Application

Slipring induction motors are used for systems specifying limitations on starting current, for high inertia drives and for frequent starting. The motors are eminently suitable for high mechanical and electrical stresses encountered under heavy duty conditions such as excavating machines, stone crushers, main and auxiliary drives in rolling mills etc. These motors are well suited for smooth starting by using the resistance bank. These motors can also be used for variable speed drives, particularly for short periods and within a small speed range.

Insulation

The motors are provided with class F insulation scheme with temperature rise for stator windings limited to class B limits and rotor winding limited to class F limits.

Enclosures: (Material & T-Box Location)

Frame Size	Enclosure Materials	Terminals Box Location	
		Standards	Options Available
100 to 160	Cast Iron	Top	----

Degree of Protection

All motors have IP55 degree of protection as per IS/IEC 60034-5. Higher degree of protection such as IP 56, IP 65 and IP 66 can be offered on request. All flange mounted motors are additionally provided with oil tight shaft protection on driving end side.

Note: For more details, refer to Annexure II on page no. 121.

Mounting

Standard mounting is B3. In case B5 mounting is required, please refer to our sales office.

Additional Mechanical Features

The Slipring's at the drive end are accessible through hinged brushes on the top after opening the T-Box cover. The brush block assembly can hence easily be replaced as a whole unit without dismantling the motor. Terminals box of the motor contains 3 terminals for stator and 3 for rotor and 2 cable entries.

Starting and Speed Control

The maximum torque (which is approx. the pull-out torque) can be obtained for starting by correct selection of the resistance of the controller. By appropriately switching the resistance as the motor picks up speed, the mean torque during starting can be as high as 2.25 times the rated full load torque.

The values of rated current and voltage required for selecting the starting resistors are listed in the performance table of Slipring motors.

For reduced load, the rotor current reduces and is given by rated current × (reduced load/rated load)

The rotor current while starting is proportional to the motor torque and determines the size of the starting resistance.

Fine speed variation is possible by inserting resistance in the rotor circuit calculated per phase as:

$$R_c = \frac{V_r \times (N_s - N) \times M_n}{3 \times I_r \times N_s \times M} - R_r$$

Where V_r, I_r and R_r are the open circuit voltage, rated current and resistance of the rotor, M_n and M are the rated and required torque values, and N_s and N are the synchronous and required speed respectively.

Since the cooling is reduced at lower speed, torque and output must be reduced as per the following table, otherwise a larger motor should be selected.

Speed %	100	90	80	70	60	50
Torque %	100	96	91	85	80	72
Output %	100	86	73	60	48	36

At lower speeds the torque speed characteristic is such that the speed varies inversely with the load. Below 50% rated speed, satisfactory operating characteristics may not be obtained even if the load torque remains constant.

If sufficiently ventilated by using a separate fan etc. the motor can provide the full load torque at reduced speed.
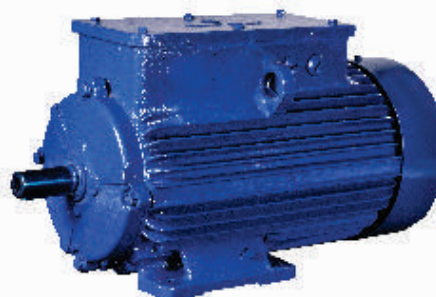
Performance table for 6-Pole motors

TEFC 3 Phase Slipring Induction Motors Crane & Hoist Duty Fr. 100L To 160L

Voltage : 415V ± 10%
Frequency : 50Hz ± 5%
Combined Variation : ± 10%

Ambient : 45°C
Duty : S3/S4/S5

Ins. Class Stator/Rotor : F/F
Temp. Rise Stator/Rotor : B/F
Protection : IP55

1000 rpm (6-Pole)

Frame Size IEC	Type Ref. B3 Construction	25%CDF kW	25%CDF Rated RPM	25%CDF Pullout Torque to Rated Torque Ratio	25%CDF Line Amps Sator	25%CDF Line Amps Rotor	40% CDF kW	40% CDF Rated RPM	40% CDF Pullout Torque to Rated Torque Ratio	40% CDF Line Amps Sator	40% CDF Line Amps Rotor	60% CDF kW	60% CDF Rated RPM	60% CDF Pullout Torque to Rated Torque Ratio	60% CDF Line Amps Sator	60% CDF Line Amps Rotor	Rotor O.C.V.	GD² Rotor	kgm² Load	Wt. of motor kg.
60 starts per hour																				
100L	MP10L613	1.3	800	1.75	3.8	17	1.1	850	2.2	3.5	13	1	870	2.50	3.4	12	65	0.034	0.09	37
100L	MP10L623	1.9	785	2.00	5.4	18.5	1.5	870	2.8	5	13	1.3	890	3.30	4.7	11	80	0.038	0.10	40
112M	MP11M623	2.6	820	2.20	9.8	22.5	2.4	840	2.2	6.4	20.5	2.1	870	2.70	6	17.1	90	0.068	0.17	58
112M	MP11M643	3.8	830	2.00	9.6	23.5	3.3	850	2.3	8.6	20.5	2.8	880	2.80	8.2	17	115	0.076	0.19	61
132M	MP13M613	4.8	860	2.10	12.5	32.5	4	890	2.6	11	26	3.4	910	3.00	9.7	21	110	0.153	0.38	90
132M	MP13M663	6.6	870	1.90	16	35	5.5	895	2.5	13.3	26.5	4.8	915	2.90	12.4	23	140	0.180	0.45	94
160L	MP16L613	8	900	2.00	18.1	33	7	920	2.1	15.8	31.3	6.5	930	2.50	14.7	27.2	165	0.310	0.77	129
160L	MP16L653	11.5	890	1.60	25.3	46.2	10	915	1.8	21	28	9	920	2.10	19.8	25.2	240	0.378	0.94	139
150 starts per hour																				
100L	MP10L613	1.3	800	1.75	3.8	17	1.1	850	2.2	3.5	13	1.3	870	2.50	3.4	12	65	0.034	0.09	37
100L	MP10L623	1.8	810	2.20	5.3	17	1.5	870	2.8	5	13	1.3	890	3.30	4.7	11	80	0.038	0.10	40
112M	MP11M623	2.6	820	2.00	6.8	22.5	2.3	850	2.4	6.2	19.5	2	875	2.80	5.9	16	90	0.068	0.17	58
112M	MP11M643	3.8	830	2.00	9.6	23.5	3.2	855	2.4	8.5	20	2.7	885	3.00	8.1	16.5	115	0.076	0.19	61
132M	MP13M613	4.5	865	2.20	11.9	30	3.7	895	2.8	10.4	23.5	3.2	915	3.30	9.4	19.5	110	0.153	0.38	90
132M	MP13M663	6.5	870	2.00	15.1	34	5.4	895	2.7	13.2	25	4.6	920	3.00	12	22	140	0.180	0.45	94
160M	MP16M613	8	900	2.00	18.1	33	7	920	2.3	15.8	29	6	930	2.70	13.4	25	165	0.310	0.77	129
160L	MP16L653	10.5	900	1.80	23.1	29.4	9.5	915	1.9	21	28	8.6	930	2.25	18.5	24	240	0.378	0.94	139
300 starts per hour																				
100L	MP10L613	1.3	800	1.75	3.8	17	1.1	850	2.2	3.5	13	0.9	890	2.80	3.3	10.5	65	0.034	0.09	37
100L	MP10L623	1.8	810	2.20	5.3	17	1.5	870	2.8	5	13	1.3	890	3.30	4.7	11	80	0.038	0.10	40
112M	MP11M623	2.6	820	2.00	6.8	22.5	2.3	850	2.4	6.2	19.5	1.9	880	3.00	5.7	15	90	0.068	0.17	58
112M	MP11M643	3.6	840	2.10	9.2	22	3	870	2.6	8.3	18.5	2.6	890	3.10	8	16	115	0.076	0.19	61
132M	MP13M613	4	890	2.60	11	26	3.4	905	3.0	9.7	21	3	920	3.50	9	18	110	0.153	0.38	90
132M	MP13M663	6.1	875	2.20	14.6	30	5.1	900	2.7	12.5	24	4.4	930	3.20	11.5	20.5	140	0.180	0.45	94
160M	MP16M613	6.7	920	2.40	15.2	28	5.5	940	2.9	12.3	23	5	945	3.20	11.2	21	165	0.310	0.77	129
160L	MP16L653	9	920	2.10	19.8	25.2	8	935	2.4	17.4	22.6	7.5	940	2.50	16.5	21	240	0.378	0.94	139

Dimensional Details: Slip Ring Motor Type MP Foot Mounted (B3) TEFC Frame 100L-160 M/L
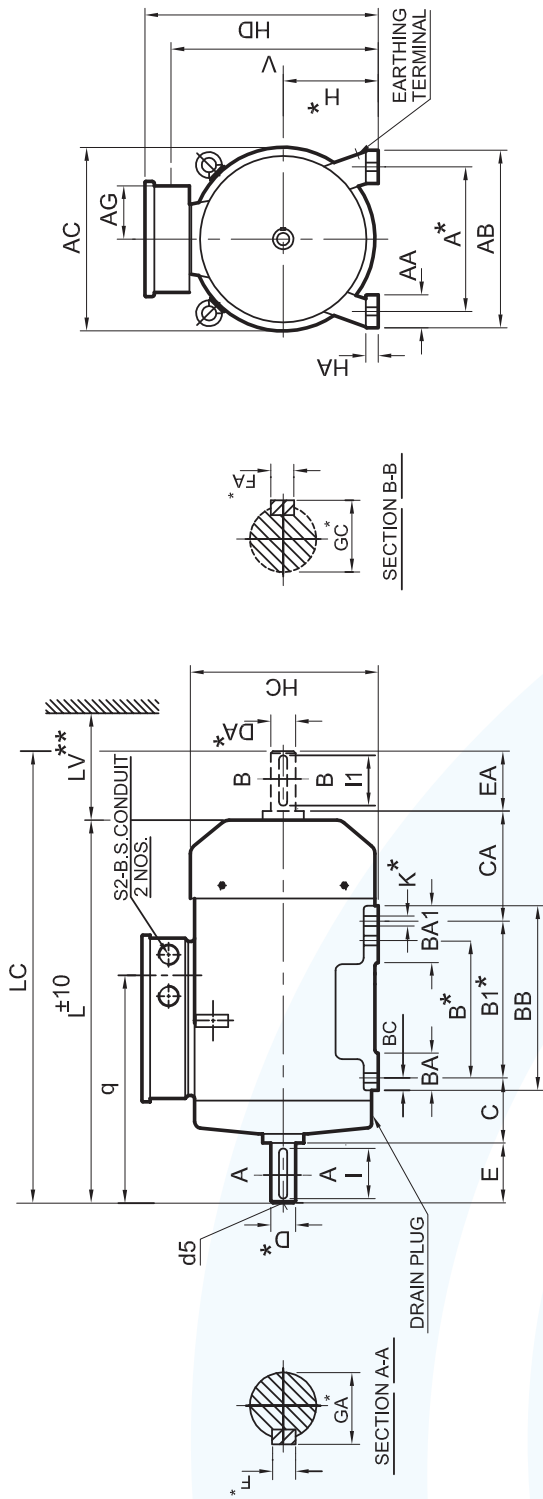
IEC Fr. size	Pole	FIXING													GENERAL										TERMINAL BOX						SHAFT	
		A*	B*	B1*	C	H*	K*	AB	BB	AA	BA	BA1	BC	HA	HC	HD	L	LC	CA	AC	LV**	V	q	AG	S2 B.S.C.	D,DA*	E / EA	F* / FA	GA* / GC*	I / I1	d5
100L	4 , 6	160	140	—	63	100	12	200	176	54	50	—	18	14	198	252	488	570	247	195	40	210	295	61	3/4"	28	60	8	31	55	M10
112M	4 , 6	190	140	—	70	112	12	230	176	62	50	—	18	15	222	281	537	620	290	220	45	230	316	63	3/4"	28	60	8	31	55	M10
132S/M	4 , 6	216	140	178	89	132	12	256	218	64	54	—	20	17	262	317	612	715	288	260	50	266	364	74	3/4"	38	80	10	41	70	M12
160M/L	4 , 6	254	210	254	108	160	15	314	294	60	70	115	20	20	318	366	730	866	287	316	60	315	434	88	1"	42	110	12	45	105	M16

TABLE A

Dimension	Tolerance	Specification
A,B	±0.75	
H	-0.5	IS : 1231
K	+0.430 / 12,15Ø	

Dimension	Tolerance	Specification
D,DA	j6 — 28Ø	IS : 1231
	k6 — 38,42Ø	IS : 2048
GA,GC,F,FA		IS : 2540
d5(centering)		

*Refer TABLE A for tolerances

- Key / key way fit : h9 / N9
- Double shaft extension can be provided with shaft dimension identical to D.E.shaft
- Also suitable for B6,B7,B8,V5 & V6 mounting as per IS 2253
- ** Minimum distance for efficient cooling of motor to be maintained by user
- All dimensions are in mm unless otherwise specified.

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