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Bharat Bijlee

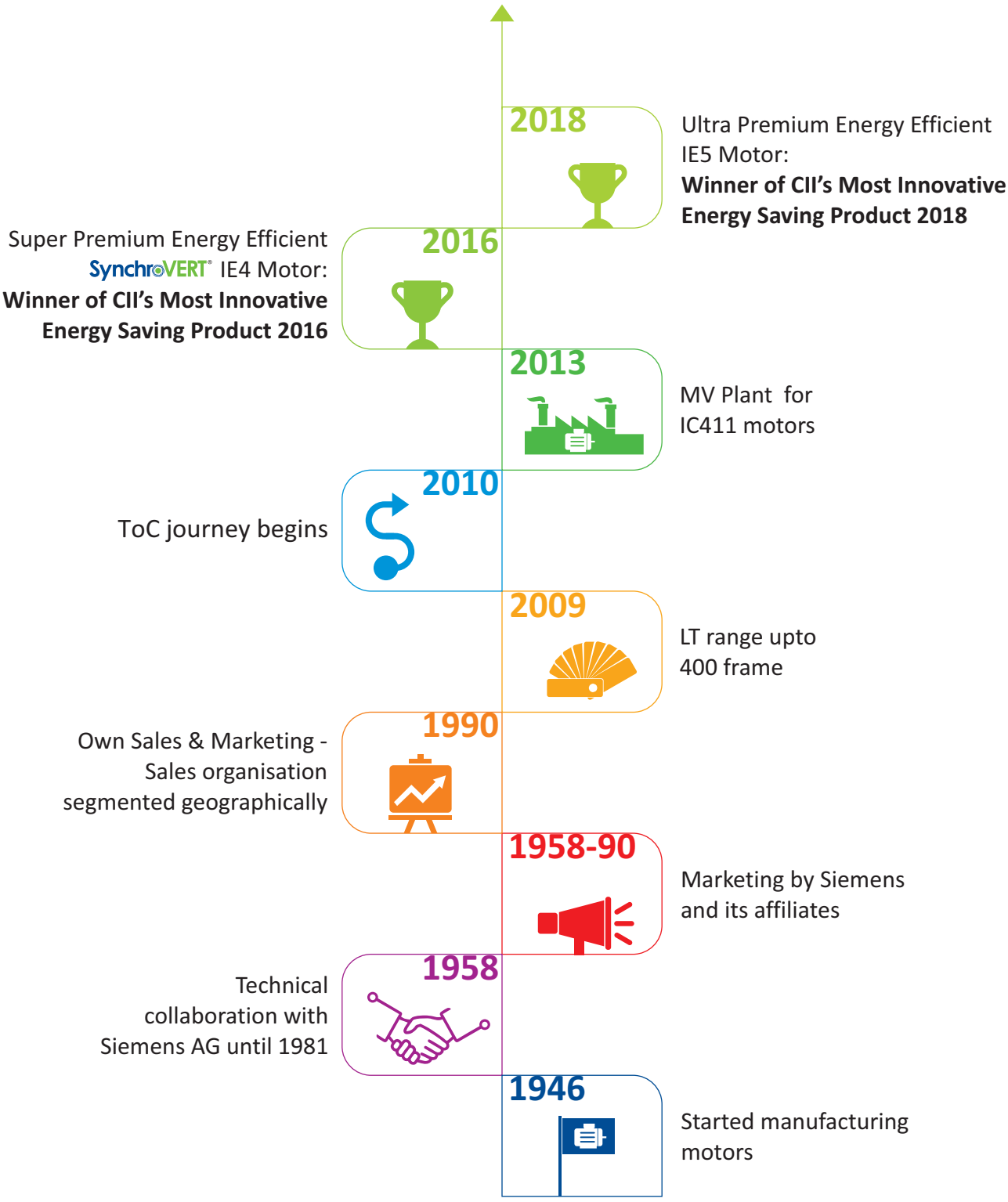
LV Motors: Premium Efficiency IE3 Safe Area

Reliable | Energy Efficient

A MOTOR FOR EVERY NEED

July 2022

BHARAT BIJLEE MOTORS: MILESTONES



WHY BHARAT BIJLEE?

Preferred brand across multiple sectors like Cement, Construction, Steel, Food & Beverages, Water & Wastewater, and Sugar & Distilleries, to name a few.

Motors suited for all applications i.e. Pumps, Compressors, Fans & Blowers, Conveyors, Lifts, Screen, Vibrators, Centrifuges, Stone Crusher, and many more.

The most suitable solutions for extremely harsh and severe applications.

Customized motors designed and manufactured to suit application-specific needs.

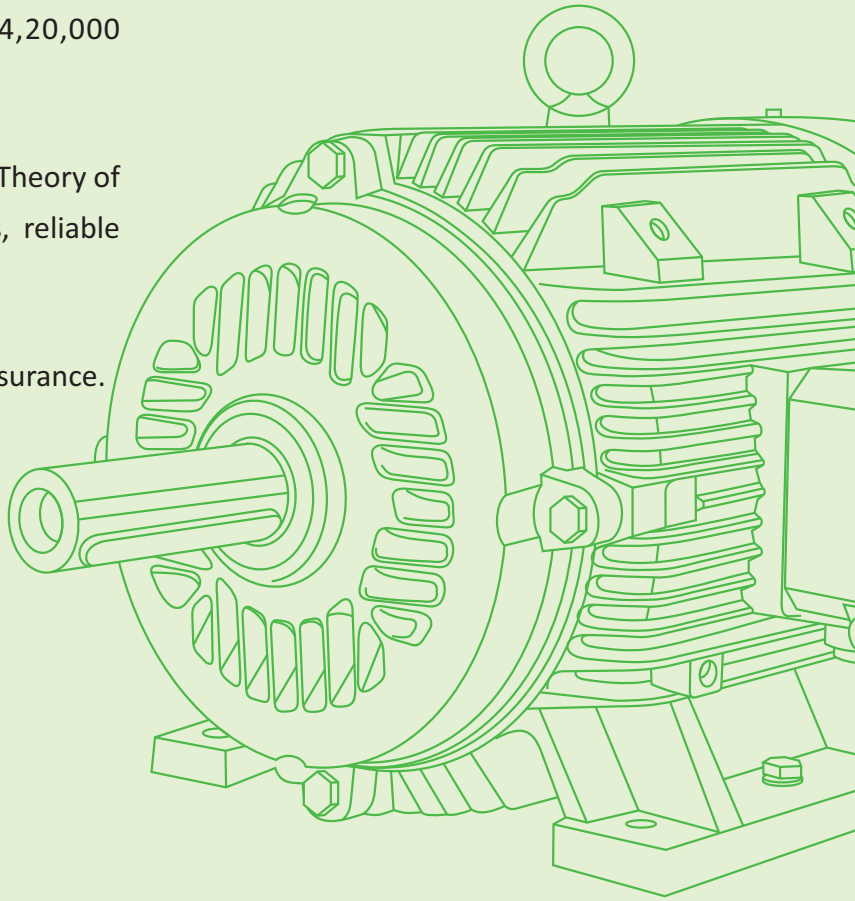
Motors conform to relevant IS/IEC standards.

Annual Production capacity over 4,20,000 motors.

Supply chain based on the concept of Theory of Constraints ensures short lead times, reliable deliveries and superior availability.

Rigorous process control and quality assurance.

Pan India dealer and service network.



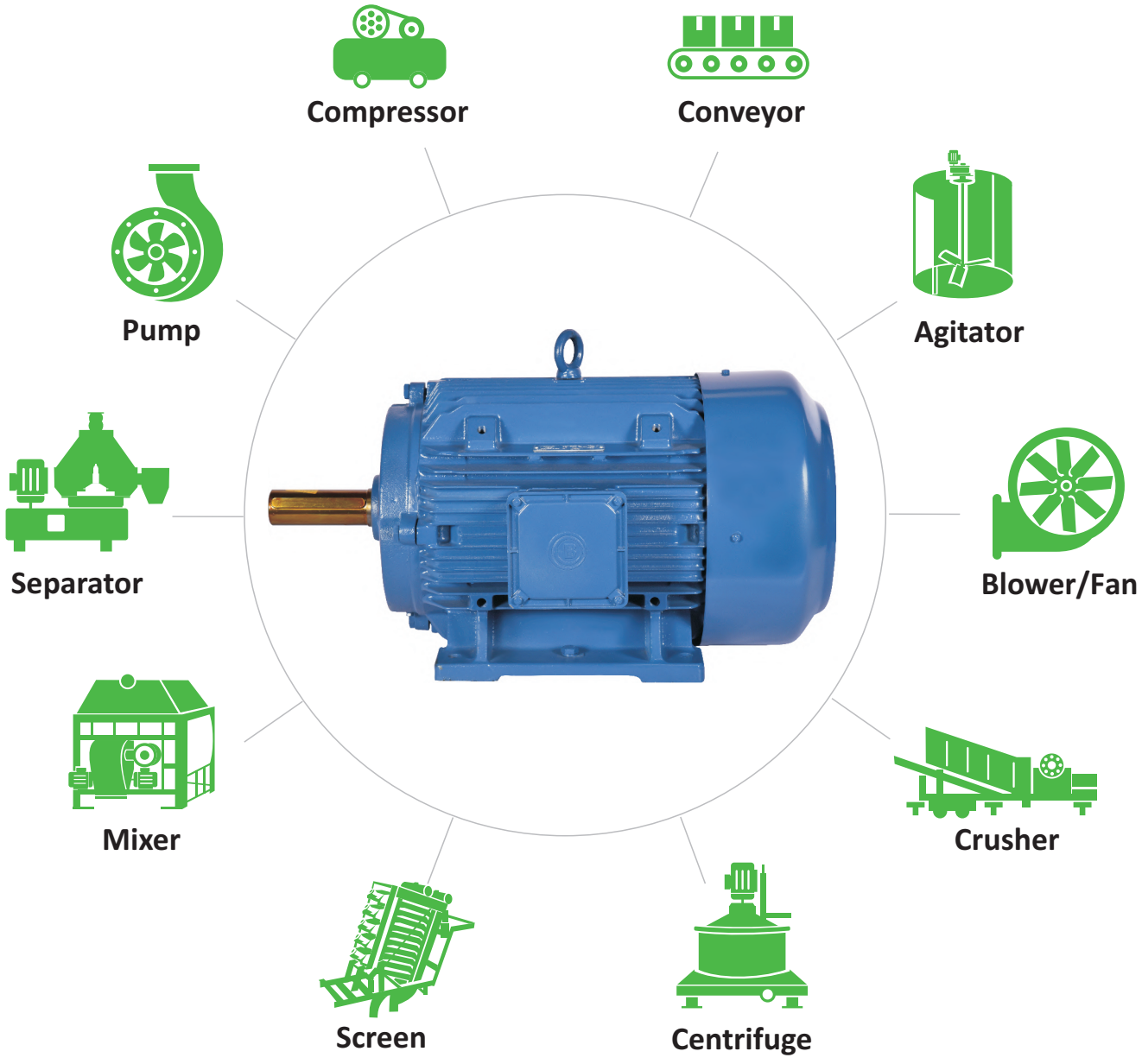
In the past few decades, India has witnessed significant economic growth due to liberalization and industrialization. The contribution of industries and services towards the Indian economy (GDP) has been increasing over a period of time. However, this is accompanied by an increase in energy demand, most of which is obtained through conventional sources of energy, which today contributes to 82% of the total power produced in our country. This ever-increasing demand leads to increase in all other aspects associated with it, which include air pollution and emission of greenhouse gases due to burning of fossil fuels (a non-renewable source of energy). In view of this situation, it becomes imperative to explore new and viable solutions to save energy. These include usage of energy-efficient equipment, especially in industries, as it accounts for over half the consumption of electricity, 60-70% of which is utilized by electric motors.

The operating cost of an electric motor is about 95% of the total cost incurred during its lifecycle, which ranges between 15 to 20 years. Organizations that have proactively invested in energy-efficient motors have reaped the benefits like of better output, increased cost savings, or both.

Bharat Bijlee has been a fore runner in energy efficiency. With a strong in-house design team, indigenous and state-of-the-art manufacturing facility equipped with a SCADA controlled test bed, we have successfully developed a wide range of premium efficiency IE3 series motors. Over the years, Bharat Bijlee has gained the trust of its customers and with the ability to deliver beyond customers' expectations, this trust has only grown stronger. Known for its product and service quality, there is more to what makes Bharat Bijlee a preferred brand across the country.

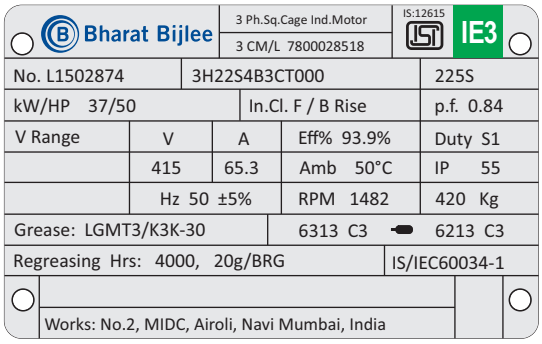
Our IE3 motors have been successfully working across all sectors and in all possible applications over the years, and have exceeded expectations of performance and reliability. Owing to this, Bharat Bijlee is one of the most trusted brands in the country today.

MAJOR APPLICATIONS OF BHARAT BIJLEE MOTORS ACROSS ALL SECTORS



REFERENCE STANDARDS

IS 15999 Part-1	Three Phase Induction Motor specifications (“Rotating Electrical Machines - Part 1: Rating & Performance”)
IS : 900	Code of practice for installation & maintenance of Induction Motors
IS: 1231	Dimensions of foot mounted A.C Induction Motors
IS: 2223	Dimensions of flange mounted A.C Induction Motors
IS: 4029	Guide for testing Three Phase Induction Motors (For Standard TEFC SCR Motors)
IS: 4889	Methods of determination of efficiency of Rotating Electrical Machines (For Standard TEFC SCR Motors)
IS/IEC 60034-5	Degree of protection provided by the integral design of Rotating Electrical Machines (IP Code Classification)
IS: 6362/IEC 60034-6	Designation of method of cooling for Rotating Electrical Machines / Method of cooling (IC Code)
IS:12065/IEC 60034-9	Permissible limits of noise level for Rotating Electric Machines
IS : 12075	Mechanical Vibration of Rotating Electrical Machines
IS : 12615	Energy-Efficient Induction Motors Three Phase Squirrel Cage
IEC 60034-30	Rotating Electrical Machines - Efficiency classes of line operated AC Motors (IE Code)
IEC 60072-1	Dimension & Output rating of Rotating Electrical Machines
IS:15999 (Part 2/Sec 1)	Standard Methods for determining Losses and Efficiency from Tests (For IE Series Motors)

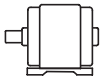
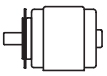
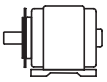
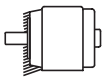


SCADA Test Facility

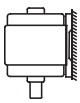
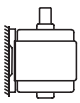
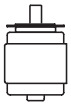
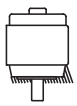
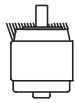
MOUNTING ARRANGEMENT

Base refers to baseplate, foundation, slide rails, pedestal, etc.

Horizontal Mounting

Symbol	Schematic Diagram	Frame	Mounting
B3 IMB3 / IM1001		With feet	Mounted on base
B5 IMB5 / IM3001		Without feet	Mounted on Type B flange with shaft extension at flange end
B35 IMB35 / IM2001		With feet	Mounted on base with feet, and on Type B flange with shaft extension at flange end
B6 IMB6 / IM1051		With feet	Mounted on base to the wall; feet towards the left when viewed from DE side
B7 IMB7 / IM1061		With feet	Mounted on base to the wall; feet towards the right when viewed from DE side
B8 IMB8 / IM1071		With feet	Mounted on base to the ceiling; feet at the top
B14 IMB14 / IM3601		Without feet	Mounted on Type C flange with shaft extension at flange end

Vertical Mounting

Symbol	Schematic Diagram	Frame	Mounting
V5 IMV5 / IM1011		With feet	Mounted on base to the wall; shaft downwards
V6 IMV6 / IM1031		With feet	Mounted on base to the wall; shaft upwards
V1 IMV1 / IM3011		Without feet	Mounted on Type B flange with shaft extension at flange end; shaft downwards
V3 IMV3 / IM3031		Without feet	Mounted on Type B flange with shaft extension at flange end; shaft upwards
V18 IMV18 / IM3611		Without feet	Mounted on Type C flange with extension at flange end; shaft downwards
V19 IMV19 / IM3631		Without feet	Mounted on Type C flange with shaft extension at flange end; shaft upwards

ADVANTAGES OF BHARAT BIJLEE PREMIUM EFFICIENCY IE3 MOTOR

- Higher efficiency
- Optimized ventilation system for cooler operation and reduced noise
- Reduced lifecycle cost
- Highly reliable under most demanding conditions
- Short payback period
- Carbon credits
- Inverter grade winding
- A sustainable future

The operating cost of a motor accounts for major expenditure during its lifecycle. Opting for premium efficient motors allows the user to realize energy cost savings in a reasonably short span of time.

Comparison of IE2 v/s IE3 motor for 2.2 kW and 22 kW is depicted in the table below, clearly showing:

- Annual energy saving for one motor
- Payback period
- Total savings over the lifespan of one motor

Aspect	Energy Savings Observed in 2.2 kW / 4 Pole motor		Energy Savings Observed in 22 kW / 4 Pole motor	
	IE3	IE2	IE3	IE2
kW Rating	2.2	2.2	22	22
Purchase Cost of Motor (INR)	16250	14990	96620	93120
Motor Efficiency	86.70%	84.30%	93.00%	91.60%
Per Hour kW Consumption	2.54	2.61	23.66	24.02
Annual running Hours: 300 Days X 16 Hrs	4800	4800	4800	4800
Power Consumption/Annum (kW)	12180	12527	113548	115284
Average energy cost (INR/kWH)	7	7	7	7
Average energy cost /annum (INR)	85260	87687	794839	806987
Annual Saving when IE3 motor is used (INR)	2427		12148	
Motor Cost Differential (INR)	1260		3500	
Payback Period for differential amount (Months)	6		3	
Saving Over 20 year Life (INR)	48546		242964	

For 20 motors each of 2.2kW and 22 kW, the savings shall be Rs.10 and 50 lakhs respectively, thus totaling to 60 lakhs during the motors' lifespan of 20 years.

GENERAL TECHNICAL SPECIFICATIONS

Range

- **Series:** 3 Phase Squirrel Cage Induction, IE3 Safe Area Motors
- **kW Rating:** 0.12 to 355
- **Frame:** 63 to 355
- **Polarity:** 2, 4, 6, 8

Standard Features	Optional Features
Voltage: 415V	Any other voltage on request
Frequency: 50 Hz	60 Hz
IP55	IP56, IP65, IP66
B3 Mounting	B5, B35 B14 (upto 132 Frame)
Ambient: 50°C	Any other on request
Altitude: up to 1000 m above mean sea level	Motors for higher altitudes on request
TB Position: Top	Any other on request
Aluminium Construction: 63 to 71 frame, 90 to 132 frame Cast Iron Construction: 80 Frame, 160 Frame & Above	Cast Iron construction: 80 to 132 Frame
Insulation: Class F	Insulation: Class H
IC411: Totally Enclosed Fan Cooled	IC410: Natural Ventilation IC416: Forced Cooling for 132 Frame & above
Sealed Bearing: upto 200 Frame Online Greasing Arrangement: 225 Frame & Above	Online Greasing Arrangement: 160 to 200 Frame
Paint Shade: Acrylic base, RAL5000	Any other shade or material on request
Fan Cover: Steel	
Thermal Protection in DCCA** Motors: 3 nos. simplex RTD	Simplex & duplex RTD: 250 Frame & Above BTD: 250 Frame & above Thermister: 80 Frame & Above
Space Heater for DCCA Motors	Space Heater: 90 Frame & Above
Inverter Duty Application for all frames	
Packing: Thermocol / Corrugated Boxes: Upto 132 Frame Packing: Wooden Packing Boxes: 160 Frame & Above	Wooden Pallets Seaworthy / Export Packing Case
For standard bearings, kindly refer to the bearing chart	Insulated Bearing: 160 Frame & Above / Hybrid Bearing: 132 to 225 Frame Cylindrical Roller Bearing on DE Side: 160 Frame & Above

Our other optional features:

- Non standard shaft material, diameter and extension.
- Front bearing locking arrangement.
- SS Hardware, canopy, water flinger, non standard paint & paint shade, cable gland.
- Provision for hollow shaft encoder mounting.
- High temperature grease.
- Reduced & special grades of vibration as per IS 12075 can be provided on request.

** Please confirm with our nearest sales office.

RE-RATING FACTORS APPLICABLE UNDER DIFFERENT CONDITIONS OF SUPPLY VOLTAGE, FREQUENCY, AMBIENT AND ALTITUDE

I. Variation in Supply Voltage and Frequency

Voltage Variation %	Frequency Variation %	Combined Voltage & Frequency %	Permissible Output as % of Rated Value
± 10	± 5	± 10	100
± 12.5	± 5	± 12.5	95
± 15	± 5	± 15	90

II. Variation in Ambient

Ambient Temperature (°C)	Permissible Output as % of Rated Value
< 30	107
30 to 45	103
50	100
55	96
60	92

III. Variation in Altitude

Altitude Above Mean Sea Level (m)	Permissible Output as % of Rated Value
1000	100
1500	97
2000	94
2500	90
3000	86
3500	82
4000	77

Method of Starting:

kW Rating	Method of Starting	No. of Leads
Upto & including 1.5kW	DOL	6
Above 1.5kW	DOL or Star / Delta	6

Number of Consecutive Starts:

For continuous (S1) duty motors wherein load $GD^2 \leq$ Motor GD^2, the motors can safely withstand 3 consecutive starts from cold condition and 2 consecutive starts from hot condition.

Starting Current Measurement of Bharat Bijlee Motors:

Induction motor starting current is generally 6 to 7 times the rated current of the motor. Starting current measurement may be carried out at reduced voltage due to capacity constraint and then extrapolated to the rated voltage. At Bharat Bijlee, the starting current measurement is done at reduced voltage as per the table below.

kW Range	Measurement at % of voltage to rated voltage
0.12kW to 90kW	70%
90kW to 200kW	60%
200kW to 355kW	35%
355kW to 560kW	25%
560kW and above (with rated voltage 690V or higher)	25%

Bearing Chart

Frame Size	Bearing Nos.	
	D.E.	N.D.E.
63	6201 2Z	6201 2Z
71	6202 2Z	6202 2Z
80	6204 2Z	6204 2Z
90S & L	6205 2Z	6205 2Z
100L	6206 2Z	6205 2Z
112M	6206 2Z	6205 2Z
132S / M	6208 2Z	6208 2Z
160M/L	6309 2Z	6209 2Z
180M/L	6310 2Z	6210 2Z
200L	6312 2Z	6212 2Z
225S/M	6313	6213
250M	6315	6215
280S/M (2 Pole)	6316	6316
280S/M (4,6,8 Pole)	6317	6316
315S/M & L	6319	6319
355L	6322	6322

LV MOTORS: IE3 SAFE AREA

Performance data: Efficiency values complying to IE3 efficiency class of IS12615

Applicable standard for testing & efficiency determination : IS15999
Voltage: 415V +/- 10%
Frequency: 50Hz +/- 5%
Combined Variation: +/- 10%

Ambient: 50°C
Duty: S1 (Continuous)
3000 rpm (2 Pole)

Insulation: Class F
Temperature Rise: Class B
Protection: IP55

Rated Output		Frame size	Type Reference	Operating characteristics at rated output									With DOL starting			Rotor GD²	Net Weight B3 constr.
				Rated Speed	Rated Current	Rated Torque	Power Factor			% Efficiency			Starting Current to Rated Current Ratio	Starting Torque to Rated Torque Ratio	Pullout Torque to Rated Torque Ratio		
kW	HP		B3 construction	RPM	Amps.	kg-m	FL	3/4L	1/2L	FL	3/4L	1/2L				kgm²	kg
0.18	0.25	63	3H063213AT000	2700	0.49	0.06	0.78	0.70	0.60	65.9	65.9	60.0	3.5	2.5	2.7	0.0005	4.5
0.25	0.35	63	3H063233AT000	2700	0.61	0.09	0.82	0.70	0.60	69.7	69.7	64.0	3.5	2.5	2.7	0.0006	5
0.37	0.50	71	3H071233AT000	2860	0.91	0.13	0.77	0.65	0.55	73.8	73.8	67.0	5.5	2.9	3.2	0.0016	7.7
0.55	0.75	71	3H071253AT000	2840	1.28	0.19	0.77	0.70	0.56	77.8	77.8	74.5	5.0	2.7	3.0	0.0018	9
0.75	1.0	80	3H0802B3AT000	2870	1.54	0.25	0.84	0.79	0.70	80.7	80.7	79.7	6.0	2.7	3.0	0.0033	11
1.1	1.5	80	3H0802E3AT000	2850	2.28	0.38	0.81	0.76	0.65	82.7	82.7	80.0	6.0	2.8	3.1	0.0037	14
1.5	2.0	90S	3H09S2B3AT000	2850	2.88	0.51	0.86	0.81	0.72	84.2	84.2	84.2	6.5	2.75	3.0	0.0066	18
2.2	3.0	90L	3H09L2E3AT000	2850	4.14	0.75	0.86	0.80	0.71	85.9	85.9	85.5	6.5	3.0	3.3	0.0084	21
3.7	5.0	100L	3H10L2B3AT000	2890	6.74	1.25	0.87	0.82	0.73	87.8	87.8	87.3	7.0	3.0	3.1	0.0158	26
5.5	7.5	132S	3H13S2C3AT000	2935	9.53	1.83	0.90	0.87	0.81	89.2	89.2	87.5	7.0	2.3	3.0	0.0878	62
7.5	10	132S	3H13S2H3AT000	2935	12.9	2.49	0.90	0.87	0.81	90.1	90.1	88.7	7.0	2.3	3.0	0.0936	65
9.3	12.5	160M	3H16M2B3CT000	2950	16.6	3.07	0.86	0.83	0.76	90.7	90.3	88.7	6.5	2.3	2.8	0.151	101
11	15	160M	3H16M2E3CT000	2950	19.3	3.63	0.87	0.83	0.76	91.2	91.2	89.2	7.0	2.5	3.0	0.173	109
15	20	160M	3H16M2H3CT000	2945	26.1	4.96	0.87	0.84	0.77	91.9	91.9	90.0	6.5	2.3	2.8	0.217	126
18.5	25	160L	3H16L2M3CT000	2945	31.3	6.12	0.89	0.86	0.79	92.4	92.4	90.8	6.5	2.3	2.8	0.258	144
22	30	180M	3H18M2B3CT000	2950	37.5	7.26	0.88	0.84	0.78	92.7	92.7	91.0	7.0	2.7	3.0	0.336	188
30	40	200L	3H20L2B3CT000	2955	50.8	9.89	0.88	0.86	0.80	93.3	93.3	91.8	6.5	2.6	3.0	0.593	280
37	50	200L	3H20L2E3CT000	2955	62.4	12.20	0.88	0.86	0.80	93.7	93.7	92.0	6.8	2.7	3.1	0.651	296
45	60	225M	3H22M2B3CT000	2965	75.7	14.8	0.88	0.86	0.82	94.0	94.0	93.0	6.6	2.1	2.7	1.19	395
55	75	250M	3H25M2E3CT000	2970	91.2	18.0	0.89	0.86	0.80	94.3	94.3	93.0	6.8	2.5	3.0	1.68	550
75	100	280S	3H28S2E3CT000	2970	121	24.6	0.91	0.89	0.86	94.7	94.7	92.7	7.0	2.0	2.7	3.08	675
90	120	280M	3H28M2H3CT000	2970	145	29.5	0.91	0.89	0.86	95.0	95.0	93.0	7.0	2.0	2.7	3.69	760
110	150	315S	3H31S2E3CT000	2982	179	35.9	0.90	0.86	0.80	95.2	94.6	93.0	7.0	2.2	2.5	5.00	940
132	180	315L	3H31L2H3CT000	2982	214	43.1	0.90	0.86	0.80	95.4	94.8	93.2	7.0	2.2	2.5	6.20	1100
150	200	315L	3H31L2A3CT000	2982	246	49.0	0.89	0.85	0.80	95.5	94.9	93.5	7.0	2.2	2.5	7.70	1390
160	215	315L	3H31L2M3CT000	2982	262	52.3	0.89	0.85	0.80	95.6	95.0	93.6	7.0	2.2	2.5	7.70	1390
180	240	355L	3H35L2A3CT000	2987	284	58.7	0.92	0.89	0.86	95.7	95.7	93.7	7.0	1.8	2.4	12.0	1680
200	270	355L	3H35L2B3CT000	2988	316	65.2	0.92	0.89	0.84	95.8	95.8	93.8	7.0	2.0	2.5	12.0	1680
225	300	355L	3H35L2C3CT000	2987	355	73.4	0.92	0.89	0.84	95.8	95.8	93.8	6.5	1.8	2.4	12.0	1680
250	335	355L	3H35L2E3CT000	2988	395	81.5	0.92	0.90	0.86	95.8	95.8	93.8	7.0	2.0	2.5	14.7	1870
280	375	355L	3H35L2G3CT000	2987	442	91.0	0.92	0.90	0.86	95.8	95.8	93.8	6.5	1.8	2.4	18.9	2140

Note: All performance values are subject to tolerance as per IS 15999 part-1

Bharat Bijlee

LV MOTORS: IE3 SAFE AREA

Performance data: Efficiency values complying to IE3 efficiency class of IS12615

Applicable standard for testing & efficiency determination : IS15999
Voltage: 415V +/- 10%
Frequency: 50Hz +/- 5%
Combined Variation: +/- 10%

Ambient: 50°C
Duty: S1 (Continuous)
1500 rpm (4 Pole)

Insulation: Class F
Temperature Rise: Class B
Protection: IP55

Rated Output		Frame size	Type Reference	Operating characteristics at rated output									With DOL starting			Rotor GD²	Net Weight B3 constr.
				Rated Speed	Rated Current	Rated Torque	Power Factor			% Efficiency			Starting Current to Rated Current Ratio	Starting Torque to Rated Torque Ratio	Pullout Torque to Rated Torque Ratio		
kW	HP		B3 construction	RPM	Amps.	kg-m	FL	3/4L	1/2L	FL	3/4L	1/2L				kgm²	kg
0.12	0.16	63	3H063433AT000	1365	0.37	0.09	0.69	0.60	0.48	64.8	64.0	61.0	3.7	1.8	2.1	0.0013	5.4
0.18	0.25	63	3H063453AT000	1350	0.51	0.13	0.70	0.61	0.49	69.9	69.0	65.0	3.7	1.7	2.0	0.0016	6
0.25	0.35	71	3H071453AT000	1400	0.67	0.17	0.71	0.63	0.52	73.5	73.5	72.0	4.0	2.0	2.5	0.0031	8
0.37	0.50	71	3H071463AT000	1405	0.97	0.26	0.69	0.61	0.50	77.3	77.3	74.0	4.5	2.5	2.8	0.0038	10
0.55	0.75	80	3H0804B3AT000	1415	1.18	0.38	0.80	0.70	0.56	80.8	80.8	79.8	5.3	2.8	3.0	0.0081	14
0.75	1.0	80	3H0804E3AT000	1420	1.71	0.51	0.74	0.63	0.50	82.5	82.5	80.0	5.5	3.0	3.3	0.0094	15
1.1	1.5	90S	3H09S4B3AT000	1425	2.33	0.75	0.78	0.70	0.55	84.1	84.1	82.5	5.5	2.5	2.7	0.0121	17
1.5	2.0	90L	3H09L4E3AT000	1425	3.14	1.03	0.78	0.70	0.55	85.3	85.3	84.5	6.0	2.5	2.7	0.0149	20
2.2	3.0	100L	3H10L4B3AT000	1435	4.53	1.49	0.78	0.72	0.60	86.7	86.7	85.8	6.0	2.5	3.0	0.0245	26
3.7	5.0	112M	3H11M4B3AT000	1455	7.37	2.48	0.79	0.74	0.60	88.4	88.4	86.5	6.5	3.0	3.5	0.0588	37
5.5	7.5	132S	3H13S4C3AT000	1455	10.3	3.68	0.83	0.78	0.66	89.6	89.6	88.4	6.5	2.5	3.0	0.117	52
7.5	10	132M	3H13M4H3AT000	1455	13.9	5.02	0.83	0.78	0.66	90.4	90.4	89.4	6.5	2.5	3.3	0.157	70
9.3	12.5	160M	3H16M4E3CT000	1465	17.3	6.18	0.82	0.77	0.66	91.0	91.0	90.4	6.5	2.1	2.5	0.212	105
11	15	160M	3H16M4H3CT000	1465	20.4	7.31	0.82	0.77	0.66	91.4	91.4	90.8	6.5	2.1	2.5	0.235	118
15	20	160L	3H16L4M3CT000	1465	27.3	9.97	0.83	0.78	0.68	92.1	92.1	91.6	6.5	2.2	2.7	0.306	136
18.5	25	180M	3H18M4B3CT000	1470	33.1	12.3	0.84	0.80	0.70	92.6	92.6	91.5	6.5	2.6	2.9	0.550	188
22	30	180L	3H18L4E3CT000	1470	39.2	14.6	0.84	0.80	0.70	93.0	93.0	92.0	6.5	2.6	2.9	0.635	209
30	40	200L	3H20L4B3CT000	1470	51.8	19.9	0.86	0.82	0.75	93.6	93.6	92.6	6.5	2.6	3.0	1.31	303
37	50	225S	3H22S4B3CT000	1480	65.3	24.4	0.84	0.80	0.71	93.9	93.9	93.4	6.5	2.5	2.6	1.79	368
45	60	225M	3H22M4E3CT000	1480	78.2	29.6	0.85	0.81	0.72	94.2	94.2	93.5	6.5	2.6	2.8	2.03	396
55	75	250M	3H25M4B3CT000	1480	96.3	36.2	0.84	0.80	0.72	94.6	94.6	93.8	6.0	2.0	2.6	3.06	500
75	100	280S	3H28S4B3CT000X	1485	131	49.2	0.84	0.80	0.72	95.0	95.0	94.2	6.5	2.5	3.0	6.11	680
90	120	280M	3H28M4H3CT000X	1487	155	59.0	0.85	0.82	0.74	95.2	95.2	94.5	6.5	2.5	3.0	7.14	735
110	150	315S	3H31S4G3CT000	1488	189	72.0	0.85	0.82	0.74	95.4	95.4	93.9	6.8	2.5	3.0	11.7	965
132	180	315M	3H31M4K3CT000	1488	226	86.4	0.85	0.82	0.74	95.6	95.6	94.1	6.8	2.5	3.0	14.0	1115
160	215	315L	3H31L4P3CT000	1490	277	105	0.84	0.80	0.72	95.8	95.8	94.5	6.6	2.5	3.0	15.6	1225
180	240	315L	3H31L4T3CT000	1491	311	118	0.84	0.80	0.72	95.9	95.9	94.6	6.6	2.7	3.0	17.8	1290
200	270	315L	3H31L4W3CT000	1491	345	131	0.84	0.80	0.72	96.0	96.0	95.0	6.6	2.7	3.0	17.8	1290
225	300	355L	3H35L4B3CT000	1490	375	147	0.87	0.83	0.72	96.0	96.0	95.0	6.0	1.7	2.4	23.3	1680
250	335	355L	3H35L4E3CT000	1492	416	163	0.87	0.83	0.72	96.0	96.0	95.0	6.5	1.8	2.4	32.7	1855
315	422	355L	3H35L4H3CT000	1492	525	206	0.87	0.83	0.72	96.0	96.0	95.0	6.5	1.8	2.4	31.9	2159

Note: All performance values are subject to tolerance as per IS 15999 part-1

LV MOTORS: IE3 SAFE AREA

Performance data: Efficiency values complying to IE3 efficiency class of IS12615

Applicable standard for testing & efficiency determination : IS15999
Voltage: 415V +/- 10%
Frequency: 50Hz +/- 5%
Combined Variation: +/- 10%

Ambient: 50°C
Duty: S1 (Continuous)
1000 rpm (6 Pole)

Insulation: Class F
Temperature Rise: Class B
Protection: IP55

Rated Output		Frame size	Type Reference	Operating characteristics at rated output									With DOL starting			Rotor GD²	Net Weight B3 constr.
				Rated Speed	Rated Current	Rated Torque	Power Factor			% Efficiency			Starting Current to Rated Current Ratio	Starting Torque to Rated Torque Ratio	Pullout Torque to Rated Torque Ratio		
kW	HP		B3 construction	RPM	Amps.	kg-m	FL	3/4L	1/2L	FL	3/4L	1/2L				kgm²	kg
0.18	0.25	71	3H071633AT000	890	0.56	0.2	0.70	0.60	0.48	63.9	63.9	62.0	3.0	2.0	2.2	0.0033	7.5
0.25	0.35	71	3H071653AT000	870	0.72	0.3	0.70	0.61	0.48	68.6	68.6	67.6	3.6	2.0	2.2	0.0038	8.7
0.37	0.50	80	3H0806B3AT000	910	0.96	0.40	0.73	0.62	0.53	73.5	73.5	72.5	4.0	2.2	2.5	0.0073	10
0.55	0.75	80	3H0806E3AT000	920	1.38	0.58	0.72	0.64	0.52	77.2	77.2	76.0	4.0	2.3	2.6	0.0101	14
0.75	1.0	90S	3H09S6B3AT000	925	1.84	0.79	0.72	0.62	0.52	78.9	78.9	78.6	4.0	2.1	2.5	0.0143	17
1.1	1.5	90L	3H09L6E3AT000	920	2.62	1.16	0.72	0.62	0.52	81.0	81.0	80.0	4.0	2.0	2.5	0.0181	20
1.5	2.0	100L	3H10L6B3AT000	935	3.51	1.56	0.72	0.62	0.54	82.5	82.5	81.0	4.5	2.3	2.5	0.0275	24
2.2	3.0	112M	3H11M6B3AT000	960	4.84	2.23	0.75	0.68	0.55	84.3	84.3	81.0	6.0	2.3	2.5	0.0691	36
3.7	5.0	132S	3H13S6C3AT000	960	7.83	3.75	0.76	0.70	0.58	86.5	86.5	86.0	5.5	2.2	2.6	0.121	50
5.5	7.5	132M	3H13M6H3AT000	965	11.3	5.55	0.77	0.70	0.60	88.0	88.0	87.5	5.5	2.2	2.6	0.180	70
7.5	10	160M	3H16M6B3CT000	970	15.2	7.53	0.77	0.72	0.61	89.1	89.1	88.5	6.0	2.0	2.6	0.275	106
9.3	12.5	160L	3H16L6E3CT000	970	18.7	9.34	0.77	0.72	0.61	89.8	89.8	89.0	6.0	2.0	2.6	0.332	122
11	15	160L	3H16L6H3CT000	970	22.0	11.0	0.77	0.72	0.61	90.3	90.3	89.2	6.0	2.0	2.6	0.390	134
15	20	180L	3H18L6B3CT000	977	27.6	15.0	0.83	0.78	0.72	91.2	91.2	91.2	5.5	2.5	3.0	0.886	205
18.5	25	200L	3H20L6B3CT000	980	34.2	18.4	0.82	0.79	0.70	91.7	91.7	91.0	6.0	2.7	3.2	1.23	253
22	30	200L	3H20L6E3CT000	980	40.5	21.9	0.82	0.80	0.70	92.2	92.2	91.2	6.0	2.7	3.2	1.47	276
30	40	225M	3H22M6B3CT000	984	51.1	29.7	0.88	0.84	0.77	92.9	92.9	92.6	6.5	3.0	3.5	2.85	387
37	50	250M	3H25M6B3CT000	985	63.4	36.6	0.87	0.85	0.77	93.3	93.3	92.7	7.0	2.8	3.0	3.40	510
45	60	280S	3H28S6B3CT000	984	79.5	44.5	0.84	0.80	0.72	93.7	93.7	93.0	6.0	2.4	2.9	5.11	600
55	75	280M	3H28M6E3CT000	985	95.7	54.4	0.85	0.81	0.72	94.1	94.1	93.4	6.0	2.5	3.0	6.82	690
75	100	315S	3H31S6B3CT000	992	130	73.6	0.85	0.82	0.72	94.6	94.6	93.6	6.0	2.5	3.0	10.7	830
90	120	315M	3H31M6E3CT000	992	155	88.4	0.85	0.82	0.72	94.9	94.9	93.9	6.0	2.5	3.0	12.4	912
110	150	315M	3H31M6H3CT000	992	189	108	0.85	0.82	0.72	95.1	95.1	94.2	6.0	2.5	3.0	15.5	1010
132	180	315L	3H31L6M3CT000	992	229	130	0.84	0.80	0.72	95.4	95.4	94.4	6.0	2.5	3.0	18.0	1175
160	215	355L	3H35L6B3CT000	990	277	157	0.84	0.81	0.71	95.6	95.6	93.0	6.0	2.0	2.5	28.7	1670
180	240	355L	3H35L6C3CT000	990	319	177	0.82	0.78	0.66	95.7	95.7	94.0	6.0	2.0	2.5	28.7	1670
200	270	355L	3H35L6E3CT000	991	346	197	0.84	0.80	0.70	95.8	95.8	94.1	6.0	2.0	2.5	35.5	1780
250	335	355L	3H35L643CT000	991	432	246	0.84	0.80	0.70	95.8	95.8	94.1	6.0	2.0	2.5	40.1	2154

Note: All performance values are subject to tolerance as per IS 15999 part-1

Bharat Bijlee

LV MOTORS: IE3 SAFE AREA

Performance data: Efficiency values complying to IE3 efficiency class of IS12615

Applicable standard for testing & efficiency determination : IS15999
Voltage: 415V +/- 10%
Frequency: 50Hz +/- 5%
Combined Variation: +/- 10%

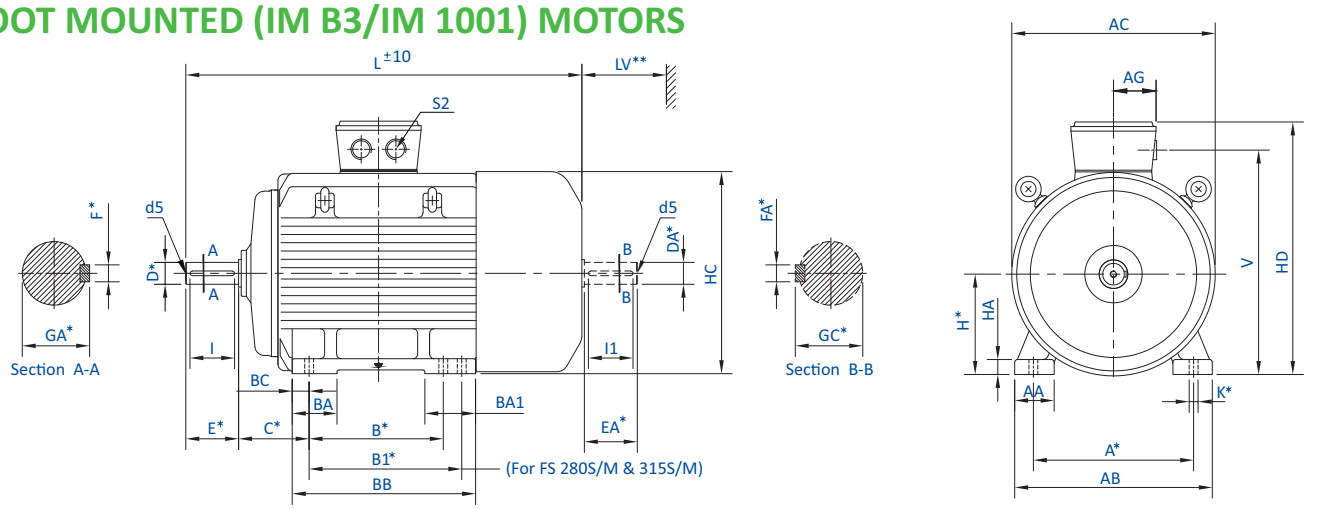
Ambient: 50°C
Duty: S1 (Continuous)
750 rpm (8 Pole)

Insulation: Class F
Temperature Rise: Class B
Protection: IP55

Rated Output		Frame size	Type Reference	Operating characteristics at rated output									With DOL starting			Rotor GD²	Net Weight B3 constr.
				Rated Speed	Rated Current	Rated Torque	Power Factor			% Efficiency			Starting Current to Rated Current Ratio	Starting Torque to Rated Torque Ratio	Pullout Torque to Rated Torque Ratio		
kW	HP		B3 construction	RPM	Amps.	kg-m	FL	3/4L	1/2L	FL	3/4L	1/2L				kgm²	kg
0.12	0.16	71	3H071833AT000	640	0.60	0.18	0.55	0.50	0.40	50.7	50.7	45.0	2.2	1.7	2.1	0.0033	7
0.18	0.25	80	3H080813AT000	675	0.78	0.26	0.55	0.48	0.40	58.7	58.7	52.0	3.0	1.8	2.2	0.0054	8
0.25	0.35	80	3H080833AT000	675	0.94	0.36	0.58	0.48	0.40	64.1	64.1	58.0	3.0	1.8	2.2	0.0078	10
0.37	0.50	90S	3H09S853AT000	700	1.10	0.51	0.68	0.58	0.45	69.3	69.3	65.0	3.5	1.8	2.0	0.0130	14
0.55	0.75	90L	3H09L863AT000	690	1.54	0.78	0.68	0.58	0.45	73.0	73.0	68.0	3.5	1.8	2.0	0.0170	15
0.75	1.0	100L	3H10L833AT000	695	2.00	1.05	0.70	0.60	0.50	75.0	75.0	73.0	3.8	1.9	2.3	0.0270	20
1.1	1.5	100L	3H10L853AT000	695	2.80	1.54	0.70	0.60	0.50	77.7	77.7	75.0	3.8	1.9	2.3	0.0340	23
1.5	2.0	112M	3H11M833AT000	700	3.64	2.09	0.72	0.64	0.52	79.7	79.7	78.0	3.8	1.7	2.2	0.0590	28
2.2	3.0	132S	3H13S8B3AT000	710	5.1	3.02	0.74	0.66	0.55	81.9	81.9	80.0	3.8	1.7	2.2	0.0910	41
3.7	5.0	160M	3H16M823CT000	715	8.1	5.04	0.75	0.70	0.58	84.5	84.5	83.0	4.8	1.7	2.2	0.219	91
5.5	7.5	160M	3H16M843CT000	715	11.8	7.49	0.75	0.70	0.58	86.2	86.2	85.0	4.8	1.8	2.3	0.350	111
7.5	10	160L	3H16L883CT000	715	15.9	10.2	0.75	0.70	0.58	87.3	87.3	86.0	4.8	1.8	2.3	0.418	126
9.3	12.5	180M	3H18M873CT000	725	19.3	12.5	0.76	0.70	0.60	88.1	88.1	87.0	5.5	2.0	2.2	0.811	188
11	15	180L	3H18L893CT000	725	22.7	14.8	0.76	0.70	0.60	88.6	88.6	87.5	5.5	2.0	2.2	0.906	203
15	20	200L	3H20L853CT000	725	28.4	20.2	0.82	0.77	0.65	89.6	89.6	88.6	6.0	2.3	2.5	1.44	271
18.5	25	225S	3H22S823CT000	725	34.8	24.9	0.82	0.80	0.72	90.1	90.1	89.1	5.5	2.0	2.2	2.11	324
22	30	225M	3H22M833CT000	725	41.2	29.6	0.82	0.80	0.72	90.6	90.6	89.6	5.5	2.0	2.2	2.41	351
30	40	250M	3H25M813CT000	730	55.7	40.0	0.82	0.80	0.72	91.3	91.3	91.0	5.5	2.0	2.2	3.25	498
37	50	280S	3H28S823CT000	730	71.9	49.4	0.78	0.74	0.65	91.8	91.8	91.0	5.5	2.0	2.2	6.18	641
45	60	280M	3H28M853CT000	738	89.3	59.4	0.76	0.72	0.60	92.2	92.2	91.5	5.5	2.0	2.2	7.25	690
55	75	315S	3H31S813CT000	739	110.3	72.5	0.75	0.72	0.62	92.5	92.5	92.0	5.5	1.8	2.0	9.6	836
75	100	315M	3H31M833CT000	739	151.5	98.8	0.74	0.70	0.62	93.1	93.1	92.5	5.5	1.8	2.0	11.4	900
90	120	315M	3H31M853CT000	741	176.4	118.3	0.76	0.72	0.64	93.4	93.4	93.0	5.5	1.8	2.0	14.8	1021
110	150	315L	3H31L873CT000	742	220.7	144.4	0.74	0.69	0.58	93.7	93.7	93.0	5.5	2.0	2.2	17.3	1228
125	170	315L	3H31L8A3CT000	742	243.7	164.1	0.76	0.70	0.60	93.9	93.9	93.0	5.5	2.0	2.2	21.5	1375
132	180	315L	3H31L893CT000	742	257.1	173.3	0.76	0.72	0.62	94.0	94.0	93.0	5.5	2.0	2.2	21.5	1375

Note: All performance values are subject to tolerance as per IS 15999 part-1

DIMENSIONAL DRAWING: IE3 EFFICIENCY SERIES FOR SAFE AREA APPLICATION FOOT MOUNTED (IM B3/IM 1001) MOTORS

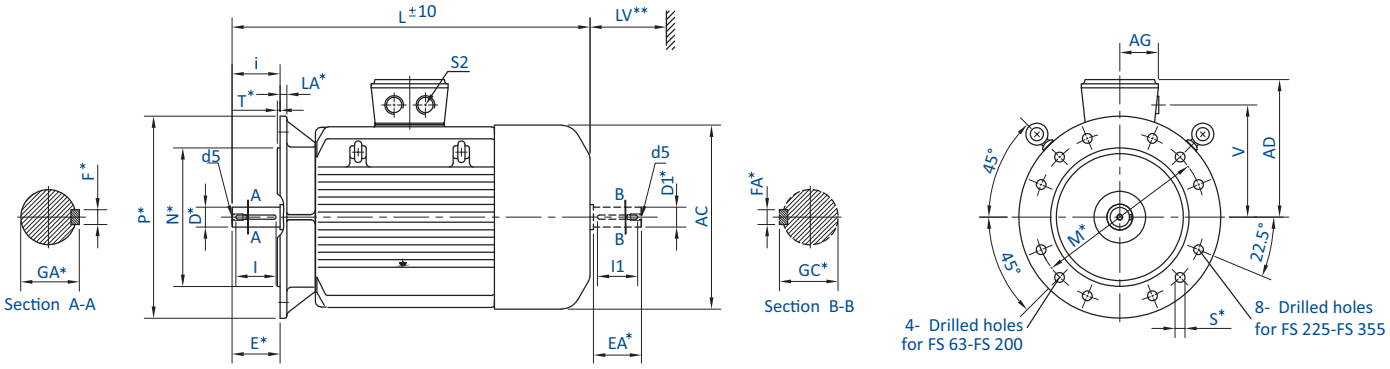


		FIXING						GENERAL												TERMINAL BOX			SHAFT					
IEC Fr. Size	Pole	A*	B*	B1*	C*	H*	K*	AB	BB	AA	BA	BA1	BC	HA	HC	HD	L	LV**	AC	V	AG	S2 BSC	D* DA*	E* EA*	F* FA*	GA* GC*	I I1	d5
63	2,4	100	80	–	40	63	7	126	100	28	30	–	10	7	125	179	206	30	124	149	40	1x3/4"	11	23	4	12.5	18	M4
71	2(0.37kW),4(0.25kW),6(0.18kW)&8	112	90	–	45	71	7	135	110	31	30	–	10	7	141	195	234	30	140	166	40	1x3/4"	14	30	5	16	25	M5
	2(0.55kW),4(0.37kW),6(0.25kW)																267											
80	2(1.1kW),4&6(0.55kW)	125	100	–	50	80	10	150	124	31	35	–	12	9	159	214	310	30	157	185	40	1x3/4"	19	40	6	21.5	35	M6
	2,6&8																267											
90S	2,4&6	140	100	–	56	90	10	168	125	34	31.5	–	13	12	177	230	336	35	174	199	52	2x3/4"	24	50	8	27	45	M8
	8																302											
90L	2,4&6		125						150								361											
	8																327											
100L	2&4	160	140	–	63	100	12	190	174	43.5	36	–	17	12	198	257	387	40	195	225	56	2x1"	28	60	8	31	55	M10
	6&8																366											
112M	4&6	190	140	–	70	112	12	220	174	47	36	–	17	12	222	282	419	45	220	246	56	2x1"	28	60	8	31	55	M10
	8																388											
132S	2	216	140	–	89	132	12	256	180	54	50	–	20	16	262	328	518	50	260	291	63	2x1"	38	80	10	41	70	M12
	4																475											
	6&8																459											
132M	4&6		178						218		54						556											
160M	2(9.3kW),4(9.3kW)&6	254	210	–	108	160	15	310	250	58	70	–	20	20	318	383	605	60	316	346	63	2x1"	42	110	12	45	105	M16
	2(11kW),4(11kW)&8																635											
	2(15kW)																654											
160L	2																700											
	4,6(11kW)&8		254						294								679											
	6																649											
180M	2,4&8	279	241	–	121	180	15	344	281	65	70	–	20	26	357	451	727	70	354	396	97	2x1 1/2"	48	110	14	51.5	100	M16
180L	4,6&8		279						319								765											
200L	2&4	318	305	–	133	200	19	398	355	85	85	–	25	32	397	519	850	80	394	449	155	2x2"	55	110	16	59	100	M20
	6&8																772											
225S	4	356	286	–	149	225	19	436	336	85	85	–	25	34	450	568	872	90	445	500	155	2x2"	60	140	18	64	130	M20
	8																827											
225M	2		311						361								867						55	110	16	59	100	
	4&6																897						60	140	18	64	130	
	8																852											
250M	2	406	349	–	168	250	24	506	425	100	115	–	46	42	495	665	993	100	489	578	243	2x2"	60	140	18	64	130	M20
	4,6&8																914						65	140	18	69	130	
280S/M	2	457	368	419	190	280	24	540	490	100	110	149	37	42	552	725	1027	115	544	638	243	2x2"	65	140	18	69	130	M20
	4,6&8																1010						75	140	20	79.5	130	
315S/M	2	508	406	457	216	315	28	625	540	120	120	155	43	45	617	834	1175	130	604	728	278	2x2"	65	140	18	69	130	M20
	4,6&8																1167						80	170	22	85	160	
315L	2		508	–					593			–					1340					2x2 1/2"	65	140	18	69	130	
	4,6&8																1332						90	170	25	95	160	M24
355L	2	610	630	–	254	355	28	710	770	110	170	–	70	45	703	939	1461	145	695	850	403	2x3"	75	140	20	79.5	130	M20
	2(280kW)																1505											
	4&6																1531						100	210	28	106	200	M24
	4(315kW),6(250kW)																1575											

Notes: * This is a mandatory dimension for all standard motors
**Minimum distance for efficient cooling of motor to be maintained by user
1. All dimensions are in mm unless otherwise specified
2. Tolerances on mandatory dimensions are as per IS: 1231
3. For non standard motors, dimensions may change. Please contact our nearest sales office for details

Notes: 1. Eyebolt is not provided in motors of 63 to 90 frame
2. Shaft extension at NDE identical to standard shaft extension at DE is not possible in 4, 6 & 8 pole in frames 315L & 355L
3. TB Position : To be read as : when viewed from DE side / when viewed parallel to the shaft / cable entry
(a) 63, 160 to 225 frame: Top / Center of body / RHS when viewed from DE side
(b) 71 to 132 Frame & 250 to 355 Frame: Top / Towards Drive End / RHS when viewed from DE side

DIMENSIONAL DRAWING: IE3 EFFICIENCY SERIES FOR SAFE AREA APPLICATION FLANGE MOUNTED (IM B5/IM 3001) MOTORS

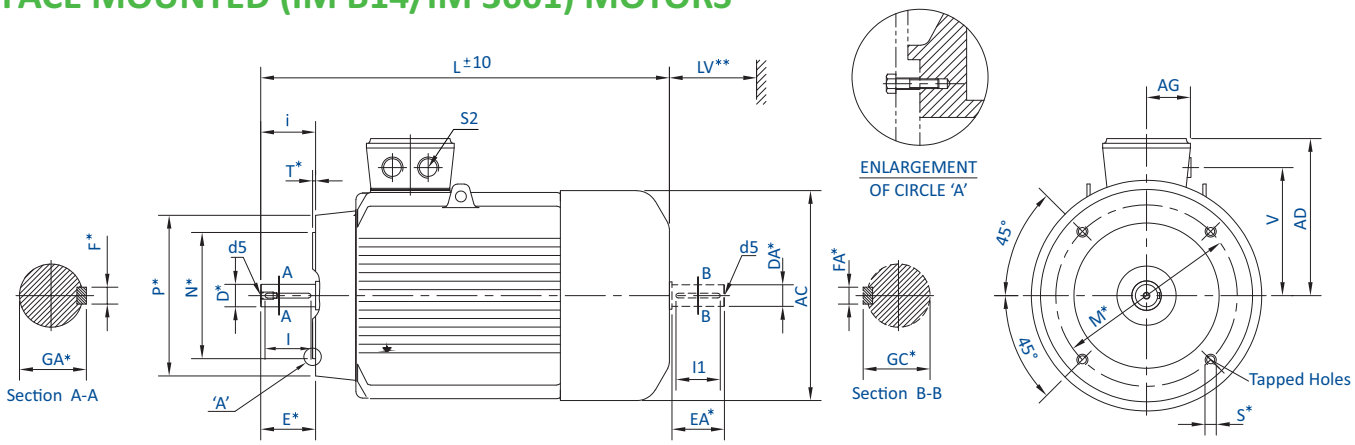


		FIXING					GENERAL						TERMINAL BOX			SHAFT					
IEC Fr. Size	Pole	P*	N*	M*	i	S*	T*	LA*	AD	L	LV**	AC	V	AG	S2 BSC	D* DA*	E* EA*	F* FA*	GA* GC*	I I1	d5
63	2,4	140	95	115	23	10	3	9	116	225	30	124	86	40	1x3/4"	11	23	4	12.5	18	M4
71	2(0.37kW),4(0.25kW),6(0.18kW)&8	160	110	130	30	10	3.5	9	124	262	30	140	95	40	1x3/4"	14	30	5	16	25	M5
	2(0.55 kW),4(0.37kW)&6(0.25kW)									296											
80	2(1.1kW),4&6(0.55kW)	200	130	165	40	12	3.5	10	134	310	30	157	105	40	1x3/4"	19	40	6	21.5	35	M6
	2,6&8									267											
90S	2,4&6	200	130	165	50	12	3.5	10	140	336	35	174	109	52	2x3/4"	24	50	8	27	45	M8
	8									302											
90L	2,4&6									361											
	8									327											
100L	2&4	250	180	215	60	15	4	11	157	387	40	195	125	56	2x1"	28	60	8	31	55	M10
	6&8									366											
112M	4&6	250	180	215	60	15	4	11	170	419	45	220	134	56	2x1"	28	60	8	31	55	M10
	8									388											
132S	2	300	230	265	80	15	4	12	196	518	50	260	159	63	2x1"	38	80	10	41	70	M12
	4									475											
	6&8									459											
132M	4&6									556											
160M	2(9.3kW),4(9.3kW)&6	350	250	300	110	19	5	13	223	605	60	316	186	63	2x1"	42	110	12	45	105	M16
	2(11kW),4(11kW)&8									635											
	2(15kW)									654											
160L	2									700											
	4,6(11kW)&8									679											
	6									649											
180M	2,4&8	350	250	300	110	19	5	13	271	727	70	354	216	97	2x1 1/2"	48	110	14	51.5	100	M16
180L	4,6&8									765											
200L	2&4	400	300	350	110	19	5	15	319	850	80	394	249	155	2x2"	55	110	16	59	100	M20
	6&8									772											
225S	4	450	350	400	140	19	5	16	343	872	90	445	275	155	2x2"	60	140	18	64	130	M20
	8									827											
225M	2				110					867						55	110	16	59	100	
	4&6				140					897						60	140	18	64	130	
	8									855											
250M	2	550	450	500	140	19	5	18	415	993	100	489	328	243	2x2"	60	140	18	64	130	M20
	4,6&8									914						65	140	18	69	130	
280S/M	2	550	450	500	140	19	5	18	445	1027	115	544	358	243	2x2"	65	140	18	69	130	M20
	4,6&8									1010						75	140	20	79.5	130	
315S/M	2	660	550	600	140	24	6	22	519	1175	130	604	413	278	2x2"	65	140	18	69	130	M20
	4,6&8				170					1167						80	170	22	85	160	
315L	2				140					1340					2x2 1/2"	65	140	18	69	130	
	4,6&8				170					1332						90	170	25	95	160	M24
355L	2	800	680	740	140	24	6	25	584	1461	145	695	495	403	2x3"	75	140	20	79.5	130	M20
	2(280kW)									1505											
	4&6				210					1531						100	210	28	106	200	M24
	4(315kW),6(250kW)									1575											

Notes: * This is a mandatory dimension for all standard motors
**Minimum distance for efficient cooling of motor to be maintained by user
1. All dimensions are in mm unless otherwise specified
2. Tolerances on mandatory dimensions are as per IS: 2223
3. For non standard motors, dimensions may change. Please contact our nearest sales office for details

Notes: 1. Eyebolt is not provided in motors of 63 to 90 frame
2. Shaft extension at NDE identical to standard shaft extension at DE is not possible in 4, 6 & 8 pole in frames 315L & 355L
3. TB Position: To be read as: when viewed parallel to the shaft / cable entry
(a) 63, 160 to 225 frame: Center of body / RHS when viewed from DE side
(b) 71 to 132 Frame & 250 to 355 Frame: Towards Drive End / RHS when viewed from DE side

DIMENSIONAL DRAWING: IE3 EFFICIENCY SERIES FOR SAFE AREA APPLICATION FACE MOUNTED (IM B14/IM 3601) MOTORS



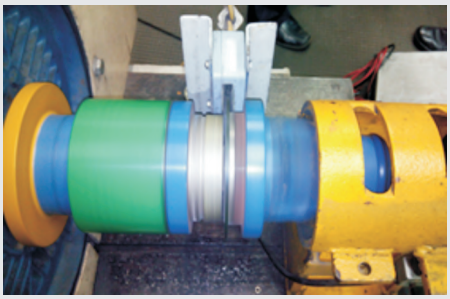
		FIXING					GENERAL					TERMINAL BOX			SHAFT					
IEC Fr. Size	Pole	P*	N*	M*	i	S*	T*	AD	L	LV**	AC	V	AG	S2 BSC	D* DA*	E* EA*	F* FA*	GA* GC*	I I1	d5
63	2,4	90	60	75	23	M5X10	2.5	116	206	30	124	86	40	1x3/4"	11	23	4	12.5	18	M4
71	2(0.37kW),4(0.25kW), 6(0.18kW)&8	105	70	85	30	M6X10	2.5	124	235	30	140	95	40	1x3/4"	14	30	5	16	25	M5
	2(0.55kW),4(0.37kW)&6 (0.25kW)								269											
80	2(1.1kW),4,6(0.55kW)	120	80	100	40	M6X13	3	134	310	30	157	105	40	1x 3/4"	19	40	6	21.5	35	M6
	2,6&8								267											
90S	2,4&6	140	95	115	50	M8X12	3	140	336	35	174	109	52	2x3/4"	24	50	8	27	45	M8
	8								302											
90L	2,4&6								361											
	8								327											
100L	2&4	160	110	130	60	M8X12	3.5	157	387	40	195	125	56	2x1"	28	60	8	31	55	M10
	6&8								366											
112M	4&6	160	110	130	60	M8X12	3.5	170	419	45	220	134	56	2x1"	28	60	8	31	55	M10
	8								388											

Notes: * This is a mandatory dimension for all standard motors
**Minimum distance for efficient cooling of motor to be maintained by user
1. All dimensions are in mm unless otherwise specified
2. Tolerances on mandatory dimensions are as per IS: 2223
3. For non standard motors, dimensions may change. Please contact our nearest sales office for details

Notes: 1. Eyebolt is not provided in motors of 63 to 90 frame
2. For the dimensional drawing of 132 frame, B14 mounting kindly contact our nearest sales office
3. TB Position: To be read as: when viewed from DE side / when viewed parallel to the shaft / cable entry
(a) 63 frame: Top / Center of body / RHS when viewed from DE side
(b) 71 to 112 Frame: Top / Towards Drive End / RHS when viewed from DE side

Raw Material Warehouse

Motor Assembly

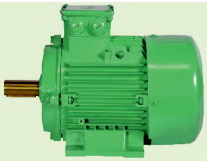
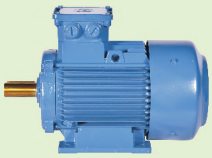
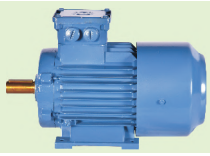


Torque Transducer

Large Motor Test Facility

LV MOTORS PRODUCT RANGE

Motors conform to relevant Indian Standards IS/IEC 60034 series
Voltage: 415V +/- 10%, Frequency: 50 Hz +/- 5%, Combined Variation: +/- 10%

Motor Type	Frame	Power (kW)	Polarity		Standard Technical Specifications
IE2 Motors IE3 Motors Large LT Motors (DCCA)	56 to 355 56 to 355 355 to 450	0.12 to 355 0.12 to 355 250 to 1250	2, 4, 6, 8 2, 4, 6, 8 2, 4, 6, 8		• Ambient: 50° C • Ambient for DCCA: 40° C • Inverter Grade Winding: For IE3 and DCCA • Duty: S1 • RTD & BTD: For DCCA motors • Mounting: B3, B5, B35, V1, B14 upto 132 Frame
IE4 Motors	112 to 225	1.5 to 45	4		• Ambient: 50° C • Inverter Duty Winding • Duty: S1 • VPI: With Class H solvent less Resin • Mounting: B3, B5, B35, V1
Standard Flame Proof Ex'd' Motors IE2 Flame Proof Ex'd' Motors IE3 Flame Proof Ex'd' Motors	80 to 315 80 to 315 80 to 315	0.37 to 200 0.37 to 200 0.37 to 180	2, 4, 6, 8 2, 4, 6, 8 2, 4, 6, 8		• Ambient: 45° C • Inverter Grade Winding: For IE3 Motors • Duty: S1 • Mounting: B3, B5, B35, V1
IE2 Increased Safety Ex ec Motors IE3 Increased Safety Ex ec Motors	63 to 355 63 to 355	0.12 to 355 0.12 to 355	2, 4, 6, 8 2, 4, 6, 8		• Ambient: 50° C • Duty: S1 • Mounting: B3, B5, B35, V1 (B14 upto 132 Frame)
Crane & Hoist Duty Motors	71 to 355	0.37 to 400	4, 6, 8		• Ambient: 45° C • Duty: S4 • Offered in DOL & Converter Fed Supply • Mounting: B3, B5, B35, V1 (B14 upto 132 Frame)
Brake Motors (With Integral DC Brake)	71 to 132	0.25 to 9.3	2, 4, 6, 8		• Ambient: 50° C • Duty: S1 • Mounting: B3, B5, B35 • Integral DC Brake
Brake Motors (With External Mounted Brake)	71 to 200	0.37 to 22	2, 4, 6, 8		• Ambient: 50° C • Duty: S1 • Mounting: B3, B5, B35 • External Mounted DC Brake/Arrangement
Slip Ring Motors	100 to 160	1.1 to 10	4, 6		• Ambient: 45° C • Duty: S3, S4, S5 • Mounting: B3
Textile Motors	100 to 160	1.1 to 15	4, 6, 8		• Ambient: 50° C • Duty: S1 • Mounting: B3, B5, B35
Cane Unloader Motors	160 to 225	11 to 30	6		• Ambient: 45° C • Start/Stop per Hour: upto 900 • Duty: S5, 50% CDF • Thermostat • Mounting: B3, B5, B35 • Forced Cooling • Shaft Material: En24

* Subject to confirmation from Bharat Bijlee

Insulation: Class 'F' with temperature rise limited to Class 'B', Rotation: Bi-directional Cooling: IC411, Degree of Protection: IP55, Altitude: Upto 1000m above MSL

Optional Features		Applications
• Non Standard Voltage: upto 690V • Higher Polarity on request • Insulation: Class H • Space Heater: 90 Frame onwards • RTD & BTD: 250 Frame onwards • PTC Thermistor: 80 to 355L • Shaft Material: EN24* • Enclosure: IP56 / 65 / 66 • Forced Cooling: 132 to 450 Frame • Roller Bearing: 160 Frame onwards	• High Temperature Grease: Suitable up to 200° C • SS Hardware • Non standard shaft diameter/extension* • Non Standard Paint • Provision for Encoder Mounting • Low Vibration as per IS or IEC • Insulated Bearing: 132 Frame onwards • SPM Nipples Provision: Frame 250 onwards	Pump, Fan, Compressor, Packing Machinery, Coiler/De-coiler, Agro Equipment, Food Processing Equipment, Paper Machinery, Agitator, Dairy Equipment, Machine Tool, Air Conditioning, Material Handling, Plastic Machinery, Textile Machinery, Cooling Tower, Crusher, Material Handling
• Insulation: Class H • Space Heater: 90 Frame onwards • PTC Thermistor: 80 to 225 Frame • Shaft Material: EN24* • Enclosure: IP56 / 65 / 66 • Roller Bearing: 160 Frame onwards	• Non standard shaft diameter/extension* • Non Standard Paint • Provision for Encoder Mounting • Low Vibration as per IS or IEC	Fans, HVAC, Pumps, Textiles, Hydraulic Press

• Non Standard Voltage: 220 to 690V
• Intermittent Duty S3, S4: In 4, 6, 8 Pole*
• Insulation: Class H
• PTC Thermistor: 80 to 315 L
• Space Heater: 90 Frame onwards
• Roller Bearing: 160 Frame onwards
• Shaft Material: EN24*
• Enclosure: IP56 / 65 / 66
	• Insulated Bearing: 132 Frame onwards
	• Non standard shaft diameter/extension*
	• Motors for inverter duty application ; offered with
	  • Combined testing of motor and VFD or
	  • Motors fitted with PTC Thermistor
	• Test facility available for combined Testing with VFD
	• Non Standard Paint
	• Low Vibration as per IS or IEC
		Pump, Fan, Compressor, Material Handling, Agitator, LPG Bottling Plant, Pharma Machinery, Chemical Plant Machinery, Machinery for Mines

• Insulation: Class H • Shaft Material: EN24* • Enclosure: IP56 / 65 / 66 • Roller Bearing: 160 Frame onwards	• Insulated Bearing: 132 Frame onwards • Non standard shaft diameter/extension* • Motors for inverter duty application with combined testing of motor and VFD for temperature class certification • Test facility available for combined testing with VFD • Non Standard Paint • Low Vibration as per IS or IEC	Pump, Fan, Compressor, Material Handling, Agitator, Pharma Machinery
• Duty: S2, S3 and S5 • Non Standard Voltage: 380 to 460V • Insulation: Class H • Space Heater: 90 Frame onwards • BTD: 250 Frame and above • PTC Thermistor: 80 to 355 L • Roller Bearing: 160 Frame onwards • Shaft Material: EN24* • Enclosure: IP56 / 65 / 66	• Motors for Inverter Duty • Insulated Bearing: 132 Frame onwards • Non standard shaft diameter/extension* • Non Standard Paint • Low Vibration as per IS or IEC	Crane, Hoist, Lift, Material Handling, Car Stacker, Door Opening
• Duty: S2 and above • Non Standard Voltage: upto 460V • Motors for Inverter Duty • Manual Release Arrangement: For 90 to 132 Frame	• Non standard shaft diameter/extension* • Non Standard Paint	Crane, Hoist, Material Handling, Textile, Pharma to name a few
• Duty: S2 and above • Non Standard Voltage: upto 460V • Motors for Inverter Duty • Manual Release Arrangement	• Double Shaft Extension for Brake Arrangement • Non Standard Paint	Crane, Hoist, Material Handling, Textile, Pharma to name a few
• Mounting: B35 • Non standard shaft diameter and extension*	• Non Standard Paint	Crane, Hoist, Lift, Material Handling
• Non Standard Voltage: upto 500V • Insulation: Class H	• Motors for Inverter Duty • Non Standard Paint • Low Vibration as per IS	Ginning, Textile Machinery
• Insulation: Class H • PTC Thermistor	• Insulated Bearing: 132 Frame onwards • Non Standard Paint	Cane Loading-Unloading Machine

CERTIFICATIONS

Super Premium Energy Efficient
SynchroVERT® IE4 Motor:
Winner of CII's Most Innovative Energy Saving Product 2016

New Product

Ultra Premium Energy Efficient
IE5 Motor:
Winner of CII's Most Innovative Energy Saving Product 2018

Upcoming Product

ISO 9001 : 2015

ISO 45001:2018

ISO 14001 : 2015

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