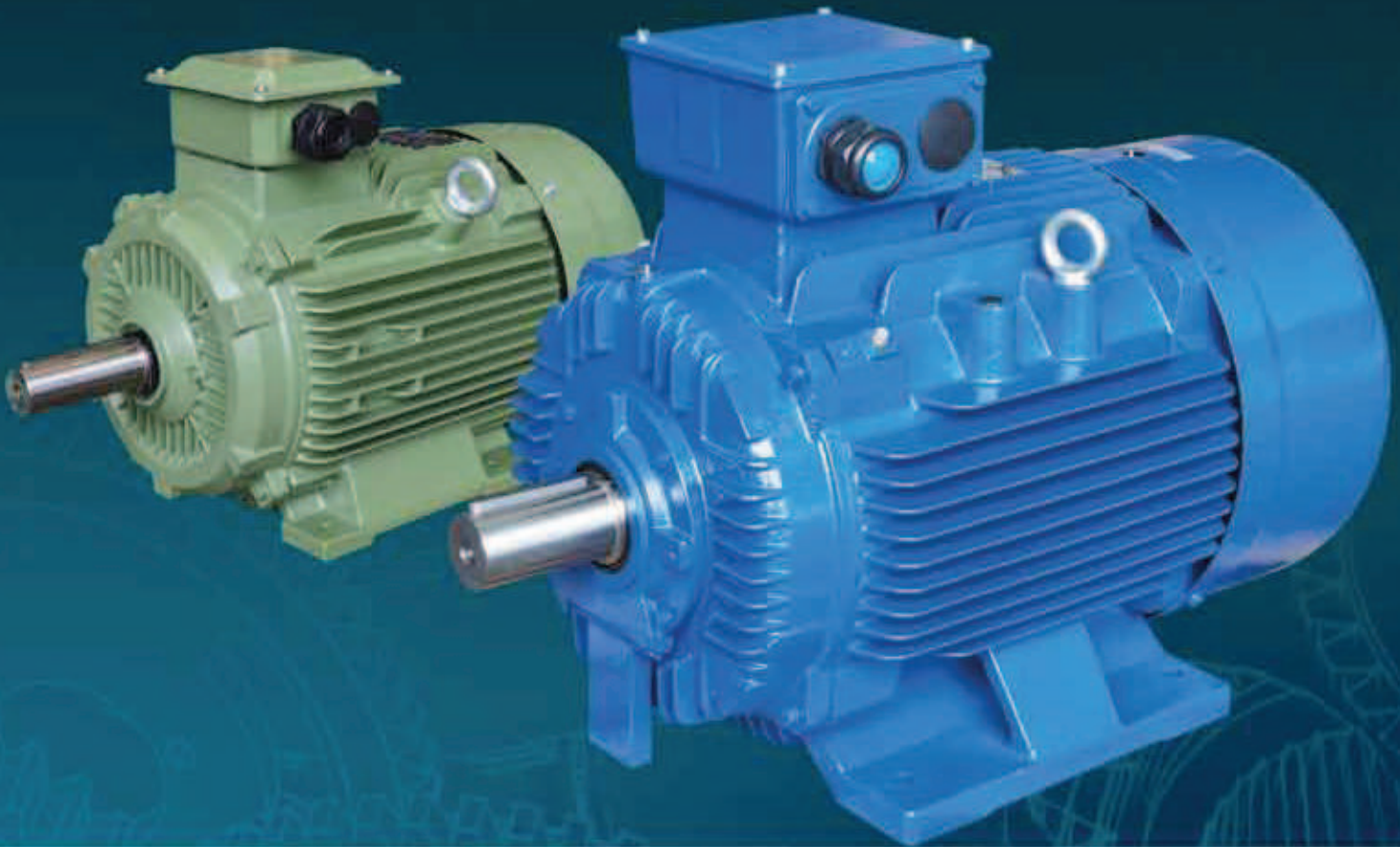


TECO

Rotates the world



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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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 40° C. For any other insulation system other than standard Class F insulation or Class B temperature rise at higher ambient temperature than standard 40° 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

TECO		PREMIUM EFFICIENCY		IE3	
3-PHASE INDUCTION MOTOR		F#			
CODE					
POLE		HP		KW	
Hz		V		V	
RPM		A		A	
CONT.		W ₆	U ₂	V ₂	
IEC 60034	Δ	U ₁	V ₁	W ₁	
INS.		U ₁	V ₁	W ₁	
S.F.	IP	AMB	°CEFF	%	
BRG.					
SER. NO.				20	
TECO Elec. & Mach. Sdn. Bhd.					
MADE IN MALAYSIA					

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 90° 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

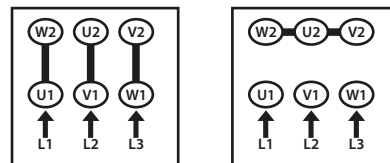
IEC 60072-1 Dimensions and output series for rotating electrical machines - Part 1: Frame numbers 56 to 400 and flange numbers 55 to 1080.

Connection Diagram

Direct-On-Line

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

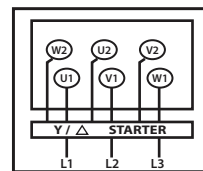
For motor rating 3kW and above:
 Low Voltage: 380~415V



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

IE 2 Performance Data



Performance

IE 2 Performance Data (2 Pole)

Motor Type AESV2S / AESU2S / AESV2S-LA

OUTPUT		FULL LOAD rpm	FRAME SIZE	EFFICIENCY			POWER FACTOR			CURRENT				TORQUE					APPROX. WEIGHT kg
kW	HP			FULL LOAD (%)	3/4 LOAD (%)	1/2 LOAD (%)	FULL LOAD (%)	3/4 LOAD (%)	1/2 LOAD (%)	FULL LOAD (A)			LRC (A)	FULL LOAD kg-m	LOCKED ROTOR %FLT	PULL-UP %FLT	BREAK-DOWN %FLT	ROTOR GD ² kg-m ²	
										VOLTAGE									
								380	400	415	400V								
0.75	1	2850	80M	77.4	78.0	76.3	85.5	78.5	66.0	1.72	1.64	1.58	9.0	0.256	215	180	280	0.005	16.5
1.1	1.5	2875	80M	79.6	80.0	78.3	85.5	79.0	67.0	2.46	2.33	2.25	17	0.372	255	200	305	0.007	19.5
1.5	2	2880	90S	81.3	81.8	80.3	86.5	80.5	69.0	3.24	3.08	2.97	24	0.507	260	245	325	0.011	24.0
2.2	3	2875	90L	83.2	84.3	83.4	87.5	82.0	70.5	4.59	4.36	4.20	35	0.745	285	240	335	0.014	28.0
3	4	2895	100L	84.6	85.9	85.7	88.0	83.0	73.0	6.12	5.82	5.61	49	1.008	245	225	310	0.022	38.0
3.7	5	2880	112M	85.5	86.5	85.4	90.0	87.0	79.0	7.31	6.94	6.69	59	1.250	240	210	320	0.038	47.5
4	5.5	2880	112M	85.8	86.9	86.6	91.0	88.0	81.0	7.78	7.39	7.13	63	1.351	235	205	315	0.042	47.5
5.5	7.5	2925	132S	87.0	87.2	86.2	86.0	82.5	74.5	11.2	10.6	10.2	82	1.830	240	180	300	0.063	66.0
7.5	10	2920	132S	88.1	88.3	87.8	82.5	77.5	68.0	15.7	14.9	14.4	98	2.499	250	230	275	0.075	72.5
11	15	2950	160M	89.4	89.3	88.1	90.5	87.5	80.5	20.7	19.6	18.9	172	3.628	230	180	305	0.154	110
15	20	2930	160M	90.3	91.0	91.2	93.5	92.5	89.0	27.0	25.6	24.7	225	4.981	245	165	280	0.192	120
18.5	25	2925	160L	90.9	91.5	91.7	93.0	91.5	88.0	33.2	31.6	30.4	290	6.154	260	185	310	0.237	135
22	30	2930	180M	91.3	91.2	90.5	91.5	90.0	85.5	40.0	38.0	36.6	295	7.306	215	185	300	0.283	175
30	40	2945	200L	92.0	92.2	91.3	90.5	89.5	86.0	54.7	52.0	50.1	440	9.912	210	150	300	0.521	245
37	50	2945	200L	92.5	92.9	92.7	91.5	90.5	87.5	66.4	63.1	60.8	585	12.22	175	130	260	0.663	275
45	60	2965	225MA	92.9	92.5	91.3	91.0	88.5	82.5	80.9	76.8	74.1	710	14.77	170	140	300	1.074	320
55	75	2970	250MA	93.2	93.2	92.6	92.5	91.5	88.0	96.9	92.1	88.8	730	18.02	165	150	300	1.343	430
75	100	2960	280SA	93.8	93.6	92.8	89.0	87.5	82.0	136	130	125	885	24.69	130	120	285	1.759	522
90	125	2970	280MA	94.1	93.9	92.8	87.5	86.0	76.0	166	158	152	1335	29.53	175	135	300	2.287	596
110	150	2975	315SA	94.3	94.1	93.0	88.0	85.0	76.5	201	191	184	1520	36.03	200	165	270	3.600	850
132	175	2975	315MA	94.6	94.3	93.4	89.5	88.0	83.0	237	225	217	1750	43.24	200	165	270	4.400	920
160	215	2975	315LA	94.8	94.5	93.5	91.0	89.5	84.5	282	268	258	2175	52.41	210	175	270	5.600	1010
200	270	2975	315LA	95.0	94.8	93.8	92.0	91.0	88.5	348	330	318	2620	65.51	210	175	260	7.200	1140
220	300	2975	355MA	95.0	94.6	93.5	91.0	90.0	85.0	387	367	354	2750	72.06	130	110	280	8.100	1650
250	335	2975	355MA	95.0	94.6	93.4	91.5	90.0	85.5	437	415	400	3100	81.89	140	120	280	12.40	1700
315	420	2978	355LA	95.0	94.8	93.8	92.0	91.0	87.0	548	520	501	3900	103.1	140	120	280	14.40	2000
375	500	2978	355CA	95.3	95.0	94.4	91.0	90.0	86.0	657	624	602	4500	122.7	150	125	280	16.00	2400

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. Effi cency, 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 2 Performance Data (4 Pole)

Performance

Motor Type AESV2S / AESU2S / AESV2S-LA

OUTPUT		FULL LOAD rpm	FRAME SIZE	EFFICIENCY			POWER FACTOR			CURRENT				TORQUE					APPROX. WEIGHT kg
kW	HP			FULL LOAD (%)	3/4 LOAD (%)	1/2 LOAD (%)	FULL LOAD (%)	3/4 LOAD (%)	1/2 LOAD (%)	FULL LOAD (A)			LRC (A)	FULL LOAD kg-m	LOCKED ROTOR %FLT	PULL-UP %FLT	BREAK-DOWN %FLT	ROTOR GD ² kg-m ²	
										VOLTAGE									
										380	400	415	400V						
0.55	0.75	1425	80M	78.1	78.0	75.1	72.5	62.0	47.5	1.48	1.40	1.35	8.0	0.376	290	260	305	0.010	17.5
0.75	1	1415	80M	79.6	79.5	76.9	73.5	63.5	49.5	1.95	1.85	1.78	11	0.516	300	295	325	0.013	20.5
1.1	1.5	1445	90S	81.4	81.4	78.9	76.0	67.0	53.0	2.70	2.57	2.47	19	0.741	270	205	325	0.017	25.0
1.5	2	1435	90L	82.8	83.7	82.6	81.0	73.0	59.5	3.40	3.23	3.11	23	1.017	250	180	300	0.022	27.5
2.2	3	1450	100L	84.3	85.0	84.1	81.5	74.0	61.0	4.87	4.62	4.45	33	1.476	210	170	300	0.041	37.0
3	4	1445	100L	85.5	85.9	84.8	82.0	75.0	62.5	6.50	6.18	5.95	44	2.020	210	170	300	0.050	40.0
3.7	5	1435	112M	86.3	87.0	87.0	86.5	83.0	74.0	7.53	7.15	6.90	59	2.509	220	150	290	0.076	50.0
4	5.5	1450	112M	86.6	87.6	87.5	85.0	80.5	71.0	8.26	7.84	7.56	58	2.684	220	200	300	0.083	53.0
5.5	7.5	1455	132S	87.7	88.7	88.6	85.5	80.5	70.0	11.1	10.6	10.2	81	3.678	255	210	305	0.123	70.5
7.5	10	1460	132M	88.7	89.6	89.5	84.0	78.5	67.0	15.3	14.5	14.0	112	4.998	275	200	305	0.142	82.0
11	15	1465	160M	89.8	90.6	90.7	86.5	83.0	74.5	21.5	20.4	19.7	160	7.306	220	180	300	0.296	115
15	20	1470	160L	90.6	91.3	91.2	86.5	82.5	73.5	29.1	27.6	26.6	220	9.929	220	185	300	0.427	140
18.5	25	1475	180M	91.2	91.7	91.6	85.5	83.0	76.5	36.0	34.2	33.0	230	12.20	200	185	300	0.654	180
22	30	1470	180L	91.6	92.4	92.2	85.5	83.5	77.5	42.7	40.5	39.1	270	14.56	195	155	250	0.770	200
30	40	1470	200L	92.3	92.9	92.9	87.5	84.5	77.0	56.4	53.6	51.7	420	19.86	230	180	300	1.217	255
37	50	1475	225SC	92.7	93.3	93.3	87.5	86.0	80.0	69.3	65.8	63.5	430	24.41	220	175	260	1.649	320
45	60	1480	225MC	93.1	93.3	92.9	86.0	82.5	75.0	85.4	81.1	78.2	580	29.58	210	170	300	1.979	355
55	75	1485	250MC	93.5	93.7	93.3	87.5	85.0	79.0	102	97.0	93.5	780	36.04	245	180	300	3.621	455
75	100	1480	280SB	94.0	94.0	93.2	87.0	84.0	77.5	139	132	128	1015	49.38	185	170	300	4.853	604
90	125	1480	280MB	94.2	94.0	93.2	85.5	82.5	75.5	170	161	155	1260	59.26	200	190	280	5.393	648
110	150	1484	315SB	94.5	94.5	93.8	88.5	86.0	79.0	200	190	183	1400	72.23	200	165	270	8.800	860
132	175	1484	315MB	94.7	94.7	94.0	88.5	86.0	79.0	239	227	219	1620	86.68	200	165	270	10.00	970
160	215	1485	315LB	94.9	94.9	94.2	88.5	87.0	80.0	289	275	265	2000	105.0	210	175	270	11.60	1050
200	270	1485	315LB	95.1	95.1	94.6	89.0	87.5	82.0	359	341	329	2450	131.2	200	165	270	14.40	1240
220	300	1485	355MB	95.1	95.1	94.4	87.0	83.5	74.5	404	384	370	2850	144.4	200	165	270	21.60	1650
250	335	1486	355MB	95.1	95.1	94.4	88.0	85.5	78.5	454	431	416	3100	163.9	200	165	270	24.40	1700
315	420	1488	355LB	95.1	95.1	94.6	88.5	85.5	78.5	569	540	521	3900	206.3	200	165	270	28.80	2000
375	500	1488	355CB	95.3	95.3	94.8	89.5	87.5	81.5	668	635	612	4450	245.6	200	165	270	34.40	2400

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.

Performance

IE 2 Performance Data (6 Pole)

Motor Type AESV2S / AESU2S / AESV2S-LA

OUTPUT		FULL LOAD rpm	FRAME SIZE	EFFICIENCY			POWER FACTOR			CURRENT				TORQUE					APPROX. WEIGHT kg
kW	HP			FULL LOAD (%)	3/4 LOAD (%)	1/2 LOAD (%)	FULL LOAD (%)	3/4 LOAD (%)	1/2 LOAD (%)	FULL LOAD (A)			LRC (A)	FULL LOAD kg-m	LOCKED ROTOR %FLT	PULL-UP %FLT	BREAK-DOWN %FLT	ROTOR GD ² kg-m ²	
										VOLTAGE									
										380	400	415	400V						
0.55	0.75	900	80M	73.1	68.8	64.9	67.0	57.0	44.0	1.71	1.62	1.56	7.0	0.595	225	220	250	0.012	18.0
0.75	1	935	90S	75.9	76.4	73.9	69.5	60.0	46.5	2.16	2.05	1.98	10	0.780	210	185	260	0.019	26.0
1.1	1.5	930	90L	78.1	78.8	76.9	71.5	62.0	48.5	2.99	2.84	2.74	14	1.151	215	190	260	0.026	30.0
1.5	2	950	100L	79.8	80.5	78.8	70.5	61.5	48.5	4.05	3.85	3.71	19	1.536	170	140	240	0.048	39.0
2.2	3	950	112M	81.8	82.4	81.1	75.0	66.5	53.0	5.45	5.18	4.99	34	2.253	280	255	300	0.071	47.0
3	4	960	132S	83.3	84.1	83.2	78.0	71.0	58.0	7.02	6.66	6.42	37	3.041	190	165	300	0.103	59.0
3.7	5	965	132M	84.3	84.3	82.8	76.0	68.5	55.0	8.78	8.34	8.04	61	3.731	180	180	270	0.131	63.0
4	5.5	960	132M	84.6	85.6	85.1	79.0	72.5	60.0	9.09	8.64	8.33	53	4.054	210	180	300	0.131	69.0
5.5	7.5	960	132M	86.0	86.9	86.5	79.5	72.5	60.5	12.2	11.6	11.2	78	5.574	230	195	300	0.188	82.0
7.5	10	960	160M	87.2	88.2	87.7	82.0	77.0	66.5	15.9	15.1	14.6	105	7.602	210	195	260	0.363	110
11	15	965	160L	88.7	89.2	88.6	81.5	76.0	65.0	23.1	22.0	21.2	170	11.09	245	205	300	0.558	140
15	20	975	180L	89.7	90.4	90.2	82.5	77.5	67.5	30.8	29.3	28.2	220	14.97	210	195	300	1.337	203
18.5	25	975	200L	90.4	91.0	90.9	79.5	75.0	65.5	39.1	37.2	35.8	260	18.46	215	195	300	1.604	250
22	30	980	200L	90.9	91.4	91.8	81.0	77.5	68.5	45.4	43.1	41.6	300	21.84	210	180	255	1.912	270
30	40	980	225MC	91.7	92.4	92.2	86.0	83.0	76.0	57.8	54.9	52.9	365	29.79	210	190	285	2.442	335
37	50	980	250MC	92.2	92.3	91.7	86.5	83.0	74.0	70.5	67.0	64.5	455	36.74	210	185	275	3.373	410
45	60	985	280SB	92.7	92.5	91.3	80.5	75.0	64.5	91.6	87.0	83.9	600	44.52	200	185	300	5.290	542
55	75	985	280MB	93.1	93.0	92.1	82.5	78.0	68.0	109	103	99.6	700	54.41	195	185	295	6.492	610
75	100	985	315SB	93.7	93.7	92.8	84.0	80.0	70.0	145	138	133	850	74.20	200	165	240	10.80	850
90	125	987	315MB	94.0	94.0	93.1	84.0	81.0	71.0	173	165	159	1070	88.86	200	165	240	12.80	900
110	150	988	315LB	94.3	94.3	93.7	85.0	82.0	73.0	209	198	191	1370	108.5	200	165	250	16.40	1030
132	175	988	315LB	94.6	94.6	94.0	85.0	82.0	73.0	249	237	228	1500	130.2	200	165	250	18.40	1150
160	215	988	355MB	94.8	94.8	94.2	85.5	82.0	73.0	300	285	275	2040	157.8	200	165	250	31.60	1650
200	270	988	355MB	95.0	95.0	94.6	86.0	83.5	76.0	372	353	341	2400	197.3	200	165	250	35.20	1800
220	300	988	355MB	95.0	95.0	94.6	86.0	83.0	75.5	409	389	375	2750	217.0	200	165	250	39.60	1900
250	335	988	355LB	95.0	95.0	94.6	86.0	83.0	75.5	465	442	426	3060	246.6	200	165	250	44.40	2080
315	420	988	355CB	95.2	95.2	94.8	87.0	85.0	78.0	578	549	529	3700	310.7	200	165	250	55.60	2650

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

Foot Mounted(B3)

Motor Type: AESV1S, AESV2S, AESV3S

Frame Size: 80M to 225M

B3

FIGURE 1

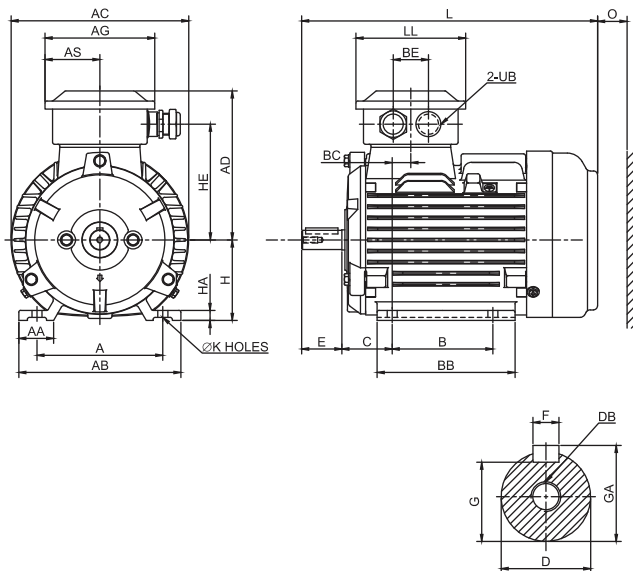
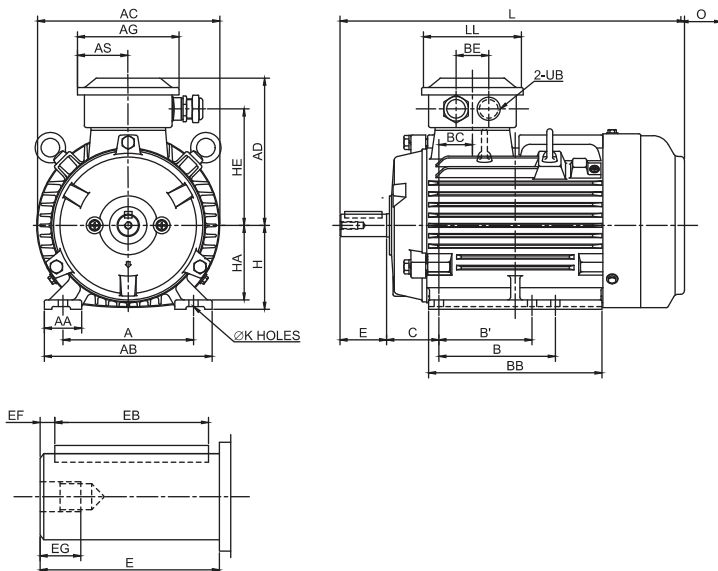


FIGURE 2



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

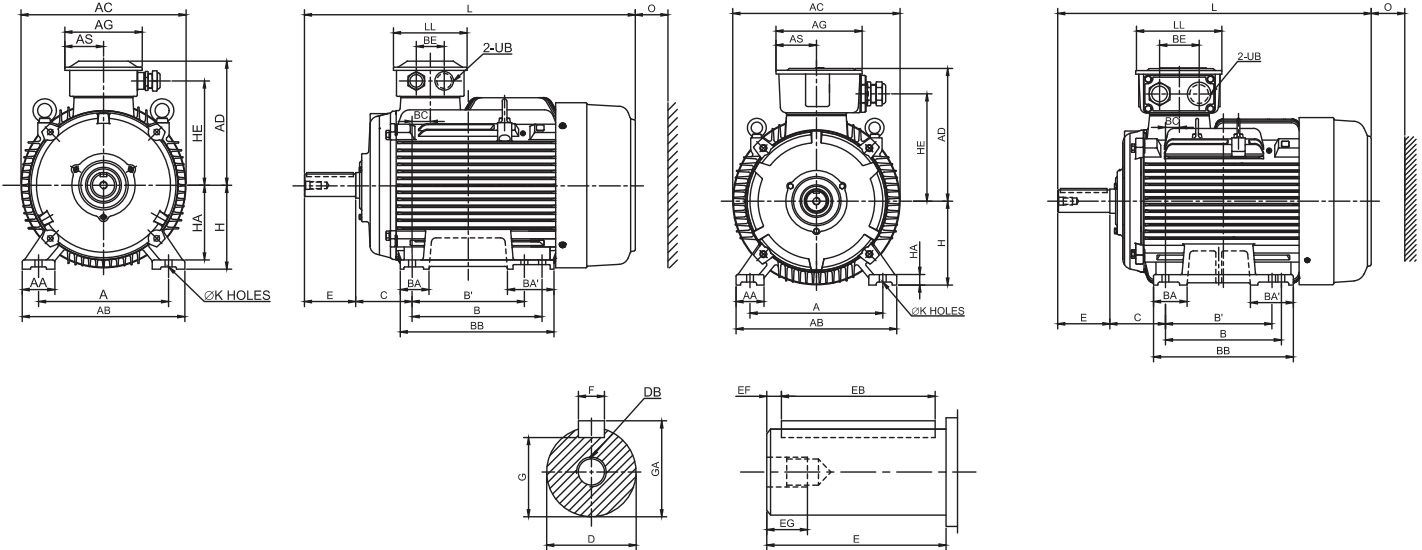
B3

Dimensions

B3 Outline Dimension

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

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) $\varnothing 19\sim\varnothing 28:j_6$, 2) $\varnothing 38\sim\varnothing 48:k_6$, 3) $\varnothing 55\sim\varnothing 65:m_6$
3. Tolerance of shaft center high H : +0, -0.5
4. Data are subject to change without prior notice

Dimensions

B3 Outline Dimension

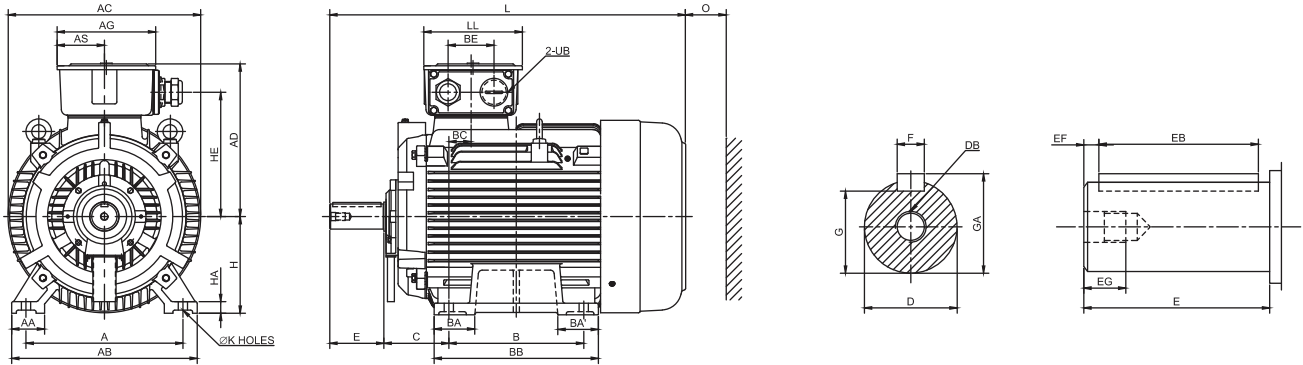
Foot Mounted(B3)

Motor Type: AESV1S, AESV2S, AESV3S

Frame Size: 250 M to 355C

B3

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	5	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	5	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	5	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	5	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	5	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	6	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	6	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	6	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	6	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	6	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

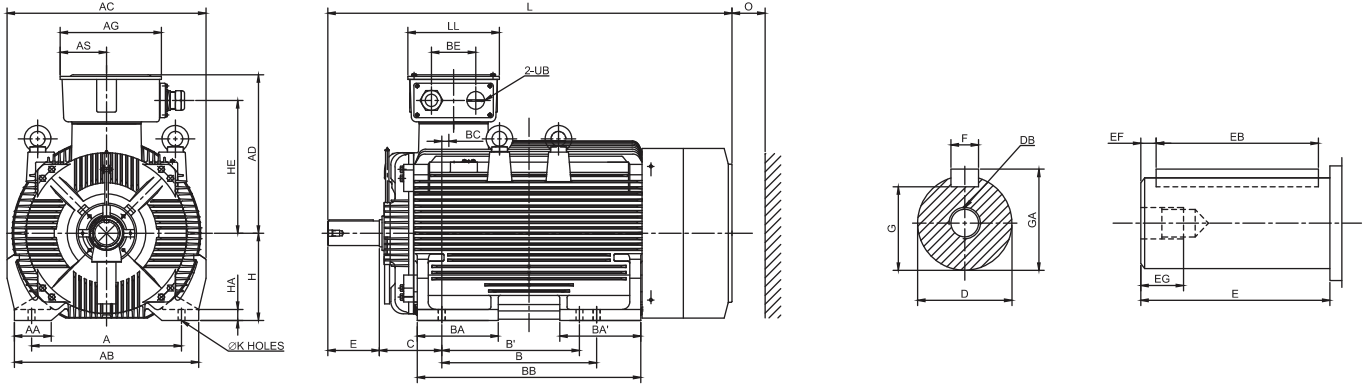
B3

Dimensions

B3 Outline Dimension

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

FIGURE 6



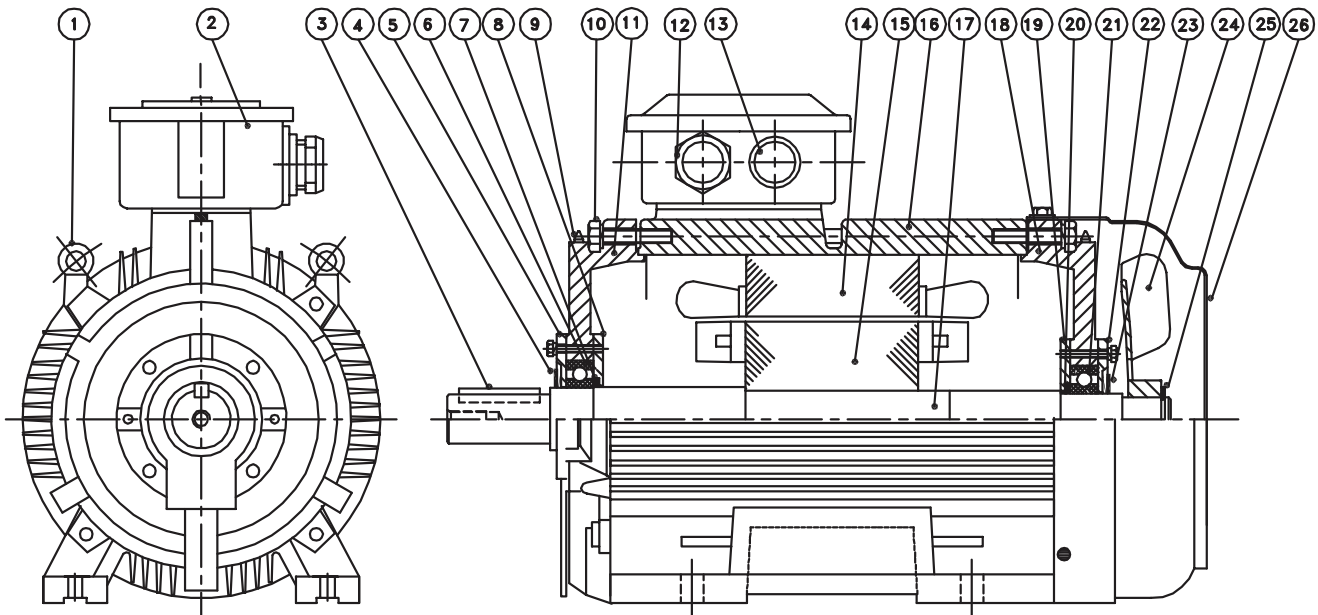
FRAME SIZE	H	HA	HE	K	L	LL	O	UB	SHAFT EXTENSION								BEARING		
									D	E	EB	EF	EG	F	G	GA	DB	DRIVE END	OPPOSITE DRIVE END
250MA	250	30	322	24	921	255	105	M63x1.5	60	140	125	7.5	42	18	53	64	M20	6313C3	6313C3
250MC	250	30	322	24	921	255	105	M63x1.5	65	140	125	7.5	42	18	58	69	M20	6315C3	6313C3
280SA	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

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	$P_{in} = E \cdot I \cdot \cos \dots\dots\dots (1 \Phi)$ $P_{in} = \sqrt{3} \cdot E \cdot I \cdot \cos \dots\dots\dots (3 \Phi)$	P_{in} in W	E: volt I: ampere
Output power	$P_{out} = E \cdot I \cdot \dots \cdot \cos \dots\dots\dots (1 \Phi)$ $P_{out} = \sqrt{3} \cdot E \cdot I \cdot \dots \cdot \cos \dots\dots\dots (3 \Phi)$	P_{out} in W	η : efficiency $\cos \Phi$: power factor
Efficiency	$= \frac{P_{out}}{P_{in}} \cdot 100\% = \frac{P_{in} - P_{loss}}{P_{in}} \cdot 100\%$	P_{loss} in W	
Power factor	$\cos = \frac{P_{in}}{\sqrt{3} \cdot E \cdot I} \cdot 100\% \dots\dots\dots (3 \Phi)$		
Synchronous speed	$N_s = \frac{120f}{P}$	N_s in min ⁻¹	f: frequency of the power supply P: poles
Slip	$S = \frac{N_s - N}{N_s} \cdot 100\%$		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	$t_s = \frac{GD^2N}{375(T_M - T_L)}$	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	$Q = \sqrt{3} \cdot E \cdot I \cdot \sin \dots\dots\dots (3 \Phi)$	Q in VAR	
Sound power level	$L_w = 10 \log\left(\frac{P}{P_o}\right)$ ($P_o = 10^{-12}W$)	L_w in dB	
Sound pressure level	$L_p = 20 \log\left(\frac{P}{P_o}\right)$ ($P_o = 2 \cdot 10^{-5}P_a$)	L_p in dB	Pa=1 N/m ²

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