Bharat Bijlee

Motors for General Application

IE2 Motor Series

CGIE/A

Introduction

Global warming is a reality and world over people are working towards reduction in carbon foot print.

Electric motor applications, in Indian industry, consume about seventy percent of the generated electrical energy. Improving efficiency of the motor is therefore a major concern in energy-efficiency efforts.

Electric motors with improved efficiency, in combination with frequency converters can save about 7% of the total worldwide electrical energy. Roughly one quarter to one third of these savings come from the improved efficiency of the motor.

A need was felt amongst users, consultants and manufacturers in India to revise existing BIS standard IS 12615:2004 to harmonize with the international standards. This will lead us to be in line with international code of standards and practices. This will also result in having uniform test procedures to facilitate the end user to compare the performance and energy efficiency of motors.

Motors from 0.37kW to 375kW make up the vast majority (approximately 90%) of installed motor population and are covered by the standard IS 12615:2011. This fulfills the need of the manufacturers to design motor for a global market. This standard defines four efficiency classes for nominal frequency 50Hz.

Salient features of BIS standard IS 12615:2011 (second revision)

This standard is primarily based on IEC 60034-30:2008 issued by the International Electrotechnical Commission except that additional performance parameters other than efficiency values have also been included.

The efficiency levels in IS 12615:2011 are based on test methods specified in IS 15999 (Part 2/sec 1):2011 / IEC 60034-2-1:2007. The standard specifies methods used to determine losses and efficiency, with the objective to calculate efficiency values more accurately.

New IE efficiency classes are as given below

Efficiency Class	Description	
IE1	Standard efficiency	Comparable to eff2
IE2	High efficiency	Comparable to eff1
IE3	Premium	Premium
IE4	Super premium	Super premium

As per the standard, efficiency class of IE4 is under consideration and would be incorporated later. The standard IS 12615:2011 covers low voltage, AC three phase squirrel cage, single speed induction motors for

- Rated voltage <= 1000V
- Rated frequency 50Hz
- Rated output between 0.37kW to 375kW
- 2P, 4P & 6P
- Rated on the basis of continuous duty (S1) or intermittent periodic duty (S3) with 80% or higher cyclic duration factor
- Capable of operating direct on line
- Rated for ambient temperature of 40 deg centigrade & altitude not exceeding 1000m
- Degree of protection IP44 or superior
- Method of cooling IC 411
- Fixing dimensions as per IS 1231 & IS 2223
- Determination of total losses with PLL determination from residual losses

This standard does not cover

- 8P motors
- Pole changing motors (multispeed motors)
- Motors made exclusively for converter duty application
- Motors completely integrated into the machine. (for example, pumps, compressors that cannot be tested separately from the machine)
- Crane & hoist duty motors

Highlights

- Efficiency values of different manufacturers are comparable only if they are measured by the same method as per IS 15999 (Part 2/sec 1):2011 / IEC 60034-2-1:2007.
- IE Class efficiencies are subject to tolerance as per IEC 60034-1
- For conditions of limitations on grid supply (e.g. limiting starting current, high tolerances of voltage and/or frequency), it may not be possible to achieve the same IE efficiency class.

- Energy efficient cage-induction motors are typically built with more active material to achieve higher efficiency and hence the starting performance of these motors differ somewhat from motors with a lower efficiency. The locked rotor current increases approximately by 10 to 15 percent for increase in each level of efficiency for the same output power. For replacing existing motors, this should be checked by the user with manufacturer for proper sizing of the protective devices.
- Old efficiency levels were Eff2 and Eff1 (as per CEMEP). For calculation of these efficiencies, fixed stray load losses (0.5% of motor output) were assumed. Now IS 12615:2011 refers to IS 15999 (Part 2/sec 1):2011 / IEC 60034-2-1:2007 for calculation of efficiency. This calculation is based on the new methods of stray load loss measurement specified in the standard. The effect is in the reduction of efficiency as compared to the earlier values.

Energy Efficient Induction Motors

(Three phase squirrel cage induction motors)

Bharat Bijlee has introduced a complete range of IE2 High efficiency motors

Product Range

Type	Frame Size	kW range
2H - IE2 High efficiency	71 TO 355L	0.37 TO 355*

Standards

All motors comply with following Indian & International standards

National/International Standards

IS : 325	Three Phase Induction motors specifications.
IS/IEC 60034-1	Rotating electric machines: Part 1 Rating and Performance
IS : 900	Code of practice for installation & maintenance of induction motors.
IS : 1231	Dimensions of foot mounted A.C Induction motors
IS : 2223	Dimensions of Flange mounted A.C Induction motors
IS 15999 part 2 section 1 /IEC 60034-2-1	Rotating Electrical Machines - Standard Methods for determining losses and efficiency from tests
IS /IEC 60034-5	Degree of protection provided by the integral design of Rotating Electrical Machines (IP code) : classification
IS : 6362 / IEC 60034-6	Designation of methods of cooling for Rotating Electrical Machines
IS : 12065 / IEC 60034-14	Permissible Limits of noise level for Rotating Electrical Machines
IS : 12075	Mechanical Vibration of Rotating Electrical Machines
IS : 12615:2011	Energy Efficient Induction Motors Three phase Squirrel Cage.
IEC 60072	Dimension & Output rating of Rotating Electrical machines.

***Note : Motors above 355kW & up to 1250kW are available in frame size 355, 400 & 450 with double ventilated cooling system. Please contact our Sales.**

CE MARK

All motors have **CE mark** on the nameplate

ELECTRICAL FEATURES

Standard Operating condition

Supply Conditions (Voltage & Frequency)

Voltage	:	415 V ± 10%
Frequncy	:	50Hz ± 5%
Combined variation	:	± 10%

Ambient

Motors are designed for ambient temperature of 50° C

Altitude

Motors are designed for an altitude up to 1000m above mean sea level.

Re-rating factors

The re-rating applicable under different conditions of 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 Temperature & Altitude

Amb. Temp. °C	Permissible output as % of rated value
<30	107
30-45	103
50	100
55	96
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

Method of starting

Our motors are suitable for following method of starting

kW rating	Method of starting	No. of leads
Upto & including 1.5 kW	DOL 415V - Star 240V - Delta	6
Above 1.5 kW	DOL or Star / Delta	6

All Bharat Bijlee motors are suitable for inverter duty application. **(Refer page 5)**

Starting Time and Duty Cycle

Motors are designed for continuous (S1) Duty. Other type of duty (S2 to S9) can be offered on request. The motors can safely withstand 3 consecutive starts from cold condition & 2 consecutive starts from hot conditions. In applications where more severe starting conditions are encountered, a special enquiry should be made e.g.

- Drives with high inertia e.g flywheel drives, eccentric presses, large fans etc.
- Drives involving intermittent duty of motors with frequent starts e.g. rolling mills, centrifuges and conveyor motors, etc.

The enquiry should be accompanied with following information.

- GD^2 and relevant speed of driven equipment
- Duty cycle/sequence of operation/no. starts/hours
- Speed-Torque diagram of driven equipment
- Method of braking (Electrical or Mechanical)

Insulation and Endurance

The Motors are provided with class F insulation scheme with temperature rise limited to class B. These motors can be used either at ambient temperature of 55^0 C or overloaded continuously by 10% (service factor = 1.1). The temperature rise will be still within limits of class F.

The slot insulation consists of Nomex-polyster-Nomex (NPN). All insulation materials used are adequately resistant to the action of microbes and fungi.

Winding & Insulation for Inverter Duty Motors

- The stators are wound with polysteremide coated with polyamide-imide top coat, (dual coated) wires as per IS 13730 : part 13, grade -II thermal class 200 copper wires.
- Vacuum Pressure Impregnation (VPI) is provided to windings.

Depending on the voltage wave rise time (dv/dt) and the maximum peak to peak voltage at the motor terminals, suitable insulation schemes are provided.

On customer's demand, insulated bearings are offered from frame size 132 and onwards on the NDE side of the motor.

Options

Motors with class 'H' insulation can be offered on request.

Thermal Protection (For Winding & Bearing)

PTC Thermisters / thermostats. RTD etc. can be embedded in stator winding on request. In case of frame sizes 250M & above Bearing Temperature Detectors (BTD) can be supplied on request.

Earthing Terminals

Two earthing terminals are provided on the body and one terminal is provided in the terminal box.

Anti-condensation Method

In order to avoid condensation of water inside the motors, they can be heated up by connecting a voltage 4 to 10% of rated voltage to the motor terminals. Adequate heating is obtained with current equal to 20-25% of rated motor current. Alternatively any of the methods indicated in IS : 900 for heating stator winding could be adopted.

Motors can also be offered with built in space heaters in frame size 90 and above.

MECHANICAL FEATURES

Enclosures: (Material & Terminal box location)

Motors are offered with following enclosure

Frame Size	Enclosure Materials	Terminals Box Location	
		Standards	Option Available
63-80	Aluminum	TOP	----
90S-112M	Aluminum	TOP	----
	Cast Iron	RHS	TOP & LHS
132S & 132M	Aluminum	TOP	-
132S-225M	Cast Iron	RHS	TOP & LHS
250M-355L	Cast Iron	TOP	RHS & LHS

All foot mounted motors are with integral feet construction. All motors up to 280 frame are with integral bearing covers and motors in frame 315 and above are with separate bearing covers.

Cooling

All motors are totally enclosed Fan Cooled (TEFC) The cooling is effected by self driven, bi-directional centrifugal fan protected by fan cover. The Type of cooling is as per IS 6362 / IEC 60034-6. Forced cooing arrangement can be provided for frame 132S and above.

Table 2

Cooling Type	Cooling Code	
TEFC	IC 411	Standard
TENV	IC 410	On Demand
FORCED COOLED	IC 416	On Demand

Degree Protection

All motors have IP55 degree of protection as per IS/IEC 60034-5. Higher degree of protection such as IP56, IP66 can be provided on request. All flanged motors are additionally provided with oil tight shaft protection on driving end side.

Bearing & Terminals Box Details

Frame Size		Bearing nos. C3 Clearance		Terminals Box Type / Location	Terminals		No. & size of cable entries	Max. Cond. Cross Sec. area mm
		DE	NDE		No.	Size		
63		6201 2Z	6201 2Z	gk030/ Top	6	M4	1×3/4“	4
71		6202 2Z	6202 2Z					
80		6004 2Z	6004 2Z					
90S,90L		6205 2Z	6205 2Z	gk130/Top	6			6
100L		6206 2Z	6205 2Z	gk230/ Top	6		2×1’’	10
112M		6206 2Z	6205 2Z					
132S,132M		6208 2Z	6208 2Z	gk330/Top	6	M5		
160M,160L		6309 2Z	6209 2Z	gk330/RHS				16
180M,180L		6310 2Z	6210 2Z	gK430/ RHS	6	M6	2× 1-1/2’’	50
200L		6312	6212	TB 225/RHS	6	M8	2 × 2’’	70
225S, 225		6313	6213					
250M		6315	6215	TB280/ Top	6	M10		150
280 S/M	2P	6316	6316					
	4, 6 & 8P	6317	6316					
315 S/M		6319	6319	TB315/ Top	6	M12	2 × 2’’	240
315L		6319	6319				2 × 2 1/2’’	
355L		6322	6322	TB355/Top	6	M16	2 × 3’’	300

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

Roller Bearing and Insulated Bearing
Alternatively motors with insulated bearing on NDE side can be offered from frame size 132S & above on request at extra price.

Motors can also be offered with cylindrical roller bearing (NU) on DE side for frame sizes 132S and above at extra price.

Grease
Sealed for life bearing (2Z) are filled with grease Unirex N3-of ESSO. Others are filled with LGMT3 of SKF make. Special high temperature grease can be provided on request.

On line Re-Greasing
On line re-greasing arrangement is provided in frame sizes 225S and above. For frame size 180M, 180L and 200L it can be provided on request.

Rotor
Entire range of motors is fitted with dynamically balanced aluminum pressure die cast squirrel cage rotors.

Shaft
All motors are provided with single shaft extension in accordance with IS : 1231. The Shaft material is C40 (EN8) Steel. However any special shaft extension and / or special shaft material e.g. EN24 or stainless steel grades are also provided on request.

Balancing & Vibration
Rotors are dynamically balanced with a half key in the shaft extension. Vibration grade is 'reduced grade' conforming to IS: 12075. Other grades as per IS 12075 or IEC 60034-14 can be provided on request.

Noise Level
Motors are designed for noise level well below the limits specified in IS: 12065

Paint
All motors are painted with acrylic paint in Blue colour, RAL shade No. 5000. Motors used in corrosive atmosphere are painted with Epoxy base paint. Any other shade or material (e.g. polyurethane paint) can be offered on request.

Packing
Motors up to 132M frame are packed in thermacol / corrugated boxes. Wooden packing boxes are provided for higher frame size. Export worthy packing is also available on request.

Bharat Bijlee IE2 motors suitable to run with VFDs
Bharat Bijlee offers the entire range of motors suitable to run with VFDs.

Motors are suitable for :

- Constant torque application like crane, hoist, reciprocating compressor etc.
- Variable torque application like centrifugal pump, fan, blowers etc.
- Constant power application like metal cutting lathes, wire winding machines etc. and are custom built to suit customer's requirements.

Motors for constant torque application suitable for speed range of 1:10, 1:5, 1:2 etc can be provided. Depending on the speed range, motors can be offered with forced cooling (IC416) or in higher frame sizes 132S and above. **Please check with our sales office, for motors to be operated above 1.5 times the synchronous speed.**

PWM, IGBT devices operate at very high frequencies (2 kHz to 15 kHz) and have very short rises times leading to high dv/dt. Longer cable lengths also contribute to higher voltages at the motors terminals due to standing wave phenomenon. These stress the insulation of the motors. Bharat Bijlee motors are provided with special impregnation system /vacuum pressure impregnation and dual coated winding wire to take care of these stresses. This insulation conforms to the requirements given in IEC 60034-18-41. For voltage higher than 500 V, refer to our sales office.

All the motors are provided with six terminals in the terminal box. Shaft induced voltage occurs due to the use of VFD. This causes flow of currents through bearing which can lead to premature bearing failure. Insulated bearings can be provided in frames from 132S onwards on request.

In closed loop system operations, speed feedback is obtained through encoder mounted on the shaft of the motors. We provide encoder mounting arrangements on Non Drive End side shaft of the motors on request.

For further details and technical offer, please refer to our Sales office in your area.




Payback Calculations:

Effect of additional stray load losses for efficiency determination as per IS 12615-2011

The new standard follows IS 15999 / IEC 60034-2-1 for arriving at the stray load losses. These losses can vary from 2.5% in small motors to 0.5% in higher ratings up to 1MW. The earlier standard IS 12615-2004 used for eff1 motors assumed stray losses as 0.5% of output. Hence the efficiency values tested by the earlier standard would be 0.5% to 1.5% higher than the new standard for the same motor.

Example is as given below

Rating 4 Pole	Eff1 specified in IS 12615-2004 (%)	IE2 specified in IS 12615-2011 (%)	Reduction in efficiency from eff1 Due to additional stray losses (%)
11kW	91.0	89.8	1.2
55kW	94.2	93.5	0.7

When comparing eff1 motor & IE2 motor, it is necessary to note the difference in testing methods. The standard has reduced the efficiency value to take care of this. At first glance a customer would feel that an IE2 motor is inferior to an Eff1 motor though both might be identical.

Hence for any comparison, it is necessary to use the same method of loss calculation. The worked out example shown below gives the energy savings per year (for 8000 hours running) of a Bharat Bijlee IE2 motor (normalized for 0.5% stray loss) over a Bharat Bijlee standard IS 325 motor

Rating kW	BBL IS325 Catalogue (eff%)	IE2 Catalogue (eff%)	Input Power (kW)	Additional Stray losses (kW)	Nomalized IE2 Eff with 0.5% Stray losses assumed	IS 325 losses (kW)	IE2 losses (kW)	Saving (kW)	Saving in kW/Year @8000 Hrs running
11	89.0	89.8	12.249	0.187(0.2424-0.0550)	91.2	1.360	1.062	0.298	2380
55	93.8	93.5	58.824	0.684 (0.959-0.275)	94.6	3.636	3.140	0.496	3968




Powered by Trust™

Energy Saving Calculations:

Table shown below gives the energy savings per year (for 8000 hours running) of a Bharat Bijlee IE2 motor (normalized for 0.5% stray loss) over a Bharat Bijlee standard IS 325 motor

	2 Pole				4 Pole				6 Pole			
Rating kW	BBL IS325 Catalogue (Eff%)	IE2 Catalogue (Eff%)	Normalized IE2 Eff with 0.5% Stray losses	Saving in kW/Year @8000 Hrs running	BBL IS325 Catalogue (Eff%)	IE2 Catalogue (Eff%)	Normalized IE2 Eff with 0.5% Stray losses	Saving in kWh/Year @8000 Hrs running	BBL IS325 Catalogue (Eff%)	IE2 Catalogue (Eff%)	Normalized IE2 Eff with 0.5% Stray losses	Saving in kWh/Year @8000 Hrs running
0.37	71	72.2	73.8	157	71	70.1	71.6	37	68	69	70.0	122
0.55	74	74.8	76.4	188	74	75.1	76.7	212	69	72.9	74.0	429
0.75	77	77.4	79.0	201	77	79.6	81.3	413	73	75.9	77.1	434
1.1	79	79.6	81.2	303	78	81.4	83.1	695	76	78.1	79.8	550
1.5	80.6	81.3	82.9	412	80	82.8	84.5	797	77	79.8	81.4	850
2.2	82.5	83.2	84.8	570	82	84.3	85.9	984	80	81.8	83.4	895
3.7	85	85.5	87.0	805	85	86.3	87.9	1137	85	84.3	85.8	334
5.5	86	87	88.5	1426	86	87.7	89.2	1840	85	86	87.5	1462
7.5	87	88.1	89.5	1944	87	88.7	90.2	2417	88	87.2	88.6	473
9.3	88	88.8	90.2	2056	88	89.3	90.7	2538	88	88	89.4	1307
11	89	89.4	90.8	1927	89	89.8	91.2	2380	88.5	88.7	90.1	1726
15	89.5	90.3	91.6	3101	90.2	90.6	91.9	2520	90	89.7	91.0	1489
18.5	90.5	90.9	92.2	2989	91.2	91.2	92.5	2289	91	90.4	91.7	1206
22	91.5	91.3	92.6	2190	91.8	91.6	92.9	2215	91.2	90.9	92.1	1989
30	92.6	92	93.2	1655	92	92.3	93.5	4228	91.8	91.7	92.9	3080
37	93	92.5	93.7	2243	93	92.7	93.9	2969	92.5	92.2	93.4	2940
45	93.5	92.9	94.0	2143	93.2	93.1	94.2	4256	93.5	92.7	93.8	1320
55	93.3	93.2	94.3	4923	93.8	93.5	94.6	3968	93.5	93.1	94.2	3423
75	94	93.8	94.8	5549	94.2	94	95.0	5618				
90	94	94.1	95.1	8756	94.7	94.2	95.2	4004				

Bharat Bijlee

Performance Table For 2- Pole Motors

IE2

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

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

Ambient: : 50 °C
Duty : S1(Continuous)

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

3000 rpm (2-Pole)

Rated Output		Frame size	Type Ref.	Operating Characteristics at Rated output									With DOL Starting		Pullout Torque to Rated Torque Ratio	Rotor GD²	Net Weight B3 Constn. Kg
				Rated Speed	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				kgm²	
0.37	0.50	71	2H0712A3	2800	0.96	0.130	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	2H071233	2805	1.29	0.190	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	2H080213	2830	1.64	0.256	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	2H080233	2830	2.34	0.380	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	2H09S243	2840	3.13	0.514	0.82	0.78	0.68	81.3	81.3	78.0	6.5	3.3	3.0	0.0091	17
2.2	3.0	90L	2H09L273	2840	4.49	0.755	0.82	0.78	0.68	83.2	83.2	81.7	6.5	3.3	3.0	0.0113	20
3.7	5.0	100L	2H10L233	2890	7.00	1.24	0.86	0.84	0.76	85.5	85.5	83.5	7.0	3.0	3.0	0.0212	26
5.5	7.5	132S	2H13S2G3	2930	9.9	1.83	0.89	0.85	0.77	87.0	86.0	82.0	7.0	2.5	3.0	0.0820	51
7.5	10.0	132S	2H13S2N3	2930	13.3	2.49	0.89	0.85	0.77	88.1	87.0	83.0	7.0	2.5	3.0	0.0980	57
9.3	12.5	160M	2H16M233	2930	16.4	3.09	0.89	0.86	0.82	88.8	88.6	84.5	7.0	2.3	2.8	0.1500	105
11	15.0	160M	2H16M253	2930	19.2	3.66	0.89	0.86	0.82	89.4	89.4	86.5	7.0	2.3	3.0	0.171	112
15	20.0	160M	2H16M263	2930	26.0	4.99	0.89	0.88	0.82	90.3	90.2	87.0	7.0	2.3	2.8	0.203	120
18.5	25.0	160L	2H16L293	2930	31.5	6.15	0.90	0.89	0.86	90.9	90.7	88.8	7.0	2.4	3.0	0.268	137
22	30.0	180M	2H18M233	2935	37.7	7.30	0.89	0.87	0.83	91.3	91.0	88.8	7.0	2.4	2.7	0.34	117
30	40.0	200L	2H20L2A3	2950	51.0	9.89	0.89	0.86	0.80	92.0	92.0	89.5	7.0	2.5	2.6	0.61	274
37	50.0	200L	2H20L253	2950	62.5	12.2	0.89	0.86	0.80	92.5	92.0	90.0	7.0	2.4	2.5	0.61	274
45	60.0	225M	2H22M253	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	2H25M233	2965	89.2	18.1	0.92	0.91	0.86	93.2	92.7	90.0	7.0	2.3	2.7	2.60	550
75	100	280S	2H28S233	2970	124	24.6	0.90	0.88	0.83	93.8	93.6	92.0	7.0	2.2	2.8	3.01	669
90	120	280M	2H28M253	2970	146	29.5	0.91	0.89	0.87	94.1	93.9	90.9	7.0	2.2	2.8	3.42	750
110	150	315S	2H31S233	2982	180	35.9	0.90	0.86	0.78	94.3	94.1	91.5	7.0	2.0	2.5	5.0	898
125	170	315M	2H31M2A3	2982	207	40.8	0.89	0.85	0.76	94.5	93.5	91.5	7.0	2.2	2.6	5.0	940
132	180	315M	2H31M233	2982	216	43.1	0.90	0.86	0.78	94.6	93.6	91.3	7.0	2.0	2.5	5.0	940
150	200	315L	2H31L2A3	2982	248	49.0	0.89	0.84	0.76	94.7	93.7	92.2	7.0	2.0	2.5	6.2	1100
160	215	315L	2H31L253	2982	261	52.3	0.90	0.85	0.77	94.8	94.1	93.0	7.0	2.0	2.5	6.2	1100
180	240	315L	2H31L2B3	2982	300	58.80	0.88	0.82	0.75	94.9	94.1	93.0	7.0	2.0	2.5	7.7	1390
*200	270	315L	2H31L273	2982	325	65.30	0.90	0.85	0.77	95	94.5	93.3	7.0	2.0	2.5	7.7	1390
*250	335	355L	2H35L213	2985	407	81.60	0.90	0.88	0.84	95.0	94.5	92.8	7.0	1.6	2.4	12.0	1680
*315	425	355L	2H35L233	2985	513	102.80	0.90	0.88	0.84	95	94.5	93.0	7.0	1.6	2.4	14.7	1870

Note :
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

Powered by Trust™

Bharat Bijlee

Performance Table For 4- Pole Motors

IE2

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

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

Ambient: : 50 °C
Duty : S1(Continuous)

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

1500 rpm (4-Pole)

Rated Output		Frame size	Type Ref.	Operating Characteristics at Rated output									With DOL Starting		Pullout Torque to Rated Torque Ratio	Rotor GD²	Net Weight B3 Constn. Kg
				Rated Speed	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				kgm²	
0.37	0.50	71	2H071433	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	2H080433	1420	1.38	0.377	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	2H080453	1410	1.75	0.518	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	2H09S423	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	2H09L473	1430	3.27	1.02	0.77	0.70	0.57	82.8	82.8	78.8	6.0	2.7	3.0	0.019	19
2.2	3.0	100L	2H10L473	1435	4.48	1.49	0.81	0.73	0.59	84.3	84.3	81.5	6.0	2.6	3.0	0.028	26
3.7	5.0	112M	2H11M473	1445	7.27	2.49	0.82	0.78	0.63	86.3	86.3	83.8	6.5	2.7	3.0	0.066	36
5.5	7.5	132S	2H13S4K3	1455	10.2	3.68	0.85	0.80	0.70	87.7	87.4	86.0	7.0	2.6	3.0	0.126	50
7.5	10	132M	2H13M4T3	1455	13.8	5.02	0.86	0.83	0.76	88.7	88.4	86.8	7.0	2.6	3.2	0.163	56
9.3	12.5	160M	2H16M4C3	1460	17.2	6.20	0.84	0.82	0.73	89.3	89.3	86.5	7.0	2.5	2.8	0.177	105
11	15.0	160M	2H16M4K3	1460	20.0	7.34	0.85	0.82	0.76	89.8	89.8	87.5	7.0	2.7	2.9	0.229	115
15	20.0	160L	2H16L4T3	1465	27.1	9.97	0.85	0.80	0.70	90.6	90.6	89.4	7.0	2.4	2.7	0.300	128
18.5	25.0	180M	2H18M473	1470	33.2	12.25	0.85	0.82	0.76	91.2	91.2	89.5	7.0	2.7	2.9	0.540	188
22	30	180L	2H18L483	1470	39.3	14.60	0.85	0.80	0.72	91.6	91.6	89.8	7.0	2.6	3.0	0.61	200
30	40	200L	2H20L453	1470	52.6	19.88	0.86	0.82	0.78	92.3	92.0	90.0	7.0	2.6	2.6	0.93	275
37	50	225S	2H22S433	1470	63.8	24.50	0.87	0.85	0.77	92.7	92.5	90.5	7.0	2.6	2.6	1.60	362
45	60	225M	2H22M453	1470	77.3	29.82	0.87	0.85	0.77	93.1	92.8	90.8	7.0	2.6	2.6	1.85	377
55	75	250M	2H25M433	1480	95.2	36.20	0.86	0.84	0.76	93.5	93.0	91.0	7.0	2.5	2.6	3.06	500
75	100	280S	2H28S423	1480	126	49.40	0.88	0.86	0.80	94.0	93.5	92.0	7.0	2.2	2.5	5.53	670
90	120	280M	2H28M453	1480	151	59.20	0.88	0.86	0.80	94.2	94.0	92.0	7.0	2.2	2.5	6.36	735
110	150	315S	2H31S413	1485	188	72.10	0.86	0.83	0.77	94.5	94.3	92.3	7.0	2.1	2.5	8.70	902
125	170	315M	2H31M4A3	1486	214	81.90	0.86	0.83	0.77	94.6	94.3	92.7	7.0	2.2	2.5	10.20	1010
132	180	315M	2H31M433	1486	223	86.50	0.87	0.85	0.78	94.7	94.5	93.0	7.0	2.1	2.5	10.20	1010
150	200	315L	2H31L4A3	1487	256	98.30	0.86	0.83	0.77	94.7	94.4	92.8	7.0	2.2	2.5	12.20	1185
160	215	315L	2H31L453	1486	270	104.8	0.87	0.86	0.78	94.9	94.6	93.1	7.0	2.1	2.5	12.20	1185
180	240	315L	2H31L463	1487	303	117.9	0.87	0.86	0.78	95.0	94.7	93.2	7.0	2.1	2.5	13.40	1262
*200	270	315L	2H31L473	1487	336	131.0	0.87	0.86	0.78	95.1	94.8	93.3	7.0	2.2	2.5	14.60	1305
*250	335	355L	2H35L413	1488	416	163.6	0.88	0.85	0.75	95.1	94.9	93.5	7.0	2.2	2.5	23.30	1680
*315	422	355L	2H35L433	1488	524	206.2	0.88	0.85	0.75	95.1	94.8	93.5	7.0	2.2	2.5	32.70	1855
**355	475	355L	2H35L453	1488	590	232.4	0.88	0.85	0.75	95.1	94.9	93.5	7.0	2.2	2.5	37.90	2025

Note :
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
**- These ratings are suitable for ambient temperature 40°C

Powered by Trust™

Bharat Bijlee

Performance Table For 6- Pole Motors

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

IE2

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

Ambient: : 50 °C
Duty : S1(Continuous)

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

1000 rpm (6-Pole)

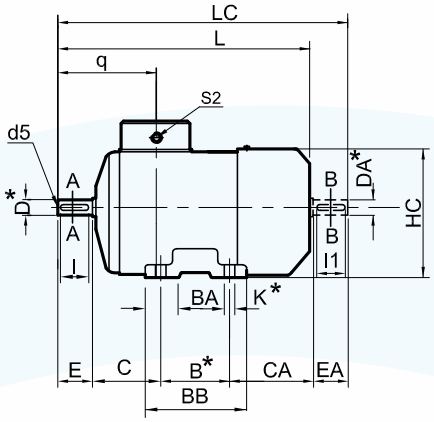
Rated Output		Frame size	Type Ref.	Operating Characteristics at Rated output									With DOL Starting		Pullout Torque to Rated Torque Ratio	Rotor GD²	Net Weight B3 Constn. Kg
				Rated Speed	Current	Rated Torque	Power Factor			% Efficiency			Starting Current to Rated Current Ratio	Starting Torque to Rated Torque Ratio			
KW	HP	IEC	B3 Construction	RPM	Amps.	Kg.m	FL	3/4L	1/2L	FL	3/4L	1/2L				kgm²	
0.37	0.5	80	2H080613	910	1.07	0.396	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	2H080633	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	2H09S633	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	2H09L653	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	2H10L633	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	2H11M653	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	2H13S6G3	960	8.00	3.75	0.76	0.65	0.57	84.3	83.0	81.5	5.5	2.0	2.5	0.130	48
5.5	7.5	132M	2H13M6T3	960	11.4	5.58	0.78	0.68	0.60	86.0	84.5	82.0	6.0	2.5	2.50	0.193	55
7.5	10	160M	2H16M633	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	2H16L663	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	2H16L673	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	2H18L633	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	2H20L633	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	2H20L653	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	2H22M643	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	2H25M633	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	2H28S613	980	81.4	44.7	0.83	0.80	0.70	92.7	92.7	91.2	6.0	2.5	2.4	5.11	573
55	75	280M	2H28M633	980	96.7	54.7	0.85	0.83	0.73	93.1	93.1	91.0	6.0	2.4	2.4	6.16	620
75	100	315S	2H31S613	985	131	74.1	0.85	0.82	0.75	93.7	93.7	92.5	6.0	2.4	2.5	10.7	830
90	120	315M	2H31M633	987	159	88.8	0.84	0.81	0.72	94.0	93.9	92.5	6.0	2.3	2.5	12.4	912
110	150	315M	2H31M653	988	191	108.4	0.85	0.82	0.73	94.3	94.3	93.3	6.0	2.3	2.5	15.5	1010
125	170	315L	2H31L6A3	988	219	123.2	0.84	0.80	0.71	94.4	94.4	93.0	6.0	2.3	2.5	18.0	1175
132	180	315L	2H31L673	988	228	130.0	0.85	0.82	0.73	94.6	94.3	92.8	6.0	2.3	2.5	18.0	1175
150	200	315L	2H31L6B3	988	265	147.8	0.83	0.80	0.70	94.7	94.4	92.8	6.0	2.3	2.5	21.5	1231
160	215	315L	2H31L693	988	276	158.0	0.85	0.82	0.73	94.8	94.6	93.0	6.0	2.3	2.5	21.5	1231
180	240	355L	2H35L6A3	990	322	177.0	0.82	0.77	0.65	94.9	94.6	93.3	6.0	2.0	2.5	28.7	1670
200	270	355L	2H35L613	990	349	196.7	0.84	0.80	0.7	95.0	94.7	93.5	6.0	2.0	2.5	28.7	1670
250	335	355L	2H35L633	990	436	246	0.84	0.80	0.7	95.0	94.7	93.4	6.0	2.0	2.5	35.5	1780

Note :
All performance values are subject to tolerance as per IS/IEC 60034-1
Efficiency measurements are without seals.

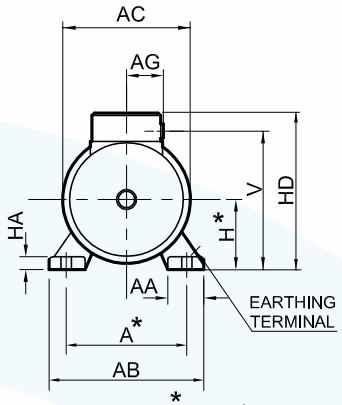
Powered by Trust™

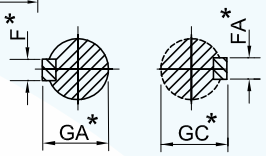
Bharat Bijlee

Dimensional Drawing: Industrial Motors Type 2H Foot Mounted (B3) TEFC IE2 series Frame 63-355L

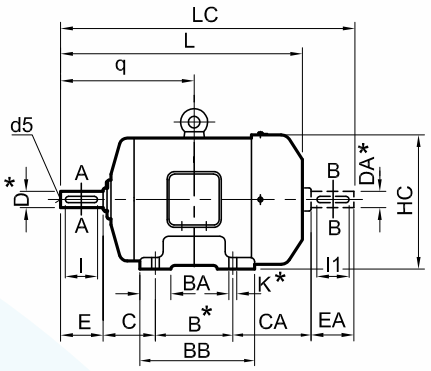


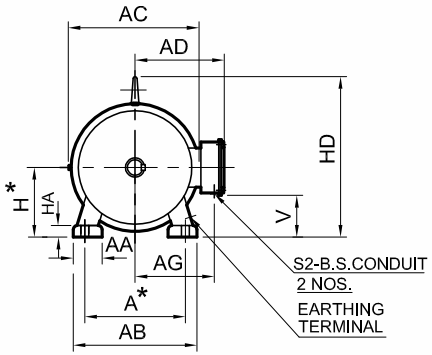
FRAME SIZE 63 TO 80



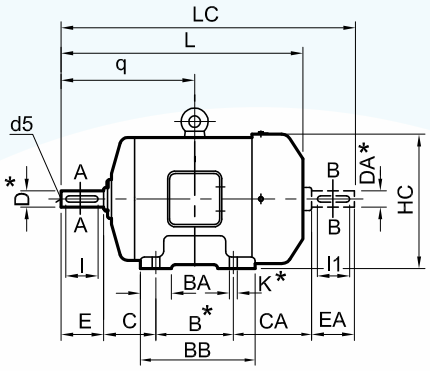


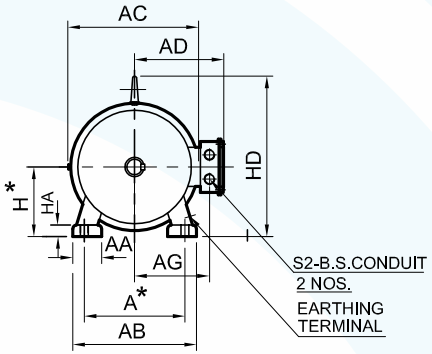
SECTION A-A SECTION B-B





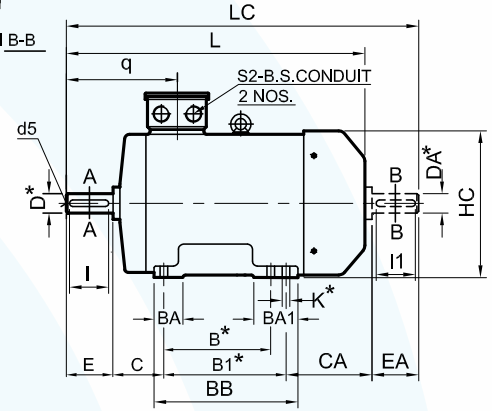
FRAME SIZE 160M TO 180L

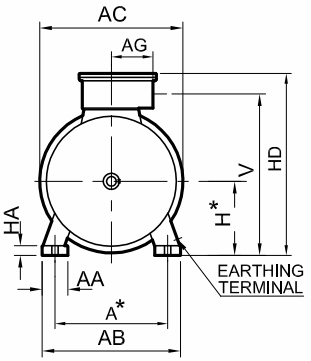




FRAME SIZE 200L TO 225M

* Refer TABLE A for tolerances





FRAME SIZE 90S TO 132M
FRAME SIZE 250M TO 355L

CAT-A-6335-3-1

Powered by Trust™

Bharat Bijlee

Dimensional Details: Industrial Motors Type 2H 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	HA	HC	HD	AD	L	LC	CA	AC	V	q	AG	S2 B.S.C.	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	—	7	125	179	—	206	241	75	124	149	104	40	3/4"	11	23	4	12.5	18	M4	—	—	—	—
71	2,4 & 6	112	90	—	45	71	7	135	110	31	30	—	7	141	195	—	234	278	83	140	166	102	40	3/4"	14	30	5	16	25	M5	—	—	—	—
80	2,4 & 6	125	100	—	50	80	10	150	124	31	35	—	9	159	214	—	267	324	94	157	185	112	40	3/4"	19	40	6	21.5	35	M6	—	—	—	—
90S	6 & 8	140	100	—	56	90	10	168	125	34	31.5	—	12	177	230	-	302	374	118	174	199	139	52	3/4"	24	50	8	27	45	M8	2 & 4	336	408	152
90L	6 & 8		125						150								327	399				153									2 & 4	361	433	152
100L	6 & 8	160	140	—	63	100	12	190	174	43.5	36	—	12	198	257	-	366	448	125	192	225	152	56	1"	28	60	8	31	55	M10	2 & 4	387	469	146
112M	6 & 8	190	140	—	70	112	12	220	174	47	36	—	12	222	282	-	388	471	141	220	249	157	56	1"	28	60	8	31	55	M10	4	419	502	172
132S	6 & 8	216	140	—	89	132	12	256	180	64	50	—	17	262	338	-	450	552	163	260	299	196	63	1"	38	80	10	41	70	M12	2 & 4	498	597	208
132M	6		178						218		54						488	590	163			215									—	—	—	—
																														4	532	635	208
160M	2	254	210	—	108	160	15	310	250	58	70	—	20	318	366	226	605	741	203	316	98	323	186	1"	42	110	12	45	105	M16	—	—	—	—
	4,6 & 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	—	26	357	412	265	679	799	217	354	83	352	216	1 1/2"	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	—	32	397	462	312	795	920	262	394	—	396	249	2"	55	110	16	59	100	M20	—	—	—	—
	6 & 8																772	897	239												4	795	920	262
225S	6 & 8	356	286	—	149	225	19	436	336	85	85	—	34	450	509	337	827	966	251	450	—	432.5	273	2"	60	140	18	64	130	M20	4	877	1026	281
225M	2		311						361								837	956	276			415			55	110	16	59	100		—	—	—	—
	6 & 8																842	991	251			445			60	140	18	64	130		4	902	1051	281
250M	2	406	349	—	168	250	24	506	425	100	115	—	42	495	665	—	983	1134	337	489	578	352	205	2"	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	42	552	725	—	1010	1160	271	544	638	360	205	2"	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	100	115	155	45	620	830	—	1137	1293	240	610	728	386	218	2"	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		2 1/2"	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	—	45	693	939	—	1461	1622	458	685	850	434	305	3"	75	140	20	79.5	130	M24	—	—	—	—
	4,6 & 8																1491	1682				464			95	170	25	100	160					

TABLE A

Dimension	Tolerance		Specification
A,B	±0.75		
H	-0.5	UPTO 280	IS : 1231
	-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

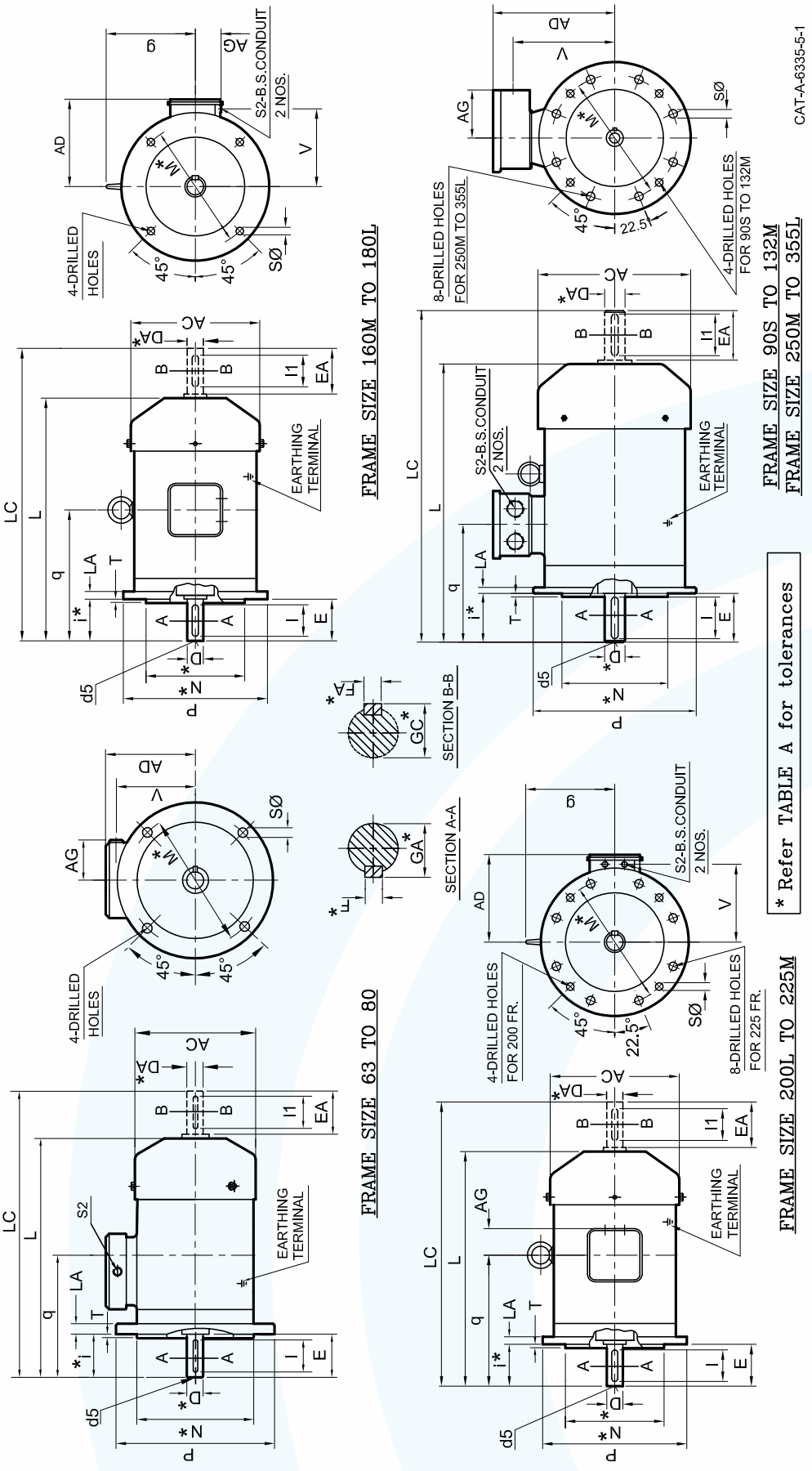
15kW/2P & 11kW/4P in 160M will have dimensions "L","LC" & "CA" as Indicated in table "B"

- 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

*Refer TABLE A for tolerances

All Dimensions are in mm unless otherwise specified.

Dimensional Drawing: Industrial Motors Type 2H Flange Mounted (B5) TEFC (IE2) series Frame 63-355L



Dimensional Details: Industrial Motors Type 2H Flange Mounted (B5) TEFC IE2 series Frame 63-355L

		FIXING					GENERAL						TERMINAL BOX					SHAFT						
IEC Fr. size	Pole	P	N*	M*	i*	S	T	LA	AD	AC	L	LC	g	V	q	AG	S2 B.S.C.	* * D,DA	E EA	F* FA*	GA* GC*	I I1	d5
63	2 & 4	140	95	115	23	10	3	9	116	124	225	260	—	86	109	40	3/4"	11	23	4	12.5	18	M4
71	2,4 & 6	160	110	130	30	10	3.5	9	124	140	261	305	—	95	127	40	3/4"	14	30	5	16	25	M5
80	2,4 & 6	200	130	165	40	12	3.5	10	134	157	267	324	—	105	112	40	3/4"	19	40	6	21.5	35	M6
90S	6 & 8	200	130	165	50	12	3.5	10	140	174	302	374	①	109	139	52	3/4"	24	50	8	27	45	M8
90L	6 & 8										327	399			153								
100L	6 & 8	250	180	215	60	15	4	11	157	195	366	448	-	125	152	56	1"	28	60	8	31	55	M10
112M	6 & 8	250	180	215	60	15	4	11	170	220	388	471	-	137	157	56	1"	28	60	8	31	55	M10
132S	6 & 8	300	230	265	80	15	4	12	206	260	450	552	-	167	196	63	1"	38	80	10	41	70	M12
132M	6										488	590			215								
160M	2	350	250	300	110	19	5	13	226	316	605	741	206	186	323	63	1"	42	110	12	45	105	M16
	4,6 & 8										585	721											
160L	6 & 8										629	765			345								
180M	2,6 & 8	350	250	300	110	19	5	13	265	354	679	799	232	216	352	97	1 1/2"	48	110	14	51.5	100	M16
180L	6 & 8										717	838			371								
200L	2	400	300	350	110	19	5	15	312	394	795	920	262	249	396	172	2"	55	110	16	59	100	M20
	6 & 8										772	897											
225S	6 & 8	450	350	400	140	19	5	16	337	450	827	966	284	273	432.5	172	2"	60	140	18	64	130	M20
225M	2				110						837	956			415			55	110	16	59	100	
	6 & 8				140						842	991			445			60	140	18	64	130	
250M	2	550	450	500	140	19	5	18	415	489	983	1134	—	328	352	205	2"	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	—	358	360	205	2"	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	610	1137	1293	—	413	386	218	2"	65	140	18	69	130	M20
	4,6 & 8				170						1167	1353			416			80	170	22	85	160	
315L	2				140						1302	1458			386		2 1/2"	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	—	495	434	305	3"	75	140	20	79.5	130	M24
	4,6 & 8				170						1491	1682			464			95	170	25	100	160	M24

TABLE B

Pole	L	LC
—	—	—
—	—	—
—	—	—
2 & 4	336	408
2 & 4	361	433
2 & 4	387	469
4	419	502
2 & 4	498	597
—	—	—
4	532	635
—	—	—
2 & 4	635	771
—	—	—
2 & 4	679	815
4	698	802
4	737	841
—	—	—
4	795	920
4	877	1026
—	—	—
4	902	1051
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—
—	—	—

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

Special Remarks

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

*Refer TABLE A for tolerances

- 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

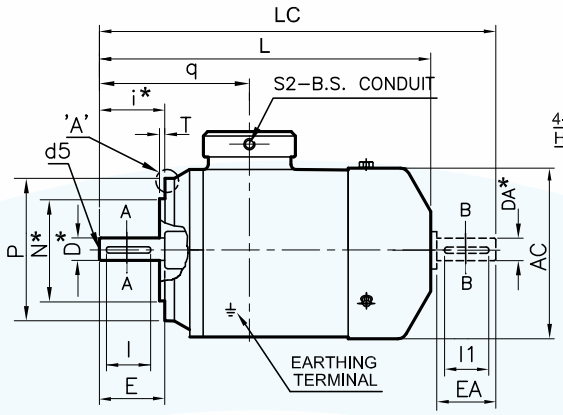
All Dimensions are in mm unless otherwise specified.

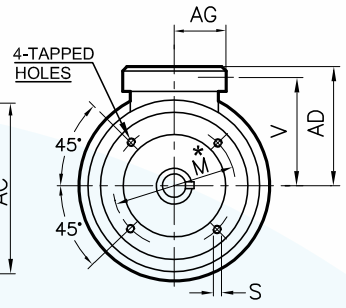
CAT-A-6335-5-2

Powered by Trust™

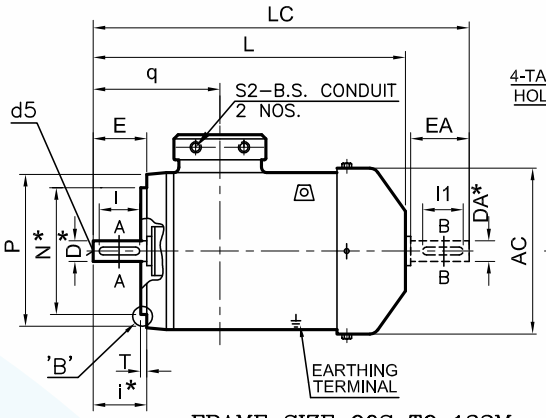
Bharat Bijlee

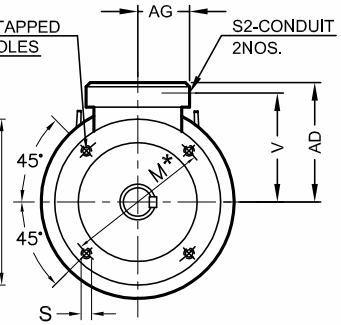
Dimensional Details: Industrial Motors Type 2H Face Mounted (B14) TEFC IE2 series Frame 63-132M



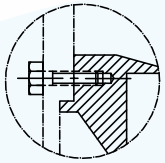


FRAME SIZE 63 TO 80

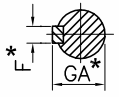




FRAME SIZE 90S TO 132M



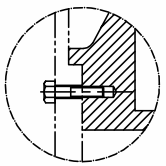
ENLARGEMENT OF CIRCLE 'A'



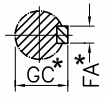
SECTION A–A

		FIXING					GENERAL						TERMINAL BOX			SHAFT					
IEC Fr. size	Pole	P	N*	M*	i*	S	T	AD	AC	L	LC	g	V	q	AG	S2 B.S.C.	D* DA*	E EA	F* FA*	GA* GC*	I I1	d5
63	2 & 4	90	60	75	23	M5X10	2.5	116	124	206	241	—	86	104	40	3/4"	11	23	4	12.5	18	M4
71	2,4 & 6	105	70	85	30	M6X10	2.5	124	140	234	278	—	95	102	40	3/4"	14	30	5	16	25	M5
80	2,4 & 6	120	80	100	40	M6X13	3	134	157	267	324	—	105	112	40	3/4"	19	40	6	21.5	35	M6
90S	6 & 8	140	95	115	50	M8X12	3	140	174	302	374	①	109	139	52	3/4"	24	50	8	27	45	M8
90L	6 & 8									327	399			153								
100L	6 & 8	160	110	130	60	M8X12	3.5	157	195	366	448	-	125	152	56	1"	28	60	8	31	55	M10
112M	6 & 8	160	110	130	60	M8X12	3.5	170	220	388	471	-	137	157	56	1"	28	60	8	31	55	M10
132S	6 & 8	250	180	215	80	M12X20	4	206	260	450	552	-	167	196	63	1"	38	80	10	41	70	M12
132M	6									488	590			215								

TABLE B		
Pole	L	LC
—	—	—
—	—	—
—	—	—
2 & 4	336	408
2 & 4	361	433
2 & 4	387	469
4	419	502
2&4	498	597
—	—	—
4	532	635



ENLARGEMENT OF CIRCLE 'B'



SECTION B–B

TABLE A

Dimension	Tolerance	Specification
N	j6	IS : 2223
M	±0.3	
i	±1	

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

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

*Refer TABLE A for tolerances

All Dimensions are in mm unless otherwise specified.

CAT-C-6313-4-1

Powered by Trust™

Bharat Bijlee

Special Design Features Offered

Electrical

Non standard Voltage	42 TO 700V
Non standard Frequency	50/ 60 Hz with efficiency class as per IEC 60034-30
Motor for wide variation*	
Voltage variation	>10%
Frequency Variation	>5%
Motors with higher ambient temperatures	>50 °C
Polarities higher than 8 pole	10pole, 12pole etc
Dual Voltage motors	In ratio 1:v3. 1:2
Multi Speed motors	2 / 3 speeds
Class H Insulation Scheme	
Motors with Thermal protection	PTC Thermisters, Thermostat, RTD, BTD etc.
Space heaters	90 Frame onwards
Motors with starting current Limitations	e.g. <600% inclusive of tolerance
Motors with intermittent duties	
Motors with flying leads	

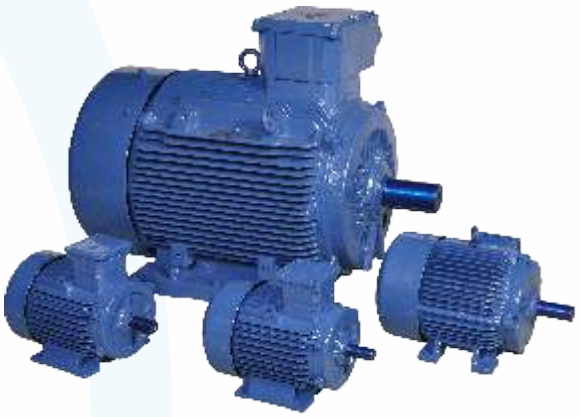
* motor performance may vary from the catalogue performance.
Please ask for data sheet for non standard motor.

Mechanical

Special Mounting	**Non Standard mounting dimensions**
Cable entries	Metric equivalent
Non Standards shaft materials	e.g. EN 24
Non Standards shaft extension dimension	
Non standards cable entries	
Cable spreader box	180 Frame onwards
Motors with cable glands	Single/Double compression
Motors with separate T.Box for space heater,thermister	200L frame and above
Low vibration motors	Reduced or special class as per IS : 12075 or vibration grade B as per IEC 60037-14
Non standards paint type	
Paint shade	e.g. Shade no. 632 RAL 7030 etc
Forced cooling arrangement (IC416)	(132 frame onwards)
Surface cooled motors (IC410)	
Motors for brake fitment	
Motors with clean flow cowl arrangement	
Motors with C.I Fan up to 225 Frame	
56 Frame motors in B5 AND B14 Mounting construction	

Product Range

Motor used in Hazardous Area	
•Flame proof motors- Ex'd' (IS/IEC:60079-1)	Frame 80 to 315L (MD)
• Increased Safety –Ex'e' (IS/IEC 60079-7)	Frame 63 to 355L (ME)
• Non sparking-Ex'n' (IS/IEC 60079-15)	Frame 63 to 355L (MN)
Brake Motors	Frame 71 to 132L (MB)
Slip ring Motors	Frame 100 to 160L (MP)
Roller table motors	As per Requirement
Crane Duty Motors	Frame 63 to 355L (MC)
Railway motors (Auxiliary drives)	Frame 180M TO 225M
Cane unloader motors	Frame 160L TO 225M
Marine duty motors	Frame 63 to 355L



NOTES

NOTES

NORTH

DELHI

1st Floor, 7 B Rajindra ParkPusa Road, New Delhi 110 060
T: +91 11 25816931/32/33/35/38 F: +91 11 25816940
Email: bbldelhi@bharatbijlee.com

LUDHIANA

SCO-146 3rd Floor Above ICCI Bank Feroz Gandhi Market Ludhiana 141 001
T: +91 161 2775 692/93
Email: bblludhiana@bharatbijlee.com

CHANDIGARH

SCO No.333-34 1st Floor Sector 35B Chandigarh.160 022
T: +91 172 2600532/35 F: +91 172 2600531
Email: bblchandigarh@bharatbijlee.com

JAIPUR

207 1ST Floor Business Plaza Near Ganapati Plaza B-8 Motilal Avenue Jaipur 302 001 T: +91 141 237 2842
Email: bbljaipur@bharatbijlee.com

INDORE

M-78 Trade Centre 18 South Tukoganj Indore 452 001
T: +91 731 2524474/2514486 F: +91 731 2527 505
Email: bblindore@bharatbijlee.com

EAST

KOLKATA

Flat No.8 Mansarawer 2nd Floor 3B Camac Street Kolkata 700 016
T: +91 33 2217 2382/83 F: +91 33 2217 2467
Email: bblcalcutta@bharatbijlee.com

REGISTERED OFFICE

Electric Mansion 6th Floor Appasaheb Marathe Marg Prabhadevi Mumbai 400 025
T: +91 22 2430 6237/6375 F: +91 22 2437 0624

MARKETING OFFICE & WORKS

No. 2 MIDC Thane Belapur Road Airoli Navi Mumbai 400 0708
T: 91 22 2763 7200/7400 F: +91 22 2763 7430
Email: motors@bharatbijlee.com

WEST

MUMBAI

501-502 5th Floor Swastik Chambers Sion Trombay Road Chembur Mumbai 400 071
T: +91 22 6145 7333/61457334 F: +91 22 25228767
Email: bblho@bharatbijlee.com

PUNE

Flat No 1 “Sai Sankalp” Ground Floor Sankalp Hsg Soc Ltd Plot no 14 Cts No 380 Opp Jog Hospital Pand Road Kothrud Pune - 411 038 T: +91 20 2432 1267 /2432 4831/2432 0232
F: +91 20 2433 9210
Email: bblpune@bharatbijlee.com

AHMEDABAD

202 Arth Complex 8-Rashmi Society Behind A K Patel House Mithakali Six Roads Ahmedabad 380 009
T:+91 79 2642 4187/2642 2455 F: +91 79 2656 3581
Email: bblahmedabad@bharatbijlee.com

NAGPUR

Plot No v-71 Neelam Appartment Narendra Nagar Nagpur 440 015 Mobile-09665093639
Email: ajay.parashar@bharatbijlee.com

SOUTH

BANGALORE

204-207 Ramanashree Chambers 2nd Flr 37 Lady Curzon Road Bangalore 560 001
T:+91 80 2559 2646 /2137 /2681 F:+91 8025592823
Email:motorbangalore@bharatbijlee.com

CHENNAI

No 12 Rishikesh No 75 (Old No.38) G N Chetty Rd T Nagar Chennai 600 017
T:+91 44 2815 4793 / 94 F:+91 44 2815 4794.
Email: bblchennai@bharatbijlee.com

SECUNDERABAD

Krishna Mansion 2nd Floor Adjacent to Bible House 134 Rashtrapati Road Secunderabad 500 003
T: +91 40 2753 4512 F: +91 40 2753 1791
Email: bblsecbad@bharatbijlee.com

COIMBATORE

112A Chenny's Chamber 1st Floor Dr. Nanjappa Road Coimbatore 641 018
T: +91 422 326 8881
Email: bblcoimbatore@bharatbijlee.com

Bharat Bijlee

Motors | Transformers | Drives | Elevator Systems | Projects

Powered by Trust™

ED1012