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AESV / AESU / AESV-LA Series
Squirrel Cage Induction Motor

AESV2S / AESU2S / AESV2S-LA (IE2) HIGH EFFICIENCY
AESV3S / AESU3S / AESV3S-LA (IE3) PREMIUM EFFICIENCY

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Content

About TECO

TECO Malaysia provides a total solution of motors and drives ever since it was incorporated on 23 December 1987. TECO Westinghouse Motor Company comprises the experience of Westinghouse, a leader in the motor industry since 1888 and TECO, a multinational conglomerate with over 50 years of motor experience. TECO Singapore itself was established in 1972 and has also set-up subsidiaries in Thailand, Malaysia, Indonesia, Vietnam and India.

Today, TECO is the one of the TOP 5 motor manufacturers in the world. Our motors are widely deployed in the industrial sectors and government project including Malaysia Customs, Immigration-CIQ, Sungai Buloh Hospital, Prime minister's office Complex, Le-meridien & Hilton International Hotels usage of : Ventilation & AHU

And all standard motors are designed to meet the latest European and International Standard. Accordance with IEC60034 and has been certify by SIRIM QAS with certificate number : PC000403

Introduction to IEC 60034-30-1

Electric motor application in the industry consumes between 30% and 40% of the generated electrical energy worldwide. Improving efficiency of the complete drive system is therefore a major concern in the energy-efficiency efforts. Many different energy efficiency standards for cage induction motors from different countries were already in use (NEMA, EPACT, CSA, CEMEP, COPANT, AS/NZS, JIS, GB and others) before IEC came up with an efficiency standard. It became increasingly difficult for manufactures to design motors for a global market and for customers to understand differences and similarities of standards in different countries, therefore IEC 60034-30-1 was developed for global standards for easy reference.

IEC 60034-30-1: Efficiency classes of single-Speed, Three Phase, Cage-induction motor (IE-code)

As part of a concerted effort worldwide to reduce energy consumption, CO2 emissions and the impact of industrial operations on the environment, TECO is committed to produce International Energy-Efficiency Class (IE) motors in order to reduce the energy consumed and in turn reduce greenhouse gas emissions. TECO's V-series are designed, manufactured and tested to meet latest European and International standard. The New V Series, which comprise of full range of Efficiency Classes IE1, IE2 & IE3 Motors.

What does this standard covers?

It specifies efficiency classes for single-speed, three-phase, 50Hz and 60 Hz, cage-induction motors that have:

- Rated Voltage up to 1000V;
- Rated Output Power between 0.12kW and 1000kW;
- Either 2, 4, 6 or 8 pole;
- Rated either duty type S1 (continuous duty) or S3 (intermittent periodic duty) with a rated cycle duration factor of 80% or higher;
- Capable of operating direct on-line;
- Rated for operating conditions in accordance with IEC 60034-1, clause 6.

CEMEP (SS530)

Before this standard was published, IEC design motors mostly follow CEMEP-EU standard for efficiency classification, which is known as EFF2 (Standard Efficiency) or EFF1 (High Efficiency). The agreed minimum levels of the respective classes are based on efficiency measurements according to old EN 60034-2:1996.

SS530 is the standard used in Singapore, SS530 define the usage of the motor into two categories: 'Continuous use' & 'Occasional used'. The definition of the 'Continuous Use' is that a motor is used more than 2900 Hours a year, and 'Occasional Use' is less than 2900 hours a year. For 'Continuous Use' motor must meet a minimum nominal efficiency equivalent to CEMEP EFF 1 and 'Occasional Use' motor must meet a minimum nominal efficiency equivalent to CEMEP EFF2.

CEMEP VS IEC 60034–30-1

The method for measuring efficiency for low-voltage three phase asynchronous motor was revised with the new EN 60034-2-1:2007 standard. The new standard significantly increases the accuracy under defined laboratory conditions. IEC 60034-30, is based on the new 60034-2-1: 2007 standard for the definition of efficiency. Where else CEMEP, was based on the previous EN 60034-2:1996. In a direct comparison of the both measuring methods at the same motor, it is expected the efficiency level determine according to the new method are up to a few percentage point below the efficiency level using the old method.

Efficiency	CEMEP	IE	Model
Standard	EFF2	IE 1	AESV1S/AESU1S
High	EFF1	IE 2	AESV2S/AESU2S
Premium	-	IE 3	AESV3S/AESU3S

Electrical Design

Type: Squirrel Cage Induction Motor
Ratings: 0.18 kW ~ 375 kW

Duty Rating

All Motors have a maximum continuous duty rating of S1 under rated load. For duty cycles other than S1 please refer to TECO.

Supply Voltage

Stock motors are designed for operation as below:
2.2kW and below : 220~240V/ 380~415V 3 phase /50Hz
3 kW and above : 380~415V 3 phase /50Hz

Insulation System

All motor are design with class F insulation and Class B temperature rise at ambient temperature of 40º C. For any other insulation system other than standard Class F insulation or Class B temperature rise at higher ambient temperature than standard 40º C, please refer to TECO.

Inverter Duty

All motors are design to be suitable for Inverter use, comply with IEC 60034-17. For intensive use of Inverter duty operations complying to IEC60034-25, please refer to TECO.

Standards

IEC 60034-1 Rotating electrical machines - Part 1: Rating and performance.

IEC 60034-2-1 Rotating electrical machines - Part 2-1: Standard methods for determining losses and efficiency from tests

IEC 60034-5 Rotating electrical machines - Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) - classification.

IEC 60034-6 Rotating electrical machines - Part 6: Methods of cooling (IC code).

IEC 60034-7 Rotating electrical machines - Part 7: Classification of types of enclosures and mounting arrangements (IM code).

IEC 60034-8 Rotating electrical machines - Part 8: Terminal markings and direction of rotation.

IEC 60034-9 Rotating electrical machines - Part 9: Noise limits.

IEC 60034-11-1 Rotating electrical machines - Part 11-1: Thermal protection.

IEC 60034-12 Rotating electrical machines - Part 12: Starting performance of single-speed three-phase cage induction motors.

IEC 60034-14 Rotating electrical machines - Part 14: Mechanical vibration of certain machines - Limits of vibration.

IEC 60034-17 Rotating electrical machines - Part 17: Cage induction motors when fed from converters - Application guide.

IEC 60034-30-1 Rotating electrical machines - Part 30: Efficiency classes for single-speed three-phase cage induction motors.

Specification

Mechanical Design

Type: Squirrel Cage Induction Motor
Frame Size: 80M to 355C
Enclosure: Totally Enclosed Fan Cooled (TEFC), Totally Enclosed Non Ventilated (TENV)

Ingress Protection

Stock motors are design to meet Ingress Protection of IP55, other special requirement please refer to TECO.

Drive Method

Stock motors are design for both Direct Coupling and Belt Drive use from frame size 80M to 250M. However, for 2 Pole Motor design for both Direct coupling and Belt drive is from Frame size 80M to 200L only. For belt drive application for other frame size, please refer to TECO.

Bearings

High Quality Deep Groove Ball Sealed Bearings are use for our stock motor from frame size 80 to 225M and Vacuum De-Gassed High Quality Deep Groove Ball Open Bearings are use for stock motor from frame Size 250M to 355C. Any special bearings, please refer to TECO.

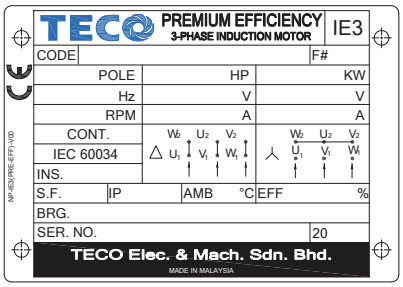
Lubrication

Both our sealed and open type bearing are grease lubricated.

Construction

Frame: High Grade Cast Iron
End Bracket: High Grade Cast Iron
External Fan: Polypropylene
Fan Cover: Pressed Steel
Shaft: Carbon Steel
Lead: 6 Leads
Iron Core: High Grade, Insulated, Cold Rolled,

Electro Magnetic Steel Plate



Terminal Box

Stock motor are fitted with pressed steel T-Box for Frame 80M to 180M and Cast Iron T-Box for frame 200L to 355M. T-Box are designed for provision of rotation by 90º to every direction that enable cable entry from 4 directions.

Finishing

Stock motor are completed with Phenolic Rust Proof Base Plus Lacquer Surface Finished Painting as standard:
Gray Color (Munsell 7.5B 3.5/0.5) (IE 1)
Blue Color (Munsell 5PB 3/8) (IE 2)
Green Color (Munsell 7.5GY 4.5/3.5) (IE 3)
Any other colour finishing, please refer to TECO.

Lifting Device

All motor from Frame Size 90 and above comes with dual eye bolt for lifting purposes.

Standards

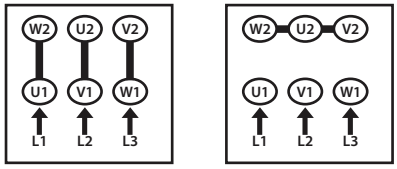
IEC 60072-1 Dimensions and output series for rotating electrical machines - Part 1: Frame numbers 56 to 400 and flange numbers 55 to 1080.

Connection Diagram

Direct-On-Line

For motor rating 2.2kW and below:
Low Voltage: 220~240V
High Voltage: 380~415V

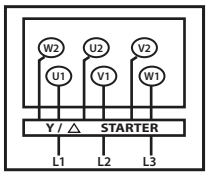
For motor rating 3kW and above:
Low Voltage: 380~415V



Star-Delta

Connect U1,V1,W1,U2,V2 & W2 to Star-Delta starter panel.

Power Supply Voltage(L1,L2,L3) to be connected to voltage indicated in Delta configuration column on the motor nameplate.



Special Enhancement

The following enhancement are also available.
Please refer to TECO.

- IP 56
- Class 'H' Insulation
- Inverter Duty Wire
- Special Paint Finishes
- Special Shaft Extensions
- Dual Speed
- Smoke Spill Duty
- Stainless Steel Hardware
- Conversion of sealed bearing to open bearing

Optional Accessories

Thermal Protection Accessories

PTC Thermistors
Resistance Temperature Detectors (RTD)
Thermostat

Moisture Protection Accessories

Space Heater

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IE 3 Performance Data

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Performance

IE 3 Performance Data (2 Pole)

Motor Type AESV3S / AESU3S / AESV3S-LA

OUTPUT		FULL LOAD	FRAME SIZE	EFFICIENCY			POWER FACTOR			CURRENT				TORQUE					APPROX. WEIGHT
										FULL LOAD (A)			LRC						
										VOLTAGE			(A)						
kW	HP	rpm		FULL LOAD (%)	3/4 LOAD (%)	1/2 LOAD (%)	FULL LOAD (%)	3/4 LOAD (%)	1/2 LOAD (%)	380	400	415	400V	FULL LOAD kg-m	LOCKED ROTOR %FLT	PULL-UP %FLT	BREAK-DOWN %FLT	ROTOR GD² kg-m²	kg
0.75	1	2875	80M	80.7	78.3	75.1	84.5	78.0	66.5	1.67	1.59	1.53	12	0.254	280	275	335	0.006	18.0
1.1	1.5	2870	80M	82.7	83.0	81.3	85.0	78.5	66.5	2.38	2.26	2.18	18	0.373	300	295	350	0.007	19.5
1.5	2	2850	90S	84.2	85.4	85.8	90.5	87.0	78.0	2.99	2.84	2.74	22	0.512	220	210	300	0.012	25.5
2.2	3	2860	90L	85.9	86.7	86.8	89.5	85.0	75.5	4.35	4.13	3.98	35	0.748	245	235	315	0.014	29.0
3	4	2855	100L	87.1	88.3	88.4	90.0	86.5	78.5	5.81	5.52	5.32	48	1.022	325	310	355	0.025	41.5
3.7	5	2870	112M	87.8	88.2	88.0	90.5	87.5	80.0	7.07	6.72	6.48	60	1.254	290	270	345	0.046	51.5
4	5.5	2875	112M	88.1	89.0	88.9	91.0	87.5	80.0	7.58	7.20	6.94	69	1.354	270	250	360	0.046	51.5
5.5	7.5	2930	132S	89.2	89.8	89.5	88.5	86.0	79.5	10.6	10.1	9.69	80	1.826	210	205	340	0.075	73.0
7.5	10	2920	132S	90.1	90.9	90.8	87.0	84.5	77.5	14.5	13.8	13.3	100	2.499	210	195	315	0.081	76.0
11	15	2935	160M	91.2	92.0	92.0	90.0	89.0	83.5	20.4	19.3	18.6	150	3.647	230	185	300	0.183	130
15	20	2935	160M	91.9	92.0	92.0	89.0	85.5	77.5	27.9	26.5	25.5	230	4.973	275	230	330	0.205	130
18.5	25	2930	160L	92.4	93.0	93.0	90.0	89.5	84.0	33.8	32.1	30.9	260	6.144	245	200	300	0.237	140
22	30	2940	180M	92.7	92.7	92.5	87.0	85.0	77.0	41.4	39.4	38.0	300	7.281	225	180	300	0.283	180
30	40	2950	200L	93.3	93.5	92.5	90.0	90.0	86.5	54.3	51.6	49.7	400	9.895	200	145	300	0.602	265
37	50	2955	200L	93.7	94.5	94.0	91.0	90.5	87.0	65.9	62.6	60.4	510	12.18	210	145	300	0.753	300
45	60	2960	225MA	94.0	94.0	93.5	91.0	91.0	88.0	79.9	75.9	73.2	615	14.79	170	140	300	1.187	340
55	75	2970	250MA	94.3	94.5	94.0	91.5	90.0	86.5	96.8	92.0	88.7	735	18.02	165	130	315	1.544	465
75	100	2970	280SA	94.7	94.6	93.6	81.5	77.0	66.5	148	140	135	1090	24.61	155	135	300	1.935	553
90	125	2970	280MA	95.0	95.0	94.0	90.5	90.0	82.5	159	151	146	1255	29.53	150	135	285	2.463	620
110	150	2972	315SA	95.2	95.0	94.0	90.0	89.0	85.0	195	185	179	1400	36.07	200	165	240	4.000	900
132	175	2972	315MA	95.4	95.3	94.5	90.5	89.5	87.0	232	221	213	1650	43.28	200	165	240	4.800	960
160	215	2975	315LA	95.6	95.5	94.8	91.0	90.0	86.5	279	265	256	2140	52.41	200	165	250	5.200	1030
200	270	2975	315LA	95.8	95.8	95.2	91.5	90.5	87.5	347	329	317	2450	65.51	200	165	250	7.200	1160
220	300	2975	355MA	95.8	95.4	94.2	91.5	90.0	85.0	381	362	349	2810	72.06	140	120	280	12.40	1750
250	335	2975	355MA	95.8	95.5	94.5	92.0	91.0	87.0	431	409	395	3000	81.89	140	120	280	13.60	1820
315	420	2978	355LA	95.8	95.5	94.5	92.0	91.0	87.0	543	516	497	3900	103.1	140	120	280	14.40	2150
375	500	2978	355CA	95.8	95.6	94.7	92.5	91.0	87.0	643	611	589	4500	122.7	150	125	280	16.00	2500

Note:
1. The above are typical values based on test according to IEC 60045-2-1:2007. (DY)
2. Tolerance according to IEC 60034-1.
3. Breakdown & Locked rotor torques are show as average expected voltages
4. Efficiency, power factor, speed and torque are the same for other voltages.
   Current values vary inversely with voltage
5. Noise according to IEC 60034-9.
6. Data subject to change without prior notice.

IE 3 Performance Data (4 Pole)

Motor Type AESV3S / AESU3S / AESV3S-LA

OUTPUT		FULL LOAD	FRAME SIZE	EFFICIENCY			POWER FACTOR			CURRENT				TORQUE					APPROX. WEIGHT
										FULL LOAD (A)			LRC						
										VOLTAGE			(A)						
kW	HP	rpm		FULL LOAD (%)	3/4 LOAD (%)	1/2 LOAD (%)	FULL LOAD (%)	3/4 LOAD (%)	1/2 LOAD (%)	380	400	415	400V	FULL LOAD kg-m	LOCKED ROTOR %FLT	PULL-UP %FLT	BREAK-DOWN %FLT	ROTOR GD^2 kg-m^2	kg
0.55	0.75	1430	80M	80.8	77.9	74.7	69.0	58.5	44.5	1.50	1.42	1.37	9.0	0.374	300	270	320	0.010	17.5
0.75	1	1410	80M	82.5	81.8	79.7	73.5	64.0	50.0	1.88	1.79	1.72	11	0.518	315	290	335	0.013	20.5
1.1	1.5	1430	90S	84.1	84.4	83.2	79.5	71.5	57.5	2.50	2.37	2.29	17	0.748	255	205	300	0.019	26.5
1.5	2	1435	90L	85.3	84.1	82.2	75.0	65.5	51.5	3.56	3.38	3.26	26	1.017	300	235	335	0.023	28.5
2.2	3	1450	100L	86.7	87.3	86.9	81.0	73.5	60.5	4.76	4.52	4.36	33	1.476	210	160	300	0.045	39.5
3	4	1455	100L	87.7	87.7	86.2	78.0	70.5	57.5	6.66	6.33	6.10	49	2.006	250	240	335	0.052	42.0
3.7	5	1445	112M	88.4	89.1	88.8	82.0	77.0	66.0	7.76	7.37	7.10	60	2.491	235	200	305	0.083	53.0
4	5.5	1445	112M	88.6	88.4	87.9	82.0	76.5	65.5	8.37	7.95	7.66	57	2.693	245	205	300	0.083	53.0
5.5	7.5	1455	132S	89.6	90.4	90.3	85.0	80.5	70.0	11.0	10.4	10.0	77	3.678	240	200	300	0.132	75.5
7.5	10	1460	132M	90.4	90.8	90.4	84.5	79.5	69.0	14.9	14.2	13.7	110	4.998	270	225	330	0.172	93.0
11	15	1460	160M	91.4	92.0	91.5	84.0	80.0	70.0	21.8	20.7	19.9	160	7.331	230	185	300	0.366	130
15	20	1460	160L	92.1	92.5	92.5	84.5	81.0	71.0	29.3	27.8	26.8	225	9.997	250	195	300	0.460	150
18.5	25	1475	180M	92.6	94.0	93.0	81.5	77.0	69.5	37.2	35.4	34.1	270	12.20	215	160	280	0.704	195
22	30	1475	180L	93.0	93.5	93.0	81.0	77.0	71.0	44.4	42.2	40.6	315	14.51	210	145	275	0.789	205
30	40	1470	200L	93.6	94.5	94.5	86.0	84.5	77.0	56.6	53.8	51.8	445	19.86	250	205	300	1.451	285
37	50	1480	225SC	93.9	94.5	94.0	85.5	82.0	73.0	70.0	66.5	64.1	505	24.33	210	175	300	1.896	350
45	60	1480	225MC	94.2	94.5	94.0	84.5	79.5	70.0	85.9	81.6	78.6	600	29.58	210	175	300	1.979	360
55	75	1485	250MC	94.6	94.6	94.0	87.5	84.5	77.0	101	95.9	92.4	750	36.04	210	185	295	3.911	480
75	100	1480	280SB	95.0	95.0	94.5	85.0	82.0	73.0	141	134	129	1030	49.38	160	150	300	5.033	621
90	125	1480	280MB	95.2	95.2	94.7	84.0	80.0	70.5	171	162	157	1260	59.26	175	165	300	6.112	706
110	150	1484	315SB	95.4	95.4	95.0	89.0	87.0	80.5	197	187	180	1400	72.23	200	165	270	9.200	920
132	175	1484	315MB	95.6	95.6	95.2	89.0	87.5	82.0	236	224	216	1650	86.68	200	165	270	10.40	1000
160	215	1485	315LB	95.8	95.8	95.5	89.5	88.0	82.0	284	269	260	2000	105.0	200	165	260	11.60	1070
200	270	1485	315LB	96.0	96.0	95.8	90.0	89.0	84.5	352	334	322	2500	131.2	200	165	260	14.00	1260
220	300	1487	355MB	96.0	96.0	95.4	88.8	86.2	79.0	392	372	359	2750	144.2	180	150	260	22.80	1750
250	335	1487	355MB	96.0	95.8	95.2	88.8	86.2	78.2	446	423	408	3280	163.8	200	165	270	27.20	1820
315	420	1488	355LB	96.0	96.0	95.5	89.5	87.5	81.0	557	529	510	3900	206.3	200	165	270	31.20	2150
375	500	1488	355CB	96.0	96.0	95.5	89.5	87.0	81.0	663	630	607	4570	245.6	200	165	270	35.60	2500

Note:
1. The above are typical values based on test according to IEC 60045-2-1:2007. (DY)
2. Tolerance according to IEC 60034-1.
3. Breakdown & Locked rotor torques are show as average expected voltages
4. Efficiency, power factor, speed and torque are the same for other voltages.
   Current values vary inversely with voltage
5. Noise according to IEC 60034-9.
6. Data subject to change without prior notice.

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Performance

IE 3 Performance Data (6 Pole)

Motor Type AESV3S / AESU3S / AESV3S-LA

OUTPUT		FULL LOAD	FRAME SIZE	EFFICIENCY			POWER FACTOR			CURRENT				TORQUE					APPROX. WEIGHT
										FULL LOAD (A)			LRC						
kW	HP	rpm		FULL LOAD (%)	3/4 LOAD (%)	1/2 LOAD (%)	FULL LOAD (%)	3/4 LOAD (%)	1/2 LOAD (%)	VOLTAGE 380	VOLTAGE 400	VOLTAGE 415	(A) 400V	FULL LOAD kg-m	LOCKED ROTOR %FLT	PULL-UP %FLT	BREAK-DOWN %FLT	ROTOR GD² kg-m²	kg
0.55	0.75	905	80M	77.2	69.7	66.2	69.0	58.0	44.5	1.57	1.49	1.44	6.0	0.591	210	195	250	0.012	19.5
0.75	1	935	90S	78.9	80.6	79.4	71.0	62.5	49.0	2.03	1.93	1.86	9.0	0.780	210	190	250	0.022	28.0
1.1	1.5	930	90L	81.0	81.2	80.5	72.0	63.5	50.0	2.87	2.72	2.62	13	1.151	210	185	240	0.026	30.5
1.5	2	950	100L	82.5	82.9	81.5	72.5	65.0	52.0	3.81	3.62	3.49	18	1.536	210	175	250	0.058	43.5
2.2	3	960	112M	84.3	84.3	82.2	67.0	59.0	47.0	5.92	5.62	5.42	29	2.230	190	180	280	0.083	53.5
3	4	970	132S	85.6	86.1	85.1	76.0	69.0	58.5	7.01	6.66	6.42	41	3.009	195	170	300	0.137	75.0
3.7	5	965	132M	86.5	87.5	87.0	77.0	70.0	58.0	8.44	8.02	7.73	56	3.731	200	185	275	0.143	77.0
4	5.5	970	132M	86.8	87.0	85.6	77.0	70.0	57.5	9.09	8.64	8.33	58	4.012	200	185	310	0.182	84.0
5.5	7.5	970	132M	88.0	88.5	87.6	79.5	72.5	60.0	11.9	11.3	10.9	88	5.517	210	205	300	0.216	91.0
7.5	10	970	160M	89.1	90.0	89.0	79.0	73.0	61.0	16.2	15.4	14.8	110	7.523	235	210	300	0.483	135
11	15	970	160L	90.3	91.0	90.5	78.0	72.0	60.5	23.7	22.5	21.7	170	11.03	295	255	300	0.628	150
15	20	970	180L	91.2	92.0	92.0	82.0	78.0	68.0	30.5	29.0	27.9	200	15.05	215	165	255	1.337	205
18.5	25	975	200L	91.7	92.5	92.5	80.5	76.0	66.5	38.1	36.2	34.9	260	18.46	220	185	265	1.829	270
22	30	975	200L	92.2	93.0	93.5	81.5	77.0	68.0	44.5	42.3	40.7	305	21.95	210	185	265	2.078	290
30	40	980	225MC	92.9	93.5	93.5	83.5	80.0	76.5	58.8	55.8	53.8	335	29.79	210	160	240	3.023	385
37	50	980	250MC	93.3	94.0	94.0	85.0	81.5	75.0	70.9	67.3	64.9	490	36.74	230	200	280	4.194	460
45	60	985	280SB	93.7	93.7	93.0	81.5	77.5	67.5	89.5	85.1	82.0	587	44.52	185	175	285	5.530	561
55	75	985	280MB	94.1	94.1	93.5	83.0	80.0	71.0	107	102	98.0	700	54.41	185	175	300	6.733	635
75	100	987	315SB	94.6	94.6	94.1	85.5	82.5	74.5	141	134	129	930	74.05	200	165	240	12.80	900
90	125	987	315MB	94.9	94.9	94.5	85.5	83.0	75.5	169	160	154	1200	88.86	200	165	240	15.20	960
110	150	988	315LB	95.1	95.1	94.7	85.5	83.0	75.5	206	195	188	1400	108.5	200	165	240	18.40	1090
132	175	988	315LB	95.4	95.4	95.0	85.5	83.0	75.5	246	234	225	1650	130.2	200	165	240	20.40	1250
160	215	988	355MB	95.6	95.6	95.2	85.5	82.0	73.0	297	283	272	2000	157.8	170	145	250	33.20	1750
200	270	988	355MB	95.8	95.8	95.4	86.0	82.5	74.0	369	350	338	2400	197.3	170	145	250	40.40	1950
220	300	988	355MB	95.8	95.8	95.5	86.5	83.5	76.0	403	383	369	2700	217.0	170	145	250	44.00	2020
250	335	988	355LB	95.8	95.8	95.5	86.8	84.0	76.5	457	434	418	3060	246.6	170	145	250	49.60	2200
315	420	988	355CB	95.8	95.8	95.5	87.0	85.0	78.0	574	546	526	3700	310.7	170	145	250	60.40	2800

Note:
1. The above are typical values based on test according to IEC 60045-2-1:2007. (DY)
2. Tolerance according to IEC 60034-1.
3. Breakdown & Locked rotor torques are show as average expected voltages
4. Efficiency, power factor, speed and torque are the same for other voltages.
   Current values vary inversely with voltage
5. Noise according to IEC 60034-9.
6. Data subject to change without prior notice.

Dimensions

B3 Outline Dimension

B3

Foot Mounted(B3)
Motor Type: AESV1S, AESV2S, AESV3S
Frame Size: 80M to 225M

FIGURE 1

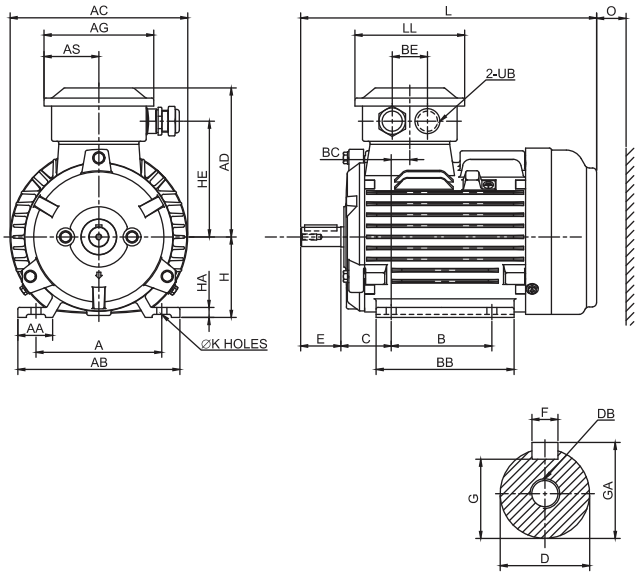
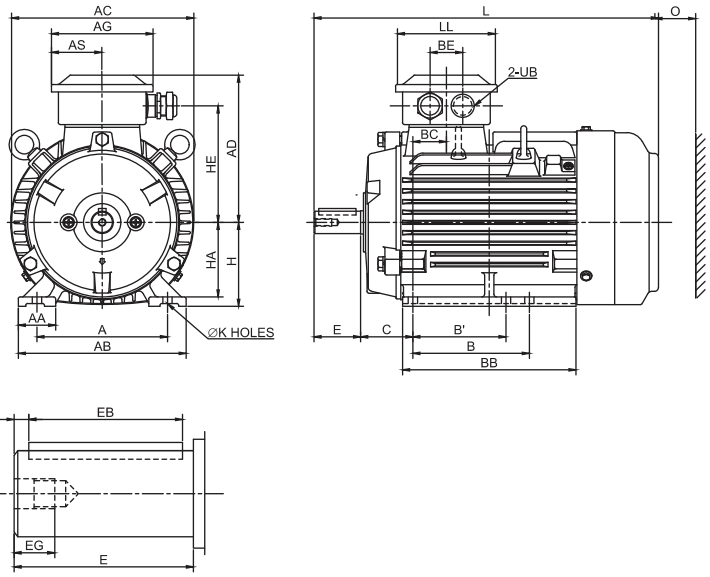


FIGURE 2



Output (kW)				FRAME SIZE	FIG. NO	A	AA	AB	AC	AD	AG	AS	B	B'	BA	BA'	BB	BC	BE	C
2P	4P	6P	8P																	
0.75 1.1	0.55 0.75	0.55	0.18	80M	1	125	34.5	161	177	148	109	54.5	100	---	---	---	137	18.5	35	50
1.5	1.1	0.75	0.37	90S	2	140	40	180	197	158	109	54.5	100	---	---	---	161	36	35	56
2.2	1.5	1.1	0.55	90L		140	40	180	197	158	109	54.5	125	100	---	---	186	36	35	56
3	2.2 3	1.5	0.75 1.1	100L		160	40	200	219	185.5	125	62.5	140	---	---	---	181	21	40	63
3.7 4	3.7 4	2.2	1.5	112M		190	45	235	235	193	125	62.5	140	---	---	---	186	28	40	70
5.5 7.5	5.5	3	2.2	132S		216	57	263	273	210.5	125	62.5	140	---	---	---	184	6	40	89
---	7.5	3.7 4 5.5	3	132M		216	57	263	273	210.5	125	62.5	178	140	---	---	222	6	40	89
11 15	11	7.5	3.7 4 5.5	160M	3	254	60	300	317	240.5	166	83	210	---	57.5	57.5	256	47	60	108
18.5	15	11	7.5	160L		254	60	300	317	240.5	166	83	254	210	57.5	101.5	300	47	60	108
22	18.5	---	---	180M		279	65	330	354	266.5	166	83	241	---	62	62	292	39	60	121
---	22	15	11	180L		279	65	330	354	266.5	166	83	279	241	62	100	330	39	60	121
30 37	30	18.5 22	15	200L	4	318	70	378	398	332	231	110.5	305	---	76	76	365	60	106	133
---	37	---	18.5	225SC		356	75	431	449	358	231	110.5	286	---	90	90	350	37.5	106	149
45	---	---	---	225MA		356	75	431	449	358	231	110.5	311	286	90	115	375	37.5	106	149
---	45	30	22	225MC		356	75	431	449	358	231	110.5	311	286	90	115	375	37.5	106	149

Note:
1. All dimensions are in mm.
2. Pre-packed shielded ball bearing for frame size 80M to 225M
3. Dual Eye-bolts provided for frame 90S to 355C
4. Data are subject to change without prior notice

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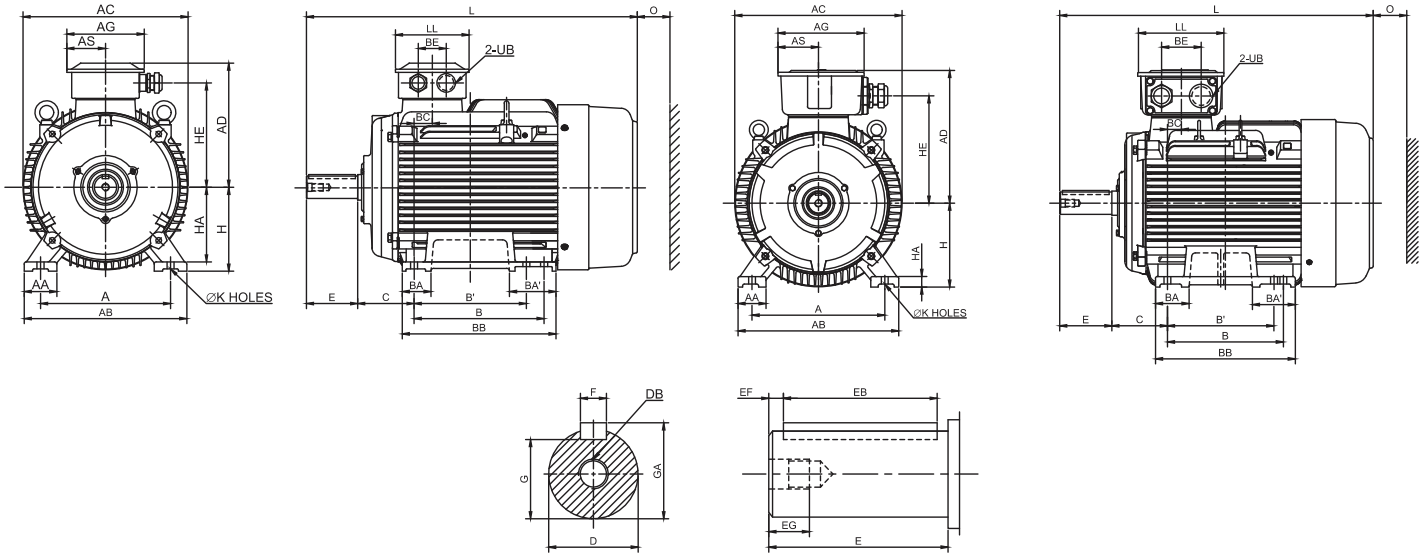
Dimensions

B3 Outline Dimension

Foot Mounted(B3)
Motor Type: AESV1S, AESV2S, AESV3S
Frame Size: 80M to 225M

B3

FIGURE 3



FRAME SIZE	H	HA	HE	K	L	LL	O	UB	SHAFT EXTENSION									BEARING	
									D	E	EB	EF	EG	F	G	GA	DB	DRIVE END	OPPOSITE DRIVE END
80M	80	10	115	10	293	109	40	M20x1.5	19	40	32	4	16	6	15.5	21.5	M6	6204ZZC3	6204ZZC3
90S	90	10	125	10	344.5	109	40	M20x1.5	24	50	40	5	19	8	20	27	M8	6205ZZC3	6205ZZC3
90L	90	10	125	10	369.5	109	40	M20x1.5	24	50	40	5	19	8	20	27	M8		
100L	100	12	146	12	392	125	50	M25X1.5	28	60	50	5	22	8	24	31	M10	6206ZZC3	6206ZZC3
112M	112	13	153.5	12	412.5	125	50	M25X1.5	28	60	50	5	22	8	24	31	M10	6306ZZC3	6306ZZC3
132S	132	16	171	12	466	125	50	M25x1.5	38	80	70	5	28	10	33	41	M12	6308ZZC3	6306ZZC3
132M	132	16	171	12	504	125	50	M25x1.5	38	80	70	5	28	10	33	41	M12		
160M	160	18	198	14.5	608	158	60	M32x1.5	42	110	100	5	36	12	37	45	M16	6309ZZC3	6307ZZC3
160L	160	18	198	14.5	652	158	60	M32x1.5	42	110	100	5	36	12	37	45	M16		
180M	180	20	224	14.5	672	158	70	M32x1.5	48	110	100	5	36	14	42.5	51.5	M16	6311ZZC3	6310ZZC3
180L	180	20	224	14.5	710	158	70	M32x1.5	48	110	100	5	36	14	42.5	51.5	M16		
200L	200	24	262	18.5	770	231	80	M50x1.5	55	110	100	5	42	16	49	59	M20	6312ZZC3	6212ZZC3
225SC	225	28	288	18.5	816	231	90	M50x1.5	60	140	125	7.5	42	18	53	64	M20	6313ZZC3	6213ZZC3
225MA	225	28	288	18.5	811	231	90	M50x1.5	55	110	100	5	42	16	49	59	M20	6312ZZC3	6212ZZC3
225MC	225	28	288	18.5	841	231	90	M50x1.5	60	140	125	7.5	42	18	53	64	M20	6313ZZC3	6213ZZC3

Note:
1. All dimensions are in mm.
2. Tolerance of shaft end diameter D: 1) Ø19~Ø28:j6, 2) Ø38~Ø48:k6, 3) Ø55~Ø65:m6
3. Tolerance of shaft center high H : +0, -0.5
4. Data are subject to change without prior notice

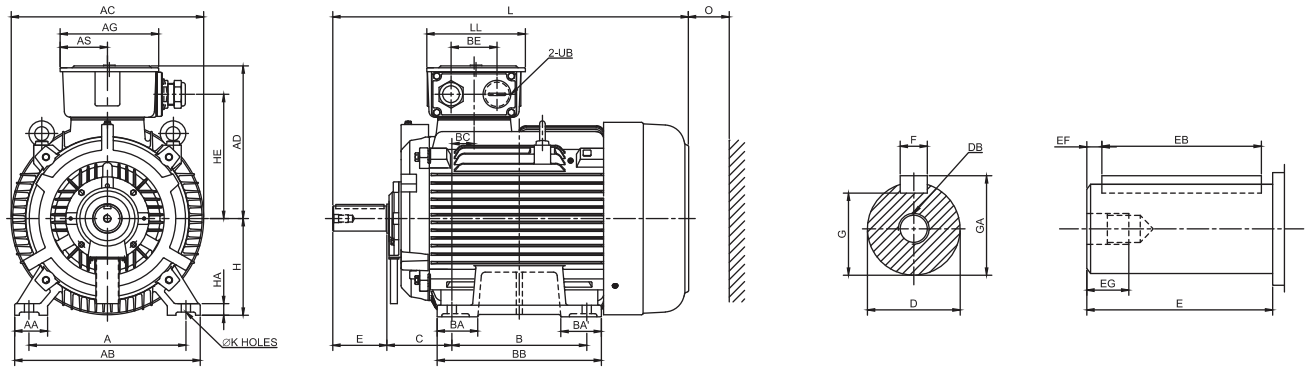
Dimensions

B3 Outline Dimension

B3

Foot Mounted(B3)
Motor Type: AESV1S, AESV2S, AESV3S
Frame Size: 250 M to 355C

FIGURE 5



Output (kW)				FRAME SIZE	FIG. NO	A	AA	AB	AC	AD	AG	AS	B	B'	BA	BA'	BB	BC	BE	C
2P	4P	6P	8P																	
55	---	---	---	250MA	5	406	85	480	499	400	255	122.5	349	---	105	105	425	57.5	119	168
---	55	37	30	250MC		406	85	480	499	400	255	122.5	349	---	105	105	425	57.5	119	168
75	---	---	---	280SA	6	457	110	560	546	433	255	122.5	368	---	110	110	445	48	119	190
---	75	45	37	280SB		457	110	560	546	433	255	122.5	368	---	110	110	445	48	119	190
90	---	---	---	280MA		457	110	560	546	433	255	122.5	419	---	130	137	495	48	119	190
---	90	55	45	280MB		457	110	560	546	433	255	122.5	419	---	130	137	495	48	119	190
110	---	---	---	315SA		508	115	615	620	527.5	336	163	406	---	210	210	620	53	140	216
---	110	75	55	315SB		508	115	615	620	527.5	336	163	406	---	210	210	620	53	140	216
132 (160)	---	---	---	315MA		508	115	615	620	527.5	336	163	457	---	240	240	670	53	140	216
---	132 (160)	90 (110)	75	315MB		508	115	615	620	527.5	336	163	457	---	240	240	670	53	140	216
160 200	---	---	---	315LA		508	130	630	620	527.5	336	163	508	---	230	230	770	53	140	216
---	160 200	110 132 (160)	90 110	315LB		508	130	630	620	527.5	336	163	508	---	230	230	770	53	140	216
(220) (250)	---	---	---	315CA		508	150	650	682	590	412	189	710	---	335	335	900	68	180	216
---	(220) (250)	(200) (220)	(132) (160)	315CB		508	150	650	682	590	412	189	710	---	335	335	900	68	180	216
(315)	---	---	---	315DA		508	150	650	682	590	412	189	900	---	180	250	1060	68	180	216
---	(315)	(250)	(200) (220)	315DB		508	150	650	682	590	412	189	900	---	180	250	1060	68	180	216
220 250	---	---	---	355MA		610	150	750	810	645	412	189	---	560	330	330	910	48	180	254
---	220 250	160 200 220	132 160	355MB		610	150	750	810	645	412	189	---	560	330	330	910	48	180	254
315	---	---	---	355LA		610	150	750	810	645	412	189	630	---	330	330	910	48	180	254
---	315	250	200 220	355LB		610	150	750	810	645	412	189	630	---	330	330	910	48	180	254
375	---	---	---	355CA		610	150	750	810	645	412	189	710	---	390	390	1100	48	180	254
---	375	315	250	355CB		610	150	750	810	645	412	189	710	---	390	390	1100	48	180	254

Note:
1. All dimensions are in mm.
2. Open type ball bearing for frame size 250M to 355C
3. Dual Eye-bolts provided for frame 90S to 355C
4. Output in ( ) is for optional frame size upon request
5. Data are subject to change without prior notice

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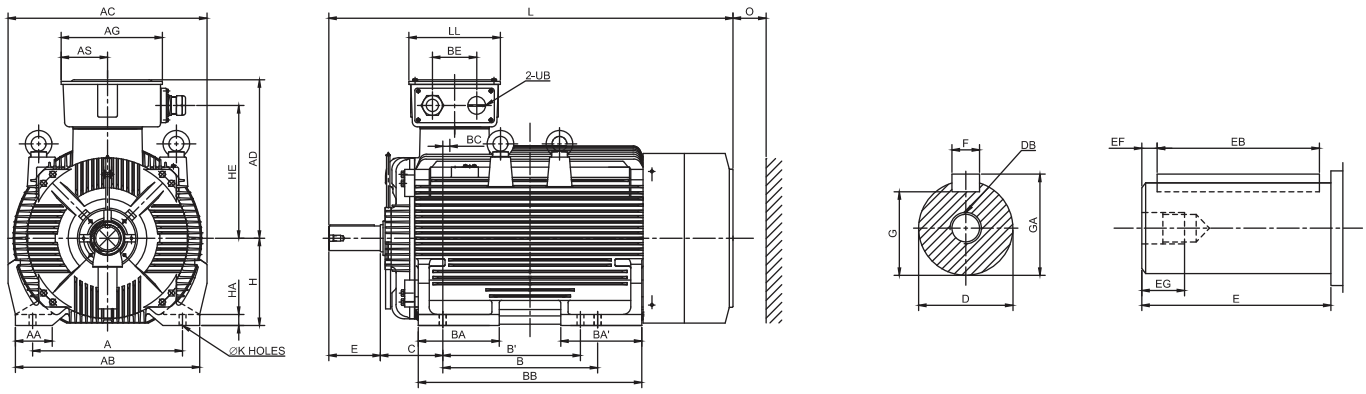
Dimensions

B3

B3 Outline Dimension

Foot Mounted(B3)
Motor Type: AESV1S, AESV2S, AESV3S
Frame Size: 250M to 355C

FIGURE 6

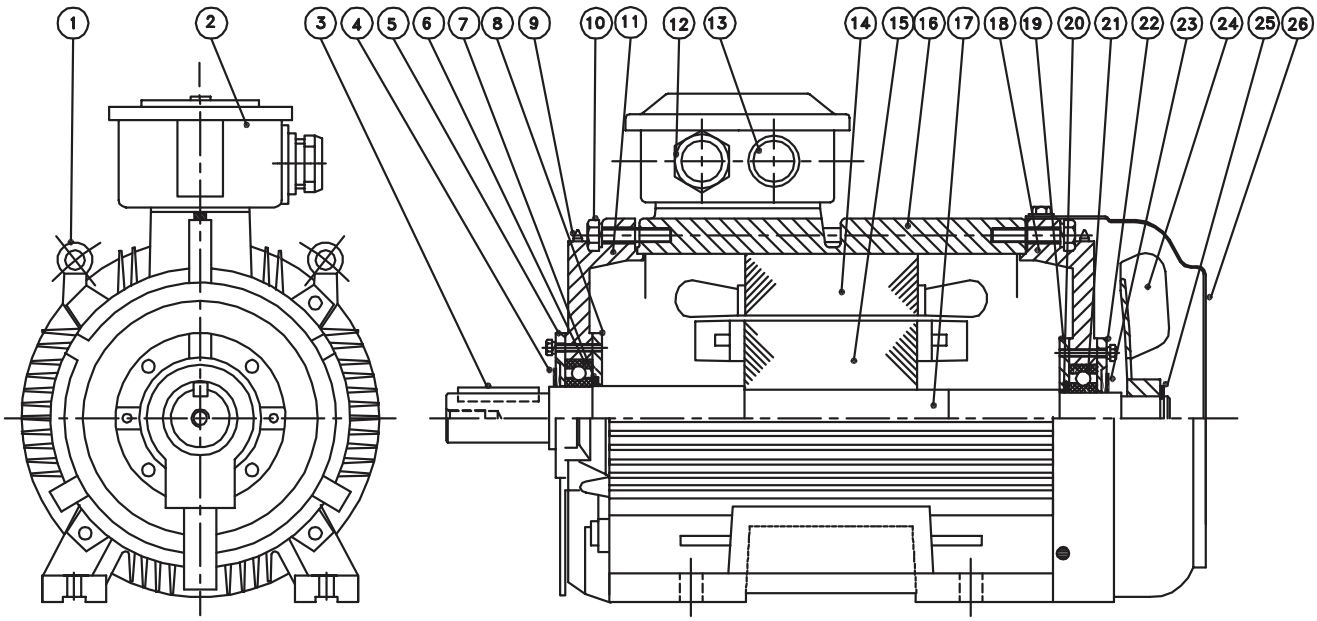


FRAME SIZE	H	HA	HE	K	L	LL	O	UB	SHAFT EXTENSION									BEARING	
									D	E	EB	EF	EG	F	G	GA	DB	DRIVE END	OPPOSITE DRIVE END
250MA	250	30	322	24	921	255	105	M63x1.5	60	140	125	7.5	42	18	53	64	M20	6313C3	6313C3
250MC	250	30	322	24	921	255	105	M63x1.5	65	140	125	7.5	42	18	58	69	M20	6315C3	6313C3
280SA	280	35	354.5	24	1037.5	255	140	M63X1.5	65	140	125	7.5	40	18	58	69	M20	6314C3	6314C3
280SB	280	35	354.5	24	1037.5	255	140	M63X1.5	75	140	125	7.5	40	20	67.5	79.5	M20	6318C3	6316C3
280MA	280	35	354.5	24	1087.5	255	140	M63X1.5	65	140	125	7.5	40	18	58	69	M20	6314C3	6314C3
280MB	280	35	354.5	24	1087.5	255	140	M63X1.5	75	140	125	7.5	40	20	67.5	79.5	M20	6318C3	6316C3
315SA	315	35	430	28	1216	322	180	M63X1.5	65	140	125	7.5	40	18	58	69	M20	6316C3	6314C3
315SB	315	35	430	28	1246	322	180	M63X1.5	80	170	160	5	40	22	71	85	M20	6320C3	6316C3
315MA	315	35	430	28	1266	322	180	M63X1.5	65	140	125	7.5	40	18	58	69	M20	6316C3	6314C3
315MB	315	35	430	28	1296	322	180	M63X1.5	80	170	160	5	40	22	71	85	M20	6320C3	6316C3
315LA	315	45	430	28	1366	322	180	M63X1.5	65	140	125	7.5	40	18	58	69	M20	6316C3	6314C3
315LB	315	45	430	28	1396	322	180	M63X1.5	80	170	160	5	40	22	71	85	M20	6320C3	6316C3
315CA	315	45	485	28	1484	372	200	M72X2	75	140	125	7.5	40	20	67.5	79.5	M20	6316C3	6316C3
315CB	315	45	485	28	1514	372	200	M72X2	95	170	160	5	48	25	86	100	M24	6322C3	6322C3
315DA	315	45	485	28	1674	372	200	M72X2	75	140	125	7.5	40	20	67.5	79.5	M20	6316C3	6316C3
315DB	315	45	485	28	1704	372	200	M72X2	95	170	160	5	48	25	86	100	M24	6322C3	6322C3
355MA	355	45	540	28	1605	372	230	M72X2	80	170	140	5	40	22	71	85	M20	6318C3	6318C3
355MB	355	45	540	28	1645	372	230	M72X2	100	210	180	5	48	28	90	106	M24	6322C3	6322C3
355LA	355	45	540	28	1605	372	230	M72X2	80	170	140	5	40	22	71	85	M20	6318C3	6318C3
355LB	355	45	540	28	1645	372	230	M72X2	100	210	180	5	48	28	90	106	M24	6322C3	6322C3
355CA	355	45	540	28	1795	372	230	M72X2	80	170	140	5	40	22	71	85	M20	6318C3	6318C3
355CB	355	45	540	28	1835	372	230	M72X2	100	210	180	5	48	28	90	106	M24	6322C3	6322C3

Note:
1. All dimensions are in mm.
2. Tolerance of shaft end diameter D: 1) Ø55~Ø100:m6
3. Tolerance of shaft center high H : 1) 80~250: +0, -0.5, 2) 280~355: +0, -1
4. Data are subject to change without prior notice

Motor Construction

Totally enclosed fan cooled, Horizontal Foot Mounting



ITEM	NAME	ITEM	NAME
1	EYE BOLT	14	STATOR
2	TERMINAL BOX ASSY	15	ROTOR
3	KEY	16	FRAME
4	V-RING (L)	17	SHAFT
5	BEARING COVER OUTER (L)	18	F BRACKET
6	BEARING (L)	19	BEARING COVER INNER (F)
7	STOP RING BEARING (L)	20	STOP RING BEARING (F)
8	BEARING COVER INNER (L)	21	BEARING (F)
9	GREASE NIPPLE	22	BEARING COVER OUTER (F)
10	SECURING BOLT	23	V-RING (F)
11	L BRACKET	24	EXTERNAL FAN
12	CABLE GLAND	25	RETAINING RING
13	PLUG	26	FAN COVER

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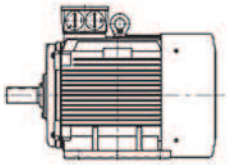
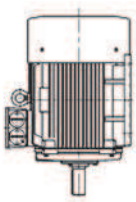
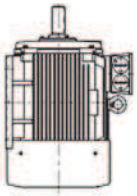
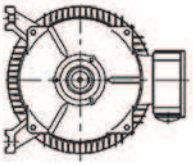
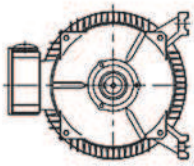
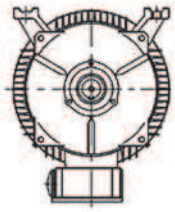
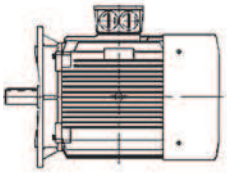
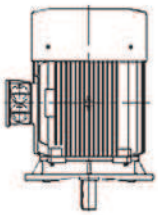
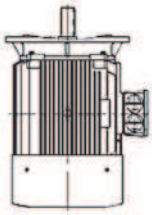
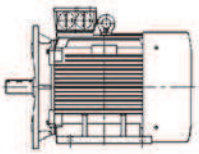
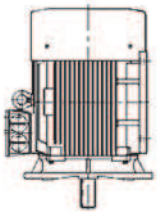
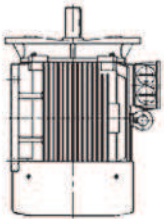
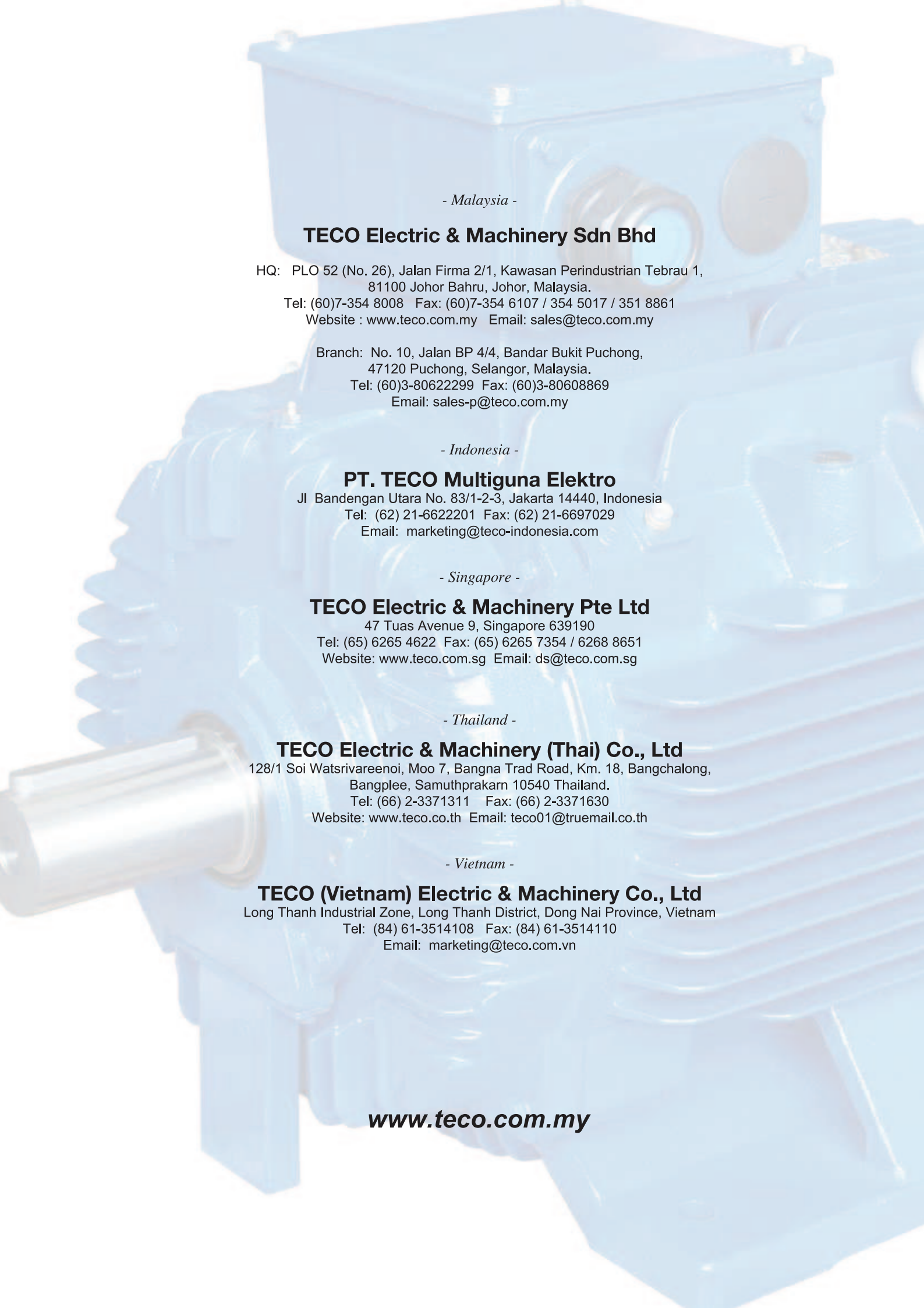
General Electrical Formulas

	Formula	Units	Definitions/ Notes
Output	1HP=746W=0.746kW		HP: horsepower
Current	$I = \frac{E}{R}$	I in A	E: volt R: Ohm
Input power	$P_{in} = E \cdot I \cdot COS \quad \cdots\cdots\cdots\cdots (1\Phi)$ $P_{in} = \sqrt{3} \cdot E \cdot I \cdot COS \quad \cdots\cdots\cdots (3\Phi)$	P_{in} in W	E: volt I: ampere
Output power	$P_{out} = E \cdot I \cdot \quad \cdot COS \quad \cdots\cdots\cdots (1\Phi)$ $P_{out} = \sqrt{3} \cdot E \cdot I \cdot \quad \cdot COS \quad \cdots (3\Phi)$	P_{out} in W	η : efficiency cos Ø : power factor
Efficiency	$= \frac{P_{out}}{P_{in}} \quad 100\% = \frac{P_{in} \quad P_{loss}}{P_{in}} \quad 100\%$	P_{loss} in W	
Power factor	$COS \quad = \frac{P_{in}}{\sqrt{3} \cdot E \cdot I} \quad 100\% \cdots\cdots (3\Phi)$		
Synchronous speed	$N_S = \frac{120f}{P}$	N_s in $\min^{-1}$	f: frequency of the power supply P: poles
Slip	$S = \frac{N_S \quad N}{N_S} \quad 100\%$		N: motor speed
Torque	$T = \frac{974kW}{N}$	T in kgf-m	1 kgf-m=9.8 N-m
Power	$P = 1.027NT$	P in W	
Starting time	$t_S = \frac{GD^2N}{375(T_M \quad T_L)}$	t_S in sec GD^2 in kgm^2	GD^2: inertia of system T_M: torque of motor
Braking time	$t_B = \frac{GD^2N}{375(T_M + T_L)}$	t_B in sec	T_L : torque of load
Reactive power absorbed by the motor	$Q = \sqrt{3} \cdot E \cdot I \cdot SIN \quad \cdots\cdots (3\Phi)$	Q in VAR	
Sound power level	$Lw = 10\log(\frac{P}{P_o})$ $(P_o = 10^{-12} W)$	Lw in dB	
Sound pressure level	$Lp = 20\log(\frac{P}{P_o})$ $(P_o = 2 \quad 10^{-5} P_a)$	Lp in dB	Pa=1 N/m^2

International Mounting Code (IM)

Foot-Mounted					
					
IM B3 (IM 1001)	IM V5 (IM 1011)	IM V6 (IM 1031)	IM B6 (IM 1051)	IM B7 (IM 1061)	IM B8 (IM 1071)
Flange-Mounted			**Foot & Flange Mounted**		
					
IM B5 (IM 3001)	IM V1 (IM 3011)	IM V3 (IM 3031)	IM B35 (IM 2001)	IM V15 (IM 2011)	IM V36 (IM 2031)

MEMO



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