



ELECTRIC MOTORS

High Efficiency Motors



MOTORING THE WHEELS OF SUCCESS



INTRODUCTION

RANGE

"Hindustan" motors are available from frame size 56 to 315 in 2, 4, 6 & 8 pole designs. The motors are suitable for continuous (S1) duty with ambient temperature of 45°C & Site altitudes of upto 1000 meters above mean sea level.

VOLTAGE & FREQUENCY

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

STANDARDS

Motors conform to IS: 325, IEC 34, Part 1 & BS 4999 for electrical specifications & IS: 1231 for mechanical dimensions.

TERMINAL BOX POSITION

Standard location of the terminal box is on top. However for frame sizes 90 to 315, the terminal box on right or left side can be provided on request. The terminal box can be rotated in steps of 90° in each position.

PROTECTION

The motors are designed with class F insulation & IP55 degree of protection as per IS: 4691 & IEC34, Part 5.

CONNECTION

Motors upto 2 HP are star connected with 3 leads & from 3 HP onwards they are delta connected with 6 leads.

TORQUE CHARACTERISTICS

The nominal torque of the motor T_N is the torque developed by the motor at rated speed n , while delivering the rated power P . The relationship between these three parameters is

$$T_N = 9550 \times [P/n] \text{ (Nm)}$$

Where P = Power (kW)

n = motor speed (rpm)

Alternatively, torque T_N in kgm can be given as

$$T_N = 974 \times [P/n] \text{ (kgm)}$$

MOMENT OF INERTIA

The moment of inertia J is given in kgm². The moment of inertia is numerically equal to $\frac{1}{4} GD^2$. The Load moment of inertia J_L of the driven machine at rated speed n_L when referred to motor speed n rpm is given by

$$J = J_L [n_L / n]^2$$

NOISE

Motors are designed for low noise levels in accordance with IS: 12065.

COOLING

Type of cooling is IC 0141 in accordance with IS: 6362. All motors are fitted with external bi-directional cooling fan.

BEARING ARRANGEMENT

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

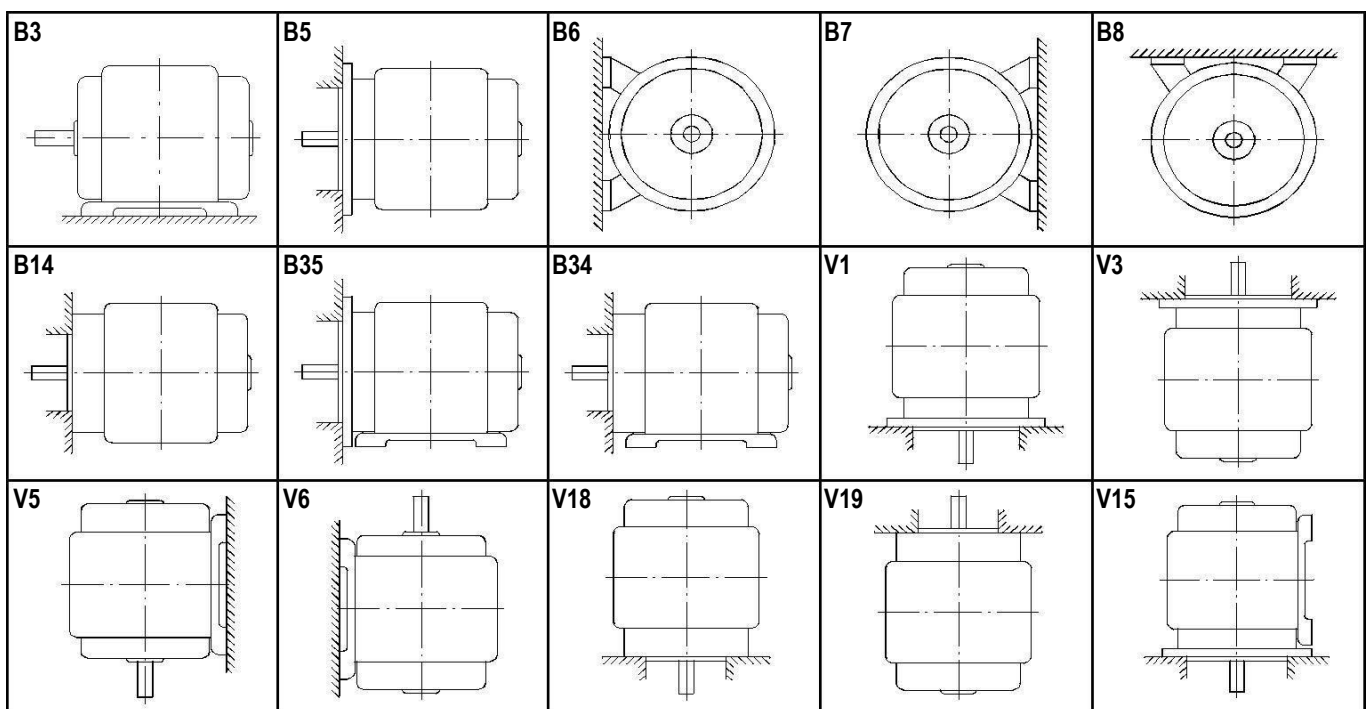
Frame Size	Driving End	Non-Driving End	Regreasing Time (hrs)	
			2 pole	4, 6, 8 pole
56	6200ZZ	6200ZZ	-	.
63	6201ZZ	6201ZZ	-	.
71	6202ZZ	6202ZZ	-	.
80	6204ZZ	6204ZZ	-	.
90S/L	6205ZZ	6205ZZ	-	.
100L	6206ZZ	6206ZZ	-	.
112M	6206ZZ	6206ZZ	-	.
132S/M	6208ZZ	6208ZZ	-	.
160M/L	6309ZZ	6209ZZ	-	.
180M/L	6310ZZ	6210ZZ	-	.
200L	6312	6312	3,500	8,000

MAXIMUM CABLE SIZE OF STANDARD MOTOR

Frame Size	Cable Entry size	Max. Cable Size DOL	Max. Cable Size Star-Delta	Terminal Stud size
56-71	1 x 3/4"	3C x 2.5mm ²	-	M4
80-90	1 x 3/4"	3C x 4mm ²	-	M4
100-132	2 x 1"	3C x 10mm ²	2 x 3C x 10mm ²	M5
160-180	2 x 1"	3C x 35mm ²	2 x 3C x 25mm ²	M6
200	2 x 2", 1 x 3/4"	3C x 120mm ²	2 x 3C x 70mm ²	M8

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

MOUNTING POSITIONS



MOTOR WEIGHTS & SHIPPING DIMENSIONS

Frame Size	Nett Wt. (kg)				Packing Wt. (kg)	Shipping Dimensions LxWxH (mm)
	2	4	6	8		
56	3	3	-	-	1	250 x 184 x 235
63	5	5	-	-	1	250 x 184 x 235
63	6	6	-	-	1	250 x 184 x 235
71	8	8	8	8	2	285 x 190 x 238
71	9	9	9	9	2	285 x 190 x 238
80	13	13	12	12	2	320 x 210 x 265
80	14	14	13	13	2	320 x 210 x 265
90S	19	18	18	18	3	365 x 280 x 315
90L	22	20	20	20	3	365 x 280 x 315
100L	30	28	28	26	4	420 x 315 x 380
100L	-	-	-	29	4	420 x 315 x 380
112M	40	39	39	39	6	460 x 335 x 440
132S	58	57	58	58	7	585 x 380 x 490
132M	65	64	66	66	7	585 x 380 x 490
160M	95	94	-	-	1	790 x 410 x 585
160M	102	100	98	98	1	790 x 410 x 585
160L	-	-	123	-	1	790 x 410 x 585
160L	120	118	123	123	1	790 x 410 x 585
180M	155	149	-	152	1	865 x 430 x 585
180L	-	166	165	165	1	865 x 430 x 585
200L	2	-	223	-	2	980 x 495 x 680
200L	2	242	242	242	2	980 x 495 x 680

ELECTRICAL PERFORMANCE

2 POLE MOTOR



Frame	Type Designati	Out		Speed (rpm)	Current	Torque	Efficiency %			Power Factor			STA	STT	POT	G D
		K	H				FL	3/4L	1/2L	F	3/4L	1/2L				
56	2HS1 050-02	0.093	0.125	2720	0.36	0.03	60.0	57.0	50.0	0.60	0.52	0.40	4.0	2	2	0.0003
56	2HS1 053-02	0.12	0.16	2750	0.45	0.04	62.0	60.0	54.0	0.60	0.52	0.40	4.0	2	2	0.0003
63	2HS1 060-02	0.18	0.25	2780	0.50	0.06	65.0	65.0	58.0	0.77	0.71	0.57	4.7	2	2	0.0009
63	2HS1 063-02	0.25	0.33	2790	0.67	0.09	66.0	66.0	60.0	0.79	0.69	0.57	4.7	2	2	0.0010
71	2HS1 070-02	0.37	0.50	2790	0.91	0.13	67.0	66.0	61.0	0.84	0.78	0.68	4.7	2	2	0.0016
71	2HS1 073-02	0.55	0.75	2815	1.25	0.19	72.5	72.0	64.0	0.84	0.79	0.71	4.7	2	2	0.0022
80	2HS1 080-02	0.75	1	2845	1.7	0.26	73.5	72.0	67.0	0.84	0.80	0.73	5.5	2	2	0.0038
80	2HS1 083-02	1	1	2850	2.3	0.38	77.0	74.0	70.0	0.86	0.82	0.75	5.5	2	2	0.0049
90S	2HS1 090-02	1	2	2860	3.1	0.51	78.5	75.0	68.0	0.86	0.77	0.61	6.0	2	3	0.0072
90L	2HS1 096-02	2	3	2880	4.3	0.74	81.0	78.5	72.5	0.88	0.80	0.70	6.0	2	3	0.0093
100L	2HS1 106-02	3	5	2900	7.1	1.24	84.0	84.0	82.0	0.86	0.83	0.75	6.0	2	3	0.0130
112M	2HS1 123-02	5	7	2905	10.0	1.84	85.7	85.7	82.0	0.89	0.86	0.78	6.0	2	3	0.0198
132S	2HS1 130-02	7	10.0	2910	13.3	2.51	87.0	86.0	84.0	0.90	0.87	0.81	6.0	2	2	0.0583
132M	2HS1 133-02	9	12.5	2915	16.4	3.11	87.0	87.0	85.0	0.91	0.87	0.81	6.0	2	2	0.0716
160M	2HS1 163-02	11.0	15.0	2920	20.0	3.67	88.5	87.5	85.5	0.86	0.84	0.79	6.5	2	2	0.1077
160M	2HS1 164-02	15.0	20.0	2925	26.5	4.99	89.5	88.5	86.0	0.88	0.86	0.80	6.5	2	2	0.1301
160L	2HS1 166-02	18.5	25.0	2930	32.0	6.15	90.0	89.5	87.0	0.89	0.86	0.81	6.5	2	2	0.1705
180M	2HS1 183-02	22.0	30.0	2935	37.0	7.30	91.0	90.0	88.0	0.91	0.87	0.81	6.5	2	2	0.3222
200L	2HS1 206-02	30.0	40.0	2950	51.0	9.91	91.5	91.0	90.0	0.89	0.87	0.82	6.5	2	2	0.4468
200L	2HS1 207-02	37.0	50.0	2950	62.0	12.22	92.0	92.0	91.0	0.90	0.88	0.83	6.5	2	2	0.5257

ELECTRICAL PERFORMANCE

4 POLE MOTOR



Frame Size	Type Designation	Output		Speed (rpm)	Current (A)	Torque (kgm)	Efficiency %			Power Factor			STA	STT	POT	GD ² (kgm ²)
		KW	HP				FL	3/4L	1/2L	FL	3/4L	1/2L				
56	2HS1 050-04	0.093	0.125	1340	0.42	0.07	53.0	50.0	41.0	0.58	0.49	0.40	3.5	1	2	0.0006
56	2HS1 053-04	0.12	0.16	1350	0.52	0.09	56.0	52.0	43.0	0.57	0.48	0.40	3.5	1	2	0.0006
63	2HS1 063-04	0.18	0.25	1360	0.57	0.13	60.0	53.0	38.0	0.73	0.58	0.45	3.5	1	2	0.0010
71	2HS1 070-04	0.25	0.33	1370	0.76	0.18	62.0	61.0	53.0	0.74	0.63	0.47	3.5	1	2	0.0016
71	2HS1 073-04	0.37	0.50	1380	1.05	0.26	66.0	65.0	58.0	0.74	0.64	0.53	3.5	1	2	0.0022
80	2HS1 080-04	0.55	0.75	1410	1.45	0.38	73.0	72.0	69.0	0.72	0.62	0.52	4.3	2	2	0.0038
80	2HS1 083-04	0.75	1	1415	1.75	0.52	74.0	73.0	68.0	0.81	0.70	0.55	4.5	2	2	0.0049
90S	2HS1 090-04	1	1	1415	2.5	0.76	76.5	76.0	74.0	0.80	0.70	0.55	5.0	2	2	0.0072
90L	2HS1 096-04	1	2	1420	3.3	1.03	79.0	79.0	77.0	0.80	0.70	0.55	5.0	2	2	0.0093
100L	2HS1 106-04	2	3	1430	4.4	1.50	82.0	82.0	80.0	0.85	0.81	0.63	5.5	2	2	0.0182
100L	2HS1 107-04	3	4	1430	6.0	2.04	82.6	82.6	81.0	0.84	0.79	0.69	5.5	2	2	0.0237
112M	2HS1 123-04	3	5	1440	7.2	2.50	85.0	85.0	84.0	0.84	0.78	0.70	5.5	2	2	0.0342
132S	2HS1 130-04	5	7	1450	10.6	3.69	87.0	87.0	86.0	0.83	0.78	0.63	5.5	2	2	0.0676
132M	2HS1 133-04	7	10.0	1450	14.2	5.04	87.0	87.0	86.0	0.84	0.79	0.69	5.5	2	2	0.0912
160M	2HS1 163-04	9	12.5	1455	17.2	6.23	88.0	88.0	87.0	0.85	0.77	0.66	6.0	2	2	0.1404
160M	2HS1 164-04	11.0	15.0	1455	20.8	7.36	89.0	89.0	87.0	0.83	0.75	0.66	6.0	2	2	0.1696
160L	2HS1 166-04	15.0	20.0	1455	27.0	10.04	90.0	90.5	89.0	0.86	0.84	0.75	6.0	2	2	0.2222
180M	2HS1 183-04	18.5	25.0	1460	34.0	12.34	90.5	90.5	89.5	0.84	0.81	0.74	6.0	2	2	0.3222
180L	2HS1 186-04	22.0	30.0	1460	39.0	14.68	91.0	91.0	90.0	0.86	0.82	0.76	6.0	2	2	0.3790
200L	2HS1 206-04	30.0	40.0	1465	52.0	19.95	92.0	92.0	91.0	0.87	0.84	0.77	6.0	2	2	0.8066

ELECTRICAL PERFORMANCE

6 POLE MOTOR



Frame Size	Type Designation	Outp		Speed (rpm)	Current (A)	Torque (kgm)	Efficiency %			Power Factor			STA	STT	POT	GD ² (kgm ²)
		KW	HP				FL	3/4L	1/2L	FL	3/4L	1/2L				
71	2HS1 070-06	0.093	0.125	870	0.45	0.10	52.0	49.0	40.0	0.55	0.44	0.33	3.0	2	2	0.0024
71	2HS1 071-06	0.12	0.16	880	0.55	0.13	55.0	52.0	41.0	0.55	0.45	0.34	3.0	2	2	0.0024
71	2HS1 073-06	0.18	0.25	900	0.65	0.19	60.0	55.0	42.0	0.64	0.55	0.38	3.0	2	2	0.0033
71	2HS1 074-06	0.25	0.33	905	0.85	0.27	64.0	59.0	44.0	0.64	0.55	0.38	3.0	2	2	0.0033
80	2HS1 080-06	0.37	0.50	915	1.10	0.39	67.0	66.0	63.0	0.70	0.63	0.51	4.0	2	2	0.0049
80	2HS1 083-06	0.55	0.75	920	1.55	0.58	70.0	69.0	66.0	0.71	0.63	0.51	4.0	2	2	0.0063
90S	2HS1 090-06	0.75	1.0	925	2.0	0.79	72.0	71.0	66.0	0.72	0.64	0.52	5.0	2	2	0.0095
90L	2HS1 096-06	1.1	1.5	930	2.9	1.15	75.0	74.0	69.0	0.70	0.58	0.42	5.0	2	2	0.0122
100L	2HS1 106-06	1.5	2.0	940	3.5	1.55	76.0	75.0	71.0	0.78	0.73	0.60	5.0	2	2	0.0269
112M	2HS1 123-06	2.2	3.0	945	4.9	2.27	80.0	79.5	75.5	0.78	0.70	0.55	5.0	2	2	0.0047
132S	2HS1 130-06	3.7	5.0	950	7.5	3.79	82.5	82.5	81.5	0.83	0.73	0.64	5.0	2	2	0.0826
132M	2HS1 133-06	5.5	7.5	950	11.0	5.64	85.0	85.0	83.5	0.82	0.77	0.67	5.0	2	2	0.1156
160M	2HS1 163-06	7.5	10.0	960	15.0	7.61	87.0	87.0	84.5	0.80	0.76	0.68	5.5	2	2	0.2625
160L	2HS1 166-06	9.3	12.5	965	17.5	9.39	88.0	88.0	85.0	0.84	0.81	0.70	5.5	2	2	0.3440
160L	2HS1 167-06	11.0	15.0	970	20.5	11.05	88.5	88.5	87.5	0.84	0.81	0.70	5.5	2	2	0.3440
180L	2HS1 186-06	15.0	20.0	970	27.5	15.06	89.5	89.5	88.0	0.85	0.82	0.72	5.5	2	2	0.5949
200L	2HS1 206-06	18.5	25.0	975	34.0	18.48	90.5	90.5	89.0	0.84	0.82	0.73	5.5	2	2	0.8605
200L	2HS1 207-06	22.0	30.0	975	40.0	21.98	91.0	91.0	90.5	0.84	0.82	0.73	5.5	2	2	1.0123

ELECTRICAL PERFORMANCE

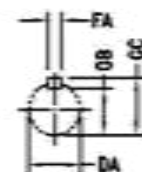
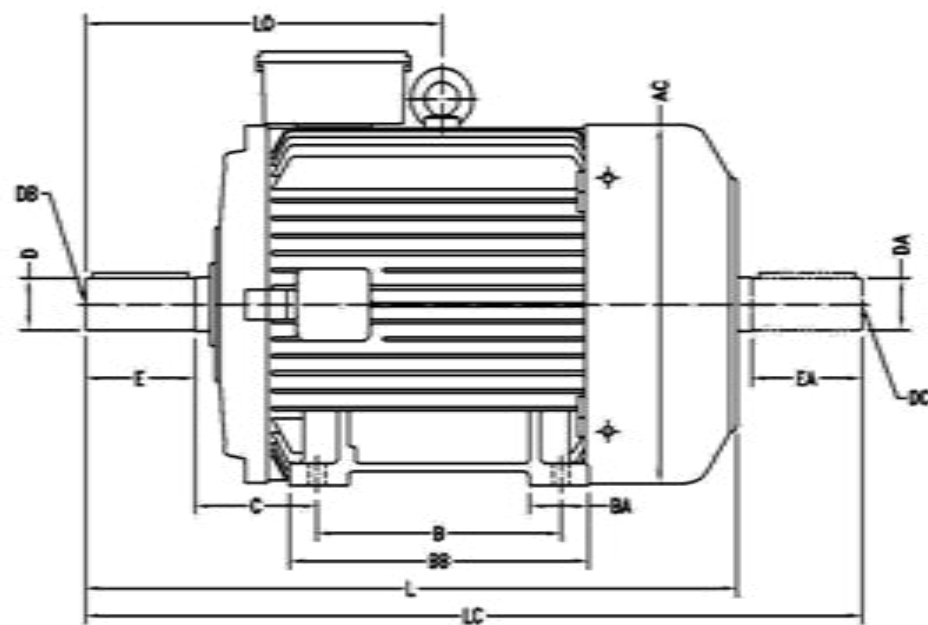
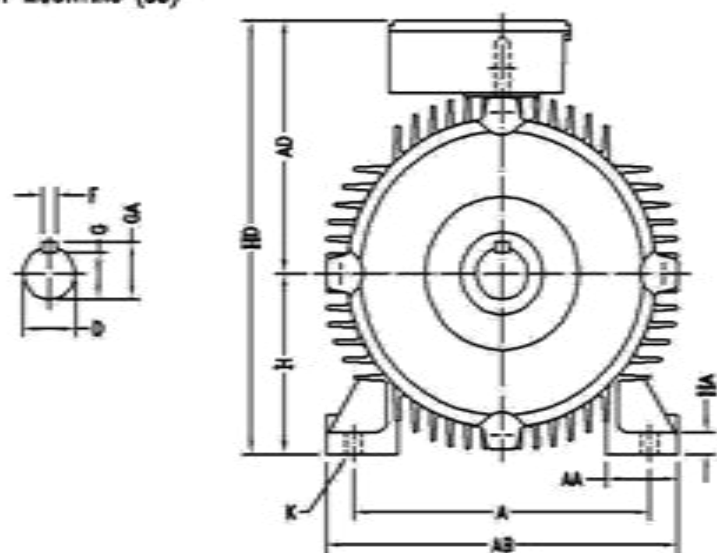
8 POLE MOTOR



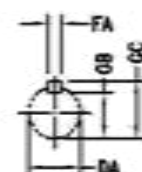
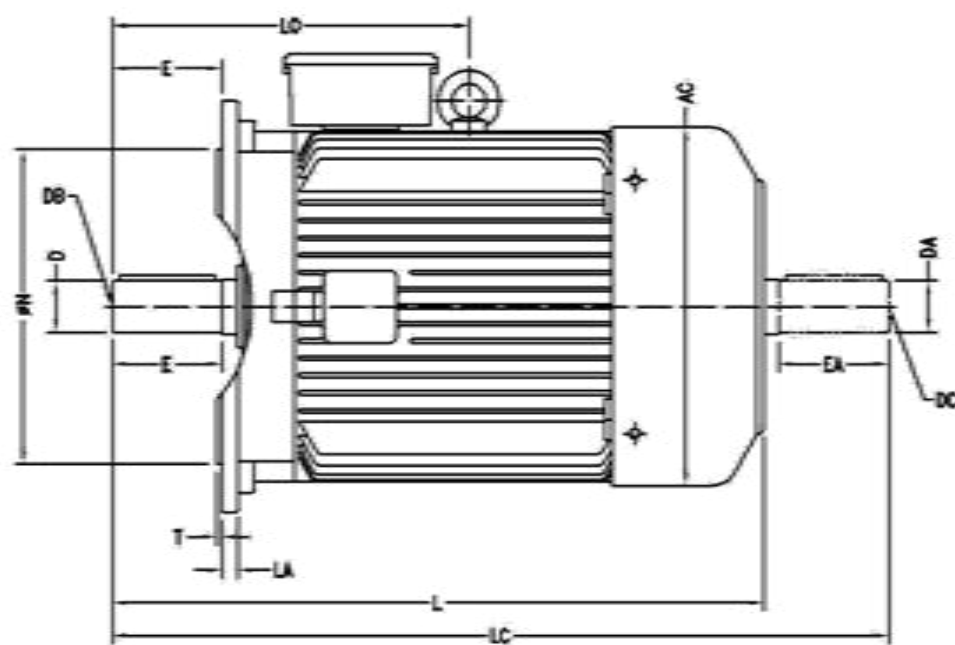
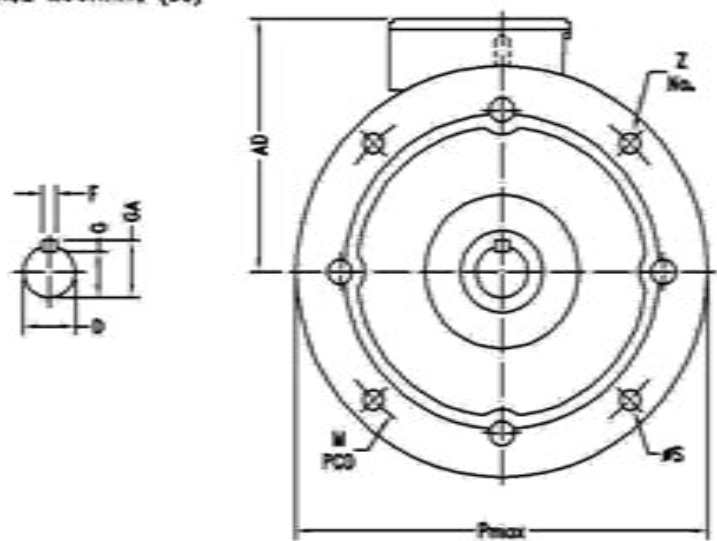
Frame Size	Type Designation	Output		Speed (rpm)	Current (A)	Torque (kgm)	Efficiency %			Power Factor			STA	STT	POT	GD ² (kgm ²)
		KW	HP				FL	3/4L	1/2L	FL	3/4L	1/2L				
71	2HS1 070-08	0.093	0.125	665	0.55	0.14	47.0	43.0	35.0	0.50	0.44	0.33	2.5	1	1	0.0024
71	2HS1 073-08	0.12	0.16	665	0.65	0.18	50.0	46.0	38.0	0.51	0.45	0.35	2.5	1	1	0.0033
80	2HS1 080-08	0.18	0.25	685	0.80	0.26	54.0	49.0	41.0	0.58	0.49	0.40	3.0	1	1	0.0049
80	2HS1 083-08	0.25	0.33	690	1.05	0.35	57.0	54.0	45.0	0.58	0.49	0.40	3.0	1	1	0.0063
90S	2HS1 090-08	0.37	0.50	690	1.30	0.52	64.0	62.0	55.0	0.62	0.53	0.43	3.5	1	1	0.0095
90L	2HS1 096-08	0.55	0.75	690	1.85	0.78	67.0	66.0	61.0	0.62	0.53	0.43	3.5	1	1	0.0122
100L	2HS1 106-08	0.75	1.0	700	2.1	1.04	72.0	71.0	66.0	0.69	0.59	0.46	4.0	1	2	0.0228
100L	2HS1 107-08	1.1	1.5	700	3.0	1.53	74.0	73.0	71.0	0.69	0.60	0.48	4.0	1	2	0.0296
112M	2HS1 123-08	1.5	2.0	705	3.9	2.07	77.0	77.0	74.0	0.69	0.64	0.51	4.0	1	2	0.0467
132S	2HS1 130-08	2.2	3.0	710	5.2	3.02	79.0	79.0	76.0	0.75	0.65	0.52	5.0	2	2	0.0826
132M	2HS1 133-08	3.7	5.0	710	8.6	5.08	81.0	81.0	79.0	0.74	0.65	0.52	5.0	2	2	0.1156
160M	2HS1 163-08	5.5	7.5	720	12.0	7.44	86.0	86.0	83.0	0.74	0.68	0.58	5.0	2	2	0.2565
160L	2HS1 166-08	7.5	10.0	720	15.7	10.15	87.0	87.0	85.0	0.76	0.71	0.58	5.0	2	2	0.3440
180M	2HS1 183-08	9.3	12.5	725	20.0	12.49	87.5	87.5	85.0	0.74	0.70	0.57	5.0	2	2	0.5057
180L	2HS1 186-08	11.0	15.0	725	24.0	14.78	88.0	88.0	85.0	0.72	0.68	0.55	5.0	2	2	0.5949
200L	2HS1 206-08	15.0	20.0	725	31.0	20.15	88.5	88.0	86.0	0.76	0.72	0.60	5.0	2	2	1.0123

All figures are subject to tolerance as per IS: 325.

FOOT MOUNTING (B3)



FLANGE MOUNTING (B5)



MECHANICAL DIMENSIONS

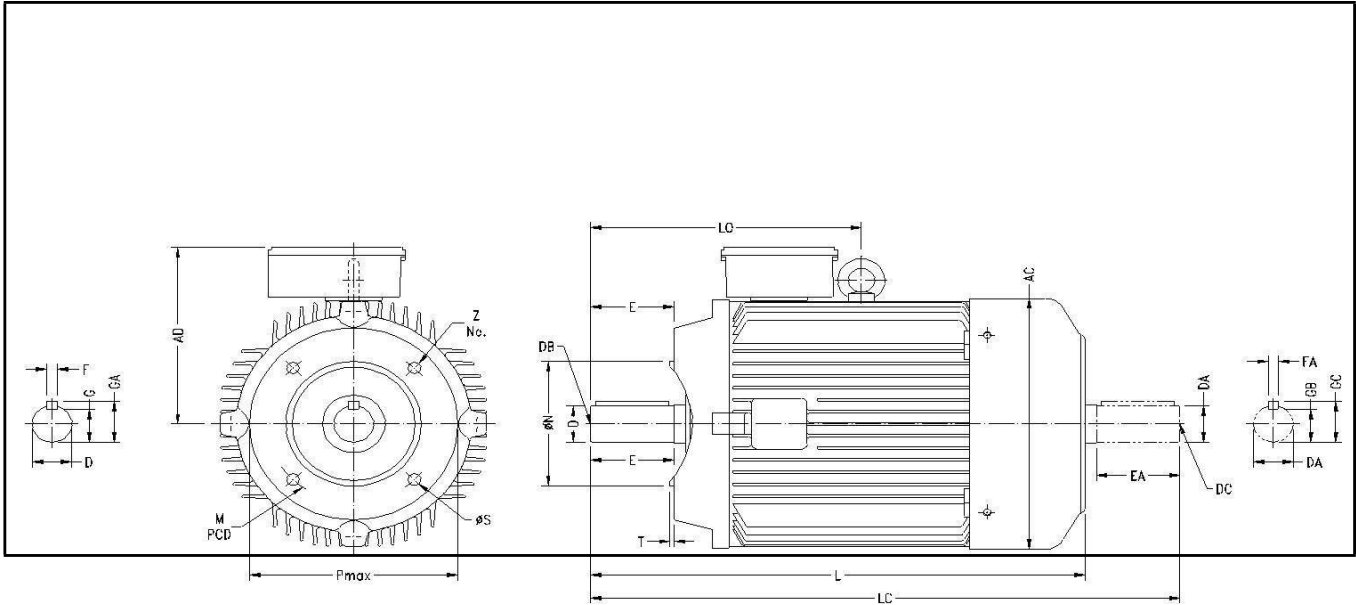
DIMENSIONS OF FOOT (B3) & FLANGE (B5) MOUNTED MOTORS

Frame Size	General					For foot mounted motors only (B3)												For flange mounted motors only (B5)								Drive End Shaft						Non drive End Shaft					
	L	LC	LO	AC	AD	A	B	C	H	K	AA	AB	BB	BA	HA	HD	P max	M PCD	øN	øS	Z No.	T max	LA	D	DB	E	F	GA	G	DA	DC	EA	FA	GC	GB		
56	180	204	-	110	80	90	71	36	56	6	25	110	91	-	6	136	140	115	95	10	4	3	9	9	M4	20	3	10.2	7.2	9	M4	20	3	10.2	7.2		
63	206	236	-	124	100	100	80	40	63	7	27	122	102	27	7	163	140	115	95	10	4	3	9	11		23	4	12.5	8.5	11		23	4	12.5	8.5		
71	240	276	-	140	105	112	90	45	71	7	31	134	112	31	8	176	160	130	110	10	4	3.5	9	14	M5	30	5	16	11	14	M5	30	5	16	11		
80	277	324	-	158	122	125	100	50	80	10	32	150	125	32	9	202	200	165	130	12	4	3.5	10	19	M6	40	6	21.5	15.5	19	M6	40	6	21.5	15.5		
90	297	354	-	180	129	140	100	56	90	10	33	168	124	32	10	219	200	165	130	12	4	3.5	10	24	M8	50	8	27	20	24	M8	50	8	27	20		
90	322	379					125					149																									
100L	366	433	-	198	152	160	140	63	100	12	43	200	180	46	14	252	250	215	180	15	4	4	11	28	M10	60	8	31	24	28	M10	60	8	31	24		
112M	389	456	230	222	165	190	140	70	112	12	49	230	180	47	15	277	250	215	180	15	4	4	11	28		60	8	31	24	28		60	8	31	24		
132S	437	524	257	262	185	216	140	89	132	12	52	256	180	48	16	317	300	265	230	15	4	4	12	38	M12	80	10	41	33	38	M12	80	10	41	33		
132M	475	562	260				178						218																								
160M	576	693	354	311	211	254	210	108	160	15	64	304	260	60	20	371	350	300	250	19	4	5	13	42	M16	110	12	45	37	42	M16	110	12	45	37		
160L	620	737					254						304																								
180M	643	760	381	336	233	279	241	121	180	15	65	335	297	101	24	413	350	300	250	19	4	5	13	48		110	14	51.5	42.5	48		110	14	51.5	42.5		
180L	681	798					279						335																								
200L	760	880	416	395	276	318	305	133	200	19	84	386	365	74	26	476	400	350	300	19	4	5	15	55		110	16	59	49	55		110	16	59	49		

MECHANICAL DIMENSIONS

DIMENSIONS OF FACE MOUNTED MOTORS (B14)

Frame Size	L	LC	LO	AC	AD	P _{max}	M PCD	øN	øS	Z No.	T	D, DA	DB, DC	E, EA	F, FA	GA, GC	G, GB
56	180	204	-	110	80	80	65	50	M5	4	2.5	9	M4	20	3	10.2	7.2
63	206	236	-	124	100	90	75	60	M5	4	2.5	11		23	4	12.5	8.5
71	240	276	-	140	105	105	85	70	M6	4	2.5	14	M5	30	5	16	11
80	277	324	-	158	122	120	100	80	M6	4	3	19	M6	40	6	22	16
90S	297	354	-	180	129	140	115	95	M8	4	3	24	M8	50	8	27	20
90L	322	379															
100L	366	433	-	198	152	160	130	110	M8	4	3.5	28	M10	60	8	31	24
112M	389	456	230	222	165	160	130	110	M8	4	3.5	28		60	8	31	24
132S	437	524	257	262	185	200	165	130	M12	4	3.5	38	M12	80	10	41	33
132M	475	562	260														



ELECTRIC MOTOR PARTS

SONAL CLUTCH MOTOR PARTS PRICE LIST

PART NO.	PARTS NAME	QTY.
01	Rotor	01
02	Ball Bearing	02
03	Frame	01
08	Stator winding	01
09	End Sheal -Rear	01
10	End Sheal - Frant	03
11	Terminal Box	03
12	Terminal Board	01
12 RP	Stator Rewinding (Re-process)	01
13	Set Screw for Earth	01
14	Terminal Board Screw	01
15	key	02
18	Oil seal	02
20	Cable Gland	02
21	Set Screw for frame	02
22	Terminal Sleeve	02
23	End Cover	01
24	Set Screw for end cover	02
25	Washer for end cover	02
29.1	Cooling Fan	01
30	Wave Washer	01

Sonal Machine Tools

Admin office / works:
30/30 Adeshwar Estate opp. Shankar Estate,
Revabhai Estate Road, C.T.M. , Amraiwadi
Ahmedabad – 380026
(Gujarat-India)
Tel: 079-25860485, 25860290
Fax: 079-25860485
Mobile: +919898278390
Email: sonalindia@rediffmail.com
Website: sonal-motors.com

