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AEEB. AEVB Series Standard Efficiency (IE1) Low Voltage

Frame sizes 63 to 315M
0.25 to 250 HP
IEC dimension

SGS UKAS STANDARDS MS SIRIM CE

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INDUCTION MOTORS – STANDARD

TECO's new generation of totally enclosed fan cooled (TEFC) Squirrel Cage Induction Motor are designed, manufactured and tested to meet current new international standards. IEC 60034-30 :2008 classification and IEC60034-2-1:2007 (measuring method). TECO's unique design, first-grade material and excellent workmanship makes TECO Motors last much longer and give cost-efficient operation.

Standard and Specification

Performance :
All standard motors are designed to meet latest European and International Standard. Accordance with IEC60034 and have been certify by SIRIM QAS with certificate number : PC 000403

Enclosure :
Totally Enclosed IP54, IP55 and IP56 designaion of International Protectition (IP), refer to IEC60034-5. For other degrees of protection, please refer to TECO.

Designation	First Numeral Protection against solid objects	Second Numeral Protection against water
IP54	The ingress of dust is not totally prevented but dust does not enter in sufficient quantity to interfere with satisfactory operation of the machines.	Water splashing against the machine from any direction shall have no harmful effect.
IP55		Water projected by a nozzle against the machine from any direction shall have no harmful effect.
IP56		Water from heavy seas or water projected in powerful jets shall not enter the machine in harmful quantities.

Time Rating :
Maximum continuous rating type S1 duty to IEC 60034-1 : 2004

Cooling :
Totally enclosed fan cooled IC411 to IEC 60034-6 : 2004

Mounting
Motors can be provided in the following mounting:

Horizontal foot mounted
Vertical flange mounted
Horizontal foot and flange mounted
Other Mounting please refer TECO

Insulation

All standard motors are class F insulation with Class B temperature rise.

Insulation Class	B	F
Maximum Permissible Temperature	130°C	155°C
Measuring Method	Resistance Method	Resistance Method
Coil Windings Temperature Rise	80°C	100°C

Maximum ambient temperature is 40°C.
Other insulation Classs are available on request.

Direction of Rotation :
All standard motors are suitable for operation in either direction of rotation.

Supply and Operation Conditions :

Electric Supply :-

220, 380 and 415 volts standard and other voltages up to 690V can be supplied on request.

Voltage Variation
All standard motors are suitable for continuous operation within ± 6% rated voltage, supplying rated output at normal rate speed. Sustained operation on voltages exceeding ± 6% rated voltage will result in overheating. They are also suitable for supply voltages with 1% phase unbalance.

Starting :
Motors up to 3HP are suitable for dicect-on-line starting. Larger motors are suitable for both autotransformer and star-delta starting.

Ambient :
All standard motor are design to operate at ambient temperature of -20 °C to 40 °C(104 °F). For other ambient temperature please refer to TECO.

Altitude :
All standard motors are designed for operation at an altitude not exceding 1,000m (3,300 feet) above sea-level For higher altitudes please refer to TECO.

Construction

Frames and 'L' or 'F' Bracket (Endshields) :
Stator frames and 'L' or 'F' bracket (endshields) are cast out of high grade pig-iron for exceptional corrosion resistance and longer motor life, precisely machined to close tolerance and jig drilled rto ensure rigid alignment, minimum vibration and interchangeability of parts.

Cooling System :
Frames and 'L' or 'F' Bracket (Endshields) have uniquely designed Close-High-Fins. Improved high air-flow external fan, assures low temperature rise, low noise and increase motor life.

Fan and an Cover :
The fans are of Poly Propylene. Cast iron fans can be provided on all frame sizes if requided. The fan cover is of pressed steel, securely bolted to the endshield. The air inlet mesh screen is designed to prevent a test finger touching the fan. Cast iron fan covers are available for all frames as an option.

Bearing and Lubrication System :

2 Pole Motors

Standard motors are fitted with high quality ball bearings for up to D315M frame. Pre-lubrication double shielded bearings are used up to and including frame D160L but a full pressure grease relief valve arrangement is provided on frames D180 to D315M.

Motors other than 2 Pole

Standard motors are fitted with high quality ball bearings for up to D315M frame. Pre-lubrication double shielded bearings frame sizes up to and including frame D180L but all larger frames are fitted with pressure grease relief system.

Shaft :
The motor shaft material is made of carbon steel. Special keyway and shaft extensions are available on request.

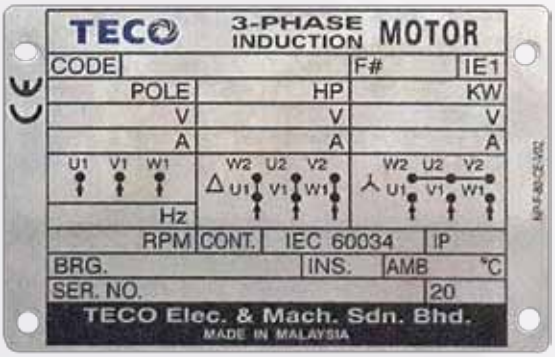
Rotor Assembly :
The rotor core is made of low loss high grade electro-magnetic steel lamination. The rotor bars are pressure die cast of high conductivity aluminium and cast integrally with end rings and wafter fan blades. All rotor assemblies are dynamically balanced and surface is treated with corrosion free coating.

Stator, Windings and Insulation System :
Stator laminations are built of high grade, insulated cold rolled electro-magnetic steel for high efficiency. All standards motors are Class F insulation with Class B temperature rise. Heavy coated, heat and moisture resistance polyester enameled copper wire are used for stator winding.

Construction / Mounting :
Basic construction are for mounting in the B3 (horizontal foot mounted), B5 (horizontal flange mounted) and V1 (vertical mounting shaft down) position. Installations can also be in B6, B7 (wall mounting with vertical shaft), B8 (Ceiling mounted), V3 (flange mounting with vertical shaft) and B3/B5 (foot and flange mounting).

For foot mounted motors in vertical applications where the weight suspended on the shaft is in excess of a recommended pulley, reference should be made to the manufacturer for additional thrust load provisions.

Nameplate :
A stainless steel rating plate containing all details as specified in IEC60034 including bearing sizes are fitted to all motors.



Hardware :
All hardwares are electric-zinc plated for better corrosion resistance.

Finish :
All inside exposed surfaces are cleaned and applied with rust-poof coating. Outside exterior is painted with phenolic rustproof base and then a lacquer surface finishing of Dark-gray colour. (Munsell 7.5 BG4/2)

Terminal Box :
The terminal box is mounted on the right hand side of the motor when viewed from shaft end, as standard. Earthing terminal is located in the terminal box. Stock motor are fitted with pressed steel T-Box for Frame 63 to 180L and cast Iron T-Box for from 200L and above.

Option :
The following additional options are available :

- IP56, enclosure
- Class 'H' Insulation
- Grease relief valves for frame down to D100
- Anti-condensation heaters
- Thermistor protection
- Special paint extensions
- Dual-speed
- Smoke spill duty
- Stainless steel hardware
- Inverter duty application

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PERFORMANCE DATA IEC 60034-30 (IE1)

MODEL : AEEB & AEVB CLASS F INSULATION 3PH / 50Hz

Output		FULL LOAD (RPM)	FRAME SIZE	EFFICIENCY			POWER FACTOR			CURRENT (380)		CURRENT (415)		TORQUE				ROTOR GD² KG-M²	Approx Weight AEEB Kg	Approx Weight AEVB Kg
HP	KW			FULL LOAD (%)	0.75 LOAD (%)	0.5 LOAD (%)	FULL LOAD (%)	0.75 LOAD (%)	0.5 LOAD (%)	FULL LOAD (A)	LOCKED ROTOR (A)	FULL LOAD (A)	LOCKED ROTOR (A)	FULL LOAD (KG-M)	LOCKED ROTOR (%FLT)	PULL UP (%FLT)	PULL OUT (%FLT)			
0.25	0.18	2730	63	60.5	58.0	51.0	77.0	69.0	58.0	0.61	2.7	0.56	2.5	0.066	330	315	340	0.002	9	9.5
		1350	63	64.0	63.0	57.5	68.0	59.5	46.5	0.66	2.6	0.60	2.4	0.135	220	210	240	0.002	9	9.5
		915	71	60.0	56.5	49.0	63.5	54.0	43.0	0.73	2.5	0.67	2.3	0.198	250	235	270	0.007	12	13
		700	80	51.0	45.0	37.0	46.5	40.0	33.5	1.16	3.5	1.06	3.2	0.259	350	340	360	0.010	20	18
0.5	0.37	2810	71	74.5	74.0	70.5	84.0	77.0	65.0	0.90	5.9	0.82	5.4	0.130	310	260	320	0.002	12	13
		1395	71	71.0	71.0	66.0	70.5	62.0	49.5	1.14	5.7	1.04	5.2	0.261	265	230	270	0.005	12	13
		920	80	65.5	64.5	57.0	67.0	57.0	46.0	1.30	5.5	1.19	5	0.395	210	200	230	0.009	20	18
		700	90S	63.5	61.0	53.5	60.0	49.0	39.0	1.49	5.5	1.36	5	0.518	190	185	260	0.017	23	24
0.75	0.55	2760	71	74.5	75.5	74.0	85.0	78.5	67.0	1.33	8.7	1.22	8	0.197	280	250	290	0.002	12	13
		1410	80	71.0	71.0	66.0	74.5	66.5	52.5	1.62	9.3	1.48	8.5	0.386	250	235	270	0.007	20	18
		910	80	67.0	67.5	62.5	69.0	59.5	47.0	1.86	8.2	1.70	7.5	0.598	220	205	230	0.012	20	18
		695	90L	69.0	69.0	65.5	70.0	59.0	47.0	1.76	7.9	1.61	7.2	0.784	170	140	205	0.023	27	27
1	0.75	2800	80	77.5	78.5	76.5	87.0	81.0	67.5	1.69	11	1.55	10	0.261	235	210	255	0.005	20	18
		1425	80	76.0	76.0	73.0	77.0	67.5	53.5	1.94	12	1.78	11	0.512	240	215	275	0.009	20	18
		935	90S	71.0	70.0	64.5	69.0	59.5	47.0	2.33	11	2.13	10	0.780	190	175	285	0.017	23	24
		700	100L	66.5	66.0	61.5	65.0	54.5	43.5	2.63	10	2.41	9	1.042	185	165	230	0.033	37	37
1.5	1.1	2810	80	80.0	81.0	79.0	86.0	79.0	65.0	2.42	16	2.22	15	0.381	265	235	290	0.006	20	18
		1425	90S	76.5	77.5	76.0	78.0	69.5	55.5	2.80	17	2.56	16	0.751	220	165	235	0.014	23	24
		935	90L	73.5	72.5	68.5	68.5	59.0	46.0	3.32	17	3.04	16	1.145	220	205	260	0.023	27	27
		690	100L	73.0	72.5	70.0	67.5	59.0	47.0	3.44	16	3.15	15	1.578	200	180	210	0.046	37	37
2	1.5	2850	90S	81.0	82.5	81.5	87.0	82.0	71.0	3.23	22	2.96	20	0.512	225	210	290	0.010	23	24
		1425	90L	79.0	81.0	80.5	81.0	73.0	60.0	3.56	23	3.26	21	1.024	230	175	240	0.017	27	27
		935	100L	75.5	74.5	71.0	74.5	65.5	52.0	4.05	22	3.71	20	1.561	200	170	235	0.033	37	37
		700	112M	74.0	74.5	71.5	67.0	59.0	46.5	4.60	20	4.21	18	2.074	185	150	240	0.065	45	47
3	2.2	2855	90L	83.5	85.0	84.5	88.0	83.5	73.0	4.55	33	4.17	30	0.750	240	230	310	0.013	27	27
		1435	100L	80.0	80.5	78.5	82.0	74.0	60.5	5.10	38	4.67	35	1.492	210	185	300	0.033	37	37
		950	112M	80.0	80.0	77.5	72.0	63.0	50.0	5.80	35	5.31	32	2.253	205	195	270	0.058	45	47
		705	132S	79.5	80.0	78.0	70.0	61.0	49.0	6.01	33	5.50	30	3.089	215	200	250	0.138	68	70
4	3	2850	100L	84.5	86.0	86.0	88.5	84.5	75.0	6.09	48	5.58	44	1.024	275	265	315	0.023	37	37
		1445	100L	82.5	82.5	79.5	81.5	73.5	60.0	6.78	56	6.21	51	2.020	250	180	320	0.046	37	37
		955	132S	84.5	85.0	83.5	81.0	75.0	63.0	6.66	40	6.10	37	3.057	170	155	260	0.125	68	70
		715	132M	80.5	81.0	80.0	67.0	58.0	45.0	8.33	42	7.63	38	4.062	210	200	260	0.180	77	80
5	3.7	2900	112M	85.0	86.0	85.5	90.5	87.5	80.5	7.37	66	6.75	60	1.252	200	170	325	0.042	44	47
		1445	112M	84.0	85.0	85.0	82.0	77.0	66.0	8.22	59	7.53	54	2.512	220	200	280	0.065	43	45
		955	132M	83.5	84.0	83.0	78.0	71.0	60.0	8.75	52	8.01	48	3.801	180	165	260	0.151	65	68
		720	160M	82.5	82.5	82.0	71.0	62.5	50.0	9.68	52	8.86	48	5.042	200	180	270	0.344	107	115
5.5	4	2910	112M	85.0	86.0	85.5	90.0	87.0	79.0	7.94	69	7.27	63	1.337	200	170	325	0.042	45	47
		1445	112M	84.5	85.5	85.0	82.0	76.0	65.0	8.77	61	8.03	56	2.693	190	180	260	0.065	45	47
		955	132M	84.5	85.0	84.0	80.5	74.0	62.0	8.93	55	8.18	50	4.075	170	155	255	0.151	77	80
		720	160M	83.0	83.5	82.5	71.5	63.5	51.0	10.50	55	9.61	50	5.543	200	190	260	0.344	128	120
7.5	5.5	2900	132S	85.0	85.5	84.0	87.0	84.5	78.0	11.25	73	10.3	67	1.845	180	160	250	0.057	68	70
		1465	132S	85.0	85.0	82.5	80.0	71.0	58.0	12.34	93	11.3	85	3.653	235	190	315	0.103	68	70
		960	132M	86.0	86.5	85.5	79.5	72.5	60.0	12.23	83	11.2	76	5.574	190	175	290	0.217	77	80
		720	160M	82.5	83.0	81.5	73.0	64.0	51.0	13.87	76	12.7	70	7.561	180	170	230	0.484	127	135
10	7.5	2895	132S	86.0	86.5	85.5	84.0	81.0	73.0	15.73	93	14.4	85	2.521	180	160	245	0.063	68	70
		1460	132M	86.5	87.0	86.0	86.0	81.0	70.0	15.29	115	14.0	105	4.998	215	175	295	0.133	77	80
		970	160M	86.5	86.5	85.0	79.5	73.5	61.5	16.60	109	15.2	100	7.523	210	180	255	0.400	128	120
		720	160L	84.5	85.0	84.5	76.0	65.5	53.0	17.69	109	16.2	100	10.083	190	180	220	0.588	151	148
15	11	2945	160M	87.6	88.0	88.0	91.0	89.0	83.0	20.97	180	19.2	165	3.634	225	140	280	0.154	128	120
		1465	160M	88.0	88.5	88.0	86.0	81.5	71.5	22.06	164	20.2	150	7.306	200	150	255	0.271	128	120
		970	160L	87.5	88.0	87.5	84.0	80.0	70.5	22.72	153	20.8	140	11.030	225	195	250	0.588	151	148
		730	180LC	87.5	88.0	87.5	78.0	70.5	58.0	24.46	153	22.4	140	14.918	200	180	230	1.233	206	205

Note : For ampere values of other voltage motors multiply the 415 volt values by the following factors :

voltage	200	220	346	365	400	420	440	500	550
Factor	2.08	1.89	1.2	1.13	1.04	0.99	0.94	0.83	0.75

2. FLT = full-load torque
3. Data are subject to revisions without notice.

PERFORMANCE DATA IEC 60034-30 (IE1)

MODEL : AEEB & AEVB CLASS F INSULATION 3PH / 50Hz

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Output		FULL LOAD (RPM)	FRAME SIZE	EFFICIENCY			POWER FACTOR			CURRENT (380)		CURRENT (415)		TORQUE				ROTOR GD² KG-M²	Approx Weight AEEB Kg	Approx Weight AEVB Kg
HP	KW			FULL LOAD (%)	0.75 LOAD (%)	0.5 LOAD (%)	FULL LOAD (%)	0.75 LOAD (%)	0.5 LOAD (%)	FULL LOAD (A)	LOCKED ROTOR (A)	FULL LOAD (A)	LOCKED ROTOR (A)	FULL LOAD (KG-M)	LOCKED ROTOR (%FLT)	PULL UP (%FLT)	PULL OUT (%FLT)			
20	15	2940	160M	88.7	90.0	90.0	92.0	90.5	86.5	28.0	218	25.6	200	4.964	220	135	260	0.192	128	120
		1465	160L	90.0	91.0	90.5	88.0	85.5	77.0	28.7	218	26.3	200	9.962	215	155	265	0.396	151	148
		970	180LC	88.0	89.0	89.0	85.0	83.0	76.0	30.5	180	27.9	165	15.05	195	140	210	1.233	206	205
		730	200LC	87.5	88.0	87.0	77.0	70.5	59.5	33.9	178	31.0	163	19.89	195	170	220	1.610	293	280
25	18.5	2940	160L	90.0	90.5	90.0	92.0	90.5	85.5	34.0	306	31.1	280	6.123	270	190	310	0.237	151	148
		1475	180MC	91.0	91.5	90.5	85.0	82.0	75.0	36.4	229	33.3	210	12.20	180	140	240	0.611	183	175
		970	200LC	88.6	89.5	90.0	83.5	82.0	76.0	38.0	213	34.8	195	18.56	190	160	200	1.610	293	280
		730	225SC	88.0	88.5	87.5	78.0	72.0	62.0	41.0	213	37.5	195	24.86	180	150	200	2.093	346	330
30	22	2940	180MA	91.0	91.5	91.0	91.5	90.5	83.0	40.2	311	36.8	285	7.281	210	155	255	0.283	190	190
		1480	180LC	91.5	92.0	91.0	85.0	82.0	74.0	43.0	317	39.4	290	14.46	190	145	245	0.773	206	205
		975	200LC	90.5	91.0	91.0	83.0	80.0	72.0	44.4	289	40.7	265	21.95	205	165	220	1.919	293	280
		730	225MC	89.0	89.0	88.0	77.0	70.5	59.0	48.8	289	44.7	265	29.83	190	170	200	2.442	370	360
40	30	2955	200LA	91.5	92.0	90.5	90.5	89.0	85.0	55.0	431	50.4	395	9.878	185	140	275	0.521	289	285
		1475	200LC	92.0	92.5	92.0	87.5	85.0	78.0	56.6	453	51.8	415	19.79	240	185	275	1.220	293	280
		985	225MC	90.5	90.0	88.5	80.0	74.0	64.0	62.9	377	57.6	345	29.63	205	175	225	2.326	370	360
		730	250SC	89.5	89.0	88.5	78.5	70.5	60.0	64.9	371	59.4	340	39.77	185	155	205	3.475	498	450
50	37	2955	200LA	92.0	92.5	91.5	91.0	89.5	86.0	67.2	535	61.5	490	12.18	195	135	270	0.663	289	285
		1480	225SC	92.5	93.0	92.0	87.0	84.0	77.0	69.9	497	64.0	455	24.33	190	160	245	1.649	346	330
		975	250SC	91.0	91.5	91.0	83.5	81.0	75.5	73.9	486	67.7	445	36.92	205	140	200	3.373	498	450
		725	250MC	90.0	90.5	89.5	79.5	73.0	62.0	78.5	481	71.9	440	49.72	185	155	205	4.572	562	520
60	45	2955	225MA	92.5	93.0	92.5	92.0	91.5	88.0	80.4	623	73.6	570	14.82	150	130	260	1.074	353	370
		1475	225MC	92.5	93.0	92.5	87.0	85.0	79.0	85.0	535	77.8	490	29.68	185	155	235	1.731	370	360
		980	250MC	92.0	92.5	92.0	82.5	78.0	69.0	90.1	612	82.5	560	44.68	220	205	260	3.829	562	520
		725	280SC	91.5	90.5	90.0	80.0	74.0	66.0	93.4	590	85.5	540	60.50	135	105	210	8.400	650	710
75	55	2970	250SA	93.0	93.0	92.5	91.0	89.0	84.5	98.7	808	90.4	740	18.02	155	130	310	1.343	466	470
		1485	250SC	93.5	93.5	93.0	87.0	85.0	79.5	102.8	803	94.1	735	36.04	265	225	250	3.621	498	450
		970	280SC	92.6	92.4	91.2	83.0	79.0	73.0	109.2	683	100	625	55.2	145	115	220	7	600	670
		730	280MC	92.0	91.6	90.6	80.0	74.0	66.0	113.6	677	104	620	73.40	135	105	210	10	680	740
100	75	2960	250MA	93.5	94.0	93.5	91.5	91.0	88.5	133.2	934	122	855	24.65	150	135	285	1.678	517	545
		1485	250MC	94.0	94.0	93.5	89.0	87.5	82.0	136.5	1028	125	941	49.14	265	220	245	4.490	562	520
		975	280MC	92.9	92.8	90.9	84.5	80.5	73.0	145.3	928	133	850	74.9	140	110	210	10	690	790
		730	315SC	92.3	91.7	90.3	80.0	75.5	68.0	154.0	928	141	850	100	135	105	210	19.1	840	920
125	90	2950	280SA	93.5	93.4	90.5	88.5	86.5	84.5	164.9	1119	151	1025	29.7	130	105	220	2.7	620	660
		1475	280SC	93.5	93.4	90.5	86.5	83.0	79.0	169.3	1119	155	1025	59.4	145	115	220	7	630	720
		975	315SC	93.3	93.2	91.0	84.5	80.5	73.0	173.6	1114	159	1020	89.9	140	110	210	15.7	870	950
		730	315MC	92.3	92.3	91.1	80.0	75.5	68.0	185.7	1114	170	1020	120	125	100	210	23.9	1020	1120
150	110	2955	280MA	93.5	93.4	90.5	88.5	86.5	84.5	202.0	1365	185	1250	36.3	120	95	210	3.6	690	760
		1480	280MC	93.5	93.4	90.5	86.5	84.5	79.0	206.4	1365	189	1250	72.4	125	100	210	8.7	710	780
		975	315MC	93.5	93.4	90.5	84.5	80.5	73.0	211.9	1365	194	1250	110	120	95	210	17	970	1100
175	132	2955	315SA	93.8	93.7	90.8	89.2	87.5	84.5	239.2	1562	219	1430	43.5	110	90	210	6.3	840	930
		1480	315SC	93.8	93.7	90.8	87.5	84.5	80.5	244.6	1562	224	1430	86.9	125	100	210	11.3	890	1020
		975	315MC	93.8	93.7	90.8	84.5	80.5	73.0	253.4	1562	232	1430	132	120	95	210	18.9	1100	1210
200	150	2960	315MA	93.8	93.7	90.8	89.2	87.5	84.5	271.9	1775	249	1625	49.4	105	85	210	7.2	910	1000
		1480	315MC	93.8	93.7	90.8	87.5	84.5	80.5	277.4	1775	254	1625	98.7	110	90	210	14.3	970	1070
250	185	2960	315MA	94.0	93.9	90.1	89.2	87.5	84.5	335.3	2190	307	2005	60.9	105	85	210	7.3	1000	1100
		1480	315MB	94.0	93.9	90.1	87.5	84.5	80.5	341.8	2190	313	2005	122	110	90	210	14.3	1070	1180

Note : For ampere values of other voltage motors multiply the 415 volt values by the following factors :

voltage	200	220	346	365	400	420	440	500	550
Factor	2.08	1.89	1.2	1.13	1.04	0.99	0.94	0.83	0.75

2. FLT = full-load torque
3. Data are subject to revisions without notice.

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OUTLINE DIMENSIONS
Totally Enclosed Fan-Cooled Type, Squirrel-Cage Motor
Dimension in mm, Foot mount B3 (IM1001)

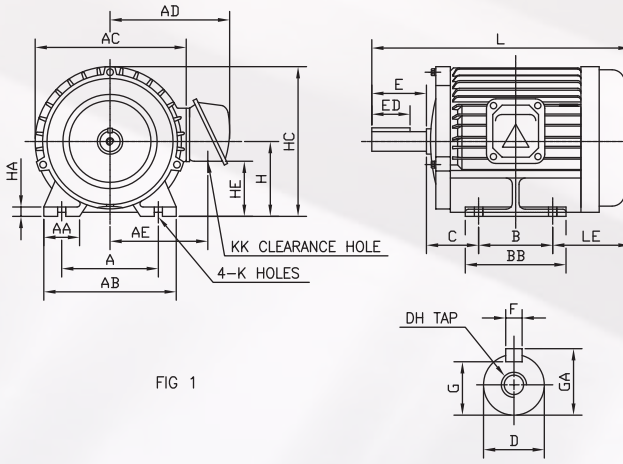

FIG 1

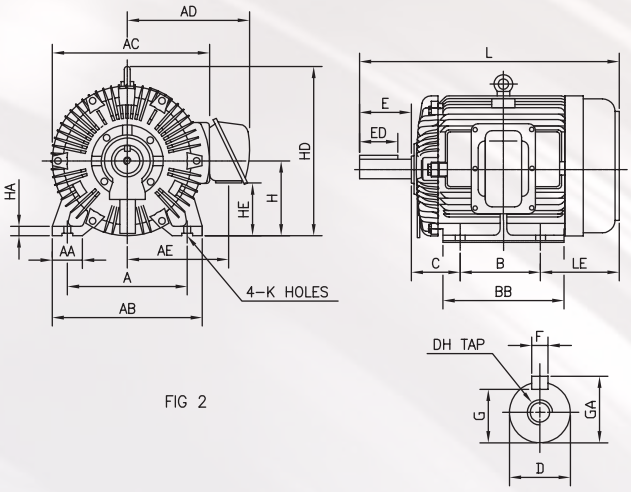

FIG 2

Output (HP)				Frame Size	Fig. No.	Dimensions (mm)											
2P	4P	6P	8P			A	AA	AB	AC	AD	AE	B	BB	C	H	HA	HC
0.25	0.25	–	–	63	1	100	28	120	144	123	93	80	100	40	63	8	135
0.5 / 0.75	0.5	0.25	–	71		112	35.5	140	162	133	103	90	115	45	71	8	152
1 / 1.5	0.75 / 1	0.5 / 0.75	0.25	80		125	35.5	155	177	159	122	100	130	50	80	9	168
2	1.5	1	0.5	90S		140	35.5	170	200	170	135	100	130	56	90	10	190
3	2	1.5	0.75	90L		140	35.5	170	200	170	135	125	150	56	90	10	190
4	3 / 4	2	1 / 1.5	100L		160	45	195	219	180	144.5	140	175	63	100	12.5	-
5 / 5.5	5 / 5.5	3	2	112M		190	45	224	238	189	154	140	175	70	112	14	-
7.5 / 10	7.5	4	3	132S		216	45	250	273	225	179.5	140	175	89	132	16	-
–	10	5 / 5.5 / 7.5	4	132M		216	45	250	273	225	179.5	178	212	89	132	16	-
15 / 20	15	10	5 / 5.5 / 7.5	160M		254	50	300	334	263	218	210	250	108	160	18	-
25	20	15	10	160L		254	50	300	334	263	218	254	300	108	160	18	-
30	–	–	–	180MA	2	279	75	355	382	305	250	241	297	121	180	20	-
–	25	–	–	180MC		279	75	355	382	305	250	241	297	121	180	20	-
–	30	20	15	180LC		279	75	355	382	305	250	279	335	121	180	20	-
40 / 50	–	–	–	200LA		318	80	400	420	342	279	305	365	133	200	25	-
–	40	25 / 30	20	200LC		318	80	400	420	342	279	305	365	133	200	25	-
–	50	–	25	225SC		356	90	450	458	382	312	286	350	149	225	30	-
60	–	–	–	225MA		356	90	450	458	382	312	311	375	149	225	30	-
–	60	40	30	225MC		356	90	450	458	382	312	311	375	149	225	30	-
75	–	–	–	250SA		406	100	500	510	479	364	311	385	168	250	36	-
–	75	50	40	250SC		406	100	500	510	479	364	311	385	168	250	36	-
100	–	–	–	250MA		406	100	500	510	479	364	349	425	168	250	36	-
–	100	60	50	250MC		406	100	500	510	479	364	349	425	168	250	36	-

Frame Size	Dimensions (mm)						Shaft Extension							Bearings	
	HD	HE	K	KK	L	LE	D	E	ED	F	G	GA	DH	DE	NDE
63	-	29	7	20	219	76	11j6	23	16	4	10	12.5	M4X8	6201ZZ	6201ZZ
71	-	54	7	20	250.5	85.5	14j6	30	24	5	11	16	M5X10	6202ZZ	6202ZZ
80	-	51	10	20	282.5	92.5	19j6	40	25	6	15.5	21.5	M6X12	6204ZZ	6204ZZ
90S	-	61	10	20	307.5	101.5	24j6	50	32	8	20	27	M8X16	6205ZZ	6205ZZ
90L	-	61	10	20	332.5	101.5	24j6	50	32	8	20	27	M8X16	6205ZZ	6205ZZ
100L	243	71	12	28	374.5	111.5	28j6	60	40	8	24	31	M10X20	6206ZZ	6305ZZ
112M	265	83	12	28	391.5	121.5	28j6	60	40	8	24	31	M10X20	6306ZZ	6306ZZ
132S	310	83	12	35	454	145	38k6	80	64	10	33	41	M12X24	6308ZZ	6306ZZ
132M	310	83	12	35	492	145	38k6	80	64	10	33	41	M12X24	6308ZZ	6306ZZ
160M	377	108	14.5	35	608	180	42k6	110	80	12	37	45	M16X32	6309ZZ	6307ZZ
160L	377	108	14.5	35	652	180	42k6	110	80	12	37	45	M16X32	6309ZZ	6307ZZ
180MA	421	119	14.5	35	672	200	48k6	110	80	14	42.5	51.5	M16X32	6211C3	6211C3
180MC	421	119	14.5	35	672	200	48k6	110	80	14	42.5	51.5	M16X32	6311ZZ	6310ZZ
180LC	421	119	14.5	35	710	200	48k6	110	80	14	42.5	51.5	M16X32	6311ZZ	6310ZZ
200LA	469	129	18.5	–	770	222	55m6	110	80	16	49	59	M20X40	6312C3	6212C3
200LC	469	129	18.5	–	770	222	55m6	110	80	16	49	59	M20X40	6,312	6212
225SC	524	153	18.5	–	816	241	60m6	140	110	18	53	64	M20X40	6313	6213
225MA	524	153	18.5	–	811	241	55m6	110	80	16	49	59	M20X40	6312C3	6213C3
225MC	524	153	18.5	–	841	241	60m6	140	110	18	53	64	M20X40	6313	6213
250SA	575	139	24	–	882.5	263.5	60m6	140	110	18	53	64	M20X40	6313C3	6213C3
250SC	575	139	24	–	882.5	263.5	70m6	140	110	20	62.5	74.5	M20X40	6316 (NU216)	6213
250MA	575	139	24	–	920.5	263.5	60m6	140	110	18	53	64	M20X40	6313C3	6213C3
250MC	575	139	24	–	920.5	263.5	70m6	140	110	20	62.5	74.5	M20X40	6316 (NU216)	6213

OUTLINE DIMENSIONS

Totally Enclosed Fan-Cooled Type, Squirrel-Cage Motor

Dimension in mm, Foot mount B3 (IM1001)

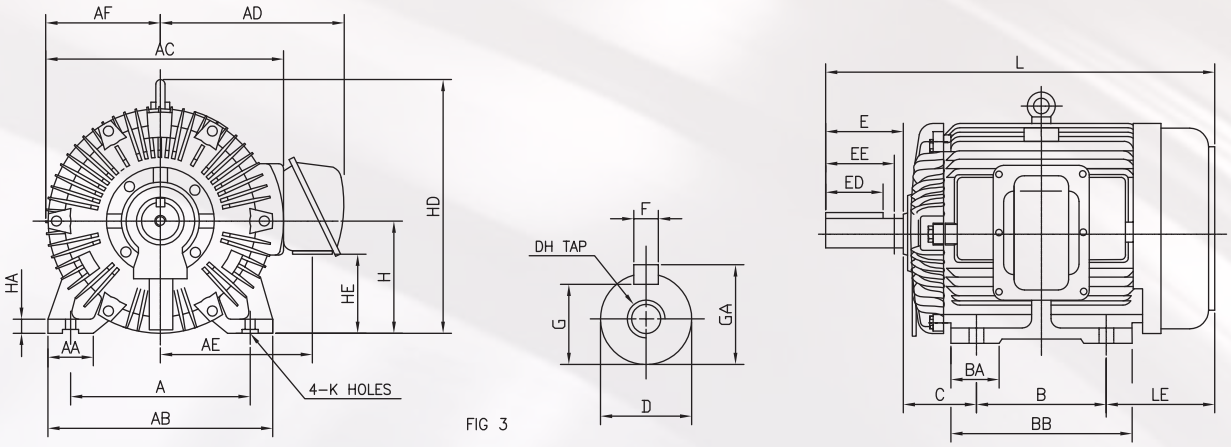

FIG 3

Output (HP)				Frame Size	Dimensions (mm)												
2P	4P	6P	8P		A	AA	AB	AC	AD	AE	AF	B	BA	BB	C	H	HA
125	–	–	–	280SA	457	110	560	625	610	455	305	368	110	445	190	280	36
–	125	75	60	280SC	457	110	560	625	610	455	305	368	110	445	190	280	36
150	–	–	–	280MA	457	110	560	625	610	455	305	419	130	495	190	280	36
–	150	100	75	280MC	457	110	560	625	610	455	305	419	130	495	190	280	36
175	–	–	–	315SA	508	115	615	625	610	455	305	406	115	490	216	315	40
–	175	125	100	315SC	508	115	615	625	610	455	305	406	115	490	216	315	40
200 / 250	–	–	–	315MA	508	115	615	625	610	455	305	457	115	540	216	315	40
–	200	150 / 175	125	315MC	508	115	615	625	610	455	305	457	115	540	216	315	40
–	250	–	–	315MB	508	115	615	625	610	455	305	457	115	540	216	315	40

Frame Size	Dimensions (mm)					Shaft Extension							Bearings		
	HD	HE	K	L	LE	D	E	ED	EE	F	G	GA	DH	DE	NDE
280SA	710	91	24	1042	344	65m6	140	110	134	18	58	69	M20X40	6314C3	6314C3
280SC	710	91	24	1072	344	80m6	170	140	157	22	71	85	M20X40	6318 (NU318C3)	6316
280MA	710	91	24	1092	344	65m6	140	110	134	18	58	69	M20X40	6314C3	6314C3
280MC	710	91	24	1122	344	80m6	170	140	157	22	71	85	M20X40	6318 (NU318C3)	6316
315SA	743	126	28	1131	369	65m6	140	110	134	18	58	69	M20X40	6314C3	6314C3
315SC	743	126	28	1161	369	85m6	170	140	157	22	76	90	M20X40	6320 (NU320C3)	6316
315MA	743	126	28	1182	369	65m6	140	110	134	18	58	69	M20X40	6314C3	6314C3
315MC	743	126	28	1212	369	85m6	170	140	157	22	76	90	M20X40	6320 (NU320C3)	6316
315MB	743	126	28	1212	369	85m6	170	140	157	22	76	90	M20X40	6320 (NU320C3)	6316

Note:

1. All dimensions are in mm
2. Tolerence of shaft centre height H : +0, -0.5 for frame size 250 and below; +0, -1.0 for frame size 280 and above.
3. Grease pre-packed shielded ball bearings for frame size 63 through 180L and 160L 2-pole.
4. Frame size 63-90L do not have lifting lug and the motor height is indicated by symbol HC.
   for frame size 100L and larger the overall height is indicated by symbol HD.
5. Usable shaft length EE.
6. Standard 4-Pole and 6-Pole motors with frame size 250S through 315M are fitted with 6 series ball bearings for direct coupling drive. NU series roller bearings in bracket ( ) can be fitted to the drive end of the 4-Pole & 6-Pole motors when higher radial loads are encountered, such as belt drive applications.
7. Open bearings and with grease nipples for regreasing for frame size 180MA 2-Pole and 200L through 315M.
8. Pressed steel plate type terminal box for frame size 180L and smaller. Cast iron T-box for frame size 200 and larger. Terminal box is rotatable through 360 degrees.
9. Data are subject to change without notice.

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OUTLINE DIMENSIONS
Totally Enclosed Fan-Cooled Type, Squirrel-Cage Motor
Dimension in mm, Flange-mount V1 (IM3011)

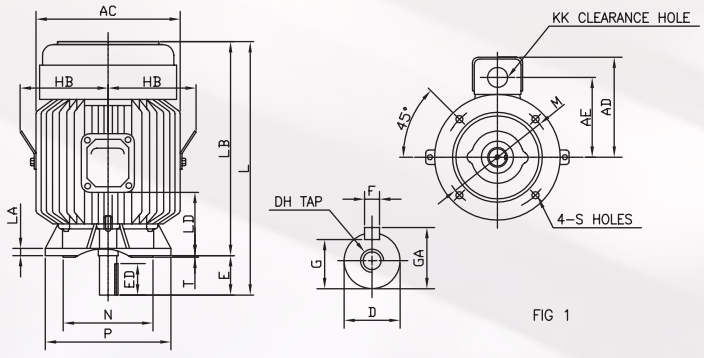

FIG 1

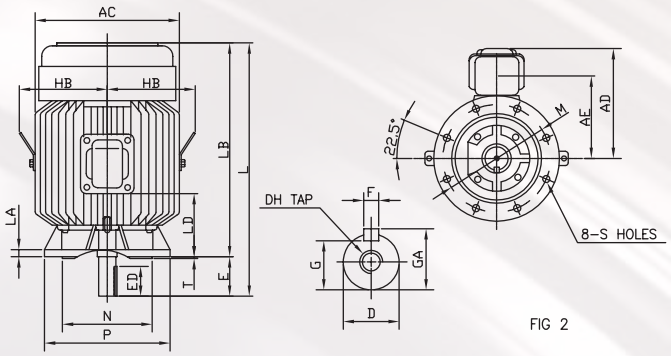

FIG 2

Output (HP)				Frame Size	Fig. No.	Dimensions (mm)									
2P	4P	6P	8P			M	N	P	S	T	LA	AC	AD	AE	HB
0.25	0.25	–	–	63	1	130	110	160	10	3.5	12	144	117	88	-
0.5 / 0.75	0.5	0.25	–	71		130	110	160	10	3.5	12	162	127	98	-
1 / 1.5	0.75 / 1	0.5 / 0.75	0.25	80		165	130	200	12	3.5	12	177	152	117	-
2	1.5	1	0.5	90S		165	130	200	12	3.5	12	200	165	130	-
3	2	1.5	0.75	90L		165	130	200	12	3.5	12	200	165	130	-
4	3 / 4	2	1 / 1.5	100L		215	180	250	14.5	4	16	219	174	140	140
5 / 5.5	5 / 5.5	3	2	112M		215	180	250	14.5	4	16	238	184	149	150
7.5 / 10	7.5	4	3	132S		265	230	300	14.5	4	20	273	219	175	169
–	10	5 / 5.5 / 7.5	4	132M		265	230	300	14.5	4	20	273	219	175	169
15 / 20	15	10	5 / 5.5 / 7.5	160M	2	300	250	350	18.5	5	20	334	258	213	217
25	20	15	10	160L		300	250	350	18.5	5	20	334	258	213	217
30	–	–	–	180MA		300	250	350	18.5	5	20	382	303	245	241
–	25	–	–	180MC		300	250	350	18.5	5	20	382	303	245	241
–	30	20	15	180LC		300	250	350	18.5	5	20	382	303	245	241
40 / 50	–	–	–	200LA		350	300	400	18.5	5	20	420	336	274	260
–	40	25 / 30	20	200LC		350	300	400	18.5	5	20	420	336	274	260
–	50	–	25	225SC		400	350	450	18.5	5	22	458	427	326	286
60	–	–	–	225MA		400	350	450	18.5	5	22	458	427	326	286
–	60	40	30	225MC		400	350	450	18.5	5	22	458	427	326	286
75	–	–	–	250SA		500	450	550	18.5	5	22	510	493	378	312
–	75	50	40	250SC		500	450	550	18.5	5	22	510	493	378	312
100	–	–	–	250MA		500	450	550	18.5	5	22	510	493	378	312
–	100	60	50	250MC		500	450	550	18.5	5	22	510	493	378	312

Frame Size	Dimensions (mm)				Shaft Extension							Bearings	
	KK	L	LB	LD	D	E	ED	F	G	GA	DH	DE	NDE
63	20	248	225	74	11j6	23	16	4	8.5	12.5	M4X8	6202ZZ	6201ZZ
71	20	277.5	247.5	82	14j6	30	24	5	11	16	M5X10	6202ZZ	6202ZZ
80	20	282.5	242.5	55	19j6	40	25	6	15.5	21.5	M6X12	6204ZZ	6204ZZ
90S	20	346.5	296.5	100	24j6	50	32	8	20	27	M8X16	6205ZZ	6205ZZ
90L	20	371.5	321.5	113	24j6	50	32	8	20	27	M8X16	6205ZZ	6205ZZ
100L	28	374.5	314.5	88	28j6	60	40	8	24	31	M10X20	6206ZZ	6305ZZ
112M	28	431.5	371.5	135	28j6	60	40	8	24	31	M10X20	6306ZZ	6306ZZ
132S	35	454	374	97	38k6	80	64	10	33	41	M12X24	6308ZZ	6306ZZ
132M	35	492	412	116	38k6	80	64	10	33	41	M12X24	6308ZZ	6306ZZ
160M	35	608	498	151	42k6	110	80	12	37	45	M16X32	6309ZZ	6307ZZ
160L	35	652	542	173	42k6	110	80	12	37	45	M16X32	6309ZZ	6307ZZ
180MA	35	672	562	170	48k6	110	80	14	42.5	51.5	M16X32	6211C3	6211C3
180MC	25	672	562	170	48k6	110	80	14	42.5	51.5	M16X32	6311ZZ	6310ZZ
180LC	35	710	600	189	48k6	110	80	14	42.5	51.5	M16X32	6311ZZ	6310ZZ
200LA	-	770	660	194	55m6	110	80	16	49	59	M20X40	6312C3	6212C3
200LC	-	770	660	194	55m6	110	80	16	49	59	M20X40	6312	6212
225SC	-	816	676	105	60m6	140	110	18	53	64	M20X40	6313	6213
225MA	-	811	701	105	55m6	110	80	16	49	59	M20X40	6312C3	6213C3
225MC	-	841	701	105	60m6	140	110	18	53	64	M20X40	6313	6213
250SA	-	882.5	742.5	85.5	60m6	140	110	18	53	64	M20X40	6313C3	6213C3
250SC	-	882.5	742.5	85.5	70m6	140	110	20	62.5	74.5	M20X40	6316	6213
250MA	-	920.5	780.5	104.5	60m6	140	110	18	53	64	M20X40	6313C3	6213C3
250MC	-	920.5	780.5	104.5	70m6	140	110	20	62.5	74.5	M20X40	6316	6213

OUTLINE DIMENSIONS

Totally Enclosed Fan-Cooled Type, Squirrel-Cage Motor

Dimension in mm, Flange-mount V1 (IM3011)

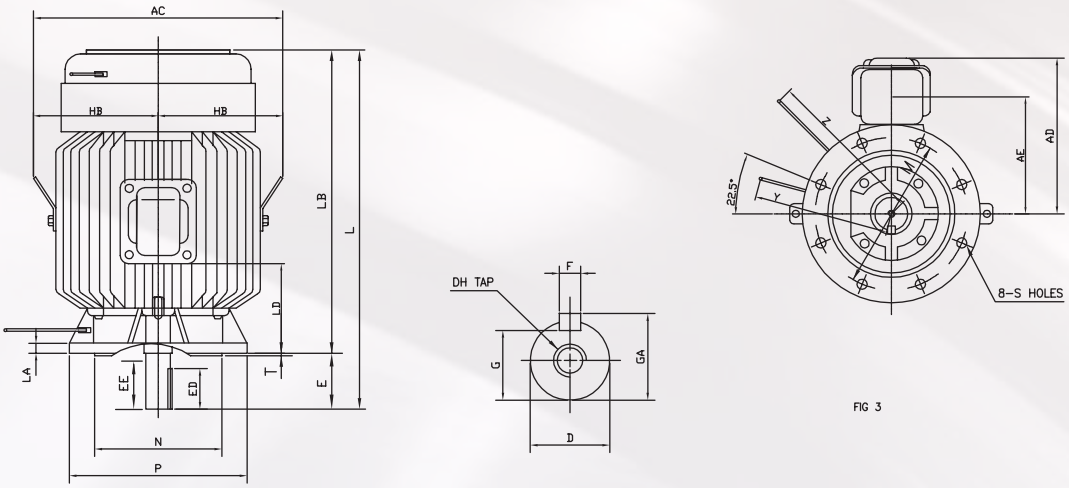

FIG 3

Output (HP)				Frame Size	Dimensions (mm)											
2P	4P	6P	8P		M	N	P	S	T	LA	AC	AD	AE	HB	Y	Z
125	–	–	–	280SA	500	450	550	19	5	22	610	610	455	383	555	555
–	125	75	60	280SC	500	450	550	19	5	22	610	610	455	383	500	555
150	–	–	–	280MA	500	450	550	19	5	22	610	610	455	383	550	555
–	150	100	75	280MC	500	450	550	19	5	22	610	610	455	383	500	555
175	–	–	–	315SA	600	550	660	24	6	25	610	610	455	383	585	585
–	175	125	100	315SC	600	550	660	24	6	25	610	610	455	383	560	555
200 / 250	–	–	–	315MA	600	550	660	24	6	25	610	610	455	383	585	585
–	200	150 / 175	125	315MC	600	550	660	24	6	25	610	610	455	383	560	555
–	250	–	–	315MB	600	550	660	24	6	25	610	610	455	383	560	555

Frame Size	Dimensions (mm)			Shaft Extension								Bearings	
	L	LB	LD	D	E	ED	EE	F	G	GA	DH	DE	NDE
280SA	1042	902	156	65m6	140	110	134	18	58	69	M20X40	6314C3	6314C3
280SC	1072	902	156	80m6	170	140	157	22	71	85	M20X40	6318 (NU318C3)	6316
280MA	1131	991	200	65m6	140	110	134	18	58	69	M20X40	6314C3	6314C3
280MC	1161	991	200	80m6	170	140	157	22	71	85	M20X40	6318 (NU318C3)	6316
315SA	1131	991	200	65m6	140	110	134	18	58	69	M20X40	6314C3	6314C3
315SC	1161	991	200	85m6	170	140	157	22	76	90	M20X40	6320 (NU320C3)	6316
315MA	1182	1042	226	65m6	140	110	134	18	58	69	M20X40	6314C3	6314C3
315MC	1212	1042	226	85m6	170	140	157	22	76	90	M20X40	6320 (NU320C3)	6316
315MB	1212	1042	226	85m6	170	140	157	22	76	90	M20X40	6320 (NU320C3)	6316

Note:

1. All dimensions are in mm
2. Tolerence N : h7
3. Grease pre-packed shielded ball bearings for frame size 63 through 180L and 160L 2-pole.
4. Usable shaft length EE.
5. Standard 4-Pole and 6-Pole motors with frame size 250S through 315M are fitted with 6 series ball bearings for direct coupling drive. NU series roller bearings in bracket ( ) can be fitted to the drive end of the 4-Pole & 6-Pole motors when higher radial loads are encountered, such as belt drive applications.
6. Open bearings and with grease nipples for regreasing for frame size 180MA 2-Pole and 200L through 315M.
7. Pressed steel plate type terminal box for frame size 180L and smaller. Cast iron T-box for frame size 200 and larger. Terminal box is rotatable through 360 degrees.
8. Data are subject to change without notice.

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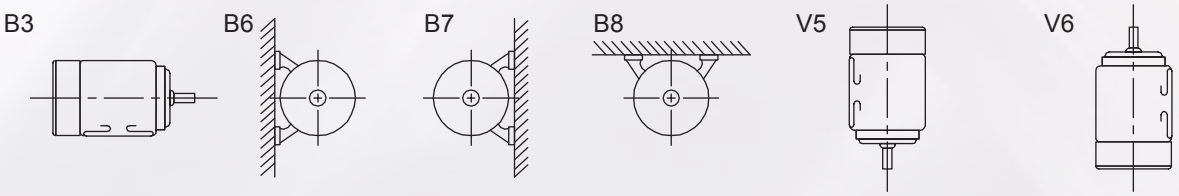
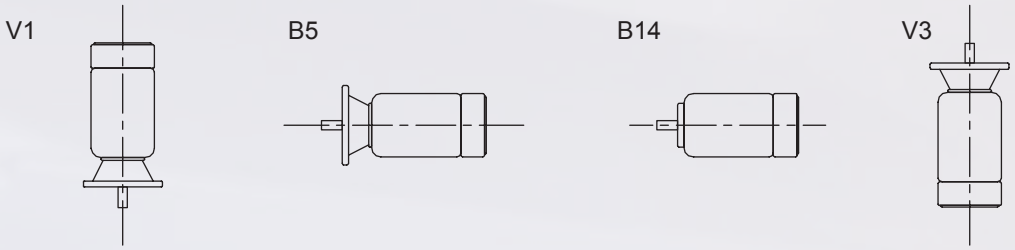
ORDERING INFORMATION

- Application
- Motor type
- Voltage, frequency, output, number of poles
- Across-the-line or reduced-voltage starting
- Direct drive, or V-belt drive (Sheave diameter, width and weight, type of V-belts)
- With or without slide rails or soleplates
- Type, size and diameter of power lead
- Indoor or outdoor use
- Environmental conditions (Ambient temperature, explosive or corrosive gas, if exists)
- Load inertia GD^2
- Load characteristics

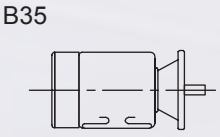
FOOT MOUNTED MOTOR



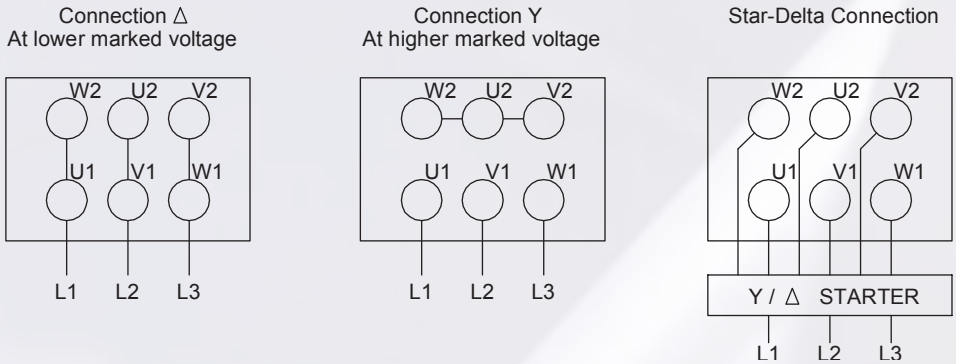
FLANGE MOUNTED MOTOR



FOOT AND FLANGE MOUNTED MOTOR



CONNECTION DRAWING



USEFUL GENERAL FORMULAS AND DEFINITIONS

Name	Formula	Units	Defination
Kilowatt loss	$= \frac{HP\ (.746)\ X\ (1.0 - efficiency)}{efficiency}$		
Power Output	1HP = 745W = 0.746Kw		HP : hosepower
Current	$I = \frac{E}{R}$	I in Amp	E : Volt R : Ohm
Input power	$P_{in} = E.I.Cos\emptyset$ - (1 Ø) $P_{in} = \sqrt{3}.\ E.I.Cos\emptyset$ - (3 Ø)	P_{in} in W	E : Volt I : ampere
Output power	$P_{0ut} = E.I.\ \eta.Cos\emptyset$ - (1 Ø) $P_{0ut} = \sqrt{3}.\ E.I.\eta.Cos\emptyset$ - (3 Ø)	P_{out} in W	
Efficiency	$\eta = \frac{P_{0ut}}{P_{in}} X\ 100\%$		
Power factor	$Cos\emptyset = \frac{P_{in}}{\sqrt{3}.\ E.I.} X\ 100\%$ - (3 Ø)		
Synchronous speed	$N_s = \frac{120\ f}{P}$	N_s in min^{-1}	f : frenquency of the power supply P : poles
Slip	$S = \frac{N_s - N}{N_s} X\ 100\%$		N : motor speed
Torque	$T = \frac{974\ Kw}{N}$	T in kgf-m	1 kgf-m = 9.8 N-m
Power	P = 1.027 NT	P in W	
Reative power absorbed by the motor	$Q = \sqrt{3}.\ E.I.SIN\ \emptyset$ - (3 Ø)	Q in VAR	

- The **Locked-Rotor Torque** of a motor is the minimum torque which it will develop at rest for all angular position of the rotor, with rated voltage applied at rated frenquency
- The **Pull-in torque** is the maximum constant torque under which the motor will pull its connected inertial load into synchronous speed at rated voltage and frenquency, when its field excitation is applied.
- The **Pull-out Torque** is the maximum sustained torque under which the motor will develop at synchronous-speed with rated voltage applied at rated frequency and with normal excitation
- The **Full-Load Torque** is the torque necessary to produce its rated horsepower at full-load speed.
  In Kg at a 1 meter radius, it is equal to the KW times 974 divided by the full-load speed
- The **Accelerating Torque** is the difference between the motor torque and the load torque from 0 to pull-in speed.
  A 10% or higher margin is desired to avoid a possible stalled or locked rotor position.
- The **Power Factor** or and alternating- current motor or generator is the ratio of the KVA input (or output) to the Kilowatt input

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