Standard and Energy Efficient IE2 Non-Sparking Motors Ex (nA)

Bharat Bijlee has introduced complete range of standard non-sparking motors for use in hazardous area -Zone 2 (flammable gases and vapors atmosphere).

Motors are conforming to IS/IEC 60079-15:2005 and IS/IEC 60079-0:2004 as regards to all safety aspects.

Type	Series	Frame Size	kW range	Poles
Standard motor	MN	63 to 355L	0.12 to 355	2P, 4P, 6P, 8P
High Efficiency IE2 Series Motors	2S	71 to 355L	0.37 to 355	2P, 4P, 6P
High Efficiency Motors	MS	90 to 450L	0.37 to 200	8P

Reference Standards

Motors comply with following Indian & International standards as applicable.

IS/IEC 60079 - 0:2004	Electrical apparatus for Explosive gas atmosphere – Part 0 General Requirements
IS/IEC 60079-15: 2005	Electrical apparatus for Explosive gas atmosphere – Part 15 Construction test and marking of type of protection 'n' electrical apparatus
IS 5572:2009	Classification of Hazardous areas (other than mining) having flammable gases and vapors for electrical installations.
IS 5571:2009	Guide for selection and installation of electrical equipment for hazardous areas (other than mines)
IEC 60079-14	Explosive atmospheres – Part 14: Electrical installations design, selection and erection

Electrical features, operational features of Non sparking motors are same as that of safe area motor. Different constructional features than standard safe area motors are mentioned below.

Special Features

Non sparking motors provide protection against auto ignition of surrounding gases which may be released under abnormal operating condition.

Limiting Temperature

These motor are designed such that the limiting temperatures of all parts in continuous operation does not exceed 200°C i.e. Temperature Class T3, as per IS / IEC 60079-15.

Standard operation Conditions

Supply conditions (Voltage & Frequency)

Voltage : 415 V ± 10%
Frequency : 50Hz ± 5%
Combined variation : ± 10%
(Absolute sum with max frequency variation 5%)

Ambient

Motors are designed for ambient temperature as mentioned in the performance tables. Higher ambient temperature motors can be offered on request.

Altitude

Motors are designed for an altitude up to 1000m above mean sea level. Motors can be offered for higher altitudes on request.

Re-rating Factors

The re-rating applicable under different conditions of variations in supply voltage, frequency, ambient & altitude are obtained by multiplying following factors.

Variation in Supply Voltage & Frequency

Voltage Variation (%)	Frequency Variation (%)	Combined Voltage & Frequency Variation (%)	Permissible output as % of rated value
± 10	± 5	± 10	100
± 12.5	± 5	± 12.5	95
± 15	± 5	± 15	90

Variation in Ambient & Altitude for all Motors

For motors with Ambient 40° C		For motors with Ambient 50° C	
Amb. Temp. (°C)	Permissible output as % of rated value	Amb. Temp. (°C)	Permissible output as % of rated value
20	107	30	107
21-35	103	30-45	103
40	100	50	100
45	95	55	96
50	91	60	92

Altitude above sea level (m)	Permissible output as % of rated value
1000	100
1500	97
2000	94
2500	90
3000	86
3500	82
4000	77

Terminal and Connection

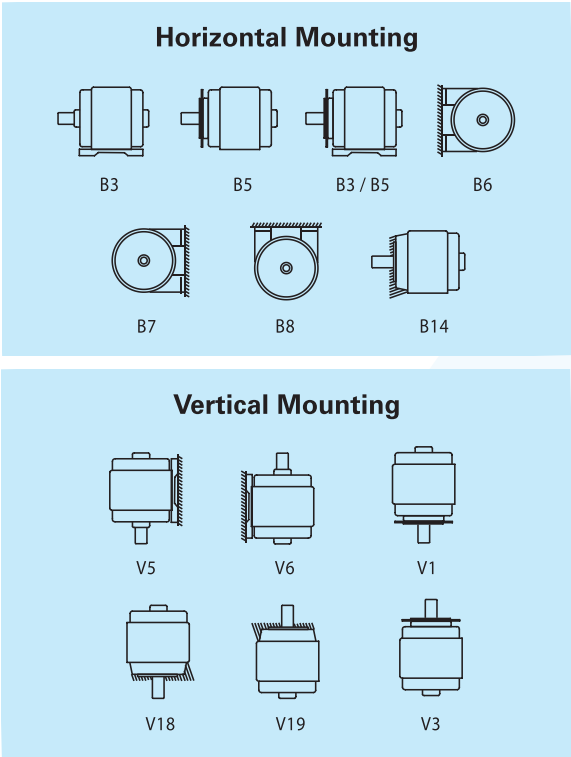
External connection of Client's power cable to the motor terminals in the terminals box must be rigidly gripped and secured against loosening and twisting. This is achieved with specially designed terminal plate in Terminals Box. Terminal plate design is as per the requirements of IS/IEC 60079-15:2005.

Enclosure and Degree of Protection

All Non-sparking motors are with totally enclosed fan cooled (TEFC) construction with degree of protection IP55 as per IS/IEC 60034-5 as a standards features. In addition, all flange mounted motors (B5 and B14) have oil tight Shaft (OTS) protection. Motor with V1, V5 and V18 Mounting are provided with a canopy fitted on the top of the fan cover.

Note: For more details, refer to annexure II on page no. 125.

Mounting



Cooling

All motors are totally Enclosed Fan cooled (TEFC). The cooling is effected by self-driven, bi-directional cast iron or fabricated centrifugal fan protected by fan cover. The type of cooling is IC 411 as per IS 6362/IEC 60034-6.

Minimum cooling distance as indicated in GA drawing has to be provided for effective cooling of the motor.

Note: For more details, refer to annexure I on page no. 124.

Terminal Box and Bearing Details

Please refer Terminals box and bearing details and alternate Terminals Box location as specified in the table 1.

Winding and Rotor Cage

The Stator winding and rotor cage are so designed that limiting temperature specified in IS/IEC 60079-15 is not exceeded. Gel coat is applied on winding overhang as an additional protection against ingress of moisture.

Air Gap

Radial air gap of the motor is such that the minimum air gap values specified in IS / IEC 60079-15 are complied with.

Paint

All internal & external surfaces are coated with epoxy polymide base acid/alkali resistant paint of Dark Admiralty Grey, Shade No. 632 (as per IS: 5)

Name Plate

Stainless steel name plate is provided on each motor. Special data such as efficiency class, temperature class and statutory approval reference are also provided on the nameplate along with the usual name plate details.

Certification

Non-sparking motors are approved by Petroleum Explosive and Safety Origination (PESO), Nagpur. A declaration to this effect is incorporation on the nameplate.

Starting current measurement of BBL motors:

Induction motor starting current is generally 6.0 to 7.0 times the full load current of the motor. This is a characteristic feature of the motor and though undesirable, it is inevitable in the design of the motor. Measurement of this starting current at rated voltage becomes difficult since it demands higher capacity of the supply system as well as use of appropriate CTs in the circuit of meters. Generally a fraction of rated starting current is passed in the motor due to capacity constraints. This current is extrapolated to rated voltage. If this measurement is done at higher voltage then the estimated starting current is more accurate.In BBL, starting current measurement is done as per below table

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

Bearing and Terminal Box Details for Ex(nA) motors

Table 1

Frame Size		Bearing Nos. C3 clearance		Terminal Box Type/ Location	Terminal		No. & size of Cable entries	Max cond. Cross Sec. area mm2
		DE	NDE		No.	Size		
63		6201 2Z	6201 2Z	gk130/TOP	3	M4	2 X M20X1.5P	4
71		6202 2Z	62022Z					
80		6004 2Z	6004 2Z					
90S, 90L		6205 2Z	6205 2Z	gk130/RHS	3*			
100L		6206 2Z	62052Z	gk230/ RHS	3*		2 X M25X1.5P	10
112M		6206 2Z	6205 2Z					
132S, 132M		6208 2Z	6208 2Z	gk330/RHS	6	M5		
160M, 160L		6309 2Z	6209 2Z	gk330/RHS				16
180M, 180L(IE2 4 P)		6310 2Z	6309 2Z	gk430/RHS	6	M6	2 X M32X1.5P	50
180M, 180L (Standard 2P, 4P, 6P, 8P & IE2 2P,6P)		6310 2Z	6210 2Z					
200L		6312 2Z	6212 2Z	TB225/RHS	6	M8	2 X M40X1.5P	70
225S, 225M		6313	6213					
250M		6315	6215	TB280/ TOP	6	M10	2 X M50X1.5P	150
280 S/M	2P	6316	6316					
	4,6 & 8P	6317	6316					
315S/M		6319	6319	TB315/ TOP	6	M12	2 X M50X1.5P	185
315L		6319	6319				2 X M63X1.5P	240
355L		6322	6322	TB 355/ TOP	6	M16	2 X M75X1.5P	300
355L/K	2P	6319	6319	TB400/ RHS	6	M20	2 X M75X1.5P	400
	4P	6322	6322					
	6P							
	8P							
400M/L	2P	6324	6322	TB400/ TOP				
	4P							
	6P							
	8P							
450M/L	4P	6326	6326					
	6P							
	8P							

*3 Terminals upto and including 1.5kW & 6 terminals for higher outputs, except IE2 motors.

Note: L10 bearing life is 50,000 hours for directly coupled loads through flexible couplings only.

** IN 315L frame for star delta connection, higher size T box of 355 frame will be provided.

Effect of Converter (VFD) supply voltage on motor performance

Note: Please refer to page 6, 7, 8, 9, 10 and 11 of Industrial Motors, technical information section.

Non sparking induction motors fed with converter supply (statutory requirement)

Combined Testing of non sparking motor and converter:

Bharat Bijlee motors have been tested and approved by statutory authorities for given temperature class with sinusoidal supply. Since VFD supply contains more harmonics, temperature rise of motor increases on VFD supply. This leads to increase in surface temperature. Also, with the VFD, motor speed is varied. When motor speed is reduced, it leads to poor cooling and higher temperature rise. So the new temperature class needs to be verified by statutory authority.

IS 5571 (Guide for selection and installation of electrical equipment for hazardous areas - other than mines) or IEC 60079-14 (Explosive atmospheres - Part 14: Electrical installations design, selection and erection) is the selection & installation guide for the user.

The statutory testing authorities insist that the motors intended for use in hazardous area, which are to be supplied with varying voltage and frequency by converter, shall be tested, certified and approved in association with the converter to determine the temperature class / maximum surface temperature. The authorities give reference to IS 5571:2009 clause 14.4.2 (a) for this testing.

This is also mentioned in the international standard IEC 60079-14:2007 (Explosive atmospheres - Part 14: Electrical installations design, selection and erection), clause 14.4.2 (a).

IS/IEC 60079-15:2005 clause 17.8.2.2 also states that the motor shall be tested with the converter to prove that the temperature class limits are not exceeded.

Note:

1. Additional factors may also need to be taken into account, which include provision by the user of additional output filters or reactors and the length of cable between converter and motor. Both these affect motor input voltage and cause additional motor heating.
2. High frequency switching in converters can lead to rapid rise time voltage stress in the windings and cable circuits and therefore a further potential source of ignition. It is necessary to consider the effects of this stress according to the type of protection. It will be necessary to add an additional output filter after the converter.
3. Bearing currents require special consideration. Possible solutions include the use of insulated bearings, either alone, or in accordance with a filter that reduces common mode voltages and / or dv/dt.

Cable length between motor and converter:

Whenever non sparking motor is fed through converter supply, normally converter is placed in safe area and motor is working in hazardous area. Hence the cable length between converter and motor is generally high, i.e. 500 to 800 meters long. For effective and trouble free operation of motor, use of filters (preferably sine wave filter) at converter output terminals is a must, when using such high cable length. The customer and / or his system integrator has to ensure that the voltage appearing at motor terminals is <= 1.56kV.

Warranty clause of motor is applicable only if sine wave filter is provided at converter output terminals by the motor user in case of use of high cable length.

Use of thermal protective devices

Use of thermistors / thermostats is recommended to monitor the temperature rise of stator winding of motor.

PERFORMANCE TABLE FOR NON SPARKING MOTORS Ex(nA)

Performance table for 2 Pole motors

TEFC 3 Phase Squirrel Cage Induction Motors - Frame size 63 to 355L

Applicable standard for testing: IS 4029
Applicable standard for efficiency determination: IS 4889

Voltage : 415V+/-10%
Frequency : 50Hz+/-5%
Combined Variation : +/-10%

Ambient: : 50°C
Duty : S1 (Continuous)
Temp.Class :T3
3000 rpm (2-Pole)

Ins. Class : F
Temp. Rise : B
Protection : IP55

Rated Output		Frame size IEC	Type ref. B3 construction	Operating characteristics at rated output									With DOL starting		Pullout Torque to Rated Torque Ratio	Rotor GD² kgm2	Net Weight B3 constr. kg
				Rated Speed RPM	Rated Current Amps.	Rated Torque kg-m	Power Factor			% Efficiency			Starting Current to Rated Current Ratio	Starting Torque to rated torque ratio			
kW	HP						FL	3/4L	1/2L	FL	3/4L	1/2L					
0.18	0.25	63	MN063213	2720	0.57	0.06	0.76	0.66	0.52	58.0	57.0	52.0	3.2	2.7	3.0	0.00085	5
0.25	0.35	63	MN063233	2720	0.65	0.09	0.82	0.75	0.63	65.0	60.0	54.0	3.5	2.4	2.6	0.00099	5
0.37	0.50	71	MN071213	2790	0.91	0.13	0.80	0.72	0.60	71.0	68.0	62.0	4.0	2.3	2.8	0.0015	6
0.55	0.75	71	MN071233	2805	1.31	0.19	0.79	0.72	0.58	74.0	74.0	71.0	5.0	2.7	3.0	0.0019	7
0.75	1.0	80	MN080213	2830	1.65	0.26	0.82	0.74	0.62	77.0	76.0	72.0	5.0	2.5	2.8	0.0037	10
1.1	1.5	80	MN080233	2840	2.36	0.38	0.82	0.75	0.63	79.0	79.0	76.0	5.9	2.7	3.0	0.0051	11
1.5	2.0	90S	MN09S233	2825	3.01	0.52	0.86	0.83	0.76	80.6	78.0	74.0	5.5	2.7	3.0	0.0071	15
2.2	3.0	90L	MN09L253	2830	4.36	0.76	0.85	0.82	0.74	82.5	80.0	76.0	6.0	3.0	3.0	0.0093	18
3.7	5.0	100L	MN10L213	2900	7.12	1.24	0.85	0.80	0.70	85.0	83.0	78.0	6.5	2.8	3.0	0.0188	24
5.5	7.5	132S	MN13S2B3	2920	10.1	1.83	0.88	0.85	0.77	85.7	85.0	80.0	6.5	2.3	3.0	0.0630	52
7.5	10.0	132S	MN13S2E3	2920	13.6	2.50	0.88	0.84	0.76	87.0	86.0	82.0	6.5	2.3	3.0	0.0760	65
9.3	12.5	132M	MN13M2N3	2920	16.5	3.10	0.89	0.85	0.76	88.0	86.0	83.0	6.5	2.4	2.9	0.0980	67
11	15	160M	MN16M213	2920	19.3	3.67	0.89	0.87	0.83	89.0	88.0	86.0	5.8	2.0	3.0	0.134	95
15	20	160M	MN16M253	2920	26.2	5.00	0.89	0.88	0.82	89.5	89.0	87.0	6.0	2.0	3.0	0.171	112
18.5	25	160L	MN16L273	2920	31.6	6.17	0.90	0.88	0.86	90.5	90.0	88.0	6.5	2.0	3.0	0.225	123
22	30	180M	MN18M213	2930	37.6	7.31	0.89	0.87	0.80	91.5	90.5	88.0	6.5	2.2	2.7	0.30	168
30	40	200L	MN20L233	2950	51.2	9.91	0.88	0.85	0.79	92.6	92.0	89.5	6.5	2.5	2.5	0.52	253
37	50	200L	MN20L253	2945	62.9	12.2	0.88	0.85	0.79	93.0	92.5	91.0	6.5	2.5	2.5	0.61	264
45	60	225M	MN22M233	2960	74.4	14.8	0.90	0.87	0.83	93.5	93.0	91.0	6.0	2.5	2.5	1.04	348
55	75	250M	MN25M213	2960	89.1	18.1	0.92	0.91	0.86	93.3	92.8	91.5	6.0	2.1	2.6	2.11	523
75	100	280S	MN28S213	2970	122	24.6	0.91	0.89	0.84	93.7	92.5	90.0	6.0	1.8	2.7	2.63	626
90	120	280M	MN28M233	2970	146	29.5	0.91	0.89	0.84	94.0	93.0	91.0	6.0	1.8	2.7	3.01	669
110	150	315S	MN31S233	2982	180	35.9	0.90	0.86	0.78	94.5	94.0	91.5	7.0	2.0	2.5	5.0	898
125	170	315M	MN31M2A3	2982	206	40.8	0.89	0.85	0.76	94.7	93.5	91.5	7.0	2.2	2.6	5.0	940
132	180	315M	MN31M233	2982	215	43.1	0.90	0.86	0.78	95.0	94.0	92.0	7.0	2.0	2.5	5.0	940
150	200	315L	MN31L2A3	2982	247	49.0	0.89	0.84	0.76	95.1	94.2	92.2	7.0	2.0	2.5	6.2	1100
160	215	315L	MN31L253	2982	260	52.3	0.90	0.85	0.77	95.2	94.6	92.7	7.0	2.0	2.5	6.2	1100
180	240	315L	MN31L2B3	2982	299	58.8	0.88	0.82	0.75	95.3	94.7	92.7	7.0	2.0	2.5	7.7	1185
200	270	355L	MN35L2A3	2985	324	65.3	0.90	0.87	0.82	95.5	95.0	93.0	7.0	1.6	2.4	12.0	1680
*250	335	355L	MN35L213	2985	404	81.6	0.90	0.88	0.84	95.7	95.2	93.7	7.0	1.6	2.4	12.0	1680
*315	425	355L	MN35L233	2985	508	102.8	0.90	0.88	0.84	95.8	95.3	93.8	7.0	1.6	2.4	14.7	1870

Notes:

- All performance values are subject to tolerance as per IS/IEC 60034-1
- Ratings above 355kW up to 630kW are available in 355 & 400 frames with Dual Circuit Cooling Arrangement (DCCA).
- Efficiency measurement are without sales

*- These ratings are suitable for class F temperature rise

PERFORMANCE TABLE FOR NON SPARKING MOTORS Ex(nA)

Performance table for 4 Pole motors

TEFC 3 Phase Squirrel Cage Induction Motors - Frame size 63 to 355L

Applicable standard for testing: IS 4029
Applicable standard for efficiency determination: IS 4889

Voltage : 415V+/-10%
Frequency : 50Hz+/-5%
Combined Variation : +/-10%

Ambient: : 50°C
Duty : S1 (Continuous)
Temp.Class :T3
1500 rpm (4-Pole)

Ins. Class : F
Temp. Rise : B
Protection : IP55

Rated Output		Frame size IEC	Type ref. B3 construction	Operating characteristics at rated output									With DOL starting		Pullout Torque to Rated Torque Ratio	Rotor GD² kgm2	Net Weight B3 constr. kg
				Rated Speed RPM	Rated Current Amps.	Rated Torque kg-m	Power Factor			% Efficiency			Starting Current to Rated Current Ratio	Starting Torque to rated torque ratio			
kW	HP						FL	3/4L	1/2L	FL	3/4L	1/2L					
0.12	0.16	63	MN063413	1330	0.41	0.09	0.75	0.65	0.50	54.0	48.0	40.0	2.4	1.9	2.3	0.00140	5
0.18	0.25	63	MN63433	1350	0.56	0.13	0.75	0.65	0.50	60.0	56.0	50.0	3.0	2.0	2.3	0.00160	5
0.25	0.35	71	MN071413	1370	0.68	0.18	0.76	0.63	0.51	67.0	64.0	58.0	3.0	2.0	2.5	0.0024	6
0.37	0.50	71	MN071433	1360	1.02	0.26	0.71	0.62	0.50	71.0	70.0	64.0	3.4	2.3	2.5	0.0033	7
0.55	0.75	80	MN080413	1405	1.28	0.38	0.81	0.70	0.56	74.0	71.0	67.0	4.0	2.4	2.6	0.0061	10
0.75	1.0	80	MN080433	1405	1.74	0.52	0.78	0.70	0.58	77.0	76.0	72.0	4.5	2.8	3.0	0.0072	11
1.1	1.5	90S	MN09S433	1410	2.45	0.76	0.80	0.73	0.61	78.0	77.0	72.0	4.2	2.3	2.7	0.0120	14
1.5	2.0	90L	MN09L453	1410	3.26	1.04	0.80	0.72	0.58	80.0	79.0	75.0	5.0	2.5	3.0	0.0160	17
2.2	3.0	100L	MN10L433	1420	4.55	1.51	0.82	0.69	0.53	82.0	80.0	76.0	5.5	2.5	3.0	0.0210	22
3.7	5.0	112M	MN11M433	1430	7.3	2.52	0.83	0.76	0.65	85.0	85.0	82.0	6.0	2.6	3.0	0.0530	32
5.5	7.5	132S	MN13S4B3	1450	10.3	3.69	0.86	0.81	0.70	86.5	86.0	84.0	6.0	2.4	3.0	0.1040	50
7.5	10.0	132M	MN13M4K3	1450	13.7	5.04	0.87	0.82	0.72	87.5	87.0	85.0	6.0	2.3	3.0	0.1260	74
9.3	12.5	160M	MN16M4A3	1450	17.4	6.25	0.84	0.80	0.72	88.5	88.0	87.0	6.0	2.0	2.5	0.141	93
11	15	160M	MN16M4C3	1450	20.5	7.39	0.84	0.81	0.76	89.0	89.0	86.0	6.0	2.1	2.5	0.177	105
15	20	160L	MN16L4K3	1450	27.5	10.1	0.84	0.83	0.79	90.2	90.5	90.0	6.0	2.1	2.5	0.235	113
18.5	25	180M	MN18M433	1460	33.2	12.3	0.85	0.82	0.72	91.2	91.2	90.0	6.0	2.4	2.5	0.460	160
22	30	180L	MN18L473	1460	39.2	14.7	0.85	0.82	0.72	91.8	91.5	90.0	6.0	2.4	2.5	0.540	188
30	40	200L	MN20L433	1465	51.6	19.9	0.88	0.84	0.77	92.0	92.0	90.0	6.0	2.6	2.6	0.860	270
37	50	225S	MN22S413	1470	63.6	24.5	0.87	0.83	0.75	93.0	93.0	91.0	6.0	2.5	2.5	1.32	328
45	60	225M	MN22M433	1470	76.3	29.8	0.88	0.84	0.75	93.2	93.2	91.0	6.0	2.5	2.5	1.60	362
55	75	250M	MN25M413	1478	93.8	36.2	0.87	0.84	0.77	93.8	93.5	92.0	6.0	2.4	2.5	2.78	500
75	100	280S	MN28S413	1485	129	49.2	0.86	0.83	0.75	94.2	94.0	93.0	6.0	2.1	2.8	5.00	653
90	120	280M	MN28M433	1485	154	59.0	0.86	0.83	0.75	94.7	94.5	93.5	6.0	2.1	2.8	6.00	713
110	150	315S	MN31S413	1485	188	72.1	0.86	0.83	0.76	94.7	94.5	93.2	6.5	2.5	3.0	9.97	862
125	170	315M	MN31M4A3	1486	216	81.9	0.85	0.81	0.74	94.8	94.5	93.3	6.5	2.5	3.0	11.7	965
132	180	315M	MN31M433	1487	225	86.5	0.86	0.83	0.76	95.0	94.8	93.8	6.5	2.5	3.0	11.7	965
150	200	315L	MN31L4A3	1488	261	98.2	0.84	0.80	0.72	95.2	95.0	93.9	6.5	2.5	3.0	14.0	1145
160	215	315L	MN31L453	1487	268	104.8	0.87	0.84	0.78	95.4	95.2	94.0	6.5	2.4	3.0	14.0	1145
180	240	315L	MN31L463	1487	305	117.9	0.86	0.83	0.76	95.5	95.3	94.0	6.5	2.5	3.0	15.6	1225
200	270	315L	MN31L473	1489	338	130.8	0.86	0.83	0.76	95.6	95.4	94.0	7.0	2.5	3.0	17.8	1290
250	335	355L	MN35L413	1488	413	163.6	0.88	0.85	0.75	95.8	95.5	94.0	6.5	2.2	2.5	23.3	1680
315	422	355L	MN35L433	1488	519	206.2	0.88	0.85	0.75	96.0	95.6	94.2	6.5	2.2	2.5	32.7	1855
*355	475	355L	MN35L453	1488	585	232.4	0.88	0.85	0.75	96.0	95.6	94.2	6.5	2.2	2.5	37.9	2025

Notes:

- All performance values are subject to tolerance as per IS/IEC 60034-1
- Ratings above 400 kW up to 1000kW are available in 355, 400 & 450 frames with Dual Circuit Cooling Arrangement (DCCA).
- Efficiency measurement are without sales

*- These ratings are suitable for class F temperature rise

PERFORMANCE TABLE FOR NON SPARKING MOTORS Ex(nA)

Performance table for 6 Pole motors

TEFC 3 Phase Squirrel Cage Induction Motors - Frame size 71 to 355L

Applicable standard for testing: IS 4029
Applicable standard for efficiency determination: IS 4889

Voltage : 415V+/-10%
Frequency : 50Hz+/-5%
Combined Variation : +/-10%

Ambient: : 50°C
Duty : S1 (Continuous)
Temp.Class :T3
1000 rpm (6-Pole)

Ins. Class : F
Temp. Rise : B
Protection : IP55

Rated Output		Frame size IEC	Type ref. B3 construction	Operating characteristics at rated output									With DOL starting		Pullout Torque to Rated Torque Ratio	Rotor GD^2 kgm2	Net Weight B3 constr. kg
				Rated Speed RPM	Rated Current Amps.	Rated Torque kg-m	Power Factor			% Efficiency			Starting Current to Rated Current Ratio	Starting Torque to rated torque ratio			
kW	HP						FL	3/4L	1/2L	FL	3/4L	1/2L					
0.25	0.35	71	MN071633	875	0.80	0.28	0.70	0.60	0.48	62.0	62.0	55.0	2.6	2.0	2.3	0.00380	7
0.37	0.50	80	MN080613	910	1.08	0.40	0.70	0.60	0.48	68.0	66.0	61.0	3.0	2.1	2.3	0.00600	10
0.55	0.75	80	MN080633	915	1.56	0.59	0.71	0.62	0.48	69.0	70.0	64.0	4.0	2.2	2.5	0.0084	11
0.75	1.0	90S	MN09S633	925	1.99	0.79	0.72	0.61	0.50	73.0	70.0	69.0	3.4	2.0	2.5	0.0122	14
1.1	1.5	90L	MN09L653	930	2.80	1.15	0.72	0.61	0.50	76.0	74.0	72.0	4.0	2.1	2.6	0.0160	17
1.5	2.0	100L	MN10L633	935	3.72	1.56	0.72	0.64	0.52	78.0	75.0	72.0	4.0	2.0	2.5	0.0250	22
2.2	3.0	112M	MN11M633	935	4.97	2.29	0.77	0.68	0.55	80.0	80.0	74.0	5.0	2.0	2.5	0.0500	29
3.7	5.0	132S	MN13S6B3	950	8.05	3.79	0.77	0.72	0.60	83.0	83.0	82.0	5.0	2.2	2.8	0.118	50
5.5	7.5	132M	MN13M6N3	950	11.6	5.64	0.78	0.74	0.64	84.5	84.5	83.0	5.5	2.5	3.0	0.172	71
7.5	10.0	160M	MN16M633	960	14.8	7.61	0.80	0.74	0.64	88.0	88.0	86.0	5.4	2.0	2.5	0.276	103
9.3	12.5	160L	MN16L663	960	18.4	9.44	0.80	0.74	0.64	88.0	88.0	87.0	5.5	2.1	2.5	0.340	113
11	15	160L	MN16L673	965	21.6	11.1	0.80	0.77	0.70	88.5	88.0	87.0	6.0	2.0	2.5	0.400	123
15	20	180L	MN18L613	965	29.0	15.1	0.80	0.75	0.62	90.0	90.0	87.0	5.5	2.6	2.3	0.680	175
18.5	25	200L	MN20L613	975	34.0	18.5	0.83	0.78	0.70	91.1	91.0	88.0	5.8	2.6	2.3	1.00	241
22	30	200L	MN20L633	975	40.3	22.0	0.83	0.77	0.68	91.5	91.0	88.0	5.8	2.6	2.3	1.20	254
30	40	225M	MN22M623	975	52.1	30.0	0.87	0.84	0.76	92.0	91.0	88.0	6.0	2.3	2.2	2.10	336
37	50	250M	MN25M603	975	63.2	37.0	0.88	0.85	0.82	92.5	92.5	91.0	6.0	2.5	2.3	3.51	458
45	60	280S	MN28S613	984	80.1	44.5	0.84	0.80	0.72	93.0	92.5	92.0	6.0	2.5	2.4	5.11	573
55	75	280M	MN28M633	984	95.2	54.4	0.86	0.83	0.76	93.5	93.0	92.0	6.0	2.4	2.4	6.16	620
75	100	315S	MN31S613	988	132	73.9	0.84	0.82	0.75	94.0	94.0	92.2	6.0	2.4	2.5	10.7	830
90	120	315M	MN31M633	989	158	88.6	0.84	0.80	0.74	94.2	94.2	92.5	6.0	2.2	2.5	12.4	912
110	150	315M	MN31M653	989	193	108.3	0.84	0.81	0.74	94.5	94.5	92.5	6.0	2.3	2.5	15.5	1010
125	170	315L	MN31L6A3	990	221	123.0	0.83	0.80	0.72	94.7	94.6	92.6	6.0	2.3	2.5	18.0	1175
132	180	315L	MN31L673	990	230	129.9	0.84	0.81	0.74	95.0	94.9	93.0	6.0	2.3	2.5	18.0	1175
150	200	315L	MN31L6B3	990	268	147.6	0.82	0.79	0.70	95.0	94.3	92.8	6.0	2.0	2.5	21.5	1231
160	215	315L	MN31L693	990	279	157.4	0.84	0.81	0.71	95.0	94.5	93.0	6.0	2.0	2.5	21.5	1231
180	240	355L	MN35L6A3	990	321	177.1	0.82	0.77	0.65	95.1	94.6	93.0	6.0	2.0	2.5	28.7	1670
200	270	355L	MN35L613	990	348	196.8	0.84	0.80	0.70	95.2	95	93.3	6.0	2.0	2.5	28.7	1670
250	335	355L	MN35L633	990	434	246.0	0.84	0.80	0.70	95.5	95	93.5	6.0	2.0	2.5	35.5	1780

Notes:

- All performance values are subject to tolerance as per IS/IEC 60034-1
- Ratings above 315kW up to 800kW are available in 355, 400 & 450 frames with Dual Circuit Cooling Arrangement (DCCA).

Efficiency measurements are without seals.

PERFORMANCE TABLE FOR NON SPARKING MOTORS Ex(nA)

Performance table for 8 Pole motors

TEFC 3 Phase Squirrel Cage Induction Motors - Frame size 90S to 355L

Applicable standard for testing: IS 4029
Applicable standard for efficiency determination: IS 4889

Voltage : 415V+/-10%
Frequency : 50Hz+/-5%
Combined Variation : +/-10%

Ambient: : 50°C
Duty : S1 (Continuous)
Temp.Class :T3
750 rpm (8-Pole)

Ins. Class : F
Temp. Rise : B
Protection : IP55

Rated Output		Frame size IEC	Type ref. B3 construction	Operating characteristics at rated output									With DOL starting		Pullout Torque to Rated Torque Ratio	Rotor GD² kgm2	Net Weight B3 constr. kg
				Rated Speed RPM	Rated Current Amps.	Rated Torque kg-m	Power Factor			% Efficiency			Starting Current to Rated Current	Starting Torque to rated torque			
kW	HP						FL	3/4L	1/2L	FL	3/4L	1/2L					
0.37	0.50	90S	MN09S813	700	1.32	0.51	0.63	0.52	0.41	62.0	55.0	48.0	2.7	1.8	2.1	0.01100	11
0.55	0.75	90L	MN09L853	690	1.81	0.78	0.63	0.55	0.43	67.0	62.0	58.0	2.9	2.0	2.4	0.01400	14
0.75	1.0	100L	MN10L813	685	2.04	1.07	0.73	0.63	0.50	70.0	70.0	64.0	3.0	1.6	1.8	0.0230	18
1.1	1.5	100L	MN10L833	690	2.91	1.55	0.71	0.62	0.48	74.0	73.0	71.0	3.3	1.9	2.3	0.0270	21
1.5	2.0	112M	MN11M813	705	3.87	2.07	0.70	0.62	0.50	77.0	77.0	75.0	3.8	1.7	2.2	0.0510	25
2.2	3.0	132S	MN13S8B3	705	5.03	3.04	0.78	0.74	0.64	78.0	78.0	75.0	3.5	1.8	2.3	0.0990	57
3.7	5.0	160M	MN16M813	720	8.05	5.01	0.78	0.74	0.65	82.0	82.0	78.0	4.4	1.8	2.0	0.217	88
5.5	7.5	160M	MN16M833	715	11.6	7.49	0.78	0.74	0.65	84.5	84.5	82.0	4.8	1.9	2.2	0.299	101
7.5	10.0	160L	MN16L873	710	15.6	10.29	0.78	0.74	0.65	86.0	84.0	82.0	5.5	2.1	2.2	0.400	119
9.3	12.5	180M	MN18M813	715	18.9	12.7	0.79	0.74	0.64	86.5	86.5	85.0	4.5	2.1	2.2	0.620	177
11	15	180L	MN18L833	720	22.1	14.9	0.79	0.74	0.64	87.5	87.5	86.0	4.5	2.1	2.2	0.720	182
15	20	200L	MN20L833	720	28.8	20.3	0.82	0.79	0.71	88.5	88.5	87.0	5.5	2.5	2.3	1.32	282
18.5	25	225S	MN22S813	725	36.6	24.9	0.79	0.77	0.69	89.0	88.0	87.0	5.3	2.1	2.2	1.950	329
22	30	225M	MN22M833	725	43.0	29.6	0.79	0.77	0.69	90.0	89.0	87.0	5.3	2.1	2.2	2.410	369
30	40	250M	MN25M813	730	55.9	40.0	0.82	0.78	0.68	91.0	90.5	89.0	5.5	2.5	2.2	3.720	472
37	50	280S	MN28S823	730	70.8	49.4	0.79	0.75	0.65	92.0	92.0	90.0	5.5	2.2	2.2	5.83	615
45	60	280M	MN28M853	730	86.1	60.0	0.79	0.75	0.65	92.0	92.0	91.0	5.5	2.2	2.2	6.86	665
55	75	315S	MN31S813	740	105	72.4	0.78	0.73	0.62	93.0	92.5	90.5	5.5	2.1	2.4	10.7	912
75	100	315M	MN31M833	740	143	98.7	0.78	0.73	0.62	93.5	93.0	92.0	5.5	2.1	2.4	12.4	912
90	120	315M	MN31M853	740	171	118.5	0.78	0.73	0.62	94.0	93.5	92.5	5.5	2.1	2.4	15.5	1010
110	150	315L	MN31L873	740	208	144.8	0.78	0.73	0.62	94.2	93.7	92.5	5.5	2.1	2.4	18.0	1170
125	170	315L	MN31L8A3	740	236	164.5	0.78	0.73	0.64	94.3	93.7	92.5	5.5	2.1	2.4	21.5	1340
132	180	315L	MN31L893	740	249	173.7	0.78	0.73	0.64	94.5	94.0	92.8	5.5	2.1	2.4	21.5	1340
150	200	355L	MN35L8A3	740	283	197.4	0.78	0.70	0.60	94.6	94.0	92.5	5.5	1.8	2.2	28.7	1670
160	215	355L	MN35L813	740	300	210.6	0.78	0.70	0.60	95.0	94.5	92.5	5.5	1.8	2.2	28.7	1670
180	240	355L	MN35L8B3	740	338	236.9	0.78	0.70	0.60	95.0	94.3	92.3	5.5	1.8	2.2	35.5	1780
200	270	355L	MN35L833	740	375	263.2	0.78	0.70	0.60	95.0	94.5	92.5	5.5	1.8	2.2	35.5	1780

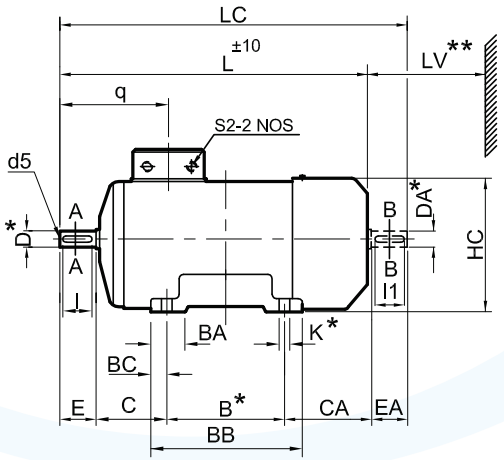
Notes:

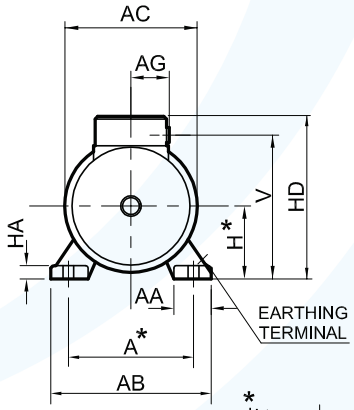
- All performance values are subject to tolerance as per IS/IEC 60034-1
- Ratings above 250 kW up to 630kW are available in 355, 400 & 450 frames with Dual Circuit Cooling Arrangement (DCCA). For more details please contact sales office.

Efficiency measurements are without seals.

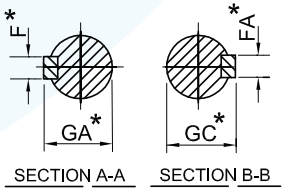
Dimensional Drawing: Increased Safety Motors (Type ME) and Non-Sparking Motors (Type MN)

Foot Mounted (B3) TEFC series-Frame 63 - 355L



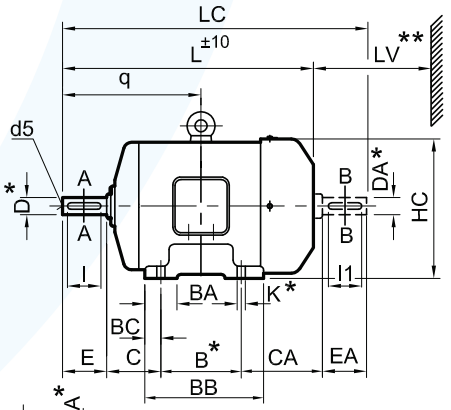


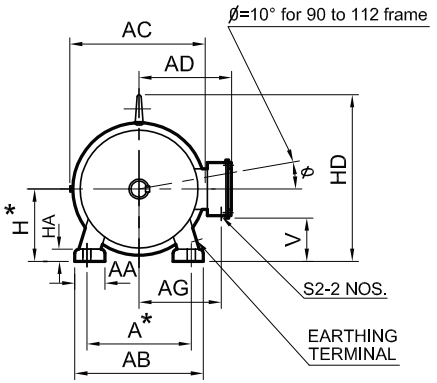
FRAME SIZE 63 TO 80



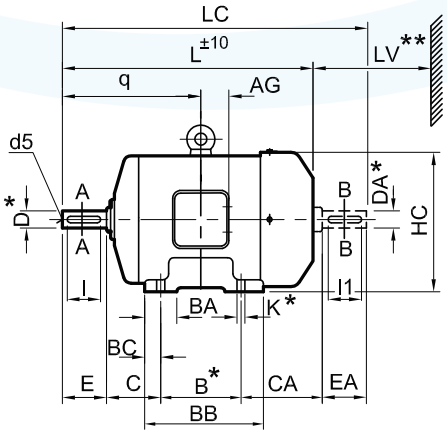
SECTION A-A

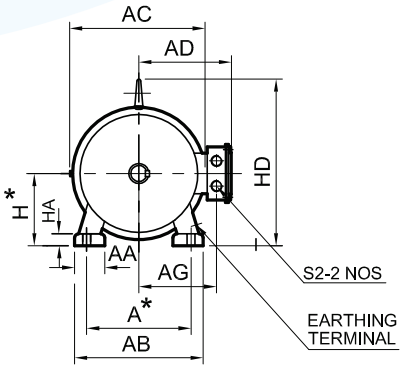
SECTION B-B





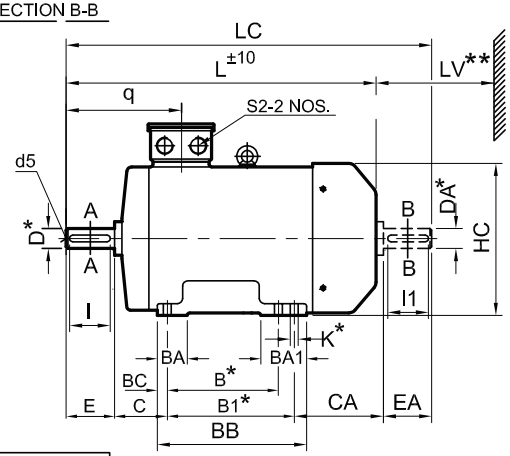
FRAME SIZE 90S TO 160L

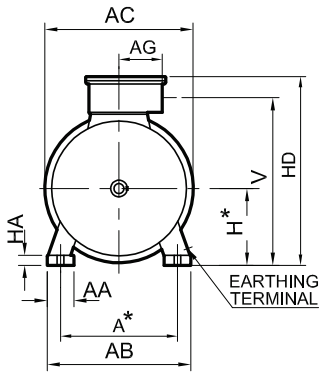




FRAME SIZE 180M TO 225M

* Refer TABLE A for tolerances





FRAME SIZE 250M TO 355L

CAT-E-6335-3-1

Dimensional Details: Increased Safety Motors (Type ME) and Non-Sparking Motors (Type MN)

Foot Mounted (B3) TEFC series-Frame 63-355L

		FIXING						GENERAL														TERMINAL BOX				SHAFT					
IEC Fr. size	Pole	A*	B*	B1*	C	H*	K*	AB	BB	AA	BA	BA1	BC	HA	HC	HD	AD	L	LC	CA	AC	LV**	V	q	AG	S2	D,DA**	E EA	F* FA*	GA* GC*	I I1	d5
63	2 & 4	100	80	—	40	63	7	126	100	28	30	—	13	7	125	190	—	206	241	75	124	30	159	104	52	M20X1.5P	11	23	4	12.5	18	M4
71	2,4 & 6	112	90	—	45	71	7	135	110	31	30	—	13	7	141	206	—	234	278	83	140	30	175	102	52	M20X1.5P	14	30	5	16	25	M5
80	2,4 & 6	125	100	—	50	80	10	150	124	31	35	—	15	9	159	225	—	267	324	94	157	30	194	112	52	M20X1.5P	19	40	6	21.5	35	M6
90S	2,4,6 & 8	140	100	—	56	90	10	180	130	50	43	—	18	13	177	①	141	302	374	143	174	35	57	156	110	M20X1.5P	24	50	8	27	45	M8
90L	2,4,6 & 8		125						155									327	399					169								
100L	2,4,6 & 8	160	140	—	63	100	12	200	176	54	50	—	21	14	198	235	179	366	448	125	195	40	66	193	138	M25X1.5P	28	60	8	31	55	M10
112M	4,6 & 8	190	140	—	70	112	12	230	176	62	51	—	21	15	222	260	191	388	471	141	220	45	80	200	151	M25X1.5P	28	60	8	31	55	M10
132S	2	216	140	—	89	132	12	256	180	64	50	—	23	17	262	308	206	475	568	189	260	50	99	239	167	M25X1.5P	38	80	10	41	70	M12
	4,6 & 8																	459	552	172											
132M	2		178						218		54							556	659	189				258							
	4,6																	497	590	172											
160M	2,4	254	210	—	108	160	15	310	250	58	70	—	23	20	318	366	226	605	741	203	316	60	98	323	186	M25X1.5P	42	110	12	45	105	M16
	6 & 8																	585	721	183											
160L	2		254						294									649	785	203				345							
	4,6 & 8																	629	765	183											
180M	2,4,6 & 8	279	241	—	121	180	15	344	281	65	70	—	23	26	357	412	265	679	799	217	354	70	83	352	216	M32X1.5P	48	110	14	51.5	100	M16
180L	2,4,6 & 8		279						319									717	838	218				371							
200L	2	318	305	—	133	200	19	398	355	85	85	—	28	32	397	462	319	795	920	262	394	80	—	396	249	M40X1.5P	55	110	16	59	100	M20
	4,6 & 8																	772	897	239											
225S	4,6 & 8	356	286	—	149	225	19	436	336	85	85	—	28	34	450	509	344	827	976	251	450	90	—	432.5	273	M40X1.5P	60	140	18	64	130	M20
225M	2		311						361									837	956	276				415			55	110	16	59	100	
	4,6 & 8																	857	1001	251				445			60	140	18	64	130	
250M	2	406	349	—	168	250	24	506	425	100	115	—	49	42	495	665	—	983	1134	337	489	100	578	352	243	M50X1.5P	60	140	18	64	130	M20
	4,6 & 8																	914	1065	268							65	140	18	69	130	
280S/M	2	457	368	419	190	280	24	540	490	100	110	149	40	42	552	725	—	1010	1160	271	544	115	638	360	243	M50X1.5P	65	140	18	69	130	M20
	4,6 & 8																										75	140	20	79.5	130	
315S/M	2	508	406	457	216	315	28	625	540	120	120	155	46	45	600	830	—	1137	1293	340	600	130	728	386	278	M50X1.5P	65	140	18	69	130	M20
	4,6 & 8																	1167	1353					416			80	170	22	85	160	
315L	2		508	—					593	120	120	120						1302	1458	454				386		M63X1.5P	65	140	18	69	130	
	4,6 & 8																	1332	1518					416			80	170	22	85	160	
355L	2	610	630	—	254	355	28	710	770	110	170	—	73	45	693	939	—	1461	1622	458	685	145	850	434	403	M75X1.5P	75	140	20	79.5	130	M20
	4,6 & 8																	1491	1682					464			95	170	25	100	160	M24

TABLE A

Dimension	Tolerance		Specification
A,B	±0.75		IS : 1231
H	-0.5	UPTO 280	
	-1	OVER 280	
K	+0.360	7,10Ø	
	+0.430	12,15Ø	
	+0.520	19,24,28Ø	

Dimension	Tolerance		Specification
D,DA	j6	11,14,19,24,28Ø	IS : 1231
	k6	38,42,48Ø	
	m6	55,60,65,75,80,95Ø	
GA,GC,F,FA			IS : 2048
d5(centering)			IS : 2540

*Refer TABLE A for tolerances

** Minimum distance for efficient cooling of motor to be maintained by user.

□ In 315L FR. For star delta connection Higher size T.Box will be provided

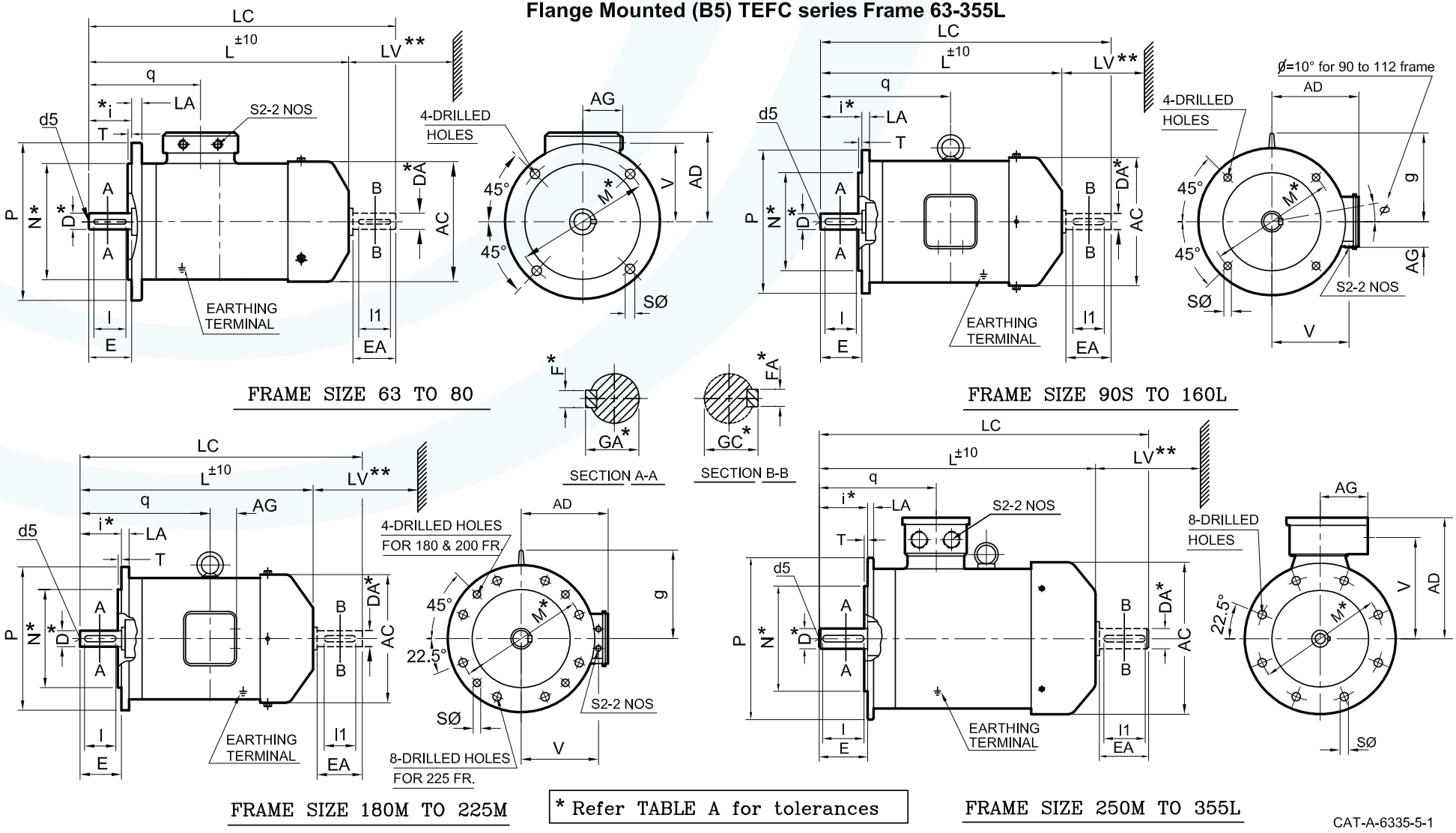
□ Double shaft extension can be provided with shaft dimension identical to DE shaft. ① Without Eye bolt

□ Also suitable for B6,B7,B8,V5 & V6 mounting as per IS 2253. □ Key / key way fit : h9 / N9

All Dimensions are in mm unless otherwise specified.

Dimensional Drawing: Increased Safety Motors (Type ME) and Non-Sparking Motors (Type MN)

Flange Mounted (B5) TEFC series Frame 63-355L



* Refer TABLE A for tolerances

CAT-A-6335-5-1

Dimensional Details: Increased Safety Motors (Type ME) and Non-Sparking Motors (Type MN)

Flange Mounted (B5) TEFC series-Frame 63-355L

		FIXING					GENERAL								TERMINAL BOX				SHAFT					
IEC Fr. size	Pole	P	N*	M*	i*	S	T	LA	AD	AC	L	LC	LV**	g	V	q	AG	S2	* * D,DA	E EA	F* FA*	GA* GC*	I I1	d5
63	2 & 4	140	95	115	23	10	3	9	127	124	225	260	30	—	96	109	52	M20X1.5P	11	23	4	12.5	18	M4
71	2,4 & 6	160	110	130	30	10	3.5	9	135	140	261	305	30	—	104	127	52	M20X1.5P	14	30	5	16	25	M5
80	2,4 & 6	200	130	165	40	12	3.5	10	145	157	267	324	30	—	114	112	52	M20X1.5P	19	40	6	21.5	35	M6
90S	2,4,6 & 8	200	130	165	50	12	3.5	10	141	174	302	374	35	①	110	156	53	M20X1.5P	24	50	8	27	45	M8
90L	2,4,6 & 8										327	399				169								
100L	2,4,6 & 8	250	180	215	60	15	4	11	179	195	366	448	40	135	138	193	56	M25X1.5P	28	60	8	31	55	M10
112M	2,4,6 & 8	250	180	215	60	15	4	11	191	220	388	471	45	148	151	200	56	M25X1.5P	28	60	8	31	55	M10
132S	2	300	230	265	80	15	4	12	206	260	475	568	50	176	167	239	63	M25X1.5P	38	80	10	41	70	M12
	2,6 & 8										459	552												
132M	2										556	659				258								
	4,6										497	590												
160M	2	350	250	300	110	19	5	13	226	316	605	741	60	206	186	323	63	M25X1.5P	42	110	12	45	105	M16
	4,6 & 8										585	721												
160L	2										649	785				345								
	4,6 & 8										629	765												
180M	2,4,6 & 8	350	250	300	110	19	5	13	265	354	679	799	70	232	216	352	97	M32X1.5P	48	110	14	51.5	100	M16
180L	2,4,6 & 8										717	838				371								
200L	2	400	300	350	110	19	5	15	319	394	795	920	80	262	249	396	172	M40X1.5P	55	110	16	59	100	M20
	4,6 & 8										772	897												
225S	4,6 & 8	450	350	400	140	19	5	16	344	450	827	976	90	284	273	432.5	172	M40X1.5P	60	140	18	64	130	M20
225M	2				110						837	956				415			55	110	16	59	100	
	4,6 & 8				140						857	1001				445			60	140	18	64	130	
250M	2	550	450	500	140	19	5	18	415	489	983	1134	100	—	328	352	243	M50X1.5P	60	140	18	64	130	M20
	4,6 & 8										914	1065							65	140	18	69	130	
280S/M	2	550	450	500	140	19	5	18	445	544	1010	1160	115	—	358	360	243	M50X1.5P	65	140	18	69	130	M20
	4,6 & 8																		75	140	20	79.5	130	
315S/M	2	660	550	600	140	24	6	22	515	600	1137	1293	—	130	413	386	278	M50X1.5P	65	140	18	69	130	M20
	4,6 & 8				170						1167	1353				416			80	170	22	85	160	
315L	2				140						1302	1458				386		M63X1.5P	65	140	18	69	130	
	4,6 & 8				170						1332	1518				416			80	170	22	85	160	
355L	2	800	680	740	140	24	6	25	584	690	1461	1622	—	145	495	434	403	M75X1.5P	75	140	20	79.5	130	M20
	4,6 & 8				170						1491	1682				464			95	170	25	100	160	M24

TABLE A

Dimension	Tolerance		Specification
N	j6	UPTO 450	IS : 2223
	js6	OVER 450	
M	±0.3	UPTO 265	
	±0.5	OVER 265	
i	±1	UPTO 85	
	±1.5	OVER 85	

Dimension	Tolerance		Specification
D,DA	j6	11,14,19,24,28Ø	IS : 1231
	k6	38,42,48Ø	
	m6	55,60,65,75,80,95Ø	
GA,GC,F,FA			IS : 2048
d5(centering)			IS : 2540

① Without Eye bolt

* Refer TABLE A for tolerances

* * Minimum distance for efficient cooling of motor to be maintained by user.

□ In 315L FR. For star delta connection Higher size T.Box will be provided

Note: For B3/B5 mounting motor in frame 63 & 71 refer to Sales office

□ Double shaft extension can be provided with shaft dimension identical to D.E.shaft

□ Also suitable for V1 & V3 mounting as per IS 2253

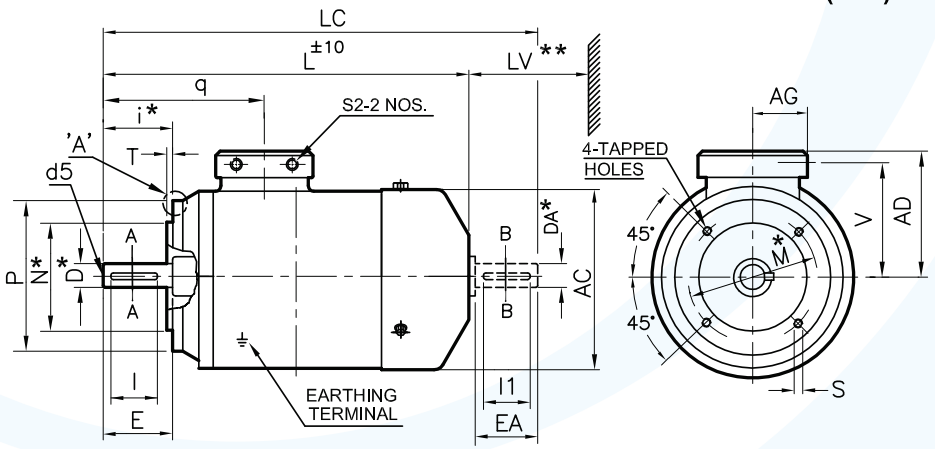
□ Key / key way fit : h9 / N9

□ 8 Nos. Fixing Holes from 225S/M frame onwards

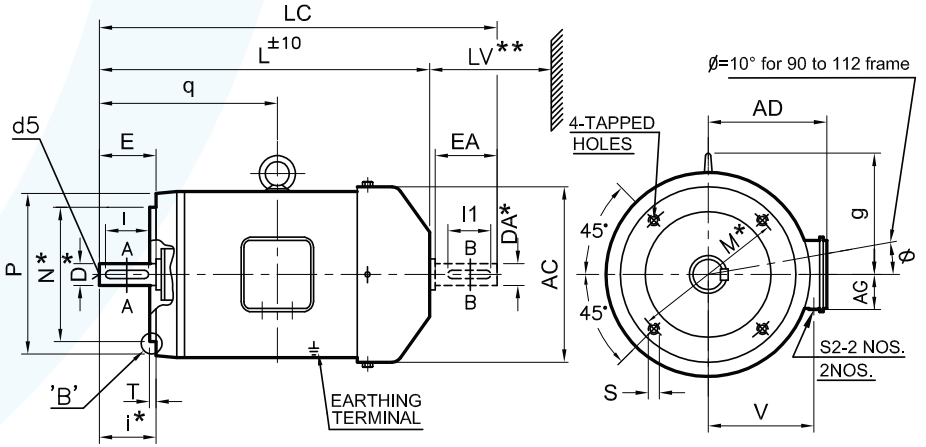
All Dimensions are in mm unless otherwise specified.

Dimensional Drawing: Increased Safety Motors (Type ME) and Non-Sparking Motors (Type MN)

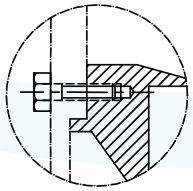
Face Mounted (B14) TEFC series-Frame 63-132M



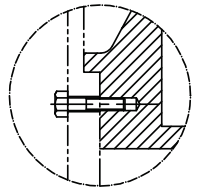
FRAME SIZE 63 TO 80



FRAME SIZE 90S TO 132M

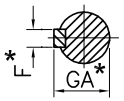


ENLARGEMENT OF CIRCLE 'A'

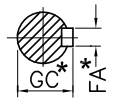


ENLARGEMENT OF CIRCLE 'B'

		FIXING					GENERAL						TERMINAL BOX				SHAFT					
IEC Fr. size	Pole	P	N*	M*	i*	S	T	AD	AC	L	LC	LV**	g	V	q	AG	S2	D* DA*	E EA	F* FA*	GA* GC*	I I1	d5
63	2 & 4	90	60	75	23	M5X10	2.5	127	124	206	241	30	—	96	104	52	M20X1.5P	11	23	4	12.5	18	M4
71	2,4 & 6	105	70	85	30	M6X10	2.5	135	140	234	278	30	—	104	102	52	M20X1.5P	14	30	5	16	25	M5
80	2,4 & 6	120	80	100	40	M6X13	3	145	157	267	324	30	—	104	112	52	M20X1.5P	19	40	6	21.5	35	M6
90S	2,4,6 & 8	140	95	115	50	M8X12	3	141	174	302	374	35	①	110	156	53	M20X1.5P	24	50	8	27	45	M8
90L	2,4,6 & 8									327	399				169								
100L	2,4,6 & 8	160	110	130	60	M8X12	3.5	179	195	366	448	40	135	138	193	56	M25X1.5P	28	60	8	31	55	M10
112M	4,6 & 8	160	110	130	60	M8X12	3.5	191	220	388	471	45	148	151	200	56	M25X1.5P	28	60	8	31	55	M10
132S	2	250	180	215	80	M12X20	4	206	260	475	568	50	176	167	239	63	M25X1.5P	38	80	10	41	70	M12
	4,6 & 8									459	552												
132M	2									556	659				258								
	4,6 & 8									497	590												



SECTION A—A



SECTION B—B

TABLE A

Dimension	Tolerance	Specification
N	j6	IS : 2223
M	±0.3	
i	±1.0	

Dimension	Tolerance		Specification
D,DA	j6	11,14,19,24,28Ø	IS : 1231
	k6	38Ø	
GA,GC,F,FA			IS : 2048
d5(centering)			IS : 2540

** Minimum distance for efficient cooling of motor to be maintained by user.

*Refer TABLE A for tolerances

① Without Eye bolt

- Also suitable for V19 & V18 mounting as per IS 2253
- Key / key way fit : h9 / N9
- Double shaft extension can be provided with shaft dimension identical to D.E. shaft

All Dimensions are in mm unless otherwise specified.

HIGH EFFICIENCY IE2 SERIES NON SPARKING MOTORS - TYPE 2S

TEFC 3 Phase Squirrel Cage Induction Motors - Frame size 71 to 355L

Applicable standard for testing & efficiency determination: IS 15999
Voltage : 415V+/-10%
Frequency : 50Hz+/-5%
Combined Variation : +/-10%

Ambient: : 50°C
Duty : S1 (Continuous)
Temp.Class : T3
3000 rpm (2-Pole)

Ins. Class : F
Temp. Rise : B
Protection : IP55

IE2

Rated Output		Frame size	Type Ref.	Operating Characteristics at Rated output									With DOL Starting		Pullout Torque to Rated Torque Ratio	Rotor GD² kgm²	Net Weight B3 Constn. Kg
				Rated Speed	Rated Current	Rated Torque	Power Factor			% Efficiency			Starting Current to Rated Current Ratio	Starting Torque to Rated Torque Ratio			
kW	HP	IEC	B3 Construction	RPM	Amps.	Kg.m	FL	3/4L	1/2L	FL	3/4L	1/2L					
0.37	0.50	71	2S0712A3	2800	0.96	0.13	0.74	0.68	0.60	72.2	72.2	66.0	5.0	2.6	3.0	0.0019	7
0.55	0.75	71	2S071233	2805	1.29	0.19	0.79	0.72	0.58	74.8	74.0	70.0	5.0	2.7	3.0	0.0019	7
0.75	1.0	80	2S080213	2830	1.64	0.26	0.82	0.74	0.62	77.4	76.5	73.5	5.0	2.5	2.8	0.0037	10
1.1	1.5	80	2S080233	2830	2.34	0.38	0.82	0.75	0.63	79.6	79.6	75.5	6.0	2.7	3.0	0.0051	11
1.5	2.0	90S	2S09S243	2840	3.13	0.51	0.82	0.78	0.68	81.3	81.3	78.0	6.5	3.3	3.5	0.0091	17
2.2	3.0	90L	2S09L273	2840	4.49	0.75	0.82	0.78	0.68	83.2	83.2	81.7	6.5	3.3	3.5	0.0113	20
3.7	5.0	100L	2S10L233	2890	6.84	1.25	0.88	0.83	0.75	85.5	85.5	84.0	6.5	3.0	3.3	0.0212	26
5.5	7.5	132S	2S13S2G3	2935	9.77	1.83	0.90	0.88	0.83	87.0	86.0	82.0	6.5	2.6	3.0	0.0820	55
7.5	10.0	132S	2S13S2N3	2935	13.2	2.49	0.90	0.87	0.82	88.1	87.5	85.0	6.5	2.6	3.0	0.0980	67
9.3	12.5	160M	2S16M233	2935	16.4	3.09	0.89	0.86	0.82	88.8	88.6	85.0	6.5	2.0	2.5	0.1500	105
11	15.0	160M	2S16M253	2935	19.2	3.65	0.89	0.84	0.76	89.4	89.4	87.0	6.5	2.3	3.0	0.171	112
15	20.0	160M	2S16M263	2930	26.0	4.99	0.89	0.88	0.82	90.3	90.0	88.0	6.5	2.0	2.5	0.203	120
18.5	25.0	160L	2S16L293	2930	31.5	6.15	0.90	0.89	0.86	90.9	90.7	89.0	6.5	2.0	2.5	0.268	137
22	30.0	180M	2S18M233	2935	37.7	7.30	0.89	0.87	0.82	91.3	91.0	88.8	7.0	2.4	2.7	0.34	177
30	40.0	200L	2S20L2A3	2955	51.0	9.89	0.89	0.86	0.80	92.0	92.0	90.0	7.0	2.6	3.0	0.61	274
37	50.0	200L	2S20L273	2955	64.0	12.2	0.87	0.84	0.76	92.5	92.5	91.0	7.0	2.2	2.5	0.64	275
45	60.0	225M	2S22M253	2965	76.6	14.8	0.88	0.85	0.78	92.9	92.7	91.0	7.0	2.5	2.5	1.13	353
55	75.0	250M	2S25M233	2965	90.2	18.1	0.91	0.89	0.86	93.2	92.7	90.0	7.0	2.3	2.7	2.60	550
75	100	280S	2S28S233	2970	122	24.6	0.91	0.89	0.86	93.8	93.6	92.0	6.5	2.0	2.8	3.01	669
90	120	280M	2S28M253	2970	146	29.5	0.91	0.89	0.86	94.1	93.9	90.9	6.5	2.0	2.8	3.42	750
110	150	315S	2S31S233	2982	180	35.9	0.90	0.86	0.80	94.3	94.1	91.5	7.0	2.2	2.5	5.0	898
125	170	315M	2S31M2A3	2982	207	40.8	0.89	0.85	0.78	94.5	93.5	91.5	7.0	2.2	2.6	5.0	940
132	180	315M	2S31M233	2982	216	43.1	0.90	0.86	0.80	94.6	93.6	91.3	7.0	2.0	2.5	5.0	940
150	200	315L	2S31L2A3	2982	248	49.0	0.89	0.84	0.78	94.7	93.7	92.2	7.0	2.0	2.5	6.2	1100
160	215	315L	2S31L253	2985	261	52.2	0.90	0.86	0.80	94.8	94.1	93.0	7.0	2.4	2.5	6.2	1100
180	240	315L	2S31L2B3	2982	300	58.8	0.88	0.82	0.75	94.9	94.1	93.0	7.0	2.0	2.5	7.7	1390
200	270	355L	2S35L2A3	2985	325	65.3	0.90	0.87	0.82	95.0	94.2	92.2	7.0	1.6	2.4	12.0	1680
*250	335	355L	2S35L213	2985	407	81.6	0.90	0.88	0.84	95.0	94.5	92.8	7.0	1.6	2.4	12.0	1680
*315	425	355L	2S35L233	2985	513	103	0.90	0.88	0.84	95.0	94.5	93.0	7.0	1.6	2.4	14.7	1870

Note : Efficiency class 'IE2' will be punched on the nameplates as per IS : 12615-2011 for ratings from 0.37kw to 375kw.
All performance values are subject to tolerance as per IS/IEC 60034-1
Efficiency measurements are without seals.

*- These ratings are suitable for ambient temperature 45°C

HIGH EFFICIENCY IE2 SERIES NON SPARKING MOTORS - TYPE 2S

TEFC 3 Phase Squirrel Cage Induction Motors - Frame size 71 to 355L

Applicable standard for testing & efficiency determination: IS 15999
Voltage : 415V+/-10%
Frequency : 50Hz+/-5%
Combined Variation : +/-10%

Ambient: : 50°C
Duty : S1 (Continuous)
Temp.Class : T3
1500 rpm (4-Pole)

Ins. Class : F
Temp. Rise : B
Protection : IP55

IE2

Rated Output		Frame size	Type Ref.	Operating Characteristics at Rated output									With DOL Starting		Pullout Torque to Rated Torque Ratio	Rotor GD² kgm²	Net Weight B3 Constn. Kg
				Rated Speed RPM	Rated Current Amps.	Rated Torque	Power Factor			% Efficiency			Starting Current to Rated Current Ratio	Starting Torque to Rated Torque Ratio			
kW	HP	IEC	B3 Construction			Kg.m	FL	3/4L	1/2L	FL	3/4L	1/2L					
0.37	0.50	71	2S071433	1380	1.03	0.26	0.71	0.62	0.50	70.1	70.1	65.0	3.4	2.3	2.5	0.0033	7
0.55	0.75	80	2S080433	1420	1.38	0.38	0.74	0.64	0.50	75.1	75.1	68.0	5.0	2.8	3.0	0.0072	11
0.75	1.0	80	2S080453	1410	1.75	0.52	0.75	0.66	0.53	79.6	79.6	74.0	5.0	2.8	3.0	0.0082	12
1.1	1.5	90S	2S09S423	1430	2.44	0.75	0.77	0.70	0.57	81.4	81.4	77.5	6.0	2.4	2.8	0.015	15
1.5	2.0	90L	2S09L473	1435	3.23	1.02	0.78	0.70	0.57	82.8	82.8	80.0	5.5	2.7	3.0	0.019	19
2.2	3.0	100L	2S10L473	1435	4.48	1.49	0.81	0.74	0.60	84.3	84.3	82.0	6.0	2.6	3.0	0.028	26
3.7	5.0	112M	2S11M473	1450	7.46	2.49	0.80	0.76	0.62	86.3	86.3	84.0	6.5	2.7	3.0	0.066	36
5.5	7.5	132S	2S13S4K3	1450	10.3	3.69	0.85	0.82	0.74	87.7	87.7	86.0	6.5	2.2	2.8	0.126	64
7.5	10	132M	2S13M4T3	1450	13.8	5.04	0.85	0.82	0.74	88.7	88.7	87.0	6.5	2.2	2.8	0.163	74
9.3	12.5	160M	2S16M4C3	1460	17.6	6.20	0.82	0.76	0.68	89.4	89.4	87.0	6.5	2.5	2.8	0.177	105
11	15.0	160M	2S16M4K3	1465	20.3	7.31	0.84	0.80	0.70	89.8	89.8	88.0	6.5	2.5	2.8	0.229	115
15	20.0	160L	2S16L4T3	1465	27.1	9.97	0.85	0.82	0.72	90.7	90.7	89.5	6.5	2.5	2.7	0.300	128
18.5	25.0	180M	2S18M473	1465	33.2	12.3	0.85	0.82	0.76	91.2	91.2	89.5	6.5	2.7	2.9	0.540	188
22	30	180L	2S18L483	1470	39.8	14.6	0.84	0.78	0.70	91.6	91.6	89.8	6.5	2.8	3.0	0.61	200
30	40	200L	2S20L453	1470	52.6	19.9	0.86	0.82	0.72	92.3	92.0	90.0	7.0	2.6	2.6	0.93	275
37	50	225S	2S22S433	1470	63.8	24.5	0.87	0.85	0.77	92.7	92.5	90.5	7.0	2.6	2.6	1.60	362
45	60	225M	2S22M453	1470	77.3	29.8	0.87	0.85	0.77	93.1	92.8	91.0	7.0	2.6	2.6	1.85	377
55	75	250M	2S25M433	1480	95.2	36.2	0.86	0.84	0.76	93.5	93.0	91.0	7.0	2.5	2.6	3.06	500
75	100	280S	2S28S423	1485	131	49.2	0.85	0.82	0.74	94.0	94.0	93.0	6.7	2.6	2.8	5.53	670
90	120	280M	2S28M453	1485	156	59.0	0.85	0.82	0.74	94.2	94.2	93.2	6.5	2.3	2.8	6.36	735
110	150	315S	2S31S413	1485	188	72.1	0.86	0.83	0.76	94.5	94.3	92.3	6.5	2.5	3.0	9.97	862
125	170	315M	2S31M4A3	1486	216	81.9	0.85	0.81	0.74	94.6	94.3	92.7	6.5	2.5	3.0	11.7	965
132	180	315M	2S31M433	1487	225	86.5	0.86	0.83	0.76	94.7	94.5	93.0	6.5	2.5	3.0	11.7	965
150	200	315L	2S31L4A3	1488	262	98.2	0.84	0.80	0.72	94.7	94.4	92.8	6.5	2.5	3.0	14.0	1145
160	215	315L	2S31L453	1487	270	105	0.87	0.84	0.78	94.9	94.6	93.1	6.5	2.4	3.0	14.0	1145
180	240	315L	2S31L463	1487	307	118	0.86	0.83	0.76	95.0	94.7	93.2	6.5	2.5	3.0	15.6	1225
200	270	315L	2S31L473	1489	340	131	0.86	0.83	0.76	95.1	94.8	93.3	7.0	2.5	3.0	17.8	1290
250	335	355L	2S35L413	1488	416	164	0.88	0.85	0.75	95.1	94.9	93.5	6.5	2.2	2.5	23.3	1680
315	422	355L	2S35L433	1488	524	206	0.88	0.85	0.75	95.1	94.8	93.5	6.5	2.2	2.5	32.7	1855
*355	475	355L	2S35L453	1488	590	232	0.88	0.85	0.75	95.1	94.9	93.5	6.5	2.2	2.5	37.9	2025

Note : Efficiency class 'IE2' will be punched on the nameplates as per IS : 12615-2011 for ratings from 0.37kw to 375kw.
All performance values are subject to tolerance as per IS/IEC 60034-1
Ratings above 400 kW up to 1000kW are available in 355, 400 & 450 frames with Dual Circuit Cooling Arrangement (DCCA).
Efficiency measurements are without seals.
*-These ratings are suitable for class F temperature rise

HIGH EFFICIENCY IE2 SERIES NON SPARKING MOTORS - TYPE 2S

TEFC 3 Phase Squirrel Cage Induction Motors - Frame size 80 to 355L

Applicable standard for testing & efficiency determination: IS 15999
Voltage : 415V+/-10%
Frequency : 50Hz+/-5%
Combined Variation : +/-10%

Ambient: : 50°C
Duty : S1 (Continuous)
Temp.Class : T3
1000 rpm (6-Pole)

Ins. Class : F
Temp. Rise : B
Protection : IP55

IE2

Rated Output		Frame size	Type Ref.	Operating Characteristics at Rated output									With DOL Starting		Pullout Torque to Rated Torque Ratio	Rotor GD² kgm²	Net Weight B3 Constn. Kg
				Rated Speed RPM	Rated Current Amps.	Rated Torque	Power Factor			% Efficiency			Starting Current to Rated Current Ratio	Starting Torque to Rated Torque Ratio			
kW	HP	IEC	B3 Construction			Kg.m	FL	3/4L	1/2L	FL	3/4L	1/2L					
0.37	0.55	80	2S080613	910	1.07	0.40	0.70	0.60	0.48	69.0	69.0	67.0	3.0	2.1	2.3	0.0060	10
0.55	0.75	80	2S080633	915	1.48	0.59	0.71	0.62	0.48	72.9	72.9	68.5	4.0	2.2	2.5	0.0084	11
0.75	1.0	90S	2S09S633	925	1.91	0.79	0.72	0.61	0.50	75.9	75.9	72.3	4.0	2.0	2.5	0.0122	14
1.1	1.5	90L	2S09L653	930	2.72	1.15	0.72	0.61	0.50	78.1	78.1	74.0	4.0	2.0	2.6	0.0160	17
1.5	2.0	100L	2S10L633	935	3.63	1.56	0.72	0.60	0.52	79.8	79.6	75.0	4.5	2.0	2.5	0.0250	22
2.2	3.0	112M	2S11M653	940	4.99	2.28	0.75	0.65	0.58	81.8	81.8	79.8	5.0	2.1	2.5	0.065	33
3.7	5.0	132S	2S13S6G3	960	8.25	3.75	0.74	0.70	0.60	84.3	83.5	82.0	5.5	2.0	2.5	0.130	52
5.5	7.5	132M	2S13M6T3	960	12.0	5.58	0.74	0.70	0.60	86.0	84.5	82.0	6.0	2.0	2.5	0.193	75
7.5	10	160M	2S16M633	960	15.0	7.61	0.80	0.74	0.64	87.2	87.2	85.2	5.5	2.0	2.5	0.276	103
9.3	12.5	160L	2S16L663	960	18.4	9.44	0.80	0.74	0.64	88.0	88.0	86.7	5.5	2.1	2.5	0.34	113
11	15	160L	2S16L673	965	21.6	11.1	0.80	0.77	0.66	88.7	88.7	87.0	6.0	2.0	2.5	0.40	123
15	20	180L	2S18L633	965	29.1	15.1	0.80	0.75	0.62	89.7	89.7	87.2	5.5	2.6	2.3	0.82	200
18.5	25	200L	2S20L633	975	34.7	18.5	0.82	0.77	0.69	90.4	90.4	88.3	5.5	2.6	2.3	1.20	254
22	30	200L	2S20L653	975	41.1	22.0	0.82	0.77	0.69	90.9	90.9	88.8	6.0	2.6	2.3	1.37	270
30	40	225M	2S22M643	975	52.9	30.0	0.86	0.84	0.76	91.7	91.2	88.7	7.0	2.5	2.2	2.41	358
37	50	250M	2S25M633	980	63.4	36.8	0.88	0.85	0.82	92.2	92.2	91.0	6.0	2.5	2.3	3.72	528
45	60	280S	2S28S613	984	80.4	44.5	0.84	0.80	0.72	92.7	92.7	91.2	6.0	2.5	2.4	5.11	573
55	75	280M	2S28M633	984	95.6	54.4	0.86	0.83	0.76	93.1	93.1	91.0	6.0	2.4	2.4	6.16	620
75	100	315S	2S31S613	988	133	73.9	0.84	0.82	0.75	93.7	93.7	92.5	6.0	2.4	2.5	10.7	830
90	120	315M	2S31M633	989	159	88.6	0.84	0.80	0.74	94.0	94.0	92.9	6.0	2.2	2.5	12.4	912
110	150	315M	2S31M653	989	193	108	0.84	0.81	0.74	94.3	94.3	93.3	6.0	2.3	2.5	15.5	1010
125	170	315L	2S31L6A3	990	222	123	0.83	0.80	0.72	94.4	94.2	93.0	6.0	2.3	2.5	18.0	1175
132	180	315L	2S31L673	990	231	130	0.84	0.81	0.74	94.6	94.6	93.8	6.0	2.3	2.5	18.0	1175
150	200	315L	2S31L6B3	990	269	148	0.82	0.79	0.70	94.7	94.3	92.8	6.0	2.0	2.5	21.5	1231
160	215	315L	2S31L693	990	280	157	0.84	0.81	0.71	94.8	94.5	93.0	6.0	2.0	2.5	21.5	1231
180	240	355L	2S35L6A3	990	322	177	0.82	0.77	0.65	94.9	94.6	93.3	6.0	2.0	2.5	28.7	1670
200	270	355L	2S35L613	990	349	197	0.84	0.80	0.70	95.0	94.7	93.5	6.0	2.0	2.5	28.7	1670
250	335	355L	2S35L633	990	436	246	0.84	0.80	0.70	95.0	94.7	93.4	6.0	2.0	2.5	35.5	1780

Note : Efficiency class 'IE2' will be punched on the nameplates as per IS : 12615-2011 for ratings from 0.37kw to 375kw.
All performance values are subject to tolerance as per IS/IEC 60034-1
Ratings above 315kW up to 800kW are available in 355, 400 & 450 frames with Dual Circuit Cooling Arrangement (DCCA).
Efficiency measurements are without seals.

HIGH EFFICIENCY NON SPARKING MOTORS - TYPE MS

Standard TEFC 3 Phase Squirrel Cage Induction Motors - Frame size 90s to 355L

Applicable standard for testing: IS 4029
Applicable standard for efficiency determination: IS 4889

Voltage : 415V+/-10%
Frequency : 50Hz+/-5%
Combined Variation : +/-10%

Ambient: : 50°C
Duty : S1 (Continuous)
Temp.Class : T3
750 rpm (8-Pole)

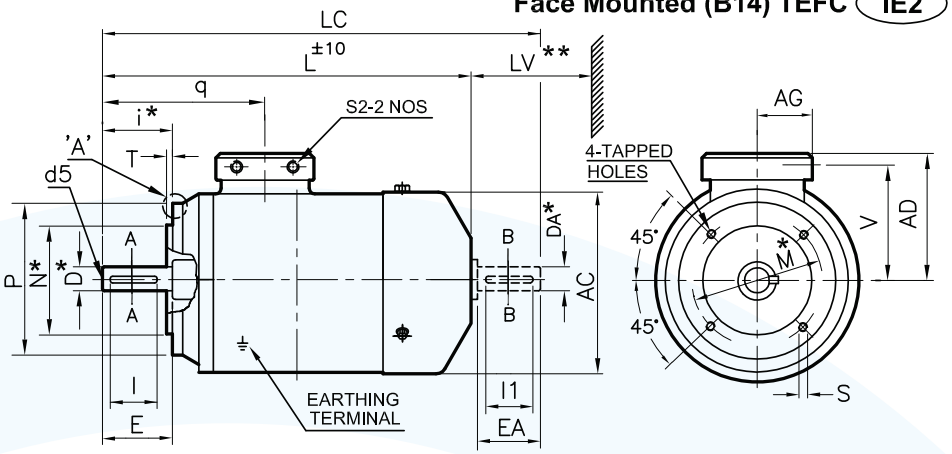
Ins. Class : F
Temp. Rise : B
Protection : IP55

Rated Output		Frame size	Type ref	Rated Speed RPM	Rated Current Amps	Rated Torque Kg.m	Operating Characteristics at Rated output						With DOL Starting			Rotor GD² kgm²	Net Weight Kg
								Power Factor			% Efficiency		Starting Current to Rated Current Ratio	Starting Torque to Rated Torque Ratio	Pullout Torque to Rated Torque Ratio		
kW	HP						FL	3/4L	1/2L	FL	3/4L	1/2L					
0.37	0.50	90S	MS09S813	700	1.22	0.51	0.63	0.52	0.41	66.8	60.0	52.0	2.7	1.8	2.1	0.0110	11
0.55	0.75	90L	MS09L853	690	1.71	0.78	0.63	0.53	0.43	71.1	67.0	62.0	2.9	2.0	2.4	0.0140	14
0.75	1.0	100L	MS10L813	685	1.94	1.07	0.73	0.63	0.50	73.8	73.8	67.0	3.0	1.7	2.0	0.0230	18
1.1	1.5	100L	MS10L833	690	2.83	1.55	0.71	0.62	0.48	76.2	76.2	73.0	3.3	1.9	2.3	0.0270	21
1.5	2.0	112M	MS11M813	705	3.83	2.07	0.70	0.62	0.50	77.9	77.9	75.0	3.8	1.7	2.2	0.0510	25
2.2	3.0	132S	MS13S8B3	705	4.87	3.04	0.78	0.74	0.64	80.5	80.0	76.0	3.5	1.8	2.3	0.0990	57
3.7	5.0	160M	MS16M813	720	7.95	5.01	0.78	0.74	0.65	83.0	83.0	78.0	4.4	1.8	2.0	0.217	88
5.5	7.5	160M	MS16M833	720	11.5	7.44	0.78	0.74	0.65	85.1	85.1	82.0	4.8	1.9	2.2	0.299	101
7.5	10	160L	MS16L873	715	15.5	10.2	0.78	0.74	0.65	86.4	86.4	84.0	5.5	2.1	2.2	0.400	119
9.3	12.5	180M	MS18M813	720	18.8	12.6	0.79	0.74	0.64	87.3	87.3	85.0	5.0	2.1	2.2	0.620	177
11	15	180L	MS18L833	720	22.0	14.9	0.79	0.74	0.64	88.1	88.1	87.0	5.0	2.1	2.2	0.720	182
15	20	200L	MS20L833	720	28.6	20.3	0.82	0.79	0.71	89.0	89.0	88.0	6.0	2.5	2.3	1.32	282
18.5	25	225S	MS22S823	725	36.3	24.9	0.79	0.77	0.69	89.8	89.8	88.0	5.5	2.1	2.2	2.10	329
22	30	225M	MS22M833	725	43.0	29.6	0.79	0.77	0.69	90.2	90.2	88.0	5.5	2.1	2.2	2.41	369
30	40	250M	MS25M813	730	55.6	40.0	0.82	0.78	0.68	91.5	91.5	89.0	6.0	2.5	2.2	3.72	472
37	50	280S	MS28S823	730	70.8	49.4	0.79	0.75	0.65	92.0	92.0	90.0	5.5	2.2	2.2	5.83	615
45	60	280M	MS28M853	730	85.8	60.0	0.79	0.75	0.65	92.4	92.4	90.0	5.5	2.2	2.2	6.86	665
55	75	315S	MS31S813	740	105	72.4	0.78	0.73	0.64	93.0	92.5	90.5	5.5	2.1	2.4	10.7	912
75	100	315M	MS31M833	740	143	98.7	0.78	0.73	0.64	93.5	93.5	92.0	5.5	2.1	2.4	12.4	912
90	120	315M	MS31M853	740	171	118	0.78	0.73	0.65	94.0	94.0	93.0	5.5	2.1	2.4	15.5	1010
110	150	315L	MS31L873	740	208	145	0.78	0.73	0.64	94.3	94.0	93.0	5.5	2.1	2.4	18.0	1170
125	170	315L	MS31L8A3	740	236	165	0.78	0.73	0.64	94.6	94.4	93.6	5.5	2.1	2.4	21.5	1340
132	180	315L	MS31L893	740	248	174	0.78	0.73	0.64	94.8	94.7	94.0	5.5	2.1	2.4	21.5	1340
150	200	355L	MS35L8A3	740	282	197	0.78	0.70	0.60	95.0	95.0	93.0	5.5	1.8	2.2	28.7	1670
160	215	355L	MS35L813	740	300	211	0.78	0.70	0.60	95.0	95.0	93.0	5.5	1.8	2.2	28.7	1670
180	240	355L	MS35L8B3	740	337	237	0.78	0.70	0.60	95.2	95.2	93.2	5.5	1.8	2.2	35.5	1780
200	270	355L	MS35L833	740	374	263	0.78	0.70	0.60	95.3	95.3	93.3	5.5	1.8	2.2	35.5	1780

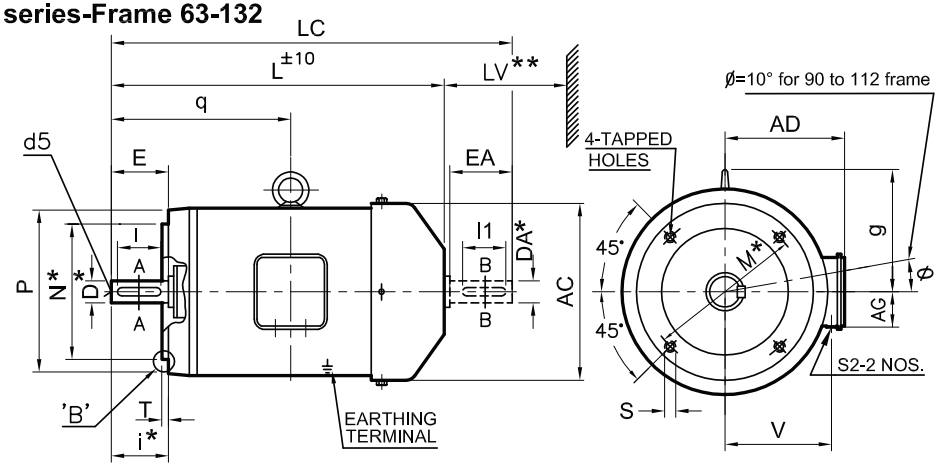
Note :
All performance values are subject to tolerance as per IS/IEC 60034-1
Efficiency measurements are without seals.
Ratings above 200kW/8P upto 630kW/8P are available in Frame 400 & 450. For details contact our sales office.

Dimensional Drawing: Non-Sparking Motors (Type 2S/MS)

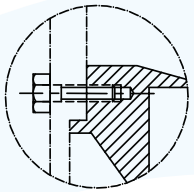
Face Mounted (B14) TEFC (IE2) series-Frame 63-132



FRAME SIZE 63 TO 80

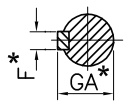


FRAME SIZE 90S TO 132M

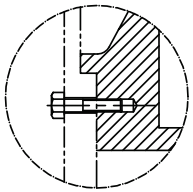


ENLARGEMENT OF CIRCLE 'A'

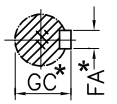
	FIXING					GENERAL							TERMINAL BOX			SHAFT							TABLE B		
IEC Fr. size	Pole	P	N*	M*	i*	S	T	AD	AC	L	LC	g	LV**	V	q	AG	S2	D* DA*	E EA	F* FA*	GA* GC*	I I1	d5	Pole	L	LC
63	2 & 4	90	60	75	23	M5X10	2.5	127	124	206	241	—	30	96	104	52	M20X1.5P	11	23	4	12.5	18	M4	—	—	—
71	2,4 & 6	105	70	85	30	M6X10	2.5	135	140	234	278	—	30	104	102	52	M20X1.5P	14	30	5	16	25	M5	—	—	—
80	2,4 & 6	120	80	100	40	M6X13	3	145	157	267	324	—	30	104	112	52	M20X1.5P	19	40	6	21.5	35	M6	—	—	—
90S	6 & 8	140	95	115	50	M8X12	3	141	174	302	374	①	35	110	156	53	M20X1.5P	24	50	8	27	45	M8	2 & 4	336	408
90L	6 & 8									327	399				169									2 & 4	361	433
100L	6 & 8	160	110	130	60	M8X12	3.5	179	195	366	448	135	40	138	193	56	M25X1.5P	28	60	8	31	55	M10	2 & 4	387	469
112M	6 & 8	160	110	130	60	M8X12	3.5	191	220	388	471	148	45	151	200	56	M25X1.5P	28	60	8	31	55	M10	4	419	502
132S	6 & 8	250	180	215	80	M12X20	4	206	260	459	552	176	50	167	239	63	M25X1.5P	38	80	10	41	70	M12	2 & 4	518	617
132M	6									497	590				258									—	—	—
																								4	556	659



SECTION A—A



ENLARGEMENT OF CIRCLE 'B'



SECTION B—B

TABLE A

Dimension	Tolerance	Specification
N	j6	IS : 2223
M	±0.3	
i	±1.0	

Dimension	Tolerance		Specification
D,DA	j6	11,14,19,24,28Ø	IS : 1231
	k6	38Ø	
GA,GC,F,FA			IS : 2048
d5(centering)			IS : 2540

** Minimum distance for efficient cooling of motor to be maintained by user.

*Refer TABLE A for tolerances

① Without Eye bolt

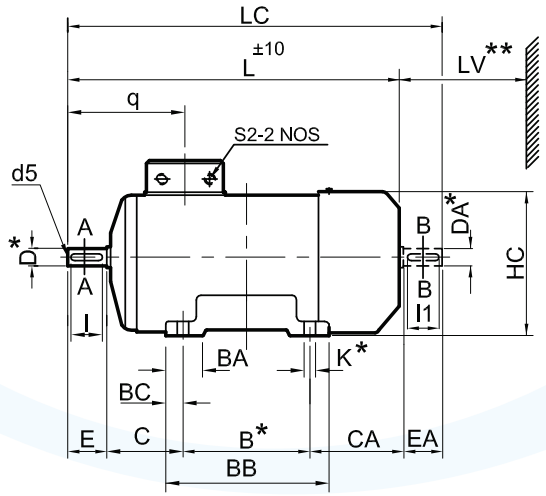
- Also suitable for V19 & V18 mounting as per IS 2253
- Key / key way fit : h9 / N9
- Double shaft extension can be provided with shaft dimension identical to D.E. shaft

All Dimensions are in mm unless otherwise specified.

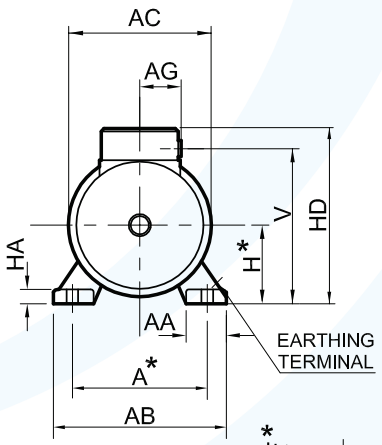
CAT-E-6313-4-1

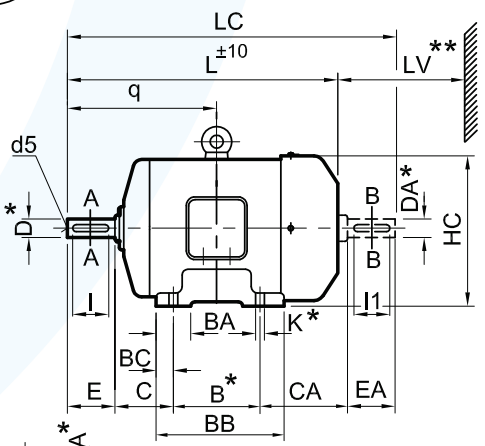
Dimensional Drawing: Non-Sparking Motors (Type 2S/MS)

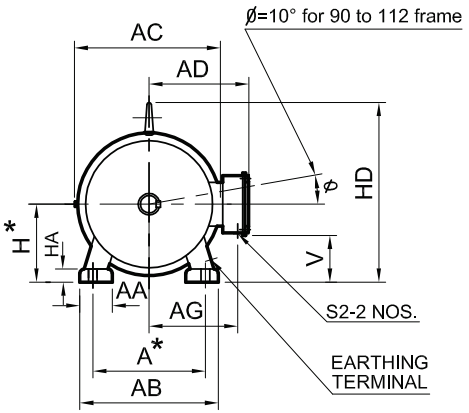
Foot Mounted (B3) TEFC (IE2) series-Frame 63-355L

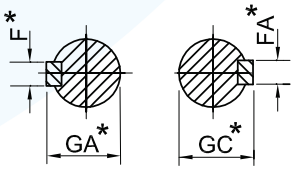


FRAME SIZE 63 TO 80





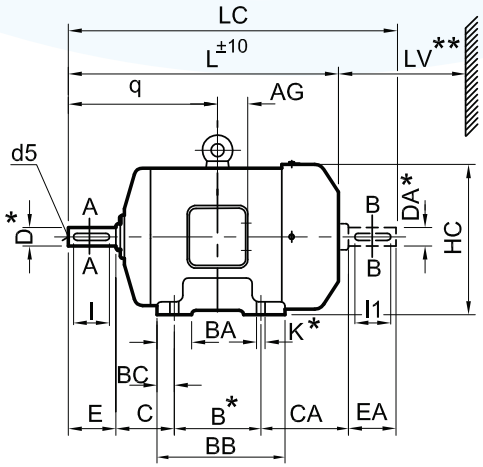


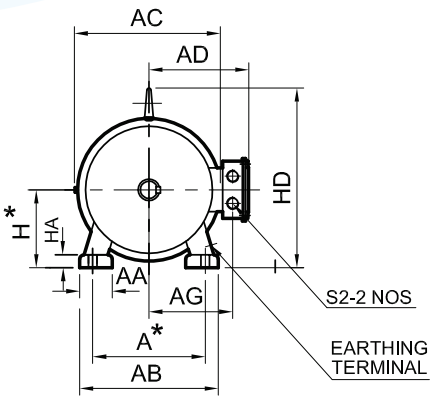


SECTION A-A

SECTION B-B

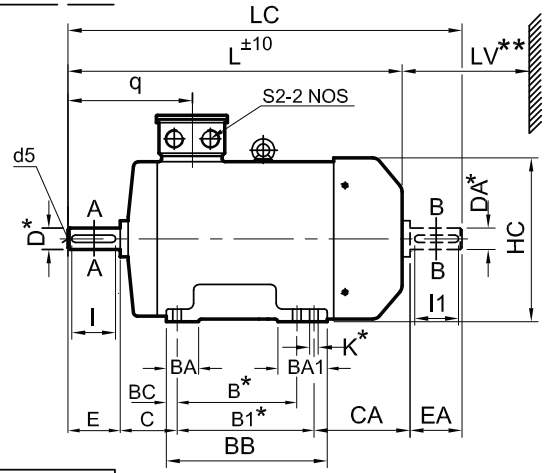
FRAME SIZE 90S TO 160L

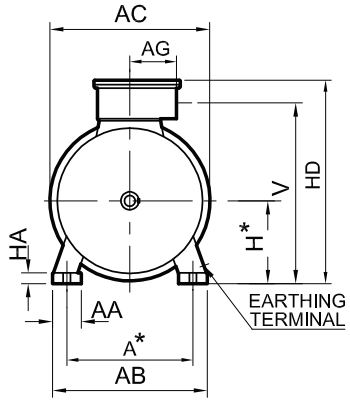




FRAME SIZE 180M TO 225M

* Refer TABLE A for tolerances





FRAME SIZE 250M TO 355L

CAT-E-6335-3-1

Dimensional Details: Non-Sparking Motors (Type 2S/MS)

Foot Mounted (B3) TEFC (IE2) series-Frame 63-355L

		FIXING						GENERAL													TERMINAL BOX				SHAFT						TABLE B			
IEC Fr. size	Pole	A*	B*	B1*	C	H*	K*	AB	BB	AA	BA	BA1	BC	HA	HC	HD	AD	L	LC	CA	AC	LV**	V	q	AG	S2	D,DA* *	E EA	F* FA*	GA* GC*	I I1	d5	Pole	L	LC	CA
63	2 & 4	100	80	—	40	63	7	126	100	28	30	—	13	7	125	190	—	206	241	75	124	30	159	104	52	M20X1.5P	11	23	4	12.5	18	M4	—	—	—	—
71	2,4 & 6	112	90	—	45	71	7	135	110	31	30	—	13	7	141	206	—	234	278	83	140	30	175	102	52	M20X1.5P	14	30	5	16	25	M5	—	—	—	—
80	2,4 & 6	125	100	—	50	80	10	150	124	31	35	—	15	9	159	225	—	267	324	94	157	30	194	112	52	M20X1.5P	19	40	6	21.5	35	M6	—	—	—	—
90S	6 & 8	140	100	—	56	90	10	180	130	50	43	—	18	13	177	①	141	302	374	143	174	35	57	156	110	M20X1.5P	24	50	8	27	45	M8	2 & 4	336	408	152
90L	6 & 8		125						155									327	399					169									2 & 4	361	433	152
100L	6 & 8	160	140	—	63	100	12	200	176	54	50	—	21	14	198	235	179	366	448	125	195	40	66	193	138	M25X1.5P	28	60	8	31	55	M10	2 & 4	387	469	146
112M	6 & 8	190	140	—	70	112	12	230	176	62	51	—	21	15	222	260	191	388	471	141	220	45	80	200	151	M25X1.5P	28	60	8	31	55	M10	4	419	502	172
132S	6 & 8	216	140	—	89	132	12	256	180	64	50	—	23	17	262	308	206	459	552	172	260	50	99	239	167	M25X1.5P	38	80	10	41	70	M12	2 & 4	518	617	228
132M	6		178						218		54							497	590	172				258									—	—	—	—
																																4	556	659	232
160M	2,4	254	210	—	108	160	15	310	250	58	70	—	23	20	318	366	226	605	741	203	316	60	98	323	186	M25X1.5P	42	110	12	45	105	M16	—	—	—	—
	6 & 8																	585	721	183												2 & 4	635	771	233
160L	6 & 8		254						294									629	765	183				345								—	—	—	—
																																2 & 4	679	815	233
180M	2,6 & 8	279	241	—	121	180	15	344	281	65	70	—	23	26	357	412	265	679	799	217	354	70	83	352	216	M32X1.5P	48	110	14	51.5	100	M16	4	698	802	220
180L	6 & 8		279						319									717	838	218				371									4	737	841	221
200L	2	318	305	—	133	200	19	398	355	85	85	—	28	32	397	462	319	795	920	262	394	80	—	396	249	M40X1.5P	55	110	16	59	100	M20	—	—	—	—
	6 & 8																	772	897	239												4	795	920	262
225S	4	356	286	—	149	225	19	436	336	85	85	—	28	34	450	509	344	852	1001	281	450	90	—	432.5	273	M40X1.5P	60	140	18	64	130	M20	—	—	—	—
225M	2		311						361									837	956	276				415			55	110	16	59	100		—	—	—	—
	6 & 8																	852	1001	251				445			60	140	18	64	130		4	877	1026	281
250M	2	406	349	—	168	250	24	506	425	100	115	—	49	42	495	665	—	993	1134	337	489	100	578	352	243	M50X1.5P	60	140	18	64	130	M20	—	—	—	—
	4,6 & 8																	914	1065	268							65	140	18	69	130		—	—	—	—
280S/M	2	457	368	419	190	280	24	540	490	100	110	149	40	42	552	725	—	1010	1160	271	544	115	638	360	243	M50X1.5P	65	140	18	69	130	M20	—	—	—	—
	4,6 & 8																										75	140	20	79.5	130					
315S/M	2	508	406	457	216	315	28	625	540	120	120	155	46	45	600	830	—	1137	1293	340	600	130	728	386	278	M50X1.5P	65	140	18	69	130	M20	—	—	—	—
	4,6 & 8																	1167	1353					416			80	170	22	85	160		—	—	—	—
315L	2		508	—					593	120	120	—						1302	1458	454				386		M63X1.5P	65	140	18	69	130		—	—	—	—
	4,6 & 8																	1332	1518					416			80	170	22	85	160					
355L	2	610	630	—	254	355	28	710	770	110	170	—	73	45	693	939	—	1461	1622	458	685	145	850	434	403	M75X1.5P	75	140	20	79.5	130	M20	—	—	—	—
	4,6 & 8																	1491	1682					464			95	170	25	100	160	M24				

TABLE A

Dimension	Tolerance		Specification
A,B	±0.75		IS : 1231
H	-0.5	UPTO 280	
	-1	OVER 280	
K	+0.360	7,10Ø	
	+0.430	12,15Ø	
	+0.520	19,24,28Ø	

Dimension	Tolerance		Specification
D,DA	j6	11,14,19,24,28Ø	IS : 1231
	k6	38,42,48Ø	
	m6	55,60,65,75,80,95Ø	
GA,GC,F,FA			IS : 2048
d5(centering)			IS : 2540

Special Remarks

15kW/2P & 11kW/4P in 160M will have dimensions "L","LC" & "CA" as Indicated in table "B"

*Refer TABLE A for tolerances

- Double shaft extension can be provided with shaft dimension identical to DE shaft.
- Also suitable for B6,B7,B8,V5 & V6 mounting as per IS 2253.

① Without Eye bolt

- Key / key way fit : h9 / N9

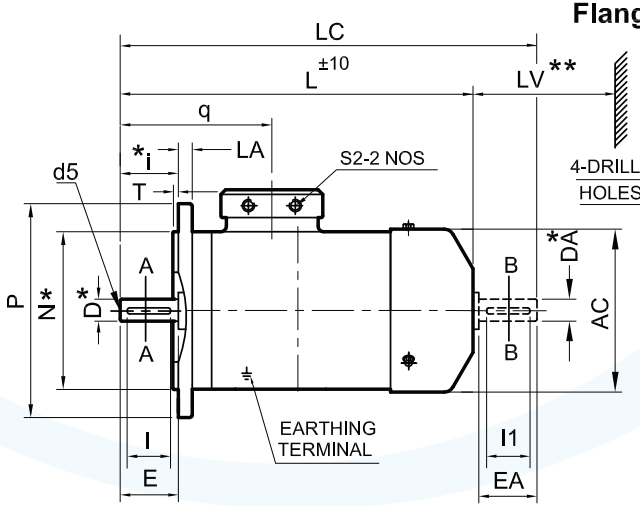
** Minimum distance for efficient cooling of motor to be maintained by user.

- In 315L FR. For star delta connection Higher size T.Box will be provided

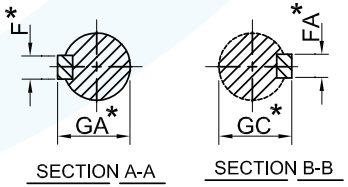
All Dimensions are in mm unless otherwise specified. CAT-A-6335-3-2

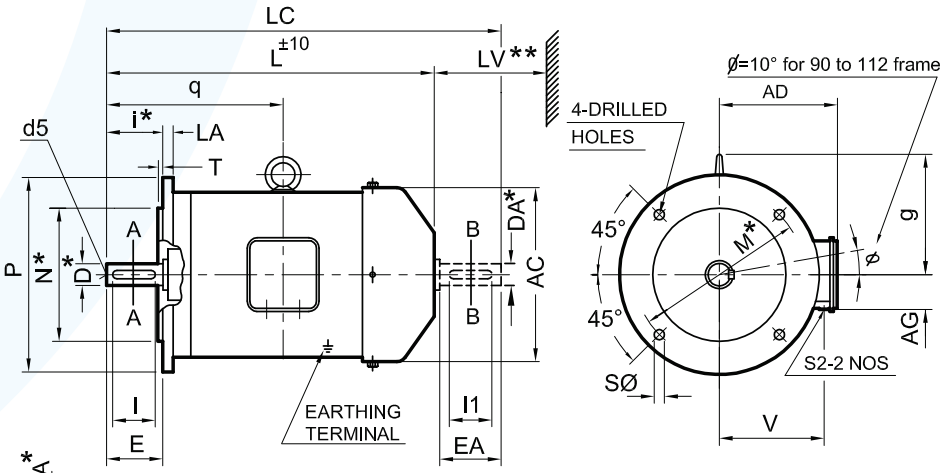
Dimensional Drawing: Non-Sparking Motors (Type 2S/MS)

Flange Mounted (B5) TEFC (IE2) series Frame 63-355L

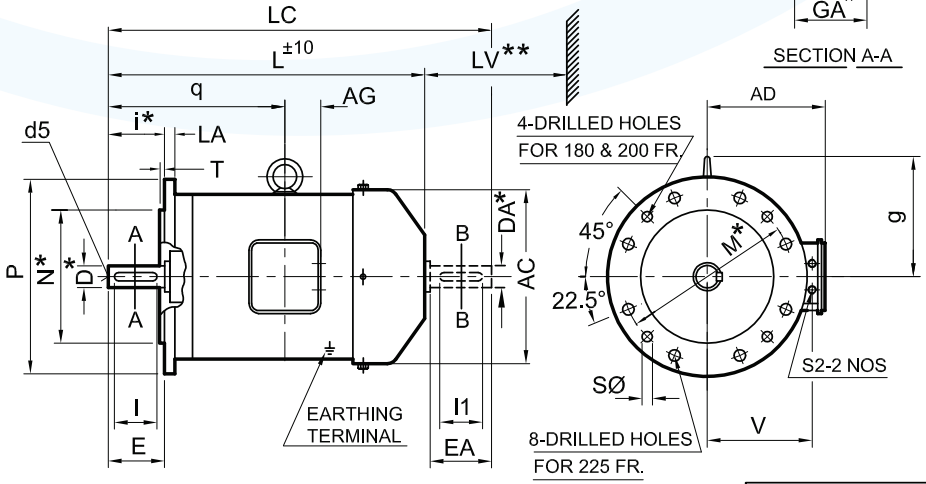


FRAME SIZE 63 TO 80

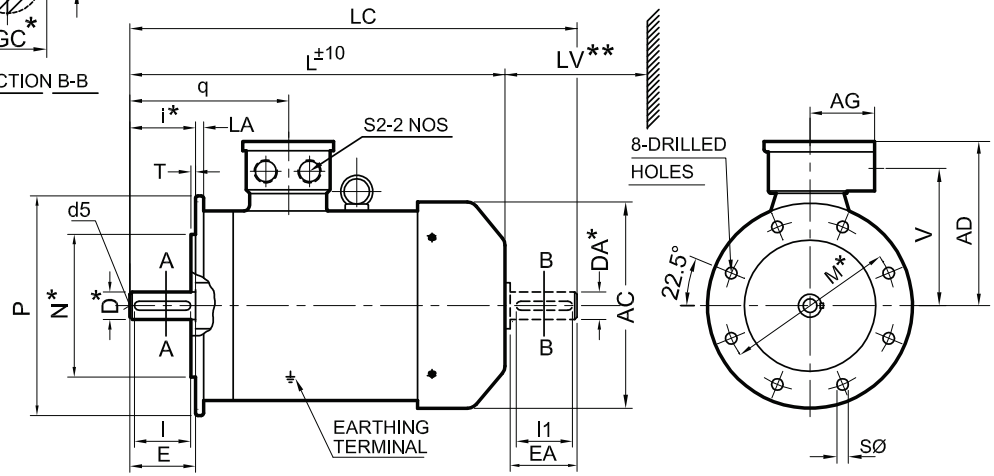




FRAME SIZE 90S TO 160L



FRAME SIZE 180M TO 225M



FRAME SIZE 250M TO 355L

* Refer TABLE A for tolerances

CAT-A-6335-5-1

Dimensional Details: Non-Sparking Motors (Type 2S/MS)

Flange Mounted (B5) TEFC (IE2) series-Frame 63-355L

		FIXING					GENERAL								TERMINAL BOX				SHAFT						TABLE B		
IEC Fr. size	Pole	P	N*	M*	i*	S	T	LA	AD	AC	L	LC	g	LV**	V	q	AG	S2	D,DA**	E EA	F* FA*	GA* GC*	I I1	d5	Pole	L	LC
63	2 & 4	140	95	115	23	10	3	9	127	124	225	260	—	30	96	109	52	M20X1.5P	11	23	4	12.5	18	M4	—	—	—
71	2,4 & 6	160	110	130	30	10	3.5	9	135	140	261	305	—	30	104	127	52	M20X1.5P	14	30	5	16	25	M5	—	—	—
80	2,4 & 6	200	130	165	40	12	3.5	10	145	157	267	324	—	30	114	112	52	M20X1.5P	19	40	6	21.5	35	M6	—	—	—
90S	6 & 8	200	130	165	50	12	3.5	10	141	174	302	374	①	35	110	156	53	M20X1.5P	24	50	8	27	45	M8	2 & 4	336	408
90L	6 & 8										327	399				169									2 & 4	361	433
100L	6 & 8	250	180	215	60	15	4	11	179	195	366	448	135	40	138	193	56	M25X1.5P	28	60	8	31	55	M10	2 & 4	387	469
112M	6 & 8	250	180	215	60	15	4	11	191	220	388	471	148	45	151	200	56	M25X1.5P	28	60	8	31	55	M10	4	419	502
132S	6 & 8	300	230	265	80	15	4	12	206	260	459	552	176	50	167	239	63	M25X1.5P	38	80	10	41	70	M12	2 & 4	518	617
132M	6										497	590				258									—	—	—
																									4	556	659
160M	2,4	350	250	300	110	19	5	13	226	316	605	741	206	60	186	323	63	M25X1.5P	42	110	12	45	105	M16	—	—	—
	6 & 8										585	721													2 & 4	635	771
160L	6 & 8										629	765				345									—	—	—
																									2 & 4	679	815
180M	2,6 & 8	350	250	300	110	19	5	13	265	354	679	799	232	70	216	352	97	M32X1.5P	48	110	14	51.5	100	M16	4	698	802
180L	6 & 8										717	838				371									4	737	841
200L	2	400	300	350	110	19	5	15	319	394	795	920	262	80	249	396	172	M40X1.5P	55	110	16	59	100	M20	—	—	—
	6 & 8										772	897													4	795	920
225S	4	450	350	400	140	19	5	16	344	450	852	1001	284	90	273	432.5	172	M40X1.5P	60	140	18	64	130	M20	—	—	—
225M	2				110						837	956				415			55	110	16	59	100		—	—	—
	6 & 8				140						852	1001				445			60	140	18	64	130		4	877	1026
250M	2	550	450	500	140	19	5	18	415	489	993	1134	—	100	328	352	243	M50X1.5P	60	140	18	64	130	M20	—	—	—
	4,6 & 8										914	1065							65	140	18	69	130		—	—	—
280S/M	2	550	450	500	140	19	5	18	445	544	1010	1160	—	115	358	360	243	M50X1.5P	65	140	18	69	130	M20	—	—	—
	4,6 & 8																		75	140	20	79.5	130				
315S/M	2	660	550	600	140	24	6	22	515	600	1137	1293	—	130	413	386	278	M50X1.5P	65	140	18	69	130	M20	—	—	—
	4,6 & 8				170						1167	1353				416			80	170	22	85	160		—	—	—
315L	2				140						1302	1458				386		M63X1.5P	65	140	18	69	130		—	—	—
	4,6 & 8				170						1332	1518				416			80	170	22	85	160				
355L	2	800	680	740	140	24	6	25	584	690	1461	1622	—	145	495	434	403	M75X1.5P	75	140	20	79.5	130	M20	—	—	—
	4,6 & 8				170						1491	1682				464			95	170	25	100	160	M24			

TABLE A

Dimension	Tolerance		Specification
N	j6	UPTO 450	IS : 2223
	js6	OVER 450	
M	±0.3	UPTO 265	
	±0.5	OVER 265	
i	±1	UPTO 85	
	±1.5	OVER 85	

Dimension	Tolerance		Specification
D,DA	j6	11,14,19,24,28Ø	IS : 1231
	k6	38,42,48Ø	
	m6	55,60,65,75,80,95Ø	
GA,GC,F,FA			IS : 2048
d5(centering)			IS : 2540

Special Remarks

15kW/2P & 11kW/4P in 160M will have dimensions "L" & "LC" as Indicated in table "B"

*Refer TABLE A for tolerances

Note: For B3/B5 mounting motor in frame 63 & 71 refer to Sales office

① Without Eye bolt

** Minimum distance for efficient cooling of motor to be maintained by user.

- In 315L FR. For star delta connection Higher size T.Box will be provided
- Double shaft extension can be provided with shaft dimension identical to D.E.shaft
- Also suitable for V1 & V3 mounting as per IS 2253
- Key / key way fit : h9 / N9
- 8 Nos. Fixing Holes from 225S/M frame onwards

All Dimensions are in mm unless otherwise specified.