SIMOTICS HV C
High Voltage Motors
1N.1

Preliminary Catalog D84.2
Version 1.15
1.1.2022

Compact motors

SIEMENS

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SIMOTICS HV C Motors

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1.1 General

The **SIMOTICS HV C** series of motors is available in shaft heights up to 900mm and covers a power range extending up to 8.7 MW (6 kV, 50 Hz, 4-pole).

This motor series covers the entire high voltage motor market and all applications in safe area and explosion protected zones.

- Air-cooled. IP55, cooling IC411/IC416
- Water-cooled, IP55, cooling IC71W
- Air-cooled, IP55, cooling IC511/516

The **SIMOTICS HV C** series has been developed for line (DOL) and converter operation. This means that in conjunction with medium-voltage SINAMICS GH150, GH180, GM150 and SM150 converters and successor products, drive systems are available in a power range up to 8.7 MW (@ 6 kV, 50 Hz, 4-pole).

The **SIMOTICS HV C** series is also suitable for operation at non-Siemens converters.

In the Appendix you will find electrical and mechanical selection tables with technical data regarding line and converter operation.

Fig 1-1 SIMOTICS HV C motor, shaft height 450, water-cooled

1.2 Regulations and standards

The motors are designed according to the following standards and regulations:

- EN 60034-1 Rating and performance
- EN 60034-2-1 Tests for losses and efficiency
- EN 60034-2-2 Tests for large machines
- EN 60034-2-3 Tests for inverter driven machines
- EN 60034-5 Degree of protection
- EN 60034-6 Methods of cooling
- EN 60034-7 Types of construction and mounting
- EN 60034-8 Terminal markings
- EN 60034-9 Noise limits
- EN 60034-11 Thermal protection
- EN 60034-12 Starting performance
- EN 60034-14 Limits of vibration
- EN 60034-15 Impulse voltage withstand levels
- EN 60034-17 Cage induction motors when fed from inverters
- EN 60034-18 Insulation systems
- IEC 60072-2 Dimension and output series 355-1000
- EN 60079-0 Explosive atmospheres Part 0 – General requirements
- EN 60079-X Applicable parts (i.e. Part 1 – Gas – Flameproof enclosure d"…)

Equivalent IEC standards are also applicable.

Power stages in compliance with NEMA and CSA are available on request.
Versions according to API are possible, including special API tests and factory hold points.
The motor dimensions are metric, which means that they can be used in a wide range of applications.

1.3 MLFB coding system for SIMOTICS HV C motors

Overview

Table 1-1 MLFB coding system

1-3	**Primary and main group, Ex-protection**							
	1NA	Safe area						
	1NB	II 2G Ex db IIB (flameproof)						
	1NC	II 2G Ex db IIC (flameproof)						
	1NN	II 3G Ex ec IIC (increased safety Zone 2) - *formerly known as Ex nA (non-sparking)* II 3D Ex tc IIIB T125 Dc (dust explosion Zone 22 – *if combined with MLFB 13 = 7*						
4	**Motor series**							
	1	SIMOTICS HV C – 1st generation						
5+6	**Shaft height**							
			45	450 mm	**71**	710 mm		
	35	355 mm	**50**	500 mm	**80**	800 mm		
	40	400 mm	**56**	560 mm	**90**	900 mm		
7	**Code number for relative length of laminated core**							
	0	Shortest	**4**	Mid-size	**8**	Longest	**9**	Special length
8	**Pole number**							
	2	2 poles						
	4	4 poles						
	6	6 poles						
	8	8 poles						
	3	10 poles – *on request*						
	5	12 poles– *on request*						
	7	14 poles– *on request*						
	0	16 poles– *on request*						
	1	18 poles– *on request*						
	9	other numbers of poles - *on request*						

9	**Cooling method**	
	A	Surface cooled, with outer fan (IC411)
	B	Surface cooled, with forced ventilation (IC416)
	S	Tube cooled, with outer fan shaft driven (IC511)
	T	Tube cooled with forced ventilated outer fan (IC516)
	W	Water jacket cooled (IC71W)
10	**Operation**	
	A	Direct on line operation, high voltage
	B	Direct on line operation, low voltage
	C	Converter operation, low voltage, SINAMICS G150
	D	Converter operation, low voltage, SINAMICS S120
	E	Converter operation, low voltage, SINAMICS S150
	F	Converter operation, low voltage, SINAMICS G180
	R	Converter operation, high voltage, SINAMICS GM150
	S	Converter operation, high voltage, SINAMICS SM150
	T	Converter operation, high voltage, SINAMICS GH180
	U	Converter operation, high voltage, SINAMICS GH150
	Z	Other converters
		Other LV converter (**Z-K1Y**)
		Other HV converter (**Z-K2Y**)
11	**Rated voltage/frequency**	
		Low voltage operation, (MLFB digit 10 = B/C/D/E/F)
	0	690V, 50Hz
	1	690V, 60Hz
	4	400V
	5	500V
	7	660V
	9	+**L6Y** + **additional text data**: other voltages

11	Rated voltage/frequency (continuation)	
		High voltage, direct-on-line, (MLFB digit 10 = A)
	0	3.3kV, 50Hz
	1	6.6kV, 60Hz
	2	13.2kV, 60Hz
	3	4.16kV, 60Hz
	4	4kV, 60Hz
	5	2.3kV, 60Hz
	6	6kV, 50Hz
	7	6.6kV, 50Hz
	8	10kV, 50Hz
	9	+**L6B**: >3.3 – 6.6kV, 50Hz
	9	+**L6C**: 9 – 11kV, 50Hz
	9	+**L6E**: >3.3 – 6.6kV, 60Hz
	9	+**L6F**: 9 – 11kV, 60Hz
	9	+**L6K**: 11kV, 50Hz
	9	+**L6Q**: 6.3kV, 50Hz
	9	+**L6T**: 3kV, 50Hz
	9	+**L6Y** + **additional text data:** other voltages
		Medium voltage converter operation, (MLFB digit 10 = R/S/T/U)
	0	7.2kV, 50Hz
	1	11kV, 50Hz
	2	2.3kV, 50Hz
	3	4.16kV, 60Hz
	4	4.16kV, 50Hz
	5	3.3kV, 50Hz
	6	6kV, 50Hz
	7	6.6kV, 50Hz
	8	6.6kV, 60Hz
	9	+**L6C**: 10kV, 50Hz
	9	+**L6E**: 6kV, 60Hz
	9	+**L6Y** + **additional text data:** other voltages

12	**Type of construction**	
	0	IM B3 (IM 1001)
	1	IM B5 with additional fixing point (IM 3001)
	4	IM V1, with protective hood (IM 3011) – *standard design for vertical IIC411/511 motors*
	6	IM B35 (IM 2001)
	8	IM V1, without protective hood (IM 3011) – *standard design for vertical IC71W motors*
	9	other type of construction
13	**Temperature class (for explosion protection)**	
	0	without temperature class
	3	Temperature class T3 (max. surface temperature 200°C/392°F)
	4	Temperature class T4 (max. surface temperature 135°C/275°F)
	7	Surface temperature T=125°C for Ex t motors
14	**Rotor design**	
	A	Standard rotor: Aluminum
	C	Standard rotor with E-Cu
	E	Standard rotor with Si-Cu
15	**Housing and bearing design**	
	A	Cast iron housing, antifriction bearings
	C	Cast iron housing, sleeve bearings
	G	Welded steel housing, antifriction bearings
	J	Welded steel housing, sleeve bearings
16	**Category**	
	0	Standard series

Example of MLFB

Table 1-2 Example of MLFB

MLFB Position	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**-**	**8**	**9**	**10**	**11**	**12**	**-**	**13**	**14**	**15**	**16**	**-**	**Z**
Safe area	**1**	**N**	**A**																	
SIMOTICS HV C	1	N	A	**1**																
Shaft height 500mm	1	N	A	1	**5**	**0**														
Output identifier	1	N	A	1	5	0	**6**													
4 poles	1	N	A	1	5	0	6	-	**4**											
Cooling IC71W	1	N	A	1	5	0	6	-	4	**W**										
SINAMICS GH150	1	N	A	1	5	0	6	-	4	W	**U**									
6kV, 50Hz	1	N	A	1	5	0	6	-	4	W	U	**6**								
IM B3	1	N	A	1	5	0	6	-	4	W	U	6	**0**							
Without temperature class	1	N	A	1	5	0	6	-	4	W	U	6	0	-	**0**					
Standard rotor Aluminum	1	N	A	1	5	0	6	-	4	W	U	6	0	-	0	**A**				
Cast iron frame, antifriction brgs.	1	N	A	1	5	0	6	-	4	W	U	6	0	-	0	A	**A**			
Standard series	1	N	A	1	5	0	6	-	4	W	U	6	0	-	0	A	A	**0**		
Final MLFB	**1**	**N**	**A**	**1**	**5**	**0**	**6**	**-**	**4**	**N**	**U**	**6**	**0**	**-**	**0**	**A**	**A**	**0**	**-**	**Z***

* Additional information as text and/or selection code is required.

1.4 Motor dimensions

Note

Use the “DT configurator” tool to get a motor drawing and/or a 3D STP model.
Quickest way to get a drawing: by using “Direct article number input” on the front page

Please note, that it is not possible to display all special accessories in standard dimension drawings and tables.
Therefore no special terminal boxes, sensors, sleeve bearing monitoring and oil supply equipment etc. are displayed.

Note

If the motor dimensions cannot be found in DT configurator, please contact headquarters for a customized drawing.

Tables for mechanical data: see document "SIMOTICS HV C - Electrical and Mechanical Data"

1.5 Electrical data

Tables for electrical data: see document "SIMOTICS HV C - Electrical and Mechanical Data"

1.6 Noise data

Noise values

Even the basic version of SIMOTICS HV C motors has low noise levels. This is achieved through the following measures:

- Low noise motor design
- Optimized ventilation
- Fans with flow optimized aerodynamic design
- Noise-optimized design of the steel fan cover
- Number of stator and rotor slots carefully selected for low magnetic noise excitation
- Magnetic slot seals

Table 1-3 Noise levels – SIMOTICS HV C motors 1NA1 IC411

SIMOTICS HV C motors 1NA1 in standard design IC411
L_{pA} sound pressure level at 50/60Hz, at no load operation, additional tolerance +3 dB(A)

Shaft height	2-pole 60 Hz L_{pA} dB(A)	2-pole 50 Hz L_{pA} dB(A)	4-pole 60 Hz L_{pA} dB(A)	4-pole 50 Hz L_{pA} dB(A)	6-pole 60 Hz L_{pA} dB(A)	6-pole 50 Hz L_{pA} dB(A)	8-pole 60 Hz L_{pA} dB(A)	8-pole 50 Hz L_{pA} dB(A)
400	85	79	83	79	77	73	73	69
450	84	80	85	81	81	77	76	72
500	85	81	86	82	81	77	77	73
560	87	83	88	84	83	79	79	75

SIMOTICS HV C motors 1NA1 in standard design IC411
L_{pA} sound pressure level at 50/60Hz, at load operation, additional tolerance +3 dB(A)

Shaft height	2-pole 60 Hz L_{pA} dB(A)	2-pole 50 Hz L_{pA} dB(A)	4-pole 60 Hz L_{pA} dB(A)	4-pole 50 Hz L_{pA} dB(A)	6-pole 60 Hz L_{pA} dB(A)	6-pole 50 Hz L_{pA} dB(A)	8-pole 60 Hz L_{pA} dB(A)	8-pole 50 Hz L_{pA} dB(A)
400	87	81	84	80	79	78	75	74
450	86	82	86	82	83	82	78	77
500	87	83	87	83	83	82	79	78
560	89	85	89	85	85	84	81	80

Lower noise levels on request!

Table 1-4 Noise levels – SIMOTICS HV C motors IC71W

SIMOTICS HV C motors 1NA1 in IC71W design
L_{pA} sound pressure level at 50/60Hz, at no load operation,
additional tolerance +3 dB(A)

Shaft height	2-pole 60 Hz L_{pA} dB(A)	2-pole 50 Hz L_{pA} dB(A)	4-pole 60 Hz L_{pA} dB(A)	4-pole 50 Hz L_{pA} dB(A)	6-pole 60 Hz L_{pA} dB(A)	6-pole 50 Hz L_{pA} dB(A)	8-pole 60 Hz L_{pA} dB(A)	8-pole 50 Hz L_{pA} dB(A)
400	70	69	66	65	67	66	70	69
450	71	70	67	66	68	67	71	70
500	72	71	68	67	68	67	72	71
560	74	73	70	69	70	69	74	73

SIMOTICS HV C motors 1NA1 in IC71W design
L_{pA} sound pressure level at 50/60Hz, at load operation,
additional tolerance +3 dB(A)

Shaft height	2-pole 60 Hz L_{pA} dB(A)	2-pole 50 Hz L_{pA} dB(A)	4-pole 60 Hz L_{pA} dB(A)	4-pole 50 Hz L_{pA} dB(A)	6-pole 60 Hz L_{pA} dB(A)	6-pole 50 Hz L_{pA} dB(A)	8-pole 60 Hz L_{pA} dB(A)	8-pole 50 Hz L_{pA} dB(A)
400	76	74	77	75	78	76	81	79
450	77	75	78	76	79	77	82	80
500	78	76	79	77	79	77	83	81
560	80	78	81	79	81	79	85	83

Lower noise levels on request!

Table 1-5 Noise levels – SIMOTICS HV C motors 1NB1/1NC1

SIMOTICS HV C motors 1NB1/1NC1 in standard design
L_{pA} sound pressure level at 50/60Hz, at no load operation,
additional tolerance +3 dB(A)

Shaft height	2-pole 60 Hz L_{pA} dB(A)	2-pole 50 Hz L_{pA} dB(A)	4-pole 60 Hz L_{pA} dB(A)	4-pole 50 Hz L_{pA} dB(A)	6-pole 60 Hz L_{pA} dB(A)	6-pole 50 Hz L_{pA} dB(A)	8-pole 60 Hz L_{pA} dB(A)	8-pole 50 Hz L_{pA} dB(A)
355	76**	72	81**	77**	75**	71**	o.r.	o.r.
400	83	79	83	79	77	73	73	69
450	84	80	85	81	81	77	76	72
500	85	81	86	82	81	77	77	73
560	87	83	88	84	83	79	79	75
710	88*	83*	83/80*	78/75*	80/79*	75/74*		
800	88*	83*	87/83*	82/78*	80/78*	75/73*		
900	89*	84*	93/87*	86/82*	85/83*	80/78*		

SIMOTICS HV C motors 1NB1/1NC1 in standard design
L_{pA} sound pressure level at 50/60Hz, at load operation,
additional tolerance +3 dB(A)

Shaft height	2-pole 60 Hz L_{pA} dB(A)	2-pole 50 Hz L_{pA} dB(A)	4-pole 60 Hz L_{pA} dB(A)	4-pole 50 Hz L_{pA} dB(A)	6-pole 60 Hz L_{pA} dB(A)	6-pole 50 Hz L_{pA} dB(A)	8-pole 60 Hz L_{pA} dB(A)	8-pole 50 Hz L_{pA} dB(A)
355	79**	75	83**	79**	79**	74**	o.r.	o.r
400	85	81	84	80	79	78	75	74
450	86	82	86	82	83	82	78	77
500	87	83	87	83	83	82	79	78
560	89	85	89	85	85	84	81	80
710	90*	85*	86/83*	81/78*	84/83*	79/78*		
800	90*	85*	90/86*	85/81*	84/82*	79/77*		
900	91*	86*	96/90*	89/85*	89/87*	84/82*		

* including option L20
** preliminary values

Lower noise levels on request!

Please note that for low temperature designs (especially for 2-pole motors) noise values do not apply automatically and must be checked by engineering!

1.7 Options, order codes

Motors can be supplied with additional equipment and/or as special versions. You must then add a "Z" to the order number

Order codes for the order number (MLFB)

Order codes have been defined for frequently requested "special versions/options". The use of order codes simplifies and speeds up the ordering process.

Note

Always use the order code for the required design.

Recommended accessories

The following is advised as standard accessories with each motor (not included):

- Six PT 100 in the stator winding (option A65) as 4-wire circuit from a separate auxiliary terminal box (option M50)
- SPM nipple for antifriction bearing design motors at DE and NDE (option G50)
- 2x2 PT100 in each bearing shell (option A42) as 4-wire circuit from terminal box for motors with sleeve bearing design
- Anti-condensation heating in a separate auxiliary terminal box (option M52), standard voltage range 220 up to 240 V (option M13)

Note

Please check "Siemens LDA Portal" for available detailed option descriptions

Please contact the factory if your customer requirement is not listed!

The following tables give an overview about the available options for SIMOTICS HV C motors

Symbols used in order code table, chapter 6.2

□	Standard design
○	Alternative design, no additional price
●	Additional text needed for clarification
✔	Available with additional price
o.r.	Price on request
-	Not available

1.7.1 Winding & rotor design

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Winding & rotor design				
Non-standard winding	C20	✔	✔	✔
Installation altitude up to 1500 m above sea level	D06	✔	✔	✔
Installation altitude up to 2000 m above sea level	D07	✔	✔	✔
Installation altitude up to 2500 m above sea level	D08	✔	✔	✔
Installation altitude up to 3000 m above sea level	D09	✔	✔	✔
Cooling air temp. <=45 °C	D11	✔	✔	✔
Cooling air temp. <=50 °C	D12	✔	✔	✔
Cooling air temp. <=55 °C	D13	✔	✔	✔
Cooling air temp. <=60 °C	D14	✔		✔
Cooling water temp. <=30 °C	D15	✔		
Cooling water temp. <=35 °C	D16	✔		
Cooling water temp. <=40 °C	D17	✔		

1.7.2 International certificates

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
International certificates				
Electric design according to NEMA MG1-12	D30		o.r.	o.r.
UL certificate (3rd party) issued by TÜV Süd	D31	✔	✔	-
Ex certificate for China	D32	✔	✔	✔
Certificate for the Eurasian customs union (EAC)	D35	✔	✔	✔
IEC Ex certificate	D37	✔	✔	✔
Ex certification for India (PESO/CCOE)	D38		o.r.	o.r.
CSA certificate (3rd party) issued by TÜV Süd	D40	✔	✔	-
Certificate for import into the Eurasian customs union (EAC)	D47	✔	✔	-
POVERKA Certificate for Russia	D48	✔	✔	✔
API 541 Standard, 4th Edition	D52		o.r.	✔
API 541 Standard, 5th Edition	D69	o.r.	o.r.	✔
Design for Zone 21/22 (conductive dust) for DOL operation; IP65	M34		-	✔
Design for Zone 22 (non-conductive dust) for DOL operation	M35		✔	✔
Design for Zone 21/22 (conductive dust) for VFD operation; IP65	M38		-	✔
Design for Zone 22 (non-conductive dust) for VFD operation	M39		-	✔

1.7.3 Frame fittings/adaptions & fixing elements

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Frame design & fixing elements				
Retrofit (description of the special design separately)	B15	o.r.	o.r.	o.r.
Backstop for clockwise direction of rotation looking at DE (counterclockwise direction blocked)	G48			o.r.
Backstop for counterclockwise direction of rotation looking at DE (clockwise direction blocked)	G49			o.r.
Machine mounting material for steel foundation incl. fixing and jacking screws, shims and tapered pins	L31	✔	✔	✔
Machine mounting material for table foundation or concrete ceiling incl. stud screws with nuts, washers, anchor plates, base plates, shims, tapered pins	L32	✔	✔	✔
Machine mounting material for concrete foundation incl t-head bolts, anchor sleeves, sole plates, shims and tapered pins	L33	✔	✔	✔
Brackets for lifting and shifting	P42			o.r.
Stainless steel (V2A) external bolts	P45	✔	✔	
Stainless steel (V4A/AISI316) external bolts	P48			✔
Internal fastening devices secured acc. API 541-2.4.1.1.D	Q51			✔
Shims of stainless steel material (V4A/AISI316) - 4mm/motor foot, not laminated	Q92			✔
Machined surface on motor feet with dowel pin holes	Q94			✔
Slotted feet holes for motor mounting	Q95			✔
Base frame for height adaptation of max. 2 shaft heights difference	Q96	o.r.	o.r.	✔
Shims 4 mm/foot made of brass, not laminated	V31			✔
Sun protection shield - fixing parts of mild steel, cover of stainless steel unpainted for horizontal motors	V99			-
Additional measures for 2 up to 4 years storage	W50			✔

1.7.4 Low temperature design

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Special measures for low temperature design				
Operation at ambient temperatures down to -50 °C and transport down to -50 °C	D02	o.r.	✔**	✔*
Operation at ambient temperatures down to -40 °C and transport down to -40 °C	D03	o.r.	✔**	✔*
Operation at ambient temperatures down to -30 °C and transport down to -40 °C	D04	o.r.	✔**	✔*
Low-temperature special sleeve bearing for oil circulation lubrication	Q27			✔
Oil sump heater for sleeve bearings	T15	o.r.	o.r.	✔

** available only for steel housing design (MLFB digit 15=G/J) and for shaft height 355*

*** available only for 1NA1*

1.7.5 Degree of protection

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Degree of protection				
Degree of protection IP65	K50	✔	✔	✔
Degree of protection IP56	K51	✔		✔
Degree of protection IP56 (non-heavy sea)	K52		✔	
Degree of protection IP66	L94	o.r.	o.r.	o.r.
Terminal boxes in IP65	Q71			✔

1.7.6 Cooling design

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Cooling design				
Leakage water detection for water cooler	H08	✔	-	-
Stainless steel cooling pipes V4A (1.4571/AISI 316Ti)	Q17	-	o.r.	✔
Stainless steel cooling pipes V2A (1.4301/AISI 304)	V97	-	✔	□

1.7.7 Sleeve bearing options

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Sleeve bearing options				
DIN flange type for forced oil lubrication for oil inlet with flowmeter, manometer and throttle valve (incl. mating flange)	**H09**	✔	✔	✔
ANSI flange type for forced oil lubrication for oil inlet with flowmeter, manometer and throttle valve (incl. mating flange)	**H10**	✔	✔	✔
DIN flange type for forced oil lubrication for oil outlet with inspection glass (incl. mating flange)	**H11**	✔	✔	✔
ANSI flange type for forced oil lubrication for oil outlet with inspection glass (incl. mating flange)	**H12**	✔	✔	✔
DIN-flange type for inlet and outlet incl. counter flange (for forced oil lubrication)	**H43**	✔	✔	✔
ANSI-flange type for inlet and outlet incl. counter flange (for forced oil lubrication)	**H44**	✔	✔	✔
Autonomous oil circulation and cooling system for sleeve bearings	**K86**	✔	✔	-
Sleeve bearings by Renk	**K88**	✔	✔	☐
Support ring for coupling guard	**L15**	✔	✔	✔
Bearing insulation on DE (insulation can be bridged)	**L18**	✔	✔	✔
Bearing insulation on NDE	**L27**	✔	✔	✔
Oil circulation lubrication (with oil cooling) instead of oil-ring lubrication	**L60**	✔	✔	✔
Ring lubrication, but prepared for future conversion to oil circulation lubrication	**L66**	✔	✔	✔
Bearing provisioned for oil pressure relief (hydrostatics)	**P07**			**o.r.**
Oil manifold made of stainless steel, connections with mating flange	**P44**	✔	✔	✔
Oil-flowmeter with contacts (two-way contact) and leads in auxiliary terminal box	**P66**	**o.r.**	**o.r.**	✔
Bearing insulation on both sides (DE bridged to mass)	**Q08**			✔
Provision for oil change during operation for sleeve bearings without forced lubrication	**Q50**			✔
Bearing ventilation for lower bearing temperature for sleeve bearings	**V26**			✔
Constant oiler DE and NDE (200 ml)	**V71**			✔

1.7.8 Antifriction bearing options

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Antifriction bearing options				
Shock pulse measurement (SPM), measuring nipple on DE and NDE	G50	✔	✔	✔
Shock pulse measurement (SPM), fixed sensor and distribution box	H05	✔	✔	-
Shock pulse measurement (SPM), complete alarm box (Vibrex), safe area	H07	✔	✔	-
Bearing for increased lateral forces (cylindrical roller bearing DE)	K20	o.r.	o.r.	o.r.
Support ring for coupling guard	L15	✔	✔	✔
Bearing insulation on DE (insulation can be bridged)	L18	✔	✔	✔*
Bearing insulation on NDE	L27	✔	✔	✔
Bearing insulation on both sides (DE bridged to mass)	Q08			✔*
Bearing ventilation for lower bearing temperature – for antifriction bearing design grease lubricated	V17			✔
Bearing for increased axial forces	V20			o.r.
Grease extractors for bearing DE and NDE, stainless steel V4A	V21			✔
Automatic grease lubricator DE and NDE - suitable for ambient temperatures from -20 °C up to +50 °C	V22			✔
Enlarged grease chamber DE and NDE	V25	o.r.	o.r.	✔
Preparation for SPM bearing monitoring, only thread M8 for adapter	W84			✔

**not available for shaft height 355*

1.7.9 Shaft/rotor design

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Shaft/rotor design				
Second shaft end up to 50 % rated torque	**K16**	✔	✔	✔
Fitting of coupling half for cylindrical shaft end with key (supplied by customer, machined and balanced)	**L17**	✔	✔	✔
Full-key balancing	**L68**	✔	✔	✔
Half-key balancing	**L69**	□	□	□
Shaft material of alloy steel	**L72**	**o.r.**	**o.r.**	✔
Second standard shaft extension for up to 100 % rated torque, for horizontal motors	**Q21**			**o.r.**
Oil press-fit for cylindrical shaft extension (incl. test coupling for load tests) – *please select only in combination with a type test (i.e. F74, F75, F82, F83, F92, F93)*	**T02**	✔	✔	✔
Tapered oil press fit with shaft nut and taper plug gauge (incl. test coupling for load tests) – *please select only in combination with a type test (i.e. F74, F75, F82, F83, F92, F93)*	**T06**	✔	✔	✔
Tapered oil press fit with shaft nut	**T36**	✔	✔	✔
Non-standard cylindrical shaft end (diameter identical or smaller as standard)	**Y55**	✔	✔	✔
Oil press-fit for cylindrical shaft extension instead of feather key connection	**Y85**	✔	✔	✔

1.7.10 Vibration values/monitoring

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	1NA1/1NN1 IC411	Ex db
Vibration values/monitoring				
Shaft vibration monitoring for sleeve bearings (Bently Nevada, Proxpac)	**A02**	✔	✔	✔
Preparation for shaft vibration monitoring for sleeve bearings	**A39**	✔	✔	✔
Vibration severity grade A, IEC 60034-14	**K01**	☐	☐	☐
Vibration severity grade B, IEC 60034-14 - *for converter driven motors at minimum and rated frequency only!*	**L81**	✔	✔	✔
1 key phasor wired to terminal box	**P61**			✔
Provision for housing vibration probe, one flat surface with thread M8x1 on DE and NDE	**P63**	✔	✔	✔
Shaft vibration monitoring for sleeve bearing with proximitor in auxiliary terminal box in stainless steel	**Q02**	**o.r.**	**o.r.**	✔
Run out and shaft vibration according PGI-Norm - max. 15 µm/50,8 µm	**Q03**			✔
Run out and shaft vibration according to Shell DEP - max. 12,5 µm/50 µm	**Q04**			✔
Sleeve bearings provisioned for one keyphasor	**Q06**			✔
1 sensor for enclosure vibration monitoring (vibration velocity), without terminal box	**V15**			✔
1 sensor for enclosure vibration monitoring (vibration acceleration), without terminal box	**V16**			✔
Run out and shaft vibration acc. to IEC 60034-14 grade A	**V66**			✔
Run out and shaft vibration acc. to IEC 60034-14 grade B	**V67**			✔
Run out and shaft vibration acc. API541 - max. 11,4 µm/38 µm	**V68**			✔

1.7.11 Noise & ventilation design

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Noise & ventilation design				
External metal fan, 2 directions of rotation	K35			✔
Clockwise rotation, viewed onto DE	K97	□	□	□
Counterclockwise rotation, viewed onto DE	K98	○	○	○
Operation for both directions of rotation	K99	✔	o.r.	o.r.
Noise reduction: sound absorber for air intake	L20		✔	✔
External metal fan, 1 direction of rotation	L23		✔	✔
Stainless steel grid for air inlet	L25		✔	✔
External stainless steel fan	V94			-
Outer fan unit in non-sparking design	W66			✔
Zinc-coated fan cowl	W69			✔
Non-standard voltage and/or frequency of forced ventilation motor	Y81	-	✔	-

1.7.12 Speed monitoring and shaft grounding

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Speed monitoring and shaft grounding				
Speed monitoring by inductive proximity switch without evaluation device	A03	✔	✔	✔
Speed encoder Sendix 5834FS2 1024 (SIL-2)	G21		✔	-
Speed encoder Sendix 5834FS2 1024 (SIL-3)	G22		✔	-
Rotary pulse encoder HOG10 M DN 1024 I SR 16H7 KLK, SIL-2	G23		✔	-
Rotary pulse encoder HOG10 M DN 1024 I SR 16H7 KLK, SIL-3	G24		✔	-
Rotary pulse encoder HOG10S100S-B76.626.01024.1, SIL-2	G25		✔	-
Rotary pulse encoder HOG10S100S-B76.626.01024.1, SIL-3	G26		✔	-
Speed encoder LL FSI 862-184560-1024, SIL-2	G27		✔	-
Speed encoder LL FSI 862-184560-1024, SIL-3	G28		✔	-
Rotary pulse encoder LL 861900220	H70	✔	✔	-
Rotary pulse encoder HOG10 D 1024 I	H73	✔	✔	-
Rotary pulse encoder HOG10 D1024 I with integrated shaft grounding	H76	✔	✔	-
Rotary pulse encoder HOG11 DN 1024 I with integrated shaft grounding and special corrosion protection	H89	✔	✔	-
Mechanical protection for rotary pulse encoder	M68	✔	✔	-
Shaft earthing device	V36			✔*
Speed encoder Ex design (SIEMENS preferred brand)	V72	-		✔

**not available for shaft height 355*

1.7.13 Winding temperature monitoring

SIMOTICS HV C		**General availability**		
Order codes	**Short code**	**1NA1/1NN1**		**Ex db**
		IC71W	**IC411**	
Winding temperature monitoring				
Motor protection with 2x3 thermistors for pre-warning/switching-off	**A12**	✔	✔	✔
Motor protection with 2x3 thermistors for pre-warning/disconnection as single protection at converter (TMS)	**A16**			✔
Motor protection with 2x3 thermistors for pre-warning/disconnection with surge arresters	**A17**			**o.r.**
1 temperature sensor PT1000	**A35**	✔	✔	✔
2 temperature sensor PT1000	**A36**	✔	✔	✔
6 temperature sensor PT1000	**A37**	✔		✔
6 embedded resistance thermometers PT100 for 2- to 4-wire connection ex terminal without lightning arresters	**A65**	✔	✔	✔
6 embedded resistance thermometers PT100 for 2- to 4-wire connection ex terminal including lightning arresters	**A66**	✔	✔	✔
6 embedded resistance thermometers PT100 (Ex ib design) for 2- to 4-wire connection ex terminal without lightning arresters	**A67**	✔	✔	✔
6 Ex ib-slot resistance thermometers PT100 in shielded design, with surge arrestors for 2- to 4-wire connection ex terminal	**Q40**	-		✔
Upgrade 6 winding resistance thermometers PT100 to 4-wire connection ex sensor instead of ex terminal	**Q43**			✔
Upgrade 6 winding resistance thermometer PT100 to 3-wire type tolerance class A ex sensor instead ex terminal	**V78**			✔

1.7.14 Bearing temperature monitoring

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Bearing temperature monitoring				
2 resistance thermometers PT100 for 2- to 4-wire connection ex terminal for antifriction bearings	A40	✔	✔	-
2 resistance thermometers PT100 for 2- to 4-wire connection ex terminal for sleeve bearings	A41	✔	✔	-
2 double resistance thermometers PT100 for 2- to 4-wire connection ex terminal for antifriction bearings	A42	✔	✔	✔
2 double resistance thermometers PT100 for 2- to 4-wire connection ex terminal for sleeve bearings	A43	✔	✔	✔
Upgrade bearing resistance thermometers PT100 to 4-wire connection ex sensor instead of ex terminal	Q44			✔
One bimetal-thermometer, diameter 100 mm, for bearing DE- and NDE	V70			✔
Upgrade bearing or coolant resistance thermometer PT100 to 3-wire type tolerance class A ex sensor instead ex terminal	V76			✔
2 bearing double resistance thermometers PT100 in Ex ib-design	V80	-		✔

1.7.15 Temperature gauges and transmitters

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Temperature gauges and transmitters				
2 dial bearing thermometers without contacts, capillary principle	A70	✔	✔	✔
2 dial bearing thermometers with 2 NO contacts, capillary principle	A71	✔	✔	-
3 SITRANS transmitters for temperature monitoring of the stator winding	T27	✔	✔	✔
2 SITRANS transmitters for temperature monitoring of the bearings	T28	✔	✔	✔
One transmitter 4-20mA with digital display with Ex db or Ex ib-approval	V88	-		o.r.

1.7.16 Heaters

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Heaters				
Anti-condensation heating, rated voltage 400 V	L08	✔	✔	-
Anti-condensation heating, rated voltage 500 V	L09	✔	✔	-
Anti-condensation heater 110-120 V (min 100 V, max. 132 V)	M12	✔	✔	✔
Anti-condensation heater 220-240 V (min 200 V, max. 264 V)	M13	✔	✔	✔
Anti-condensation heating, Ex-certified, Zone 1, 110-120 V (min. 100 V, max. 132 V)	M14	✔	✔	-
Anti-condensation heating, Ex-certified, Zone 1, 220-240 V (min. 200 V, max. 264 V)	M15	✔	✔	-
Heating in main terminal box	P84	o.r.	o.r.	✔
Anti-condensation heating with other rated voltages for Ex-motors, voltage to be defined	Q48	-		✔

1.7.17 Auxiliary terminal boxes

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Auxiliary terminal boxes				
Auxiliary terminal box made of cast iron	M50	✔	✔	-
Auxiliary terminal box made of stainless steel	M51	✔	✔	✔
Separate auxiliary terminal box for anti-condensation heater	M52	✔	✔	✔
Auxiliary terminal box in cast iron design (safe, Ex eb, Ex ib-design) with removable gland plate "undrilled"	Q75	-		✔
Auxiliary terminal box in cast iron design (safe, Ex eb, Ex ib-design) with removable gland plate "metric thread drilled and with metal plug"	Q76	-		✔
Breather IP66 Ex eb, for auxiliary terminal box	Q77	-		✔
Auxiliary terminal box in cast iron Ex db-design	V43	-		✔
Auxiliary terminal box in cast iron Ex eb-design	W72	-		✔

1.7.18 Main terminal box & options

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Main terminal box & options				
Terminal box on right hand side (viewed onto DE) – *standard for IC511 motors*	K09	✔	✔	✔ / ☐
Terminal box on left hand side (viewed onto DE)	K10	✔	✔	✔
Terminal box on top, cable entry from the right (viewed onto DE) – *not possible for IC511 motors*	K11	☐	☐	☐ / -
Terminal box on top, cable entry from the left (viewed onto DE) – *not possible for IC511 motors*	K12	✔	✔	✔ / -
Rotation of the terminal box by 90 °, cable entry from DE	K83	✔	✔	✔
Rotation of the terminal box by 90 °, cable entry from NDE	K84	✔	✔	✔
Enlarged terminal box (11 kV version)	L59	✔	✔	-
Second main terminal box	L67	✔	✔	✔
Terminal box rotated 180 °, cable entry from above – *only possible in case of K09/K10*	N83	✔	✔	o.r.
Main terminal box NDE	N85	✔	✔	-
Main terminal box in Ex db-design, 3 synthetic terminals	Q31	-		✔
Main terminal box in Ex eb-design, 6 synthetic terminals for parallel connection	Q32	-		✔
Main terminal box suitable for installation of 3 current transformers differential type	Q33	-		✔
Main terminal box "phase separated" Ex eb max. 11 kV - 3 cast resin terminals	V23	-		✔
Main terminal box "phase separated" Ex eb max. 11 kV – 6 cast resin terminals, increased short-circuit strength	V24	-		✔
Main terminal box in Ex db-design - 6 terminals for integrated neutral point	V44	-		✔
Euromold main terminal box with connector, 3 terminals	V48	-		✔
Euromold main terminal box with connector, 6 terminals	V49	-		✔
Main terminal box "phase separated" Ex eb design max. 6.6 kV, 3 cast resin terminals	V50	-		✔
Main terminal box "phase separated" Ex eb design max. 6.6 kV, 6 cast resin terminals	V51	-		✔
Main terminal box "phase segregated" Ex eb design max. 6.6 kV, 3 cast resin terminals	V52	-		✔
Special large Ex db main terminal box (max. 13.8 kV, gas group IIB + H_2) including lightning arrestors and surge capacitors	V63	-		✔
Separate Ex db terminal box (max. 11 kV) including lightning arrester and surge capacitors	V64	-		✔

1.7.19 Neutral point terminal box & options

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Neutral point terminal box & options				
Neutral point terminal box standard, max. 6.6 kV	**L55**	✔	✔	✔
Neutral point terminal box standard, max. 11 kV	**L56**	✔	✔	✔
Neutral point terminal box max. 6.6 kV, 6 terminals	**L57**	✔	✔	-
Neutral point terminal box max. 11 kV, for installation of current transformers (without current transformer)	**L58**	✔	✔	-
Neutral point terminal box Ex eb "phase separated" – 3 cast resin terminals - 11 kV	**Q38**	-		✔
Neutral point terminal box Ex eb "phase separated" – 6 cast resin terminals - 11 kV	**Q72**	-		✔
Neutral point terminal box Ex db - max. 6.6 kV	**V38**	-		✔
Neutral point terminal box Ex db - max. 11 kV	**V39**	-		✔
Neutral point terminal box Ex db- provisioned for 3 window type current transformers	**V40**	-		✔
Neutral point terminal box Ex eb "phase segregated" – 3 cast resin terminals, max. 6.6 kV	**V41**	-		✔
Neutral point terminal box Ex eb "phase segregated" – 6 cast resin terminals, max. 6.6 kV	**V42**	-		✔

1.7.20 Fittings for main- and neutral point terminal boxes

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Accessories for main- and neutral point terminal boxes				
Undrilled cable entry plate on main terminal box	L01	✔	✔	✔
Gland plate for 3 winding ends for power supply connection via separately set up terminal boxes, free cable length 3 m from enclosure	L79	✔	✔	-
Cable entry frame MCT	M59	✔	✔	✔
Breather IP66 Ex eb, for main terminal box	Q78			✔
Breather IP66 Ex eb, for neutral point terminal box	Q79			✔
Steel cable gland with undrilled cable entry board for terminal box	T25	✔	✔	-
3 current transformers type 4MA72	T26	✔	✔	-
3 current transformers "window self-balance type" in Ex db terminal box with attached main terminal box	V27	-		✔
Raychem heat shrink caps for terminals in the main terminal box (phase insulation)	V53			✔
3 ring core current transformer - *for use in neutral point terminal box V40*	V57			✔
3 current transformers, window self-balance type	V58	✔	✔	-
Partial discharge monitoring - inductive; without evaluation unit and commissioning	V59			✔
Partial discharge monitoring - capacitive; without evaluation unit and commissioning – *IRIS couplers*	V60	o.r.	o.r.	✔

1.7.21 Name plates

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Name plates				
Second rating plate, separately	K31			✔
Engraved tag plate fixed on terminal box	V96			✔
Second rating plate installed in terminal box	W47			✔
Warning plates in other languages than German or English; other plates according SN66020	W49			✔
Up to 5 additional plates for customer data (indicate quantity and text)	Y82	●	●	●

1.7.22 Painting systems

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Painting systems				
Outdoor installation with high salinity or areas with almost constant condensation (corrosivity category C5)	E81	✔	✔	✔
Outdoor installation with moderate salinity (corrosivity category C4)	E82	✔	✔	✔
Outdoor installation with low salinity (corrosivity category C3)	E83	✔	✔	✔
Paint finish according to corrosivity category C3, 180 µm	K73	✔	✔	✔
Paint finish according to corrosivity category C4, 240 µm	K74	✔	✔	✔
Paint finish according to corrosivity category C5-I (300 µm)	K75	✔	✔	✔
Paint finish according to corrosivity category C5-M (320 µm)	K76	✔	✔	✔
Indoor use in sulfurous atmosphere	M06	✔	✔	✔
2 metal test sheets (100x150 mm) with paint layer for special paint inspection	V08	o.r.		✔
Coating system Z21/J08 – 300 µm (offshore, C5M-high)	V19			o.r.
Paint colors according Munsell or British Standard	Y50			●
Paint finish non-standard color	Y53	●	●	●

1.7.23 Ship building classifications

See chapter 1.8

1.7.24 Warranty

SIMOTICS HV C Order codes	Short code	General availability 1NA1/1NN1 IC71W	 IC411	 Ex db
Warranty				
Extension of the liability for defects to a total of 24 months (2 years) from date of delivery	**Q80**	✔	✔	✔
Extension of the liability for defects to a total of 30 months (2.5 years) from date of delivery	**Q81**	✔	✔	✔
Extension of the liability for defects to a total of 36 months (3 years) from date of delivery	**Q82**	✔	✔	✔
Extension of the liability for defects to a total of 42 months (3.5 years) from date of delivery	**Q83**	✔	✔	✔
Extension of the liability for defects to a total of 48 months (4 years) from date of delivery	**Q84**	✔	✔	✔
Extension of the liability for defects to a total of 60 months (5 years) from date of delivery	**Q85**	✔	✔	✔

1.8 Marine applications

General

SIMOTICS HV C motors for marine applications have been designed for below-deck operation on ships.
If the motors are intended for on deck operation or for offshore applications, then these must be explicitly ordered using an additional order code.
The reason for this is that in these cases special measures are required.

The thermal utilization of the motors is adapted to the generally higher ambient temperatures onboard ships.
If the application demands compliance with additional regulations, such as explosion protection, the appropriate motor series must be chosen.

The motors onboard ships are subdivided into three importance categories by the marine classification societies in collaboration with customers, depending on the field of application:

- Essential Service for Propulsion or also Primary Essential Service
- Essential Service or also Secondary Essential Service or Important Service
- Non-Essential Service or Non-Important Service

As the assignment of a drive to one of the importance categories has a direct impact on the scope of the marine options, this must be known when ordering the motor.

Table 1-6 Services of the motor manufacturer, associated with the categories

	Essential Service for Propulsion	**Essential Service**	**Non-Essential Service**
Typical applications	Propeller drive, thruster (if used as main drive/declared as propulsion)	Thrusters, lateral thrust units, anchor winches, bilge and ballast pumps, fire-fighting pumps	Pumps for service water
Version	In accordance with the regulations of the classification society		In accordance with ambient conditions of the classification society
Acceptance test certificate	Acceptance test certificate 3.2 according to EN10204		Acceptance test certificate 3.1 according to EN 10204[1)]
Individual acceptance by classification society	Will be performed. Motor is assigned an individual certificate of the classification society.		Not necessary
Ordering several identical motors	Differentiation between the first motor and additional ones must be realized when ordering using an order code.		No distinction
Rating plate data	Information about ambient conditions of the classification society		
Stamp of the classification society	Stamp on the shaft[2)] and enclosure		No stamp

1) Certificate is not stipulated by the classification society, but it is issued according to the internal quality standards within the scope of a routine test.
2) If the classification society supervises construction.

Note

Ice Class

If ships operate in ice-clogged waterways, they are required to consider these additional requirements (ice class) in motor design.
Designs for ice class are not included in the standard marine motor designs and must be inquired in engineering on a case-to-case basis

Table 1-7 Ship building societies

Society	**Abbreviation**	**Location**
American Bureau Of Shipping	ABS	USA
Bureau Veritas	BV	France
China Classification Society	CCS	China
DNV GL Maritime	DNV GL	Norway/Germany
Korean Register	KR	Korea
Lloyds Register	LR	UK
Nippon Kaiji Kyokai	NK	Japan
Russian Maritime Register of Shipping	RMRS	Russia
Registro Italiano Navale	RINA	Italy

Benefits

The marine motors offer the user several advantages and benefits:

- Cast iron and steel versions can be supplied for corrosive atmospheres especially for high humidity levels and salt laden air
- Increased corrosion protection using specially designed paint finishes is available
- Certified marine motors can be supplied for use in areas to be protected against explosion
- In depth know-how regarding customer requirements
- Worldwide service network with 24-hour service hotline for motors and converters

Application

Our marine motors are designed for use onboard ships (installed below deck or on deck)

Applications onboard ships as main and auxiliary drives below deck, e.g.:

- Fans (air conditioning, refrigeration plants)
- Pumps (for fire-extinguishing water, fuels, oils)
- Winches (anchor winches, warping winches, lifting gear)
- Compressors
- Bow thruster drives
- Main propulsion drives
- Ex motors for hazardous zones

If marine motors are to be used on deck in especially corrosive atmospheres or in offshore applications, then they must be additionally upgraded to meet these more stringent conditions.

Typical applications are:

- Coastal areas, e.g. oil rigs, drilling ships
- Dynamic positioning drives for platforms
- Pumps

Offshore versions must be specifically ordered, as they require special measures.

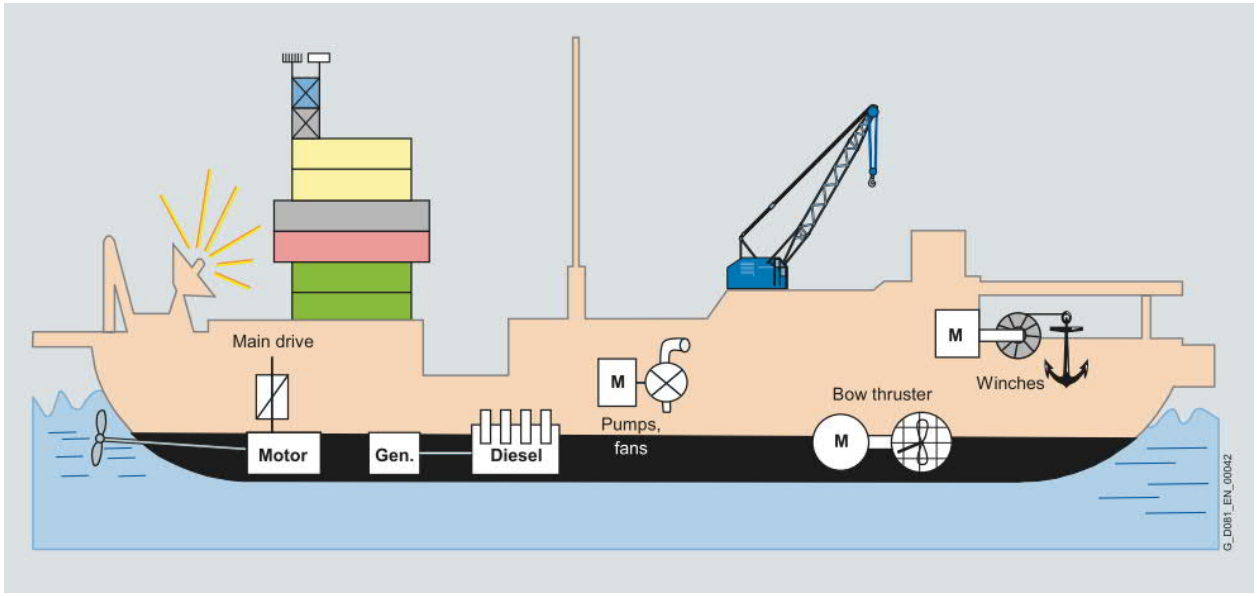

Fig 1-2 Typical areas of application

Technical Data

Table 1-8 Regulations of the individual classification societies for motors

Class. society	Coolant temperature KT		Admissible temperature rise limit according to the classification society Temperature class			Rated power limit individual accept. test	Constr. supervision mandatory
	Water-cooling °C	Air-cooling °C	130 (B) K	155 (F), $P_{rated} < 5MW$ K	155 (F), $P_{rated} \geq 5MW$ K	kW	
ABS	32	50	70	95	90	≥ 100	-
BV	32	45	75	100	95	≥ 100	≥ 500 kW
CCS	32	45	75	100	95	All	All
DNV GL	32	45	75	100	100	≥ 300	-
KR	32	45	75	100	95	≥ 7.5	-
LR	32	45	70	95	90	≥ 100	≥ 100 kW

SIMOTICS HV C motors for marine applications must be ordered with the classification-specific options.

This ensures that both, the mechanical design of the motor, and the tests are performed exactly in accordance with the instructions provided by the respective classification society.

There are four categories of classification-specific options:

1. **Design options** define the marine-compatible technical design in accordance with the definitions of the classification society
2. **Certification options** define the scope of the test certificates
3. **Test options define** the scope of the individual tests
4. **Additional options** for deviations and special conditions: specify the customer's request for participation in the tests at the factory, or define coolant temperatures that differ from the requirements of the classification society (additional plain text required)

The options of the importance categories listed above are combined with each other depending on the class of importance, classification society and other conditions.

If motors are to be designed according to the specifications of several classification societies, a special inquiry is necessary.

Motors for Non-Essential Services

The technical design is in accordance with the ambient operating conditions specified by the classification society. One of the marine design options X00, X01, X12[1)], X03, X04, X05, X06, X07, X08 or X09 must be specified depending on the classification society.

Acceptance inspections are not required.

There is no distinction between ordering an individual motor or several ones.

Table 1-9 Order codes for Non-Essential Service marine motors SIMOTICS HV C

Non-Essential Service	Options according to the classification society								
	ABS	**BV**	**CCS**	**DNV GL**	**KR**	**LR**	**NK**	**RMRS**	**RINA**
Technical version	X00	X01	1)	X03	X05	X06	X07	X08	X09

1) Non-Essential Service must be handled by CCS just like an essential service.

Motors for Essential Services

The technical design is in accordance with regulations of the classification society: Options X10 to X19.

An acceptance test certificate 3.2 according to EN 10204 and a product certificate of the classification society are provided with each motor.

Depending on the classification society, the test steps are defined by options X30 to X48 for the first motor (even numbers) and X31 to X49 for the additional motors (uneven numbers).

Options J70 to J88 or J71 to J89 define the expenditure for certifying the motor.

Table 1-10 Order codes for Essential Service marine motors SIMOTICS HV C

Essential Service	Options according to the classification society								
	ABS	**BV**	**CCS**	**DNV GL**	**KR**	**LR**	**NK**	**RM RS**	**RI NA**
Technical version	X10	X11	X12	X13	X15	X16	X17	X18	X19
Certification									
• First motor	J70	J72	J74	J76	J80	J82	J84	J86	J88
• Additional motor	J71	J73	J75	J77	J81	J83	J85	J87	J89
Scope of the tests and presence of representatives of the classification society									
• First motor	X30	X32	X34	X36	X40	X42	X44	X46	X48
• Additional motor	X31	X33	X35	X37	X41	X43	X45	X47	X49
Tests in presence of representatives of the customer (in addition to the inspector of the classification society)	X99								
Conditions deviating from classification requirements must be fulfilled	E80								

Option E80 is used if a different coolant temperature KT is required.

The KT must also be specified in plain text, e.g. KT55.

Motors for Essential Services for Propulsion

The technical design is in accordance with regulations of the classification society:

Options X20 to X29. An acceptance test certificate 3.2 according to EN 10204 and a product certificate of the classification society are provided with each motor.

Depending on the classification society, the test steps are defined by options X60 to X78 for the first motor (even numbers) and X61 to X79 for the additional motors (uneven numbers). Options N40 to N52, or N41 to N59 define the expenditure for certifying the motor.

Table 1-11 Order codes for Essential Service for Propulsion marine motors SIMOTICS HV C

Essential Service for Propulsion	Options according to the classification society								
	ABS	**BV**	**CCS**	**DNV GL**	**KR**	**LR**	**NK**	**RM RS**	**RI NA**
Technical version	X20	X21	X22	X23	X25	X26	X27	X28	X29
Certification									
• First motor	N40	N42	N44	N46	N50	N52	N54	N56	N58
• Additional motor	N41	N43	N45	N47	N51	N53	N55	N57	N59
Scope of the tests and presence of representatives of the classification society									
• First motor	X60	X62	X64	X66	X70	X72	X74	X76	X78
• Additional motor	X61	X63	X65	X67	X71	X73	X75	X77	X79
Tests in presence of representatives of the customer (in addition to the inspector of the classification society)	X99								
Conditions deviating from classification requirements must be fulfilled	E80								

Option E80 is used if a different coolant temperature KT is required.

The KT must also be specified in plain text, e.g. KT55.

1.9 Test options

Tests and inspections for SIMOTICS HV C motors

Order code		
Unwitnessed	**Witnessed**	**Test description**
F00	**F01**	Routine test according to IEC *(sine wave voltage)*
	F03	Final inspection
F04	**F05**	Heat run test under full load or partial load, if applicable load replacement test for determining winding temperature rise on motors in horizontal version
F14	**F15**	Measurement of no-load characteristic and determination of core and friction losses
F16	**F17**	Measurement of locked-rotor characteristic and determination of losses
F18	**F19**	Measurement of load characteristic *Depending on factory: horizontal testing of vertical motors possible*
F22	**F23**	Dissipation factor test (tan delta) on 2 test coils *(test coils separate F90)*
F26	**F27**	Dissipation factor test (tan delta) on built-in stator winding in test field
F28	**F29**	No-load noise measurement, without noise analysis *Please use option F62/F63 for noise analysis*
F34	**F35**	Recording of current and torque curves at load
F36	**F37**	Determination of moment of inertia by retardation method
F38	**F39**	Overspeed test
F42	**F43**	Sealed winding conformance test (wet test) according to NEMA
F46	**F47**	Partial discharge measurement
F52	**F53**	Measurement of starting torque and –current *Depending on factory: horizontal testing of vertical motors possible*
F54	**F55**	Measurement of insulation resistance and polarization index
F58	**F59**	Vibration analysis (no-load)
F60	**F61**	Impulse-voltage test or AC test on 2 single test coils *(select test coils extra with F90)*
F62	**F63**	Noise level analysis (no-load)
	F67	Sleeve bearing inspection after test run
F74	**F75**	Type test at test field converter
F80	**F81**	Load noise measurement, without noise analysis *(F04/F05/F82/F83/F92/F93 needed)*
F82	**F83**	Type test at load for horizontal motors *(sine wave voltage)*
F90		2 Test coils *(test with extra price)*
F92	**F93**	Type test at load for vertical motors *(sine wave voltage)* *Depending on factory: horizontal testing of vertical motors possible*
	F97	System test at customer VFD (SINAMICS GH/GM/SM) *(max. 3 days! Service technician for converter setting not included!) on request*
	X97	Remote acceptance test
	X98	Hybrid acceptance test - in factory & remote

Note

Please see available test descriptions in "Siemens LDA Portal" for more details on tests.

1.10 Documentation

General

The documentation for SIMOTICS HV C is based on the actual equipment, accessories and tests of the motor.
SIMOTICS HV C documentation is provided via the documentation download portal and is triggered at certain point in the order processing.

Pre-documentation DPRV

Pre-documentation package DPRV is provided via the documentation download portal in separate PDF files.
Check the Intranet at LDA Delivery Times Sharepoint for documentation delivery times.

The following is included in the DPRV at least:

- Letter preliminary documentation
- Dimensional drawing (DXF, PDF, STEP)
- Preliminary dimensional drawing text, mechanical data, and details
- Electrical data sheet
- For DOL motors: Current/torque curve
- Transient air gap torques
- Foundation loads
- Equivalent circuit diagram
- Thermal limit curve
- Shaft dimensional drawing (for 1NA. only)

Documentation DPOR

Documentation package DPOR is provided via the documentation download portal in separate PDF files.
Check the Intranet at LDA Delivery Times Sharepoint for documentation delivery times.

The following is included in the DPOR at least:

- Letter final documentation
- Final Dimensional drawing (DXF, PDF, STEP)
- Final dimensional drawing text, mechanical data, and details
  - Circuit diagrams
  - Terminal box drawings
  - Bearing and lubrication data
  - Setting values e.g. for PT100s
  - Lifting and transport recommendations
- Final electrical data sheet:
  - For DOL motors: Current/torque curve
  - Transient air gap torques
  - Foundation loads
  - Equivalent circuit diagram
  - Thermal limit curve
- Shaft dimensional drawing

Additional documents

See the table below for additional possible documents

Order code	Documentation description
B08	Preliminary documentation DPRV subject to approval (hold point, extend lead time)
B09	Modular dimension drawing text instead of one document
B16	Photo subject to approval prior to delivery
B17	Expediting during production
B22	Documentation as email
B23	Documentation as hard copy 1 set
B27	Run out protocol
B28	Protocol air gap calculation
B29	Painting thickness measurement protocol
B30	Certificate of origin
B34	Standard inspection and test plan (ITP)
B35	Document: balancing report
B36	Document: test and inspection description
B37	Document: load characteristics
B38	Document: spare part recommendation
B41	Document: instrumentation data sheets
B43	Document: production schedule, generated once
B44	Document: production schedule, updated biweekly
B45	Document: production schedule, updated monthly
B48	Document: order-specific inspection and test plan
D00	Documentation in German [1]
D54	Documentation in Czech (operating & safety instructions) [2]
D55	Documentation in Polish (operating & safety instructions) [2]
D56	Documentation in Russian (operating & safety instructions, datasheet, drawing) [2]
D57	Documentation in Japanese (operating & safety instructions) [2]
D62	Documentation in Danish (operating & safety instructions) [2]
D71	Documentation in Romanian (operating & safety instructions) [2]
D72	Documentation in Italian (operating & safety instructions) [2]
D73	Documentation in Finnish (operating & safety instructions) [2]
D74	Documentation in Dutch (operating & safety instructions) [2]
D75	Documentation in Turkish (operating & safety instructions) [2]
D76	Documentation in English [1]
D77	Documentation in French (operating & safety instructions, datasheet, drawing) [2]
D78	Documentation in Spanish (operating & safety instructions, datasheet, drawing) [2]
D79	Documentation in Portuguese (operating & safety instructions) [2]
D80	Documentation in Bulgarian (operating & safety instructions) [2]
D81	Documentation in Norwegian (operating & safety instructions) [2]

[1] Complete documentation available

[2] Please contact headquarters about availability/delivery time of additional documents

Order code	Documentation description
D82	Documentation in Hungarian (operating & safety instructions) [2]
D83	Documentation in Swedish (operating & safety instructions) [2]
D84	Documentation in simplified Chinese (operating & safety instructions) [2]
D85	Documentation in Slovenian (operating & safety instructions) [2]
D86	Documentation in Greek (operating & safety instructions) [2]
D87	Documentation in Slovakian (operating & safety instructions) [2]
D88	Documentation in Estonian (operating & safety instructions) [2]
D89	Documentation in Latvian (operating & safety instructions) [2]
D90	Documentation in Lithuanian (operating & safety instructions) [2]
D91	Documentation language Serbian (operating & safety instructions) [2]
U02	Customer data sheet
U03	Current starting time characteristic
U09	Woehler curve
U13	Calculation of the axial magnetic pull
U14	Lateral critical speed analysis
U16	Speed starting time characteristic
U36	Coating description
U41	Certificate of conformity for mounting parts
U42	Certificate of conformity for terminal box
U44	Certificate of conformity IP degree of protection
U45	Lifting lug calculation
U60	Shaft material certificate 3.1
U62	Calibration certificates for all installed resistance thermometers PT100
U69	Manufacturing record book
U74	Material certificate for lamination 2.2
U75	Material certificate for copper 2.2
U85	Coating layer thickness protocol 3.1 of each layer

[1] Complete documentation available

[2] Please contact headquarters about availability/delivery time of additional documents

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