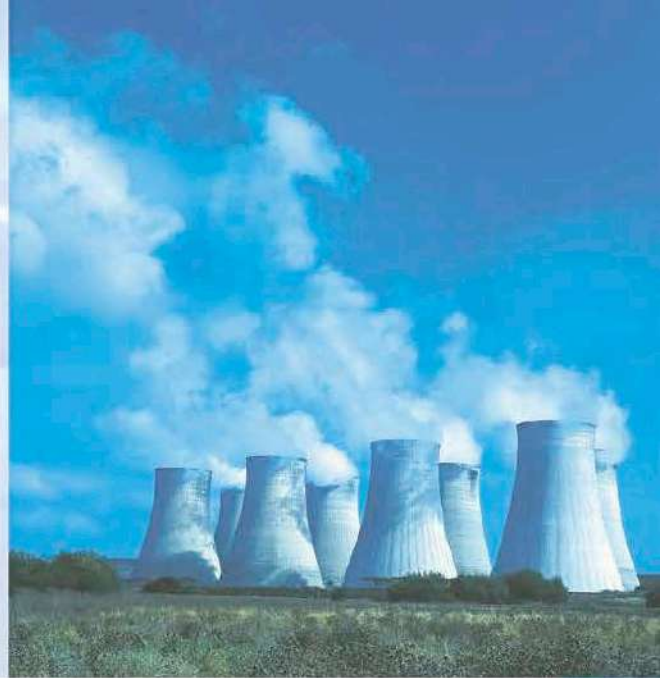


TECHNICAL SPECIFICATIONS



hindustan
ELECTRIC MOTORS



motoring the wheels of success



CORPORATE QUALITY POLICY



- We are committed to the design and manufacture of premium quality motors at a competitive price.
- We will always ensure that our customer requirements are determined and met effectively so that we will have continual quality improvement in all our products and services.
- We will achieve this by regularly reviewing our QMS and continually improving upon the effectiveness of the QMS.

HM hindustan ELECTRIC MOTORS



Precision. Consistently.

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India's foremost manufacturer of Motors

Establishing, strengthening and sustaining the development of a strong company not only means deploying resources, expertise and knowhow but also great determination and confidence in the future. Through all these years of intensive activity and quick expansions, the action towards common goal to stand out as a strong consistent group, constantly striving for improvement have driven Hindustan motor attain and achieve a leading position in the Indian Motor industry.

Hindustan Motor, an ISO 9001:2008 company is the leading Electric Motor Manufacturer in India with a proven track record of over four decades.

From a modest beginning with electric motor unit in Mumbai, Hindustan Motor has set up state of art manufacturing facilities at Daman & Vapi. The last four decades have seen the core business develop along with different product lines; flameproof motors, crane duty motors, cooling tower motors, textile motors, inverter duty motors, brake motors & other motors for customer specific application. In the manufacture of motor, a competitive edge lies in providing consistent quality, high reliability with innovative products. Our expansion in Daman & Vapi was to address these key market determinants. The manufacturing set up is sourced out from the world renowned machinery and technology suppliers with constant up gradations and expansions.

3



Our primary focuscustomer satisfaction

Hindustan Motors derives its strength from its customers. The growth of the latter is the prerequisite to the growth of the company and hence customers' satisfaction is its prime objective. In an ongoing process to improve customer satisfaction, Hindustan motor offers a variety of Services:

- Competitive prices
- Consistent quality
- Just in time delivery
- Product development for a changing Market
- A targeted stocking policy
- Technical support for applications / projects

Hindustan motor has highly experienced qualified and dedicated professionals with strong adherence to the quality management system.

Hindustan motor has offices all over the country and also has a wide network of authorised distributors, dealers and service centers to cater to all the customer segments in India and abroad.

Hindustan motor has earned the trust and reputation in India and abroad by winning the customers' confidence. Millions of motors have been manufactured and are in operation in India & abroad.

Hindustan brand motors are preferred choice in OEM, end users, heavy industries, cooling tower application and various diverse application and industries. The titans of Indian industry & consultants / specifiers are now referring Hindustan motor for most critical and specific applications.

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PRODUCT RANGE



HIGH EFFICIENCY STANDARD MOTORS

Frames : 56 to 355L
 Rating : 0.093 to 315.0 kW
 Poles : 2, 4, 6 & 8
 Mountings : B3, B5, B14 & combinations
 Protection : IP55
 Enclosure : TEFC



MULTI SPEED MOTORS

Frames : 71 to 355L
 Rating : 0.12 to 150.0 kW
 Poles : 4/2, 8/4, 6/4, 8/6 & others
 Mountings : B3, B5, B14 & combinations
 Protection : IP55
 Enclosure : TEFC



ROLLER TABLE MOTORS

Frames : 112M to 160L
 Rating : 0.75 to 7.5 kW
 Poles : 4, 6 & 8
 Mountings : B5
 Protection : IP55
 Enclosure : TENV, TEFC



HIGH EFF. FLAMEPROOF MOTORS FOR GAS GROUPS IIA & IIB AS PER IS/IEC 60079

Frames : 63 to 315L
 Rating : 0.18 to 200.0 kW
 Poles : 2, 4, 6 & 8
 Mountings : B3, B5, B14 & combinations
 Protection : IP55
 Enclosure : TEFC



MULTI SPEED FLAMEPROOF MOTORS FOR GAS GROUPS IIA & IIB AS PER IS/IEC 60079

Frames : 71 to 315L
 Rating : 0.12 to 120.0 kW
 Poles : 4/2, 8/4, 6/4, 8/6 & others
 Mountings : B3, B5, B14 & combinations
 Protection : IP55
 Enclosure : TEFC



COOLING TOWER MOTORS - STANDARD & FLAMEPROOF

Frames : 71 to 315
 Rating : 0.37 to 37.0 kW
 Poles : 4, 6, 8, 10 & 12
 Mountings : B3 or B5
 Protection : IP55
 Enclosure : TENV, TEFC



TORQUE MOTORS

Frames : 63 to 160L
 Rating : 0.037 to 5.5 kW
 Poles : 4, 6 & 8
 Mountings : B3, B5, B14 or special
 Protection : IP55
 Enclosure : Totally enclosed or force cooled
 Torque : 0.048 to 3.57 kg.m



BRAKE MOTORS

Frames : 63 to 250MX
 Rating : 0.18 to 55.0 kW
 Poles : 2, 4, 6 & 8
 Mountings : B3, B5, B14 & combinations
 Protection : IP54
 Brake Torque : Upto 800Nm
 Duty Cycle : S1 - S8



INVERTER DUTY MOTORS

Frames : 90 to 355L
 Rating : 0.37 to 315.0 kW
 Poles : 2, 4, 6 & 8
 Mountings : B3, B5, B14 & combinations
 Protection : IP55
 Enclosure : Totally Enclosed Force Cooled with 3 ph fan motor



CRANE DUTY MOTORS

Frames : 71 to 315L
 Rating : 0.18 to 200.0 kW
 Poles : 4, 6 & 8
 Mountings : B3, B5, B14 & combinations
 Protection : IP55
 Enclosure : TEFC
 Duty Cycle : S3 - S5
 Starts/hour : 60, 150, 300



TEXTILE MOTORS

Frames : 100 to 180L
 Rating : 0.55 to 15.0 kW
 Poles : 4, 6 & 8
 Mountings : B3, B5, B14, Pad & combinations
 Protection : IP55
 Enclosure : TENV, TEFC with clean flow
 Applications : Ring, Loom, Carding, Ginning & Spinning



SPECIAL APPLICATION MOTORS

Dual Voltage / Dual Frequency motors
 Low Vibration motors for machine tools
 Motors for Extreme Climatic Conditions
 Motor for Import Substitute

STANDARDS & REFERENCES

HINDUSTAN motors are manufactured according to Indian & International standards.

Description	IS	IEC
3 phase induction motor specification	IS 325	IEC 60034-1
Code of practice for installation & maintenance of induction motor	IS 900	-
Dimensions & output seires for rotating electrical machines	IS 1231 (Foot mounted motors) IS 2223 (Flange mounted motors)	IEC 600072-1
Symbols of construction & mounting arrangement	IS 2253	IEC 60034-7
Guide for testing 3 ph induction motor (For standard TEFC motors)	IS 4029	-
Classification of degrees of protection	IS 4691	IEC 60034-5
Terminal marking & direction of rotation	IS 4728	IEC 60034-8
Methods of determination of efficiency of rotating electrical machines (For standard TEFC motors)	IS 4889	-
Methods of cooling	IS 6362	IEC 60034-6
Permissible limits of noise levels for rotating electrical machines	IS 12065	IEC 60034-9
Mechanical vibration of rotating electrical machines	IS 12075	IEC 60034-14
Energy efficient induction motors - 3 phase squirrel cage	IS 12615	IEC 60034-30
Methods of test, determination of efficiency (For IE2, IE3 motors)	IS 15999 (Part 2 / Sec 1)	IEC 60034-2-1

Additional standars for hazardous area motors

Electrical apparatus for explosive atmospheres - General requirements	IS/IEC 60079-0
Electrical apparatus for explosive atmospheres - Equipment protection by flameproof enclosures "d"	IS/IEC 60079-1
Classification of hazardous areas (other than mines) having flammable gases & vapours for electrical installation	IS 5572
Guide for selection & installation of electrical equipment in hazardous areas (other than mines)	IS 5571

Other Specifications: Inter plant standard for steel industries: IPSS-1-03-007

All the motors are manufactured in Quality Assurance System compliant with ISO 9000.


The motors covered by the present catalogue comply with the regulations & stadnards consistent with IS & IEC standards.

Glossary:

IS - Indian standards published by Bureau of Indian Standard (BIS)

IEC - International Electrotechnical Commission

RATING PLATE

		3 Ph. IND. MOTOR		IE3	CE
		IEC:60034-1			
Amb.	50 °C	IP	55	In.Cl.	F
Duty	S1				
Type	2HE3 223-0403		Frame	225MX	
Brg	6313/6313		%Eff	94.2	
S.No.	1215 M 543586		Encl.	TEFC	
Hz	V	kW/HP	A	RPM	PF
50	415 Δ	45.0/60.0	77.8	1475	0.85
$\pm 5\%$	$\pm 10\%$	MADE IN INDIA			

AMBIENT TEMPERATURE

HMM Motors are designed for 50°C ambient temperature.

Permitted output (% of rated output)

$\leq 30^\circ\text{C}$	107 %
30°C - 45°C	103 %
50° C	100 %
55° C	96 %
60° C	92 %

TOLERANCE ON PERFORMANCE PARAMETERS & DIMENSIONS

Performance Parameter	Tolerances
1 Efficiency (η)	
– motors up to and including 150 kW	- 15 % of (1 - η)
– motors above 150 kW	- 10 % of (1 - η)
2 Total losses (applicable to motors with ratings >150 kW)	+10 % of the total losses
3 Power factor (cos ϕ)	- 1/6 of (1 - cos ϕ); min 0.02, max 0.07
4 Slip at full load and at working temperature	
– For motors having output < 1 kW	± 30 % of the slip
– For motors having output ≥ 1 kW	± 20 % of the slip
5 Locked rotor current (I_{ST}) with any specified starting apparatus	+ 20 % of the current
6 Locked rotor torque (T_{ST})	- 15 % to + 25 % of the torque (+25 % may be exceeded by agreement between manufacturer & purchaser)
7 Pull out torque (T_{PO})	- 10 % of the torque except that after allowing for this tolerance the torque shall be not less than 1,6 or 1,5 times the rated torque
8 Moment of inertia	± 10 % of the value

Dimension	Tolerances
Frame Size H ≤ 250	0, - 0.5 mm
≥ 280	0, - 1mm
Diameter D of shaft extension:	
• 11 to 28 mm	j6
• 32 to 48 mm	k6
• 55mm and over	m6
Diameter N of flange spigot:	
Up to F 500 B	j6
above F 500 B	js6
Key width	h9
Width of drive shaft keyway (normal keying)	P9
Key depth:	
• Square section	h9
• Rectangular section	h11
Eccentricity of shaft in flanged motors (standard class):	
D ≤ 10 mm	0.030 mm
10 mm < D ≤ 18 mm	0.035 mm
18 mm < D ≤ 30 mm	0.040 mm
30 mm < D ≤ 50 mm	0.050 mm
50 mm < D ≤ 80 mm	0.060 mm
80 mm < D ≤ 120 mm	0.070 mm
Concentricity of spigot diameter and perpendicularity of mating surface of flange to shaft (standard class)	
Flange:	
F65 to F 115	0.080 mm
F130 to F 265	0.100 mm
F300 to F 500	0.125 mm
F600 to F740	0.160 mm
F940 to F1080	0.200 mm



TERMINAL BOX DATA

Frame Size	Cable Entry size		Max. Cable Size DOL starting	Max. Cable Size Star-Delta starting	Terminal Stud size
	Safe Area	Hazardous Area			
63-90	1 x 3/4" BSC	1 x M20	3C x 4mm ²	-	M4
100-132	2 x 1" BSC	2 x M25	3C x 10mm ²	2 x 3C x 10mm ²	M5
160-180	2 x 1" BSC	2 x M25	3C x 35mm ²	2 x 3C x 25mm ²	M6
200	2 x 2" BSC	2 x M40	3C x 120mm ²	2 x 3C x 70mm ²	M8
225-250		2 x M50			
280-315	2 x 2 1/2" BSC	2 x M63	3C x 240mm ²	2 x 3C x 150mm ²	M12
355	2 x 3" BSC	-	3C x 400mm ²	2 x 3C x 300mm ²	M16

Equivalent metric & Pg threadings can also be provided on request.

EFFECT OF VARIATION VOLTAGE AND FREQUENCY ON MOTOR PERFORMANCE

Characteristics	Voltage		Frequency	
	110%	90%	105%	95%
Torque Starting & Maximum	Increase 21%	Decrease 19%	Decrease 10%	Increase 11%
Speed				
Synchronous	No Change	No Change	Increase 5%	Decrease 5%
Full Load	Increase 1%	Decrease 1.5%	Increase 5%	Decrease 5%
Current				
No Load	Increase 10-15%	Decrease 10-12%	Decrease 5-6%	Increase 5-6%
Starting	Increase 10-12%	Decrease 10-12%	Decrease 5-6%	Increase 5-6%
Full Load	Decrease 7%	Increase 11%	Slight Decrease	Slight Decrease
Temp Rise	Decrease 3-4°C	Increase 6-7°C	Slight Decrease	Slight Decrease
Over Load Capacity	Increase 21%	Decrease 19%	Slight Decrease	Slight Decrease
MAG Noise	Slight Increase	Slight Decrease	Slight Decrease	Slight Increase
Efficiency				
Full Load	Increase 0.5-1%	Decrease 2%	Slight Increase	Slight Decrease
Power Factor				
Full Load	Decrease 3%	Increase 1%	Slight Increase	Slight Decrease

BEARING ARRANGEMENT

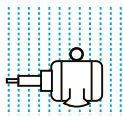
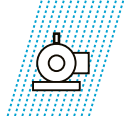
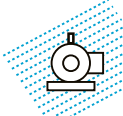
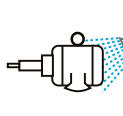
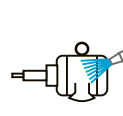
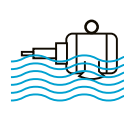
Frames upto 180 have sealed bearings which are lubricated for life. Frames 200 & above have regreasing arrangement as a standard feature.

Frame Size	Safe Area Motors		Hazardous Area (Flameproof) Motors		Regreasing Time (Hrs.)	
	DE side	NDE side	DE side	NDE side	2 pole	4, 6, 8 pole
63	6201ZZ	6201ZZ	6201ZZ	6201ZZ	-	-
71	6202ZZ	6202ZZ	6202ZZ	6202ZZ	-	-
80	6204ZZ	6204ZZ	6204ZZ	6204ZZ	-	-
90S/L	6205ZZ	6205ZZ	6205ZZ	6205ZZ	-	-
100L	6206ZZ	6206ZZ	6206ZZ	6206ZZ	-	-
112M	6206ZZ	6206ZZ	6306ZZ	6206ZZ	-	-
132S/M	6208ZZ	6208ZZ	6308ZZ	6208ZZ	-	-
160M/L	6309ZZ	6209ZZ	6309ZZ	6309ZZ	-	-
180M/L	6310ZZ	6210ZZ	6310ZZ	6310ZZ	-	-
200L	6312 #	6312 #	6312ZZ	6312ZZ	# 3500	# 8000
225S/M	6313	6313	6313	6313	3,500	8,000
250M	6315	6315	6315	6315	2,500	6,000
280S/M	6317	6317	6317	6317	2,000	5,000
315S/M/L	6319	6319	6319	6319	2,000	4,000
355S/M/L	6322	6322	-	-	2,000	3,000

The regreasing time mentioned is for horizontal mounted motors. For vertical mounted motors, it should be reduced by half.

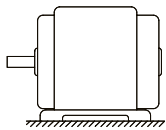
DEGREE OF PROTECTION

The degree of protection as classified in IS 4691 is given below. It is denoted by two digits. The first digit denotes protection against solid bodies or particles and the second digit denotes protection against liquid. All our standard TEFC motor have degree of protection IP 55, unless otherwise specified.

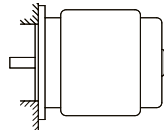
Second Characteristic Numerical							
First Characteristic Numerical	No Protection	Dripping water from top shall not harm	Dripping water up to 15° from vertical shall not harm	Dripping water up to 60° from vertical shall not harm	Water splashes shall not harm	Water projected by nozzle shall not harm	Water from heavy seas shall not harm
	0	1	2	3	4	5	6
0	No Protection						
1	Machine protected against bodies > 50mm dia						
2	Machine protected against bodies > 12mm dia	IP 21	IP 22	IP 23			
4	Machine protected against bodies > 1mm dia				IP 44		
5	Dust-protected machine				IP 54	IP 55	IP 56
6	No ingress of dust					IP 65	

MOUNTING POSITIONS

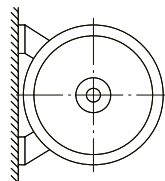
HORIZONTAL MOUNTING



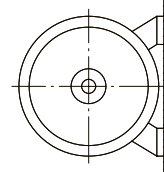
IM B3



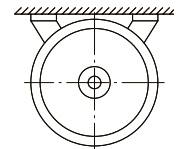
IM B5



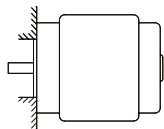
IM B6



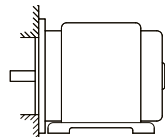
IM B7



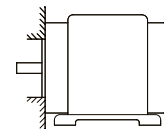
IM B8



IM B14



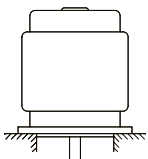
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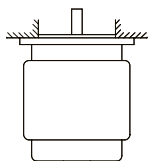
IM B34

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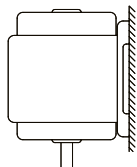
VERTICAL MOUNTING



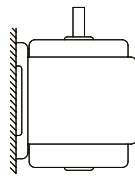
IM V1



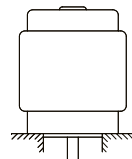
IM V3



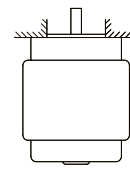
IM V5



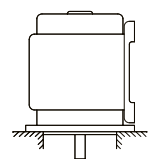
IM V6



IM V18



IM V19



IM V15

DUTY CLASSES

The various operating cycles of driven machines can be classified into nine basic duties, ranging from S1 to S9 separately indicated below. Suitable motors can be offered to match the duty cycles of the driven machines.

CLASSES OF DUTY

The following are the duty types:

Duty	Type	Description	Application
S1	Continuous duty	Operation at constant load maintained for sufficient time to allow the machine to reach thermal equilibrium. These are our standard motors.	Pumps, Blowers, Fan Compressors
S2	Short time duty	Operation at constant load for a given time, less than that required to reach thermal equilibrium, followed by a time de-energized and at rest of sufficient duration to re-establish machine temperatures within 2°K of the coolant temperature. The recommended values for the short-time duty are 10, 30, 60 and 90 minutes.	Operation of gates of dams, siren, Capstan, Valve Actuators, Mixers etc.
S3	Intermittent periodic duty	A sequence of identical duty cycles, each including a time of operation at constant load and a time de-energized and at rest. In this duty, the cycle is such that the starting current does not significantly affect the temperature rise. Unless otherwise specified, the duration of the cycle is 10 minutes. The recommended values for the load factor are 15, 25, 40 and 60 percent. These motors also come in crane duty applications and the duty cycle is designated as S3-40%, S3-60%. The no. of starts are also less; either 45 or 60 st/hr.	Valve actuators, Wire drawing machines
S4	Intermittent periodic duty with starting	A sequence of identical duty cycles each consisting of a period of starting, a period of operation at constant load and a rest period, the operating, rest & de-energized being too short to attain thermal equilibrium during one duty cycle. In this duty the stopping of the motor is obtained either by natural deceleration after disconnection of the electricity supply or by means of braking such as mechanical brake which does not cause additional heating of the windings. These are generally suitable for crane duty / lift duty applications. The duty is mentioned as S4-60% CDF, 150 st/hr etc.	Hoists, cranes, lifts
S5	Intermittent periodic duty with starting and braking	A sequence identical duty cycles each consisting of a period of starting, a period of operation at constant load, a period of braking and a rest period. The operating and de-energized periods being too short to attain thermal equilibrium. In this duty braking is rapid and is carried out electrically through electromagnetic DC brakes or by injection of DC voltage in the rotor. Since the braking is done electrically, the braking losses are also added to the starting losses, thus making this duty most stringent and heavy. The duty is mentioned as S5-60% CDF, 300 st/hr etc.	Hoists, Cranes, Rolling Mills
S6	Continuous duty with intermittent periodic loading	A sequence of identical duty cycles each consisting of a period of operation at constant load & a period of operation at no-load, The operation and no-load periods are too short to attain thermal equilibrium during one duty cycle. Unless otherwise specified the duration of the duty cycle is 10 minutes. The recommended values of CDF are 15, 25, 40 and 60 percent. This duty is different from S2 duty, as in S2 Duty there is a period of rest after the load operation. Normal S1 duty motors are suitable to operate on S6 duty provided the load Inertia is maximum equal to motor inertia.	Conveyors, Machine Tools
S7	Continuous duty with starting and braking	A sequence of identical duty cycles each consisting of a period of starting, a period of operation at constant load & a period of electrical braking. There is no rest and de-energized period. This is also a very stringent duty application similar to S5 duty, except in this case there is no rest period.	Machine Tools, Balancing machines, Tapping machines
S8	Continuous duty with periodic speed changes	A sequence of identical duty cycles each consisting of a period of operation at constant load corresponding to a determined speed of rotation, followed immediately by a period of operation at another load corresponding to a different speed of rotation (carried out, for example, by means of change of the number of poles in the case of induction motors), the operating periods being too short to attain equilibrium during one duty cycle. There is no rest and de-energized period. These motors are always Multi-speed Motors for e.g. 4P/2P, 8P/4P, 6P/4P etc. Here the Speed change is done by Pole Changing method. This is achieved by connecting the motor terminals in two different ways to achieve 2 different speeds.	Special applications where the motor is required to run at different speeds and different loads

Duty	Type	Description	Application
S9	Duty with non periodic load and speed variations	A duty in which generally load and speed are varying non-periodically within the permissible operating range. This duty includes frequently applied overloads that may greatly exceed the full loads. For this duty type, suitable load values should be taken as the basis of the overload concept.	Special applications where the motor is required to run at different speeds and different loads

DESIGNATION

A duty type is designated by means of the abbreviation given below. For the duty type S2 the abbreviation is followed an indication of the duration of the duty. For duty type S3 and S6 the abbreviations are followed by an indication of the cyclic duration factor.

Examples: S2 60 minutes • S3 25 percent • S6 40 percent

For the duty types S4 and S5 the abbreviation are followed by the indication of the cyclic duration factor, the number of starts per hour (st/hr) and the factor of inertia (FI)

Examples: S4-25%, 120 st/hr, load factor = 2 (load factor = load inertia/motor inertia)

For the duty type S7 the abbreviation is followed by the indication of the number of cycles per hour and the factor of inertia.

Examples: S7-500 st/hr, load factor = 2

For the duty type S8 and S9 the abbreviation is followed by the indication of the number of duty cycles per hour and the factor of inertia together with the load. In addition, the cyclic duration factor should be indicated for each speed.

Examples: S8 or S9 30 st/hr, load factor = 3

S2/S3 RATED MOTOR OUTPUTS

Standard motors can be used for S2 and S3 duties with increased outputs. However, the starting torque and pullout torque as percentage of full load torque would be reduced. The ratings indicated in the table are with minimum 200% pull out torque.

SPARES

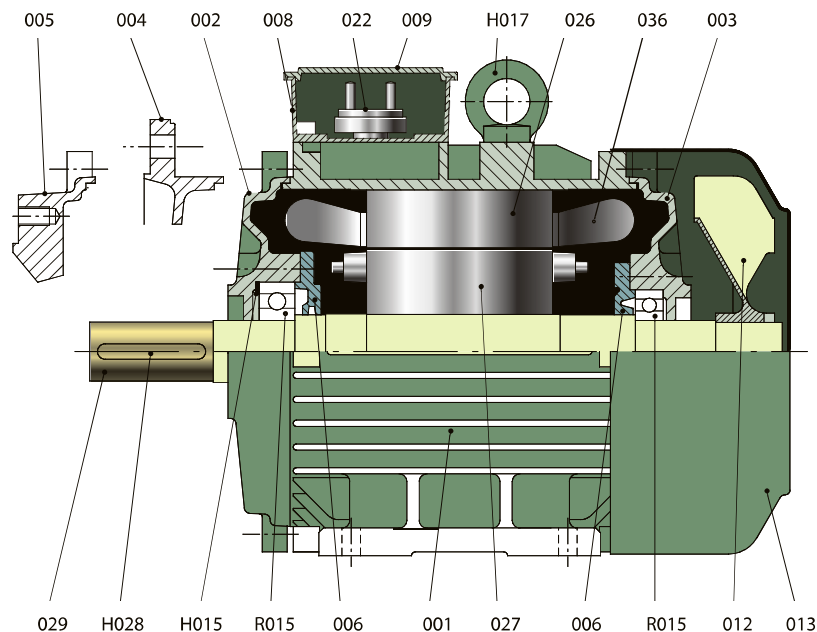


Table of Components

005 - Endshield DE B14	H017 - Eye bolt	H015 - Wavy washer	R015 - Bearing NDE
004 - Endshield DE B5	026 - Stator packet	R015 - Bearing DE	012 - Fan
002 - Endshield DE B3	036 - Stator winding	006 - Bearing cover DE	013 - Fan cover
008 - Terminal box	003 - Endshield NDE	001 - Stator body	
022 - Terminal block	029 - Shaft	027 - Rotor packet	
009 - Terminal box cover	H028 - Shaft key	006 - Bearing cover NDE	

FLAMEPROOF MOTORS

Hazardous areas are defined as those locations where explosive gas – air mixture may occur in dangerous concentrations and are defined in accordance to Indian Standard IS 5572. The general classification is as highlighted in the following table:

Zone	Classification of Area as per IS 5572	Use of Electrical Equipment
Zone "0"	Area in which hazardous atmosphere is continuously present	Use of Motors is to be avoided as far as possible or use Intrinsically safe or pressurized electrical equipment.
Zone "1"	Area in which hazardous atmosphere is likely to be present at any time under normal operating conditions	Flame Proof Motors with Type Ex'd' as specified in IS /IEC 60079-1
Zone "2"	Area in which hazardous atmosphere is likely to be present only under abnormal operating conditions & for a short period	Motors with all electrical contacts to be enclosed in flame proof enclosure and conform to IS 6381 and designated as Type "e" or IS 9628 and designated as Type "n"

Customers are to select the motor type depending on the type of area of operation of the motors and should generally follow the guidelines given above in conjunction with the relevant Indian Standards specified above.

Classification of hazardous gases:

Hazardous gases have been classified in IS/IEC 60079-0 and IS 5572 are associated with only Flame Proof Motors as listed below:

Note: FLP Motors are offered suitable for Gas Groups IIA and IIB only. Any other gas not specified in the below table, one has to refer relevant IS for the motor selection.

GROUP OF ENCLOSURES SUITABLE FOR PARTICULAR FLAMMABLE GAS OR VAPOUR AS PER IS: IS/IEC 60079-0

Group of Enclosure	Gas or Vapour			
I	Methane (firedamp)			
IIA	Ammonia Industrial methane* Blast furnace gas Carbon monoxide Propane Butane Pentane	Hexane Heptane Iso octane Decane Benzene Xylene Cyclohexene	Acetone Ethyl methyl ketone Methyl acetate Ethyl acetate n-Propyl acetate n-Butyl acetate Amyl acetate	Chloroethylene Methanol Ethanol Iso-butanol n-Butanol Amyl alcohol Ethyl nitrate
IIB	1,3-Butadiene, Ethelene	Diethyl ether	Ethylene oxide	Town gas**
IIC	Hydrogen			

* Industrial methane includes methane mixed with not more than 10% by volume of hydrogen.

** Town gas may contain not more than 57% by volume of hydrogen & not more than 16% by volume of carbon monoxide. The remainder being the mixture of paraffin hydrocarbons & inert gas.

Paint & Finish: All motors are given special treatment of primer & paint to internal as well as external surfaces. All external surfaces are coated with epoxy polyimide base acid/alkali resistant paint of RAL shade 7046.

Terminal Box Location: flame proof motors have terminal box on the top as standard.

Maintaining the type of Protection during operation:

Each motor must be provided with a protective circuit breaker or an equally effective device. In particular, the following should be noted.

1. The joint faces must not be remachined nor finished or coated with varnish or paint. The surfaces must be kept metallicly clean. A thin film or oil grease must be applied as protection against rust. The use of gaskets at points where there were originally none is not permitted.
2. Defective mounting screws and bolts must be replaced promptly by new ones of a material with at least the same tensile-strength as the original ones.
3. Care should be taken to see that all screws, bolts, nuts etc. used for fixing the parts of flameproof enclosures are provided with spring washers wherever originally supplied to prevent them from getting loose due to shocks and vibration during operation.



ELECTRICAL PERFORMANCE - STANDARD MOTOR

2 POLE MOTOR

2 POLE MOTOR

Output		Safe Area Motors										Flameproof (Ex'd') Motors								
KW	HP	Frame Size	Type Designation	Speed (rpm)	Current (A)	Torque (kgm)	Efficiency %			Power Factor			I _{st} /I _N	T _{st} /T _N	T ₉₀ /T _N	GD ² (kgm ²)	Wt. (kg)	Frame Size	Type Designation	Wt. (kg)
							FL	3/4L	1/2L	FL	3/4L	1/2L								
0.18	0.25	63	2HS1 060-02	2780	0.50	0.06	65.0	65.0	58.0	0.77	0.71	0.57	4.7	2.0	2.3	0.0009	5	63 FLP	2FD1 063-02	20
0.25	0.33	63	2HS1 063-02	2790	0.67	0.09	66.0	66.0	60.0	0.79	0.69	0.57	4.7	2.0	2.3	0.0009	6	63 FLP	2FD1 064-02	20
0.37	0.50	71	2HS1 070-02	2790	0.91	0.13	67.0	66.0	61.0	0.84	0.78	0.68	4.7	2.4	2.7	0.0010	8	71 FLP	2FD1 070-02	21
0.55	0.75	71	2HS1 073-02	2815	1.25	0.19	72.5	72.0	64.0	0.84	0.79	0.71	4.7	2.4	2.7	0.0014	9	71 FLP	2FD1 073-02	22
0.75	1.0	80	2HS1 080-02	2845	1.7	0.26	73.5	72.0	67.0	0.84	0.80	0.73	5.5	2.3	2.6	0.0038	13	80 FLP	2FD1 080-02	27
1.1	1.5	80	2HS1 083-02	2850	2.3	0.38	77.0	74.0	70.0	0.86	0.82	0.75	5.5	2.3	2.6	0.0049	14	80 FLP	2FD1 083-02	28
1.5	2.0	90S	2HS1 090-02	2860	3.1	0.51	78.5	75.0	68.0	0.86	0.77	0.61	6.0	2.5	3.0	0.0072	19	90 FLP	2FD1 090-02	38
2.2	3.0	90L	2HS1 096-02	2880	4.3	0.74	81.0	78.5	72.5	0.88	0.80	0.70	6.0	2.5	3.0	0.0093	22	90 FLP	2FD1 096-02	41
3.7	5.0	100L	2HS1 106-02	2900	7.1	1.24	84.0	84.0	82.0	0.86	0.83	0.75	6.0	2.5	3.0	0.0130	30	100L FLP	2FD1 106-02	51
5.5	7.5	112M	2HS1 123-02	2905	10.0	1.84	85.7	85.7	82.0	0.89	0.86	0.78	6.0	2.5	3.0	0.0198	40	112M FLP	2FD1 123-02	65
7.5	10.0	132S	2HS1 130-02	2910	13.3	2.51	87.0	86.0	84.0	0.90	0.87	0.81	6.0	2.3	2.8	0.0583	58	132M FLP	2FD1 130-02	94
9.3	12.5	132M	2HS1 133-02	2915	16.4	3.11	87.0	87.0	85.0	0.91	0.87	0.81	6.0	2.3	2.8	0.0716	65	132M FLP	2FD1 133-02	98
11.0	15.0	160M	2HS1 163-02	2920	20.0	3.67	88.5	87.5	85.5	0.86	0.84	0.79	6.5	2.2	2.5	0.1077	95	160L FLP	2FD1 163-02	162
15.0	20.0	160M	2HS1 164-02	2925	26.5	4.99	89.5	88.5	86.0	0.88	0.86	0.80	6.5	2.2	2.5	0.1301	102	160L FLP	2FD1 164-02	171
18.5	25.0	160L	2HS1 166-02	2930	32.0	6.15	90.0	89.5	87.0	0.89	0.86	0.81	6.5	2.2	2.5	0.1705	120	160L FLP	2FD1 166-02	181
22.0	30.0	180M	2HS1 183-02	2935	37.0	7.30	91.0	90.0	88.0	0.91	0.87	0.81	6.5	2.2	2.5	0.3222	155	180L FLP	2FD1 183-02	208
30.0	40.0	200L	2HS1 206-02	2950	51.0	9.91	91.5	91.0	90.0	0.89	0.87	0.82	6.5	2.2	2.5	0.4468	228	200L FLP	2FD1 206-02	294
37.0	50.0	200L	2HS1 207-02	2950	62.0	12.22	92.0	92.0	91.0	0.90	0.88	0.83	6.5	2.2	2.5	0.5257	246	200L FLP	2FD1 207-02	309
45.0	60.0	225M	2HS1 223-02	2955	74.0	14.83	92.5	92.5	91.5	0.91	0.89	0.85	6.5	2.2	2.5	0.7682	365	225M FLP	2FD1 223-02	403
55.0	75.0	250M	2HS1 253-02	2965	91.0	18.07	93.0	92.5	91.0	0.90	0.88	0.84	6.5	2.2	2.5	1.0690	369	250M FLP	2FD1 253-02	528
75.0	100.0	280S	2HS1 280-02	2975	124.0	24.55	93.5	93.0	92.0	0.90	0.87	0.83	6.5	2.2	2.5	2.5414	555	280S FLP	2FD1 280-02	740
90.0	120.0	280M	2HS1 283-02	2975	148.0	29.47	94.0	93.5	92.5	0.90	0.87	0.83	6.5	2.2	2.5	2.9368	576	280M FLP	2FD1 283-02	770
110.0	150.0	315S	2HS1 310-02	2980	180.0	35.95	94.0	93.5	92.5	0.90	0.87	0.83	6.5	2.2	2.5	3.9194	750	315S FLP	2FD1 310-02	1250
132.0	180.0	315M	2HS1 313-02	2980	212.0	43.14	94.5	94.0	93.0	0.92	0.89	0.85	6.5	2.2	2.5	4.6393	780	315M FLP	2FD1 313-02	1285
160.0	215.0	315L	2HS1 316-02	2985	253.0	52.21	95.0	94.5	93.5	0.93	0.90	0.86	6.5	2.2	2.5	5.5991	930	315L FLP	2FD1 316-02	1325
200.0	270.0	315L	2HS1 317-02	2985	313.0	65.26	95.0	94.5	93.5	0.94	0.90	0.86	6.5	2.2	2.5	7.0389	965	315L FLP	2FD1 317-02	1360
225.0	300.0	355S	2HS1 350-02	2985	355.0	73.42	95.5	95.0	94.0	0.92	0.90	0.86	6.5	1.8	2.5	8.9735	1630			
250.0	335.0	355M	2HS1 353-02	2985	395.0	81.57	95.5	95.0	94.0	0.92	0.90	0.86	6.5	1.8	2.5	10.0292	1710			
275.0	370.0	355L	2HS1 356-02	2985	430.0	89.73	96.2	96.2	95.2	0.92	0.90	0.86	6.5	1.8	2.5	11.0849	1790			
315.0	425.0	355L	2HS1 357-02	2985	495.0	102.78	96.2	96.2	95.2	0.92	0.90	0.86	6.5	1.8	2.5	12.6685	1900			

Note: Motors upto 1.5kW are star (Y) connected suitable for DOL starting. Motors above 1.5kW are delta (Δ) connected suitable for DOL/Y/Δ starting.

ELECTRICAL PERFORMANCE - STANDARD MOTOR

4 POLE MOTOR

4 POLE MOTOR

Output		Safe Area Motors										Flameproof (Ex'd') Motors								
KW	HP	Frame Size	Type Designation	Speed (rpm)	Current (A)	Torque (kgm)	Efficiency %			Power Factor			T _{5T} /T _N	T ₉₀ /T _N	GD ² (kgm ²)	Wt. (kg)	Frame Size	Type Designation	Wt. (kg)	
							FL	3/4L	1/2L	FL	3/4L	1/2L								
0.18	0.25	63	2HS1 063-04	1360	0.57	0.13	60.0	53.0	38.0	0.73	0.58	0.45	3.5	1.9	2.1	0.0010	6	63 FLP	2FD1 063-04	20
0.25	0.33	71	2HS1 070-04	1370	0.76	0.18	62.0	61.0	53.0	0.74	0.63	0.47	3.5	1.9	2.1	0.0016	8	71 FLP	2FD1 070-04	20
0.37	0.50	71	2HS1 073-04	1380	1.05	0.26	66.0	65.0	58.0	0.74	0.64	0.53	3.5	1.9	2.1	0.0022	9	71 FLP	2FD1 073-04	20
0.55	0.75	80	2HS1 080-04	1410	1.45	0.38	73.0	72.0	69.0	0.72	0.62	0.52	4.3	2.0	2.3	0.0038	13	80 FLP	2FD1 080-04	26
0.75	1.0	80	2HS1 083-04	1415	1.75	0.52	74.0	73.0	68.0	0.81	0.70	0.55	4.5	2.0	2.3	0.0049	14	80 FLP	2FD1 083-04	27
1.1	1.5	90S	2HS1 090-04	1415	2.5	0.76	76.5	76.0	74.0	0.80	0.70	0.55	5.0	2.2	2.5	0.0072	18	90 FLP	2FD1 090-04	38
1.5	2.0	90L	2HS1 096-04	1420	3.3	1.03	79.0	79.0	77.0	0.80	0.70	0.55	5.0	2.2	2.5	0.0093	20	90 FLP	2FD1 096-04	40
2.2	3.0	100L	2HS1 106-04	1430	4.4	1.50	82.0	82.0	80.0	0.85	0.81	0.63	5.5	2.2	2.5	0.0182	28	100L FLP	2FD1 106-04	50
3.0	4.0	100L	2HS1 107-04	1430	6.0	2.04	82.6	82.6	81.0	0.84	0.79	0.69	5.5	2.2	2.5	0.0237	30	100L FLP	2FD1 107-04	52
3.7	5.0	112M	2HS1 123-04	1440	7.2	2.50	85.0	85.0	84.0	0.84	0.78	0.70	5.5	2.2	2.5	0.0342	39	112M FLP	2FD1 123-04	64
5.5	7.5	132S	2HS1 130-04	1450	10.6	3.69	87.0	87.0	86.0	0.83	0.78	0.63	5.5	2.3	2.5	0.0676	57	132M FLP	2FD1 130-04	92
7.5	10.0	132M	2HS1 133-04	1450	14.2	5.04	87.0	87.0	86.0	0.84	0.79	0.69	5.5	2.3	2.5	0.0912	64	132M FLP	2FD1 133-04	95
9.3	12.5	160M	2HS1 163-04	1455	17.2	6.23	88.0	88.0	87.0	0.85	0.77	0.66	6.0	2.2	2.5	0.1404	94	160L FLP	2FD1 163-04	160
11.0	15.0	160M	2HS1 164-04	1455	20.8	7.36	89.0	89.0	87.0	0.83	0.75	0.66	6.0	2.2	2.5	0.1696	100	160L FLP	2FD1 164-04	167
15.0	20.0	160L	2HS1 166-04	1455	27.0	10.04	90.0	90.5	89.0	0.86	0.84	0.75	6.0	2.2	2.5	0.2222	118	160L FLP	2FD1 166-04	181
18.5	25.0	180M	2HS1 183-04	1460	34.0	12.34	90.5	90.5	89.5	0.84	0.81	0.74	6.0	2.2	2.5	0.3222	149	180L FLP	2FD1 183-04	204
22.0	30.0	180L	2HS1 186-04	1460	39.0	14.68	91.0	91.0	90.0	0.86	0.82	0.76	6.0	2.2	2.5	0.3790	166	180L FLP	2FD1 186-04	215
30.0	40.0	200L	2HS1 206-04	1465	52.0	19.95	92.0	92.0	91.0	0.87	0.84	0.77	6.0	2.2	2.5	0.8066	242	200L FLP	2FD1 206-04	308
37.0	50.0	225SX	2HS1 220-04	1470	64.0	24.52	92.5	92.5	91.5	0.87	0.85	0.79	6.0	2.2	2.5	1.2224	325	225SX FLP	2FD1 220-04	411
45.0	60.0	225MX	2HS1 223-04	1475	77.0	29.72	93.0	93.0	92.0	0.87	0.85	0.79	6.0	2.2	2.5	1.4552	359	225MX FLP	2FD1 223-04	423
55.0	75.0	250MX	2HS1 253-04	1480	92.0	36.20	94.0	94.0	93.0	0.88	0.87	0.82	6.0	2.2	2.5	2.2563	390	250MX FLP	2FD1 253-04	536
75.0	100.0	280SX	2HS1 280-04	1482	130.0	49.29	94.0	94.0	93.0	0.85	0.83	0.80	6.0	2.2	2.5	3.9994	570	280SX FLP	2FD1 280-04	745
90.0	120.0	280MX	2HS1 283-04	1482	155.0	59.15	94.5	94.5	93.5	0.85	0.83	0.80	6.0	2.2	2.5	4.7993	590	280MX FLP	2FD1 283-04	775
110.0	150.0	315SX	2HS1 310-04	1485	185.0	72.15	95.0	95.0	94.0	0.87	0.85	0.81	6.0	2.2	2.5	8.1503	764	315SX FLP	2FD1 310-04	1270
132.0	180.0	315MX	2HS1 313-04	1485	223.0	86.58	95.2	95.2	94.5	0.87	0.85	0.81	6.0	2.2	2.5	9.7803	800	315MX FLP	2FD1 313-04	1305
160.0	215.0	315LX	2HS1 316-04	1485	268.0	104.94	95.5	95.5	94.5	0.87	0.85	0.81	6.0	2.2	2.5	11.8549	950	315LX FLP	2FD1 316-04	1345
200.0	270.0	315LX	2HS1 317-04	1485	334.0	131.18	95.5	95.5	94.5	0.87	0.85	0.81	6.0	2.2	2.5	14.8187	1000	315LX FLP	2FD1 317-04	1395
225.0	300.0	355SX	2HS1 350-04	1488	375.0	147.28	96.0	96.0	95.2	0.87	0.84	0.77	6.5	2.0	2.4	12.9372	1670			
250.0	335.0	355MX	2HS1 353-04	1488	416.0	163.64	96.0	96.0	95.2	0.87	0.84	0.77	6.5	2.0	2.4	14.2641	1740			
275.0	370.0	355LX	2HS1 356-04	1488	454.0	180.01	96.2	96.2	95.5	0.88	0.86	0.78	6.5	2.0	2.4	16.2545	1840			
315.0	425.0	355LX	2HS1 357-04	1488	515.0	206.19	96.2	96.2	95.5	0.88	0.86	0.78	6.5	2.0	2.4	19.2400	1980			

Note: Motors upto 1.5kW are star (Y) connected suitable for DOL starting. Motors above 1.5kW are delta (Δ) connected suitable for DOL / Y/Δ starting.

ELECTRICAL PERFORMANCE - STANDARD MOTOR

6 POLE MOTOR

6 POLE MOTOR

Output		Frame Size	Type Designation	Speed (rpm)	Current (A)	Torque (kgm)	Efficiency %			Power Factor			I _{ST} /I _N	T _{ST} /T _N	T _{PO} /T _N	GD ² (kgm ²)	Wt. (kg)	Flameproof (Ex'd) Motors		
KW	HP						FL	3/4L	1/2L	FL	3/4L	1/2L						Wt. (kg)	Frame Size	Type Designation
0.093	0.125	71	2HS1 070-06	870	0.45	0.10	52.0	49.0	40.0	0.55	0.44	0.33	3.0	2.0	2.1	0.0024	8	71 FLP	2FD1 070-06	20
0.12	0.16	71	2HS1 071-06	880	0.55	0.13	55.0	52.0	41.0	0.55	0.45	0.34	3.0	2.0	2.1	0.0024	8	71 FLP	2FD1 071-06	20
0.18	0.25	71	2HS1 073-06	900	0.65	0.19	60.0	55.0	42.0	0.64	0.55	0.38	3.0	2.0	2.1	0.0033	9	71 FLP	2FD1 073-06	21
0.25	0.33	71	2HS1 074-06	905	0.85	0.27	64.0	59.0	44.0	0.64	0.55	0.38	3.0	2.0	2.1	0.0033	9	71 FLP	2FD1 074-06	21
0.37	0.50	80	2HS1 080-06	915	1.10	0.39	67.0	66.0	63.0	0.70	0.63	0.51	4.0	2.0	2.1	0.0049	12	80 FLP	2FD1 080-06	27
0.55	0.75	80	2HS1 083-06	920	1.55	0.58	70.0	69.0	66.0	0.71	0.63	0.51	4.0	2.0	2.1	0.0063	13	80 FLP	2FD1 083-06	28
0.75	1.0	90S	2HS1 090-06	925	2.0	0.79	72.0	71.0	66.0	0.72	0.64	0.52	5.0	2.2	2.4	0.0095	18	90 FLP	2FD1 090-06	38
1.1	1.5	90L	2HS1 096-06	930	2.9	1.15	75.0	74.0	69.0	0.70	0.58	0.42	5.0	2.2	2.4	0.0122	20	90 FLP	2FD1 096-06	41
1.5	2.0	100L	2HS1 106-06	940	3.5	1.55	76.0	75.0	71.0	0.78	0.73	0.60	5.0	2.0	2.3	0.0269	28	100L FLP	2FD1 106-06	51
2.2	3.0	112M	2HS1 123-06	945	4.9	2.27	80.0	79.5	75.5	0.78	0.70	0.55	5.0	2.0	2.3	0.0467	39	112M FLP	2FD1 123-06	63
3.7	5.0	132S	2HS1 130-06	950	7.5	3.79	82.5	82.5	81.5	0.83	0.73	0.64	5.0	2.0	2.3	0.0826	58	132M FLP	2FD1 130-06	87
5.5	7.5	132M	2HS1 133-06	950	11.0	5.64	85.0	85.0	83.5	0.82	0.77	0.67	5.0	2.0	2.3	0.1156	66	132M FLP	2FD1 133-06	94
7.5	10.0	160M	2HS1 163-06	960	15.0	7.61	87.0	87.0	84.5	0.80	0.76	0.68	5.5	2.0	2.3	0.2625	98	160L FLP	2FD1 163-06	162
9.3	12.5	160L	2HS1 166-06	965	17.5	9.39	88.0	88.0	85.0	0.84	0.81	0.70	5.5	2.0	2.3	0.3440	123	160L FLP	2FD1 166-06	169
11.0	15.0	160L	2HS1 167-06	970	20.5	11.05	88.5	88.5	87.5	0.84	0.81	0.70	5.5	2.0	2.3	0.3440	123	160L FLP	2FD1 167-06	169
15.0	20.0	180L	2HS1 186-06	970	27.5	15.06	89.5	89.5	88.0	0.85	0.82	0.72	5.5	2.0	2.3	0.5949	165	180L FLP	2FD1 186-06	213
18.5	25.0	200L	2HS1 206-06	975	34.0	18.48	90.5	90.5	89.0	0.84	0.82	0.73	5.5	2.0	2.3	0.8605	223	200L FLP	2FD1 206-06	286
22.0	30.0	200L	2HS1 207-06	975	40.0	21.98	91.0	91.0	90.5	0.84	0.82	0.73	5.5	2.0	2.3	1.0123	242	200L FLP	2FD1 207-06	301
30.0	40.0	225MX	2HS1 223-06	980	54.0	29.82	92.0	92.0	90.5	0.84	0.82	0.74	6.0	2.0	2.3	1.8378	357	225MX FLP	2FD1 223-06	421
37.0	50.0	250MX	2HS1 253-06	982	66.5	36.70	92.5	92.5	90.5	0.84	0.82	0.74	6.0	2.0	2.3	2.5127	390	250MX FLP	2FD1 253-06	560
45.0	60.0	280SX	2HS1 280-06	983	79.0	44.59	93.0	93.0	92.0	0.85	0.83	0.75	6.0	2.1	2.4	4.3751	552	280SX FLP	2FD1 280-06	740
55.0	75.0	280MX	2HS1 283-06	983	96.0	54.50	93.0	93.0	92.0	0.86	0.84	0.76	6.0	2.1	2.4	5.2502	580	280MX FLP	2FD1 283-06	770
75.0	100.0	315SX	2HS1 310-06	987	131.0	74.01	94.0	94.0	93.0	0.85	0.84	0.75	6.0	2.1	2.4	7.2611	750	315SX FLP	2FD1 310-06	1285
90.0	120.0	315MX	2HS1 313-06	987	157.0	88.81	94.0	94.0	93.0	0.85	0.84	0.75	6.0	2.1	2.4	8.5948	780	315MX FLP	2FD1 313-06	1320
110.0	150.0	315LX	2HS1 316-06	987	189.0	108.55	94.5	94.5	93.5	0.86	0.83	0.76	6.0	2.1	2.4	10.3731	960	315LX FLP	2FD1 316-06	1355
132.0	180.0	315LX	2HS1 317-06	987	227.0	130.26	94.5	94.5	93.5	0.86	0.83	0.76	6.0	2.1	2.4	12.4477	985	315LX FLP	2FD1 317-06	1380
160.0	215.0	355SX	2HS1 350-06	988	279.0	157.73	95.2	95.2	94.5	0.84	0.81	0.73	6.0	2.0	2.5	17.8193	1660			
200.0	270.0	355MX	2HS1 353-06	988	345.0	197.17	95.5	95.5	95.0	0.84	0.81	0.75	6.0	2.0	2.5	22.3883	1830			
225.0	300.0	355LX	2HS1 356-06	988	385.0	221.81	95.5	95.5	95.0	0.85	0.82	0.76	6.0	2.0	2.5	25.1298	1920			
250.0	335.0	355LX	2HS1 357-06	988	430.0	246.46	95.6	95.6	95.1	0.85	0.82	0.76	6.0	2.0	2.5	27.8712	2020			

Note: Motors upto 1.5kW are star (Y) connected suitable for DOL starting. Motors above 1.5kW are delta (Δ) connected suitable for DOL / Y/Δ starting.

ELECTRICAL PERFORMANCE - STANDARD MOTOR

8 POLE MOTOR

8 POLE MOTOR

Output		Safe Area Motors										Flameproof (Ex'd') Motors								
KW	HP	Frame Size	Type Designation	Speed (rpm)	Current (A)	Torque (kgm)	Efficiency %			Power Factor			I_{st}/I_n	T_{st}/T_n	T_{Po}/T_n	GD ² (kgm ²)	Wt. (kg)	Frame Size	Type Designation	Wt. (kg)
							FL	3/4L	1/2L	FL	3/4L	1/2L								
0.093	0.125	71	2HS1 070-08	665	0.55	0.14	47.0	43.0	35.0	0.50	0.44	0.33	2.5	1.5	1.7	0.0024	8	71 FLP	2FD1 070-08	21
0.12	0.16	71	2HS1 073-08	665	0.65	0.18	50.0	46.0	38.0	0.51	0.45	0.35	2.5	1.5	1.7	0.0033	9	71 FLP	2FD1 073-08	21
0.18	0.25	80	2HS1 080-08	685	0.80	0.26	54.0	49.0	41.0	0.58	0.49	0.40	3.0	1.6	1.8	0.0049	12	80 FLP	2FD1 080-08	28
0.25	0.33	80	2HS1 083-08	690	1.05	0.35	57.0	54.0	45.0	0.58	0.49	0.40	3.0	1.6	1.8	0.0063	13	80 FLP	2FD1 083-08	29
0.37	0.50	90S	2HS1 090-08	690	1.30	0.52	64.0	62.0	55.0	0.62	0.53	0.43	3.5	1.7	1.9	0.0095	18	90 FLP	2FD1 090-08	38
0.55	0.75	90L	2HS1 096-08	690	1.85	0.78	67.0	66.0	61.0	0.62	0.53	0.43	3.5	1.7	1.9	0.0122	20	90 FLP	2FD1 096-08	40
0.75	1.0	100L	2HS1 106-08	700	2.1	1.04	72.0	71.0	66.0	0.69	0.59	0.46	4.0	1.8	2.0	0.0228	26	100L FLP	2FD1 106-08	48
1.1	1.5	100L	2HS1 107-08	700	3.0	1.53	74.0	73.0	71.0	0.69	0.60	0.48	4.0	1.8	2.0	0.0296	29	100L FLP	2FD1 107-08	50
1.5	2.0	112M	2HS1 123-08	705	3.9	2.07	77.0	77.0	74.0	0.69	0.64	0.51	4.0	1.9	2.1	0.0467	39	112M FLP	2FD1 123-08	63
2.2	3.0	132S	2HS1 130-08	710	5.2	3.02	79.0	79.0	76.0	0.75	0.65	0.52	5.0	2.2	2.4	0.0826	58	132M FLP	2FD1 130-08	86
3.7	5.0	132M	2HS1 133-08	710	8.6	5.08	81.0	81.0	79.0	0.74	0.65	0.52	5.0	2.2	2.4	0.1156	66	132M FLP	2FD1 133-08	93
5.5	7.5	160M	2HS1 163-08	720	12.0	7.44	86.0	86.0	83.0	0.74	0.68	0.58	5.0	2.0	2.2	0.2565	98	160L FLP	2FD1 163-08	168
7.5	10.0	160L	2HS1 166-08	720	15.7	10.15	87.0	87.0	85.0	0.76	0.71	0.58	5.0	2.0	2.2	0.3440	123	160L FLP	2FD1 166-08	182
9.3	12.5	180M	2HS1 183-08	725	20.0	12.49	87.5	87.5	85.0	0.74	0.70	0.57	5.0	2.0	2.2	0.5057	152	180L FLP	2FD1 183-08	202
11.0	15.0	180L	2HS1 186-08	725	24.0	14.78	88.0	88.0	85.0	0.72	0.68	0.55	5.0	2.0	2.2	0.5949	165	180L FLP	2FD1 186-08	213
15.0	20.0	200L	2HS1 206-08	725	31.0	20.15	88.5	88.0	86.0	0.76	0.72	0.60	5.0	2.0	2.2	1.0123	242	200L FLP	2FD1 206-08	300
18.5	25.0	225SX	2HS1 220-08	728	37.0	24.75	89.5	89.5	88.0	0.78	0.74	0.68	5.0	2.0	2.2	1.5437	325	225MX FLP	2FD1 220-08	407
22.0	30.0	225MX	2HS1 223-08	730	44.0	29.35	90.5	90.5	89.0	0.77	0.73	0.68	5.0	2.0	2.2	1.8378	357	225MX FLP	2FD1 223-08	419
30.0	40.0	250MX	2HS1 253-08	730	60.0	40.03	91.0	91.0	89.5	0.76	0.73	0.67	5.0	2.0	2.2	2.5127	390	250MX FLP	2FD1 253-08	553
37.0	50.0	280SX	2HS1 280-08	735	71.0	49.03	92.0	92.0	90.0	0.79	0.76	0.66	5.0	2.0	2.2	4.8613	570	280SX FLP	2FD1 280-08	745
45.0	60.0	280MX	2HS1 283-08	735	88.0	59.63	92.5	92.5	91.5	0.77	0.74	0.64	5.0	2.0	2.2	5.8335	590	280MX FLP	2FD1 283-08	775
55.0	75.0	315SX	2HS1 310-08	737	106.0	72.69	93.0	93.0	92.0	0.78	0.75	0.65	5.0	2.0	2.2	7.2611	750	315SX FLP	2FD1 310-08	1260
75.0	100.0	315MX	2HS1 313-08	737	145.0	99.12	93.0	93.0	92.0	0.77	0.74	0.64	5.0	2.0	2.2	8.5948	780	315MX FLP	2FD1 313-08	1290
90.0	120.0	315LX	2HS1 316-08	737	170.0	118.94	93.5	93.5	92.5	0.79	0.75	0.66	5.0	2.0	2.2	10.3731	930	315LX FLP	2FD1 316-08	1325
110.0	150.0	315LX	2HS1 317-08	737	207.0	145.37	93.5	93.5	92.5	0.79	0.75	0.66	5.0	2.0	2.2	12.4477	960	315LX FLP	2FD1 317-08	1355
132.0	180.0	355SX	2HS1 350-08	738	250.0	174.21	94.5	94.5	93.5	0.78	0.75	0.65	6.0	2.0	2.2	12.9372	1670			
160.0	215.0	355MX	2HS1 353-08	738	302.0	211.17	94.5	94.5	93.5	0.78	0.75	0.65	6.0	2.0	2.2	14.9276	1760			
200.0	270.0	355LX	2HS1 356-08	740	374.0	263.24	95.0	95.0	94.0	0.78	0.75	0.65	6.0	2.0	2.2	18.2448	1920			
225.0	300.0	355LX	2HS1 357-08	740	420.0	296.15	95.0	95.0	94.0	0.78	0.75	0.65	6.0	2.0	2.2	20.2352	2020			

Note: Motors upto 1.5kW are star (Y) connected suitable for DOL starting. Motors above 1.5kW are delta (Δ) connected suitable for DOL / Y/Δ starting.

ELECTRICAL PERFORMANCE - IE2 MOTOR

2 POLE MOTOR

2 POLE MOTOR

Output		Safe Area Motors										Flameproof (Ex'd) Motors								
KW	HP	Frame Size	Type Designation	Speed (rpm)	Current (A)	Torque (kgm)	Efficiency %			Power Factor			T_{5r}/T_N	T_{90}/T_N	GD ² (kgm ²)	Wt. (kg)	Frame Size	Type Designation	Wt. (kg)	
							FL	3/4L	1/2L	FL	3/4L	1/2L								
0.37	0.50	71	2HE2 070-02	2810	0.90	0.13	72.2	72.2	70.0	0.70	0.75	0.79	5.0	2.2	2.6	0.0010	8	71 FLP	2FE2 070-02	21
0.55	0.75	71	2HE2 073-02	2840	1.3	0.19	74.8	74.8	71.0	0.70	0.75	0.79	5.5	2.3	2.7	0.0014	9	71 FLP	2FE2 073-02	22
0.75	1.0	80	2HE2 080-02	2860	1.7	0.26	77.4	77.4	75.0	0.72	0.76	0.79	6.5	2.3	2.7	0.0038	13	80 FLP	2FE2 080-02	27
1.1	1.5	80	2HE2 083-02	2860	2.4	0.37	79.6	79.6	76.0	0.80	0.77	0.73	6.5	2.3	2.7	0.0049	15	80 FLP	2FE2 083-02	28
1.5	2.0	90S	2HE2 090-02	2880	3.2	0.51	81.3	81.3	77.0	0.80	0.77	0.73	6.5	2.4	2.8	0.0072	19	90 FLP	2FE2 090-02	38
2.2	3.0	90L	2HE2 096-02	2890	4.5	0.74	83.2	83.2	80.0	0.82	0.78	0.74	7.0	2.4	2.8	0.0093	22	90 FLP	2FE2 096-02	41
3.7	5.0	100L	2HE2 106-02	2900	7.2	1.24	85.5	85.5	82.0	0.84	0.81	0.77	7.0	2.4	2.8	0.0130	30	100L FLP	2FE2 106-02	51
5.5	7.5	132S	2HE2 130-02	2925	10.0	1.83	87.0	87.0	84.0	0.88	0.85	0.80	7.0	2.3	2.7	0.0583	56	132M FLP	2FE2 130-02	94
7.5	10.0	132S	2HE2 131-02	2925	13.3	2.50	88.1	88.1	85.0	0.89	0.86	0.82	7.0	2.2	2.5	0.0583	58	132M FLP	2FE2 131-02	94
9.3	12.5	160M	2HE2 163-02	2930	16.5	3.09	88.8	88.8	85.5	0.88	0.85	0.80	7.0	2.3	2.8	0.1301	103	160L FLP	2FE2 163-02	162
11.0	15.0	160M	2HE2 164-02	2935	19.5	3.65	89.4	89.4	86.0	0.88	0.85	0.80	7.0	2.3	2.8	0.1301	103	160L FLP	2FE2 164-02	162
15.0	20.0	160M	2HE2 165-02	2940	26.4	4.97	90.3	90.3	86.5	0.88	0.85	0.80	7.0	2.3	2.8	0.1705	120	160L FLP	2FE2 165-02	171
18.5	25.0	160L	2HE2 166-02	2940	32.0	6.13	90.9	90.9	87.0	0.88	0.85	0.80	7.0	2.3	2.8	0.1974	125	160L FLP	2FE2 166-02	181
22.0	30.0	180M	2HE2 183-02	2945	38.0	7.28	91.3	91.3	88.0	0.88	0.85	0.80	7.0	2.3	2.7	0.1972	163	180L FLP	2FE2 183-02	200
30.0	40.0	200L	2HE2 206-02	2955	51.0	9.89	92.0	92.0	89.0	0.89	0.86	0.81	7.0	2.3	2.7	0.4468	246	200L FLP	2FE2 206-02	294
37.0	50.0	200L	2HE2 207-02	2960	62.8	12.18	92.5	92.5	89.5	0.89	0.86	0.81	7.0	2.3	2.7	0.5257	248	200L FLP	2FE2 207-02	309
45.0	60.0	225M	2HE2 223-02	2960	76.0	14.81	92.9	92.9	90.0	0.89	0.86	0.81	7.0	2.3	2.7	0.6722	376	225M FLP	2FE2 223-02	390
55.0	75.0	250M	2HE2 253-02	2965	91.0	18.07	93.2	93.2	90.5	0.90	0.87	0.83	7.0	2.3	2.7	1.0690	369	250M FLP	2FE2 253-02	530
75.0	100.0	280S	2HE2 280-02	2975	124.0	24.55	93.8	93.8	91.0	0.90	0.87	0.83	7.0	2.3	2.7	2.2591	570	280S FLP	2FE2 280-02	735
90.0	120.0	280M	2HE2 283-02	2975	148.0	29.47	94.1	94.1	91.5	0.90	0.87	0.83	7.0	2.3	2.7	2.4850	592	280M FLP	2FE2 283-02	770
110.0	150.0	315S	2HE2 310-02	2980	180.0	35.95	94.3	94.3	91.8	0.90	0.87	0.83	7.0	2.2	2.6	3.3595	750	315S FLP	2FE2 310-02	1230
125.0	170.0	315M	2HE2 313-02	2980	204.0	40.86	94.5	94.5	92.0	0.90	0.87	0.83	7.0	2.2	2.6	3.9994	780	315M FLP	2FE2 313-02	1253
132.0	180.0	315M	2HE2 314-02	2980	216.0	43.14	94.6	94.6	92.0	0.90	0.87	0.83	7.0	2.2	2.6	3.9994	780	315M FLP	2FE2 314-02	1255
160.0	215.0	315L	2HE2 316-02	2985	260.0	52.21	94.8	94.8	92.5	0.90	0.87	0.83	7.0	2.2	2.6	4.6393	930	315L FLP	2FE2 316-02	1290
200.0	270.0	315L	2HE2 317-02	2985	326.0	65.26	95.0	95.0	93.0	0.90	0.87	0.83	7.0	2.2	2.6	4.1594	965	315L FLP	2FE2 317-02	1325
250.0	335.0	355M	2HE2 353-02	2985	407.0	81.57	95.0	95.0	93.0	0.90	0.87	0.83	7.0	2.0	2.4	8.9735	1710			
315.0	425.0	355L	2HE2 357-02	2985	512.0	102.78	95.0	95.0	93.0	0.90	0.87	0.83	7.0	2.0	2.4	10.0292	1900			

Note: Motors upto 1.5kW are star (Y) connected suitable for DOL starting. Motors above 1.5kW are delta (Δ) connected suitable for DOL / Y/Δ starting.

ELECTRICAL PERFORMANCE - IE2 MOTOR

4 POLE MOTOR

4 POLE MOTOR

Safe Area Motors													Flameproof (Ex'd') Motors							
Output KW	HP	Frame Size	Type Designation	Speed (rpm)	Current (A)	Torque (kgm)	Efficiency %			Power Factor			I _{st} /I _N	T _{st} /T _N	T _{po} /T _N	GD ² (kgm ²)	Wt. (kg)	Frame Size	Type Designation	Wt. (kg)
							FL	3/4L	1/2L	FL	3/4L	1/2L								
0.37	0.50	71	2HE2 073-04	1390	1.0	0.26	70.1	70.1	65.0	0.73	0.67	0.58	6.0	1.9	2.3	0.0022	9	71 FLP	2FE2 073-04	20
0.55	0.75	80	2HE2 080-04	1420	1.4	0.38	75.1	75.1	71.0	0.73	0.67	0.58	6.0	1.9	2.3	0.0038	13	80 FLP	2FE2 080-04	26
0.75	1.0	80	2HE2 083-04	1415	1.7	0.52	79.6	79.6	75.0	0.77	0.70	0.63	6.0	2.5	3.0	0.0062	17	80 FLP	2FE2 083-04	30
1.1	1.5	90S	2HE2 090-04	1430	2.4	0.75	81.4	81.4	80.0	0.78	0.73	0.65	6.0	2.5	3.0	0.0093	20	90 FLP	2FE2 090-04	40
1.5	2.0	90L	2HE2 096-04	1430	3.2	1.02	82.8	82.8	81.0	0.79	0.74	0.65	6.0	2.4	2.8	0.0134	25	90 FLP	#	-
2.2	3.0	100L	2HE2 106-04	1440	4.4	1.49	84.3	84.3	82.5	0.83	0.76	0.65	6.5	2.4	2.8	0.0182	28	100L FLP	2FE2 106-04	50
3.7	5.0	112M	2HE2 123-04	1445	7.1	2.49	86.3	86.3	85.0	0.84	0.80	0.68	7.0	2.4	2.8	0.0404	45	112M FLP	2FE2 123-04	68
5.5	7.5	132S	2HE2 130-04	1450	10.5	3.69	87.7	87.7	86.0	0.83	0.79	0.72	7.0	2.4	2.8	0.0676	57	132M FLP	2FE2 130-04	92
7.5	10.0	132M	2HE2 133-04	1450	14.1	5.04	88.7	88.7	87.0	0.83	0.79	0.72	7.0	2.2	2.6	0.1013	66	132M FLP	2FE2 133-04	96
9.3	12.5	160M	2HE2 163-04	1455	17.5	6.23	89.3	89.3	87.5	0.83	0.80	0.72	7.0	2.2	2.6	0.1696	100	160L FLP	2FE2 163-04	167
11.0	15.0	160M	2HE2 164-04	1455	20.5	7.36	89.8	89.8	88.0	0.83	0.80	0.72	7.0	2.2	2.6	0.1871	105	160L FLP	2FE2 164-04	170
15.0	20.0	160L	2HE2 166-04	1455	27.5	10.04	90.6	90.6	89.0	0.84	0.80	0.73	7.0	2.2	2.6	0.2573	123	160L FLP	2FE2 166-04	186
18.5	25.0	180M	2HE2 183-04	1460	33.5	12.34	91.2	91.2	90.5	0.84	0.80	0.74	7.0	2.3	2.6	0.3222	156	180L FLP	2FE2 183-04	205
22.0	30.0	180L	2HE2 186-04	1460	40.0	14.68	91.6	91.6	90.5	0.84	0.80	0.74	7.0	2.3	2.6	0.3790	172	180L FLP	2FE2 186-04	215
30.0	40.0	200L	2HE2 206-04	1465	54.0	19.95	92.3	92.3	91.0	0.84	0.80	0.74	7.0	2.3	2.6	0.7298	254	200L FLP	2FE2 206-04	305
37.0	50.0	225SX	2HE2 220-04	1470	65.0	24.52	92.7	92.7	91.5	0.85	0.83	0.77	7.0	2.3	2.6	1.1642	335	225SX FLP	2FE2 220-04	407
45.0	60.0	225MX	2HE2 223-04	1475	78.0	29.72	93.1	93.1	92.0	0.86	0.83	0.77	7.0	2.3	2.6	1.3970	370	225MX FLP	2FE2 223-04	418
55.0	75.0	250MX	2HE2 253-04	1480	94.0	36.20	93.5	93.5	93.0	0.87	0.84	0.79	7.0	2.3	2.6	1.9856	410	250MX FLP	2FE2 253-04	525
75.0	100.0	280SX	2HE2 280-04	1482	128.0	49.29	94.0	94.0	93.5	0.87	0.84	0.79	7.0	2.2	2.5	3.5195	590	280SX FLP	2FE2 280-04	733
90.0	120.0	280MX	2HE2 283-04	1482	152.0	59.15	94.2	94.2	93.5	0.87	0.84	0.80	7.0	2.2	2.5	4.1594	610	280MX FLP	2FE2 283-04	754
110.0	150.0	315SX	2HE2 310-04	1485	187.0	72.15	94.5	94.5	93.7	0.87	0.84	0.80	7.0	2.2	2.5	7.7057	790	315SX FLP	2FE2 310-04	1260
125.0	170.0	315MX	2HE2 313-04	1485	215.0	81.99	94.6	94.6	93.8	0.86	0.84	0.80	7.0	2.2	2.5	8.8912	820	315MX FLP	2FE2 313-04	1285
132.0	180.0	315MX	2HE2 314-04	1485	226.0	86.58	94.7	94.7	94.0	0.86	0.84	0.80	7.0	2.2	2.5	8.8912	820	315MX FLP	2FE2 314-04	1285
160.0	215.0	315LX	2HE2 316-04	1485	272.0	104.94	94.9	94.9	94.2	0.86	0.84	0.80	7.0	2.2	2.5	10.3731	990	315LX FLP	2FE2 316-04	1320
200.0	270.0	315LX	2HE2 317-04	1485	336.0	131.18	95.1	95.1	94.6	0.87	0.84	0.80	7.0	2.2	2.5	13.0404	1000	315LX FLP	2FE2 317-04	1360
250.0	335.0	355MX	2HE2 353-04	1488	420.0	163.64	95.1	95.1	94.6	0.87	0.84	0.78	7.0	2.0	2.4	15.9163	1740	315LX FLP	2FE2 317-04	1360
315.0	425.0	355LX	2HE2 357-04	1488	527.0	206.19	95.1	95.1	94.6	0.87	0.84	0.78	7.0	2.0	2.4	19.9879	1980	# Currently not available		

Note: Motors upto 1.5kW are star (Y) connected suitable for DOL starting. Motors above 1.5kW are delta (Δ) connected suitable for DOL / Y/Δ starting.

ELECTRICAL PERFORMANCE - IE2 MOTOR

6 POLE MOTOR

6 POLE MOTOR

Output		Safe Area Motors										Flameproof (Ex'd') Motors								
KW	HP	Frame Size	Type Designation	Speed (rpm)	Current (A)	Torque (kgm)	Efficiency %			Power Factor			I _{st} /I _N	T _{st} /T _N	T ₉₀ /T _N	GD ² (kgm ²)	Wt. (kg)	Frame Size	Type Designation	Wt. (kg)
							FL	3/4L	1/2L	FL	3/4L	1/2L								
0.37	0.50	80	2HE2 080-06	925	1.0	0.39	69.0	69.0	64.0	0.54	0.65	0.75	4.5	1.9	2.2	0.0049	12	80 FLP	2FE2 080-06	27
0.55	0.75	80	2HE2 083-06	930	1.5	0.58	72.9	72.9	67.0	0.52	0.63	0.70	4.5	2.2	2.6	0.0063	13	80 FLP	2FE2 083-06	28
0.75	1.0	90S	2HE2 090-06	935	2.0	0.78	75.9	75.9	73.0	0.52	0.63	0.69	5.0	2.1	2.5	0.0122	20	90 FLP	2FE2 090-06	41
1.1	1.5	90L	2HE2 096-06	935	2.7	1.15	78.1	78.1	74.0	0.54	0.68	0.73	5.0	2.1	2.5	0.0176	24	90 FLP	2FE2 096-06	45
1.5	2.0	100L	2HE2 106-06	945	3.4	1.55	79.8	79.8	77.0	0.56	0.70	0.77	5.5	2.1	2.5	0.0269	28	100L FLP	2FE2 106-06	51
2.2	3.0	112M	2HE2 123-06	950	4.8	2.26	81.8	81.8	78.5	0.58	0.71	0.78	6.0	2.1	2.5	0.0467	39	112M FLP	2FE2 123-06	63
3.7	5.0	132S	2HE2 130-06	950	7.6	3.79	84.3	84.3	80.0	0.62	0.74	0.80	6.0	2.2	2.6	0.0991	60	132M FLP	2FE2 130-06	89
5.5	7.5	132M	2HE2 133-06	955	11.0	5.61	86.0	86.0	83.0	0.62	0.76	0.81	6.5	2.2	2.6	0.1321	68	132M FLP	2FE2 133-06	95
7.5	10.0	160M	2HE2 163-06	960	14.6	7.61	87.2	87.2	84.0	0.65	0.77	0.82	7.0	2.2	2.6	0.2625	100	160L FLP	2FE2 163-06	162
9.3	12.5	160L	2HE2 166-06	965	18.0	9.39	88.0	88.0	85.0	0.65	0.77	0.82	7.0	2.1	2.5	0.3440	117	160L FLP	2FE2 166-06	169
11.0	15.0	160L	2HE2 167-06	970	21.0	11.05	88.7	88.7	86.0	0.65	0.77	0.82	7.0	2.1	2.5	0.4164	124	160L FLP	2FE2 167-06	174
15.0	20.0	180L	2HE2 186-06	970	29.0	15.06	89.7	89.7	86.5	0.65	0.75	0.80	7.0	2.1	2.5	0.5949	170	180L FLP	2FE2 186-06	213
18.5	25.0	200L	2HE2 206-06	975	35.6	18.48	90.4	90.4	87.0	0.65	0.75	0.80	7.0	2.1	2.5	0.8605	238	200L FLP	2FE2 206-06	286
22.0	30.0	200L	2HE2 207-06	975	42.0	21.98	90.9	90.9	87.5	0.65	0.75	0.80	7.0	2.1	2.5	1.1642	255	200L FLP	2FE2 207-06	315
30.0	40.0	225MX	2HE2 223-06	975	56.0	29.97	91.7	91.7	88.0	0.66	0.77	0.81	7.0	2.1	2.4	1.4702	372	225MX FLP	2FE2 223-06	408
37.0	50.0	250MX	2HE2 253-06	980	68.0	36.77	92.2	92.2	89.0	0.67	0.79	0.82	7.0	2.1	2.4	2.0474	390	250MX FLP	2FE2 253-06	530
45.0	60.0	280SX	2HE2 280-06	983	80.0	44.59	92.7	92.7	89.4	0.73	0.81	0.84	7.0	2.2	2.4	3.8890	570	280SX FLP	2FE2 280-06	720
55.0	75.0	280MX	2HE2 283-06	983	98.0	54.50	93.1	93.1	89.7	0.73	0.81	0.84	7.0	2.2	2.4	4.8613	590	280MX FLP	2FE2 283-06	760
75.0	100.0	315SX	2HE2 310-06	986	133.0	74.09	93.7	93.7	90.0	0.73	0.81	0.84	7.0	2.1	2.4	7.2611	750	315SX FLP	2FE2 310-06	1285
90.0	120.0	315MX	2HE2 313-06	986	159.0	88.90	94.0	94.0	92.0	0.74	0.81	0.84	7.0	2.1	2.4	8.5948	780	315MX FLP	2FE2 313-06	1320
110.0	150.0	315MX	2HE2 314-06	986	192.0	108.66	94.3	94.3	92.0	0.75	0.82	0.85	7.0	2.1	2.4	10.3731	960	315MX FLP	2FE2 314-06	1355
125.0	170.0	315LX	2HE2 316-06	987	215.0	123.35	94.4	94.4	92.5	0.76	0.83	0.86	7.0	2.1	2.4	10.3731	985	315LX FLP	2FE2 316-06	1355
132.0	180.0	315LX	2HE2 317-06	987	227.0	130.26	94.6	94.6	93.0	0.76	0.83	0.86	7.0	2.1	2.4	10.3731	985	315LX FLP	2FE2 317-06	1355
160.0	215.0	355SX	2HE2 350-06	988	280.0	157.73	94.8	94.8	94.0	0.75	0.82	0.85	7.0	2.1	2.4	19.1900	1660			
200.0	270.0	355MX	2HE2 353-06	988	345.0	197.17	95.0	95.0	94.5	0.75	0.82	0.85	7.0	2.1	2.4	21.0176	1830			
250.0	335.0	355LX	2HE2 357-06	988	433.0	246.46	95.0	95.0	94.5	0.75	0.82	0.85	7.0	2.1	2.4	23.7590	2020			

Note: Motors upto 1.5kW are star (Y) connected suitable for DOL starting. Motors above 1.5kW are delta (Δ) connected suitable for DOL / Y/Δ starting.

ELECTRICAL PERFORMANCE - IE3 MOTOR

2 POLE MOTOR

2 POLE MOTOR

Output		Safe Area Motors										Flameproof (Ex'd') Motors								
KW	HP	Frame Size	Type Designation	Speed (rpm)	Current (A)	Torque (kgm)	Efficiency %			Power Factor			I _{ST} /I _N	T _{ST} /T _N	T _{PO} /T _N	GD ² (kgm ²)	Wt. (kg)	Frame Size	Type Designation	Wt. (kg)
							FL	3/4L	1/2L	FL	3/4L	1/2L								
0.37	0.50	71	2HE3 070-02	2810	0.90	0.13	75.5	75.5	72.0	0.76	0.69	0.57	6.5	2.1	2.5	0.0010	8	71 FLP	2FE3 070-02	21
0.55	0.75	71	2HE3 073-02	2840	1.3	0.19	78.1	78.1	75.0	0.78	0.74	0.60	7.0	2.2	2.6	0.0014	9	71 FLP	2FE3 073-02	22
0.75	1.0	80	2HE3 080-02	2860	1.6	0.26	80.7	80.7	78.0	0.81	0.76	0.63	7.0	2.1	2.5	0.0049	15	80 FLP	2FE3 080-02	28
1.1	1.5	80	2HE3 083-02	2860	2.2	0.37	82.7	82.7	80.0	0.84	0.80	0.72	7.0	2.1	2.5	0.0062	17	80 FLP	2FE3 083-02	30
1.5	2.0	90S	2HE3 090-02	2850	3.0	0.51	84.2	84.2	84.0	0.83	0.81	0.75	7.0	2.5	3.0	0.0052	20	90 FLP	2FE3 090-02	36
2.2	3.0	90L	2HE3 096-02	2850	4.3	0.75	85.9	85.9	84.5	0.83	0.81	0.75	7.7	2.5	3.0	0.0066	23	90 FLP	2FE3 096-02	39
3.7	5.0	100L	2HE3 106-02	2890	6.8	1.25	87.8	87.8	85.0	0.86	0.83	0.77	7.7	2.5	3.0	0.0168	32	100L FLP	#	-
5.5	7.5	132S	2HE3 130-02	2945	9.8	1.82	89.2	89.2	87.0	0.88	0.86	0.82	7.7	2.5	3.0	0.0583	58	132M FLP	2FE3 130-02	94
7.5	10.0	132S	2HE3 131-02	2945	13.0	2.48	90.1	90.1	89.5	0.89	0.87	0.84	7.7	2.5	3.0	0.0716	65	132M FLP	2FE3 131-02	98
9.3	12.5	160M	2HE3 163-02	2940	16.0	3.08	90.7	90.7	89.0	0.89	0.86	0.81	7.0	2.3	2.8	0.1700	115	160L FLP	#	-
11.0	15.0	160M	2HE3 164-02	2940	19.0	3.64	91.2	91.2	90.0	0.88	0.86	0.79	7.0	2.3	2.8	0.1700	117	160L FLP	#	-
15.0	20.0	160M	2HE3 165-02	2935	25.3	4.98	91.9	91.9	90.9	0.90	0.88	0.82	7.0	2.5	2.9	0.2040	123	160L FLP	#	-
18.5	25.0	160L	2HE3 166-02	2930	31.0	6.15	92.4	92.4	91.4	0.90	0.88	0.81	7.0	2.3	2.8	0.2312	135	160L FLP	#	-
22.0	30.0	180M	2HE3 183-02	2935	37.0	7.30	92.7	92.7	91.5	0.89	0.87	0.81	7.0	2.2	2.7	0.2585	172	180L FLP	2FE3 183-02	206
30.0	40.0	200L	2HE3 206-02	2950	49.0	9.91	93.3	93.3	92.2	0.91	0.89	0.85	7.0	2.0	2.5	0.5257	250	200L FLP	2FE3 206-02	309
37.0	50.0	200L	2HE3 207-02	2955	60.5	12.20	93.7	93.7	92.5	0.91	0.90	0.85	7.0	2.0	2.5	0.5257	253	200L FLP	2FE3 207-02	309
45.0	60.0	225M	2HE3 223-02	2960	73.0	14.81	94.0	94.0	93.0	0.91	0.90	0.86	7.0	2.3	2.5	0.8450	382	225M FLP	2FE3 223-02	410
55.0	75.0	250M	2HE3 253-02	2960	89.0	18.10	94.3	94.3	93.0	0.91	0.90	0.86	7.0	2.0	2.5	1.0690	373	250M FLP	2FE3 253-02	535
75.0	100.0	280S	2HE3 280-02	2965	121.5	24.64	94.7	94.7	93.5	0.91	0.90	0.86	7.0	2.0	2.8	2.9368	570	280S FLP	2FE3 280-02	735
90.0	120.0	280M	2HE3 283-02	2965	145.0	29.56	95.0	95.0	94.0	0.91	0.89	0.84	7.0	2.0	2.8	2.9368	592	280M FLP	2FE3 283-02	770
110.0	150.0	315S	2HE3 310-02	2975	177.0	36.01	95.2	95.2	94.0	0.91	0.90	0.86	7.0	1.9	2.6	4.6393	780	315S FLP	2FE3 310-02	1285
125.0	170.0	315M	2HE3 313-02	2975	201.0	40.92	95.3	95.3	94.0	0.91	0.90	0.86	7.7	2.0	2.6	4.6393	780	315M FLP	2FE3 313-02	1285
132.0	180.0	315M	2HE3 314-02	2975	212.0	43.22	95.4	95.4	94.2	0.91	0.90	0.87	7.5	1.9	2.6	4.6393	780	315M FLP	2FE3 314-02	1290
160.0	215.0	315L	2HE3 316-02	2975	257.0	52.38	95.6	95.6	94.0	0.91	0.90	0.88	7.5	1.9	2.6	5.4392	965	315L FLP	2FE3 316-02	1325
200.0	270.0	315L	2HE3 317-02	2975	320.0	65.48	95.8	95.8	94.5	0.91	0.90	0.87	7.5	2.0	2.6	5.5991	965	315L FLP	2FE3 317-02	1325
250.0	335.0	355M	2HE3 353-02	2980	403.0	81.71	95.8	95.8	94.0	0.90	0.88	0.84	7.5	1.9	2.6	8.9735	1710	#	Currently not available	
315.0	425.0	355L	2HE3 357-02	2980	506.0	102.96	95.8	95.8	94.0	0.90	0.88	0.84	7.5	2.0	2.6	10.0292	1900	#	Currently not available	

Note: Motors upto 1.5kW are star (Y) connected suitable for DOL starting. Motors above 1.5kW are delta (Δ) connected suitable for DOL / Y/Δ starting.

ELECTRICAL PERFORMANCE - IE3 MOTOR

4 POLE MOTOR

4 POLE MOTOR

Output		Safe Area Motors										Flameproof (Ex'd') Motors								
KW	HP	Frame Size	Type Designation	Speed (rpm)	Current (A)	Torque (kgm)	Efficiency %			Power Factor			I_{st}/I_N	T_{st}/T_N	T_{po}/T_N	GD ² (kgm ²)	Wt. (kg)	Frame Size	Type Designation	Wt. (kg)
							FL	3/4L	1/2L	FL	3/4L	1/2L								
0.37	0.50	71	2HE3 073-04	1420	1.0	0.25	73.0	73.0	68.0	0.50	0.63	0.71	5.0	2.2	2.6	0.0028	11	71 FLP	2FE3 073-04	22
0.55	0.75	80	2HE3 080-04	1430	1.3	0.37	78.0	78.0	74.0	0.53	0.66	0.75	6.0	2.2	2.6	0.0049	15	80 FLP	2FE3 080-04	27
0.75	1.0	80	2HE3 083-04	1430	1.6	0.51	82.5	82.5	78.0	0.64	0.75	0.79	6.5	2.6	3.0	0.0062	17	80 FLP	2FE3 083-04	30
1.1	1.5	90S	2HE3 090-04	1430	2.3	0.75	84.1	84.1	81.5	0.64	0.75	0.79	6.5	2.5	3.0	0.0093	20	90 FLP	2FE3 090-04	40
1.5	2.0	90L	2HE3 096-04	1435	3.1	1.02	85.3	85.3	83.0	0.64	0.75	0.79	6.5	2.5	3.0	0.0134	25	90 FLP	#	-
2.2	3.0	100L	2HE3 106-04	1440	4.3	1.49	86.7	86.7	84.0	0.67	0.78	0.82	7.5	2.5	3.0	0.0237	34	100L FLP	2FE3 106-04	52
3.7	5.0	112M	2HE3 123-04	1450	7.5	2.49	88.4	88.4	85.5	0.60	0.69	0.78	7.5	2.5	3.0	0.0497	45	112M FLP	2FE3 123-04	71
5.5	7.5	132S	2HE3 130-04	1455	10.5	3.68	89.6	89.6	87.0	0.65	0.76	0.81	7.5	2.5	3.0	0.0811	60	132M FLP	2FE3 130-04	93
7.5	10.0	132M	2HE3 133-04	1455	14.2	5.02	90.4	90.4	88.0	0.66	0.76	0.81	7.5	2.5	3.0	0.1081	68	132M FLP	2FE3 133-04	97
9.3	12.5	160M	2HE3 163-04	1465	16.5	6.18	91.0	91.0	90.0	0.86	0.82	0.86	7.5	2.5	2.8	0.2369	107	160L FLP	#	-
11.0	15.0	160M	2HE3 164-04	1460	19.8	7.34	91.4	91.4	90.2	0.85	0.80	0.85	7.0	2.3	2.6	0.2369	107	160L FLP	#	-
15.0	20.0	160L	2HE3 166-04	1470	26.2	9.94	92.1	92.1	91.4	0.86	0.83	0.86	7.0	2.4	2.7	0.3032	132	160L FLP	#	-
18.5	25.0	180M	2HE3 183-04	1470	32.8	12.26	92.6	92.6	91.6	0.85	0.81	0.85	7.0	2.4	2.7	0.3790	165	180L FLP	2FE3 183-04	215
22.0	30.0	180L	2HE3 186-04	1470	38.8	14.58	93.0	93.0	92.0	0.85	0.81	0.85	7.0	2.3	2.6	0.4359	180	180L FLP	2FE3 186-04	223
30.0	40.0	200L	2HE3 206-04	1475	52.5	19.81	93.6	93.6	92.5	0.85	0.81	0.85	7.5	2.3	2.6	0.9987	276	200L FLP	2FE3 206-04	325
37.0	50.0	225SX	2HE3 220-04	1475	63.5	24.43	93.9	93.9	93.0	0.86	0.83	0.86	7.0	2.3	2.6	1.3970	370	225SX FLP	2FE3 220-04	418
45.0	60.0	225MX	2HE3 223-04	1475	77.8	29.72	94.2	94.2	93.2	0.85	0.82	0.85	7.5	2.5	2.8	1.6299	390	225MX FLP	2FE3 223-04	430
55.0	75.0	250MX	2HE3 253-04	1482	92.0	36.15	94.6	94.6	94.0	0.88	0.86	0.88	7.5	2.5	2.8	2.3466	410	250MX FLP	2FE3 253-04	547
75.0	100.0	280SX	2HE3 280-04	1482	125.0	49.29	95.0	95.0	94.2	0.88	0.85	0.88	7.5	2.2	2.5	4.1594	610	280SX FLP	2FE3 280-04	754
90.0	120.0	280MX	2HE3 283-04	1482	150.0	59.15	95.2	95.2	94.0	0.88	0.85	0.88	7.5	2.2	2.5	5.1192	640	280MX FLP	2FE3 283-04	785
110.0	150.0	315SX	2HE3 310-04	1485	183.0	72.15	95.4	95.4	94.4	0.88	0.85	0.88	7.0	2.0	2.4	10.3731	775	315SX FLP	2FE3 310-04	1320
125.0	170.0	315MX	2HE3 313-04	1485	205.0	81.99	95.5	95.5	94.5	0.89	0.87	0.89	7.5	2.2	2.5	11.8549	950	315MX FLP	2FE3 313-04	1345
132.0	180.0	315MX	2HE3 314-04	1485	216.0	86.58	95.6	95.6	94.5	0.89	0.87	0.89	7.5	2.2	2.5	11.8549	950	315MX FLP	2FE3 314-04	1345
160.0	215.0	315LX	2HE3 316-04	1485	260.0	104.94	95.8	95.8	94.5	0.89	0.87	0.89	7.5	2.2	2.5	13.0404	980	315LX FLP	2FE3 316-04	1360
200.0	270.0	315LX	2HE3 317-04	1485	326.0	131.18	96.0	96.0	95.0	0.89	0.87	0.89	7.5	2.2	2.5	15.4114	1020	315LX FLP	2FE3 317-04	1400
250.0	335.0	355MX	2HE3 353-04	1485	412.0	163.97	96.0	96.0	95.0	0.88	0.85	0.88	7.5	2.0	2.5	15.9163	1740	#	Currently not available	
315.0	425.0	355LX	2HE3 357-04	1486	519.0	206.47	96.0	96.0	95.0	0.88	0.85	0.88	7.5	2.0	2.5	19.9879	1980	#	Currently not available	

Note: Motors upto 1.5kW are star (Y) connected suitable for DOL starting. Motors above 1.5kW are delta (Δ) connected suitable for DOL / Y/Δ starting.

ELECTRICAL PERFORMANCE - IE3 MOTOR

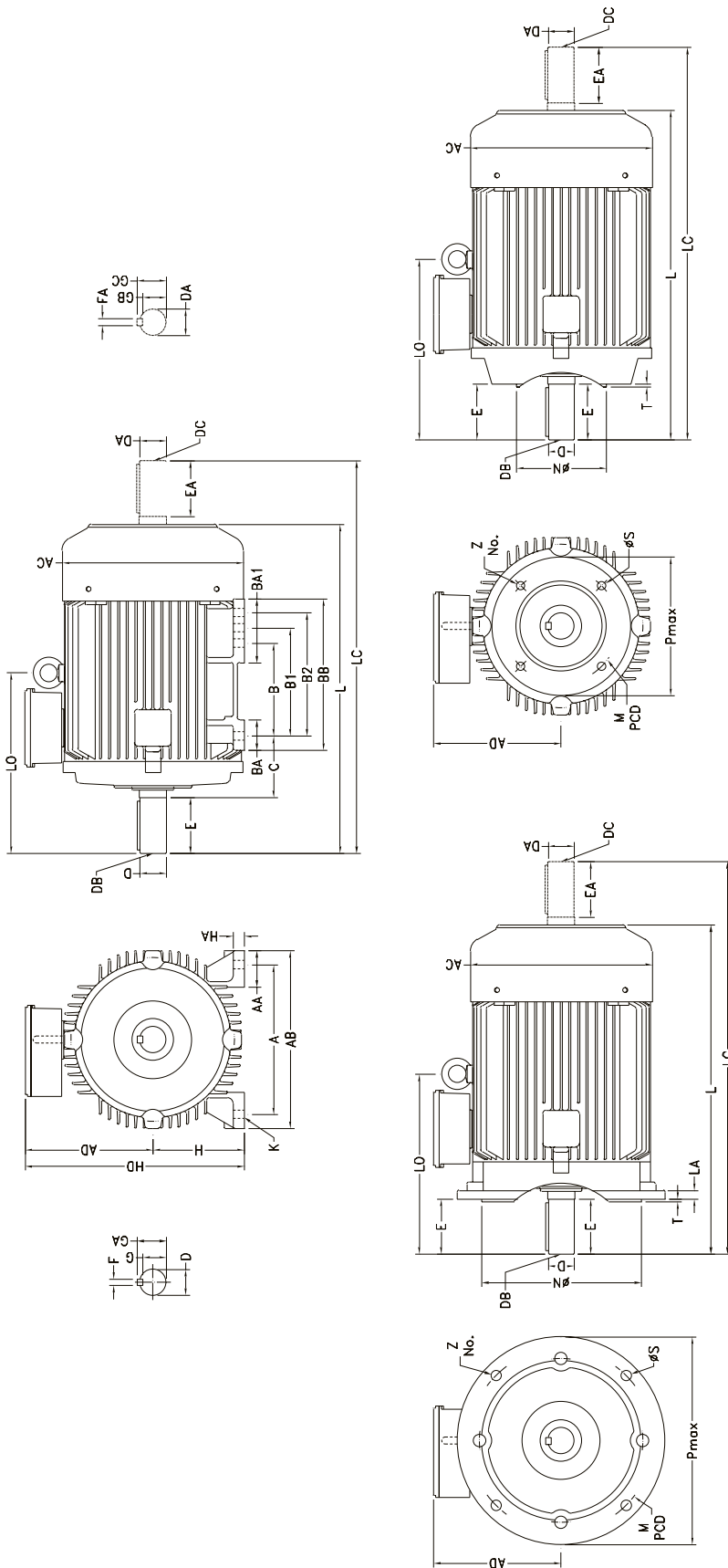
6 POLE MOTOR

6 POLE MOTOR

Output		Safe Area Motors										Flameproof (Ex'd') Motors										
		Frame Size	Type Designation	Speed (rpm)	Current (A)	Torque (kgm)	Efficiency %			Power Factor			I _{st} /I _N	T _{st} /T _N	T ₉₀ /T _N	GD ² (kgm ²)	Wt. (kg)	Frame Size	Type Designation	Wt. (kg)		
KW	HP						FL	3/4L	1/2L	FL	3/4L	1/2L	FL	3/4L	1/2L							
0.37	0.50	80	2HE3 080-06	925	1.1	0.39	71.9	71.9	68.0	0.68	0.63	0.50	5.0	1.8	2.3	0.0049	15	80 FLP	2FE3 080-06	27		
0.55	0.75	80	2HE3 083-06	925	1.5	0.58	75.9	75.9	70.0	0.70	0.62	0.50	5.0	2.0	2.4	0.0080	16	80 FLP	2FE3 083-06	30		
0.75	1.0	90S	2HE3 090-06	930	1.9	0.79	78.9	78.9	74.0	0.70	0.62	0.50	5.0	2.2	2.6	0.0135	24	90 FLP	2FE3 090-06	42		
1.1	1.5	90L	2HE3 096-06	940	2.7	1.14	81.0	81.0	76.0	0.70	0.62	0.50	5.5	2.2	2.6	0.0190	25	90 FLP	2FE3 096-06	45		
1.5	2.0	100L	2HE3 106-06	945	3.3	1.55	82.5	82.5	80.0	0.77	0.71	0.60	5.5	2.2	2.6	0.0336	34	100L FLP	2FE3 106-06	54		
2.2	3.0	112M	2HE3 123-06	955	4.7	2.24	84.3	84.3	82.0	0.77	0.71	0.60	6.0	2.2	2.6	0.0650	44	112M FLP	2FE3 123-06	67		
3.7	5.0	132S	2HE3 130-06	960	7.5	3.75	86.5	86.5	84.0	0.79	0.72	0.63	6.5	2.4	2.8	0.1321	68	132M FLP	2FE3 130-06	95		
5.5	7.5	132M	2HE3 133-06	960	11.0	5.58	88.0	88.0	86.0	0.79	0.72	0.63	7.5	2.6	3.0	0.1487	70	132M FLP	2FE3 133-06	97		
7.5	10.0	160M	2HE3 163-06	965	14.0	7.57	89.1	89.1	88.0	0.84	0.79	0.69	7.0	2.2	2.5	0.3718	108	160L FLP	#	-		
9.3	12.5	160L	2HE3 166-06	965	17.0	9.39	89.8	89.8	88.5	0.85	0.80	0.70	7.0	2.2	2.5	0.4759	122	160L FLP	#	-		
11.0	15.0	160L	2HE3 167-06	965	20.0	11.10	90.3	90.3	88.5	0.85	0.80	0.70	7.0	2.2	2.5	0.5503	128	160L FLP	#	-		
15.0	20.0	180L	2HE3 186-06	970	27.5	15.06	91.2	91.2	90.0	0.83	0.80	0.71	7.5	2.3	2.6	0.7437	180	180L FLP	2FE3 186-06	220		
18.5	25.0	200L	2HE3 206-06	978	34.0	18.42	91.7	91.7	90.3	0.83	0.78	0.70	7.0	2.2	2.5	1.1642	246	200L FLP	2FE3 206-06	315		
22.0	30.0	200L	2HE3 207-06	978	40.0	21.91	92.2	92.2	90.7	0.83	0.78	0.69	7.0	2.2	2.5	1.3667	268	200L FLP	2FE3 207-06	329		
30.0	40.0	225MX	2HE3 223-06	980	55.0	29.82	92.9	92.9	91.5	0.82	0.77	0.67	7.0	2.2	2.5	1.8378	380	225MX FLP	2FE3 223-06	421		
37.0	50.0	250MX	2HE3 253-06	982	66.0	36.70	93.3	93.3	92.0	0.84	0.81	0.72	7.0	2.2	2.5	2.6988	410	250MX FLP	2FE3 253-06	580		
45.0	60.0	280SX	2HE3 280-06	984	79.0	44.54	93.7	93.7	92.5	0.85	0.82	0.75	7.0	2.3	2.5	4.8613	590	280SX FLP	2FE3 280-06	760		
55.0	75.0	280MX	2HE3 283-06	984	95.0	54.44	94.1	94.1	93.2	0.86	0.84	0.77	7.0	2.3	2.5	5.8335	600	280MX FLP	2FE3 283-06	800		
75.0	100.0	315SX	2HE3 310-06	986	131.0	74.09	94.6	94.6	93.5	0.84	0.81	0.73	7.0	2.3	2.4	8.5948	780	315SX FLP	2FE3 310-06	1320		
90.0	120.0	315MX	2HE3 313-06	986	156.0	88.90	94.9	94.9	94.0	0.85	0.81	0.73	7.0	2.3	2.4	10.3731	960	315MX FLP	2FE3 313-06	1355		
110.0	150.0	315LX	2HE3 314-06	987	194.0	108.55	95.1	95.1	94.0	0.83	0.79	0.69	7.5	2.5	2.5	11.8549	1000	315LX FLP	2FE3 314-06	1370		
125.0	170.0	315LX	2HE3 316-06	987	218.0	123.35	95.2	95.2	94.0	0.84	0.80	0.71	7.5	2.5	2.5	11.8549	1000	315LX FLP	2FE3 316-06	1370		
132.0	180.0	315LX	2HE3 317-06	988	228.0	130.13	95.4	95.4	94.5	0.84	0.81	0.72	7.5	2.5	2.5	14.2259	1030	315LX FLP	2FE3 317-06	1400		
160.0	215.0	355SX	2HE3 350-06	990	276.0	157.41	95.6	95.6	95.0	0.84	0.81	0.72	7.0	2.0	2.4	23.7590	2020					
200.0	270.0	355MX	2HE3 353-06	990	347.0	196.77	95.8	95.8	95.0	0.84	0.80	0.71	7.0	2.2	2.4	23.7590	2020					
250.0	335.0	355LX	2HE3 357-06	989	430.0	246.21	95.8	95.8	95.0	0.84	0.81	0.73	7.0	2.0	2.4	26.5005	2040					

Note: Motors upto 1.5kW are star (Y) connected suitable for DOL starting. Motors above 1.5kW are delta (Δ) connected suitable for DOL / Y/Δ starting.

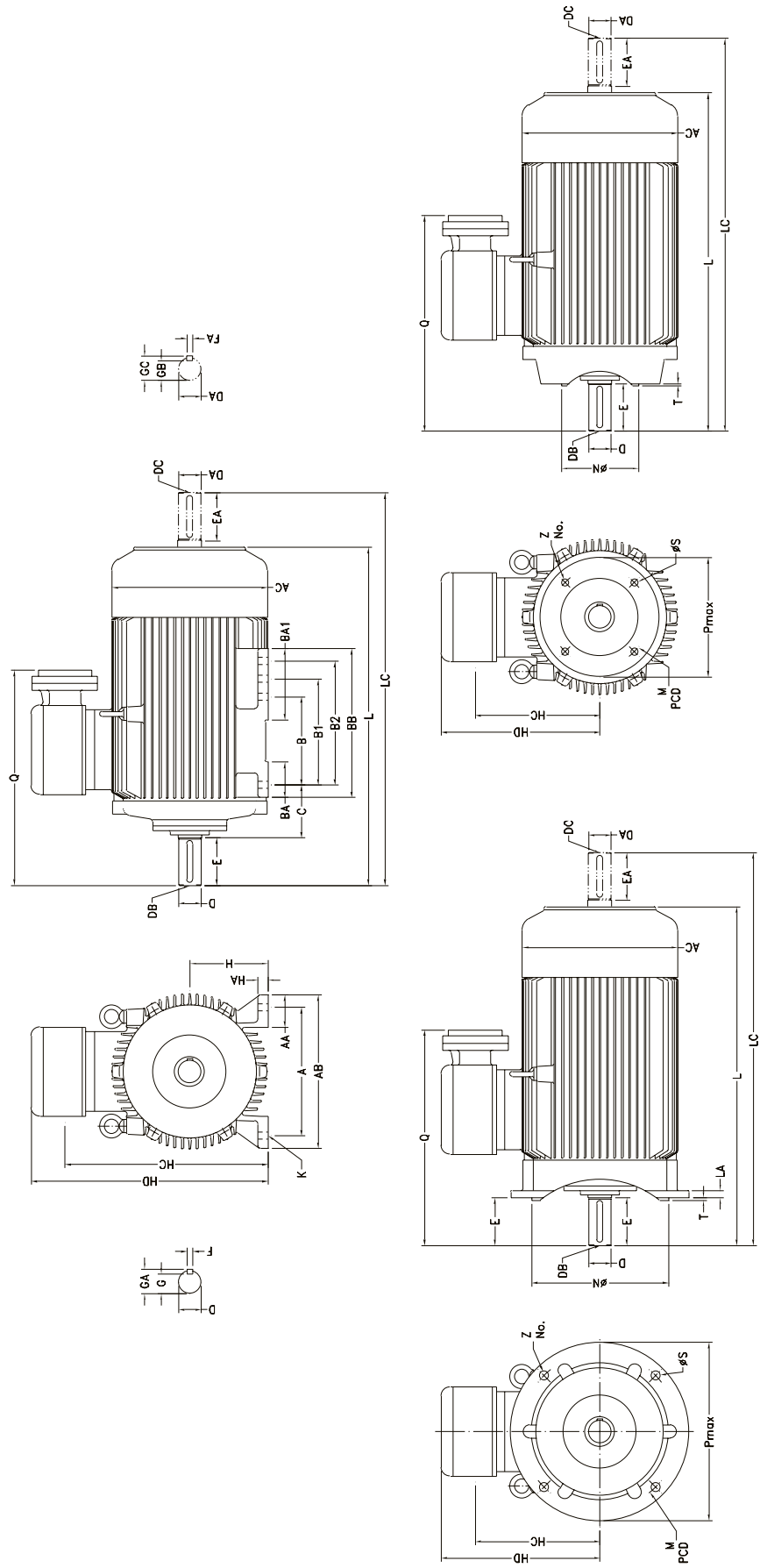
MECHANICAL DIMENSIONS - STANDARD, IE2, IE3 MOTORS



Frame Size	Motor Type	Pole	General												Foot mounted motors (B3)						Flange mounted motors (B5)						DE Shaft						NDE Shaft																
			L	LC	LO	AC	AD	A	B	B1	B2	C	H	K	AA	AB	BB	BA	BA1	HA	HD	P	P max	M PCD	ϕN	ϕS	Z No.	T	LA	D	DB	E	F	GA	G	DA	DC	EA	FA	GC	GB								
280S/M	HS1/HE2/HE3	2	1040	1195	590	543	426	457	368	419	190	280	24	100	557	483	90	145	42	706	550	500	450	19	5	18	65	140	18	69	58	65		140	18	69	58	140	18	69	58								
		4,6,8	1155	1332	611			406	457								151																																
280SX/MX	HE2/HE3	4,6	1318	1505	666			457	508							616																																	
		2	1185	1392	641			406	457								533																																
315S/M	HS1/HE2/HE3	2	1492	1647	748			508	560	457	216	315	28	112	620	533	100	151	46	775	660	600	550	24	8	23	80	170	22	85	71	80		M20	170	22	85	71	170	22	85	71							
		4,6,8	1348	1565	696			457	508								616																																
315SX/MX	HE2/HE3	4,6	1492	1647	748			508	560	457	216	315	28	112	620	533	100	151	46	775	660	600	550	24	8	23	80	170	22	85	71	80		M20	170	22	85	71	170	22	85	71							
		4	1348	1565	696			457	508								616																																
355S/M/L	HS1/HE2/HE3	2	1522	1707	778			610	630	508	254	355	28	130	730	770	160	270	50	941	800	740	680																										
		4,6,8	1707	1907	808			610	630	508	254	355	28	130	730	770	160	270	50	941	800	740	680																										
355SX/MX/LX	HE2/HE3	4,6	1522	1707	778			610	630	508	254	355	28	130	730	770	160	270	50	941	800	740	680																										
		2	1707	1907	808			610	630	508	254	355	28	130	730	770	160	270	50	941	800	740	680																										

MECHANICAL DIMENSIONS - FLAMEPROOF, IE2, IE3 MOTORS

DIMENSIONS OF FOOT (B3), FLANGE (B5) & FACE (B14) MOUNTED FLAME PROOF MOTORS



MECHANICAL DIMENSIONS - FLAMEPROOF, IE2, IE3 MOTORS

Frame Size	General										Foot mounted motors (B3)										Flange mounted motors (B5)										Face mounted motors (B14)						DE, NDE & Shaft					
	L	LC	AC	Q	A	B	B1	B2	C	H	K	AA	AB	BB	BA	BA1	HA	HC	HD	P max	M PCD	øN	øS	Z No.	T	LA	HC	HD	P max	M PCD	øN	S	Z No.	T	D, DA	DB, DC	E, EA	F, FA	G, GA, GB			
63 FLP	256	285	124	224	100	80	-	40	63	7	30	128	102	32	32	9	188	225	140	115	95	10	3	9	125	162	90	75	60	M5	2.5	11	M4	23	4	12.5	8.5					
71 FLP	281	316	140	234	112	90	-	45	71	7	31	140	112	35	35	10	203	240	160	130	110	10	3	9	132	169	105	85	70	M6	3	14	M5	30	5	16	11					
80 FLP	310	355	158	254	125	100	-	50	80	10	34	156	130	40	40	12	223	260	200	165	130	12	3.5	10	143	180	120	100	80	M8	3	19	M6	40	6	21.5	15.5					
90 FLP	380	435	180	274	140	100	125	56	90	10	37	174	155	43	68	12	244	282	250	215	180	15	4	11	154	192	140	115	95	M8	4	24	M8	50	8	27	20					
100L FLP	423	488	198	330	160	140	-	63	100	12	44	200	170	50	50	14	281	338	250	215	180	15	4	11	181	238	160	130	110	M12	3.5	28	M10	60	8	31	24					
112M FLP	443	511	222	330	190	140	-	70	112	12	49	226	180	55	55	15	306	363	250	215	180	15	4	11	194	251	160	130	110	M12	3.5	28	M12	60	8	31	24					
132M FLP	548	635	262	370	216	140	178	89	132	12	54	258	220	60	98	17	342	400	300	265	230	15	4	12	210	268	200	165	130	M12	3.5	38	M12	80	10	41	33					
160L FLP	675	792	314	458	254	210	254	108	160	15	73	320	306	78	122	25	399	460	350	300	250	15	4	13	239	300	230	180	130	M16	4.2	42	M16	110	12	45	37					
180L FLP	766	885	354	474	279	241	279	121	180	15	80	360	338	95	133	25	446	505	350	300	250	15	4	15	266	325	230	180	130	M16	4.2	48	M16	110	14	51.5	42.5					
200L FLP	820	940	395	531	318	305	-	133	200	19	85	398	370	95	95	28	494	565	400	350	300	15	4	15	294	365	230	180	130	M16	4.2	55	M16	110	16	59	49					
225S FLP	886	1006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	319	390	230	180	130	M16	4.2	55	M16	110	16	59	49					
225M FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	319	390	230	180	130	M16	4.2	55	M16	110	16	59	49					
225SX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	319	390	230	180	130	M16	4.2	55	M16	110	16	59	49					
225MX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	319	390	230	180	130	M16	4.2	55	M16	110	16	59	49					
250M FLP	1003	1153	484	573	406	349	-	168	250	24	109	496	439	120	120	33	594	665	550	500	450	19	8	16	344	415	230	180	130	M16	4.2	60	M16	140	18	64	53					
250MX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	60	M16	140	18	64	53					
280S FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	60	M16	140	18	64	53					
280M FLP	1130	1277	543	689	457	368	419	190	280	24	120	557	519	119	170	40	700	797	550	500	450	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
280SX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
280MX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315S FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315M FLP	1386	1593	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315L FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315SX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315MX FLP	1416	1623	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315LX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315MXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315LXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315MXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315LXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315MXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315LXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315MXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315LXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315MXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315LXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315MXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315LXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315MXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315LXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315MXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315LXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315MXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315LXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315MXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315LXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315MXX FLP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	8	16	344	415	230	180	130	M16	4.2	65	M20	140	18	69	58					
315LXX FLP	-	-																																								

BRAKE MOTOR

Construction:

Brake Motors are used for various applications where instantaneous stopping of the driven load is required. The operation of the brake is "FAIL SAFE TYPE" i.e. normally ON. When the electrical power to the motor is cut-off or the power fails, the brake is applied.

Brake motor is a combination of an A.C. induction motor and an electromagnetic AC or DC brake. The electromagnetic brake is mounted on the non-driving end of the motor.

DC brake motors are provided with a rectifier which provides the required DC voltage to the brake coil which in turn operates the brake. The supply to the rectifier is fed from any two terminals (between any two phases) in the main terminal box of the motor.

General applications of Brake motors are printing machinery, textile machinery, rolling mills, cranes & hoists, material handling equipments, machine tools etc.

Working:

When the power to the motor is switched off, a braking torque is generated which presses the armature plate of the brake against the mounting flange. When the supply resumes, a magnetic field is produced in the brake coil and this pulls the armature plate against the spring force and the shaft is now free to rotate.

Range of Hindustan Brand Brake Motors:

KW	: 0.18 to 55.0 kW
Pole	: 2P, 4P, 6P & 8P
Mounting	: B3, B5, B14 & combinations
Frame	: 63 to 250MX
Motor Voltage	: 415V±10% or as required
Frequency	: 50Hz±5% or as required
Braking torque	: Up to 800Nm
Brake coil voltage	: 190V DC (Other voltages on request)
Protection	: IP54
Duty cycle	: S1 – S8

Special Features:

- The brake motors are simple & rugged & so easy for maintenance.
- No separate DC supply is required as the rectifier is provided which gives the required DC voltage for energisation of the brake.
- The rectifier is mounted inside the main terminal box so no separate terminal box required.

General guidelines for selection of suitable Brake Model:

The Brakes are rated by torque & selection of suitable model can be made by calculating the required torque, rating of the brake & then matching it with static torque.

$$\text{Torque (Nm)} = 9550 \times (\text{KW} / \text{RPM}) \times \text{Safety Factor (SF)}$$

where kW-Kilowatts of motor,

RPM-Speed of motor,

SF-Safety Factor depending on type of prime mover & load.

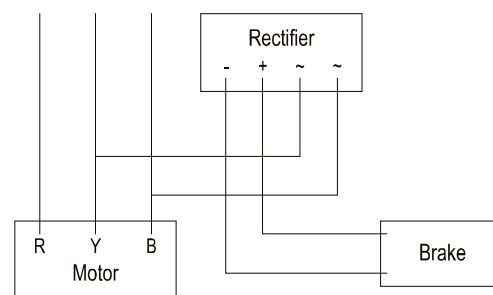
For electric motor, SF = 2 to 3

For diesel engine, SF = 4 to 5

For compressor, SF = 5 to 6.



Brake Coil Connection Diagram:



Brake coil is energized by DC side switching as shown in the diagram.

Applications:

Hindustan Brake motors can be used in many applications. A few of them are listed below;

- Machine tools
- Textile machinery
- Cranes & hoists
- Printing Machinery
- Material handling equipments
- Geared motors
- Cable reeling drums
- Rolling mills

Enquiry Details:

When placing an enquiry, please furnish the following details;

- Application details
- Motor power & speed
- Brake size / required braking torque
- Mounting
- No. of start/stops per hour
- Duty cycle

Note:

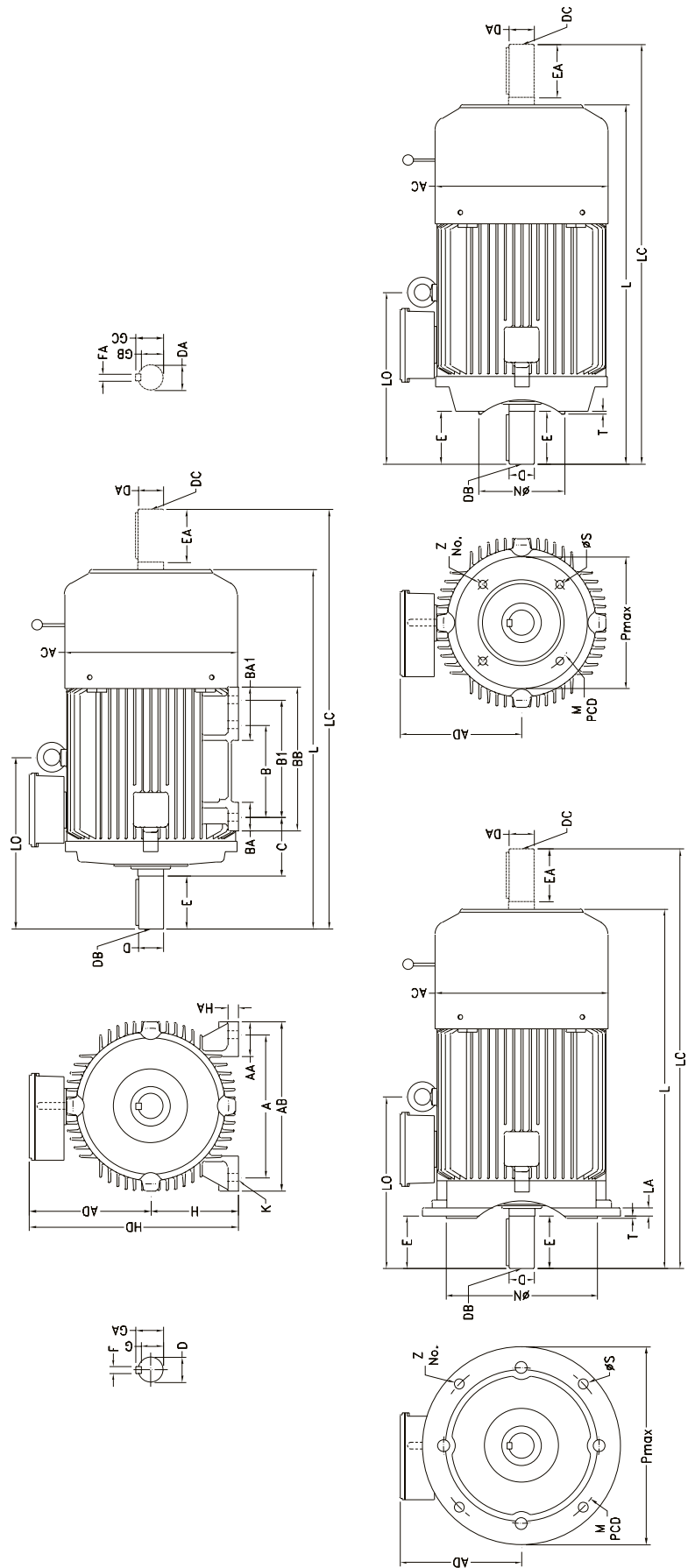
1. Selection chart is a general guideline for selection of brake size. If braking torque required is other than that mentioned in selection chart, this can be provided on request.
2. Brake motors with safety factor less than 2 are not suitable for crane/hoisting applications.
3. The motor must never be switched "ON" unless brake is energised & the brake should never be de-energised when the motor is "ON".
4. Brake motors with higher braking torque can also be provided on request.

SELECTION CHART - BRAKE MOTOR

Output		Frame Size	Type Designation	Speed (rpm)	Motor Torque (Nm)	Brake Size	Brake Torque (Nm)	Safety Factor	Brake Rel. Time (ms)	Output		Frame Size	Type Designation	Speed (rpm)	Motor Torque (Nm)	Brake Size	Brake Torque (Nm)	Safety Factor	Brake Rel. Time (ms)
KW	HP									KW	HP								
2 POLE										4 POLE									
0.18	0.25	63	2HB1 060-02	2780	0.62	06	4	6.47	35	0.18	0.25	63	2HB1 063-04	1360	1.26	06	4	3.16	35
0.25	0.33	63	2HB1 063-02	2790	0.86	06	4	4.67	35	0.25	0.33	71	2HB1 070-04	1370	1.74	06	4	2.29	35
0.37	0.50	71	2HB1 070-02	2790	1.27	06	4	3.16	35	0.37	0.50	71	2HB1 073-04	1380	2.56	08	8	3.12	65
0.55	0.75	71	2HB1 073-02	2815	1.87	06	4	2.14	35	0.55	0.75	80	2HB1 080-04	1410	3.73	08	8	2.15	65
0.75	1.0	80	2HB1 080-02	2845	2.52	08	8	3.18	65	0.75	1.0	80	2HB1 083-04	1415	5.06	10	16	3.16	90
1.1	1.5	80	2HB1 083-02	2850	3.69	08	8	2.17	65	1.1	1.5	90S	2HB1 090-04	1415	7.43	12	32	4.31	120
1.5	2.0	90S	2HB1 090-02	2860	5.01	10	16	3.19	90	1.5	2.0	90L	2HB1 096-04	1420	10.09	12	32	3.17	120
2.2	3.0	90L	2HB1 096-02	2880	7.30	10	16	2.19	90	2.2	3.0	100L	2HB1 106-04	1430	14.70	14	60	4.08	150
3.7	5.0	100L	2HB1 106-02	2900	12.19	12	32	2.62	120	3.7	5.0	112M	2HB1 123-04	1440	24.55	14	60	2.44	150
5.5	7.5	112M	2HB1 123-02	2905	18.09	14	60	3.32	150	5.5	7.5	132S	2HB1 130-04	1450	36.24	18	150	4.14	300
7.5	10.0	132S	2HB1 130-02	2910	24.63	14	60	2.44	150	7.5	10.0	132M	2HB1 133-04	1450	49.42	18	150	3.04	300
9.3	12.5	132M	2HB1 133-02	2915	30.48	14	60	1.97	150	9.3	12.5	160M	2HB1 163-04	1455	61.07	18	150	2.46	300
11.0	15.0	160M	2HB1 163-02	2920	35.99	18	150	4.17	300	11.0	15.0	160M	2HB1 164-04	1455	72.24	18	150	2.08	300
15.0	20.0	160M	2HB1 164-02	2925	49.00	18	150	3.06	300	15.0	20.0	160L	2HB1 166-04	1455	98.50	20	260	2.64	400
18.5	25.0	160L	2HB1 166-02	2930	60.33	18	150	2.49	300	18.5	25.0	180M	2HB1 183-04	1460	121.07	20	260	2.15	400
22.0	30.0	180M	2HB1 183-02	2935	71.62	18	150	2.09	300	22.0	30.0	180L	2HB1 186-04	1460	143.98	25	400	2.78	500
30.0	40.0	200L	2HB1 206-02	2950	97.17	20	260	2.68	400	30.0	40.0	200L	2HB1 206-04	1465	195.66	25	400	2.04	500
37.0	50.0	200L	2HB1 207-02	2950	119.84	20	260	2.17	400	37.0	50.0	225SX	2HB1 220-04	1470	240.50	31	600	2.49	500
45.0	60.0	225M	2HB1 223-02	2955	145.51	25	400	2.75	500	45.0	60.0	225MX	2HB1 223-04	1475	291.51	31	600	2.06	500
55.0	75.0	250M	2HB1 253-02	2965	177.24	25	400	2.26	500	55.0	75.0	250MX	2HB1 253-04	1480	355.08	31	800	2.25	500
6 POLE										8 POLE									
0.093	0.125	71	2HB1 070-06	870	1.02	06	4	3.92	35	0.093	0.125	71	2HB1 070-08	665	1.34	06	4	2.99	35
0.18	0.25	71	2HB1 073-06	900	1.91	06	4	2.09	35	0.18	0.25	80	2HB1 080-08	685	2.51	08	8	3.19	65
0.25	0.33	71	2HB1 074-06	905	2.64	08	8	3.03	65	0.25	0.33	80	2HB1 083-08	690	3.46	08	8	2.31	65
0.37	0.50	80	2HB1 080-06	915	3.86	08	8	2.07	65	0.37	0.50	90S	2HB1 090-08	690	5.12	12	32	6.25	120
0.55	0.75	80	2HB1 083-06	920	5.71	10	16	2.80	90	0.55	0.75	90L	2HB1 096-08	690	7.62	12	32	4.20	120
0.75	1.0	90S	2HB1 090-06	925	7.75	12	32	4.13	120	0.75	1.0	100L	2HB1 106-08	700	10.24	14	60	5.86	150
1.1	1.5	90L	2HB1 096-06	930	11.30	12	32	2.83	120	1.1	1.5	100L	2HB1 107-08	700	15.01	14	60	4.00	150
1.5	2.0	100L	2HB1 106-06	940	15.25	14	60	3.94	150	1.5	2.0	112M	2HB1 123-08	705	20.33	14	60	2.95	150
2.2	3.0	112M	2HB1 123-06	945	22.24	14	60	2.70	150	2.2	3.0	132S	2HB1 130-08	710	29.61	18	150	5.07	300
3.7	5.0	132S	2HB1 130-06	950	37.21	18	150	4.03	300	3.7	5.0	132M	2HB1 133-08	710	49.79	18	150	3.01	300
5.5	7.5	132M	2HB1 133-06	950	55.32	18	150	2.71	300	5.5	7.5	160M	2HB1 163-08	720	72.99	18	150	2.06	300
7.5	10.0	160M	2HB1 164-06	960	74.65	18	150	2.01	300	7.5	10.0	160L	2HB1 166-08	720	99.53	20	260	2.61	400
9.3	12.5	160L	2HB1 166-06	965	92.08	20	260	2.82	400	9.3	12.5	180M	2HB1 183-08	725	122.57	20	260	2.12	400
11.0	15.0	160L	2HB1 167-06	970	108.35	20	260	2.40	400	11.0	15.0	180L	2HB1 186-08	725	144.97	25	400	2.76	500
15.0	20.0	180L	2HB1 186-06	970	147.76	25	400	2.71	500	15.0	20.0	200L	2HB1 206-08	725	197.69	25	400	2.02	500
18.5	25.0	200L	2HB1 206-06	975	181.30	25	400	2.21	500	18.5	25.0	225SX	2HB1 220-08	728	242.81	31	600	2.47	500
30.0	40.0	225MX	2HB1 223-06	980	292.50	31	600	2.05	500	22.0	30.0	225MX	2HB1 223-08	730	287.96	31	600	2.08	500
37.0	50.0	250MX	2HB1 253-06	982	360.01	31	800	2.22	500	30.0	40.0	250MX	2HB1 253-08	730	392.67	31	800	2.04	500

MECHANICAL DIMENSIONS - BRAKE MOTORS

DIMENSIONS OF FOOT (B3), FLANGE (B5) & FACE (B14) MOUNTED BRAKE MOTORS



MECHANICAL DIMENSIONS - BRAKE MOTORS

Frame Size	Brake Size	General													Foot mounted motors (B3)										Flange mounted motors (B5)										Face mounted motors (B14)						DE, NDE & Shaft													
		L	LC	LO	AC	AD	A	B	B1	C	H	K	AA	AB	BB	BA	BA1	HA	HD	P _{max}	M	φN	φS	Z No.	T	LA	P _{max}	M	φN	φS	Z No.	T	D ₁	DA	DB	DC	EA	EB	FA	FB	GC	GD	GA	GB	GC	GD								
63	6	270	300	-	124	106	100	80	-	40	63	7	27	122	102	27	27	7	169	140	115	95	10	3	9	90	75	60	M5		11	M4	23	4	12.5	8.5																		
71	8	315	346	-	140	115	112	90	-	45	71	7	31	134	112	31	31	8	186	160	130	110	10		105	85	70	M6		14	M5	30	5	16	11																			
80	10	350	402	-	158	125	125	100	-	50	80	10	30	150	125	31	36	9	205					3.5	120	100	80	M8		19	M6	40	6	21.5	15.5																			
90S	12	411	472	-	180	133	140	100	-	56	90	10	33	168	124	37	10	223	200	165	130	12		10	140	115	95	M8		24	M8	50	8	27	20																			
90L	10	436	497	-	180	133	140	100	125	56	90	10	33	168	124	37	62								140	115	95	M8		24	M8	50	8	27	20																			
100L	12	475	542	221	198	175	160	140		63	100	12	43	200	180	53	46	14	275	250	215	180	15	4	11	160	130	110	M12		28	M10	60	8	31	24																		
112M	14	495	562	228	222	185	190	140		70	112	12	49	230	180	53	47	15	297	300	265	230	15	4	12	200	165	130	M12		38	M12	80	10	41	33																		
132S	18	580	667							89	132	12	52	256	180	47	85	16	337	300	265	230	15	4	12	200	165	130	M12		38	M12	80	10	41	33																		
132M	14	618	705	260	262	205	216	140		178					180	47	85	16	337	300	265	230	15	4	12	200	165	130	M12		38	M12	80	10	41	33																		
160M	18	715	832												260	60	20	376	350	300	250	19	5	15	250	215	180	M16		42	M16	110	12	45	37																			
160L	20	774	891	354	313.5	216	254	210	254	108	160	15	64	304	304	104	20	416	350	300	250	19	5	15	250	215	180	M16		42	M16	110	12	45	37																			
180M	18	776	894	381	354	236	279	241		121	180	15	65	335	297	66	24	416	350	300	250	19	5	15	250	215	180	M16		42	M16	110	12	45	37																			
180L	25	833	951							279					335	103							19	5	15	250	215	180	M16		42	M16	110	12	45	37																		
200L	20	905	1028	416	395	276	318	305	-	133	200	19	84	386	365	74	74	26	476	400	350	300	19	5	15	250	215	180	M16		42	M16	110	12	45	37																		
225M	25	1025	1145	436											297	66	24	416	350	300	250	19	5	15	250	215	180	M16		42	M16	110	12	45	37																			
225SX	31	1055	1205	466	435	297	356	286	311	149	225	19	92	428	371	74	95	28	522	450	400	350	19	5	15	250	215	180	M16		42	M16	110	12	45	37																		
225MX	31	1055	1205	466	435	297	356	286	311	149	225	19	92	428	371	74	95	28	522	450	400	350	19	5	15	250	215	180	M16		42	M16	110	12	45	37																		
250M	25	1115	1270	483	481	319	406	349	-	168	250	24	105	490	433	93	38	569	550	500	450	19	5	15	250	215	180	M16		42	M16	110	12	45	37																			
250MX	31	1115	1270	483	481	319	406	349	-	168	250	24	105	490	433	93	38	569	550	500	450	19	5	15	250	215	180	M16		42	M16	110	12	45	37																			

Note:
 1) Suffix "X" denotes motors other than 2 pole motors.
 2) All flange dimensions are conforming to IS: 2223.
 3) "S" Shaft dimensions on NDE side may be different for 2P motors. Please contact sales office for details.

COOLING TOWER MOTOR



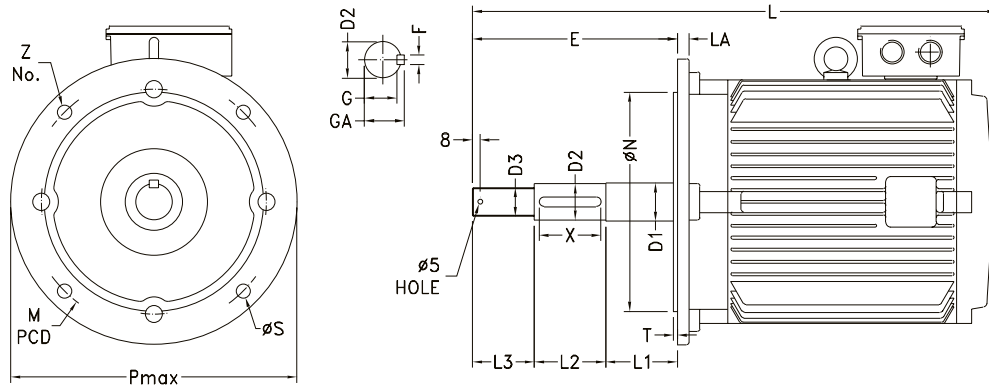
INTRODUCTION

Cooling tower motors are specially designed flange mounted motors in totally enclosed construction to suit air conditioning & refrigeration industries. They are provided with special long shaft construction with external threaded end to directly mount the fan blades. This also helps in the better cooling of the motor. Motors are compact in design & less in weight to facilitate easy maintenance. They are available as standard catalogue designs or as custom built.

RANGE

Power	: 0.37 to 37.0 kW
Polarity	: 4P, 6P, 8P, 10P & 12P
Mounting	: B5 flange mounted
Frame size	: 71 to 315
Voltage	: 415V ± 10% or as required
Frequency	: 50Hz ± 5% or as required
Ambient	: 45°C
Altitude	: up to 1000m above msl
Enclosure	: Totally Enclosed Non Ventilated (TENV) / TEFC
Protection	: IP55
Ins. class	: Class F with temp. rise limited to class B.
Duty	: S1

MECHANICAL DIMENSIONS



Frame	D1	D2	D3	F	GA	G	L1	L2	L3	E	P max	M PCD	øN	øS	Z No.	T	LA	X	L	
71	15	14	M12	5	16	11	50	40	65	155	160	130	110	10	4	3.5	9	35	331	
80	20	19	M16	6	21.5	15.5	50	55		170	200	165	130	12		4	3.5	10	45	368
90S	25	24		8	27	20														405
90L			30	28	M24	31	24	50	55	250	215	180	15	4	4	11	65	432		
100L	446																			
112M	40	38	M30	10	41	33	75	75	70	220	300	265	230	19	4	4	12	65	520	
132S				558																
132M	45	42	M30	12	45	37	75	75	70	290	350	300	250	19	4	4	13	65	619	
160M				663																
160L	50	48	M30	14	51.5	42.5	100	120	70	290	400	350	300	19	4	4	15	65	732	
180M				770																
180L	60	55	M30	14	51.5	42.5	100	120	70	290	400	350	300	19	4	4	15	65	851	
200L				851																
225SX	65	60	M30	18	64	53	100	120	70	290	450	400	350	19	4	4	16	110	855	
225MX				855																
250MX	75	65	M36	18	69	58	100	120	70	290	450	400	350	19	4	4	16	110	940	
280SX	940																			
280MX	85	75	M36	20	79.5	67.5	100	120	70	290	305	550	500	450	8	4	18	110	1045	
315SX				1045																
315MX	95	80	M36	22	85	71	120	170	85	375	660	600	550	24	4	6	23	154	1250	
315MX				1250																

Note: 1) Suffix "X" denotes motors other than 2 pole motors. 2) All flange dimensions are conforming to IS: 2223.

ELECTRICAL PERFORMANCE - COOLING TOWER MOTOR

Output		Frame Size	Type Designation	Speed (rpm)	Current (A)	Torque (kgm)	Efficiency %			Power Factor			I _{ST} /I _N	T _{ST} /T _N	T _{PO} /T _N	GD ² (kgm ²)
KW	HP						FL	3/4L	1/2L	FL	3/4L	1/2L				
4 POLE																
0.37	0.50	71	2HL1 073-04	1380	1.05	0.26	66.0	65.0	58.0	0.74	0.64	0.53	3.5	1.9	2.1	0.0022
0.75	1.0	80	2HL1 083-04	1415	1.75	0.52	74.0	73.0	68.0	0.81	0.70	0.55	4.5	2.0	2.3	0.0049
1.1	1.5	90S	2HL1 090-04	1415	2.5	0.76	76.5	76.0	74.0	0.80	0.70	0.55	5.0	2.2	2.5	0.0072
1.5	2.0	90L	2HL1 096-04	1420	3.3	1.03	79.0	79.0	77.0	0.80	0.70	0.55	5.0	2.2	2.5	0.0093
6 POLE																
0.75	1.0	90S	2HL1 090-06	925	2.0	0.79	72.0	71.0	66.0	0.72	0.64	0.52	5.0	2.2	2.4	0.0095
1.1	1.5	90L	2HL1 096-06	930	2.9	1.15	75.0	74.0	69.0	0.70	0.58	0.42	5.0	2.2	2.4	0.0122
1.5	2.0	100L	2HL1 106-06	940	3.5	1.55	76.0	75.0	71.0	0.78	0.73	0.60	5.0	2.0	2.3	0.0269
2.2	3.0	112M	2HL1 123-06	945	4.9	2.27	80.0	79.5	75.5	0.78	0.70	0.55	5.0	2.0	2.3	0.0047
3.7	5.0	132S	2HL1 130-06	950	7.5	3.79	82.5	82.5	81.5	0.83	0.73	0.64	5.0	2.0	2.3	0.0826
5.5	7.5	132M	2HL1 133-06	950	11.0	5.64	85.0	85.0	83.5	0.82	0.77	0.67	5.0	2.0	2.3	0.1156
7.5	10.0	160M	2HL1 164-06	960	15.0	7.61	87.0	87.0	84.5	0.80	0.76	0.68	5.5	2.0	2.3	0.2625
9.3	12.5	160L	2HL1 166-06	965	17.5	9.39	88.0	88.0	85.0	0.84	0.81	0.70	5.5	2.0	2.3	0.3440
11.0	15.0	160L	2HL1 167-06	970	20.5	11.05	88.5	88.5	87.5	0.84	0.81	0.70	5.5	2.0	2.3	0.3440
8 POLE																
1.1	1.5	100L	2HL1 106-08	700	3.0	1.53	74.0	73.0	71.0	0.69	0.60	0.48	4.0	1.8	2.0	0.0296
1.5	2.0	112M	2HL1 123-08	705	3.9	2.07	77.0	77.0	74.0	0.69	0.64	0.51	4.0	1.9	2.1	0.0467
2.2	3.0	132S	2HL1 130-08	710	5.2	3.02	79.0	79.0	76.0	0.75	0.65	0.52	5.0	2.2	2.4	0.0826
3.7	5.0	132M	2HL1 133-08	710	8.6	5.08	81.0	81.0	79.0	0.74	0.65	0.52	5.0	2.2	2.4	0.1156
5.5	7.5	160M	2HL1 164-08	720	12.0	7.44	86.0	86.0	83.0	0.74	0.68	0.58	5.0	2.0	2.2	0.2565
7.5	10.0	160L	2HL1 166-08	720	15.7	10.15	87.0	87.0	85.0	0.76	0.71	0.58	5.0	2.0	2.2	0.3440
9.3	12.5	180M	2HL1 183-08	725	20.0	12.49	87.5	87.5	85.0	0.74	0.70	0.57	5.0	2.0	2.2	0.5057
11.0	15.0	180L	2HL1 186-08	725	24.0	14.78	88.0	88.0	85.0	0.72	0.68	0.55	5.0	2.0	2.2	0.5949
15.0	20.0	200L	2HL1 206-08	725	31.0	20.15	88.5	88.0	86.0	0.76	0.72	0.60	5.0	2.0	2.2	1.0123
10 POLE																
1.5	2.0	132S	2HL1 130-10	555	4.5	2.63	74.0	74.0	71.0	0.63	0.55	0.43	4.5	2.0	2.2	0.0826
2.2	3.0	132M	2HL1 133-10	555	5.7	3.86	78.0	78.0	76.0	0.69	0.61	0.49	4.5	2.0	2.2	0.1198
3.7	5.0	160M	2HL1 164-10	560	9.0	6.44	81.0	81.0	79.0	0.71	0.62	0.50	5.0	2.1	2.3	0.2072
5.5	7.5	180M	2HL1 183-10	560	14.0	9.57	82.0	81.5	80.0	0.67	0.58	0.45	5.0	2.0	2.2	0.5057
7.5	10.0	180L	2HL1 186-10	565	18.0	12.93	83.0	82.5	80.0	0.70	0.62	0.48	5.0	2.0	2.2	0.5949
9.3	12.5	180L	2HL1 187-10	570	22.0	15.89	84.0	83.5	81.0	0.70	0.62	0.49	5.0	2.0	2.2	0.6544
11.0	15.0	180L	2HL1 188-10	570	25.0	18.80	85.0	85.0	83.0	0.72	0.64	0.50	5.0	2.0	2.2	0.7734
15.0	20.0	200L	2HL1 206-10	575	34.0	25.41	86.5	86.0	84.0	0.71	0.63	0.52	4.5	2.0	2.2	1.2654
18.5	25.0	225MX	2HL1 223-10	575	43.0	31.34	89.0	89.0	87.0	0.67	0.60	0.50	4.0	2.0	2.2	1.8378
12 POLE																
1.1	1.5	132S	2HL1 130-12	460	3.8	2.33	70.0	68.0	64.0	0.58	0.50	0.40	3.5	1.7	1.9	0.0826
1.5	2.0	132M	2HL1 133-12	460	4.9	3.18	71.0	70.0	66.0	0.60	0.52	0.42	3.5	1.7	1.9	0.1198
2.2	3.0	160M	2HL1 164-12	465	6.0	4.61	79.0	79.0	75.0	0.65	0.54	0.45	4.5	2.0	2.2	0.2072
3.7	5.0	160L	2HL1 166-12	465	10.0	7.75	80.0	80.0	77.0	0.64	0.55	0.42	4.5	2.0	2.2	0.2857
5.5	7.5	180M	2HL1 183-12	470	15.0	11.40	82.0	82.0	80.0	0.62	0.54	0.42	4.5	1.9	2.1	0.5949
7.5	10.0	180L	2HL1 186-12	470	20.0	15.54	82.0	82.0	80.0	0.64	0.55	0.43	4.5	1.9	2.1	0.6544
9.3	12.5	180L	2HL1 187-12	470	23.0	19.27	84.0	84.0	82.0	0.67	0.59	0.46	4.5	1.9	2.1	0.7734
11.0	15.0	200L	2HL1 206-12	485	33.0	22.09	84.5	84.0	81.0	0.55	0.47	0.38	4.5	1.9	2.1	1.2654
15.0	20.0	225MX	2HL1 223-12	480	40.0	30.44	85.5	85.5	83.5	0.61	0.54	0.43	4.0	1.8	2.0	1.8378
18.5	25.0	250MX	2HL1 253-12	485	54.0	37.15	86.5	86.0	82.0	0.55	0.48	0.37	4.0	1.9	2.1	2.5127
22.0	30.0	280SX	2HL1 280-12	485	56.0	44.18	89.0	89.0	87.0	0.61	0.54	0.44	4.0	1.8	2.0	4.8613
30.0	40.0	280MX	2HL1 283-12	485	77.0	60.25	89.3	89.3	87.2	0.61	0.55	0.44	4.0	1.9	2.1	5.8335
37.0	50.0	315SX	2HL1 310-12	488	103.0	73.85	89.3	89.3	86.0	0.56	0.49	0.39	4.0	2.0	2.1	7.2611
45.0	60.0	315MX	2HL1 314-12	488	125.0	89.82	90.0	90.0	87.0	0.56	0.49	0.39	4.0	2.0	2.1	10.3731

- Note :
- 1) All figures are subject to applicable tolerances.
 - 2) All the above ratings can be offered in flameproof enclosure wherever applicable.
 - 3) All the above ratings can be offered in totally enclosed fan cooled (TEFC) construction as well.

CRANE DUTY MOTOR



INTRODUCTION:

Crane duty motors are specially designed for frequent starts/stops & reversing required in cranes & lifts of all types. They can also be used in applications such as material handling, weirs & sluices, auxiliary motors in rolling mills or wherever intermittent drives are required.

RANGE:

KW : 0.18 to 200.0 kW
Pole : 4P, 6P & 8P
Mounting : B3, B5, B14 & combinations
Frame : 71 to 315LX
Voltage : 415V \pm 10% or as required
Frequency : 50Hz \pm 5% or as required
Ambient : 50°C. (Refer Table 1)
Altitude : up to 1000m above msl (Refer Table 2)
Rotor type : Squirrel cage aluminium die cast
Enclosure : Totally enclosed fan cooled (TEFC)
Protection : IP55
Ins. class : Class F with temp. rise limited to class B
Duty cycle : S3, S4 & S5

Table 1

Ambient temp. (°C)	Deration factor for Power
50°C	1.00
55°C	0.96
60°C	0.92

Table 2

Altitude above msl (m)	Deration factor for Power
1000	1.00
1500	0.97
2000	0.94
2500	0.90
3000	0.86

CONSTRUCTION:

Castings: Crane duty motors' housings & end shields are made from high quality castings as per IS 210. All components are machined to correct accuracy & alignment.

Stampings: The stampings are made from low loss high permeability steel.

Terminal Box: Standard location of terminal box is on top. However the terminal box on right or left side can be provided on request. The terminal box can be rotated in steps of 90° in each position. Motors up to 250 frames have aluminium boxes whereas frames 280 & 315 are with cast iron terminal boxes as standard. Cast iron terminal boxes up to frames 250 can also be provided on request.

Winding & Protection: All motors are wound with super enameled dual coat copper wires. This enable motors to be used for inverter applications as well. Features like vacuum pressure impregnation (VPI) & PTC thermistors embedded in stator winding can be provided on request.

Earthing terminals: Two earthing terminals are provided, one in the terminal box & other on the motor body.

Anti-condensation Heater: To avoid moisture accumulation inside the motor, the motor windings can be heated by connecting 4-10% of rated voltage to the motor terminals. This will generate enough heat equivalent to 20-25% of rated current. Alternatively any method as described in IS: 900 can be used. Motor can also be offered with space heaters on request for frames 90 & above.

MOTORS WITH INTEGRAL BRAKES:

These motors can be supplied with integral electromagnetic DC fail safe brakes with built in rectifiers for frames up to frames 250MX.

FLAMEPROOF MOTORS:

"Hindustan" crane duty motors are also available with flameproof enclosures.

ENQUIRY DETAILS:

When placing an enquiry, please furnish the following details;

- Application details
- Motor power & speed
- Voltage & frequency variations
- Mounting
- No. of start/stops per hour with duty & CDF
- Load GD² at motor speed
- Load torque or torque/speed curve of driven equipment
- Duty cycle diagram if other than those described herein

SELECTION CHART FOR CRANE & HOIST DUTY MOTORS

4 POLE

4 POLE

Frame Size	Type Designation	Speed (rpm)	Torque (kgm)	Eff (%)	Power Factor	S3/S4 Duty 60 st/hr			S3/S4 Duty 150 st/hr			S3/S4 Duty 300 st/hr			T_{ST}/T_N	T_{PO}/T_N	Rotor GD ² (kgm ²)
						40% CDF Power (kW)	40% CDF Current (A)	40% CDF Power (kW)	40% CDF Current (A)	40% CDF Power (kW)	40% CDF Current (A)	60% CDF Power (kW)	60% CDF Current (A)	60% CDF Power (kW)			
71	2HC1 070-04	1320	0.41	66.0	0.72	0.55	1.6	0.55	1.6	0.55	1.6	0.55	1.6	4.0	2.2	2.7	0.0022
80	2HC1 080-04	1350	0.54	73.0	0.71	0.75	2.0	0.75	2.0	0.75	2.0	0.75	2.0	4.5	2.3	2.7	0.0038
80	2HC1 083-04	1365	0.78	73.0	0.70	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0	4.7	2.3	2.7	0.0049
90S	2HC1 090-04	1375	1.06	76.5	0.72	1.5	3.8	1.5	3.8	1.5	3.8	1.5	3.8	5.2	2.3	2.7	0.0072
90L	2HC1 096-04	1375	1.56	78.0	0.75	2.2	5.2	2.2	5.2	2.2	5.2	2.2	5.2	5.2	2.4	2.8	0.0093
100L	2HC1 106-04	1395	2.58	82.0	0.77	3.7	8.2	3.7	8.2	3.7	8.2	3.7	8.2	5.5	2.4	2.8	0.0182
112M	2HC1 123-04	1400	3.83	83.0	0.77	5.5	12.0	5.5	12.0	5.5	12.0	5.5	12.0	5.5	2.6	3.0	0.0342
132S	2HC1 130-04	1415	5.16	87.0	0.77	7.5	15.5	7.5	15.5	7.5	15.5	7.5	15.5	5.5	2.3	2.6	0.0676
132M	2HC1 133-04	1415	6.40	87.0	0.78	9.3	19.0	9.3	19.0	9.3	19.0	9.3	19.0	5.7	2.7	3.0	0.0912
160M	2HC1 163-04	1430	7.49	87.0	0.76	11.0	23.0	11.0	23.0	11.0	23.0	11.0	23.0	6.0	2.3	2.5	0.1404
160M	2HC1 164-04	1430	10.22	88.0	0.76	15.0	31.0	15.0	31.0	15.0	31.0	15.0	31.0	6.0	2.3	2.5	0.1696
160L	2HC1 166-04	1430	12.60	87.0	0.79	18.5	37.5	18.5	37.5	18.5	37.5	18.5	37.5	6.0	2.6	3.0	0.2222
180L	2HC1 186-04	1440	14.88	90.0	0.81	22.0	42.0	22.0	42.0	22.0	42.0	22.0	42.0	6.5	2.6	3.0	0.3790
200L	2HC1 206-04	1440	20.29	91.0	0.83	30.0	55.0	30.0	55.0	30.0	55.0	30.0	55.0	6.5	2.7	3.0	0.8066
225SX	2HC1 220-04	1450	24.85	91.5	0.85	37.0	66.0	37.0	66.0	37.0	66.0	37.0	66.0	7.0	2.5	3.0	1.2224
225MX	2HC1 223-04	1450	30.23	92.0	0.86	45.0	79.0	45.0	79.0	45.0	79.0	45.0	79.0	7.0	2.5	3.0	1.4552
250MX	2HC1 253-04	1455	36.82	92.0	0.86	55.0	97.0	55.0	97.0	55.0	97.0	55.0	97.0	7.0	2.5	3.0	2.2563
280SX	2HC1 280-04	1460	50.03	92.5	0.84	75.0	134.0	75.0	134.0	75.0	134.0	75.0	134.0	7.0	2.5	3.0	3.9994
280MX	2HC1 283-04	1460	60.04	92.5	0.85	90.0	160.0	90.0	160.0	90.0	160.0	90.0	160.0	7.0	2.5	3.0	4.7993
315SX	2HC1 310-04	1470	72.88	93.0	0.86	110.0	191.0	110.0	191.0	110.0	191.0	110.0	191.0	7.0	2.5	3.0	8.1503
315MX	2HC1 313-04	1470	87.46	93.0	0.87	132.0	227.0	132.0	227.0	132.0	227.0	132.0	227.0	7.0	2.5	3.0	9.7803
315LX	2HC1 316-04	1470	106.01	94.0	0.87	160.0	272.0	160.0	272.0	160.0	272.0	160.0	272.0	7.0	2.5	3.0	11.8549
315LX	2HC1 317-04	1470	119.27	94.0	0.87	180.0	305.0	180.0	305.0	180.0	305.0	180.0	305.0	7.0	2.5	3.0	13.3368
315LX	2HC1 318-04	1470	132.52	94.0	0.87	200.0	340.0	200.0	340.0	200.0	340.0	200.0	340.0	7.0	2.5	3.0	14.8187

To be offered against specific enquiry

Suffix "X" denotes motors other than 2 pole motors.



SELECTION CHART FOR CRANE & HOIST DUTY MOTORS

6 POLE

Frame Size	Type Designation	Speed (rpm)	Torque (kgm)	Eff (%)	Power Factor	S3/S4 Duty 60 st/hr			S3/S4 Duty 150 st/hr			S3/S4 Duty 300 st/hr			I_{ST}/I_N	T_{ST}/T_N	T_{PO}/T_N	Rotor GD ² (kgm ²)	
						40% CDF Power (kW)	40% CDF Current (A)	60% CDF Power (kW)	40% CDF Power (kW)	40% CDF Current (A)	60% CDF Power (kW)	40% CDF Power (kW)	40% CDF Current (A)	60% CDF Power (kW)					40% CDF Current (A)
71	2HC1 070-06	870	0.41	60.0	0.66	0.37	1.3	0.37	1.3	0.37	1.3	0.37	1.3	0.37	1.3	3.5	1.6	2.0	0.0033
80	2HC1 080-06	870	0.62	67.0	0.63	0.55	1.8	0.55	1.8	0.55	1.8	0.55	1.8	0.55	1.8	4.3	2.2	2.5	0.0049
80	2HC1 083-06	870	0.84	69.0	0.69	0.75	2.2	0.75	2.2	0.75	2.2	0.75	2.2	0.8	2.2	4.3	2.2	2.5	0.0063
90S	2HC1 090-06	895	1.20	72.0	0.66	1.1	3.2	1.1	3.2	1.1	3.2	1.1	3.2	1.1	3.2	5.2	2.3	2.5	0.0095
90L	2HC1 096-06	895	1.63	74.0	0.67	1.5	4.2	1.5	4.2	1.5	4.2	1.5	4.2	1.5	4.2	5.2	2.3	2.5	0.0122
100L	2HC1 106-06	905	2.37	75.0	0.74	2.2	5.5	2.2	5.5	2.2	5.5	2.2	5.5	2.2	5.5	5.5	2.4	2.7	0.0269
112M	2HC1 123-06	915	3.94	79.0	0.74	3.7	8.8	3.7	8.8	3.7	8.8	3.7	8.8	3.7	8.8	5.5	2.4	2.7	0.0467
132S	2HC1 130-06	930	5.76	84.0	0.71	5.5	12.8	5.5	12.8	5.5	12.8	5.5	12.8	5.5	12.8	5.5	2.4	2.7	0.0826
132M	2HC1 133-06	935	7.81	85.0	0.72	7.5	17.0	7.5	17.0	7.5	17.0	7.5	17.0	7.5	17.0	5.5	2.3	2.6	0.1156
160M	2HC1 164-06	945	9.59	86.0	0.72	9.3	21.0	9.3	21.0	9.3	21.0	9.3	21.0	9.3	21.0	6.0	2.3	2.6	0.2625
160L	2HC1 166-06	950	11.28	87.0	0.73	11.0	24.0	11.0	24.0	11.0	24.0	11.0	24.0	11.0	24.0	6.0	2.3	2.6	0.3440
160L	2HC1 167-06	955	15.30	87.0	0.75	15.0	32.0	15.0	32.0	15.0	32.0	15.0	32.0	15.0	32.0	6.0	2.3	2.6	0.3440
200L	2HC1 206-06	960	18.77	89.0	0.75	18.5	38.5	18.5	38.5	18.5	38.5	18.5	38.5	18.5	38.5	6.0	2.5	3.0	0.8605
200L	2HC1 207-06	960	22.32	89.0	0.76	22.0	45.0	22.0	45.0	22.0	45.0	22.0	45.0	22.0	45.0	6.0	2.5	3.0	1.0123
225MX	2HC1 223-06	965	30.28	90.0	0.83	30.0	56.0	30.0	56.0	30.0	56.0	30.0	56.0	30.0	56.0	6.0	2.3	2.6	1.8378
250MX	2HC1 253-06	965	37.35	91.0	0.86	37.0	66.0	37.0	66.0	37.0	66.0	37.0	66.0	37.0	66.0	6.0	2.3	2.6	2.5127
280SX	2HC1 280-06	967	45.33	93.0	0.85	45.0	79.0	45.0	79.0	45.0	79.0	45.0	79.0	45.0	79.0	6.0	2.3	2.6	4.3751
280MX	2HC1 283-06	967	55.40	92.0	0.86	55.0	97.0	55.0	97.0	55.0	97.0	55.0	97.0	55.0	97.0	6.0	2.3	2.6	5.2502
315SX	2HC1 310-06	970	75.31	93.0	0.86	75.0	131.0	75.0	131.0	75.0	131.0	75.0	131.0	75.0	131.0	6.0	2.3	2.6	7.2611
315MX	2HC1 313-06	970	90.37	93.0	0.86	90.0	157.0	90.0	157.0	90.0	157.0	90.0	157.0	90.0	157.0	6.0	2.3	2.6	8.5948
315MX	2HC1 314-06	970	110.45	93.0	0.87	110.0	189.0	110.0	189.0	110.0	189.0	110.0	189.0	110.0	189.0	6.0	2.3	2.6	10.3731
315LX	2HC1 316-06	970	132.54	93.0	0.87	132.0	227.0	132.0	227.0	132.0	227.0	132.0	227.0	132.0	227.0	6.0	2.3	2.6	12.4477
315LX	2HC1 317-06	970	160.66	93.0	0.86	160.0	279.0	160.0	279.0	160.0	279.0	160.0	279.0	160.0	279.0	6.0	2.3	2.6	14.2259

To be offered against specific enquiry

Suffix "X" denotes motors other than 2 pole motors.

6 POLE

SELECTION CHART FOR CRANE & HOIST DUTY MOTORS

8 POLE

8 POLE

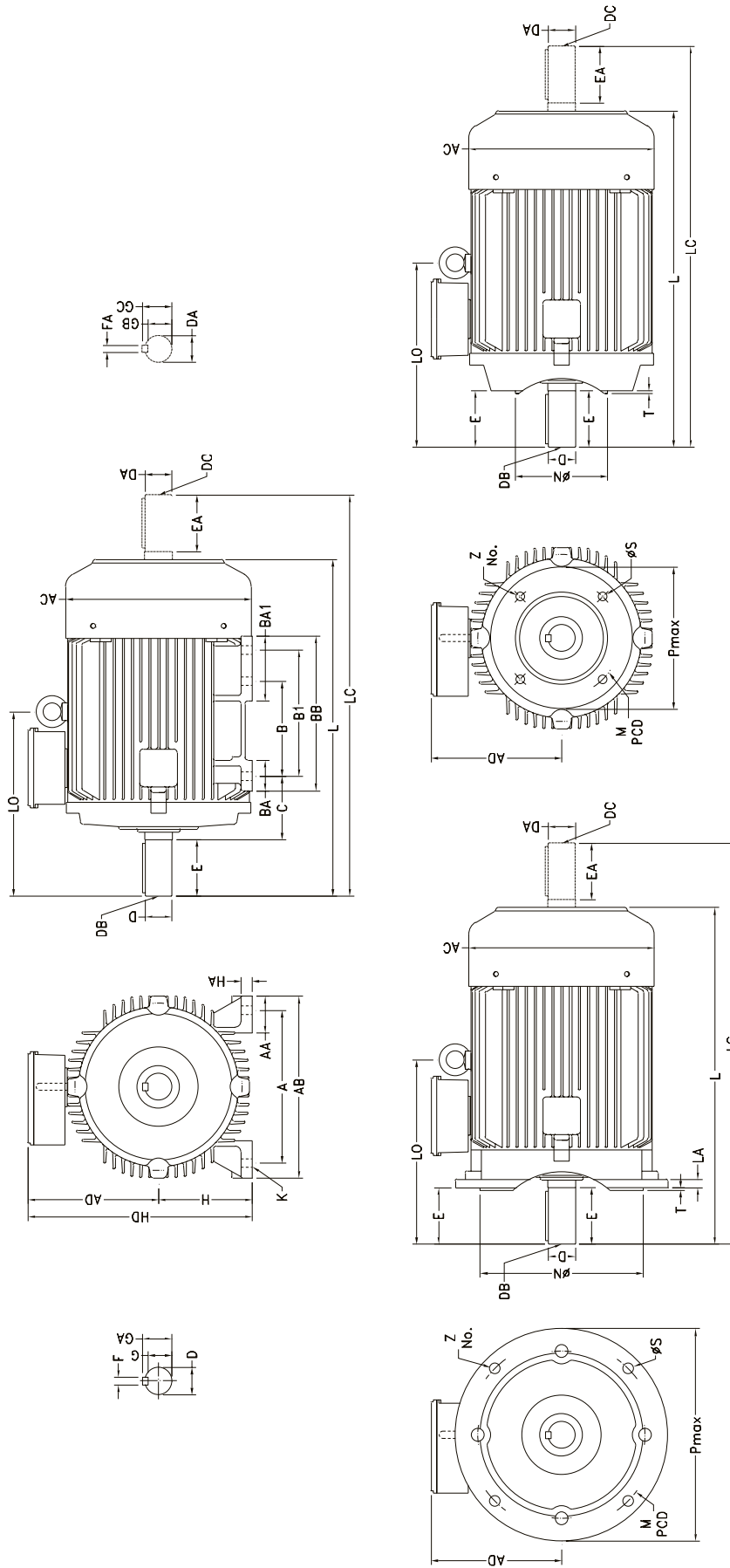
Frame Size	Type Designation	Speed (rpm)	Torque (kgm)	Eff (%)	Power Factor	S3/S4 Duty 60 st/hr			S3/S4 Duty 150 st/hr			S3/S4 Duty 300 st/hr			I_{ST}/I_N	T_{ST}/T_N	T_{PO}/T_N	Rotor GD ² (kgm ²)
						40% CDF Power (kW)	40% CDF Current (A)	60% CDF Power (kW)	40% CDF Power (kW)	40% CDF Current (A)	60% CDF Power (kW)	40% CDF Power (kW)	40% CDF Current (A)	60% CDF Power (kW)				
80	2HC1 083-08	640	0.56	57.0	0.65	0.37	1.4	0.37	1.4	0.37	1.4	0.37	1.4	3.0	2.0	2.3	0.0063	
90S	2HC1 090-08	650	0.82	64.0	0.57	0.55	2.1	0.55	2.1	0.55	2.1	0.55	2.1	3.0	2.1	2.4	0.0095	
90L	2HC1 096-08	665	1.10	67.0	0.68	0.75	2.3	0.75	2.3	0.75	2.3	0.75	2.3	4.0	2.2	2.5	0.0122	
100L	2HC1 106-08	665	1.61	72.0	0.63	1.1	3.4	1.1	3.4	1.1	3.4	1.1	3.4	4.3	2.2	2.5	0.0228	
100L	2HC1 107-08	665	2.20	73.0	0.66	1.5	4.3	1.5	4.3	1.5	4.3	1.5	4.3	4.5	2.2	2.5	0.0296	
112M	2HC1 123-08	685	3.13	76.0	0.71	2.2	5.7	2.2	5.7	2.2	5.7	2.2	5.7	5.0	2.2	2.5	0.0467	
132S	2HC1 130-08	695	5.19	78.0	0.67	3.7	9.8	3.7	9.8	3.7	9.8	3.7	9.8	5.5	2.2	2.5	0.0826	
160M	2HC1 164-08	695	7.71	83.0	0.68	5.5	13.5	5.5	13.5	5.5	13.5	5.5	13.5	5.5	2.2	2.5	0.2625	
160L	2HC1 166-08	695	10.51	83.5	0.69	7.5	18.0	7.5	18.0	7.5	18.0	7.5	18.0	5.5	2.2	2.5	0.3440	
160L	2HC1 167-08	695	13.03	83.5	0.70	9.3	22.0	9.3	22.0	9.3	22.0	9.3	22.0	5.5	2.2	2.5	0.3440	
180L	2HC1 186-08	700	15.31	87.0	0.66	11.0	26.5	11.0	26.5	11.0	26.5	11.0	26.5	5.5	2.2	2.5	0.5949	
200L	2HC1 206-08	700	20.87	88.0	0.70	15.0	34.0	15.0	34.0	15.0	34.0	15.0	34.0	5.5	2.2	2.5	1.1023	
225SX	2HC1 220-08	705	25.56	89.0	0.71	18.5	41.0	18.5	41.0	18.5	41.0	18.5	41.0	5.5	2.2	2.5	1.5437	
225MX	2HC1 223-08	710	30.18	89.5	0.74	22.0	46.0	22.0	46.0	22.0	46.0	22.0	46.0	5.5	2.2	2.5	1.8378	
250MX	2HC1 253-08	715	40.87	91.0	0.76	30.0	60.0	30.0	60.0	30.0	60.0	30.0	60.0	5.5	2.2	2.5	2.5127	
280SX	2HC1 280-08	720	50.05	92.0	0.79	37.0	71.0	37.0	71.0	37.0	71.0	37.0	71.0	6.0	2.2	2.5	4.8613	
280MX	2HC1 283-08	720	60.88	92.5	0.77	45.0	88.0	45.0	88.0	45.0	88.0	45.0	88.0	6.0	2.2	2.5	5.8335	
315SX	2HC1 310-08	730	73.38	92.0	0.78	55.0	106.0	55.0	106.0	55.0	106.0	55.0	106.0	6.0	2.2	2.5	7.2611	
315MX	2HC1 313-08	730	100.07	92.5	0.77	75.0	146.0	75.0	146.0	75.0	146.0	75.0	146.0	6.0	2.2	2.5	8.5948	
315MX	2HC1 314-08	730	120.08	93.0	0.79	90.0	170.0	90.0	170.0	90.0	170.0	90.0	170.0	6.0	2.2	2.5	10.3731	
315LX	2HC1 316-08	730	146.77	93.0	0.79	110.0	207.0	110.0	207.0	110.0	207.0	110.0	207.0	6.0	2.2	2.5	12.4477	
315LX	2HC1 317-08	730	176.12	93.0	0.79	132.0	250.0	132.0	250.0	132.0	250.0	132.0	250.0	6.0	2.2	2.5	14.2259	

To be offered against specific enquiry

Suffix "X" denotes motors other than 2 pole motors.

MECHANICAL DIMENSIONS - CRANE DUTY MOTORS

FOOT (B3), FLANGE (B5) & FACE (B14) MOUNTED CRANE DUTY MOTORS



MECHANICAL DIMENSIONS - CRANE DUTY MOTORS

Frame Size	General													Foot mounted motors (B3)							Flange mounted motors (B5)							Face mounted motors (B14)							DE, NDE & Shaft												
	L	LC	LO	AC	AD	A	B	B1	C	H	K	AA	AB	BB	BA	BA1	HA	HD	P max	M	øN	øS	Z No.	T max	LA	P max	M	øN	øS	Z No.	T	DA	DB, DC	EA	E	FA	F	GA, GC	G, GB								
71	240	272	-	140	107	112	90	-	45	71	7	31	134	112	31	31	8	178	160	130	110	10			9	105	85	70			14	M5	30	5	16	11											
80	282	326	-	158	125	125	100	-	50	80	10	30	150	125	31	36	9	205									120	100	80			19	M6	40	6	21.5	15.5										
90S	319	376	-	180	133	140	100	-	56	90	10	33	168	124	33	37	10	223	200	165	130	12			10	140	115	95			24	M8	50	8	27	20											
90L	344	401	-	180	133	140	-	125					149																																		
100L	374	440	221	198	153	160	140	-	63	100	12	43	200	180	46	46	14	253	250	215	180																										
112M	398	464	228	222	168	190	140	-	70	112	12	49	230	180	47	47	15	280	300	265	230																										
132S	451	538	260	262	185	216	140	-	89	132	12	52	256	180	47	47	16	317	350	300	250																										
132M	489	576					-	178					218																																		
160M	589	706	354	314	216	254	210	-	108	160	15	64	304	260	60	60	20	376																													
160L	633	750					-	254					304																																		
180M	655	772	381	354	236	279	241	-	121	180	15	65	335	297	66	66	24	416	350	300	250																										
180L	693	810					-	279					335																																		
200L	760	880	416	395	276	318	305	-	133	200	19	84	386	365	74	74	26	476	400	350	300																										
225SX	835	985	466	435	297	356	286	311	149	225	19	90	428	371	74	95	28	522	450	400	350																										
225MX																																															
250MX	930	1085	483	481	319	406	349	-	168	250	24	105	490	433	93	93	38	569	550	500	450																										
280SX	1040	1195	590	543	426	457	368	419	190	280	24	100	557	483	90	145	42	706																													
280MX																																															
315SX	1185	1392	641				406	457					533																																		
315MX							457	508	216	315	28	112	620																																		
315LX	1348	1565	696				457	508					616																																		

Note: 1) Suffix "X" denotes motors other than 2 pole motors.
 2) All flange dimensions are conforming to IS: 2223.
 3) "S" Shaft dimensions on NDE side may be different for 2P motors. Please contact sales office for details.



RANGE

3G All Aluminium motors are available from frame size 63 to 132 in 2, 4, 6 & 8 pole designs. The motors are suitable for continuous (S1) duty with ambient temperature of 50°C & site altitudes of up to 1000 meters above mean sea level.

VOLTAGE & FREQUENCY

Motors are designed for 3 phase, 415V±10% & 50Hz±5% with combined variation of 10%. Any other voltage &/or frequency is available on request.

STANDARDS

All electrical specifications of the motors are according to IS 325 & IEC 60034-1. The mechanical dimensions are as per IS 1231 & IS 2223.

BEARING ARRANGEMENT

3G motors are fitted with pre-lubricated sealed bearings as standard feature. The end covers are equipped with cast iron metal inserts fitted integral in the bearing housings. This facilitates easy changeability of parts without causing any damage to the bearing housing.

INSULATION

The motors are designed for class F insulation with class B temp. rise. In case the motors are utilised to class F temp. limits, either the ambient temp. can go up to 55°C for the same rated output or the rated output can be increased by 10%.

PROTECTION

The motors are designed for IP55 degree of protection as per IS 4691 / IEC 60034-5.

CONNECTION

All motors have 6 leads terminated in the terminal box. Motors up to 1.5 kW are star connected & higher rating motors are delta connected.

NOISE

Motors are designed for low noise levels in accordance with IS 12065 / IEC 60034-9.

VIBRATION

All the rotors are dynamically balanced using the half key & conforms to IS 12075 / IEC 60034-14.

COOLING

Type of cooling is IC 0411 in accordance with IS 6362 / IEC 60034-6. All motors are fitted with external bi-directional cooling fan.

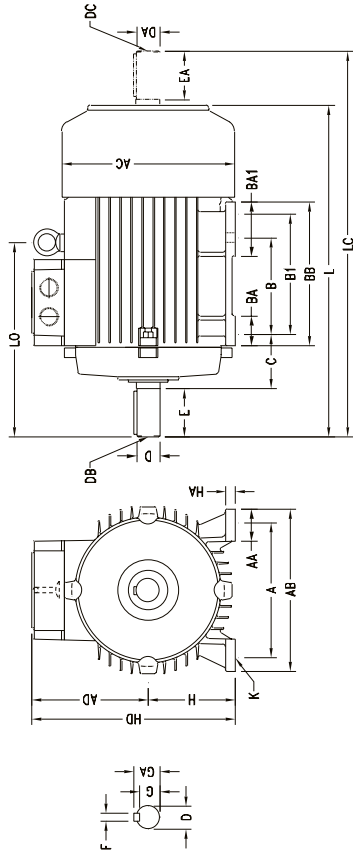
TERMINAL BOX DETAILS

Frame Size	63-80	90	100-132
Cable Entry Size	1 x ¾"	2 x ¾"	2 x 1"
Max. Cable Size DOL Starting	3C x 4mm ²	3C x 10mm ²	
Max. Cable Size Y-D Starting	-	2 x 3C x 10mm ²	
Terminal Stud Size	M4		M5

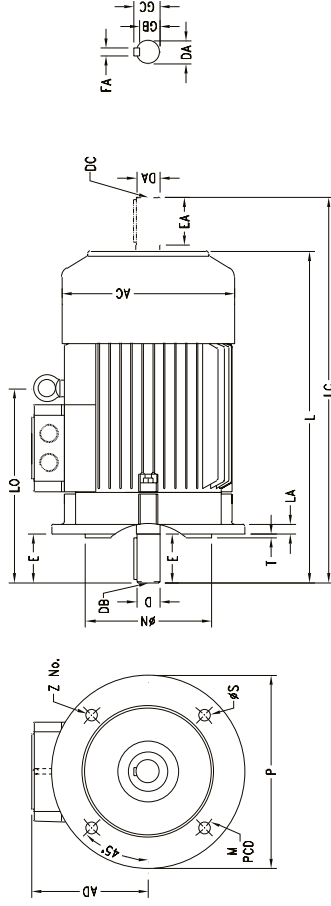
MECHANICAL DIMENSIONS - 3G ALUMINIUM MOTORS

FOOT (B3) & FLANGE (B5) MOUNTED 3G ALUMINIUM MOTORS

FOOT MOUNTING (B3)



FLANGE MOUNTING (B5)



Frame Size	General											Foot mounted motors (B3)										Flange mounted motors (B5)							DE, NDE & Shaft					
	L	LC	LO	AC	AD	A	B	B1	C	H	K	AA	AB	BB	BA	BA1	HA	HD	P	M	PCD	φN	φS	Z No.	T max	LA	D, DA	DB, DC	E, EA	F, FA	GA, GC	G, GB		
63	206	236	-	124	94	100	80	-	40	63	7	27	122	102	27	27	7	157	140	115	95	10	3	9	11	M4	M4	23	4	12.5	8.5			
71	240	272	-	140	102	112	90	-	45	71	7	27	134	112	26	26	6	173	160	130	110	10	3.5	14	M5	M5	30	5	16	11				
80	281	326	-	158	111	125	100	-	50	80	10	30	149	125	27	27	8	191	200	165	130	12	4	19	M6	M6	40	6	21.5	15.5				
90S	344	401	204	180	121	140	100	125	56	90	10	33	168	149	31	56	10	211	250	215	180	15	4	24	M8	M8	50	8	27	20				
90L	383	450	211	198	137	160	140	-	63	100	12	43	200	180	46	46	14	237	250	215	180	15	4	28	M10	M10	60	8	31	24				
112M	418	484	251	222	149	190	140	-	70	112	12	49	230	180	47	47	15	261	300	265	230	15	4	38	M12	M12	80	10	41	33				
132S	501	586	284	262	169	216	140	178	89	132	12	52	256	218	48	86	16	301	300	265	230	15	4	38	M12	M12	80	10	41	33				
132M	501	586	284	262	169	216	140	178	89	132	12	52	256	218	48	86	16	301	300	265	230	15	4	38	M12	M12	80	10	41	33				

Note: 1) All flange dimensions are conforming to IS: 2223.

2) " S " Shaft dimensions on NDE side may be different for 2P motors. Please contact sales office for details.

TESTING

The standard test programmes are divided into three parts; routine tests, type tests & optional tests. The routine tests are done to every machine & are included in the price of the machine. Type tests are performed in addition to routine tests normally to one of the machines of a series of similar machine or by request of the customer. Optional tests are additional tests subject to mutual agreement between purchaser & manufacturer.

Contents of test programmes:

Routing tests	
1.	Insulation resistance test
2.	Measurement of stator resistance
3.	No load test
4.	Locked rotor test
5.	Reduced voltage running up test (up to 37kW)
6.	High voltage test

Optional tests	
1.	Vibration severity test
2.	Noise level measurement
3.	Degree of protection test
4.	Temp. rise test at limiting values of voltage and frequency variation
5.	Overspeed test
6.	Test on insulation system

Type tests	
1.	Dimensions
2.	Measurement of stator resistance
3.	No load test
4.	Reduced voltage running up test (up to 37kW)
5.	Locked rotor test
6.	Full load test
7.	Temperature rise test
8.	Momentary overload test
9.	Insulation resistance test
10.	High voltage test

SPECIAL CUSTOMISED DESIGNS

Frames	63	71	80	90	100	112	132	160	180	200	225	250	280	315	355
Electrical															
Non std voltage &/or frequency	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Gelcoat on winding overhang	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Vacuum pressure impregnation	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Insulation class H	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Two speed motors	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
High torque motors	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Special performance requirements	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Mechanical															
Second std shaft end	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Non std shaft end	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
B6, B7, B8, V5, V6 mtg.	□	□	□	□	□	□	□	□	□	□	□	□	□	N	N
V1 mtg.	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
B5, V3 mtg.	■	■	■	■	■	■	■	■	■	■	■	■	■	■	N
B35, V15 mtg.	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
B14, V18, V19 mtg.	■	■	■	■	■	■	■	■	-	-	-	-	-	-	-
B34 mtg.	■	■	■	■	■	■	■	■	-	-	-	-	-	-	-
Non std flange	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Spl. vibration level	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Epoxy paint	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Thermisters, RTD	N	N	■	■	■	■	■	■	■	■	■	■	■	■	■
Anti condensation heater	N	N	N	■	■	■	■	■	■	■	■	■	■	■	■
Regreasing arrangement	N	N	N	N	N	N	N	N	N	□	□	□	□	□	□
Colours other than RAL 6011	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Special shaft material	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Cast iron cooling fan	■	■	■	■	■	■	■	■	■	■	■	■	■	■	□
IP 56 protection	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Special bearings	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Encoder mounting arrangement	N	N	N	■	■	■	■	■	■	■	■	■	■	■	■
Force cooling arrangement	N	N	N	■	■	■	■	■	■	■	■	■	■	■	■
Larger terminal box	■	■	■	■	■	■	■	■	■	■	■	■	■	■	N
Cast iron terminal box	■	■	■	■	■	■	■	■	■	■	■	■	□	□	□
Motors with service factor	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Extremely high & low ambient temp.	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Cannot be supplied
 No extra cost
 Extra cost

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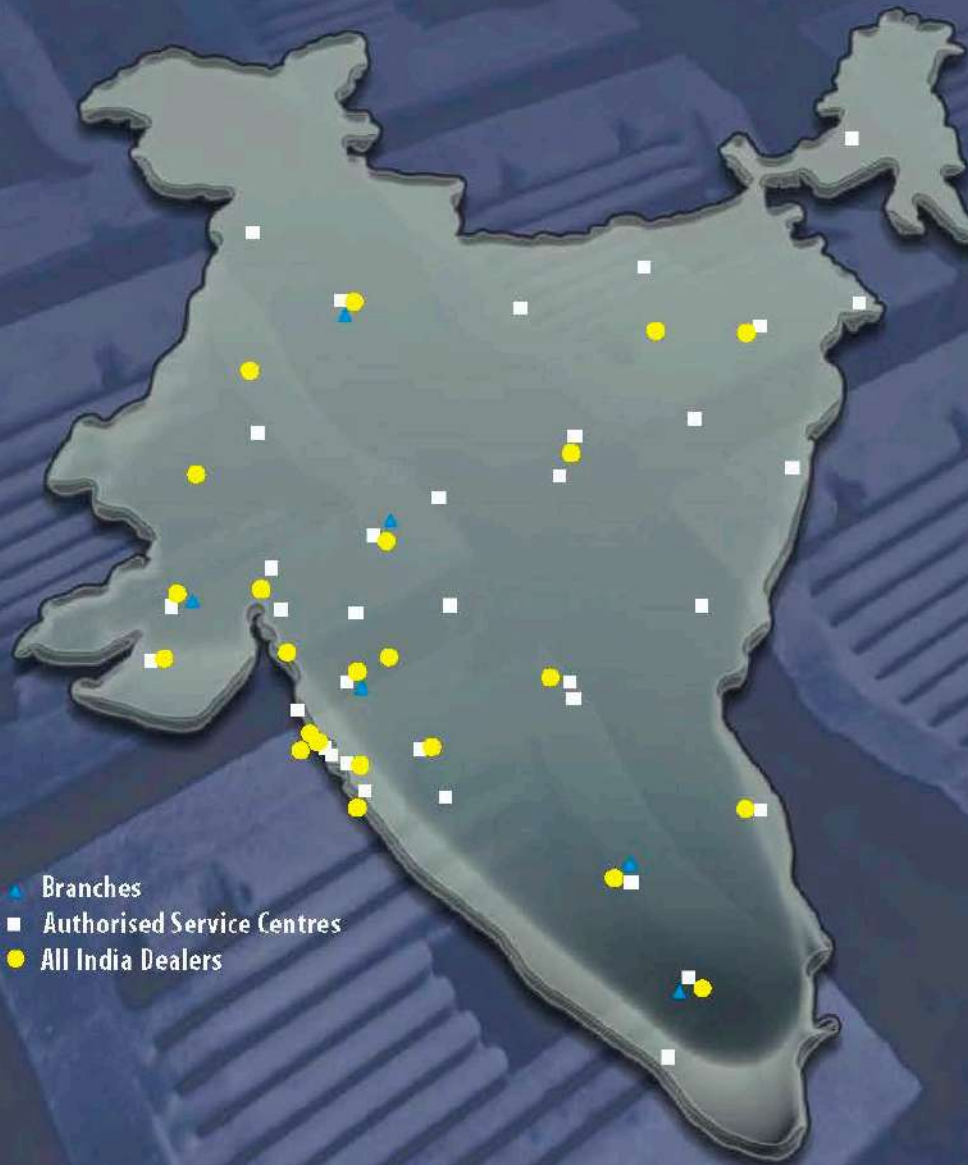
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SOUTH

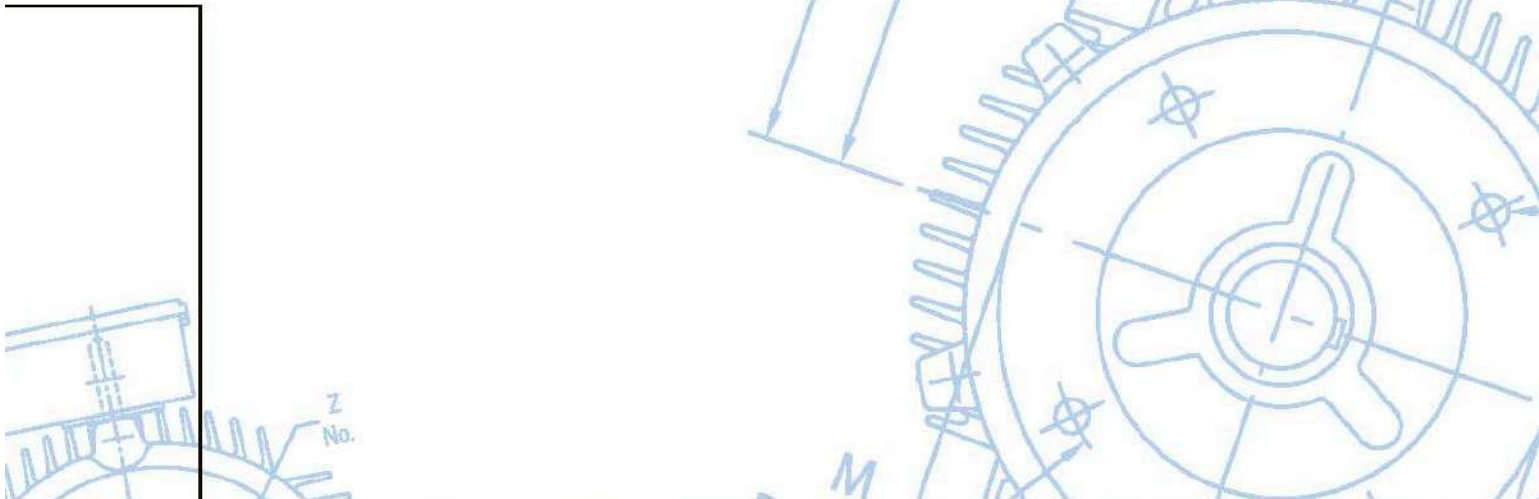
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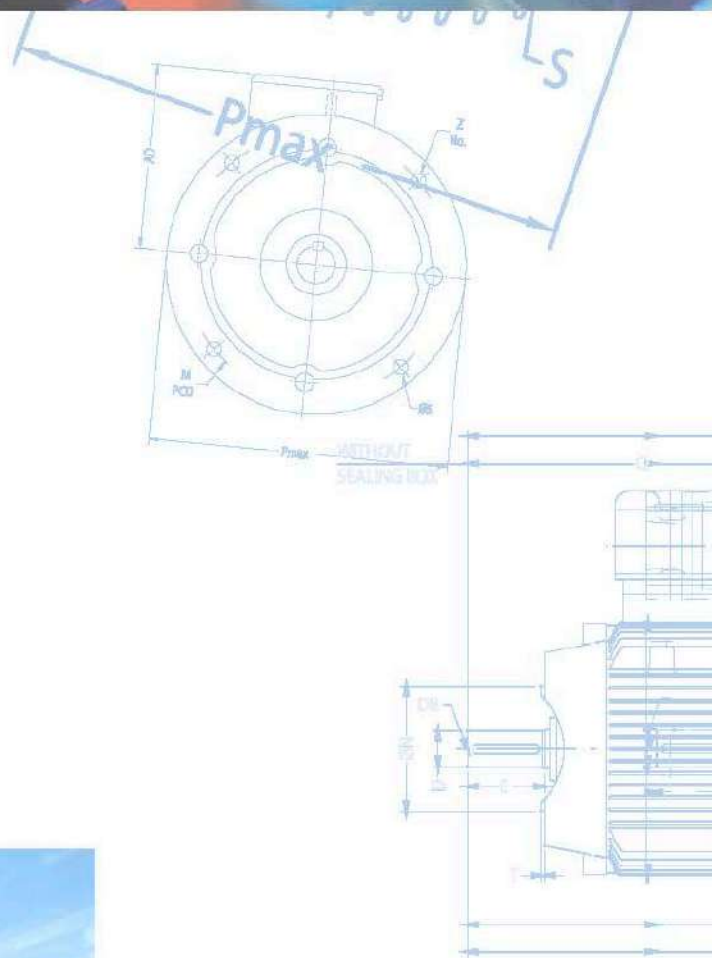
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