiten, indem er die Bremsspule in den ersten Momenten der Einschaltung übermäßig erregt, um dann, nach erfolgter Bremslösung, in die normale Halbwellenfunktion umzuschalten.

Le redresseur **SB** à contrôle électronique de l'excitation réduit les temps de déblocage du frein en surexcitant l'électro-aimant durant les premiers instants d'enclenchement pour passer ensuite au fonctionnement normal à demi-onde une fois le frein désactivé.

L'impiego del raddrizzatore tipo **SB** è sempre da prevedere nei casi di:

Use of the **SB** rectifier is mandatory in the event of:

Der Einsatz eines Gleichrichters vom Typ **SB** wird in folgenden Fällen empfohlen:

L'utilisation du redresseur type **SB** doit toujours être prévue dans les cas suivants :

- elevato numero di interventi orari
- tempi di sblocco freno ridotti
- elevate sollecitazioni termiche del freno

- high number of operations per hour
- reduced brake release response time
- brake is exposed to extreme thermal stress

- hohe Anzahl von Schaltungen pro Stunde
- schnelle Bremsansprechzeiten
- starke thermische Beanspruchungen der Bremse

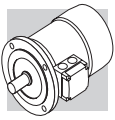
- nombre d'interventions horaires élevé
- temps de déblocage frein réduits
- sollicitations thermiques du frein élevées

Per applicazioni dove è richiesto un rapido rilascio del freno sono disponibili a richiesta i raddrizzatori **NBR** o **SBR**. Questi raddrizzatori completano i tipi **NB** e **SB**, integrando nel cir-

Rectifiers **NBR** or **SBR** are available for applications requiring quick brake release response. These rectifiers complement the **NB** and **SB** types as their elec-

Für die Anwendungen, bei denen eine schnelle Ansprechzeit der Bremse gefordert wird, können auf Anfrage die Gleichrichter **NBR** oder **SBR** geliefert werden. Diese Gleichrichter erweitern die

Pour les applications nécessitant un déblocage rapide du frein, sur demande les redresseurs **NBR** ou **SBR** sont disponibles. Ces redresseurs complètent les types **NB** et **SB**, en intégrant



cuito elettronico un interruttore statico che interviene diseccando rapidamente il freno in caso di mancanza di tensione.

Questa soluzione consente di ridurre i tempi di rilascio del freno evitando ulteriori cablaggi e contatti esterni.

Per il migliore utilizzo dei raddrizzatori **NBR** e **SBR** è richiesta l'alimentazione separata del freno.

Tensioni disponibili: 230V ± 10%, 400V ± 10%, 50/60 Hz.

tronic circuit incorporates a static switch that de-energizes the brake quickly in the event voltage is missing.

This arrangement ensures short brake release response time with no need for additional external wiring and contacts.

*Optimum performance of rectifiers **NBR** and **SBR** is achieved with separate brake power supply.*

Available voltages: 230V ± 10%, 400V ± 10%, 50/60 Hz.

Funktion der Typen **NB** und **SB**, indem in dem elektronischen Schaltkreis ein statischen Schalter integriert ist, durch dessen Auslösen die Bremse im Fall eines Spannungsausfalls schnell abgeregt wird.

Diese Lösung ermöglicht eine Verringerung der Ansprechzeiten der Bremse, wodurch weitere Schaltungen und externe Sensoren vermieden werden können.

Im Hinblick auf einen besseren Einsatz der Gleichrichter **NBR** und **SBR** ist bei der Bremse eine separate Versorgung erforderlich. Verfügbare Spannungen: 230V ± 10%, 400V ± 10%, 50/60 Hz.

dans le circuit électronique un interrupteur statique qui intervient en désexcitant rapidement le frein en cas de coupure de tension.

Cette solution permet de réduire les temps de déblocage du frein en évitant d'autres câblages et contacts extérieurs.

*Pour une meilleure utilisation des redresseurs **NBR** et **SBR** l'alimentation séparée du frein est nécessaire.*

Tensions disponibles : 230V ± 10%, 400V ± 10%, 50/60 Hz.

Dati tecnici freni FD

Nella tabella (A54) sottostante sono riportati i dati tecnici dei freni in c.c. tipo FD.

(A54)

FD brake technical specifications

The table (A54) below reports the technical specifications of DC brakes FD.

Technische Daten - Bremstyp FD

In der nachstehenden Tabelle (A54) werden die technischen Daten der Gleichstrombremsen vom Typ FD angegeben.

Caractéristiques techniques freins FD

Le tableau (A54) suivant indique les caractéristiques techniques des freins en c.c. type FD.

Freno Brake Bremse Frein	Coppia frenante M_b [Nm] Brake torque M_b [Nm] Bremsmoment M_b [Nm] Couple de freinage M_b [Nm]			Rilascio Release Ansprchzeit Déblocage		Frenatura Braking Bremmung Freinage		Wmax per frenata Wmax per brake operation Wmax pro Bremsung Wmax par freinage			W	P
	molle / springs feder / ressorts			t_1	t_{1s}	t_2	t_{2c}	[J]				
	6	4	2	[ms]	[ms]	[ms]	[ms]	10 s/h	100 s/h	1000 s/h		
FD02	—	3.5	1.75	30	15	80	9	4500	1400	180	15	17
FD03	5	3.5	1.75	50	20	100	12	7000	1900	230	25	24
FD53	7.5	5	2.5	60	30	100	12					
FD04	15	10	5	80	35	140	15	10000	3100	350	30	33
FD14												
FD05	40	26	13	130	65	170	20	18000	4500	500	50	45
FD15	40	26	13	130	65	170	20					
FD55	55	37	18	—	65	170	20					
FD06S	60	40	20	—	80	220	25	20000	4800	550	70	55
FD56	—	75	37	—	90	150	20	29000	7400	800	80	65
FD06		100	50		—	100	150					
FD07	150	100	50	—	120	200	25	40000	9300	1000	130	65
FD08*	250	200	170	—	140	350	30	60000	14000	1500	230	100
FD09**	400	300	200	—	200	450	40	70000	15000	1700	230	120

* valori di coppia frenante ottenuti con n° 9, 7, 6 molle rispettivamente

* *brake torque values obtained with 9, 7 and 6 springs, respectively*

* Werte, der durch den Einsatz von jeweils 9, 7, 6 Federn erreichten Bremsmomente

* *valeurs de couple de freinage obtenues respectivement avec n° 9, 7, 6 ressorts*

** valori di coppia frenante ottenuti con n° 12, 9, 6 molle rispettivamente

** *brake torque values obtained with 12, 9 and 6 springs, respectively*

** Werte, der durch den Einsatz von jeweils 12, 9, 6 Federn erreichten Bremsmomente

** *valeurs de couple de freinage obtenues respectivement avec n° 12, 9, 6 ressorts*

Legenda:

t_1 = tempo di rilascio del freno con alimentatore a semionda

t_{1s} = tempo di rilascio del freno con alimentatore a controllo elettronico dell'eccitazione

t_2 = ritardo di frenatura con interruzione lato c.a. e alimentazione separata

t_{2c} = ritardo di frenatura con interruzione lato c.a.e c.c. — I valori di t_1 , t_{1s} , t_2 , t_{2c} indicati nella tab. (A54) sono riferiti al freno tarato alla coppia massima, trafero medio e tensione nominale

W_{max} = energia max per frenata

W = energia di frenatura tra due regolazioni successive del trafero

P_b = potenza assorbita dal freno a 20°C

M_b = coppia frenante statica (±15%)

s/h = avviamenti orari

Key:

t_1 = *brake release time with half-wave rectifier*

t_{1s} = *brake release time with over-energizing rectifier*

t_2 = *brake engagement time with AC line interruption and separate power supply*

t_{2c} = *brake engagement time with AC and DC line interruption — Values for t_1 , t_{1s} , t_2 , t_{2c} indicated in the tab. (A54) are referred to brake set at maximum torque, medium air gap and rated voltage*

W_{max} = *max energy per brake operation*

W = *braking energy between two successive air gap adjustments*

P_b = *brake power absorption at 20 °C*

M_b = *static braking torque (±15%)*

s/h = *starts per hour*

Zeichenerklärung:

t_1 = *Ansprchzeit der Bremse mit Halbwellengleichrichter*

t_{1s} = *Ansprchzeit der Bremse mit elektronisch gesteuerten Erregungsgleichrichter*

t_2 = *Bremsverzögerung mit Unterbrechung auf Wechselstromseite und Fremdversorgung*

t_{2c} = *Bremsverzögerung mit Unterbrechung auf Wechselstrom- und Gleichstromseite — Die in der Tab. (A54) angegebenen Werte t_1 , t_{1s} , t_2 , t_{2c} beziehen sich auf eine auf das max. Bremsmoment geeichte Bremse, mit mittlerem Luftspalt und Nennspannung*

W_{max} = *max. Energie pro Bremsung*

W = *Bremsenergie zwischen zwei Einstellungen des Luftspalts*

P_b = *bei 20 ° C von der Bremse aufgenommene Leistung (50 Hz)*

M_b = *statisches Bremsmoment (±15%)*

s/h = *Einschaltungen pro stunde*

Légende:

t_1 = *temps de déblocage du frein avec dispositif d'alimentation à demi-onde*

t_{1s} = *temps de déblocage du frein avec dispositif d'alimentation à contrôle électronique de l'excitation*

t_2 = *retard de freinage avec interruption côté c.a. et alimentation séparée*

t_{2c} = *retard de freinage avec interruption côté c.a. et c.c. — Les valeurs de t_1 , t_{1s} , t_2 , t_{2c} indiquées dans le tab. (A54) se réfèrent au frein étaloné au couple maximal, entrefer moyen et tension nominale*

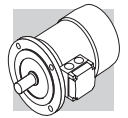
W_{max} = *énergie max. par freinage*

W = *énergie de freinage entre deux réglages successifs de l'entrefer*

P_b = *puissance absorbée par le frein à 20 °C*

M_b = *couple de freinage statique (±15%)*

s/h = *démarrages horaires*



Collegamenti freno FD

I motori standard ad una velocità sono forniti con il collegamento del raddrizzatore alla morsetteria motore già realizzato in fabbrica. Per motori a 2 velocità, e dove è richiesta l'alimentazione del freno separata, prevedere il collegamento al raddrizzatore in accordo alla tensione freno V_B indicata nella targhetta del motore. **Data la natura induttiva del carico, per il comando del freno e per l'interruzione lato corrente continua devono essere utilizzati contatti con categoria d'impiego AC-3 secondo IEC 60947-4-1.**

Tabella (A55) - Alimentazione freno dai morsetti motore ed interruzione lato a.c.

Tempo di arresto t_2 ritardato e funzione delle costanti di tempo del motore. Da prevedere quando sono richiesti avviamenti/arresti progressivi.

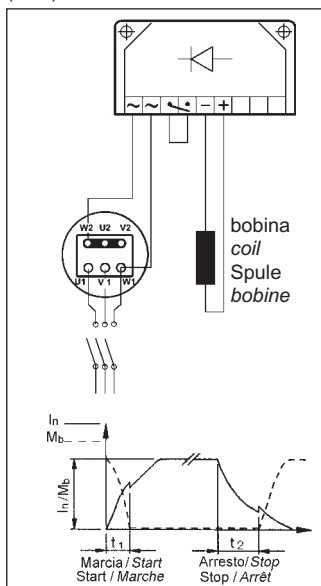
Tabella (A56) - Bobina freno con alimentazione separata ed interruzione lato c.a.

Tempo di arresto normale ed indipendente dal motore. Si realizzano i tempi di arresto t_2 indicati nella tabella (A54).

Tabella (A57) - Bobina freno con alimentazione dai morsetti motore ed interruzione lato c.a. e c.c.

Arresto rapido con i tempi d'intervento t_{2c} indicati in tabella (A54).

(A55)



Le tabelle da (A55) a (A58) riportano gli schemi tipici di collegamento per alimentazione 400 V, motori 230/400V collegati a stella e freno 230 V.

FD brake connections

On standard single-pole motors, the rectifier is connected to the motor terminal board at the factory.

For switch-pole motors and where a separate brake power supply is required, connection to rectifier must comply with brake voltage V_B stated in motor name plate.

Because the load is of the inductive type, brake control and DC line interruption must use contacts from the usage class AC-3 to IEC 60947-4-1.

Table (A55) - Brake power supply from motor terminals and AC line interruption

Delayed stop time t_2 and function of motor time constants. Mandatory when soft-start/stops are required.

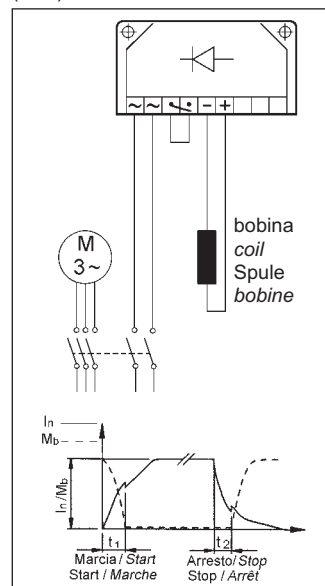
Table (A56) - Brake coil with separate power supply and AC line interruption

Normal stop time independent of motor. Achieved stop times t_2 are indicated in the table (A54).

Table (A57) - Brake coil power supply from motor terminals and AC/DC line interruption. Quick stop with operation times t_{2c} as per table (A54).

Table (A58) - Brake coil with separate power supply and AC/DC line interruption. Stop time decreases by values t_{2c} indicated in the table (A54).

(A56)



Tables (A55) through (A58) show the typical connection diagrams for 400 V power supply, star-connected 230/400V motors and 230 V brake.

Anschlüsse - Bremstyp FD

Die einpoligen Motoren werden vom Werk ab mit an die Motorspannung angeschlossenem Gleichrichter geliefert.

Für die polumschaltbaren Motoren, und Bremse mit separater Versorgung, wird in Übereinstimmung mit der auf dem Typenschild des Motors angegebenen Bremsspannung V_B der Anschluss an den Gleichrichter vorgesehen.

Da es sich bei der Bremsleistung um eine induktive Kraft handelt, müssen gemäß IEC 60947-4-1 für die Steuerung der Bremse und die Unterbrechung der Gleichstromseite Kontakte der Kategorie AC-3 verwendet werden.

Tabelle (A55) - Bremsversorgung über die Motorspannung und Unterbrechung der Wechselstromseite.

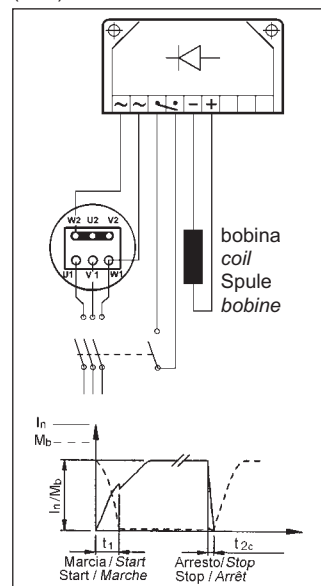
Verzögerter und von den Zeitkonstanten des Motors abhängige Haltezeit t_2 . Vorzusehen, wenn progressive Starts/Stops erforderlich sind.

Tabelle (A56) - Bremsspule mit separater Spannungsversorgung und Unterbrechung der Wechselstromseite. Normale und vom Motor unabhängige Stoppzeiten. Es werden die in der Tabelle (A54) angegebenen Stoppzeiten t_2 realisiert.

Tabelle (A57) - Bremsspule mit Versorgung über die Motorspannung und Unterbrechung der Gleich- und der Wechselstromseite. Schneller Stopp mit den in der Tabelle (A54) angegebenen Ansprechzeiten t_{2c} .

Tabelle (A58) - Bremsspule mit separater Spannungsversorgung und Unterbrechung der Gleich- und der Wechselstromseite. Reduzierte Stoppzeiten der in der Tabelle (A54) angegebenen Werte t_{2c} .

(A57)



In den Tabellen (A55) bis (A58) werden die typischen Schaltungen für Versorgung mit 400 V, Motoren 230/400V mit Sternschaltung und einer Bremsspannung von 230 V wiedergegeben.

Raccordements frein FD

Les moteurs standard à une vitesse sont fournis avec le raccordement du redresseur au bornier moteur déjà réalisé en usine.

Pour les moteurs à 2 vitesses, et lorsqu'une alimentation séparée du frein est requise, prévoir le raccordement au redresseur conformément à la tension frein V_B indiquée sur la plaque signalétique du moteur.

Etant donné la nature inductive de la charge, pour la commande du frein et l'interruption côté courant continu, il est nécessaire d'utiliser des contacts avec catégorie d'utilisation AC-3 selon la norme IEC 60947-4-1.

Tableau (A55) - Alimentation frein depuis bornes moteur et interruption côté c.a.

Temps d'arrêt t_2 retardé et fonction des constantes de temps du moteur. A prévoir lorsque des démarrages/arrests progressifs sont requis.

Tableau (A56) - Bobine de frein avec alimentation séparée et interruption côté c.a.

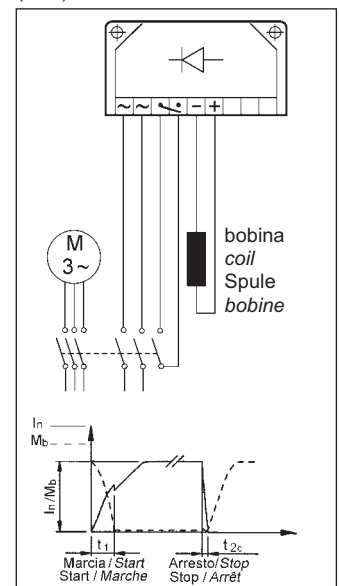
Temps d'arrêt normal et indépendant du moteur. Les temps d'arrêts t_2 sont ceux indiqués dans le tableau (A54).

Tableau (A57) - Bobine de frein avec alimentation depuis les bornes moteur et interruption côté c.a. et c.c.

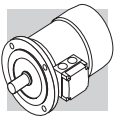
Arrêt rapide avec les temps d'intervention t_{2c} indiqués dans le tableau (A54).

Tableau (A58) - Bobine de frein avec alimentation séparée et interruption côté c.a. et c.c. Temps d'arrêt réduit selon les valeurs t_{2c} indiquées dans le tableau (A54).

(A58)



Les tableaux de (A55) à (A58) indiquent les schémas typiques de branchement pour une alimentation de 400 V, moteurs 230/400V raccordés en étoile et frein 230 V.



**M7 - MOTORI AUTOFRENANTI
IN C.A., TIPO BN_FA**

**M7 - AC BRAKE MOTORS
TYPE BN_FA**

**M7 - WECHSELSTROM-
BREMSMOTOREN-TYP
BN_FA**

**M7 - MOTEURS FREIN EN C.A.,
TYPE BN_FA**

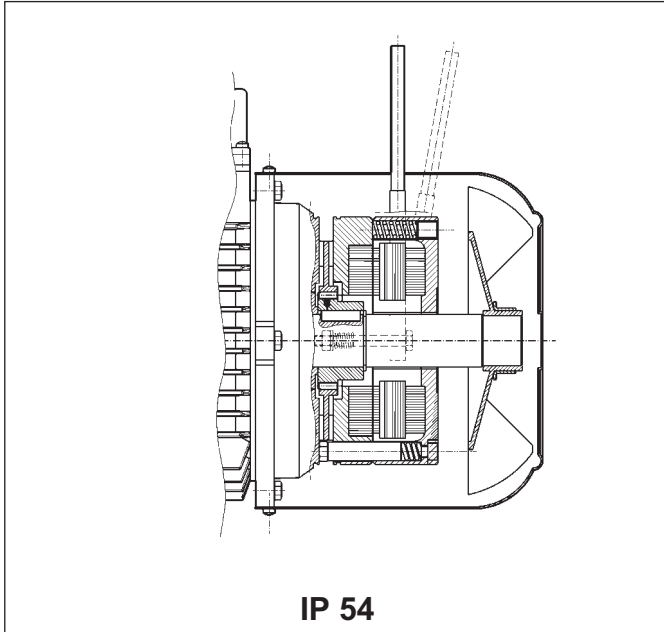
Grandezze: BN 63 ... BN 180M

Frame sizes: BN 63 ... BN 180M

Baugrößen: BN 63 ... BN 180M

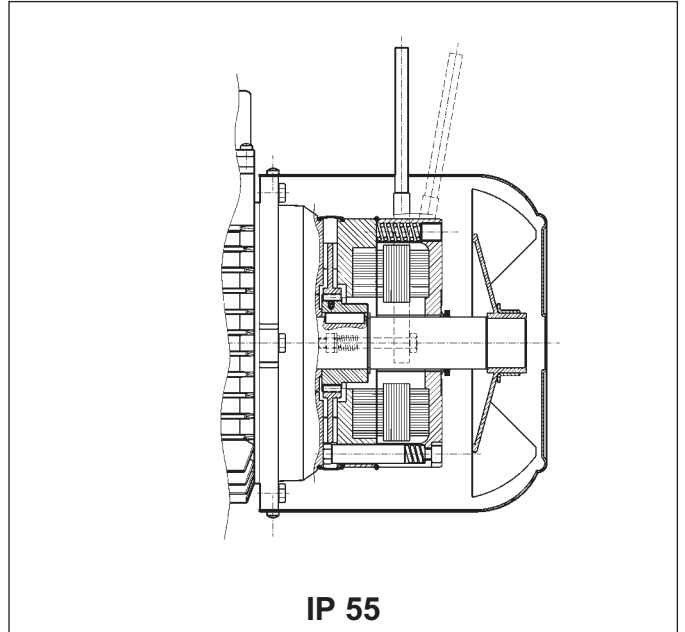
Tailles : BN 63 ... BN 180M

(A59)



IP 54

(A60)



IP 55

Freno elettromagnetico con alimentazione in **corrente alternata** trifase, fissato con viti allo scudo motore; le molle di precarico realizzano il posizionamento assiale del corpo magnete.

Il disco freno è scorrevole assialmente sul mozzo trascinatore in acciaio calettato sull'albero e provvisto di molla antivibrazione. La coppia frenante è pre-impostata in fabbrica su valori che sono indicati nelle tabelle dati tecnici dei relativi motori.

L'azione del freno è inoltre modulabile, regolando con continuità la coppia frenante, tramite le viti che realizzano il precarico delle molle; il campo di regolazione della coppia è: $30\% M_{bMAX} < M_b < M_{bMAX}$ (M_{bMAX} è il momento frenante max riportato in tab. (A62).

Il freno tipo FA presenta dinamiche molto elevate che lo rendono idoneo in applicazioni dove sono richieste frequenze di avviamento elevate con tempi d'intervento molto rapidi.

A richiesta, i motori possono essere previsti di leva per lo sblocco manuale con ritorno automatico (R). Per la specifica della posizione angolare della leva vedi relativa variante alla pag. 420.

*Electromagnetic brake operates from three-phase **alternated current** power supply and is bolted onto conveyor shield. Preloading springs provide axial positioning of magnet body.*

Steel brake disc slides axially on steel hub shrunk onto motor shaft with anti-vibration spring. Brake torque factory setting is indicated in the corresponding motor rating charts.

Spring preloading screws provide stepless braking torque adjustment.

Torque adjustment range is $30\% M_{bMAX} < M_b < M_{bMAX}$ (where M_{bMAX} is maximum braking torque as shown in tab. (A62).

Thanks to their high dynamic characteristics, FA brakes are ideal for heavy-duty applications as well as applications requiring frequent stop/starts and very fast response time.

Motors may be equipped with manual release lever with automatic return (R) at request. See variants at page 420 for available lever locations.

Elektromagnetische Bremse mit **Drehstromversorgung**, die mittels Schrauben am hinteren Motorschild befestigt ist. Die Federn sorgen dabei für die axiale Ausrichtung des Magnetkörpers.

Die Bremsscheibe (Stahl) gleitet axial auf dem sich auf dem Rotor befindlichen Mitnehmer, der über eine Paßfeder mit Motorwelle verbunden und mit einer Schwingungsdämpffeder ausgestattet ist.

Das Bremsmoment wird auf das entsprechende Motormoment eingestellt (siehe Tabelle der technischen Daten der entsprechenden Motoren).

Das Bremsmoment ist stufenlos durch über die Schrauben die die Federvorspannung einstellbar. Der Einstellbereich beträgt $30\% M_{bMAX} < M_b < M_{bMAX}$ (M_{bMAX} steht für den max. Bremsmoment, der in der Tab (A62) angegeben wird).

Die Bremse vom Typ FA zeichnet sich durch ihre hohen Dynamik aus, weshalb sie für Anwendungen geeignet sind, in denen hohe Schaltfrequenzen und schnelle Ansprechzeiten gefordert werden.

Auf Anfrage können die Motoren mit einem Lüfterhebel für die manuelle Lüftung der Bremse mit automatischer Rückstellung (R) geliefert werden. Die Angabe der Montageposition erfolgt über die Angabe der Option auf Seite 420.

*Frein électromagnétique avec alimentation en **courant alternatif** triphasé, fixé avec des vis au bouclier; les ressorts de précharge réalisent le positionnement axial de la bobine.*

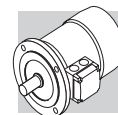
Le disque frein coulisse de façon axiale sur le moyeu d'entraînement en acier, calé sur l'arbre et doté de ressort antivibration.

Le couple de freinage est pré-réglé en usine aux valeurs qui sont indiquées dans les tableaux des caractéristiques techniques des moteurs correspondants.

De plus, l'action du frein est modulable, en réglant le couple de freinage en continu au moyen des vis qui réalisent la précharge des ressorts; la plage de réglage du couple est de $30\% M_{bMAX} < M_b < M_{bMAX}$ (M_{bMAX} est le couple de freinage maximum indiqué dans le tab. (A62).

Le frein type FA présente des caractéristiques dynamiques très élevées, il est donc adapté pour des applications nécessitant des fréquences de démarrage élevées et des temps d'intervention très rapides.

Sur demande, les moteurs peuvent être prévus avec levier pour le déblocage manuel avec retour automatique (R). Pour la spécification de la position angulaire du levier, voir variante page 420.



Grado di protezione

L'esecuzione standard prevede il grado di protezione IP54. In opzione, il motore autofrenante BN_FA viene fornito con grado di protezione **IP 55** prevedendo le seguenti varianti costruttive:

- anello V-ring posizionato sull'albero motore N.D.E.
- fascia di protezione in gomma
- anello O-ring

Degree of protection

Standard protection class is IP54. Brake motor BN_FA is also available in protection class **IP 55**, which mandates the following variants:

- V-ring at N.D.E. of motor shaft
- rubber protection sleeve
- O-ring

Schutzart

Die Standardausführung ist Schutzart IP54 vor. Optional kann der Bremsmotor BN_FA auch in der Schutzart **IP 55** geliefert werden, was durch die folgenden zusätzlichen Bauteile erreicht wird:

- V-Ring an der Motorwelle N.D.E.
- Schutzring aus Gummi
- O-Ring

Degré de protection

L'exécution standard prévoit le degré de protection IP54. En option, le moteur frein BN_FA est fourni avec degré de protection **IP 55**, les variations de construction suivantes sont prévues :

- bague V-ring positionné sur l'arbre moteur N.D.E.
- bande de protection en caoutchouc
- joint torique

Alimentazione freno FA

Nei motori a singola polarità l'alimentazione della bobina freno è derivata direttamente dalla morsettiera motore e la tensione del freno quindi coincide con la tensione del motore. In questo caso la tensione del freno può essere omessa dalla designazione

Per i motori a doppia polarità, e per i motori con alimentazione separata del freno, è presente una morsettiera ausiliaria con 6 terminali per il collegamento alla linea del freno. In entrambi i casi il valore di tensione del freno dovrà essere specificato in designazione.

Nella tabella seguente sono riportate le condizioni di alimentazione standard del freno in c.a. per i motori a singola e doppia polarità:

FA brake power supply

In single speed motors, power supply is brought to the brake coil direct from the motor terminal box. As a result, brake voltage and motor voltage are the same. In this case, brake voltage indication may be omitted in the designation.

Switch-pole motors and motors with separate brake power supply feature an auxiliary terminal board with 6 terminals for connection to brake line. In both cases, brake voltage indication in the designation is mandatory. The following table reports standard AC brake power supply ratings for single- and switch-pole motors:

Stromversorgung - Bremstyp FA

Bei den einpoligen Motoren wird die Versorgung der Bremsspule direkt vom Motorklemmenkasten abgenommen, das bedeutet, dass die Spannung der Bremse mit der Motorspannung übereinstimmt. In diesem Fall braucht die Bremsenspannung nicht extra angegeben werden.

Für die polumschaltbaren Motoren und für eine separate Bremsversorgung ist eine Hilfsklemmenleiste mit 6 Anschlüssen vorgesehen, die einen Anschluß der Bremse ermöglichen. In beiden Fällen muss die Bremsenspannung in der Bestellung angegeben werden.

In der nachstehenden Tabelle werden für die einpoligen und die polumschaltbaren Motoren die Standardspannungen der Wechselstrombremsen angegeben.

Alimentation frein FA

Sur les moteurs à simple polarité, l'alimentation de la bobine frein dérive directement du bornier moteur, par conséquent, la tension du frein coïncide avec la tension du moteur. Dans ce cas, la tension du frein peut être omise de la désignation.

Pour les moteurs à double polarité et les moteurs avec alimentation séparée du frein, une boîte à bornes auxiliaire avec 6 bornes pour le raccordement à la ligne du frein, est présente. Dans les deux cas, la valeur de tension du frein doit être spécifiée dans la désignation.

Le tableau suivant indique les conditions d'alimentation standard du frein en c.a. pour les moteurs à simple et double polarité :

(A61)

motori a singola polarità single-pole motor Einpolige Motoren Moteurs à simple polarité	BN 63...BN 132	BN 160...BN 180
	M05...M4LB	M4LC...M5
	230Δ / 400Y V ±10% – 50 Hz	400Δ/ 690Y V ±10% – 50 Hz
	265Δ / 460Y ±10% - 60 Hz	460Y – 60 Hz

motori a doppia polarità (alimentazione da linea separata) switch-pole motors (separate power supply line) Polumschaltbare Motoren (separate Versorgung) Moteurs à double polarité (alimentation depuis ligne séparée)	BN 63...BN 132
	M05...M4
	230Δ / 400Y V ±10% – 50 Hz
	460Y - 60 Hz

Se non diversamente specificato, l'alimentazione standard del freno è 230Δ /400Y V - 50 Hz.

Unless otherwise specified, standard brake power supply is 230Δ /400Y V - 50 Hz.

Falls nicht anderweitig angegeben, beträgt die Standardversorgung der Bremse 230Δ /400Y V - 50 Hz.

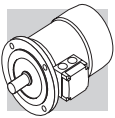
Sauf spécification contraire, l'alimentation standard du frein est 230Δ /400Y V - 50 Hz.

Su richiesta, sono disponibili tensioni speciali, nel campo 24...690 V, 50-60 Hz.

Special voltages in the 24...690 V, 50-60 Hz range are available at request.

Auf Anfrage können Sonderspannungen von 24...690 V, 50-60 Hz geliefert werden.

Sur demande, des tensions spéciales sont disponibles dans la plage 24...690 V, 50-60 Hz.



Dati tecnici freni FA

Technical specifications of FA brakes

Technische Daten der Bremsen vom Typ FA

Caractéristiques techniques freins FA

(A62)

Freno Brake Bremsse Frein	Coppia frenante Brake torque Bremsmoment Couple de freinage M _b [Nm]	Rilascio Release Ansprchzeit Déblocage t ₁ [ms]	Frenatura Braking Bremsung Freinage t ₂ [ms]	W _{max}			W [MJ]	P _b [VA]
				10 s/h	100 s/h	1000 s/h		
FA 02	3.5	4	20	4500	1400	180	15	60
FA 03	7.5	4	40	7000	1900	230	25	80
FA 04	15	6	60	10000	3100	350	30	110
FA 14								
FA 05	40	8	90	18000	4500	500	50	250
FA 15								
FA 06S	60	16	120	20000	4800	550	70	470
FA 06	75	16	140	29000	7400	800	80	550
FA 07	150	16	180	40000	9300	1000	130	600
FA 08	250	20	200	60000	14000	1500	230	1200

Legenda:

M_b = max coppia frenante statica (±15%)
 t₁ = tempo di rilascio freno
 t₂ = ritardo di frenatura
 W_{max} = energia max per frenata (capacità termica del freno)
 W = energia di frenatura tra due regolazioni successive del traferro
 P_b = potenza assorbita dal freno a 20° (50 Hz)
 s/h = avviamenti orari

Key:

M_b = max static braking torque (±15%)
 t₁ = brake release time
 t₂ = brake engagement time
 W_{max} = max energy per brake operation (brake thermal capacity)
 W = braking energy between two successive air gap adjustments
 P_b = power drawn by brake at 20° (50 Hz)
 s/h = starts per hour

Legende:

M_b = statisches max. Bremsmoment (±15%)
 t₁ = Bremsenansprechzeit
 t₂ = Bremsverzögerung
 W_{max} = max. Energie pro Bremsung (Wärmeleistung der Bremse)
 W = Bremsenergie zwischen zwei Einstellungen des Luftspalts
 P_b = bei 20° von der Bremse aufgenommene Leistung (50 Hz)
 s/h = Einschaltungen pro stunde

Légende:

M_b = couple de freinage statique max (±15%)
 t₁ = temps de déblocage frein
 t₂ = retard de freinage
 W_{max} = énergie max par freinage (capacité thermique du frein)
 W = énergie de freinage entre deux réglages successifs de l'entrefer
 P_b = puissance absorbée par le frein à 20° (50 Hz)
 s/h = démarrages horaires

N.B.

I valori di t₁ e t₂ riportati in tabella sono riferiti al freno tarato alla coppia nominale, traferro medio e tensione nominale.

NOTE

Values t₁ and t₂ in the table refer to a brake set at rated torque, medium air gap and rated voltage.

HINWEIS:

Die in der Tabelle angegebenen Werte t₁ und t₂ beziehen sich auf eine Bremse, die auf das Nenn Drehmoment, einen mittleren Luftspalt und die Standardspannung eingestellt ist.

N.B.

Les valeurs de t₁ et t₂ indiquées dans le tableau se réfèrent au frein étalonné au couple nominal, entrefer moyen et tension nominale.

Collegamenti freno FA

FA brake connections

Abschlüsse - Bremstyp FA

Raccordements frein FA

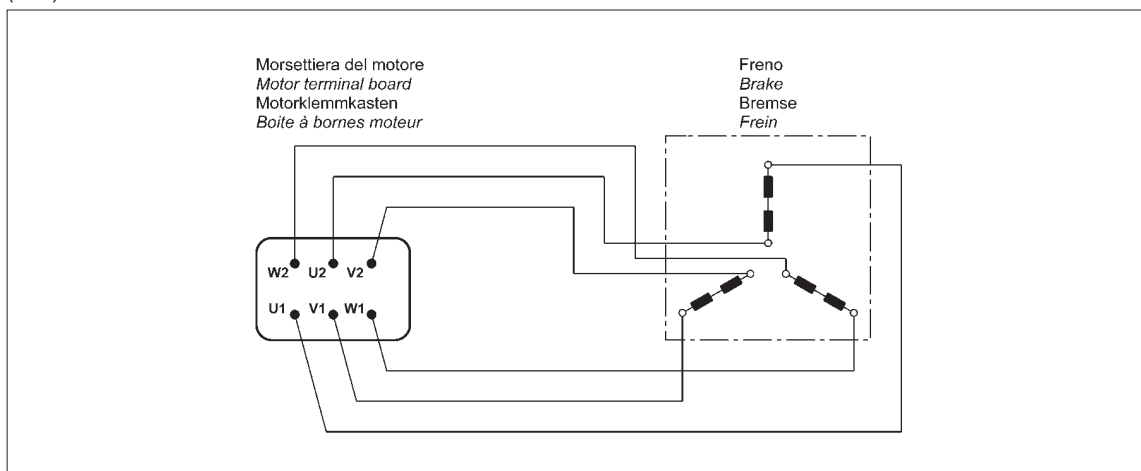
Per i motori con alimentazione del freno derivata direttamente dall'alimentazione motore i collegamenti alla morsettiera corrispondono a quanto riportato nello schema (A63):

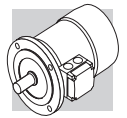
The diagram (A63) shows the wiring when brake is connected directly to same power supply of the motor:

Bei den Motoren mit direkter Bremsspannungsversorgung müssen die Anschlüsse im Klemmenkasten entsprechend den Angaben im Schema (A63) angeschlossen werden:

Pour les moteurs avec alimentation du frein dérivant directement de l'alimentation moteur, les raccordements à la boîte à bornes correspondent aux indications du schéma (A63) :

(A63)





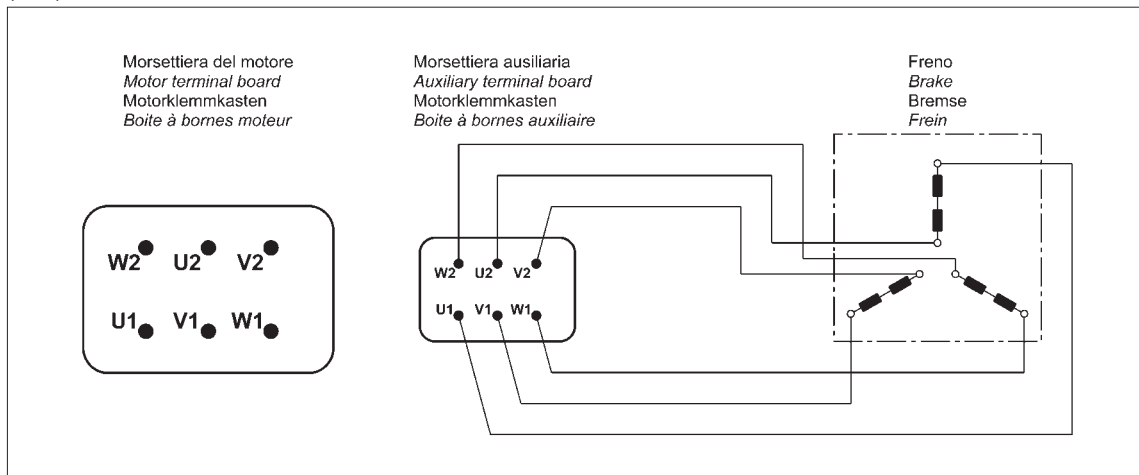
Per i motori a doppia polarità e, quando richiesto, per i motori ad una velocità con alimentazione da linea separata è prevista una morsettiera ausiliaria a 6 morsetti per il collegamento del freno; in questa esecuzione i motori prevedono la scatola copri-morsetti maggiorata. Vedi schema (A64):

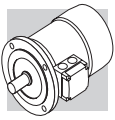
Switch-pole motors and, at request, single-pole motors with separate power supply are equipped with an auxiliary terminal board with 6 terminals for brake connection.
In this version, motors feature a larger terminal box. See diagram (A64):

Bei den polumschaltbaren Motoren und, auf Anfrage, auch bei den einpoligen Motoren mit separater Bremsversorgung ist für den Anschluss der Bremse ein Hilfsklemmenkasten mit 6 Klemmen vorgesehen. In diesen Ausführungen haben die Motoren einen größeren Klemmenkasten. Siehe Schema (A64):

Pour les moteurs à double polarité et, lorsque cela est requis, pour les moteurs à une vitesse avec alimentation depuis ligne séparée, une boîte à bornes auxiliaire à 6 bornes est prévue pour le raccordement du frein ; dans cette exécution les moteurs prévoient un couvercle bornier majoré. Voir schéma (A64) :

(A64)





**M8 - MOTORI AUTOFRENANTI
IN C.A., TIPO BN_BA**

**M8 - AC BRAKE MOTORS
TYPE BN_BA**

**M8 - DREHSTROM-BREMS-
MOTOREN MIT WECH-
SELS- TROMBREMSE
VOM TYP BN_BA**

**M8 - MOTEURS FREIN EN C.A.,
TYPE BN_BA**

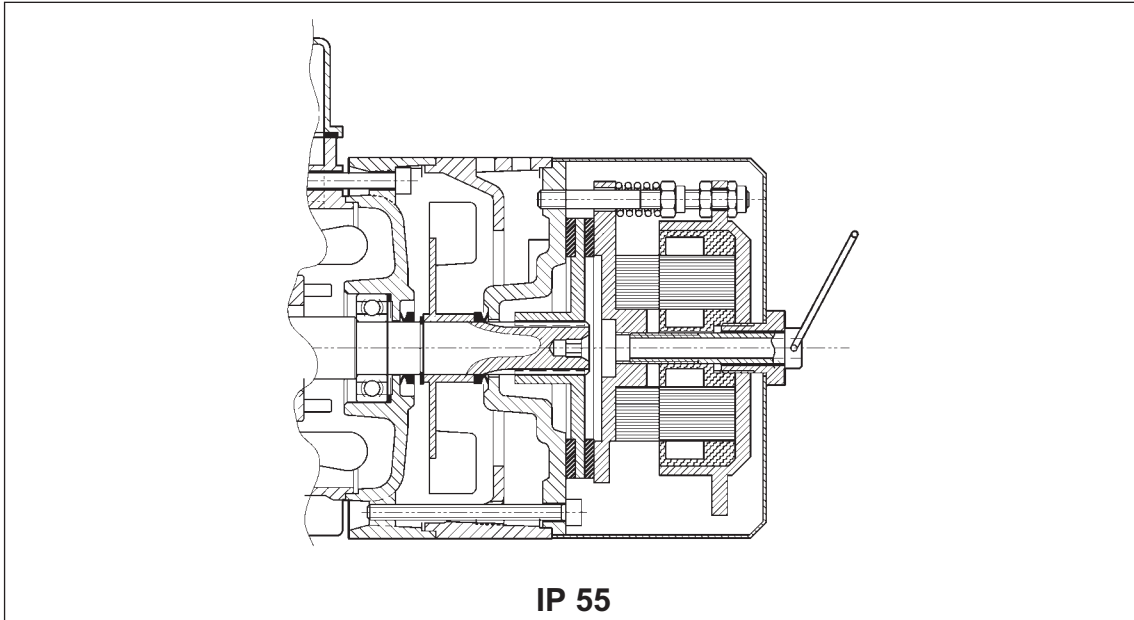
Grandezze: BN 63 ... BN 132M

Frame sizes: BN 63 ... BN 132M

Baugrößen: BN 63 ... BN 132M

Tailles : BN 63 ... BN 132M

(A65)



Freno elettromagnetico con alimentazione in **corrente alternata** trifase, fissato con viti allo scudo convogliatore.

Disco freno in acciaio scorrevole assialmente sull'albero motore scanalato (mozzo trascinatore in acciaio calettato sull'albero per grandezza 244).

I motori sono forniti con freno tarato alla massima coppia.

La coppia freno è regolabile con continuità agendo sulle viti di compressione delle molle; il campo di regolazione consentito è $30\% M_{bMAX} < M_b < M_{bMAX}$ (M_{bMAX} è il momento frenante massimo riportato in tab. (A66)). Di serie i motori sono forniti completi di vite per lo sblocco manuale del freno, con mantenimento della posizione di rilascio per consentire la rotazione dell'albero motore.

La vite di sblocco deve essere smontata dopo l'utilizzo per assicurare il corretto funzionamento del freno, ed evitare situazioni potenzialmente pericolose.

Il freno BA, oltre alle elevate caratteristiche dinamiche tipiche dei freni in corrente alternata, presenta una costruzione robusta con energia di frenatura aumentata che lo rendono particolarmente idoneo a servizi pesanti, oltre che in applicazioni dove sono richieste frequenze di manovra elevate e tempi d'intervento molto rapidi.

*Electromagnetic brake operates from three-phase **alternated current** power supply and is bolted onto conveyor shield.*

Steel brake disc slides axially on splined motor shaft (steel drive hub is shrunk onto shaft on frame size 244).

Factory setting is maximum brake torque.

Step less braking torque adjustment by screws which compress the brake springs. Allowed adjustment range is $30\% M_{bMAX} < M_b < M_{bMAX}$ (where M_{bMAX} is maximum braking torque as shown in tab. (A66)).

Motors are supplied complete with manual brake release screw as standard. Screw may be locked in the release position to allow for motor shaft rotation.

The brake release screw must be removed after use to ensure proper brake operation and avoid potentially dangerous conditions.

In addition to the high dynamic characteristics typical of AC brakes, a sturdy design and increased braking energy make the BA brake ideal for heavy-duty applications as well as applications requiring frequent stop/starts and very fast response time.

Elektromagnetische Bremse mit **Drehstromversorgung**, die mittels Schrauben am Motorschild des Motors befestigt ist.

Die Bremsscheibe (Stahl) gleitet axial auf der Rotorwelle (bei Baugröße 244 über einem auf die Welle aufgezogenem Mitnehmer aus Stahl).

Die Motoren werden mit einer auf das maximale Drehmoment des Motors eingestellten Bremse geliefert.

Das Bremsdrehmoment ist durch Betätigen der Federdruckschrauben stufenlos regelbar. Der zulässige Einstellbereich beträgt $30\% M_{bMAX} < M_b < M_{bMAX}$ (M_{bMAX} steht für den max. Bremsmoment, das in der Tab. (A66) angegeben wird).

Die Motoren werden serienmäßig mit einer Schraube zur manuelle Bremslüftung geliefert; die arretierbar ist, um ein Drehen der Motorwelle zu ermöglichen.

Diese Schraube muss im Betrieb des Motors wieder abmontiert werden, damit die korrekte Funktion der Bremse gesichert ist.

Die Bremse vom Typ BA zeichnet sich durch ihre dynamischen Eigenschaften und die robuste Bauweise aus, durch die sie eine erhöhte Bremsenergie abzugeben kann. Diese Bremstypen eignen sich besonders für einen Einsatz unter harten Bedingungen und überall dort, wo häufige Schaltfrequenzen und schnelle Ansprechzeiten gefordert werden.

*Frein électromagnétique avec alimentation en **courant alternatif** triphasé, fixé avec des vis au bouclier.*

Disque frein en acier coulissant de façon axiale sur l'arbre moteur rainuré (moyeu d'entraînement en acier calé sur l'arbre pour la taille 244).

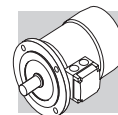
Les moteurs sont fournis avec frein étalonné au couple maximal.

Le couple de freinage est réglable en continu en intervenant sur les vis de compression des ressorts ; la plage de réglage autorisé est de $30\% M_{bMAX} < M_b < M_{bMAX}$ (M_{bMAX} étant le couple de freinage maximum indiqué dans le tab. (A66)).

De série, les moteurs sont fournis avec vis de déblocage manuel du frein, avec maintien de la position de relâchement afin de permettre la rotation de l'arbre moteur.

La vis de déblocage doit être démontée après utilisation afin de garantir le fonctionnement correct du frein et d'éviter les situations potentiellement dangereuses.

Le frein BA, outre les caractéristiques dynamiques élevées typiques des freins en courant alternatif, est de fabrication robuste avec énergie de freinage majorée, ce qui le rend particulièrement adapté pour les services difficiles ainsi que pour les applications nécessitant des fréquences de manœuvre élevées et des temps d'intervention très rapides.



Grado di protezione

È disponibile un'unica esecuzione, con grado di protezione IP55.

Protection class

Only available in protection class IP55.

Schutzart

Es ist eine nur die Ausführung in Schutzklasse IP55 verfügbar.

Degré de protection

Il est disponible en une exécution unique, avec degré de protection IP55.

Alimentazione freno BA

Nei motori a singola polarità l'alimentazione della bobina freno è derivata direttamente dalla morsettiera motore e la tensione del freno quindi coincide con la tensione del motore. In questo caso la tensione del freno può essere omessa dalla designazione.

Per i motori a doppia polarità, e per i motori con alimentazione separata del freno, è presente una morsettiera ausiliaria con 6 terminali per il collegamento alla linea del freno. In entrambi i casi il valore di tensione del freno dovrà essere specificato in designazione.

Nella tabella seguente sono riportate le condizioni di alimentazione standard del freno in c.a. per i motori a singola e doppia polarità:

BA brake power supply

In single speed motors, power supply is brought to the brake coil direct from the motor terminal box. As a result, brake voltage and motor voltage are the same. In this case, brake voltage indication may be omitted in the designation.

Switch-pole motors and motors with separate brake power supply feature an auxiliary terminal board with 6 terminals for connection to brake line. In both cases, brake voltage indication in the designation is mandatory. The following table reports standard AC brake power supply ratings for single- and switch-pole motors:

Stromversorgung - Bremstyp BA

Bei den einpoligen Motoren wird die Versorgung der Bremsspule direkt vom Motorklemmenkasten abgezweigt, das bedeutet also, dass die Spannung der Bremse mit der Motorspannung übereinstimmt. In diesem Fall braucht die Bremsenspannung nicht extra angegeben werden.

Für polumschaltbaren Motoren und für eine separate Bremsversorgung ist eine Hilfsklemmenleiste mit 6 Anschlüssen vorgesehen, die einen Anschluss der Bremse ermöglichen. In beiden Fällen muss die Bremsenspannung bei der Bestellung angegeben werden.

In der nachstehenden Tabelle werden für die einpoligen und die polumschaltbaren Motoren die Standardversorgung der Wechselstrombremsen angegeben.

Alimentation frein BA

Sur les moteurs à simple polarité, l'alimentation de la bobine frein dérive directement du bornier moteur, par conséquent, la tension du frein coïncide avec la tension du moteur. Dans ce cas, la tension du frein peut être omise de la désignation.

Pour les moteurs à double polarité et les moteurs avec alimentation séparée du frein, un boîte à bornes auxiliaire avec 6 bornes pour le raccordement au réseau du frein, est présente. Dans les deux cas, la valeur de tension du frein doit être spécifiée dans la désignation.

Le tableau suivant indique les conditions d'alimentation standard du frein en c.a. pour les moteurs à simple et double polarité :

(A65)

motori a singola polarità single-pole motor Einpolige Motoren Moteurs à simple polarité	BN 63 ... BN 132
	230Δ / 400Y V ±10% – 50 Hz
	265Δ / 460Y ±10% - 60 Hz
motori a doppia polarità (alimentazione da linea separata) switch-pole motors (separate power supply line) Polumschaltbare Motoren (separate Versorgung) Moteurs à double polarité (alimentation depuis ligne séparée)	BN 63 ... BN 132
	230Δ / 400Y V ±10% – 50 Hz
	460Y - 60 Hz

Se non diversamente specificato, l'alimentazione standard del freno è 230Δ / 400Y V - 50 Hz.

Unless otherwise specified, standard brake power supply is 230Δ / 400Y V - 50 Hz.

Falls nicht anderweitig angegeben, beträgt die Standardversorgung der Bremse 230Δ / 400Y V - 50 Hz.

Sauf spécification contraire, l'alimentation standard du frein est 230Δ / 400Y V - 50 Hz.

Su richiesta, sono disponibili tensioni speciali, nel campo 24...690 V, 50-60 Hz.

Special voltages in the 24...690 V, 50-60 Hz range are available at request.

Auf Anfrage können Sonderspannungen von 24...690 V, 50-60 Hz geliefert werden.

Sur demande, des tensions spéciales sont disponibles dans la plage 24...690 V, 50-60 Hz.

Dati tecnici freni BA

Nella tabella (A66) sottostante sono riportati i dati tecnici dei freni in c.a., tipo BA.

BA brake technical specifications

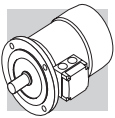
The table (A66) below reports the technical specifications for AC brakes type BA.

Technische Daten der Bremsen vom Typ BA

In der nachstehenden Tabelle (A66) werden die technischen Daten der Wechselstrombremsen vom Typ BA angegeben:

Caractéristiques techniques freins BA

Le tableau (A66) ci-dessous indique les caractéristiques techniques des freins en c.a., type BA.



(A66)

Freno Brake Bremsen Frein	Coppia frenante Brake torque Bremsmoment Couple de freinage M_b [Nm]	Rilascio Release Ansprchzeit Déblocage t_1 [ms]	Frenatura Braking Bremsung Freinage t_2 [ms]	Wmax			W [MJ]	P_b [VA]
				[J]				
				10 s/h	100 s/h	1000 s/h		
BA 60	5	5	20	4000	1500	180	30	60
BA 70	8	6	25	7000	2700	300	60	75
BA 80	18	6	25	10000	3100	350	80	110
BA 90	35	8	35	13000	3600	400	88	185
BA 100	50	8	35	18000	4500	500	112	225
BA 110	75	8	35	28000	6800	750	132	270
BA 140	150	15	60	60000	14000	1500	240	530

Legenda:

M_b = max coppia frenante statica ($\pm 15\%$)

t_1 = tempo di rilascio freno

t_2 = ritardo di frenatura

W_{max} = energia max per frenata (capacità termica del freno)

W = energia di frenatura tra due regolazioni successive del traferro

P_b = potenza assorbita dal freno a 20° (50 Hz)

s/h = avviamenti orari

N.B.

I valori di t_1 e t_2 riportati in tabella sono riferiti al freno tarato alla coppia nominale, traferro medio e tensione nominale.

Key:

M_b = max static braking torque ($\pm 15\%$)

t_1 = brake release time

t_2 = brake engagement time

W_{max} = max energy per brake operation (brake thermal capacity)

W = braking energy between two successive air gap adjustments

P_b = brake power absorption at 20° (50 Hz)

s/h = starts per hour

NOTE

Values t_1 and t_2 in the table refer to a brake set at rated torque, medium air gap and rated voltage.

Legende:

M_b = statisches max. Bremsmoment ($\pm 15\%$)

t_1 = Bremsenansprechzeit

t_2 = Bremsverzögerung

W_{max} = max. Energie pro Bremsung (Wärmeleistung der Bremse)

W = Bremsenergie zwischen zwei Einstellungen des Luftspalts

P_b = bei 20° von der Bremse aufgenommene Leistung (50 Hz)

s/h = Einschaltungen pro stunde

HINWEIS:

Die in der Tabelle angegebenen Werte t_1 und t_2 beziehen sich auf eine Bremse, die auf das Nenn Drehmoment, einen mittleren Luftspalt und die Standardspannung eingestellt ist.

Légende:

M_b = couple de freinage statique max ($\pm 15\%$)

t_1 = temps de déblocage frein

t_2 = retard de freinage

W_{max} = énergie max par freinage (capacité thermique du frein)

W = énergie de freinage entre deux réglages successifs de l'entrefer

P_b = puissance absorbée par le frein à 20° (50 Hz)

s/h = démarrages horaires

N.B.

Les valeurs de t_1 et t_2 indiquées dans le tableau se réfèrent au frein étaloné au couple nominal, entrefer moyen et tension nominale.

Collegamenti freno BA

Per i motori con alimentazione del freno derivata direttamente dall'alimentazione motore i collegamenti alla morsettiera corrispondono a quanto riportato nello schema (A67):

BA brake connections

The diagram (A67) shows the required connections to terminal box when brake is to be connected directly to motor power supply:

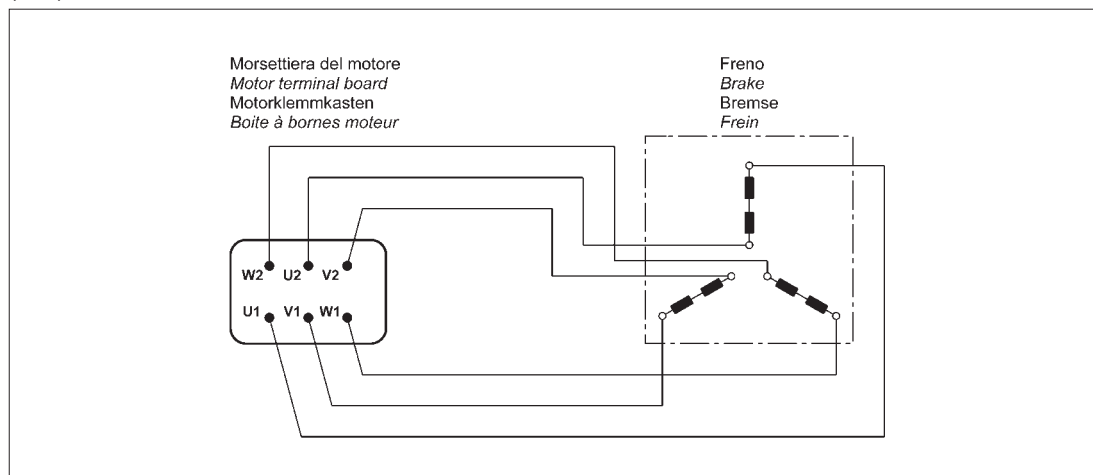
Abschlüsse - Bremstyp BA

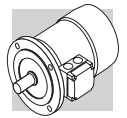
Bei den Motoren mit direkter Bremsspannungsversorgung müssen die Anschlüsse im Klemmenkasten entsprechend den Angaben im Schema (A67) angeschlossen werden:

Raccordements frein BA

Pour les moteurs avec alimentation du frein dérivant directement de l'alimentation moteur, les raccordements à la boîte à bornes correspondent aux indications du schéma (A67) :

(A67)





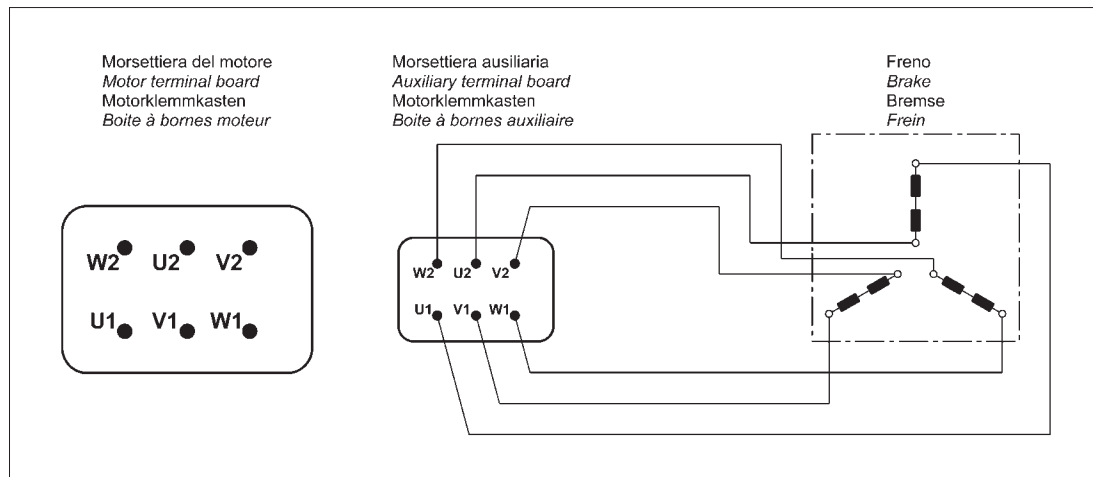
Per i motori a doppia polarità e, quando richiesto, per i motori ad una velocità con alimentazione da linea separata è prevista una morsettiera ausiliaria a 6 morsetti per il collegamento del freno; in questa esecuzione i motori prevedono la scatola coprimorsetti maggiorata. Vedi schema (A68):

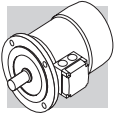
Switch-pole motors and, at request, single-pole motors with separate power supply line are equipped with an auxiliary terminal board with 6 terminals for brake connection. In this version, motors feature a larger terminal box. See diagram (A68):

Bei den polumschaltbaren Motoren und, auf Anfrage, auch bei den einpoligen Motoren mit separater Bremsversorgung ist für den Anschluss der Bremse ein Hilfsklemmenkasten mit 6 Klemmen vorgesehen. In diesen Ausführungen haben die Motoren einen größeren Klemmenkasten. Siehe Schema (A68):

Pour les moteurs à double polarité et, lorsque cela est requis, pour les moteurs à une vitesse avec alimentation depuis ligne séparée, une boîte à bornes auxiliaire à 6 bornes est prévue pour le raccordement du frein ; dans cette exécution les moteurs prévoient un couvercle bornier majoré. Voir schéma (A68) :

(A68)





M9 - SISTEMI DI SBLOCCO FRENO

I freni a pressione di molle tipo **FD** e **FA** possono essere dotati opzionalmente di dispositivi per lo sblocco manuale del freno, normalmente utilizzati per condurre interventi di manutenzione sulle parti di macchina, o dell'impianto, comandate dal motore.

M9 - BRAKE RELEASE SYSTEMS

*Spring-applied brakes type **FD** and **FA** may be equipped with optional manual release devices. These are typically used for manually releasing the brake before servicing any machine or plant parts operated by the motor.*

M9 - BREMSLÜFTHEBEL

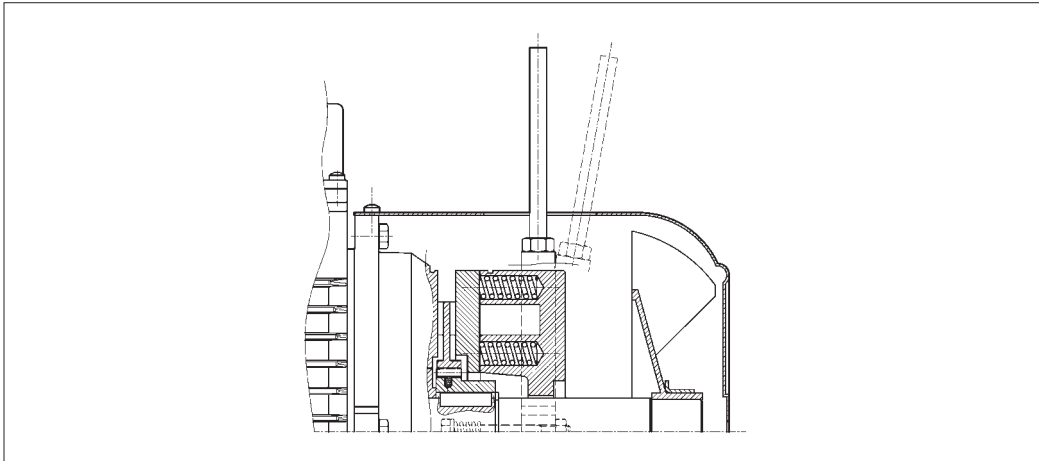
Die Federdruckbremsen vom Typ **FD** und **FA** können Optional mit Bremslüfthebeln geliefert werden, die ein manuelles Lüften der Bremse ermöglichen. Diese Lüftungseinrichtungen können bei Instandhaltungsarbeiten an vom Motor betriebenen Maschinen- oder Anlagenteilen verwendet werden.

M9 - SYSTEMES DE DEBLOCAGE FREIN

*Les freins à pression de ressorts type **FD** et **FA** peuvent, en option, être dotés de dispositifs de déblocage manuel du frein, normalement utilisés pour effectuer des interventions d'entretien sur les composants de la machine, ou de l'installation commandée par le moteur.*

(A69)

R



La leva di sblocco è dotata di ritorno automatico, tramite dispositivo a molla.

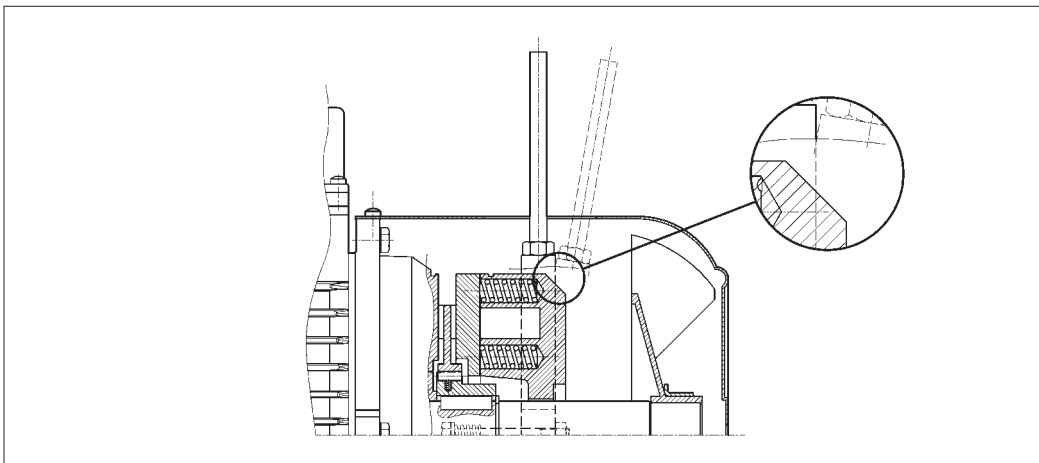
A return spring brings the release lever back in the original position.

Bremslüfthebel mit automatischer Rückstellung durch Federkraft.

Le levier de déblocage est doté de retour automatique, au moyen d'un dispositif à ressort.

(A70)

RM

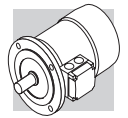


Sui motori tipo BN_FD la leva di sblocco può essere temporaneamente bloccata in posizione di rilascio del freno, avvitando la stessa fino ad impegnarne l'estremità in un risalto del corpo del freno.

On motors type BN_FD, if the option RM is specified, the release device may be locked in the "release" position by tightening the lever until its end becomes engaged with a brake housing projection.

Der Bremslüfthebel kann zeitweise in der Bremslüftposition arretiert werden, indem man ihn so lange einschraubt, bis die Bremse arretiert ist. Für die unterschiedlichen Motor-

Levier de déblocage peut être temporairement bloqué en position de déblocage du frein en le vissant jusqu'à engager l'extrémité dans une saillie du corps du frein. La disponibilité des systèmes de


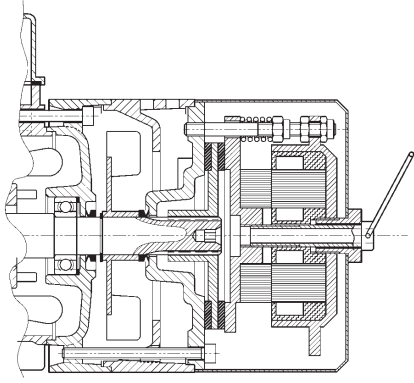


La disponibilità dei sistemi di sblocco freno è diversa per i vari tipi di motore, ed è descritta dalla tabella seguente:

The availability for the various disengagement devices is charted here below:

typen sind ebenso verschiedene Bremslüftsysteme verfügbar, die Sie der folgenden Tabelle entnehmen können:

débloccage du frein est différente en fonction des types de moteur et figure dans le tableau suivant :

(A71)	R	RM
BN_FD	BN 63...BN 200	2p 63A2 ≤ H ≤ 132M2 4p 63A4 ≤ H ≤ 132MA4 6p 63A6 ≤ H ≤ 132MA6
M_FD	M 05...M 5	M 05...M 4LA
BN_FA	BN 63...BN 180M	
M_FA	M 05...M 5	
BN_BA	 <p>di serie std. supply serienmäßig de série</p>	

Orientamento della leva di sblocco

Release lever orientation

Ausrichtung des Bremslüfthebels

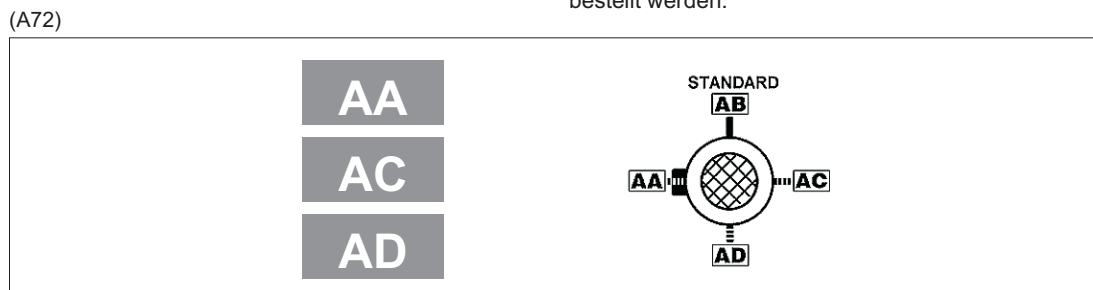
Orientation du levier de déblocage

Per entrambe le opzioni **R** e **RM**, la leva di sblocco del freno viene collocata, se non diversamente specificato, con orientamento di 90° in senso orario, rispetto alla posizione della morsettiera - riferimento **[AB]** nel disegno sottostante. Orientamenti alternativi, tipo **[AA]**, **[AC]** e **[AD]** possono essere richiesti citandone la relativa specifica:

Unless otherwise specified, the release lever is located 90° away from the terminal box – identified by letters **[AB]** in the diagram below – in a clockwise direction on both options **R** and **RM**. Alternative lever positions **[AA]**, **[AC]** and **[AD]** are also possible when the corresponding option is specified:

Bei beiden Optionen, **R** und **RM**, wird der Bremslüfthebel, falls nicht anderweitig festgelegt, um 90° im Uhrzeigersinn zur Position des Klemmenkastens montiert (Position **[AB]** in der nachfolgenden Zeichnung). Andere Positionen: **AA** (0° zum Klemmenkasten), **AC** (180° zum Klemmenkasten) oder **AD** (270° zum Klemmenkasten, im Uhrzeigersinn vom Lüfter aus gesehen) können unter Angabe der entsprechenden Spezifikation bestellt werden:

Pour les deux options **R** et **RM**, le levier de déblocage du frein est positionné, sauf spécification contraire, avec une orientation de 90° dans le sens des aiguilles d'une montre par rapport à la position de la boîte à bornes - référence **[AB]** sur le dessin ci-dessous. Des orientations différentes, type **[AA]**, **[AC]** et **[AD]** peuvent être demandées à condition de préciser la position correspondante :



Caratteristiche volani (F1)

Fly-wheel data (F1)

Eigenschaften der Schwunräder (F1)

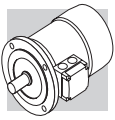
Caractéristiques volants (F1)

La tabella seguente riporta il peso e l'inerzia aggiuntiva del volani che possono essere richiesti tramite l'opzione F1. Le dimensioni complessive rimangono invariate.



The table below shows values of weight and inertia of flywheel (option F1). Overall dimensions of motors remain unchanged.

Die folgende Tabelle gibt das Gewicht und das Trägheitsmoment der Zusatzschwunräder an (Option F1). Die Gesamtmaße bleiben unverändert.

Le tableau suivante indique le poids et l'inertie des volants supplémentaires sans variations de l'encombrement moteur.



(A73)

Dati tecnici volano per motori tipo: / Main data for flywheel of motore type: / Eigenschaften der Schwungräder für Motoren typ: / Données volant pour moteurs type: BN_FD, M_FD			
		Peso volano / Fly-wheel weight Gewicht Schwungrad / Poids volant [Kg]	Inerzia volano / Fly-wheel inertia Trägheitsmoment Schwungrad / Inertie volant [Kgm ²]
BN 63	M05	0.69	0.00063
BN 71	M1	1.13	0.00135
BN 80	M2	1.67	0.00270
BN 90 S - BN 90 L	–	2.51	0.00530
BN 100	M3	3.48	0.00840
BN 112	–	4.82	0.01483
BN 132 S - BN 132 M	M4	6.19	0.02580

M10 - OPZIONI

Protezioni termiche

Oltre alla protezione garantita dall'interruttore magnetotermico, i motori possono essere provvisti di sonde termiche incorporate per proteggere l'avvolgimento da eccessivo riscaldamento dovuto a scarsa ventilazione o servizio intermittente. Questa protezione dovrebbe sempre essere prevista per motori servoventilati (IC416).

M10 - OPTIONS

Thermal protective devices

In addition to the standard protection provided by the magneto-thermal device, motors can be supplied with built-in thermal probes to protect the winding against overheating caused, by insufficient ventilation or by an intermittent duty. This additional protection should always be specified for servoventilated motors (IC416).

M10 - OPTIONEN

Thermische Schutzeinrichtungen

Abgesehen von den Motorschutzschaltern mit thermischem und elektromagnetischem Auslöser können die Motoren mit integrierten Temperaturfühlern zum Schutz der Wicklung vor Überhitzung z.B. wegen unzureichender Lüftung oder Aussetzbetriebs ausgestattet werden. Diese Schutzeinrichtung muß bei fremdbelüfteten Motoren stets vorgesehen werden (IC416).

M10 - OPTIONS

Protections thermiques

Outre la protection garantie par l'interrupteur magnéothermique, les moteurs peuvent être équipés de sondes thermiques incorporées pour protéger le bobinage contre une surchauffe excessive due par exemple à une ventilation insuffisante ou un service intermittent. Cette protection devrait toujours être prévue pour les moteurs servoventilés (IC416).

E3

Sonde termiche a termistori

Sono dei semiconduttori che presentano una rapida variazione di resistenza in prossimità della temperatura nominale di intervento (150 °C). L'andamento della caratteristica $R = f(T)$ è normalizzato dalle Norme DIN 44081, IEC 34-11. Questi sensori presentano il vantaggio di avere ingombri ridotti, un tempo di risposta molto contenuto e, dato che il funzionamento avviene senza contatti, sono completamente esenti da usura. In genere vengono impiegati termistori a coefficiente di temperatura positivo denominati anche "resistori a conduttore freddo" PTC. A differenza delle sonde termiche bimetalliche, non possono intervenire direttamente sulle correnti delle bobine di eccitazione e devono pertanto essere collegati ad una speciale unità di controllo (apparecchio di sgancio) da interfacciare alle connessioni esterne. Con questa protezione vengono inseriti tre PTC, (collegati in serie), nell'avvolgimento con terminali disponibili in morsettiera ausiliaria.

Thermistors

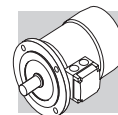
These are semi-conductors having rapid resistance variation when they are close to the rated switch off temperature (150 °C). Variations of the $R = f(T)$ characteristic are specified under DIN 44081, IEC 34-11 Standards. These elements feature several advantages: compact dimensions, rapid response time and, being contact-free, absolutely no wear. Positive temperature coefficient thermistors are normally used (also known as PTC "cold conductor resistors"). Contrary to bimetallic thermostats, they cannot directly intervene on currents of energizing coils, and must therefore be connected to a special control unit (triggering apparatus) to be interfaced with the external connections. Thus protected, three PTCs connected in series are installed in the winding, the terminals of which are located on the auxiliary terminal-board.

Temperaturfühler und Thermistoren

Hierbei handelt es sich um Halbleiter, die eine schnelle Änderung des Widerstands in der Nähe der Nennansprechtemperatur (150 °C) zeigen. Der Verlauf der Kennlinie $R = f(T)$ ist durch die DIN-Normen 44081 und IEC 34-11 festgelegt. Diese Sensoren haben folgende Vorteile: sie weisen geringe Außenmaße und eine äußerst kurze Ansprechzeit auf und sind vollkommen verschleißfrei, da sie berührungslos arbeiten. Im allgemeinen werden Thermistoren mit positivem Temperaturkoeffizienten verwendet, die auch als "Kaltleiter" (PTC-Widerstände) bezeichnet werden. Im Unterschied zu Bimetall-Temperaturfühlern können sie nicht direkt auf die Erregungsströme der Spulen wirken, sondern müssen an eine spezielle Steuereinheit (Auslösegerät) angeschlossen werden, die mit den externen Anschlüssen kompatibel ist. Mit dieser Schutzeinrichtung werden drei in Reihe geschaltete PTC-Widerstände in die Wicklung eingesetzt, deren Endanschlüsse an einer Zusatzklemmleiste verfügbar sind.

Sondes thermométriques

Ce sont des semiconducteurs qui présentent une variation rapide de résistance à proximité de la température nominale d'intervention (150 °C). L'évolution de la caractéristique $R = f(T)$ est défini par les Normes DIN 44081, IEC 34-11. Ces capteurs présentent l'avantage d'avoir des encombrements réduits, un temps de réponse très bref et, du fait que le fonctionnement a lieu sans contact, il sont exempts d'usure. En général, on utilise des thermistors à coefficient de température positif dénommés également "résistors à conducteur froid" PTC. Contrairement aux sondes thermiques bimétalliques, ils ne peuvent intervenir directement sur les courants des bobines d'excitation et doivent par conséquent être reliés à une unité spéciale de contrôle (appareil de déconnexion) à interfacer aux connexions extérieures. Avec cette protection, trois sondes, (reliées en série), sont insérées dans le bobinage avec extrémités disponibles dans le bornier auxiliaire.



D3

Sonde termiche bimetalliche

I protettori di questo tipo contengono all'interno di un involucro un disco bimetallico che, raggiunta la temperatura nominale di intervento (150 °C), commuta i contatti dalla posizione di riposo. Con la diminuzione della temperatura, il disco e i contatti riprendono automaticamente la posizione di riposo. Normalmente si impiegano tre sonde bimetalliche in serie con contatti normalmente chiusi e terminali disponibili in una morsettiere ausiliaria.

Bimetallic thermostates

These types of protective devices house a bimetal disk. When the rated switch off temperature (150 °C) is reached, the disk switches the contacts from their initial rest position. As temperature falls, the disk and the contacts automatically return to rest position. Three bimetallic thermostates connected in series are usually employed, with normally closed contacts. The terminals are located on an auxiliary terminal-board.

Bimetall-Temperaturfühler

Diese Schutzeinrichtungen bestehen aus einer Kapsel, in der sich eine Bimetallscheibe befindet, die bei Erreichen der Nennansprechtemperatur (150 °C) anspricht. Nach Absenkung der Temperatur geht der Schaltkontakt automatisch in Ruhestellung zurück. Normalerweise werden drei in Reihe geschaltete Bimetallfühler mit Öffnern verwendet, deren Endverschlüsse an einer Zusatzklemmleiste verfügbar sind.

Sondes theramiques biméalliques

Les protecteurs de ce type contiennent, dans une enveloppe interne, un disque bimétallique qui, lorsque la température nominale d'intervention (150 °C) est atteinte, commutent les contacts de la position de repos. Avec la diminution de la température, le disque et les contacts reprennent automatiquement la position de repos. Normalement, on utilise trois sondes biméalliques en série avec contacts normalement fermés et extrémités disponibles dans un bornier auxiliaire.

H1

Riscaldatori anticondensa

I motori funzionanti in ambienti molto umidi e/o in presenza di forti escursioni termiche, possono essere equipaggiati con una resistenza anti-condensa. L'alimentazione monofase è prevista da morsettiere ausiliaria posta nella scatola principale. Le potenze assorbite dalla resistenza elettrica sono elencate qui di seguito:

Anti-condensation heaters

Where an application involves high humidity or extreme temperature fluctuation, motors may be equipped with an anti-condensate heater. A single-phase power supply is available in the auxiliary terminal board inside the main terminal box. Values for the absorbed power are listed here below:



Wicklungsheizung

Die Motoren, die in besonders feuchten Umgebungen und/oder unter starken Temperaturschwankungen eingesetzt werden, können mit einem Heizelement als Kondenswasserschutz ausgestattet werden. Die einphasige Versorgung erfolgt über eine Zusatzklemmleiste, die sich im Klemmenkasten befindet. Werte fuer die Leistungsaufnahme sind in folgender Tabelle aufgeführt.

Rechauffeurs anticondensation

Les moteurs fonctionnant dans des milieux très humides et/ou en présence de fortes plages thermiques peuvent être équipés d'une résistance anticondensation. L'alimentation monophasée est prévue par l'intermédiaire d'une boîte à bornes auxiliaire située dans la boîte principale. Les puissances absorbées sont indiqués de suite :

(A74)

		H1
		1~ 230V ± 10% P [W]
BN 56...BN 80	M0...M2	10
BN 90...BN 160MR	M3 - M4	25
BN 160M...BN 180M	M5	50
BN 180L...BN 200L	—	50

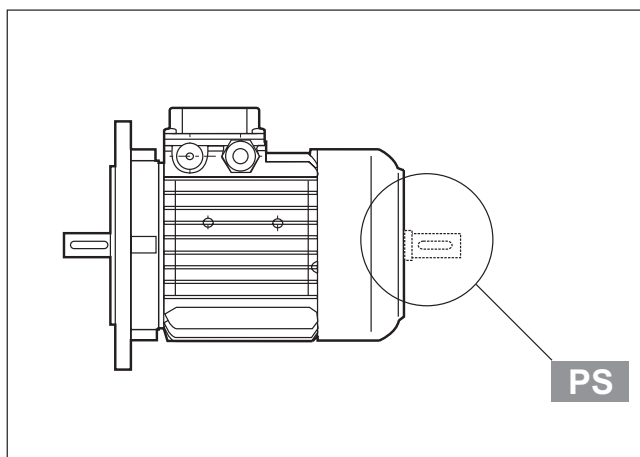
Importante!
Durante il funzionamento del motore la resistenza anticondensa non deve mai essere inserita.

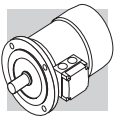
Warning!
Always remove power supply to the anti-condensate heater before operating the motor.

Warnung!
Während des Motorbetriebs darf die Wicklungsheizung nie gespeist werden.

Avertissement!
Durant le fontionnement du moteur, la résistance anticondensation ne doit jamais être alimentée.

PS





Seconda estremità d'albero

L'opzione esclude le varianti RC, TC, U1, U2, EN1, EN2, EN3 – non applicabile ai motori con freno tipo BA.
Le dimensioni sono reperibili nelle tavole dimensionali dei motori.

Second shaft extension

This option is not compatible with variants RC, TC, U1, U2, EN1, EN2, EN3 – and is not feasible on motors equipped with BA brake.
For shaft dimensions please see motor dimensions tables.

Zweites Wellenende

Diese Option schließt die Optionen RC, TC, U1, U2, EN1, EN2, EN3 aus – sie kann nicht außerdem nicht an Motoren, die mit einer Bremse vom Typ BA ausgestattet sind, angebaut werden. Die entsprechenden Maße können den Maßtabellen der Motoren entnommen werden.

Arbre à double extrémité

L'option exclut les variantes RC, TC, U1, U2, EN1, EN2, EN3 – non applicables aux moteurs avec frein type BA.
Les dimensions figurent sur les planches de dimensions des moteurs.

AL

AR

Dispositivo antiritorno

Nelle applicazioni dove è necessario impedire la rotazione inversa del motore dovuta all'azione del carico, è possibile impiegare motori provvisti di un dispositivo antiritorno (disponibile solo sulla serie M). Questo dispositivo, pur consentendo la libera rotazione nel senso di marcia, interviene istantaneamente in caso di mancanza di alimentazione bloccando la rotazione dell'albero nel senso inverso.

Il dispositivo antiritorno è lubrificato a vita con grasso specifico per questa applicazione.

In fase di ordine dovrà essere indicato chiaramente il senso di marcia previsto.

In nessun caso il dispositivo antiritorno dovrà essere utilizzato per impedire la rotazione inversa nel caso di collegamento elettrico errato.

Nella tabella (A75) sono indicate le coppie nominale e massima di bloccaggio attribuite ai dispositivi antiritorno utilizzati, mentre la raffigurazione schematica del dispositivo è inserita nella tabella (A76).

Le dimensioni sono le stesse del motore autofrenante.

Per il senso di rotazione libera contattare il Servizio Tecnico di Bonfiglioli Riduttori.

Backstop device

For applications where backdriving must be avoided, motors equipped with an anti run-back device can be used (available for the M series only). While allowing rotation in the direction required, this device operates instantaneously in case of a power failure, preventing the shaft from running back.

The anti run-back device is life lubricated with special grease for this specific application.

When ordering, customers should indicate the required rotation direction, AL or AR.

Never use the anti run-back device to prevent reverse rotation caused by faulty electrical connection.

Table (A75) shows rated and maximum locking torques for the anti run-back devices.

A diagram of the device can be seen in Table (A76).

Overall dimensions are same as the corresponding brake motor.

For the direction of free rotation contact Bonfiglioli's Technical Service.

Rücklaufsperr

Für Anwendungen, bei denen ein durch die Last verursachtes Rücklaufen des Motors verhindert werden soll, können Motoren installiert werden, die über eine Rücklaufsperr verfügen (nur bei Serie M verfügbar).

Diese Vorrichtung, die eine völlig unbehinderte Drehung des Motors in Laufrichtung gestattet, greift sofort ein, wenn die Spannung fehlt, und verhindert die Drehung der Welle in die Gegenrichtung.

Die Rücklaufsperr verfügt über eine Dauer - Schmierung mit einem speziell für diese Anwendung geeigneten Fett.

Bei der Bestellung muß die vorgesehene Drehrichtung des Motors genau angegeben werden.

Die Rücklaufsperr darf keinesfalls verwendet werden, um im Falle eines fehlerhaften elektrischen Anschlusses die Drehung in die Gegenrichtung zu verhindern. In Tabelle (A75) sind die Nenndrehmomente und Höchstdrehmomente für die verwendeten Rücklaufsperr angegeben; Abbildung (A76) zeigt eine schematische Darstellung der Vorrichtung.

Die abmessungen sind ähnlich denen der Bremsmotoren.

Für die freie Drehrichtung eingehend bitte an den technischen Service von Bonfiglioli Riduttori.

Dispositif anti-retour

Pour les applications où il est nécessaire d'empêcher la rotation inverse du moteur à cause de l'action de la charge, il est possible d'utiliser des moteurs dotés d'un dispositif anti-retour (disponible seulement sur la série M).

Ce dispositif, bien que permettant la libre rotation dans le sens de marche, intervient instantanément en cas de manque d'alimentation en bloquant la rotation de l'arbre dans le sens inverse.

Le dispositif anti-retour est lubrifié à vie avec une graisse spécifique pour cette application.


En phase de commande, il faudra indiquer clairement le sens de marche prévu. En aucun cas, le dispositif anti-retour ne devra être utilisé pour empêcher la rotation inverse en cas de branchement électrique erroné.

Le tableau (A75) indique le couple nominal et le couple maximum de blocage attribués aux dispositifs anti-retour utilisés alors que la représentation schématique du dispositif se trouve dans le tableau (A76).

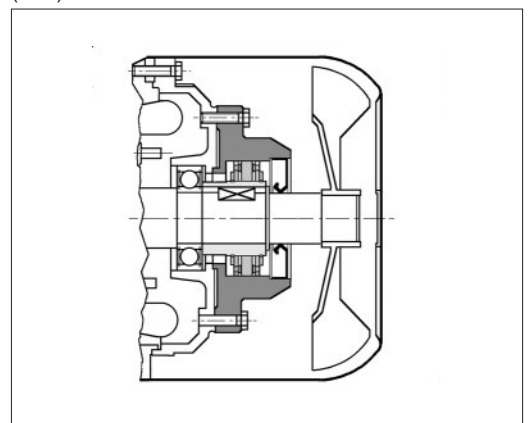
Les dimensions sont le même du moteur frein.

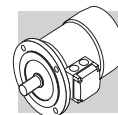
Pour le sens de rotation libre contacter le Service Technique Bonfiglioli Riduttori.

(A75)

	Coppia nominale di bloccaggio <i>Rated locking torque</i> Nenndrehmoment der Sperre <i>Couple nominal de blocage</i>	Coppia max. di bloccaggio <i>Max. locking torque</i> Max. Drehmoment der Sperre <i>Couple maxi. de blocage</i>	Velocità di distacco <i>Release speed</i> Ausrückgeschwindigkeit <i>Vitesse de décollement</i>
	[Nm]	[Nm]	[min ⁻¹]
M1	6	10	750
M2	16	27	650
M3	54	92	520
M4	110	205	430

(A76)





Ventilazione

I motori sono raffreddati mediante ventilazione esterna (IC 411 secondo CEI EN 60034-6) e sono provvisti di ventola radiale in plastica, funzionante in entrambi i versi di rotazione.

L'installazione dovrà assicurare una distanza minima della calotta copriventola dalla parete più vicina, in modo da non creare impedimento alla circolazione dell'aria, oltre che permettere l'esecuzione della manutenzione ordinaria del motore e, se presente, del freno.

Su richiesta, a partire dalle grandezze BN 71, oppure M1, i motori possono essere forniti con ventilazione forzata ad alimentazione indipendente. Il raffreddamento è realizzato per mezzo di un ventilatore assiale con alimentazione indipendente, montato sulla calotta copriventola (metodo di raffreddamento IC 416).

Questa esecuzione è utilizzata in caso di alimentazione del motore tramite inverter allo scopo di estendere il campo di funzionamento a coppia costante anche a bassa velocità, o quando per lo stesso sono richieste elevate frequenze di avviamento.

Da questa opzione sono esclusi i motori autofrenanti tipo BN_BA e tutti i motori con doppia sporgenza d'albero (opzione PS).

Ventilation

Motors are cooled through outer air blow (IC 411 according to CEI EN 60034-6) and are equipped with a plastic radial fan, which operates in both directions.

Ensure that fan cover is installed at a suitable distance from the closest wall so to allow air circulation and servicing of motor and brake, if fitted.

On request, motors can be supplied with independently power-supplied forced ventilation system starting from BN 71 or M1 size.

Motor is cooled by an axial fan with independent power supply and fitted on the fan cover (IC 416 cooling system).

This version is used in case of motor driven by inverter so that steady torque operation is possible even at low speed or when high starting frequencies are needed.

Brake motors of BN_BA type and all motors with rear shaft projection (PS option) are excluded.

Belüftung

Die Motoren werden mittels Fremdbelüftung gekühlt (IC 411 gemäß CEI EN 60034-6) und sind mit einem Radiallüfterrad aus Kunststoff ausgestattet, das in beide Richtungen dreht.

Die Installation muss zwischen Lüfterradkappe und der nächstliegenden Wand einen Mindestabstand berücksichtigen, so dass der Luftumlauf nicht behindert werden kann. Dieser Abstand ist jedoch ebenso für die regelmäßige Instandhaltung des Motors und, falls vorhanden, der Bremse erforderlich.

Ab der Baugröße BN 71 oder M1 können die Motoren auf Anfrage mit einer unabhängig gespeisten Zwangsbelüftung geliefert werden. Die Kühlung erfolgt hierdurch einen unabhängig gespeisten Axialventilator, der auf die Lüfterradkappe (Kühlmethode IC 416) montiert wird.

Diese Ausführung wird im Fall eines über einen Frequenzumrichter versorgten Motor verwendet, so dass der Betriebsbereich bei konstantem Drehmoment auch auf die niedrige Drehzahl ausgedehnt wird, oder im Fall von hohen Anlauffrequenzen.

Von dieser Option ausgeschlossen sind die Bremsmotoren BN_BA und Motoren mit beidseitig herausragender Welle (Option PS).

Ventilation

Les moteurs sont refroidis par ventilation externe (IC 411 selon CEI EN 60034-6) et sont équipés de ventilateur radial en plastique fonctionnant dans les deux sens de rotation.



L'installation doit garantir une distance minimum de la calotte cache-ventilateur par rapport au mur le plus proche de façon à ne pas créer d'empêchement à la circulation de l'air ainsi que pour permettre les interventions d'entretien ordinaire du moteur et, si présent, du frein.

Sur demande, à partir de la taille BN 71, ou M1, les moteurs peuvent être fournis avec ventilation forcée à alimentation indépendante. Le refroidissement est réalisé au moyen d'un ventilateur axial avec alimentation indépendante monté sur la calotte cache-ventilateur (méthode de refroidissement IC 416).

Cette exécution est utilisée en cas d'alimentation du moteur par variateur dans le but d'étendre aussi la plage de fonctionnement à couple constant aux faibles vitesses ou lorsque des fréquences de démarrage élevées sont nécessaire à celui-ci.

Les moteurs frein type BN_BA et les moteurs avec arbre sortant des deux côtés (option PS) SP sont exclus de cette option.

(A77)

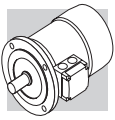
Dati di alimentazione / Power supply / Daten der Stromversorgung / Données d'alimentation					
		V a.c. ± 10%	Hz	P [W]	I [A]
BN 71	M1	1~ 230	50 / 60	22	0.12
BN 80	M2			22	0.12
BN 90	—			40	0.30
BN 100 (*)	M3			50	0.25
BN 112	—	3~ 230 Δ / 400Y	50	50	0.26 / 0.15
BN 132S	M4S			110	0.38 / 0.22
BN 132M...BN 160MR	M4L				
BN 160...BN 180M	M5		50	180	1.25 / 0.72

Per la variante sono disponibili due esecuzioni alternative, denominate **U1** e **U2**, aventi lo stesso ingombro in senso longitudinale. Per entrambe le esecuzioni, la maggiore lunghezza della calotta copriventola (ΔL) è riportata nella tabella che segue. Dimensioni complessive ricavabili dalle tavole dimensionali dei motori.



This variant has two different models, called **U1** and **U2**, having the same longitudinal size. Longer side of fan cover (ΔL) is specified for both models in the table below. Overall dimension can be reckoned from motor size table.

Für die Varianten sind als Alternative zwei Ausführungen verfügbar: **U1** und **U2** mit dem gleichen Längsmaßen. Für beide Ausführungen wird die Verlängerung der Lüfterradkappe (ΔL) in der nachstehenden Tabelle wiedergegeben. Gesamtmaße können den Tabellen entnommen werden, in denen die Motormaße angegeben werden.

Pour la variante sont disponibles deux exécutions alternatives, dénommées **U1** et **U2**, ayant le même encombrement dans le sens longitudinal. Pour les deux exécutions, la majoration de la longueur de la calotte cache-ventilateur (ΔL) est indiquée dans le tableau suivant. Dimensions totales à calculer d'après les planches de dimensions des moteurs.



(A78)

Tabella maggiorazione lunghezze motore / Extra length for servoveilated motors Tabelle - Motorverlängerung / Tableau majoration longueurs moteur			
		ΔL_1	ΔL_2
BN 71	M1	93	32
BN 80	M2	127	55
BN 90	—	131	48
BN 100	M3	119	28
BN 112	—	130	31
BN 132S	M4S	161	51
BN 132M	M4L	161	51

ΔL_1 = variazione dimensionale rispetto alla quota LB del motore standard corrispondente

ΔL_1 = extra length to LB value of corresponding standard motor

ΔL_1 = Maßänderung gegenüber Maß LB des entsprechenden Standardmotors

ΔL_1 = variation de dimension par rapport à la cote LB du moteur standard correspondant

ΔL_2 = variazione dimensionale rispetto alla quota LB del motore autofrenante corrispondente

ΔL_2 = extra length to LB value of corresponding brake motor

ΔL_2 = Maßänderung gegenüber Maß LB des entsprechenden Bremsmotors

ΔL_2 = variation de dimension par rapport à la cote LB du moteur frein correspondant

U1



Terminali di alimentazione del ventilatore in scatola morsetti separata.

Nei motori autofrenanti grandezza BN 71...BN 160MR, con variante **U1**, la leva di sblocco non è collocabile nella posizione AA. L'opzione non è disponibile per i motori conformi alle norme CSA e UL (opzione CUS).

Fan wiring terminals are housed in a separate terminal box.

*In brake motors of size BN 71...BN 160MR, with **U1** model, the release lever cannot be positioned to AA.*

The option is not applicable to motors compliant with the CSA and UL norms (option CUS).

Versorgungsanschlüsse des Ventilators im Zusatzklemmenkasten.

Bei den Bremsmotoren in der Baugröße BN 71...BN 160MR, mit Variante **U1** kann der Bremslösehebel nicht in der Position AA. Die Option ist nicht anwendbar für die Motoren entsprechend den Normen CSA und UL (Option CUS).

Bornes d'alimentation du ventilateur dans un bornier séparé.

*Pour les moteurs frein taille BN 71...BN 160MR, avec variante **U1**, le levier de déblocage ne peut être installé en position AA. L'option n'est pas disponible pour les moteurs conformes aux normes CSA et UL (option CUS).*

U2



I terminali del ventilatore sono collocati nella scatola morsetti-riera principale del motore.

L'opzione U2 non è applicabile ai motori da BN 160 a BN 200L, con eccezione dei motori BN 160MR, per i quali l'opzione è disponibile e ai motori con opzione CUS (conformi alle norme CSA e UL).

Fan terminals are wired in the motor terminal box.

The U2 option does not apply to motors BN 160 through BN 200L, with the only exception of motor BN 160MR for which the option is available instead and to motors with option CUS (compliant to norms CSA and UL).



Versorgungsanschlüsse des Ventilators befinden sich im Hauptklemmenkasten des Motors.

Die Option U2 ist nicht anwendbar bei den Motoren BN160M...BN200L, außer den Motoren BN160MR wofür die Option verfügbar ist, und bei den Motoren mit der CUS-Option (entsprechend den Normen CSA und UL).

Bornes d'alimentation du ventilateur dans le bornier principal du moteur.

L'option n'est pas applicable aux moteurs BN 160...BN 200L, sauf pour les moteurs BN 160MR, pour lesquels l'option est disponible et aux moteurs avec l'option CUS (conforme aux normes CSA et UL).

(A79)

(*)			V a.c. \pm 10%	Hz	P [W]	I [A]
	BN 100_U2	M3	3~ 230 Δ / 400Y	50 / 60	40	0.12 / 0.09

RC

Tettuccio parapigioggia

Il dispositivo parapigioggia, che è raccomandato quando il motore è montato verticalmente con l'albero verso il basso, serve a proteggere il motore stesso dall'ingresso di corpi solidi e dallo stillicidio.

Drip cover

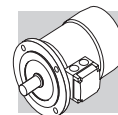
The drip cover protects the motor from dripping and avoids the ingress of solid bodies. It is recommended when motor is installed in a vertical position with the shaft downwards.

Schutzdach

Das Schutzdach, dessen Montage dann empfohlen wird, wenn der Motor senkrecht mit einer nach unten gerichteten Welle ausgerichtet wird, dient dem Schutz des Motors vor einem Eindringen von festen Fremdkörpern und Tropfwasser.

Capot de protection anti-pluie

Le capot de protection anti-pluie est recommandé lorsque le moteur est monté verticalement avec l'arbre vers le bas, il sert à protéger le moteur contre l'introduction de corps solides et le suintement.





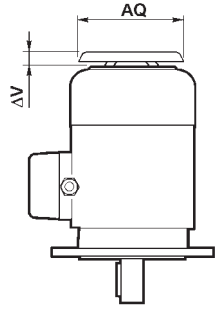
Le dimensioni aggiuntive sono indicate nella tabella (A80). Il tettuccio esclude le varianti PS, EN1, EN2, EN3 e non è applicabile ai motori con freno tipo BA

Relevant dimensions are indicated in the table (A80). The drip cover is not compatible with variants PS, EN1, EN2, EN3 and will not fit motors equipped with a BA brake.

Die Maßerweiterungen werden in der Tabelle (A80) angegeben. Das Schutzdach schließt die Möglichkeit der Varianten PS, EN1, EN2, EN3 und kann bei Motoren mit dem Bremstyp BA nicht montiert werden.

Les dimensions à ajouter sont indiquées dans le tableau (A80). Le capot antipluie exclue les variantes PS, EN1, EN2, EN3 et n'est pas applicable aux moteurs avec frein type BA.

(A80)

		AQ	ΔV	
BN 63	M05	118	24	
BN 71	M1	134	27	
BN 80	M2	152	25	
BN 90	—	168	30	
BN 100	M3	190	28	
BN 112	—	211	32	
BN 132...BN 160MR	M4	254	32	
BN 160M...BN 180M	M5	302	36	
BN 180L...BN 200L	—	340	36	

TC

Tettuccio tessile

La variante del tettuccio tipo TC è da specificare quando il motore è installato in ambienti dell'industria tessile, dove sono presenti filamenti che potrebbero ostruire la griglia del copriventola, impedendo il regolare flusso dell'aria di raffreddamento. L'opzione esclude le varianti EN1, EN2, EN3 e non è applicabile ai motori con freno tipo BA. L'ingombro complessivo è lo stesso del tettuccio tipo RC.

Textile canopy

Option TC is a cover variant for textile industry environments, where lint may obstruct the fan grid and prevent a regular flow of cooling air. This option is not compatible with variants EN1, EN2, EN3 and will not fit motors equipped with a BA brake. Overall dimensions are the same as drip cover type RC.

Schutzdach

Die Variante des Schutzdachs vom Typ TC muss dann spezifiziert werden, wenn der Motor in Bereichen der Textilindustrie installiert wird, in denen Stofffusseln das Lüfterradgitter verstopfen und so einen regulären Kühlluftfluss verhindern könnten. Diese Option schließt die Möglichkeit der Varianten EN1, EN2, EN3 aus und kann bei Motoren mit einer Bremse vom Typ BA nicht appliziert werden. Die Gesamtmaße entsprechen denen des Schutzdachs vom Typ RC.

Capot textile

La variante del capot type TC est à spécifier lorsque le moteur est installé dans des sites de l'industrie textile, où sont présents des filaments qui pourraient obstruer la grille du cache-ventilateur et empêcher le flux régulier de l'air de refroidissement. L'option exclue les variantes EN1, EN2, EN3 et n'est pas applicable aux moteurs avec frein type BA. L'encombrement total est identique à celui du capot type RC.

Dispositivi di retroazione

I motori possono essere dotati di tre diversi tipi di encoder, qui di seguito descritti. Il montaggio dell'encoder esclude le esecuzioni con doppia estremità d'albero (PS) e tettuccio di protezione (RC, TC). Il dispositivo non è applicabile ai motori dotati del freno im c.a., tipo BA.

Feedback units

Motors may be combined with three different types of encoders to achieve feedback circuits. Configurations with double-extended shaft (PS) and rain canopy (RC, TC) are not compatible with encoder installation. Also not compatible are motors equipped with a.c. brakes, type BA.

Geber-anschluß

Die Motoren können mit drei unterschiedlichen Encodertypen ausgestattet werden. Nachstehend finden Sie die entsprechenden Beschreibungen. Die Montage des Encoders schließt die Version mit zweitem Wellenende (PS) und Schutzdach (RC, TC) aus. Die Vorrichtung kann an Motoren mit Bremse vom Typ BA nicht angebaut werden.

Dispositifs de retroaction

Pour moteurs peuvent être dotés de trois types de codeurs différents, décrits ci-après. Le montage du codeur exclu les exécutions avec arbre à double extrémité (PS) et le capot de protection (RC, TC). Le dispositif n'est pas applicable aux moteurs avec frein en c.a., type BA.

EN1

Encoder incrementale, $V_{IN}=5V$, uscita line-driver RS 422.

Incremental encoder, $V_{IN}=5V$, line-driver output RS 422.

Inkremental-Encoder, $V_{IN}=5V$, Ausgang „line-driver“ RS 422.

Codeur incrémental, $V_{IN}=5V$, sortie line-driver RS 422.

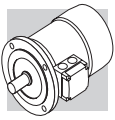
EN2

Encoder incrementale, $V_{IN}=10-30V$, uscita line driver RS 422.

Incremental encoder, $V_{IN}=10-30V$, line-driver output RS 422.

Inkremental-Encoder, $V_{IN}=10-30V$, Ausgang „line driver“ RS 422.

Codeur incrémental, $V_{IN}=10-30V$, sortie line-driver RS 422.



EN3

Encoder incrementale, $V_{IN}=12-30$ V, uscita push-pull 12-30 V

Incremental encoder, $V_{IN}=12-30$ V, push-pull output 12-30 V

Inkremental-Encoder, $V_{IN}=12-30$ V, Ausgang „push-pull“ 12-30 V

Codeur incrémental, $V_{IN}=12-30$ V, sortie push-pull 12-30 V

(A81)

	EN1	EN2	EN3
interfaccia / Interface Schnittstelle / interface	RS 422	RS 422	push-pull
tensione alimentazione / Power supply voltage Versorgungsspannung / tension d'alimentation	[V] 4...6	10...30	12...30
tensione di uscita / Output voltage Ausgangsspannung / tension de sortie	[V] 5	5	12...30
corrente di esercizio senza carico / No-load operating current Betriebsstrom ohne Belastung / courant d'utilisation sans charge	[mA] 120	100	100
n° di impulsi per giro / No. of pulses per revolution Impulse pro Drehung / nbre d'impulsions par tour	1024		
n° segnali / No. of signals Signale / nbre de signaux	6 (A, B, C + segnali invertiti / inverted signals invertierte Signale / signaux inversés)		
max. frequenza di uscita / Max. output frequency Max. Ausgangsfrequenz / fréquence max. de sortie	[kHz]	600	
max. velocità / Max. speed Max. Drehzahl / vitesse max.	[min ⁻¹]	6000 (9000 min ⁻¹) x 10s	
campo di temperatura / Temperature range Temperaturbereich / plage de température	[°C]	-30...+100	
grado di protezione / Protection class Schutzgrad / degré de protection	IP 65		

EN1, EN2, EN3	
BN 63...BN 200L	M05...M5
BN 63_FD...BN 200L_FD	M05_FD...M5_FD
BN 63_FA...BN 200L_FA	M05_FA...M5_FA

Se l'opzione EN_ è richiesta per motori di grandezza BN71...BN160MR e M1...M4, contemporaneamente all'opzione U1/U2, le variazioni dimensionali coincidono con quelle dell'opzione U1/U2.






If the encoder device (options EN1, EN2, EN3) is specified on motors BN71...BN160MR and M1...M4, along with the independent fan cooling (options U1, U2), the extra length of motor is coincident with that of the correspondent U1 and U2 execution.

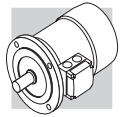
EN_ + U1		
		L3
BN 160M...BN 180M	M5	72
BN 180L...BN 200L	-	82
BN 160M_FD...BN 180M_FD	M5_FD	35
BN 180L_FD...BN 200L_FD	-	41

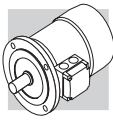
Wenn der Encoder (Optionen EN1, EN2, EN3) für Motoren der Baugrößen BN71...BN160MR und M1...M4 zusammen mit Fremd Lüftung (Optionen U1, U2) ausgelegt ist, stimmen die Maßänderungen des Motors mit jenen der entsprechenden Ausführungen U1 und U2 überein.

Si un codeur (option EN1, EN2, EN3) est nécessaire sur les moteurs de tailles BN71...BN160MR et M1...M4, en association avec la ventilation forcée (options U1, U2), la variation de dimensions du moteur coïncide avec celle des exécutions U1 et U2 correspondantes.






2 P**3000 min⁻¹ - S1****50 Hz**

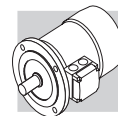
Ph	kW		n min ⁻¹	Mn Nm	IE1	η (100%) %	η (75%) %	η (50%) %	cos φ	In [400V] A	Is In %	Ms Mn %	Ma Mn %	Jm x 10 ⁻⁴ kgm ²	IM B5 	freno c.c. / d.c. brake G.S.-bremse / frein c.c.						freno c.a. / a.c. brake W.S.-bremse / frein c.a.											
																FD			FA			BA			FD			FA			BA		
																Mod.	Mb Nm	Zo 1/h NB SB	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb Nm	Zo 1/h	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb Nm	Zo 1/h	Jm x 10 ⁻⁴ kgm ²	IM B5 			
0.18	BN 63A	2	2730	0.63		59.9	56.9	51.9	0.77	0.56	3.0	2.1	2.0	2.0	3.5	FD 02	1.75	3900	4800	2.6	5.2	FA 02	1.75	4800	4800	2.6	5.0	BA 60	5	3500	4.0	5.8	
0.25	BN 63B	2	2740	0.87		66.0	64.8	64.8	0.76	0.72	3.3	2.3	2.3	2.3	3.9	FD 02	1.75	3900	4800	3.0	5.6	FA 02	1.75	4800	4800	3.0	5.4	BA 60	5	3600	4.3	6.2	
0.37	BN 63C	2	2800	1.26		69.1	66.8	66.8	0.78	0.99	3.9	2.6	2.6	3.3	5.1	FD 02	3.5	3600	4500	3.9	6.8	FA 02	3.5	4500	4500	3.9	6.6	BA 60	5	3500	5.3	7.4	
0.37	BN 71A	2	2820	1.25		73.8	73.0	70.6	0.76	0.95	4.8	2.8	2.6	3.5	5.4	FD 03	3.5	3000	4100	4.6	8.1	FA 03	3.5	4200	4200	4.6	7.8	BA 70	8	3500	5.5	9.3	
0.55	BN 71B	2	2820	1.86		76.0	75.8	74.8	0.76	1.37	5.0	2.9	2.8	4.1	6.2	FD 03	5	2900	4200	5.3	8.9	FA 03	5	4200	4200	5.3	8.6	BA 70	8	3600	6.1	10.1	
0.75	BN 71C	2	2810	2.6		76.6	76.2	76.2	0.76	1.86	5.1	3.1	2.8	5.0	7.3	FD 03	5	1900	3300	6.1	10	FA 03	5	3600	3600	6.1	9.7	BA 70	8	3200	7.0	11.2	
0.75	BN 80A	2	2810	2.6	●	76.2	75.5	68.3	0.81	1.75	4.8	2.6	2.2	7.8	8.6	FD 04	5	1700	3200	9.4	12.5	FA 04	5	3200	3200	9.4	12.4	BA 80	18	2800	10.8	13.9	
1.1	BN 80B	2	2800	3.8	●	76.4	76.2	75.0	0.81	2.57	4.8	2.8	2.4	9.0	9.5	FD 04	10	1500	3000	10.6	13.4	FA 04	10	3000	3000	10.6	13.3	BA 80	18	2700	12.0	14.8	
1.5	BN 80C	2	2800	5.1	●	79.1	79.5	77.2	0.81	3.4	4.9	2.7	2.4	11.4	11.3	FD 04	15	1300	2600	13.0	15.2	FA 04	15	2600	2600	13.0	15.1	BA 80	18	2400	14.4	16.6	
1.5	BN 90SA	2	2870	5.0	●	82.0	81.5	78.1	0.80	3.4	5.9	2.7	2.6	12.5	12.3	FD 14	15	900	2200	14.1	16.5	FA 14	15	2200	2200	14.1	16.4	BA 90	35	1600	19.5	19.6	
1.85	BN 90SB	2	2880	6.1	●	82.5	82.0	75.4	0.80	4.0	6.2	2.9	2.6	16.7	14	FD 14	15	900	2200	18.3	18.2	FA 14	15	2200	2200	18.3	18.1	BA 90	35	1700	23.7	21.3	
2.2	BN 90L	2	2880	7.3	●	82.7	82.1	80.8	0.80	4.8	6.3	2.9	2.7	16.7	14	FD 05	26	900	2200	21	20	FA 05	26	2200	2200	21	20.7	BA 90	35	1700	24	21.3	
3	BN 100L	2	2860	10.0	●	81.5	81.3	77.4	0.79	6.7	5.6	2.6	2.2	31	20	FD 15	26	700	1600	35	26	FA 15	26	1600	1600	35	27	BA 100	50	1300	43	30	
4	BN 100LB	2	2870	13.3	●	83.1	83.0	77.8	0.80	8.7	5.8	2.7	2.5	39	23	FD 15	40	450	900	43	29	FA 15	40	1000	1000	43	30	BA 100	50	850	51	33	
4	BN 112M	2	2900	13.2	●	85.5	84.5	83.0	0.82	8.2	6.9	3.0	2.9	57	28	FD 06S	40	—	950	66	39	FA 06S	40	950	950	66	40	BA 110	75	850	73	41	
5.5	BN 132SA	2	2890	18.2	●	84.7	84.5	81.2	0.84	11.2	5.9	2.6	2.2	101	35	FD 06	50	—	600	112	48	FA 06	50	600	600	112	49	BA 140	150	500	151	67	
7.5	BN 132SB	2	2900	25	●	86.5	86.3	84.4	0.85	14.7	6.4	2.6	2.2	145	42	FD 06	50	—	550	154	55	FA 06	50	550	550	154	56	BA 140	150	450	195	74	
9.2	BN 132M	2	2930	30	●	87.0	86.5	83.6	0.86	17.7	6.7	2.8	2.3	178	53	FD 56	75	—	430	189	66	FA 06	75	430	430	189	67	BA 140	150	400	228	85	
11	BN 160MR	2	2920	36	●	87.6	87.0	86.0	0.88	20.6	6.9	2.9	2.5	210	65																		
15	BN 160MB	2	2930	49	●	89.6	89.4	88.0	0.86	28.1	7.1	2.6	2.3	340	84																		
18.5	BN 160L	2	2930	60	●	90.4	90.1	89.0	0.86	34	7.6	2.7	2.3	420	97																		
22	BN 180M	2	2930	72	●	89.9	89.7	89.5	0.88	40	7.8	2.6	2.4	490	109																		
30	BN 200LA	2	2930	98	●	90.7	90.1	87.6	0.89	54	7.8	2.7	2.9	770	140																		

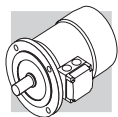




Ph	kW	Ph	n	Mn	IE1	η (100%) %	η (75%) %	η (50%) %	$\cos \phi$	In	$\frac{Is}{In}$	$\frac{Ms}{Mn}$	$\frac{Ma}{Mn}$	$\frac{Jm}{kgm^2}$	IM B5	freno c.c. / d.c. brake G.S.-bremse / frein c.c.				freno c.a. / a.c. brake W.S.-bremse / frein c.a.											
																FD		FA		BA		FA		BA							
Mod	Nm	Mb	Nm	Z _o	Z _o	Z _o	1/h	SB	1/h	IM B5	IM B5	Mod.	Nm	Mb	Mod.	Nm	Z _o	Z _o	IM B5	IM B5	Mod.	Nm	Z _o	Z _o							
0.06	BN 56A	4	1340	0.43	46.8	44.2	41.3	0.65	0.28	2.6	2.3	2.0	1.5	3.1	FD 02	1.75	10000	13000	2.6	5.2	FA 02	1.75	13000	2.6	5.0	BA 60	5	9000	4.0	5.8	
0.09	BN 56B	4	1350	0.64	51.7	47.6	42.9	0.60	0.42	2.6	2.5	2.4	1.5	3.1	FD 02	3.5	10000	13000	3.0	5.6	FA 02	3.5	13000	3.0	5.4	BA 60	5	9000	4.3	6.2	
0.12	BN 63A	4	1350	0.85	59.8	56.2	47.0	0.62	0.47	2.6	1.9	1.8	2.0	3.5	FD 02	3.5	7800	10000	3.9	6.8	FA 02	3.5	10000	3.9	6.6	BA 60	5	8500	5.3	7.4	
0.18	BN 63B	4	1320	1.30	54.8	52.9	52.5	0.67	0.71	2.6	2.2	2.0	2.3	3.9	FD 03	3.5	6000	9400	8.0	8.6	FA 03	5.0	9400	8.0	8.3	BA 70	8	8500	8.9	9.8	
0.25	BN 63C	4	1340	1.78	65.3	65.0	57.9	0.69	0.80	2.7	2.1	1.9	3.3	5.1	FD 53	7.5	4300	8700	10.2	10	FA 03	7.5	8700	10.2	9.7	BA 70	8	8000	11.1	11.2	
0.25	BN 71A	4	1380	1.73	63.7	62.2	59.1	0.73	0.78	3.3	1.9	1.7	5.8	5.1	FD 04	10	4100	8000	16.6	12.1	FA 04	10	8000	16.6	12.0	BA 80	18	7400	18	13.5	
0.37	BN 71B	4	1370	2.6	66.8	66.7	63.0	0.76	1.05	3.7	2.0	1.9	6.9	5.9	FD 04	15	4100	7800	22	13.8	FA 04	15	7800	22	13.7	BA 80	18	7400	23	15.2	
0.55	BN 71C	4	1380	3.8	69.0	68.9	68.8	0.74	1.55	4.1	2.3	2.3	9.1	7.3	FD 04	15	2600	5300	27	15.2	FA 04	15	5300	27	15.1	BA 80	18	5100	28	16.6	
0.55	BN 80A	4	1390	3.8	72.0	71.3	69.7	0.77	1.43	4.1	2.3	2.0	15	8.2	FD 14	15	4800	8000	23	16.4	FA 14	15	8000	23	16.3	BA 90	35	6500	28	19.5	
0.75	BN 80B	4	1400	5.1	75.0	74.5	69.3	0.78	1.85	4.9	2.7	2.5	20	9.9	FD 05	26	3400	6000	32	19.6	FA 05	26	6000	32	20.3	BA 90	35	5400	35	21	
1.1	BN 80C	4	1400	7.5	75.5	76.2	70.4	0.78	2.70	5.1	2.8	2.5	25	11.3	FD 05	26	3200	5900	34	21.1	FA 05	26	5900	34	21.8	BA 90	35	5400	37	22.5	
1.1	BN 90S	4	1390	7.6	76.5	76.2	72.2	0.77	2.70	4.6	2.6	2.2	21	12.2	FD 15	40	2600	4700	44	25	FA 15	40	4700	44	25	BA 100	50	4000	52	29	
1.5	BN 90LA	4	1410	10.2	78.7	78.5	74.9	0.77	3.6	5.3	2.8	2.4	28	13.6	FD 15	40	2400	4400	58	28	FA 15	40	4400	58	29	BA 100	50	3800	66	32	
1.85	BN 90LB	4	1390	12.7	78.6	78.9	77.2	0.79	4.3	5.1	2.8	2.6	30	15.1	FD 05	26	3200	5900	34	21.1	FA 05	26	5900	34	21.8	BA 90	35	5400	37	22.5	
2.2	BN 100LA	4	1410	14.9	81.1	81.4	79.9	0.75	5.2	4.5	2.2	2.0	40	18.3	FD 15	40	2600	4700	44	25	FA 15	40	4700	44	25	BA 100	50	4000	52	29	
3	BN 100LB	4	1410	20	82.6	83.8	83.7	0.77	6.8	5.0	2.3	2.2	54	22	FD 15	40	2400	4400	58	28	FA 15	40	4400	58	29	BA 100	50	3800	66	32	
4	BN 112M	4	1430	27	84.4	84.2	81.6	0.81	8.4	5.6	2.7	2.5	98	30	FD 06S	60	—	1400	107	40	FA 06S	60	2100	107	42	BA 110	75	2000	114	43	
5.5	BN 132S	4	1440	36	84.7	84.8	82.5	0.81	11.6	5.5	2.3	2.2	213	44	FD 56	75	—	1050	223	57	FA 06	75	1200	223	58	BA 140	150	1200	263	76	
7.5	BN 132MA	4	1440	50	86.0	86.3	85.3	0.81	15.5	5.7	2.5	2.4	270	53	FD 06	100	—	950	280	66	FA 07	100	1000	280	71	BA 140	150	1000	320	85	
9.2	BN 132MB	4	1440	61	88.4	88.6	87.5	0.80	18.8	5.9	2.7	2.5	319	59	FD 07	150	—	900	342	75	FA 07	150	900	342	77	BA 140	150	900	369	91	
11	BN 160MR	4	1440	73	87.6	87.8	86.0	0.81	22.4	6.0	2.7	2.5	360	70	FD 07	150	—	850	382	86	FA 07	150	850	382	88						
15	BN 160L	4	1460	98	88.7	88.5	88.4	0.81	30	6.0	2.3	2.1	650	99	FD 08	200	—	750	725	129	FA 08	200	750	710	128						
18.5	BN 180M	4	1460	121	89.3	89.5	89.2	0.81	37	6.2	2.6	2.5	790	115	FD 08	250	—	700	865	145	FA 08	250	700	850	144						
22	BN 180L	4	1460	144	89.9	90.0	90.0	0.80	44	6.4	2.5	2.5	1250	135	FD 09	300	—	400	1450	175											
30	BN 200L	4	1460	196	91.4	91.7	91.0	0.80	59	7.1	2.7	2.8	1650	157	FD 09	400	—	300	1850	197											

Pn kW		n min ⁻¹	Mn Nm	IE1	η (100%) %	η (75%) %	η (50%) %	cos φ	In [400V] A	Is In	Ms Mn	Ma Mn	Jm x 10 ⁻⁴ kgm ²	IM B5 	freno c.c. / d.c. brake G.S.-bremse / frein c.c.						freno c.a. / a.c. brake W.S.-bremse / frein c.a.									
															FD			FA			BA			FA			BA			
															Mod.	Mb Nm	Z _o 1/h NB SB	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb Nm	Z _o 1/h	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb Nm	Z _o 1/h	Jm x 10 ⁻⁴ kgm ²	IM B5 	
0.09	BN 63A	6	880		41.0	41.0	32.9	0.53	0.60	2.1	2.1	1.8	3.4	4.6	FD 02	3.5	9000	14000	4.0	6.3	FA 02	3.5	14000	4.0	6.1	BA 60	5	12000	5.4	6.9
0.12	BN 63B	6	870		45.0	44.0	41.8	0.60	0.64	2.1	1.9	1.7	3.7	4.9	FD 02	3.5	9000	14000	4.3	6.6	FA 02	3.5	14000	4.3	6.4	BA 60	5	12000	5.7	7.2
0.18	BN 71A	6	900		55.0	55.5	51.0	0.69	0.68	2.6	1.9	1.7	8.4	5.5	FD 03	5.0	8100	13500	9.5	8.2	FA 03	5.0	13500	9.5	7.9	BA 70	8	12300	10.4	9.4
0.25	BN 71B	6	900		62.0	58.5	51.4	0.71	0.82	2.6	1.9	1.7	10.9	6.7	FD 03	5.0	7800	13000	12	9.4	FA 03	5.0	13000	12	9.1	BA 70	8	12000	12.9	10.6
0.37	BN 71C	6	910		66.0	60.0	53.3	0.69	1.17	3.0	2.4	2.0	12.9	7.7	FD 53	7.5	5100	9500	14	10.4	FA 03	7.5	9500	14	10.1	BA 70	8	8900	14.9	11.6
0.37	BN 80A	6	910		68.0	67.4	63.3	0.68	1.15	3.2	2.2	2.0	21	9.9	FD 04	10	5200	8500	23	13.8	FA 04	10	8500	23	13.7	BA 80	18	8000	24	15.2
0.55	BN 80B	6	920		70.0	69.8	64.3	0.68	1.67	3.9	2.6	2.2	25	11.3	FD 04	15	4800	7200	27	15.2	FA 04	15	7200	27	15.1	BA 80	18	6800	28	16.6
0.75	BN 80C	6	920	●	70.0	70.0	64.4	0.65	2.38	3.8	2.5	2.2	28	12.2	FD 04	15	3400	6400	30	16.1	FA 04	15	6400	30	16.0	BA 80	18	6100	31	17.5
0.75	BN 90S	6	920	●	70.0	69.0	64.2	0.68	2.27	3.8	2.4	2.2	26	12.6	FD 14	15	3400	6500	28	16.8	FA 14	15	6500	28	16.7	BA 90	35	5500	33	19.9
1.1	BN 90L	6	920	●	72.9	72.6	69.1	0.69	3.2	3.9	2.3	2.0	33	15	FD 05	26	2700	5000	37	21	FA 05	26	5000	37	22	BA 90	35	4600	40	22
1.5	BN 100LA	6	940	●	75.2	74.2	70.3	0.72	4.0	4.1	2.1	2.0	82	22	FD 15	40	1900	4100	86	28	FA 15	40	4100	86	29	BA 100	50	3800	94	32
1.85	BN 100LB	6	930	●	76.6	72.8	62.6	0.73	4.8	4.6	2.1	2.0	95	24	FD 15	40	1700	3600	99	30	FA 15	40	3600	99	31	BA 100	50	3400	107	34
2.2	BN 112M	6	940	●	78.5	79.0	76.5	0.73	5.5	4.8	2.2	2.0	168	32	FD 06S	60	—	2100	177	42	FA 06S	60	2100	177	44	BA 110	75	2000	184	45
3	BN 132S	6	940	●	79.7	77.0	75.1	0.76	7.1	5.1	1.9	1.8	216	36	FD 56	75	—	1400	226	49	FA 06	75	1400	226	50	BA 140	150	1200	266	68
4	BN 132MA	6	950	●	81.4	81.5	79.5	0.77	9.2	5.5	2.0	1.8	295	45	FD 06	100	—	1200	305	58	FA 07	100	1200	318	63	BA 140	150	1050	345	77
5.5	BN 132MB	6	945	●	83.1	80.9	79.1	0.78	12.2	6.1	2.1	1.9	383	56	FD 07	150	—	1050	406	72	FA 07	150	1050	406	74	BA 140	150	1000	433	88
7.5	BN 160M	6	955	●	85.0	85.0	84.8	0.81	15.7	5.9	2.2	2.0	740	83	FD 08	170	—	900	815	112	FA 08	170	900	815	113					
11	BN 160L	6	960	●	86.4	86.5	85.9	0.81	22.7	6.6	2.5	2.3	970	103	FD 08	200	—	800	1045	133	FA 08	200	800	1045	133					
15	BN 180L	6	970	●	87.7	88.0	87.3	0.82	30	6.2	2.0	2.4	1550	130	FD 09	300	—	600	1750	170										
18.5	BN 200LA	6	960	●	88.6	88.0	87.3	0.81	37	5.9	2.0	2.3	1700	145	FD 09	400	—	450	1900	185										















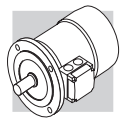
2/4 P

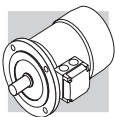
3000/1500 min⁻¹ - S1






50 Hz

Pn kW		n min ⁻¹	Mh Nm	η %	cos φ	In [400V] A	Is In	Ms Mn	Ma Mn	Jm x 10 ⁻⁴ kgm ²	IM B5 	freno c.c. / d.c. brake G.S.-bremse / frein c.c.						freno c.a. / a.c. brake W.S.-bremse / frein c.a.											
												FD			FA			BA			FD			FA			BA		
												Mod.	Mb Nm	Zo 1/h	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb Nm	Zo 1/h	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb Nm	Zo 1/h	Jm x 10 ⁻⁴ kgm ²	IM B5 			
0.20	BN 63B	2	0.71	55	0.82	0.64	3.5	2.1	1.9	2.9	4.4	FD 02	3.5	2200	2600	3.5	6.1	FA 02	3.5	2600	5100	3.5	5.9	BA 60	5	2000	4000	4.9	6.7
0.15		4	1.06	49	0.67	0.66	2.6	1.8	1.7	4.7	4.4		4000	5100															
0.28	BN 71A	2	0.99	56	0.82	0.88	2.9	1.9	1.7	4.7	4.4	FD 03	3.5	2100	2400	5.8	7.1	FA 03	3.5	2400	4800	5.8	6.8	BA 70	8	2100	4200	5.6	8.3
0.20		4	1.39	59	0.72	0.68	3.1	1.8	1.7				3800	4800															
0.37	BN 71B	2	1.29	56	0.82	1.16	3.5	1.8	1.8	5.8	5.1	FD 03	5	1400	2100	6.9	7.8	FA 03	5	2100	4200	6.9	7.5	BA 70	8	1800	3600	7.8	9.0
0.25		4	1.72	60	0.73	0.82	3.3	2.0	1.9				2900	4200															
0.45	BN 71C	2	1.55	63	0.85	1.21	3.8	1.8	1.8	6.9	5.9	FD 03	5	1400	2100	8.0	8.6	FA 03	5	2100	4200	8.0	8.3	BA 70	8	1800	3600	8.9	9.8
0.30		4	2.0	63	0.73	0.94	3.6	2.0	1.9				2900	4200															
0.55	BN 80A	2	1.9	63	0.85	1.48	3.9	1.7	1.7	15	8.2	FD 04	5	1600	2300	16.6	12.1	FA 04	5	2300	4000	16.6	12.0	BA 80	18	2100	3700	18	13.5
0.37		4	2.5	67	0.79	1.01	4.1	1.8	1.9				3000	4000															
0.75	BN 80B	2	2.6	65	0.85	1.96	3.8	1.9	1.8	20	9.9	FD 04	10	1400	1600	22	13.8	FA 04	10	1600	3600	22	13.7	BA 80	18	1500	3300	22	15.2
0.55		4	3.8	68	0.81	1.44	3.9	1.7	1.7				2700	3600															
1.1	BN 90S	2	3.8	71	0.82	2.73	4.7	2.3	2.0	21	12.2	FD 14	10	1500	1600	23	16.4	FA 14	10	1600	2800	23	16.3	BA 90	35	1300	2300	28	19.5
0.75		4	5.2	66	0.79	2.08	4.6	2.4	2.2				2300	2800															
1.5	BN 90L	2	5.2	70	0.85	3.64	4.5	2.4	2.1	28	14.0	FD 05	26	1050	1200	32	20	FA 05	26	1200	2000	32	21	BA 90	35	1100	35	21	
1.1		4	7.6	73	0.81	2.69	4.7	2.5	2.2				1600	2000															
2.2	BN 100LA	2	7.5	72	0.85	5.2	4.5	2.0	1.9	40	18.3	FD 15	26	600	900	44	25	FA 15	26	900	44	25	25	BA 100	50	750	51	29	
1.5		4	10.2	73	0.79	3.8	4.7	2.0	2.0				1300	2300															
3.5	BN 100LB	2	11.7	80	0.84	7.5	5.4	2.2	2.1	61	25	FD 15	40	500	900	65	31	FA 15	40	900	65	32	32	BA 100	50	750	72	35	
2.5		4	16.8	82	0.80	5.5	5.2	2.2	2.2				1000	2100															
4	BN 112M	2	13.3	79	0.83	8.8	6.1	2.4	2.0	98	30	FD 06S	60	—	—	107	40	FA 06S	60	700	107	42	42	BA 110	75	600	114	43	
3.3		4	22.2	80	0.80	7.4	5.1	2.1	2.0				—	—	—	—	—												
5.5	BN 132S	2	18.2	80	0.87	11.4	5.9	2.4	2.0	213	44	FD 56	75	—	—	223	57	FA 06	75	350	223	58	58	BA 140	150	300	263	76	
4.4		4	29	82	0.84	9.2	5.3	2.2	2.0				—	—	—	—	—												
7.5	BN 132MA	2	25	82	0.87	15.2	6.5	2.4	2.0	270	53	FD 06	100	—	—	280	66	FA 07	100	350	293	71	71	BA 140	150	300	320	85	
6		4	40	84	0.85	12.1	5.8	2.3	2.1				—	—	—	—	—												
9.2	BN 132MB	2	30	83	0.86	18.6	6.0	2.6	2.2	319	59	FD 07	150	—	—	342	75	FA 07	150	300	342	77	77	BA 140	150	300	369	91	
7.3		4	48	85	0.85	14.6	5.5	2.3	2.1				—	—	—	—	—												

Pn kW		n min ⁻¹	Mh Nm	η %	cos φ	In [400V] A	Is In	Ms Mn	Ma Mn	Jm x 10 ⁻⁴ kgm ²	IM B5 	freno c.c. / d.c. brake G.S.-bremse / frein c.c.						freno c.a. / a.c. brake W.S.-bremse / frein c.a.											
												FD			FA			BA			FD			FA			BA		
												Mod.	Mb Nm	Zo 1/h NB SB	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb Nm	Zo 1/h	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb Nm	Zo 1/h	Jm x 10 ⁻⁴ kgm ²	IM B5 			
0.25	BN 71A	2	0.84	60	0.82	0.73	4.3	1.9	1.8	6.9	5.9	FD 03	1.75	1500	1700	8.0	8.6	FA 03	2.5	1700	13000	8.0	8.3	BA 70	8	1500	8.9	9.8	
0.08		6	0.84	43	0.70	0.38	2.1	1.4	1.5				10000	13000															
0.37	BN 71B	2	1.23	62	0.80	1.08	4.4	1.9	1.8	9.1	7.3	FD 03	3.5	1000	1300	10.2	10.0	FA 03	3.5	1300	11000	10.2	9.7	BA 70	8	1200	11.1	11.2	
0.12		6	1.27	44	0.73	0.54	2.4	1.4	1.5				9000	11000															
0.55	BN 80A	2	1.88	63	0.86	1.47	4.5	1.9	1.7	20	9.9	FD 04	5	1500	1800	22	13.8	FA 04	5	1800	6300	22	13.7	BA 80	18	1700	23	15.2	
0.18		6	1.85	52	0.65	0.77	3.3	2	1.9				4100	6300															
0.75	BN 80B	2	2.6	66	0.87	1.89	4.3	1.8	1.6	25	11.3	FD 04	5	1700	1900	27	15.2	FA 04	5	1900	6000	27	15.1	BA 80	18	1800	28	16.6	
0.25		6	2.6	54	0.67	1.00	3.2	1.7	1.8				3800	6000															
1.1	BN 90L	2	3.7	67	0.84	2.82	4.7	2.1	1.9	28	14.0	FD 05	13	1400	1600	32	20	FA 05	13	1600	5200	32	21	BA 90	35	1500	35	21	
0.37		6	3.8	59	0.71	1.27	3.3	1.6	1.6				3400	5200															
1.5	BN 100LA	2	5.0	73	0.84	3.53	5.1	1.9	2.0	40	18.3	FD 15	13	1000	1200	44	24	FA 15	13	1200	4000	44	25	BA 100	50	1050	51	29	
0.55		6	5.6	64	0.67	1.85	3.5	1.7	1.8				2900	4000															
2.2	BN 100LB	2	7.2	77	0.85	4.9	5.9	2.0	2.0	61	25	FD 15	26	700	900	65	31	FA 15	26	900	3000	65	32	BA 100	50	800	72	36	
0.75		6	7.5	67	0.64	2.5	3.3	1.9	1.8				2100	3000															
3	BN 112M	2	9.9	78	0.87	6.4	6.3	2.0	2.1	98	30	FD 06S	40	—	1000	107	40	FA 06S	40	1000	2600	107	32	BA 110	75	930	114	43	
1.1		6	11.1	72	0.64	3.4	3.9	1.8	1.8				—	2600															
4.5	BN 132S	2	14.8	78	0.84	9.9	5.8	1.9	1.8	213	44	FD 56	37	—	500	223	57	FA 06	37	500	2100	223	58	BA 140	150	400	263	76	
1.5		6	14.9	74	0.67	4.4	4.2	1.9	2.0				—	2100															
5.5	BN 132M	2	18.0	78	0.87	11.7	6.2	2.1	1.9	270	53	FD 56	50	—	400	280	66	FA 06	50	400	1900	280	67	BA 140	150	350	320	85	
2.2		6	22	77	0.71	5.8	4.3	2.1	2.0				—	1900															









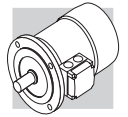
Pn kW		n min ⁻¹	Mh Nm	η %	cos φ	In [400V] A	Is In	Ms Mn	Ma Mn	Jm x 10 ⁻⁴ kgm ²	IM B5 	freno c.c. / d.c. brake G.S.-bremse / frein c.c.						freno c.a. / a.c. brake W.S.-bremse / frein c.a.											
												FD			FA			BA			FD			FA			BA		
												Mod.	Mb Nm	Zo 1/h	NB	SB	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb Nm	Zo 1/h	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb Nm	Zo 1/h	Jm x 10 ⁻⁴ kgm ²	IM B5 	
0.25	BN 71A	2	0.86	61	0.87	0.68	3.9	1.8	1.9	10.9	6.7	FD 03	1.75	1300	1400	12	9.4	FA 03	2.5	1400	12	9.1	BA 70	8	1300	12.9	10.6		
0.06		8	0.84	31	0.61	0.46	2	1.8	1.9				10000	13000						13000					12000				
0.37	BN 71B	2	1.26	63	0.86	0.99	3.9	1.8	1.9	12.9	7.7	FD 03	3.5	1200	1300	14	10.4	FA 03	3.5	1300	14	10.1	BA 70	8	1200	14.9	11.6		
0.09		8	1.28	34	0.75	0.51	1.8	1.4	1.5				9500	13000						13000					12000				
0.55	BN 80A	2	1.86	66	0.86	1.40	4.4	2.1	2.0	20	9.9	FD 04	5	1500	1800	22	13.8	FA 04	5	1800	22	13.7	BA 80	18	1700	23	15.2		
0.13		8	1.80	41	0.64	0.72	2.3	1.6	1.7				5600	8000						8000					7500				
0.75	BN 80B	2	2.6	68	0.88	1.81	4.6	2.1	2.0	25	11.3	FD 04	10	1700	1900	27	15.2	FA 04	10	1900	27	15.1	BA 80	18	1800	28	16.6		
0.18		8	2.5	43	0.66	0.92	2.3	1.6	1.7				4800	7300						7300					7000				
1.1	BN 90L	2	3.7	63	0.84	3.00	4.5	2.1	1.9	28	14	FD 05	13	1400	1600	32	20	FA 05	13	1600	32	21	BA 90	35	1400	35	21		
0.28		8	3.9	48	0.63	1.34	2.4	1.8	1.9				3400	5100						5100					4500				
1.5	BN 100LA	2	5.0	69	0.85	3.69	4.7	1.9	1.8	40	18.3	FD 15	13	1000	1200	44	25	FA 15	13	1200	44	25	BA 100	50	1000	52	29		
0.37		8	5.1	46	0.63	1.84	2.1	1.6	1.6				3300	5000						5000					4200				
2.4	BN 100LB	2	7.9	75	0.82	5.6	5.4	2.1	2.0	61	25	FD 15	26	550	700	65	31	FA 15	26	700	65	32	BA 100	50	600	72	36		
0.55		8	7.5	54	0.58	2.5	2.6	1.8	1.8				2000	3500						3500					3100				
3	BN 112M	2	9.9	76	0.87	6.5	6.3	2.1	1.9	98	30	FD 06S	40	—	900	107	40	FA 06S	40	900	107	42	BA 110	75	800	114	43		
0.75		8	10.4	60	0.65	2.8	2.5	1.6	1.6				—	—	2900					2900					2700				
4	BN 132S	2	13.3	73	0.84	9.4	5.6	2.3	2.4	213	44	FD 56	37	—	500	223	57	FA 06	37	500	223	58	BA 140	150	400	263	76		
1		8	13.8	66	0.62	3.5	2.9	1.9	1.8				—	—	3500					3500					3000				
5.5	BN 132M	2	18.3	75	0.84	12.6	6.1	2.4	2.5	270	53	FD 06	50	—	400	280	66	FA 06	50	400	280	67	BA 140	150	350	320	85		
1.5		8	21	68	0.63	5.1	2.9	1.9	1.9				—	—	2400					2400					2100				

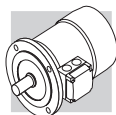
2/12 P



3000/500 min⁻¹ - S3 60/40%






50 Hz

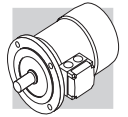
Pn kW		freno c.c. / d.c. brake G.S.-bremse / frein c.c.										freno c.a. / a.c. brake W.S.-bremse / frein c.a.																						
		FD					FA					BA																						
		Mod.	Mb Nm	Zo 1/h	NB SB	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb Nm	Zo 1/h	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb max Nm	Zo 1/h	Jm x 10 ⁻⁴ kgm ²	IM B5 																	
0.55	BN 80B	2	1.86	64	0.89	4.2	1.39	4.2	1.6	1.7	25	11.3	15.2	FD 04	5	1000	1300	27	15.2	FA 04	5	1300	12000	27	15.1	BA 80	18	1200	28	16.6				
0.09		12	2.0	30	0.63	1.8	0.69	1.8	1.9	1.8			8000		8000	12000																		
0.75	BN 90L	2	2.6	56	0.89	4.2	2.17	4.2	1.8	1.7	26	12.6	18.6	FD 05	13	1000	1150	30	18.6	FA 05	13	1150	6300	30	19.3	BA 90	35	1050	33	19.9				
0.12		12	2.7	26	0.63	1.7	1.06	1.7	1.4	1.6			4600		4600	6300																		
1.1	BN 100LA	2	3.7	65	0.85	4.5	2.87	4.5	1.6	1.8	40	18.3	25	FD 15	13	700	900	44	25	FA 15	13	900	6000	44	25	BA 100	50	750	52	29				
0.18		12	4.0	26	0.54	1.5	1.85	1.5	1.3	1.5			4000		4000	6000																		
1.5	BN 100LB	2	4.9	67	0.86	5.6	3.76	5.6	1.9	1.9	54	22	28	FD 15	13	700	900	58	28	FA 15	13	900	5000	58	29	BA 100	50	800	66	32				
0.25		12	5.4	36	0.46	1.8	2.18	1.8	1.7	1.8			3800		3800	5000																		
2	BN 112M	2	6.6	74	0.88	6.5	4.43	6.5	2.1	2	98	30	40	FD 06S	20	—	800	107	40	FA 06S	20	800	3400	107	42	BA 110	75	750	114	43				
0.3		12	6.2	46	0.43	2	2.19	2	2.1	2			—		—	3400																		
3	BN 132S	2	9.8	74	0.87	6.8	6.7	6.8	2.3	1.9	213	44	57	FD 56	37	—	450	223	57	FA 06	37	450	3000	223	58	BA 140	150	380	263	76				
0.5		12	10.2	51	0.43	2	3.3	2	1.7	1.6			—		—	3000																		
4	BN 132M	2	13.1	75	0.89	5.9	8.6	5.9	2.4	2.3	270	53	66	FD 56	37	—	400	280	66	FA 06	37	400	2800	280	67	BA 140	150	350	320	85				
0.7		12	14.5	53	0.44	1.9	4.3	1.9	1.7	1.6			—		—	2800																		

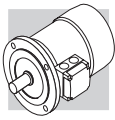




Pn kW		n min ⁻¹	Mn Nm	η %	cos φ	In [400V] A	Is In	Ms Mn	Ma Mn	Jm ⁴ x 10 ⁻⁴ kgm ²	IM B5 	freno c.c. / d.c. brake G.S.-bremse / frein c.c.						freno c.a. / a.c. brake W.S.-bremse / frein c.a.												
												FD			FA			BA			FA			BA						
												Mod.	Mb Nm	Zo 1/h	Mod.	Mb Nm	Zo 1/h	Mod.	Mb Nm	Zo 1/h	Mod.	Mb Nm	Zo 1/h	Mod.	Mb Nm	Zo 1/h	Mod.	Mb Nm	Zo 1/h	
0.22	BN 71B	4	1.5	64	0.74	0.67	3.9	1.8	1.9	9.1	7.3	IM B5	FD 03	3.5	2500	3500	10.2	10	FA 03	3.5	3500	9000	10.2	9.7	BA 70	8	3200	8200	11.1	11.2
0.13		6	1.4	43	0.67	0.65	2.3	1.6	1.7					5000	9000															
0.30	BN 80A	4	2.0	61	0.82	0.87	3.5	1.3	1.5	15	8.2		FD 04	5	2500	3100	16.6	12.1	FA 04	5	3100	6000	16.6	12.0	BA 80	18	2800	18	13.5	
0.20		6	2.1	54	0.66	0.81	3.2	1.9	2.0					4000	6000															
0.40	BN 80B	4	2.7	63	0.75	1.22	3.9	1.8	1.8	20	9.9		FD 04	10	1800	2300	22	13.8	FA 04	10	2300	5500	22	13.7	BA 80	18	2200	23	15.2	
0.26		6	2.7	55	0.70	0.97	2.7	1.5	1.6					3600	5500															
0.55	BN 90S	4	3.7	70	0.78	1.45	4.5	2.0	1.9	21	12.2		FD 14	10	1500	2100	23	16.1	FA 14	10	2100	4100	23	16.3	BA 90	35	1700	28	19.5	
0.33		6	3.4	62	0.70	1.10	3.7	2.3	2.0					2500	4100															
0.75	BN 90L	4	5.0	74	0.78	1.88	4.3	1.9	1.8	28	14		FD 05	13	1400	2000	32	20	FA 05	13	2000	3600	32	21	BA 90	35	1800	35	21	
0.45		6	4.7	66	0.71	1.39	3.3	2.0	1.9					2300	3600															
1.1	BN 100LA	4	7.2	74	0.79	2.72	5.0	1.7	1.9	82	22		FD 15	26	1400	2000	86	28	FA 15	26	2000	3300	86	29	BA 100	50	1800	94	32	
0.8		6	8.0	65	0.69	2.57	4.1	1.9	2.1					2100	3300															
1.5	BN 100LB	4	9.9	75	0.79	3.65	5.1	1.7	1.9	95	25		FD 15	26	1300	1800	99	31	FA 15	26	1800	3000	99	32	BA 100	50	1600	107	34	
1.1		6	11.1	72	0.68	3.24	4.3	2.0	2.1					2000	3000															
2.3	BN 112M	4	15.2	75	0.78	5.7	5.2	1.8	1.9	168	32		FD 06S	40	—	1600	177	42	FA 06S	40	1600	2400	177	44	BA 110	75	1500	184	45	
1.5		6	14.9	73	0.72	4.1	4.9	2.0	2.0					—	—	2400														
3.1	BN 132S	4	20	83	0.83	6.5	5.9	2.1	2.0	213	44		FD 56	37	—	1200	223	57	FA 06	37	1200	1900	223	58	BA 140	150	1000	263	76	
2		6	20	77	0.75	4.9	4.5	2.1	2.1					—	—	1900														
4.2	BN 132MA	4	27	84	0.82	8.8	5.9	2.1	2.2	270	53		FD 06	50	—	900	280	66	FA 06	50	900	1500	280	67	BA 140	150	800	320	85	
2.6		6	26	79	0.72	6.6	4.3	2.0	2.0					—	—	1500														





Pn kW		n min ⁻¹	Mh Nm	η %	cos φ	In [400V] A	Is In	Ms Mn	Ma Mn	Jm x 10 ⁻⁴ kgm ²	IM B5 	freno c.c. / d.c. brake G.S.-bremse / frein c.c.				freno c.a. / a.c. brake W.S.-bremse / frein c.a.												
												FD		FA		BA		FA		BA								
												Mod.	Mb Nm	Zo 1/h	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb Nm	Zo 1/h	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb max Nm	Zo 1/h	Jm x 10 ⁻⁴ kgm ²	IM B5 		
0.37	BN 80A	4	2.5	63	0.82	1.03	3.3	1.4	1.4	15	8.2	FD 04	10	2300	3500	16.6	12.1	FA 04	10	3500	7000	16.6	12.0	BA 80	18	3200	18	13.5
0.18		8	2.5	44	0.60	0.98	2.2	1.5	1.6				4500	7000												6500		
0.55	BN 80B	4	3.8	65	0.86	1.42	3.8	1.7	1.6	20	9.9	FD 04	10	2200	2900	22	13.8	FA 04	10	2900	6500	22	13.7	BA 80	18	2500	23	15.2
0.30		8	4.3	49	0.65	1.36	2.3	1.7	1.8				4200	6500												5600		
0.65	BN 90S	4	4.5	73	0.85	1.51	4.0	1.9	1.9	28	13.6	FD 14	15	2300	2800	30	17.8	FA 14	15	2800	6000	30	17.7	BA 90	35	2400	35	21
0.35		8	4.8	49	0.57	1.81	2.5	2.1	2.2				3500	6000												5100		
0.9	BN 90L	4	6.3	73	0.87	2.05	3.8	1.8	1.8	30	15.1	FD 05	26	1700	2100	34	21	FA 05	26	2100	4200	34	22	BA 90	35	1900	37	22
0.5		8	7.1	57	0.62	2.04	2.4	2.1	2				2500	4200												3800		
1.3	BN 100LA	4	8.7	72	0.83	3.14	4.3	1.7	1.8	82	22	FD 15	40	1300	1700	86	28	FA 15	40	1700	3400	86	29	BA 100	50	1500	94	32
0.7		8	9.6	58	0.64	2.72	2.8	1.8	1.8				2000	3400												3100		
1.8	BN 100LB	4	12.1	69	0.87	4.3	4.2	1.6	1.7	95	25	FD 15	40	1200	1700	99	31	FA 15	40	1700	2600	99	32	BA 100	50	1500	107	34
0.9		8	12.3	62	0.63	3.3	3.2	1.7	1.8				1600	2600												2400		
2.2	BN 112M	4	14.6	77	0.85	4.9	5.3	1.8	1.8	168	32	FD 06S	60	—	—	1200	42	FA 06S	60	1200	2000	177	43	BA 110	75	1100	184	45
1.2		8	16.1	70	0.63	3.9	3.3	1.9	1.8				—	—	—	—	—									1900		
3.6	BN 132S	4	24	80	0.82	7.9	6.5	2.1	1.9	295	45	FD 56	75	—	—	1000	58	FA 06	75	1000	1400	305	59	BA 140	150	900	345	77
1.8		8	24	72	0.55	6.6	4.6	1.9	2				—	—	—	—	—									1200		
4.6	BN 132M	4	30	81	0.83	9.9	6.5	2.2	1.9	383	56	FD 06	100	—	—	1000	69	FA 07	100	1000	1300	406	74	BA 140	150	900	433	88
2.3		8	31	73	0.54	8.4	4.4	2.3	2				—	—	—	—	—									1200		

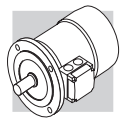




Pn kW	Pn kW	n min ⁻¹	Mn Nm	IE1	η (100%) %	η (75%) %	η (50%) %	cos φ	In [400V] A	Is In %	Ms Mn %	Ma Mn %	Jm x 10 ⁻⁴ kgm ²	IM B9 Kg	freno c.c. / d.c. brake G.S.-bremse / frein c.c.				freno c.a. / a.c. brake W.S.-bremse / frein c.a.							
															Mod.	Mb Nm	Zo 1/h	SB	Mod.	Mb Nm	Zo 1/h	IM B9 Kg				
0.18	M 05A 2	2730	0.63	●	59.9	56.9	51.9	0.77	0.56	3.0	2.1	2.0	2.0	3.2	FD 02	1.75	3900	4800	2.6	4.9	FA 02	1.75	4800	2.6	4.7	
0.25	M 05B 2	2740	0.87	●	66.0	64.8	64.8	0.76	0.72	3.3	2.3	2.3	2.3	3.6	FD 02	1.75	3900	4800	3.0	5.3	FA 02	1.75	4800	3.0	5.1	
0.37	M 05C 2	2800	1.26	●	69.1	66.8	66.8	0.78	0.99	3.9	2.6	3.3	3.3	4.8	FD 02	3.5	3600	4500	3.9	6.5	FA 02	3.5	4500	3.9	6.3	
0.55	M 1SD 2	2820	1.86	●	76.0	75.8	74.8	0.76	1.37	5.0	2.9	4.1	4.1	5.8	FD 03	5	2900	4200	5.3	8.5	FA 03	5	4200	5.3	8.2	
0.75	M 1LA 2	2810	2.6	●	76.6	76.2	76.2	0.76	1.86	5.1	3.1	2.8	5.0	6.9	FD 03	5	1900	3300	6.1	9.6	FA 03	5	3300	6.1	9.3	
1.1	M 2SA 2	2800	3.8	●	76.4	76.2	75.0	0.81	2.57	4.8	2.8	2.4	9.0	8.8	FD 04	10	1500	3000	10.6	11.9	FA 04	10	3000	10.6	12.6	
1.5	M 2SB 2	2800	5.1	●	79.1	79.5	77.2	0.81	3.4	4.9	2.7	2.4	11.4	10.6	FD 04	15	1300	2600	13.0	9.9	FA 04	15	2600	13.0	14.4	
2.2	M 3SA 2	2880	7.3	●	82.7	82.1	81.0	0.80	4.8	6.3	2.9	2.7	24	15.5	FD 15	26	1100	2400	28	22	FA 15	26	2400	28	23	
3	M 3LA 2	2860	10.0	●	81.5	81.3	77.4	0.79	6.7	5.6	2.6	2.2	31	18.7	FD 15	26	700	1600	35	25	FA 15	26	1600	35	26	
4	M 3LB 2	2870	13.3	●	83.1	83.0	77.8	0.80	8.7	5.8	2.7	2.5	39	22	FD 15	40	450	900	43	28	FA 15	40	900	43	29	
5.5	M 4SA 2	2890	18.2	●	84.7	84.5	81.2	0.84	11.2	5.9	2.6	2.2	101	33	FD 06	50	—	600	112	46	FA 06	50	600	112	47	
7.5	M 4SB 2	2900	25	●	86.5	86.3	84.4	0.85	14.7	6.4	2.6	2.2	145	40	FD 06	50	—	550	154	53	FA 06	50	550	154	54	
9.2	M 4LA 2	2930	30	●	87.0	86.5	83.6	0.86	17.7	6.7	2.8	2.3	178	51	FD 56	75	—	430	189	64	FA 06	75	430	189	65	
11	M 4LC 2	2920	36	●	87.6	87.0	86.0	0.88	20.6	6.9	2.9	2.5	210	60												
15	M 5SB 2	2930	49	●	89.6	89.4	86.0	0.86	28.1	7.1	2.6	2.3	340	70												
18.5	M 5SC 2	2930	60	●	90.4	90.1	89.0	0.86	34	7.6	2.7	2.3	420	83												
22	M 5LA 2	2930	72	●	89.9	89.7	89.5	0.88	40	7.8	2.6	2.4	490	95												

4 P**1500 min⁻¹ - S1****50 Hz**

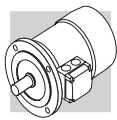
Pn kW		n min ⁻¹	Mn Nm	IE1	η (100%) %	η (75%) %	η (50%) %	cos φ	In [400V] A	Is In -	Ms Mn -	Ma Mn -	Jm x 10 ⁻⁴ kgm ²	IM B9 	freno c.c. / d.c. brake G.S.-bremse / frein c.c.				freno c.a. / a.c. brake W.S.-bremse / frein c.a.						
															Mod	Mb Nm	Zo 1/h	NB SB	Jm x 10 ⁻⁴ kgm ²	IM B9 	Mod.	Mb Nm	Zo 1/h	Jm x 10 ⁻⁴ kgm ²	IM B9 
0.09	M 0B 4	1350	0.64		51.7	47.6	42.9	0.60	0.42	2.6	2.5	2.4	1.5	2.9	FD 02	1.75	10000	13000	2.6	4.9	FA 02	1.75	13000	2.6	4.9
0.12	M 05A 4	1350	0.85		59.8	56.2	47.0	0.62	0.47	2.6	1.9	1.8	2.0	3.2	FD 02	3.5	10000	13000	3.0	5.3	FA 02	3.5	13000	3.0	5.1
0.18	M 05B 4	1320	1.30		54.8	52.9	52.5	0.67	0.71	2.6	2.2	2.0	2.3	3.6	FD 02	3.5	7800	10000	3.9	6.5	FA 02	3.5	10000	3.9	6.3
0.25	M 05C 4	1340	1.78		65.3	65.0	57.9	0.69	0.80	2.7	2.1	1.9	3.3	4.8	FD 03	5	6000	9400	8.0	8.2	FA 03	5	9400	8.0	7.9
0.37	M 1SD 4	1370	2.6		66.8	66.7	63.0	0.76	1.05	3.7	2.0	1.9	6.9	5.5	FD 53	7.5	4300	8700	10.2	9.6	FA 03	7.5	8700	10.2	9.3
0.55	M 1LA 4	1380	3.8		69.0	68.9	68.8	0.74	1.55	4.1	2.3	2.3	9.1	6.9	FD 04	15	4100	7800	22	13.1	FA 04	15	7800	22	13
0.75	M 2SA 4	1400	5.1	●	75.0	74.5	69.3	0.78	1.85	4.9	2.7	2.5	20	9.2	FD 04	15	2600	5300	27	14.5	FA 04	15	5300	27	14.4
1.1	M 2SB 4	1400	7.5	●	76.4	76.2	70.4	0.78	2.66	5.1	2.8	2.5	25	10.6	FD 15	26	2800	4900	38	22	FA 15	26	4900	38	23
1.5	M 3SA 4	1410	10.2	●	79.6	80.5	79.3	0.77	3.5	4.6	2.1	2.1	34	15.5	FD 15	40	2600	4700	44	24	FA 15	40	4700	44	24
2.2	M 3LA 4	1410	14.9	●	81.1	81.4	79.9	0.75	5.2	4.5	2.2	2.0	40	17	FD 15	40	2400	4400	58	27	FA 15	40	4400	58	28
3	M 3LB 4	1410	20	●	82.6	83.8	83.7	0.77	6.8	5.0	2.3	2.2	54	21	FD 55	55	—	1300	65	29	FA 15	40	1300	65	30
4	M 3LC 4	1400	27	●	82.7	83.1	80.5	0.78	9.0	4.7	2.3	2.2	61	23	FD 56	75	—	1050	223	55	FA 06	75	1050	223	56
5.5	M 4SA 4	1440	36	●	84.7	84.8	82.5	0.81	11.6	5.5	2.3	2.2	213	42	FD 06	100	—	950	280	64	FA 07	100	950	280	65
7.5	M 4LA 4	1440	50	●	86.0	86.3	85.3	0.81	15.5	5.7	2.5	2.4	270	51	FD 07	150	—	900	342	73	FA 07	150	900	342	75
9.2	M 4LB 4	1440	61	●	88.4	88.6	87.5	0.80	18.8	5.9	2.7	2.5	319	57	FD 07	150	—	850	382	81	FA 07	150	850	382	83
11	M 4LC 4	1440	73	●	87.6	87.8	86.0	0.81	22.4	6.0	2.7	2.5	360	65	FD 08	200	—	750	725	115	FA 08	200	750	710	114
15	M 5SB 4	1460	98	●	88.7	88.5	88.4	0.81	30.1	6.0	2.3	2.1	650	85	FD 08	250	—	700	865	131	FA 08	250	700	850	130
18.5	M 5LA 4	1460	121	●	89.3	89.5	89.2	0.81	37	6.2	2.6	2.5	790	101											







6 P

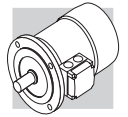
1000 min⁻¹ - S1

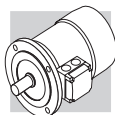
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





Pn kW	Pn kW	n min ⁻¹	Mn Nm	IE1	η (100%) %	η (75%) %	η (50%) %	cos φ	In [400V] A	Is In A	Ms Mn	Ma Mn	Jm x 10 ⁻⁴ kgm ²	IM B9 kg	freno c.c. / d.c. brake G.S.-bremse / frein c.c.				freno c.a. / a.c. brake W.S.-bremse / frein c.a.					
															Mod.	Mb Nm	Zo 1/h	SB	Mod.	Mb Nm	Zo 1/h	IM B9 kg		
0.09	M 05A 6	880	0.98		41.0	41.0	32.9	0.53	0.60	2.1	2.1	1.8	3.4	4.3	FD 02	3.5	9000	14000	4.0	FA 02	3.5	14000	4.0	5.8
0.12	M 05B 6	870	1.32		45.0	44.0	41.8	0.60	0.64	2.1	1.9	1.7	3.7	4.6	FD 02	3.5	9000	14000	4.3	FA 02	3.5	14000	4.3	6.1
0.18	M 15C 6	900	1.91		55.0	55.5	51.0	0.69	0.68	2.6	1.9	1.7	8.4	5.1	FD 03	5	8100	13500	9.5	FA 03	5	13500	9.5	7.5
0.25	M 15D 6	900	2.7		62.0	58.5	51.4	0.71	0.82	2.6	1.9	1.7	10.9	6.3	FD 03	5	7800	13000	12	FA 03	5	13000	12	8.7
0.37	M 1LA 6	910	3.9		66.0	60.0	53.3	0.69	1.17	3.0	2.4	2.0	12.9	7.3	FD 53	7.5	5100	9500	14	FA 03	7.5	9500	14	9.7
0.55	M 25A 6	920	5.7		70.0	69.8	64.3	0.68	1.67	3.9	2.6	2.2	25	10.6	FD 04	15	4800	7200	27	FA 04	15	7200	27	14.4
0.75	M 25B 6	920	7.8	●	70.0	70.0	64.4	0.65	2.38	3.8	2.5	2.2	28	11.5	FD 04	15	3400	6400	30	FA 04	15	6400	30	15.3
1.1	M 35A 6	920	11.4	●	75.0	74.0	72.0	0.72	2.9	4.3	2.0	1.8	33	17	FD 15	26	2700	5000	37	FA 15	26	5000	37	24
1.5	M 3LA 6	940	15.2	●	75.2	74.2	70.3	0.72	4.0	4.1	2.1	2.0	82	21	FD 15	40	1900	4100	86	FA 15	40	4100	86	28
1.85	M 3LB 6	930	19.0	●	76.6	72.8	62.6	0.73	4.8	4.6	2.1	2.0	95	23	FD 15	40	1700	3600	99	FA 15	40	3600	99	30
2.2	M 3LC 6	930	23	●	77.7	76.8	72.4	0.71	5.8	4.7	2.3	2.1	95	23	FD 55	55	—	1900	99	FA 15	55	1900	99	30
3	M 45A 6	940	30	●	79.7	77.0	75.1	0.76	7.1	5.1	1.9	1.8	216	34	FD 56	75	—	1400	226	FA 06	75	1400	226	48
4	M 4LA 6	950	40	●	81.4	81.5	79.5	0.77	9.2	5.5	2.0	1.8	295	43	FD 06	100	—	1200	305	FA 07	100	1200	305	57
5.5	M 4LB 6	945	56	●	83.1	80.9	79.1	0.78	12.2	6.1	2.1	1.9	383	54	FD 07	150	—	1050	406	FA 07	150	1050	406	72
7.5	M 55A 6	955	75	●	85.0	85.0	84.8	0.81	15.7	5.9	2.2	2.0	740	69	FD 08	170	—	900	815	FA 08	170	900	800	98
11	M 55B 6	960	109	●	86.4	86.5	85.9	0.81	22.7	6.6	2.5	2.3	970	89	FD 08	200	—	800	1045	FA 08	200	800	1030	118





Pn kW		n min ⁻¹	Mn Nm	η %	cos φ	In [400V] A	Is In	Ms Mn	Ma Mn	Jm ⁴ kgm ²	IM B9 	freno c.c. / d.c. brake G.S.-bremse / frein c.c.				freno c.a. / a.c. brake W.S.-bremse / frein c.a.						
												Mod.	Nm	Zo 1/h	NB SB	Jm ⁴ kgm ²	IM B9 	Mod.	Nm	Zo 1/h	Jm ⁴ kgm ²	IM B9 
0.20	M 05A	2	0.71	55	0.82	0.64	3.5	2.1	1.9	2.9	4.1	FD 02	3.5	2200	2600	3.5	2600	3.5	5.8	2600	3.5	5.8
0.15		4	1.06	49	0.67	0.66	2.6	1.8	1.7	4.7	4		4000	5100	5100	5100	5100	5100	5100	5100	5100	5.6
0.28	M 15B	2	0.99	56	0.82	0.88	2.9	1.9	1.7	4.7	4	FD 03	3.5	2100	2400	5.8	2400	5.8	6.7	2400	5.8	6.4
0.20		4	1.39	59	0.68	1.02	3.1	1.8	1.7	5.8	4.7		3800	4800	4800	4800	4800	4800	4800	4800	4800	7.1
0.37	M 15C	2	1.29	56	0.82	1.16	3.5	1.8	1.8	6.9	5.5	FD 03	5	1400	2100	6.9	2100	6.9	7.4	2100	6.9	7.1
0.25		4	1.72	60	0.73	0.82	3.3	2	1.9	6.9	5.5		2900	4200	4200	4200	4200	4200	4200	4200	4200	7.9
0.45	M 15D	2	1.55	63	0.85	1.21	3.8	1.8	1.8	9.1	6.9	FD 03	5	1400	2100	8	2100	8	8.2	2100	8	7.9
0.30		4	2.0	63	0.74	0.93	3.8	2.1	1.9	20	9.2		2900	4200	4200	4200	4200	4200	4200	4200	4200	9.3
0.55	M 15A	2	1.9	73	0.79	1.38	4.2	2	1.8	25	10.7	FD 03	5	1600	2200	10.2	2200	10.2	9.6	2200	10.2	9.3
0.37		4	2.5	68	0.72	1.09	3.9	2.2	2	34	15.5		3300	4600	4600	4600	4600	4600	4600	4600	4600	13
0.75	M 25A	2	2.6	65	0.85	1.96	3.8	1.9	1.8	40	17	FD 04	10	1400	1600	22	1600	22	13.1	1600	22	13
0.55		4	3.8	68	0.81	1.44	3.9	1.7	1.7	40	17		2700	3600	3600	3600	3600	3600	3600	3600	3600	14.5
1.1	M 25B	2	3.9	65	0.86	2.84	3.9	2	1.9	25	10.7	FD 04	10	1200	1500	27	1500	27	14.5	1500	27	14.5
0.75		4	5.1	75	0.81	1.78	4.5	2.1	2	34	15.5		2300	3100	3100	3100	3100	3100	3100	3100	3100	23
1.5	M 35A	2	5.1	74	0.83	3.5	4.7	2.1	2	40	17	FD 15	26	700	1000	38	1000	38	22	1000	38	23
1.1		4	7.4	77	0.78	2.6	4.3	2.1	2	40	17		1600	2600	2600	2600	2600	2600	2600	2600	2600	24
2.2	M 35A	2	7.5	72	0.85	5.2	4.5	2	1.9	61	23	FD 15	26	600	900	44	900	44	24	900	44	24
1.5		4	10.2	73	0.79	3.8	4.7	2	2	61	23		1300	2300	2300	2300	2300	2300	2300	2300	2300	30
3.5	M 35B	2	11.7	80	0.84	7.5	5.4	2.2	2.1	213	42	FD 15	40	500	900	65	900	65	29	900	65	30
2.5		4	16.8	82	0.80	5.5	5.2	2.2	2.2	213	42		1000	1000	2100	2100	2100	2100	2100	2100	2100	56
4.8	M 4 SA	2	15.8	81	0.88	9.7	6	2	1.9	213	42	FD 06	50	—	400	233	400	233	55	400	233	56
3.8		4	25.4	81	0.84	8.1	5.2	2.1	2.1	213	42		—	—	950	950	950	950	55	400	233	56
5.5	M 45B	2	18.2	80	0.87	11.4	5.9	2.4	2	270	51	FD 56	75	—	350	223	350	223	55	350	223	56
4.4		4	29	82	0.84	9.2	5.3	2.2	2	270	51		100	—	900	900	900	900	55	350	223	56
7.5	M 45A	2	25	82	0.87	15.2	6.5	2.4	2	319	57	FD 06	100	—	350	280	350	280	64	350	280	65
6		4	40	84	0.85	12.1	5.8	2.3	2.1	319	57		150	—	950	950	950	950	64	350	280	65
9.2	M 45B	2	30	83	0.86	18.6	6	2.6	2.2	319	57	FD 07	150	—	300	342	300	342	73	300	342	75
7.3		4	48	85	0.85	14.6	5.5	2.3	2.1	319	57		150	—	800	800	800	800	73	300	342	75

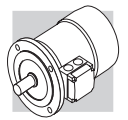


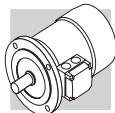






Pn kW		n min ⁻¹	Mn Nm	η %	cos φ	In [400V] A	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	$\frac{J_m}{kgm^2}$	IM B9  Kg	freno c.c. / d.c. brake G.S.-bremse / frein c.c.						freno c.a. / a.c. brake W.S.-bremse / frein c.a.					
												FD			FA								
		Mod.		Mb Nm	Z ₀ 1/h	NB SB	Z ₀ 1/h	Jm x 10 ⁻⁴ kgm ²	IM B9  Kg	Mod.		Mb Nm	Z ₀ 1/h	Jm x 10 ⁻⁴ kgm ²	IM B9  Kg								
0.25	M1SA	2	0.84	60	0.82	0.73	4.3	1.9	1.8	6.9	5.5	FD 03	1.75	1500	1700	8	8.2	FA 03	1.75	1700	8	7.9	
0.08		6	0.84	43	0.70	0.38	2.1	1.4	1.5				10000	13000						13000			
0.37	M1LA	2	1.23	62	0.80	1.08	4.4	1.9	1.8	9.1	6.9	FD 03	3.5	1000	1300	10.2	9.6	FA 03	3.5	1300	10.2	9.3	
0.12		6	1.27	44	0.73	0.54	2.4	1.4	1.5				9000	11000						11000			
0.55	M2SA	2	1.88	63	0.86	1.47	4.5	1.9	1.7	20	9.2	FD 04	5	1500	1800	22	13.1	FA 04	5	1800	22	13	
0.18		6	1.85	52	0.65	0.77	3.3	2.0	1.9				4100	6300						6300			
0.75	M2SB	2	2.6	66	0.87	1.89	4.3	1.8	1.6	25	10.6	FD 04	5	1700	1900	27	14.5	FA 04	5	1900	27	14.4	
0.25		6	2.6	54	0.67	1.00	3.2	1.7	1.8				3800	6000						6000			
1.1	M3SA	2	3.7	71	0.82	2.73	4.9	1.8	1.9	34	15.5	FD 15	13	1000	1300	38	22	FA 15	13	1300	38	23	
0.37		6	3.8	63	0.70	1.21	3.1	1.5	1.8				3500	5000						5000			
1.5	M3LA	2	5.0	73	0.84	3.53	5.1	1.9	2.0	40	17	FD 15	13	1000	1200	44	24	FA 15	13	1200	44	24	
0.55		6	5.6	64	0.67	1.85	3.5	1.7	1.8				2900	4000						4000			
2.2	M3LB	2	7.2	77	0.85	4.9	5.9	2.0	2.0	61	23	FD 15	26	700	900	65	29	FA 15	26	900	65	30	
0.75		6	7.5	67	0.64	2.5	3.3	1.9	1.8				2100	3000						3000			
3	M4SA	2	9.9	74	0.88	6.6	5.6	2.0	2.1	170	36	FD 56	37	—	600	182	48	FA 06	37	600	182	50	
1.1		6	10.9	73	0.68	3.2	4.5	2.2	2				—	2200					2200				
4.5	M4SB	2	14.8	78	0.84	9.9	5.8	1.9	1.8	213	42	FD 56	37	—	500	223	55	FA 06	37	500	223	56	
1.5		6	14.9	74	0.67	4.4	4.2	1.9	2.0				—	2100					2100				
5.5	M4LA	2	18.0	78	0.87	11.7	6.2	2.1	1.9	270	51	FD 06	50	—	400	280	64	FA 06	50	400	280	65	
2.2		6	22	77	0.71	5.8	4.3	2.1	2.0				—	1900					1900				

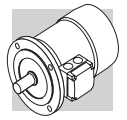
2/8 P**3000/750 min⁻¹ - S3 60/40%****50 Hz**

Pn kW		n min ⁻¹	Mn Nm	η %	cos φ	In [400V] A	Is In	Ms Mn	Ma Mn	Jm ⁴ x 10 ⁻⁴ kgm ²	IM B9 	freno c.c. / d.c. brake G.S.-bremse / frein c.c.						freno c.a. / a.c. brake W.S.-bremse / frein c.a.					
												Mod.	Mb Nm	Zo 1/h	NB SB	Jm ⁴ x 10 ⁻⁴ kgm ²	IM B9 	Mod.	Mb Nm	Zo 1/h	Jm ⁴ x 10 ⁻⁴ kgm ²	IM B9 	
0.37	M 1LA	2800	1.26	63	0.86	0.99	3.9	1.8	1.9	12.9	7.3	FD 03	3.5	1200	1300	14	10	FA 03	3.5	1300	14	9.7	
0.09	8	670	1.28	34	0.75	0.51	1.8	1.4	1.5	20	9.2	FD 04	5	9500	13000	22	13.1	FA 04	5	13000	22	13	
0.55	M 2SA	2830	1.86	66	0.86	1.40	4.4	2.1	2	25	10.6	FD 04	10	1500	1800	27	14.5	FA 04	10	1800	27	14.4	
0.13	8	690	1.80	41	0.64	0.72	2.3	1.6	1.7	34	15.5	FD 15	13	5600	8000	38	22	FA 15	13	8000	38	23	
0.75	M 2SB	2800	2.6	68	0.88	1.81	4.6	2.1	2	40	17	FD 15	13	1700	1900	44	24	FA 15	13	1900	44	24	
0.18	8	690	2.5	43	0.66	0.92	2.3	1.6	1.7	61	23	FD 15	26	4800	7300	50	29	FA 15	26	7300	50	30	
1.1	M 3SA	2870	3.7	69	0.84	2.74	4.6	1.8	1.7	162	36	FD 56	37	1000	1300	65	48	FA 15	37	1300	65	50	
0.28	8	690	3.9	44	0.56	1.64	2.3	1.4	1.7	213	42	FD 56	37	3400	5000	182	55	FA 06	37	5000	182	56	
1.5	M 3LA	2880	5.0	69	0.85	3.69	4.7	1.9	1.8	270	51	FD 15	26	1000	1200	65	64	FA 15	26	1200	65	65	
0.37	8	690	5.1	46	0.63	1.84	2.1	1.6	1.6	270	51	FD 15	26	3300	5000	182	48	FA 15	26	5000	182	50	
2.4	M 3LB	2900	7.9	75	0.82	5.6	5.4	2.1	2	162	36	FD 56	37	550	700	65	48	FA 06	37	700	65	30	
0.55	8	700	7.5	54	0.58	2.5	2.6	1.8	1.8	213	42	FD 56	37	2000	3500	182	55	FA 06	37	3500	182	50	
3	M 4SA	2920	9.8	72	0.85	7.1	5.6	2	1.8	270	51	FD 56	37	—	600	600	182	48	FA 06	37	600	65	
0.75	8	710	10.1	61	0.64	2.8	3	1.7	1.8	270	51	FD 56	37	—	3400	3400	182	55	FA 06	37	3400	50	
4	M 4SB	2870	13.3	73	0.84	9.4	5.6	2.3	2.4	270	51	FD 06	50	—	500	500	280	64	FA 06	50	500	56	
1	8	690	13.8	66	0.62	3.5	2.9	1.9	1.8	270	51	FD 06	50	—	3500	3500	280	64	FA 06	50	3500	65	
5.5	M 4LA	2870	18.3	75	0.84	12.6	6.1	2.4	2.5	270	51	FD 06	50	—	400	400	280	64	FA 06	50	400	65	
1.5	8	690	21	68	0.63	5.1	2.9	1.9	1.9	270	51	FD 06	50	—	2400	2400	280	64	FA 06	50	2400	65	





Pn kW		n min ⁻¹	Mn Nm	η %	cos φ	In [400V] A	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	$\frac{J_m}{kgm^2}$	IM B9 	freno c.c. / d.c. brake G.S.-bremse / frein c.c.						freno c.a. / a.c. brake W.S.-bremse / frein c.a.					
												Mod.	Mb Nm	Z _o 1/h	NB SB	$\frac{J_m}{kgm^2}$	IM B9 	Mod.	Mb Nm	Z _o 1/h	$\frac{J_m}{kgm^2}$	IM B9 	
0.55	M 2SA	2820	1.86	64	0.89	1.39	4.2	1.6	1.7	25	10.6	FD 04	5	1000	1300	27	14.5	FA 04	5	1300	27	14.4	
0.09		430	2.0	30	0.63	0.69	1.8	1.9	1.8					8000	12000								
0.75	M 3SA	2900	2.5	65	0.81	2.06	5.2	1.9	2.1	34	15.5	FD 15	13	700	900	38	22	FA 15	13	900	38	23	
0.12		460	2.5	33	0.43	1.22	1.9	1.3	1.6					5000	7000								
1.1	M 3LA	2850	3.7	65	0.85	2.87	4.5	1.6	1.8	40	17	FD 15	13	700	900	44	24	FA 15	13	900	44	24	
0.18		430	4.0	26	0.54	1.85	1.5	1.3	1.5					4000	6000								
1.5	M 3LB	2900	4.9	67	0.86	3.76	5.6	1.9	1.9	54	21	FD 15	13	700	900	58	27	FA 15	13	900	58	28	
0.25		440	5.4	36	0.46	2.18	1.8	1.7	1.8					3800	5000								
2	M 3LC	2850	6.7	70	0.84	4.9	4.9	1.8	1.7	61	23	FD 55	18	—	700	65	29	FA 15	18	700	65	30	
0.3		450	6.4	38	0.47	2.4	1.7	1.6	1.7					—	3500								
3	M 4SA	2920	9.8	74	0.87	6.7	6.8	2.3	1.9	213	42	FD 56	37	—	450	223	55	FA 06	37	450	223	56	
0.5		470	10.2	51	0.43	3.3	2	1.7	1.6					—	3000								
4	M 4LA	2920	13.1	75	0.89	8.6	5.9	2.4	2.3	270	51	FD 56	37	—	400	280	64	FA 06	37	400	280	65	
0.7		460	14.5	53	0.44	4.3	1.9	1.7	1.6					—	2800								

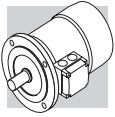


**M12 - DIMENSIONI
MOTORI**

***M12 - MOTORS
DIMENSIONS***

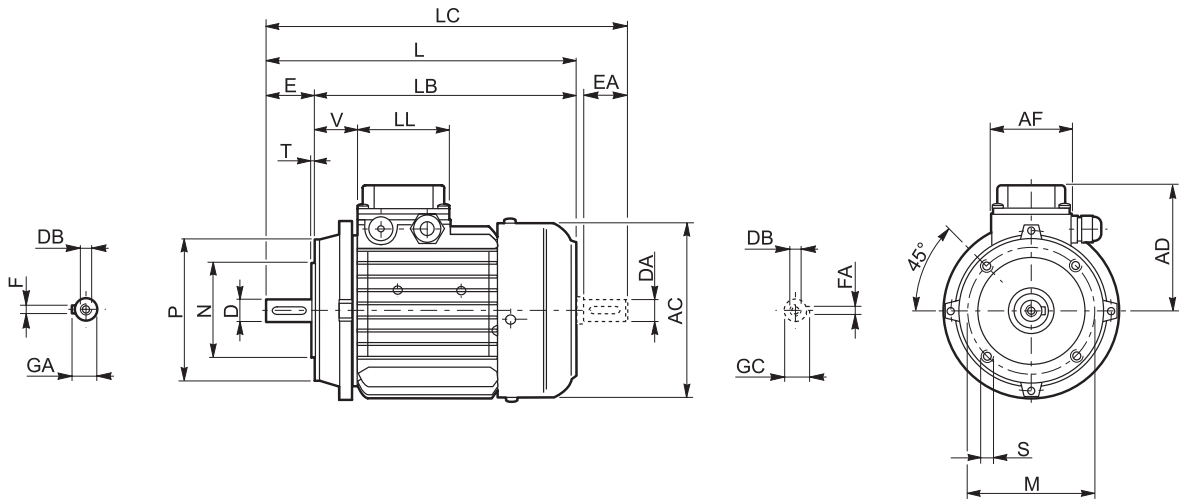
**M12 - MOTORENABMES-
SUNGEN**

***M12 - DIMENSIONS
MOTEURS***

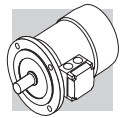


BN

IM B14

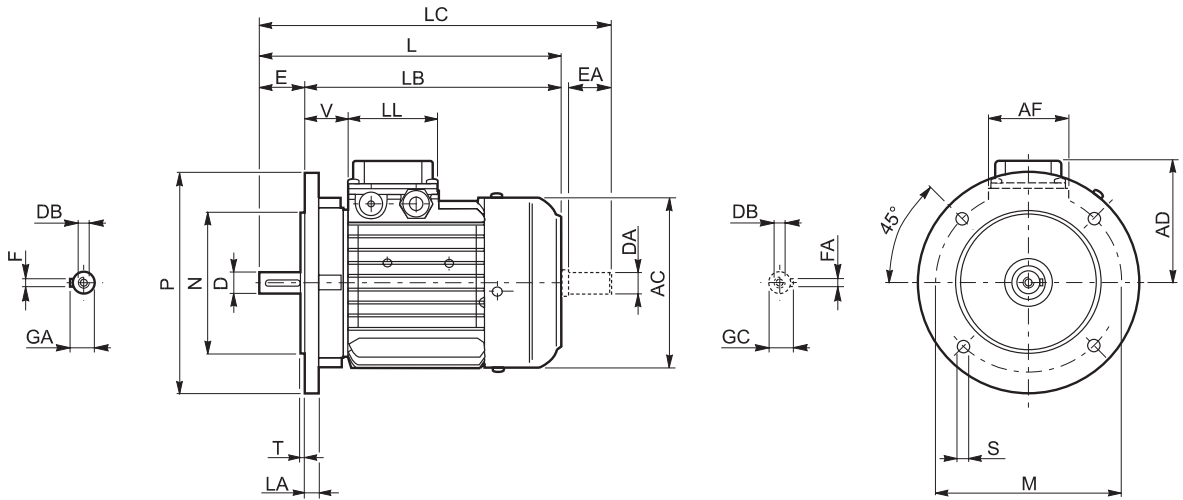


	Albero / Shaft / Welle / Arbre					Flangia / Flange / Flansch / Bride					Motore / Motor / Motor / Moteur							
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	AC	L	LB	LC	AD	AF	LL	V
BN 56	9	20	M3	10.2	3	65	50	80	M5	2.5	110	185	165	207	91	74	80	34
BN 63	11	23	M4	12.5	4	75	60	90			121	207	184	232	95			26
BN 71	14	30	M5	16	5	85	70	105	M6		138	249	219	281	108			37
BN 80	19	40	M6	21.5	6	100	80	120		3	156	274	234	315	119	38		
BN 90	24	50	M8	27	8	115	95	140	M8		3.5	176	326	276	378	133	98	98
BN 100	28	60	M10	31		130	110	160		195		367	307	429	142	50		
BN 112						219	385	325	448	157		52						
BN 132	38	80	M12	41	10	165	130	200	M10	4	258	493	413	576	193	118	118	58



BN

IM B5



	Albero / Shaft / Welle / Arbre					Flangia / Flange / Flansch / Bride						Motore / Motor / Motor / Moteur								
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V	
BN 56	9	20	M3	10.2	3	100	80	120	7	3	8	110	185	165	207	91	74	80	34	
BN 63	11	23	M4	12.5	4	115	95	140	9.5		10	121	207	184	232				95	26
BN 71	14	30	M5	16	5	130	110	160	11.5		3.5	11.5	138	249	219				281	108
BN 80	19	40	M6	21.5	6	165	130	200	14	4	14	156	274	234	315	119	98	98	38	
BN 90	24	50	M8	27	8							176	326	276	378	133			44	
BN 100	28	60	M10	31	8	215	180	250	18.5	5	15	195	367	307	429	142	118	118	50	
BN 112												219	385	325	448	157			52	
BN 132	38	80	M12	41	10	265	230	300	18.5	5	20	258	493	413	576	193	187	187	58	
BN 160 MR	42 38 (1)	110 80 (1)	M16 M12 (1)	45 41 (1)	12 10 (1)	300	250	350			15	310	596	486	680	245			218	
BN 160 M									18	348	640	530	724	261	51					
BN 160 L											708	598	823		52					
BN 180 M	48 38 (1)	110 110 (1)	M16 M16 (1)	51.5 41 (1)	14 10 (1)	350	300	400	18	722	612	837	66							
BN 180 L	48 42 (1)			51.5 45 (1)	14 12 (1)				52											
BN 200 L	55 42 (1)			M20 M16 (1)	59 45 (1)				16 12 (1)	66										

N.B.:

1) Queste dimensioni sono riferite alla seconda estremità d'albero.

NOTE:

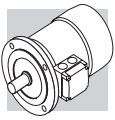
1) These values refer to the rear shaft end.

HINWEIS:

1) Diese Maße betreffen das zweite Wellenende.

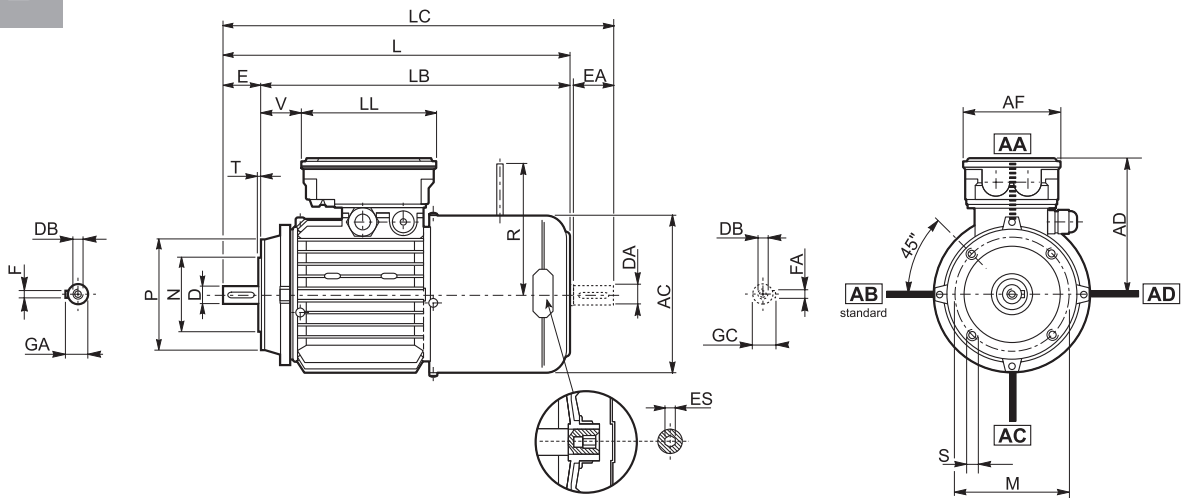
REMARQUE :

1) Ces dimensions se réfèrent à la deuxième extrémité de l'arbre.



BN_FD

IM B14



	Albero / Shaft / Welle / Arbre					Flangia / Flange / Flansch / Bride					Motore / Motor / Motor / Moteur									
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	AC	L	LB	LC	AD	AF	LL	V	R	ES
BN 63	11	23	M4	12.5	4	75	60	90	M5	2.5	121	272	249	297	122	98	133	14	96	5
BN 71	14	30	M5	16	5	85	70	105	M6		138	310	280	342	135			25	103	
BN 80	19	40	M6	21.5	6	100	80	120	M8	3	156	346	306	388	146	110	165	41	129	6
BN 90 S	24	50	M8	27	8	115	95	140			176	409	359	461	149			39	160	
BN 90 L						130	110	160	219	484	424	547	173	62	160	73	199			
BN 100	28	60	M10	31	10	130	110	160	195	458	398	521	158	62	160	73	199			
BN 112						219	484	424	547	173	73	199								
BN 132	38	80	M12	41	10	165	130	200	M10	4	258	603	523	686	210	140	188	122	204 (1)	

N.B.:

1) Per freno FD07 quota R=226.

NOTE:

1) For FD07 brake value R=226.

HINWEIS:

1) Für Bremse FD07, Maß R=226.

REMARQUE :

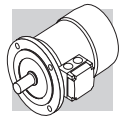
1) Pour frein FD07 valeur R=226.

L'esagono ES non è presente con l'opzione PS.

ES hexagon is not supplied with PS option.

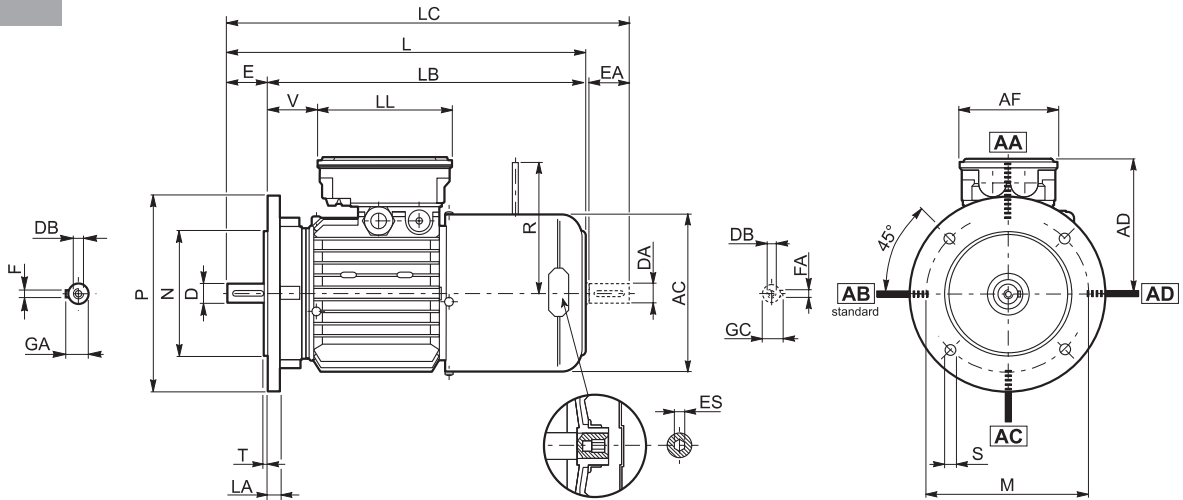
Der Sechskant ES ist bei der Option PS nicht vorhanden.

L'hexagone ES n'est pas disponible avec l'option PS.



BN_FD

IM B5



	Albero / Shaft / Welle / Arbre					Flangia / Flange / Flansch / Bride						Motore / Motor / Motor / Moteur									
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V	R	ES
BN 63	11	23	M4	12.5	4	115	95	140	9.5	3	10	121	272	249	297	122	98	133	14	96	5
BN 71	14	30	M5	16	5	130	110	160				138	310	280	342	135			25	103	
BN 80	19	40	M6	21.5	6	165	130	200	11.5	3.5	11.5	156	346	306	388	146	110	165	41	129	6
BN 90 S	24	50	M8	27	8							176	409	359	461	149			39	160	
BN 90 L						28	60	M10	31	215	180	250	14	15	219	484	424	547	173	73	199
BN 100	28	60	M10	31	10	265	230	300	14	4	20	195	458	398	521	158	140	188	62	199	6
BN 112												219	484	424	547	173			73	199	
BN 132	38	80	M12	41	10	300	250	350	18.5	5	15	258	603	523	686	210	187	187	122	204 (2)	—
BN 160 MR	42 38 (1)	110 80 (1)	M16 M12 (1)	45 41 (1)	12 10 (1)							672	562	755	161	226					
BN 160 M						48	38 (1)	M16 M16 (1)	51.5 41 (1)	14 10 (1)	310	736	626	820	245	51	266				
BN 160 L	48 42 (1)	110 110 (1)	M16 M16 (1)	51.5 45 (1)	14 12 (1)	348	780					670	864	261	52	305					
BN 180 M							55	42 (1)	M20 M16 (1)	59 45 (1)	16 12 (1)	866	756	981	64	305					
BN 180 L	55 42 (1)	110 110 (1)	M20 M16 (1)	59 45 (1)	16 12 (1)	878	768	993				64	305								
BN 200 L						350	300	400	348	768	993	64	305								

N.B.:

1) Queste dimensioni sono riferite alla seconda estremità d'albero.

2) Per freno FD07 quota R=226.

NOTE:

1) These values refer to the rear shaft end.

2) For FD07 brake value R=226.

HINWEIS:

1) Diese Maße betreffen das zweite Wellenende.

2) Für Bremse FD07, Maß R=226.

REMARQUE :

1) Ces dimensions se réfèrent à la deuxième extrémité de l'arbre.

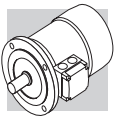
2) Pour frein FD07 valeur R=226.

L'esagono ES non è presente con l'opzione PS.

ES hexagon is not supplied with PS option.

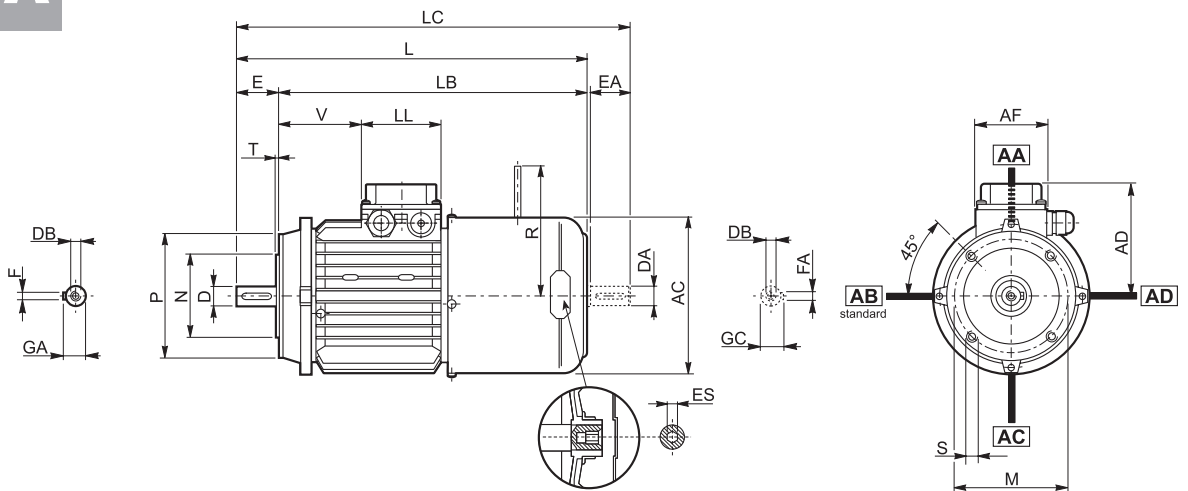
Der Sechskant ES ist bei der Option PS nicht vorhanden.

L'hexagone ES n'est pas disponible avec l'option PS.



BN_FA

IM B14



	Albero / Shaft / Welle / Arbre					Flangia / Flange / Flansch / Bride					Motore / Motor / Motor / Moteur									
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	AC	L	LB	LC	AD	AF	LL	V	R	ES
BN 63	11	23	M4	12.5	4	75	60	90	M5	2.5	121	272	249	119	95	74	80	26	116	5
BN 71	14	30	M5	16	5	85	70	105	M6		138	310	280	342	108			68	124	
BN 80	19	40	M6	21.5	6	100	80	120	M6	156	346	306	388	119	83			134		
BN 90	24	50	M8	27	8	115	95	140	M8	3	176	409	359	461	133	98	98	95	160	6
BN 100	28	60	M10	31		130	110	160		3.5	195	458	398	521	142			119	198	
BN 112						219	484	424	547	157	128	198								
BN 132	38	80	M12	41	10	165	130	200	M10	4	258	603	523	686	193	118	118	180	200 (1)	

N.B.:

1) Per freno FA07 quota R=217.

NOTE:

1) For FA07 brake value R=217.

HINWEIS:

1) Für Bremse FA07, Maß R=217.

REMARQUE :

1) Pour frein FA07 valeur R=217.

Per la versione BN..FA le dimensioni della scatola morsetti AD, AF, LL, V sono uguali al tipo BN..FD.

For motors type BN..FA, the terminal box sizes AD, AF, LL, V are the same as for BN..FD.

Bei der Motor typ BN..FA sind die Maße des Klemmenkastens AD, AF, LL, V denen der Version BN..FD gleich.

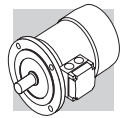
Pour moteurs type BN..FA les dimensions de la boîte à bornes AD, AF, LL, V sont les mêmes de BN..FD.

L'esagono ES non è presente con l'opzione PS.

ES hexagon is not supplied with PS option.

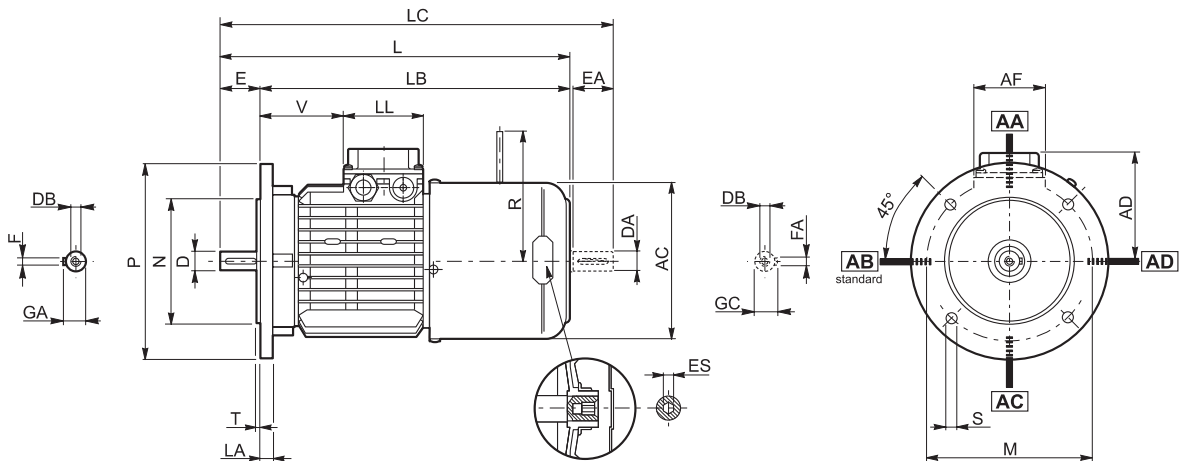
Der Sechskant ES ist bei der Option PS nicht vorhanden.

L'hexagone ES n'est pas disponible avec l'option PS.



BN_FA

IM B5



	Albero / Shaft / Welle / Arbre					Flangia / Flange / Flansch / Bride						Motore / Motor / Motor / Moteur									
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V	R	ES
BN 63	11	23	M4	12.5	4	115	95	140	9.5	3	10	121	272	249	297	95	74	80	26	116	5
BN 71	14	30	M5	16	5	130	110	160				138	310	280	342	108			68	124	
BN 80	19	40	M6	21.5	6	165	130	200	11.5	3.5	11.5	156	346	306	388	119	98	98	83	134	6
BN 90	24	50	M8	27	176							409	359	461	133	95			160		
BN 100	28	60	M10	31	8	215	180	250	14	4	14	195	458	398	521	142	118	118	119	198	6
BN 112												15	219	484	424	547			157	128	
BN 132	38	80	M12	41	10	265	230	300	18.5	5	15	20	603	523	686	193	118	118	180	200 (2)	—
BN 160 MR	42 38 (1)	110 80 (1)	M16 M12 (1)	45 41 (1)	12 10 (1)	300	250	350				258	672	562	755				218	217	
BN 160 M									310	736	626	820	245	187	187	51	247				
BN 160 L	48 38 (1)			51.5 41 (1)	14 10 (1)							780	670	864							
BN 180 M																					

N.B.:

- 1) Queste dimensioni sono riferite alla seconda estremità d'albero.
- 2) Per freno FA07 quota R=217.

NOTE:

- 1) These values refer to the rear shaft end.
- 2) For FA07 brake value R=217.

HINWEIS:

- 1) Diese Maße betreffen das zweite Wellenende.
- 2) Für Bremse FA07, Maß R=217.

REMARQUE :

- 1) Ces dimensions se réfèrent à la deuxième extrémité de l'arbre.
- 2) Pour frein FA07 valeur R=217.

Le dimensioni AD, AF, LL e V relative alla scatola morsetti dei motori BN...FA dotati di alimentazione separata del freno (opzione SA) coincidono con quelle dei motori BN...FD di pari taglia.

Dimensions AD, AF, LL and V, relevant to terminal box of motors BN...FA featuring the separate brake supply (option SA), are coincident with corresponding dimensions of same-size BN...FD motors.

Die Abmessungen des Klemmenkastens der Motoren BN ... FA AD, AF, LL und V in bezug auf die separate Spannungsversorgung (Option SA) stimmen mit den Abmessungen der entsprechenden Motoren BN...FD überein.

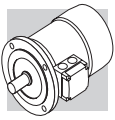
Les dimensions AD, AF, LL et V relatives à la boîte à borne des moteurs BN...FA équipés d'alimentation séparée du frein (option SA) sont identiques à celles des moteurs BN...FD de la même taille.

L'esagono ES non è presente con l'opzione PS.

ES hexagon is not supplied with PS option.

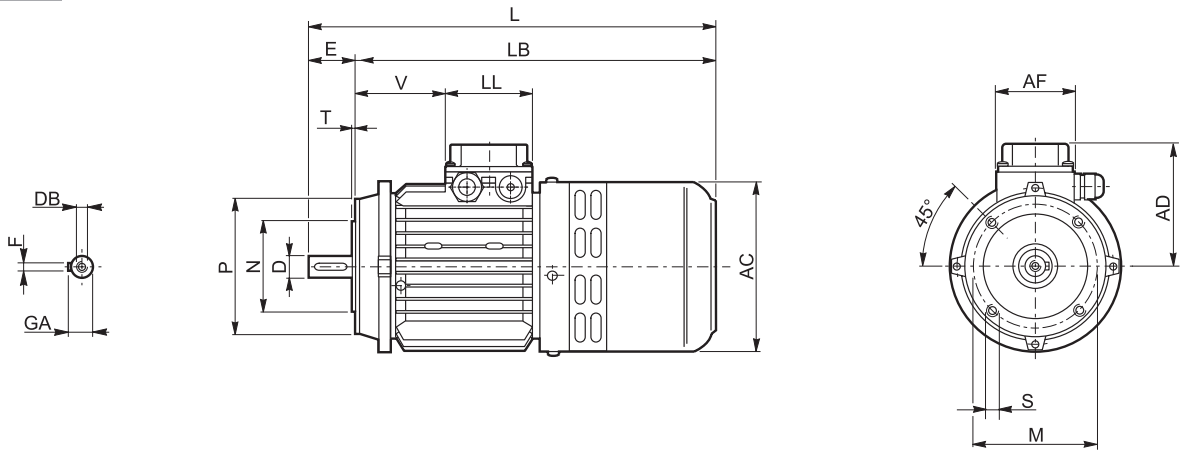
Der Sechskant ES ist bei der Option PS nicht vorhanden.

L'hexagone ES n'est pas disponible avec l'option PS.



BN_BA

IM B14



	Albero / Shaft / Welle / Arbre					Flangia / Flange / Flansch / Bride					Motore / Motor / Motor / Moteur						
	D	E	DB	GA	F	M	N	P	S	T	AC	L	LB	AD	AF	LL	V
BN 63	11	23	M4	12.5	4	75	60	90	M5	2.5	124	298	275	95	74	80	28
BN 71	14	30	M5	16	5	85	70	105	M6		138	327	297	108			68
BN 80	19	40	M6	21.5	6	100	80	120		M8	3	156	372	332	119	98	98
BN 90	24	50	M8	27	8	115	95	140	M8		3.5	176	425	375	133		
BN 100	28	60	M10	31		130	110	160		M10	4	195	477	417	142	119	
BN 112					219	500	440	157	128								
BN 132	38	80	M12	41	10	165	130	200	M10	4	258	638	558	193	118	118	180

N.B.:

Le dimensioni AD, AF, LL e V relative alla scatola morsetti dei motori BN...BA dotati di alimentazione separata del freno (opzione SA) coincidono con quelle dei motori BN...FD di pari taglia.

NOTE:

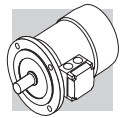
Dimensions AD, AF, LL and V, relevant to terminal box of motors BN...BA featuring the separate brake supply (option SA), are coincident with corresponding dimensions of same-size BN...FD motors

HINWEIS:

Die Abmessungen des Klemmkastens der Motoren BN ... BA AD, AF, LL und V in bezug auf die separate Spannungsversorgung (Option SA) stimmen mit den Abmessungen der entsprechenden Motoren BN...FD überein.

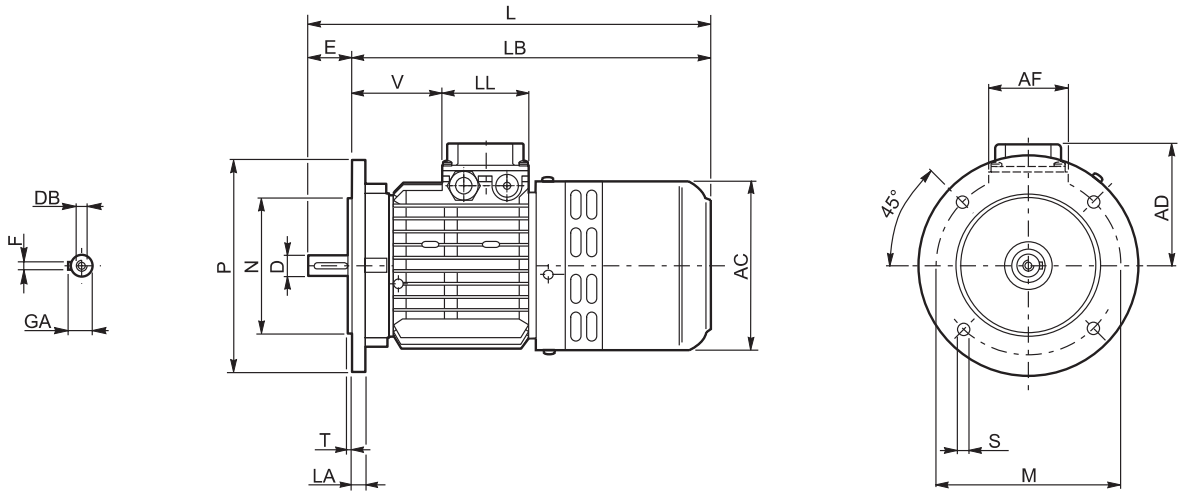
REMARQUE :

Les dimensions AD, AF, LL et V relatives à la boîte à borne des moteurs BN...BA équipés d'alimentation séparée du frein (option SA) sont identiques à celles des moteurs BN...FD de la même taille.



BN_BA

IM B5



	Albero / Shaft / Welle / Arbre					Flangia / Flange / Flansch / Bride						Motore / Motor / Motor / Moteur						
	D	E	DB	GA	F	M	N	P	S	T	LA	AC	L	LB	AD	AF	LL	V
BN 63	11	23	M4	12.5	4	115	95	140	9.5	3	10	124	298	275	95	74	80	28
BN 71	14	30	M5	16	5	130	110	160				138	327	297	108			68
BN 80	19	40	M6	21.5	6	165	130	200	11.5	3.5	11.5	156	372	332	119	98	98	83
BN 90	24	50	M8	27	176							425	375	133	95			
BN 100	28	60	M10	31	8	215	180	250	14	4	14	195	477	417	142	98	98	119
BN 112												15	219	500	440			157
BN 132	38	80	M12	41	10	265	230	300			20	258	638	558	193	118	118	180

N.B.:

Le dimensioni AD, AF, LL e V relative alla scatola morsetti dei motori BN...BA dotati di alimentazione separata del freno (opzione SA) coincidono con quelle dei motori BN...FD di pari taglia.

NOTE:

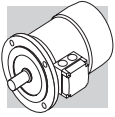
Dimensions AD, AF, LL and V, relevant to terminal box of motors BN...BA featuring the separate brake supply (option SA), are coincident with corresponding dimensions of same-size BN...FD motors

HINWEIS:

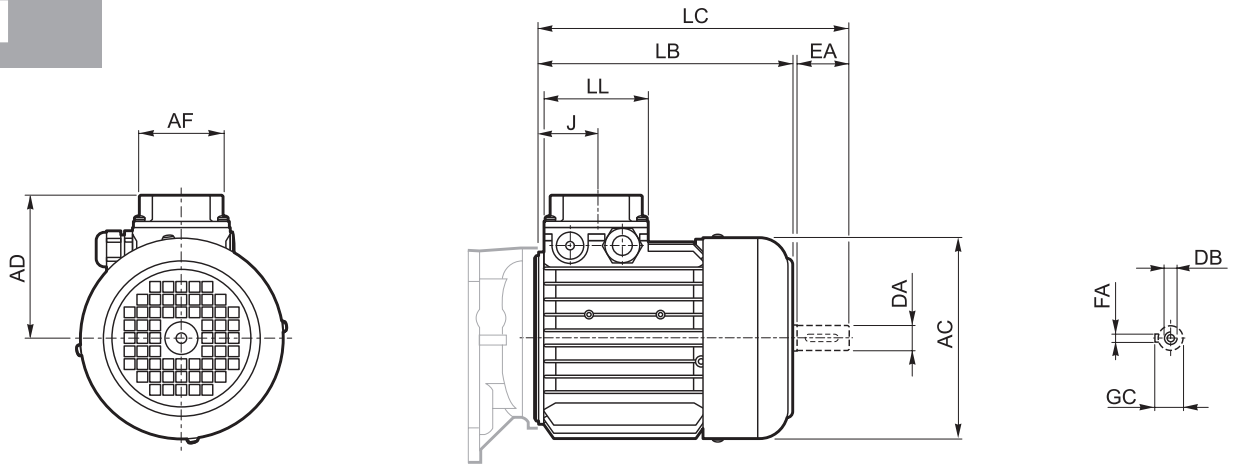
Die Abmessungen des Klemmkastens der Motoren BN ... BA AD, AF, LL und V in bezug auf die separate Spannungsversorgung (Option SA) stimmen mit den Abmessungen der entsprechenden Motoren BN...FD überein.

REMARQUE :

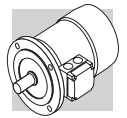
Les dimensions AD, AF, LL et V relatives à la boîte à borne des moteurs BN...BA équipés d'alimentation séparée du frein (option SA) sont identiques à celles des moteurs BN...FD de la même taille.



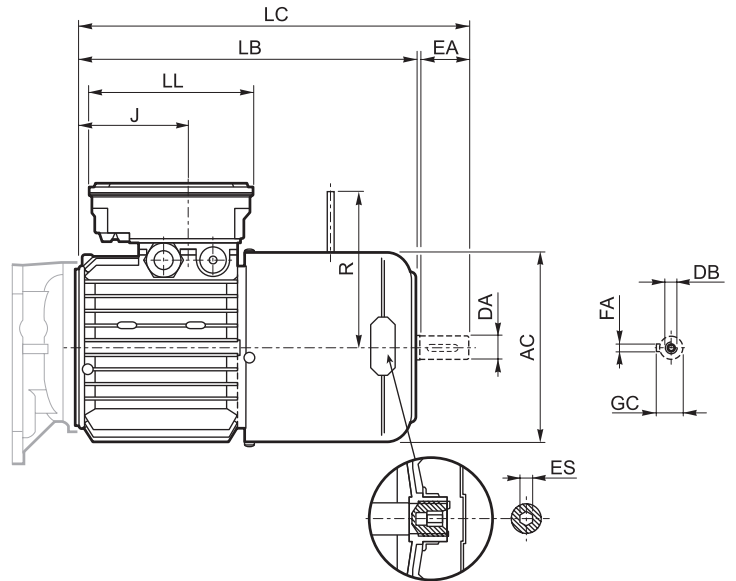
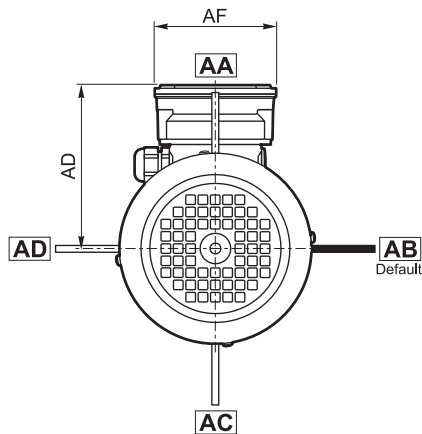
M



	Seconda estremità albero / Rear shaft end Zweite Wellenende / Deuxième extrémité de l'arbre					Motore / Motor / Motor / Moteur						
	DA	EA	DB	FA	GC	AC	LB	LC	AF	LL	J	AD
M 0	9	20	M3	3	10.2	110	133	155	74	80	42	91
M 05	11	23	M4	4	12.5	121	165	191			48	95
M 1	14	30	M5	5	16	138	187	219			45	108
M 2 S	19	40	M6	6	21.5	156	202	245			44	119
M 3 S	28	60	M10	8	31	195	230	293	98	98	53.5	142
M 3 L							262	325				
M 4	38	80	M12	10	41	258	361	444	118	118	64.5	193
M 4 LC							396	479				
M 5 S						310	418	502	187	187	77	245
M 5 L							462	546				



M_FD



	Seconda estremità albero / Rear shaft end Zweite Wellenende / Deuxième extrémité de l'arbre					Motore / Motor / Motor / Moteur								
	DA	EA	DB	FA	GC	AC	LB	LC	AF	LL	J	AD	R	ES
M 05	11	23	M4	4	12.5	121	231	256	98	133	48	122	96	5
M 1	14	30	M5	5	16	138	248	280			73	135	103	
M 2 S	19	40	M6	6	21.5	156	272	314			88	146	129	
M 3 S	28	60	M10	8	31	195	326	389	110	165	124.5	158	160	6
M 3 L							353	416						
M 4	38	80	M12	10	41	258	470	553	140	188	185.5	210	204 (1)	
M 4 LC							495	578			64.5		226	
M 5 S						310	558	642	187	187	77	245	266	
M 5 L	602	686												

N.B.:

1) Per freno FD07 quota R=226.

NOTE:

1) For FD07 brake value R=226.

HINWEIS:

1) Für Bremse FD07, Maß R=226.

REMARQUE :

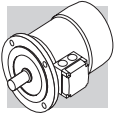
1) Pour frein FD07 valeur R=226.

L'esagono ES non è presente con l'opzione PS.

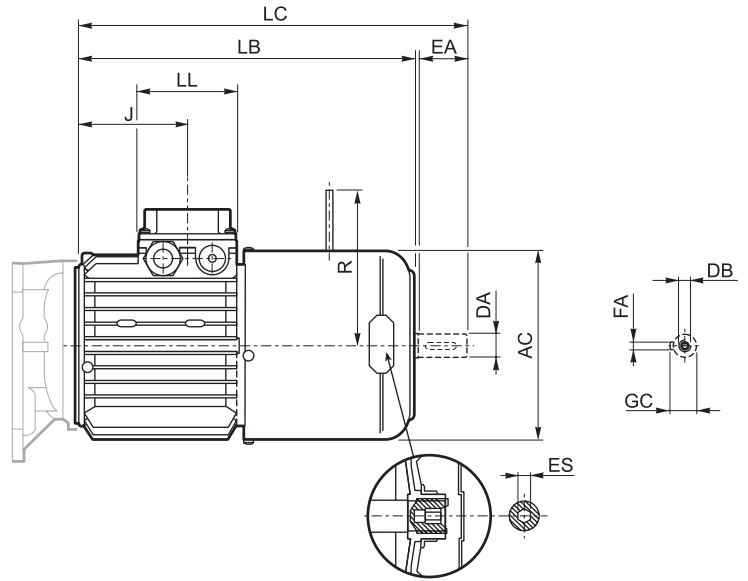
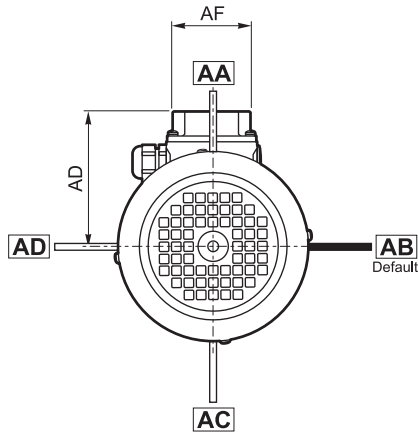
ES hexagon is not supplied with PS option.

Der Sechskant ES ist bei der Option PS nicht vorhanden.

L'hexagone ES n'est pas disponible avec l'option PS.



M_FA



	Seconda estremità albero / Rear shaft end Zweite Wellenende / Deuxième extrémité de l'arbre					Motore / Motor / Motor / Moteur								
	DA	EA	DB	FA	GC	AC	LB	LC	AF	LL	J	AD	R	ES
M 05	11	23	M4	4	12.5	121	231	256	74	80	48	95	116	5
M 1	14	30	M5	5	16	138	248	280			73	108	124	
M 2 S	19	40	M6	6	21.5	156	272	314			88	119	134	
M 3 S	28	60	M10	8	31	195	326	389	98	98	124.5	142	160	6
M 3 L							353	416						
M 4	38	80	M14	10	41	258	470	553	118	118	185.5	193	200 (1)	
M 4 LC							495	578			64.5		217	
M 5 S			M12			310	558	642	187	187	77	245	247	—
M 5 L														

N.B.:

1) Per freno FA07 quota R=217.

NOTE:

1) For FA07 brake value R=217.

HINWEIS:

1) Für Bremse FA07, Maß R=217.

REMARQUE :

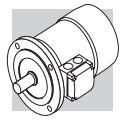
1) Pour frein FA07 valeur R=217.

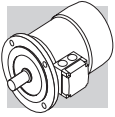
L'esagono ES non è presente con l'opzione PS.


ES hexagon is not supplied with PS option.

Der Sechskant ES ist bei der Option PS nicht vorhanden.

L'hexagone ES n'est pas disponible avec l'option PS.





R00_0				
	Descrizione	Description	Beschreibung	Description
...	Aggiunto riduttori 323 e 325.	<i>Gearboxes 323 and 325 added.</i>	Getriebe 323 und 325 hinzugefügt.	<i>Ajout réducteurs 323 et 325.</i>
45 ... 213	Aggiornato tabelle dati tecnici.	<i>Technical specifications tables updated.</i>	Tabellen der technischen Daten aktualisiert.	<i>Mise à jour tableaux des données techniques.</i>
214 ... 387	Aggiornato capitolo dimensioni.	<i>Dimensions section updated.</i>	Kapitel der Abmessungen aktualisiert.	<i>Mise à jour chapitre dimensions.</i>
390 ... 456	Aggiornato sezione "Motori elettrici".	<i>"Electric motors" section updated.</i>	Abschnitt "Elektromotoren" aktualisiert.	<i>Mise à jour de la section «Moteurs électriques».</i>

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