



ALUMINIUM MOTORS CATALOGUE



ENERTECH

INTRODUCTION

Enertech electric motors with aluminum units are suitable for various kinds of applications. The output ratings are from 0.06kW to 11kW. The frame sizes are from 56 to 160.

The ESA motors have aluminum stator frames, endshields, feet and terminal boxes.

The location of the terminal box in standard design is on the top, on the right or on the left are possible. The position of the entry opening can be adjusted to suit the existing connection facilities by turning through 90°.

Those aluminum motors are suitable for the following applications: pumps, fans, compressors, conveyor systems, packaging machines, automation and drives, manufacturing industry...

Motors comply with the requirements of European CE marking.

Motors are designed for high efficiency IE1 and IE2, reliable operation and low temperature giving a long economical service life.

Enertech single phase Motors are an ideal general purpose motor range in cap start-cap run (ESD), cap-run (ESS).

ESS series aluminum housing single-phase capacitor-run asynchronous motors, with latest design are made of selected quality material and conform to the IEC standard. ESS motors are reliable in operation, good appearance, and can be maintained easily, while with low noise, little vibration and at the same time, light weight and simple in construction. The starting torque is 0.45~0.75 of full load torque.

This series motors are suitable where the requirements of starting torque is low and long-term continuous operation, such as home electric appliances, pumps, fans, etc.

ESD series aluminum housing, single-phase, dual-capacitor asynchronous motors. ESD motors have good performance, safety and reliable operation. The starting torque is 2.5 of full load torque.

This series motors are suitable for the occasion where the requirements of high starting torque and high load, such as air-compressors, pumps, and many other machines.



GENERAL SPECIFICATION

Cooling and ventilation

The standard cooling method is totally Enclosed fan-cooled (TEFC) in accordance with code IC411 of IEC 60034-6. Standard motors in sizes 80-315 are equipped with radial-flow plastic fans. Standard motors in size 355 are equipped with radial-flow aluminium fans.

Voltage and frequency

Standard voltages are 380V/50Hz or 415V/50Hz, but can be wound for any single voltage in the range 200-600V at a frequency 50 or 60 Hz. The motors will operate satisfactorily with voltage variations of $\pm 10\%$ from the rated voltage.

Noise

The permitted noise levels of electrical machines are fixed in IEC 60034 - 9 (EN 60034-9). The noise level of ESA-ESS-ESD motors is well below these limit value. For details, please refer to the performance data tables.

Quality assurance

Stringent quality procedures are observed from first design to finished products in accordance with ISO 9001 documented quality systems. Our factories have been assessed to meet these requirements, a further assurance that only the highest possible standards of quality are accepted.

Enclosure

The standard degree of protection is IP55. The IP55 enclosure means complete hoseproof and dustproof protection. A higher degree of protection is available.

Connection

Direct - on line starting can be used on all frame sizes. Motors up to and including 3kW are star connected and cannot be started with Star/Delt started. Motors 4kW and above can be started with Star/Delt started.

Vibration

Standard motors are designed for vibration class N (normal). Vibration class R (reduced) and vibration class S (special) are available on request.





GENERAL SPECIFICATION

Against solar radiation

High solar radiation will result in undue temperature rise. In these circumstances motors should be screened from solar radiation by placement of adequate sun-shades which do not inhibit air flow.

Degree of protection

Standard levels of enclosure protection for all ESC frame sizes for both motor and terminal box is IP55, with IP56, IP65 and IP66 available on request. Enclosure designations comply with IEC or AS60529. The enclosure protection required will depend upon the environmental and operational conditions within which the motor is to operate.

IP standard explanation

IP	5	5
	1	2

International protection rating prefix (IEC 60034 - 5)

First Numeral

First characteristic numeral

Degree of protection of persons against approach to live parts or contact with live or moving parts (other than smooth rotating shafts and the like) inside the enclosure, and degree of protection of equipment within the enclosure against the ingress of solid foreign bodies.

4. Protected against solid object greater than 1.0 mm: Wires or strips of thickness greater than 1.0 mm, solid objects exceeding 1.0 mm.
5. Dust protected: Ingress of dust is not totally prevented but it does not enter in sufficient quantity to interfere with satisfactory operation of the equipment.
6. Dust tight: No ingress of dust.

Second Numeral

Second characteristic numeral

4. Protected against splashing water: Water splashed against the enclosure from any direction shall have no harmful effect.
5. Protected against water jets: Water projected by a nozzle against the enclosure from any direction shall have no harmful effect.
6. Protected against heavy seas: Water from heavy seas or water projected in powerful jets (larger nozzle and higher pressure than second numeral 5) shall not enter the enclosure in harmful quantities.



Shaft

ESA-ESS-ESD motors have standard shaft extension lengths which provided with standard key, drilled and tapped hole. Non standard shaft extensions are available upon special order, with shaft design outlined on a detailed drawing. Shaft extension run out, concentricity and perpendicularity to face of standard flange mount motors, comply with normal grade tolerance as specified in IEC 60072-1 and AS1359. Precision grade tolerance is available upon special order.

Finish

Standard ESA-ESS-ESD motor color is RAL 9006. Other colors are also available. All castings and steel parts are provided with a prime coat of rust-resistant paint. The finishing coat of enamel paint is sufficient for normal conditions, however special paint systems can be provided to accommodate stringent requirements for motors in corrosive environments. Special coatings are needed to resist such substances as acid, salt water and extreme climatic conditions.

Electrical design

As standard, ESA-ESS-ESD motors have the following design and operating parameters. Performance data is based on this standard. Any deviation should be examined and performance values altered in accordance with the information provided in this section.

Three phase, 380V, 50Hz

Ambient cooling air temperature, 40°C

Altitude - 1000m Duty cycle S1 (continuous)

Rotation - Clockwise viewed from drive end

Connection - 220 volt Delta/380 volt Star (3kW and below)

- 380 volt Delta/660 volt Star (4kW and above)

Voltage and frequency

Standard ESA-ESS-ESD motors are designed for a power supply of three phase 380V, 50Hz. Motors can be manufactured for any supply between 100V and 600V and frequencies other than 50Hz.



STANDARD AND REGULATION

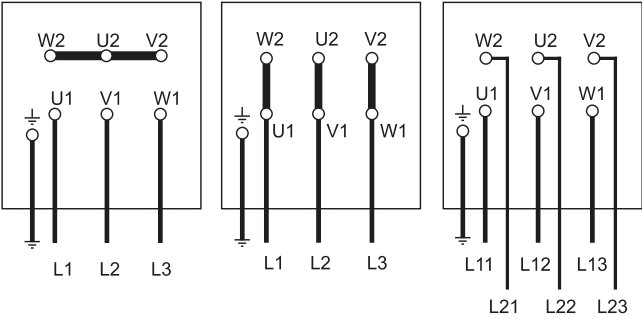
ESA-ESS-ESD motors are built to comply with the requirements of the following international standards and regulation:

1. International Electrotechnical commission - IEC 60034 and IEC 60072.
2. British Standards - BS5000 and BS 4999.
3. Australian Standards -AS 1359.
4. The requirements of European EC marking. Low voltage Directive 73/23 (1973), modified by Directive 93/68 (1993) and the EMC - Directive 89/336. These ESC motors are designed to use with other machinery, and they should only be used if the complete machinery is in conformity with the provisions of the Directive of safety of machinery (89/93/EEC).WW

Standards	IEC	CENELEC	BS
General requirements for electrical machines	60034-1	EN 60034-1	4999-1 4999-69
Methods of determining losses and efficiency	60034-2	HD 53 2	4999-34
Degrees of protection	60034-5	EN60034-5	4999-20
Methods of cooling	60034-6	EN60034-6	4999-21
Mounting arrangements	60034-7	EN60034-7	4999-22
Terminal markings and direction of rotation	60034-8	HD 53 8S4	4999-3
Noise limits	60034-9	EN60034-9	4999-51
Starting performance	60034-12	EN60034-12	4999-112
Mechanical vibration	60034-14	EN60034-14	4999-50
Standard voltages	60038	HD 472 S1	---
Dimensions and output ratings	60072	---	---
Mounting dimensions and relationship framesizes-output ratings	60072	HD 231	4999-10 51-110
Shaft dimensions	60072	HD 231	4999-10
Classification of environmental conditions	600721-2-1	---	---
Insulation material	60085	---	---

*The ESA motor range corresponds to the new international standard IEC 60034-30

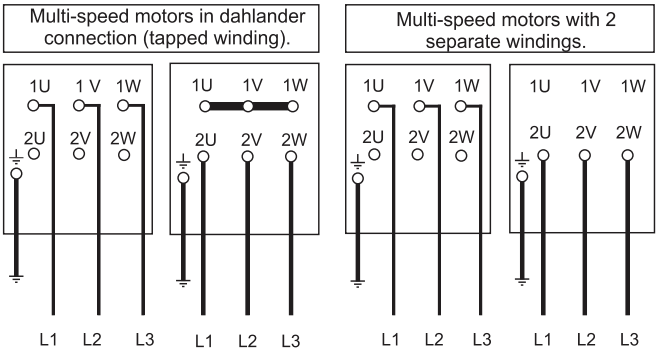
Connection Diagrams



Star connection

Delta connection

Connection to Star-delta starter



Low speed



High speed


Low speed

High speed

Rating Plate


Frame size from 56 to 160

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TYPE					SERIAL NUMBER				
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	AMB.TEMP		°C		DUTY				
BEARING DE				NDE		WEIGHT		KG	
VOLTS	CONN.	Hz	kW	RPM	AMP	Cos Ø	EFF.%		



ENERTECH ELECTRIC MOTORS(AUSTRALIA)

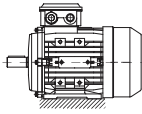
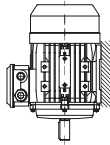
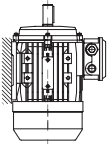
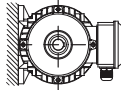
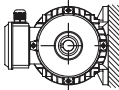
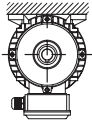
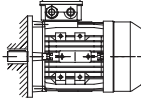
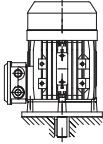
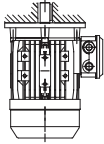
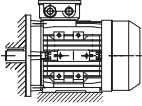
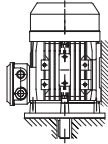
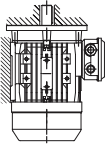
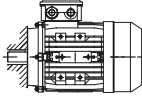
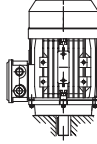
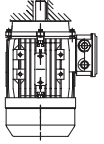
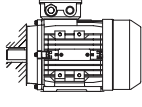
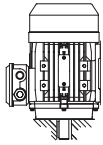
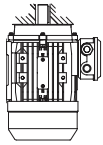
3 PHASE ASYNCHRONOUS MOTOR



IE 2

TYPE				SERIAL NUMBER			
○	INS.CL.		IP	PRODUCT CODE:			○
	AMB.TEMP		°C	DUTY			
BEARING DE			NDE		WEIGHT		KG
VOLTS	CONN.	Hz	kW	RPM	AMP	Cos Ø	EFF.%

Mounting

Foot mount <div>  B3 (IM1001)* </div>	<div>  V5 (IM1011) </div>	<div>  V6 (IM1031) </div>
<div>  B6 (IM1051) </div>	<div>  B7 (IM1061) </div>	<div>  B8 (IM1071) </div>
Large flange mount <div>  B5 (IM3001)* </div>	<div>  V1 (IM3011)* </div>	<div>  V3 (IM3031) </div>
Large flange and feet <div>  B3/B5 (IM2001)* </div>	<div>  V1/V5 (IM2011) </div>	<div>  V3/V6 (IM2031) </div>
Small flange mount <div>  B14 (IM3601) </div>	<div>  V18 (IM3611) </div>	<div>  V19 (IM3631) </div>
Small flange and feet <div>  B3/B14 (IM2101) </div>	<div>  V5/V18 (IM2111) </div>	<div>  V6/V19 (IM2131) </div>



GENERAL SPECIFICATION

Duty

EnerTech motors are suitable for S1 operation (continuous operation under rated load). When the motor is operated under any other type of duty the following information should be supplied to determine the correct motorsize:

1. Continuous duty S1: The motor works at a constant load for enough time to reach temperature equilibrium.

2. Short time duty S2: The motor works at a constant load, but not long enough to reach temperature equilibrium, and the rest periods are long enough for the motor to reach ambient temperature.

3. Intermittent periodic duty S3: Sequential, identical run and rest cycles with constant load. Temperature equilibrium is never reached. Starting current has little effect on temperature rise.

4. Intermittent periodic duty with starting S4: Sequential identical start, run and rest cycles with constant load. Temperature equilibrium is not reached, but starting current affects temperature rise.

5. Intermittent periodic duty with electric braking S5: Sequential, identical cycles of starting, running at constant load, electric braking and rest. Temperature equilibrium is not reached.

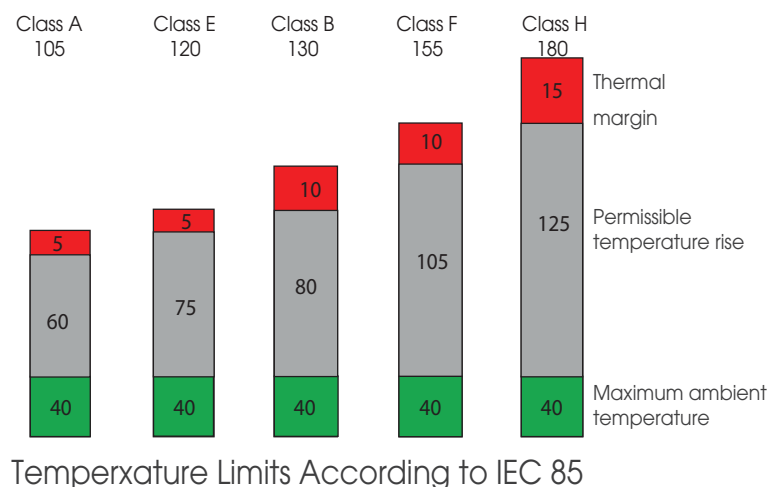
6. Continuous operation with intermittent load S6: Sequential, identical cycles of running with constant load and running with no load. No rest periods.

7. Continuous operation with electric braking S7: Sequential, identical cycles of starting, running at constant load and electric braking. No rest periods.

8. Continuous operation with periodic changes in load and speed S8: Sequential, identical, duty cycles of start, running at constant load and given speed, then run at other constant load and speeds. No rest periods.

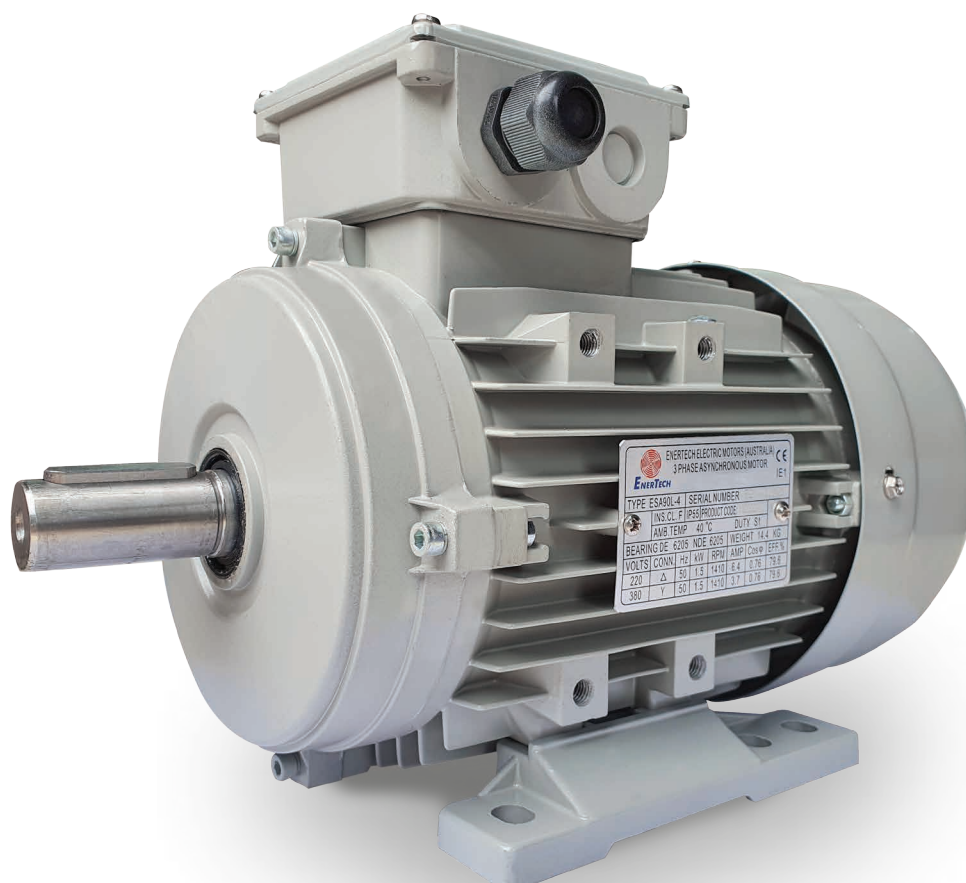
Insulation

The insulation system is Class F (155°C) and the motors are designed to operate with Class B (80°C). This ensures long life and reliability with the ability to withstand ambient temperatures as high as 54°C or up to 15% overload in adverse electrical supply situations. Non-Standard ESS-ESD will provide a safety margin of 45°C and can be safely operated at elevated ambient temperatures. Due to their conservative design many sizes in the ESC range of motors have temperature rises considerably less than 80°C and therefore provide even greater safety margins.



ESA SERIES

THREE-PHASE ALUMINIUM MOTORS





GENERAL SPECIFICATION

Motor wound for 50Hz at rated voltage	Connected to	Data in percentage of values at 50Hz and rated voltage						
		Output	r/min	I_L/I_N	I_L	T_N	T_L/T_N	T_B/T_N
380V	400V 50Hz	100	100	95	110	100	110	110
	380V 60Hz	100	120	98	83	83	70	85
	400V 60Hz	105	120	98	90	87	80	90
	415V 60Hz	110	120	98	95	91	85	93
	440V 60Hz	115	120	100	100	96	95	98
	460V 60Hz	120	120	100	105	100	100	103
400V	380V 50Hz	100	100	105	91	100	90	90
	415V 50Hz	100	100	96	108	100	108	108
	400V 60Hz	100	120	98	83	83	70	85
	415V 60Hz	104	120	98	89	86	75	88
	440V 60Hz	110	120	98	95	91	85	93
	460V 60Hz	115	120	100	100	96	93	98
415V	480V 60Hz	120	120	100	105	100	100	103
	380V 50Hz*	100	100	109	84	100	84	84
	400V 50Hz	100	100	104	93	100	93	93
	440V 50Hz	100	100	94	112	100	112	112
	415V 60Hz	100	120	98	83	83	70	85
	440V 60Hz	105	120	98	90	87	80	90
525V	460V 60Hz	110	120	98	95	91	85	94
	480V 60Hz	115	120	100	100	96	95	98
	550V 50Hz	100	100	95	110	100	110	110
	525V 60Hz	100	120	98	83	83	70	85
	550V 60Hz	105	120	98	90	87	80	90
	575V 60Hz	110	120	98	95	91	85	94
	600V 60Hz	115	120	100	100	96	95	98

*Not applicable for motors with F class temperature rise

*Note: This table is not applicable for hazardous area motors

1) I_N = Full load current T_N = Full load torque motors

I_L/I_N = Locked rotor current/full load current

T_L/T_N = Locked rotor torque/full load torque

T_B/T_N = Breakdown torque/full load torque

Standard torque values for alternative supplies are obtainable only with special windings. For these purpose-built motors the performance data is the same as for 380V motors except for the currents which are calculated with the accompanying formula:

Where:

$$I_x = \frac{380 \times I_N}{U_x}$$

I_x = Current

I_N = Full load current at 380 volt

U_x = Design voltage

Temperature and altitude

Standard torque values for alternative supplies are obtainable only with special windings. For these purpose-built motors the performance data is the same as for 380V motors except for the currents which are calculated with the accompanying formula:

Ambient temperature	Temperature factor	Altitude above sea level	Altitude factor
30°C	1.06	1000m	1.00
35°C	1.03	1500m	.98
40°C	1.00	2000m	0.94
45°C	0.97	2500m	0.91
50°C	0.93	3000m	0.87
55°C	0.88	3500m	0.82
60°C	0.82	4000m	0.77

$$\text{Effective Power} = \frac{\text{Rated Power}}{\text{Temperature Factor} \times \text{Altitude Factor}}$$

Example 1

Effective Power required = 2.2 kW

Air temperature = 50°C (factor 0.93)

Altitude = 2500 metres (factor 0.91)

$$\text{Rated power required} = \frac{2.2}{0.93 \times 0.91} = 2.6 \text{ kW}$$

The appropriate motor is one with a rated power above the required, being 3 kW.

Example 2

Rated power = 7.5 kW

Air temperature = 50°C (factor 0.93)

Altitude = 1500 metres (factor 0.98)

$$\text{Effective Power} = 7.5 \times 0.93 \times 0.98 = 6.84 \text{ kW}$$

Rotation

For clockwise rotation, viewed from drive end, standard three phase ESA motor terminal markings coincide with the sequence of the phase line conductors.

For counter clockwise rotation, viewed from drive end, two of the line conductors have to be reversed. This is made clear in the table of connection diagrams three phase motors with cage rotor.

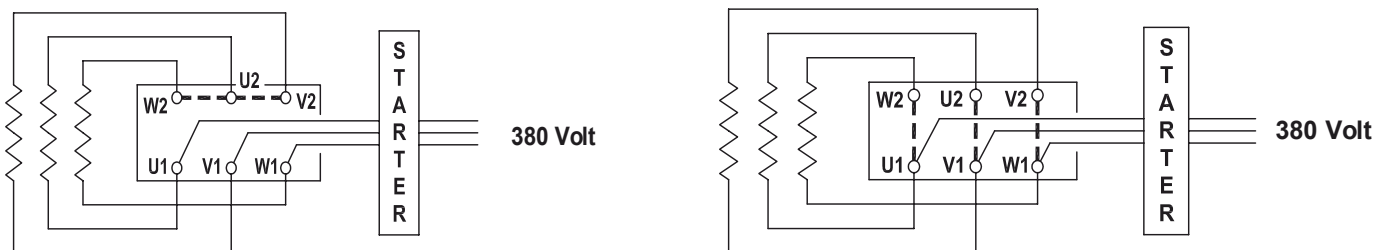
Connection

A motor's rated voltage must agree with the power supply line-to-line voltage. It is careful to Ensure the correct connection to the motor terminals.

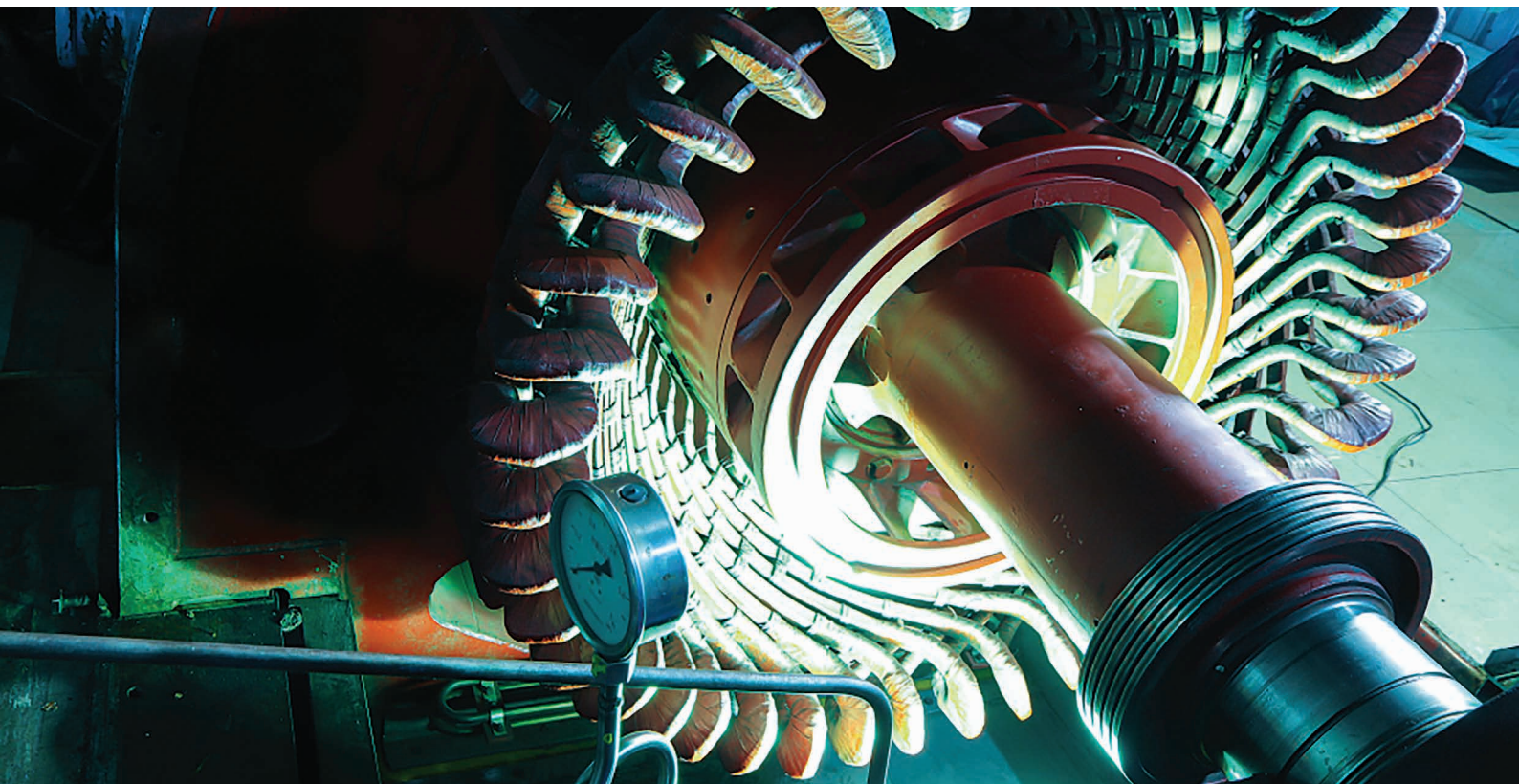
Internal connections, voltages and VF drive selection

Standard terminal connections for motors 3kW and below is 220V delta / 380V star. These motors are designed for 380V Direct On Line (D.O.L.) starting, when connected in the star configuration. They are also suitable for operation with 220V three phase variable frequency drives when connected in the delta configuration. Standard terminal connection for motors 4kW and above is 380V delta / 660V star. These motors are designed for 380V Direct On Line (D.O.L.) starting, when connected in the delta configuration. They are also suitable for operation with 380V three phase variable frequency drives. Alternatively they can be operated D.O.L. in the star configuration from a 660V supply or with a 60V variable frequency drive. In this case the drive must be supplied with an output reactor to protect the winding insulation. These size motors are also suitable for 380V star-delta starting as described below. Motor connected for D.O.L. starting with bridges in place for star connection (3kW and below).

Connection Diagram for ESA series:



Motor connected for D.O.L. starting with bridges in place for delta connection (4kW and above).



Starting

All of the following starter options are available and are the best supplied together with the motor.

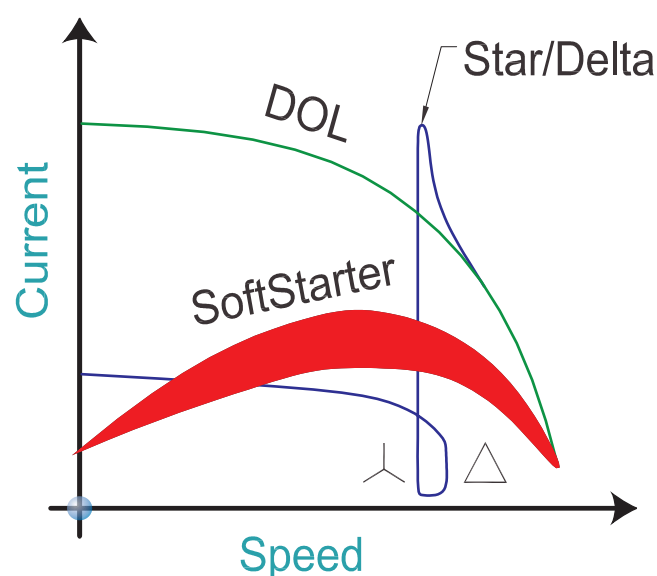
D.O.L Starter

When an electric motor is started by direct connection to the power supply (D.O.L.), it draws a high current, called the 'starting current', which is approximately equal in magnitude to the locked rotor current I_L . As listed in the performance data, locked rotor current can be up to 8 times the rated current I_N of the motor. In circumstances where the motor starts under no load or where high starting torque is not required, it is preferable to reduce the starting current by one of the following means.

Star - Delta starting

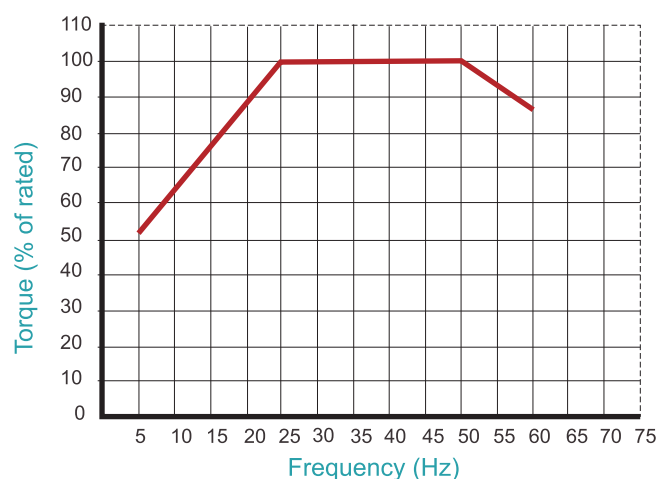
The ESA motors 4kW and above are suitable for the star-delta starting method. Through the use of a star-delta starter, the motor terminals are connected in the star configuration during starting, and reconnected to the delta configuration when running.

The benefits of this starting method are a significantly lower starting current, to a value about 1/3 of the D.O.L. starting current, and a corresponding starting torque also reduced to about 1/3 of its D.O.L. value. It should be noted that a second current surge occurs on change-over to the delta connection. The level of this surge will depend on the speed the motor has reached at the moment of changeover.



VVVF

Variable Voltage Variable Frequency drives are primarily recognized for their ability to manipulate power from a constant 3 phase 50/60Hz supply converting it to variable voltage and variable frequency power. This enables the speed of the motor to be matched to its load in a flexible and energy efficient manner. The only way of producing starting torque equal to full load torque with full load current is by using VVVF drives. The functionally flexible VVVF drive is also commonly used to reduce energy consumption on fans, pumps and compressors and offers a simple and repeatable method of changing speeds or flow rates.



EDM Concerns

Capacitive voltages in the rotor can be generated due to an effect caused by harmonics in the waveform causing voltage discharge to earth through the bearings. This discharge results in etching of the bearing running surfaces. This effect is known as Electrical Discharge Machining (EDM). It can be controlled with the fitment of appropriate filters to the drive. To further reduce the effect of EDM, an insulated non drive bearing can be used.

Speed at partial loads

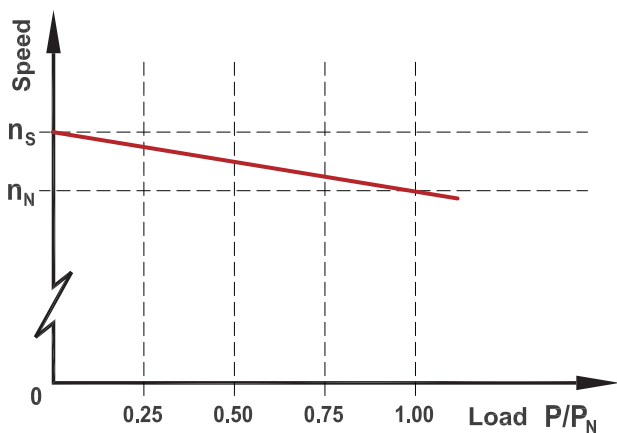
The relationship between the motor speed and the degree of loading on an ESA motor is approximately linear up to the rated load. This is expressed graphically in the accompanying drawing.

Where:

n_N = full load speed

n_S = asynchronous speed

P/P_N = partial load factor



Current at partial loads

Current at partial loads can be calculated using the following formula.

$$\text{Where: } I_x = \frac{P_{out_x}}{\sqrt{3} \times U_N \times \cos\phi_x \times \eta} \times 10^5$$

I_x = partial load current (amps)

P_{out_x} = partial load (kW)

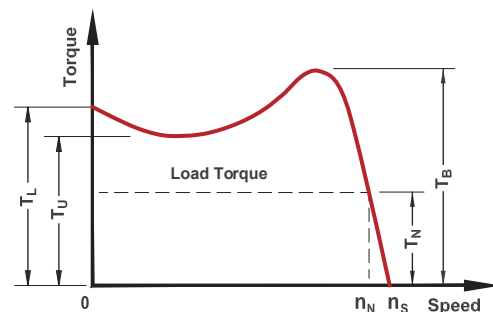
U_N = rated voltage

$\cos\phi_x$ = partial load power factor

η_x = partial load efficiency (%)

Torque characteristics

Typical characteristics of torque behaviour relative to speed are shown in the torque speed curve example below.



Where:

T_N = full load torque

T_L = locked rotor torque

T_U = pull-up torque

T_B = break down torque

n_N = full load speed

n_S = asynchronous speed

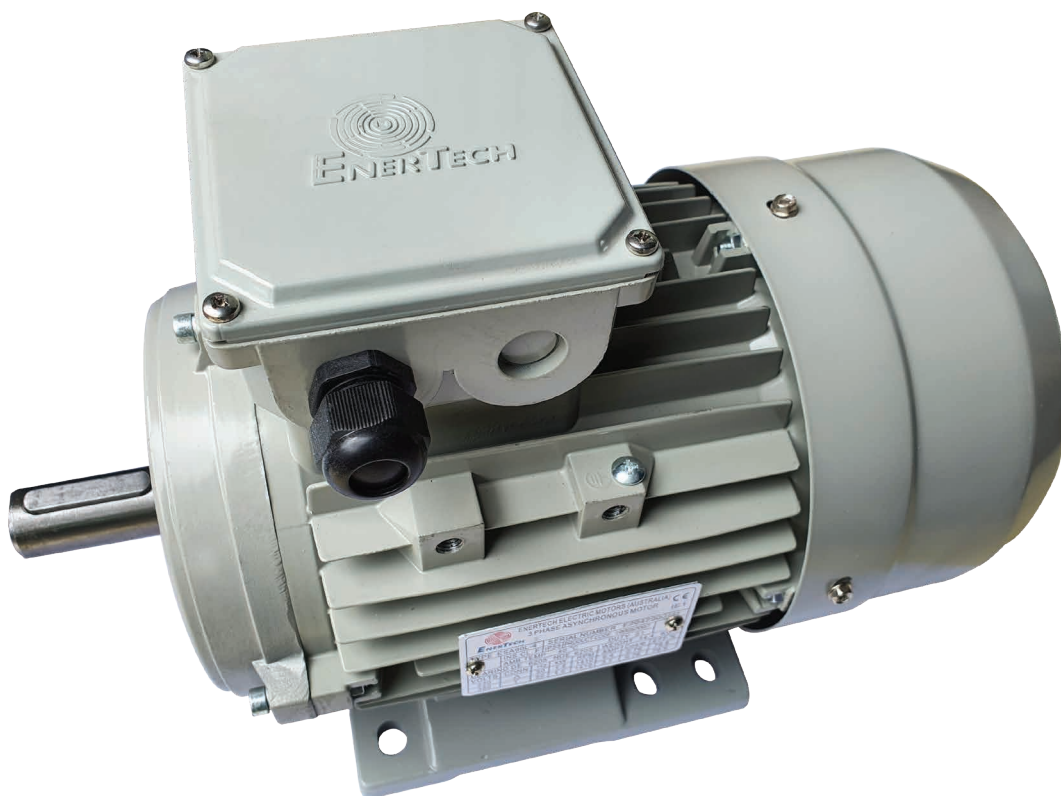
ESA-ESS-ESD motors all exceed the minimum starting torque requirements for Design N (Normal torque) as specified in IEC60034-12, and in most cases meet the requirements of Design H (High torque). Rated torque can be calculated with the following formula:

$$\text{Where: } T_N = \frac{9950 \times P_N}{n_N}$$

T_N = full load torque (Nm)

P_N = full load output power (kW)

n_N = full load speed (r/min)



2 Pole - 3000 rpm asynchronous speed 50 Hz

Frame size	Output (kW)	Full load speed (RPM)	Current			Efficiency at 100% full load	Power factor cos φ at 100% full load	Locked rotor I _L /I _N	Torque			Noise level at 1m dB (A)	Net weight (kg)
			full load I _N 50 Hz						Full load torque T _N (Nm)	Locked rotor torque T _L /T _N	Break down torque T _B /T _N		
			220V (A)	380V (A)	660V (A)								
56 1	0.09	2710	0.68	0.38		53.0	0.72	4	0.32	2.2	2.3	58	2.6
56 2	0.12	2710	0.73	0.42		61.0	0.72	4	0.42	2.2	2.3	58	3.0
63 1	0.18	2710	1.00	0.58		63.0	0.75	6	0.63	2.2	2.4	61	4.0
63 2	0.25	2710	1.29	0.75		65.0	0.78	6	0.88	2.2	2.4	61	4.2
71 1	0.37	2730	1.76	1.02		70.0	0.79	6	1.29	2.2	2.4	64	5.2
71 2	0.55	2760	2.57	1.49		71.0	0.79	6	1.90	2.2	2.4	64	6.0
80 1	0.75	2770	3.21	1.86		73.0	0.84	6	2.59	2.2	2.4	67	8.7
80 2	1.1	2770	4.56	2.64		76.2	0.83	6	3.79	2.2	2.4	67	10.0
90S	1.5	2840	5.97	3.46		78.5	0.84	6	5.04	2.2	2.4	72	12.0
90L	2.2	2840	8.39	4.85		81.0	0.85	6	7.40	2.2	2.4	72	14.0
100L	3	2840	11.0	6.34		82.6	0.87	7	10.09	2.2	2.3	76	20.0
112M	4	2580		8.30	4.78	84.2	0.87	7.5	14.81	2.2	2.3	77	26.0
132 S1	5.5	2900		11.1	6.38	85.7	0.88	7.5	18.11	2.0	2.2	80	38.0
132 S2	7.5	2920		14.9	8.57	87.0	0.88	7.5	24.53	2.0	2.2	80	41.3
132M	9.2	2930		17.8	10.3	88.0	0.89	7.5	29.99	2.0	2.2	81	48.2
160M	11	2940		21.0	12.1	88.4	0.90	7.5	35.73	2.0	2.2	86	76.0



4 Pole - 1500 rpm asynchronous speed 50 Hz

IE1

Frame size	Output (kW)	Full load speed (RPM)	Current			Efficiency at 100% full load	Power factor cos φ at 100% full load	Locked rotor I _L /I _N	Torque			Noise level at 1m dB (A)	Net weight (kg)
			full load I _N 50 Hz						Full load torque T _N (Nm)	Locked rotor torque T _L /T _N	Break down torque T _B /T _N		
			220V (A)	380V (A)	660V (A)								
56 1	0.06	1360	0.64	0.37		50.0	0.56	4	0.42	2.3	2.4	50	2.9
56 2	0.09	1360	0.82	0.47		52.0	0.59	4	0.63	2.3	2.4	50	3.2
63 1	0.12	1360	1.00	0.58		52.0	0.64	4	0.84	2.2	2.4	52	3.7
63 2	0.18	1360	1.28	0.74		57.0	0.65	4	1.26	2.2	2.4	52	4.2
71 1	0.25	1365	1.52	0.88		60.0	0.72	6	1.74	2.2	2.4	55	5.0
71 2	0.37	1370	2.02	1.17		65.0	0.74	6	2.58	2.2	2.4	55	5.8
80 1	0.55	1370	2.87	1.66		67.0	0.75	6	3.83	2.2	2.4	58	8.1
80 2	0.75	1380	3.50	2.03		72.0	0.78	6	5.19	2.2	2.4	58	9.1
90S	1.1	1400	4.80	2.78		76.2	0.79	6	7.50	2.2	2.4	61	11.7
90L	1.5	1400	6.27	3.63		78.5	0.80	6	10.23	2.2	2.4	61	14.4
100L 1	2.2	1420	8.80	5.09		81.0	0.81	7	14.80	2.2	2.3	64	19.2
100L 2	3	1420	11.8	6.81		82.6	0.81	7	20.18	2.2	2.3	64	22.5
112M	4	1430		8.70	5.01	84.2	0.83	7	26.71	2.2	2.2	65	29.0
132S	5.5	1450		11.6	6.68	85.7	0.84	7	36.22	2.2	2.2	71	39.0
132M	7.5	1450		15.4	8.87	87.0	0.85	7	49.40	2.2	2.2	71	48.6
132L 1	9.2	1460		18.8	10.8	87.5	0.85	7.5	60.18	2.2	2.2	74	56.5
160M	11	1460		21.7	12.5	88.4	0.87	7	71.95	2.2	2.2	75	73.0

IE2

80	0.75	1410	3.25	1.88	1.08	79.6	0.76	5.3	5.08	2.8	3.0	58	9.1
90S	1.1	1420	4.55	2.63	1.52	81.4	0.78	6.7	7.40	3.8	2.6	61	11.7
90L	1.5	1420	6.02	3.48	2.01	82.8	0.79	7.2	10.09	4.0	2.7	61	14.4
100L1	2.2	1440	8.78	5.08	2.93	84.3	0.80	7.4	14.59	3.6	3.6	64	19.2
100L2	3	1440	11.51	6.66	3.84	85.5	0.80	7.8	19.90	3.8	3.5	64	22.5
112M	4	1440	14.97	8.66	4.99	86.6	0.81	7.1	26.53	3.1	2.9	65	29.0
132S	5.5	1450	19.78	11.45	6.59	87.9	0.83	7.4	36.22	2.6	2.7	71	39.0
132M	7.5	1450	26.42	15.29	8.81	88.7	0.84	7.7	49.40	2.8	2.7	71	48.6
160M	11	1450	39.20	22.70	13.07	89.8	0.82	7.7	72.45	2.7	3.1	75	73.0

6 Pole - 1000 rpm asynchronous speed 50 Hz

IE1

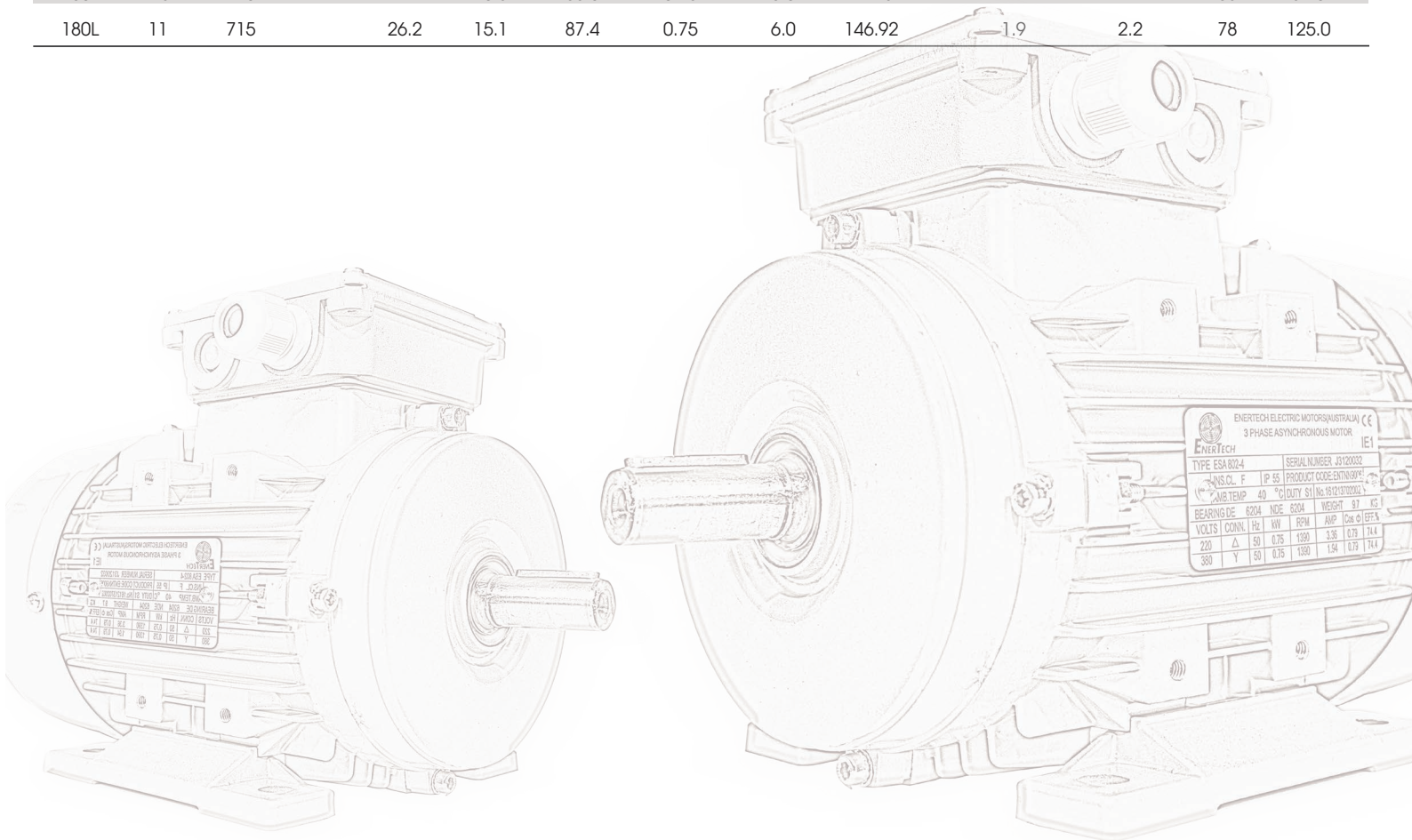
Frame size	Output (kW)	Full load speed (RPM)	Current			Efficiency at 100% full load	Power factor cos φ at 100% full load	Locked rotor I _L /I _N	Torque			Noise level at 1m dB (A)	Net weight (kg)
			full load I _N 50 Hz						Full load torque T _N (Nm)	Locked rotor torque T _L /T _N	Break down torque T _B /T _N		
			220V (A)	380V (A)	660V (A)								
63 1	0.09	840	0.92	0.53		42.0	0.61	3.5	1.02	2.0	2.0	50	4.2
63 2	0.12	850	1.13	0.65		45.0	0.62	3.5	1.35	2.0	2.0	50	4.5
71 1	0.18	880	1.28	0.74		56.0	0.66	4	1.95	1.6	1.7	52	5.6
71 2	0.25	900	1.59	0.92		59.0	0.70	4	2.65	2.1	2.2	52	6.0
80 1	0.37	900	2.24	1.30		62.0	0.70	4	3.93	1.9	1.9	56	8.1
80 2	0.55	900	2.99	1.73		67.0	0.72	4	5.84	2.0	2.3	56	9.6
90S	0.75	920	3.96	2.29		69.0	0.72	5.5	7.79	2.2	2.2	59	11.3
90L	1.1	925	5.49	3.18		72.0	0.73	5.5	11.36	2.2	2.2	59	14.4
100L 1	1.5	945	9.00	4.05		74.0	0.76	6	15.16	2.2	2.2	61	18.8
112M	2.2	955	9.70	5.64		78.0	0.76	6	22.00	2.2	2.2	64	25.0
132S	3	960	13.1	7.59		79.0	0.76	6.5	29.84	2.0	2.0	64	35.0
132M 1	4	960	17.2		5.72	80.5	0.76	6.5	39.79	2.0	2.0	68	47.0
132M 2	5.5	960	22.6		7.53	83.0	0.77	6.5	54.71	2.0	2.0	68	50.0
160M	7.5	960	28.6		9.50	86.0	0.80	6.5	74.61	2.0	2.2	68	70.0
160L	11	960	41.8		13.9	87.5	0.79	6.5	109.43	2.0	2.2	73	87.0

IE2

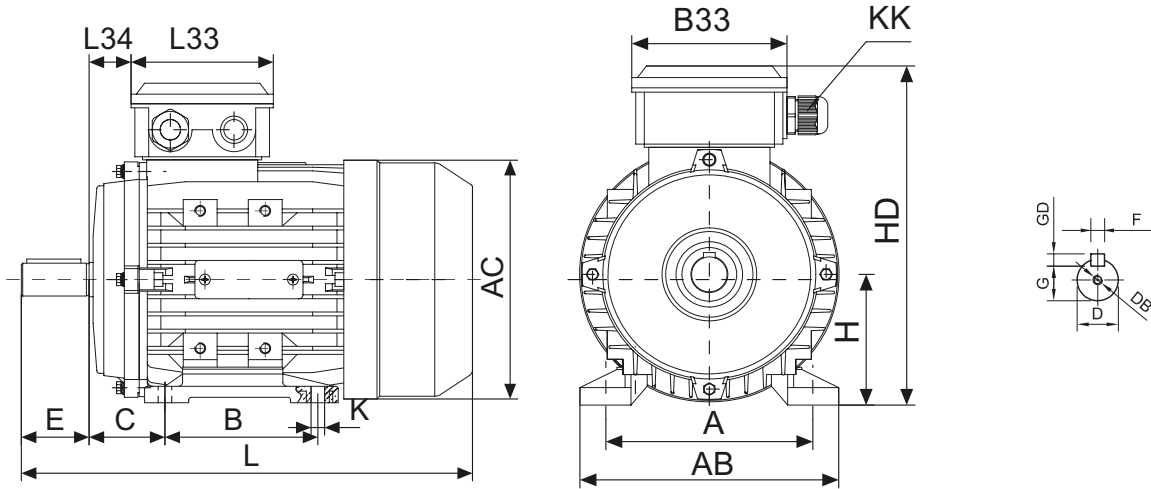
90S	0.75	925	3.65	2.11	1.22	76.0	0.71	4.7	7.74	3.1	3.1	59	11.3
90L	1.1	930	5.13	2.97	1.71	78.1	0.72	5	11.30	3.2	3.2	59	14.4
100L	1.5	940	6.74	3.90	2.25	80.0	0.73	5.9	15.24	3.1	2.9	61	18.8
112M	2.2	945	9.41	5.45	3.14	81.8	0.75	5.5	22.23	2.6	2.8	64	25.0
132S	3	960	12.44	7.20	4.15	83.3	0.76	5.7	29.84	2.2	2.7	64	35.0
132M1	4	960	16.11	9.33	5.37	84.6	0.77	6.2	39.79	2.4	2.7	68	47.6
132M2	5.5	960	21.80	12.62	7.27	86.0	0.77	6.7	54.71	2.6	2.7	68	50.7
160M	7.5	970	29.21	16.91	9.74	87.5	0.77	5.6	73.84	2.0	2.8	68	70.0
160L	11	970	41.59	24.08	13.86	89.0	0.78	5.8	108.30	2.0	2.8	73	87.0

8 Pole - 750 rpm asynchronous speed 50 Hz

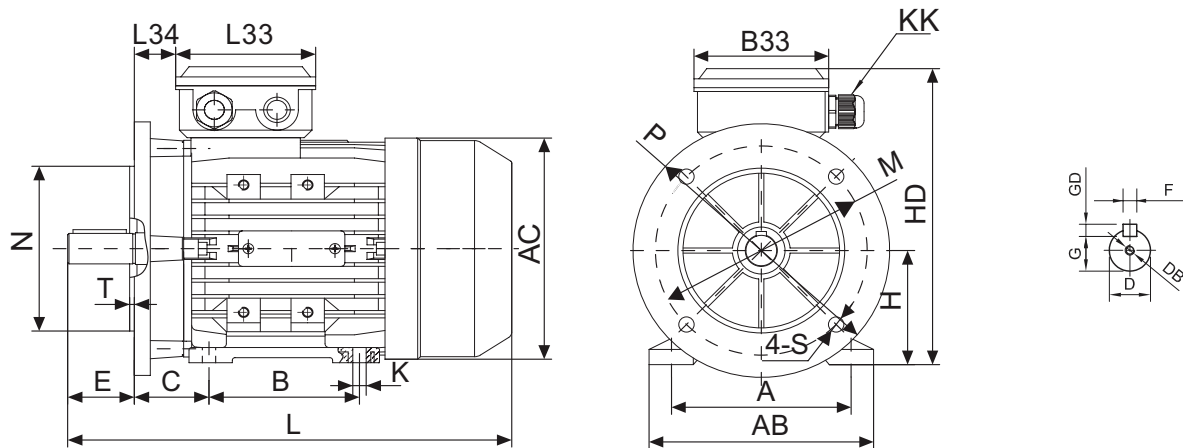
Frame size	Output (kW)	Full load speed (RPM)	Current			Efficiency at 100% full load	Power factor cos ϕ at 100% full load	Locked rotor I_L / I_N	Torque			Noise level at 1m dB (A)	Net weight (kg)
			full load I_N 50 Hz						Full load torque T_N (Nm)	Locked rotor torque T_L / T_N	Break down torque T_B / T_N		
			220V (A)	380V (A)	660V (A)								
71 1	0.09	680	0.88	0.51		46.0	0.56	3.0	1.26	1.5	1.7	50	5.6
71 2	0.12	680	1.05	0.61		51.0	0.59	2.7	1.68	1.6	1.7	50	6.0
80 1	0.18	680	0.52	0.88		51.0	0.61	2.8	2.53	1.5	1.7	52	9.4
80 2	0.25	680	1.92	1.11		56.0	0.61	2.7	3.51	1.6	2.0	52	10.1
90S	0.37	680	2.45	1.42		63.0	0.63	2.8	5.20	1.6	1.8	56	12.5
90L	0.55	680	3.36	1.95		66.0	0.65	3.0	7.72	1.6	1.8	56	15.3
100L 1	0.75	710	4.45	2.58		66.0	0.67	3.5	10.09	1.7	2.1	59	17.2
100L 2	1.1	710	5.81	3.36		72.0	0.69	3.5	14.80	1.7	2.1	59	19.5
112M	1.5	710	7.82	4.53		74.0	0.68	4.2	20.18	1.8	2.1	61	25.5
132S	2.2	720	10.3	6.28		75.0	0.71	5.5	29.18	2.0	2.0	64	34.2
132M	3	720	14.0	8.11		77.0	0.73	5.5	39.79	2.0	2.0	64	40.0
160M 1	4	730		10.4	5.99	80.0	0.73	6.0	52.33	1.9	2.1	68	59.0
160M 2	5.5	720		13.5	7.99	83.5	0.74	6.0	72.95	2.0	2.2	68	69.0
160L	7.5	720		17.9	10.3	85.0	0.75	6.0	99.48	1.9	2.2	68	87.0
180L	11	715		26.2	15.1	87.4	0.75	6.0	146.92	1.9	2.2	78	125.0



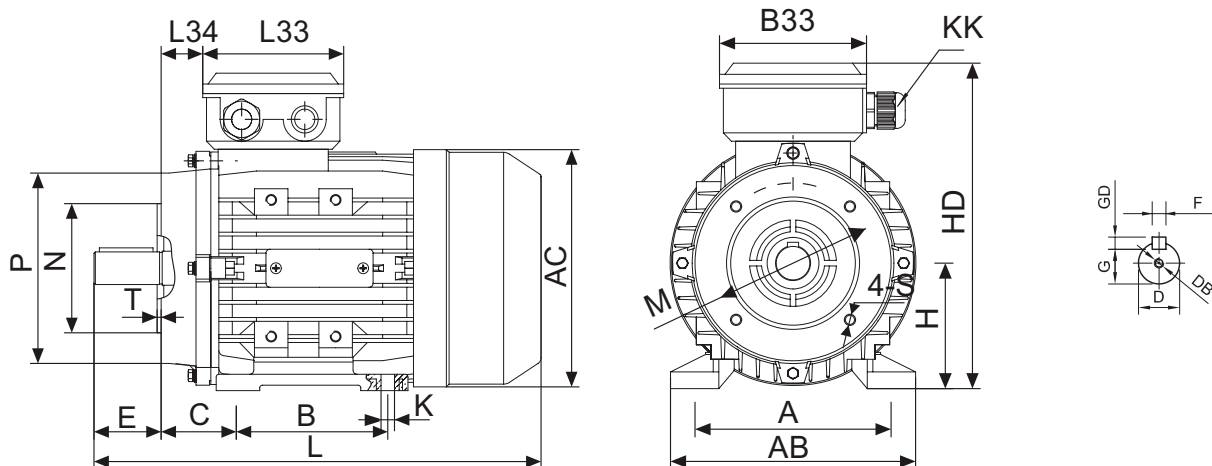
Dimension foot mount B3



Dimension foot - flange mount B35



Dimension foot - flange mount B34



Foot mount B3

Frame size	A	AB	AC	B	B33	C	D	DB	E	F	GD	G	H	HD	K	KK	L	L33
56	90	110	117	71	88	36	9	M3	20	3	3	7.2	56	156	5.8X8.8	-	196	88
63	100	120	130	80	94	40	11	M4	23	4	4	8.5	63	171	7X10	M16	220	94
71	112	132	147	90	94	45	14	M5	30	5	5	11	71	186	7X10	M20	241	94
80	125	160	163	100	105	50	19	M6	40	6	6	15.5	80	213	10X13	M20	290	105
90S	140	175	183	100	105	56	24	M8	50	8	7	20	90	229	10X13	M20	312	105
90L	140	175	183	125	105	56	24	M8	50	8	7	20	90	229	10X13	M20	337	105
100L	160	198	205	140	105	63	28	M10	60	8	7	24	100	252	12X15	M20	369	105
112M	190	220	229	140	112	70	28	M10	60	8	7	24	112	279	12X15	M25	395	112
132S	216	252	265	140	112	89	38	M12	80	10	8	33	132	318	12X15	M25	437	112
132M/L	216	252	265	178	112	89	38	M12	80	10	8	33	132	318	12X15	M25	475	112

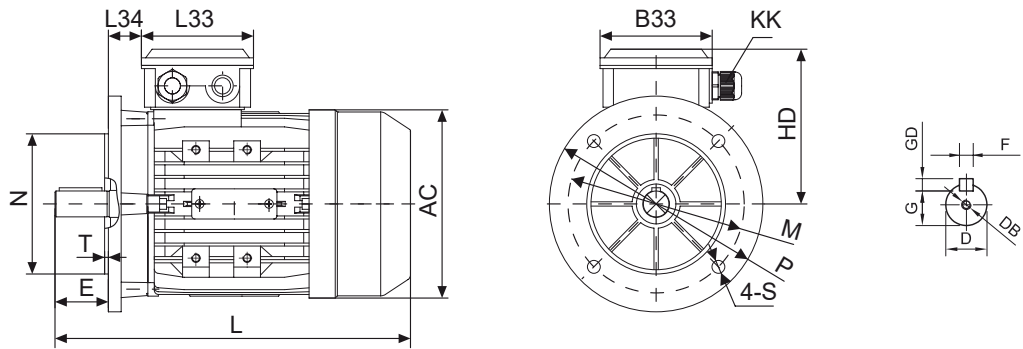
Flange mount B35

Frame size	A	AB	AC	B	B33	C	D	DB	E	F	GD	G	H	HD	K	KK	L	L33	L34	M	N	P	S	T
56	90	110	117	71	88	36	9	M3	20	3	3	7.2	56	156	5.8X8.8	-	196	88	14	100	80	120	7	3.0
63	100	120	130	80	94	40	11	M4	23	4	4	8.5	63	171	7X10	M16	220	94	14	115	95	140	10	3.0
71	112	132	147	90	94	45	14	M5	30	5	5	11	71	186	7X10	M20	241	94	20	130	110	160	10	3.5
80	125	160	163	100	105	50	19	M6	40	6	6	15.5	80	213	10X13	M20	290	105	27	165	130	200	12	3.5
90S	140	175	183	100	105	56	24	M8	50	8	7	20	90	229	10X13	M20	312	105	30	165	130	200	12	3.5
90L	140	175	183	125	105	56	24	M8	50	8	7	20	90	229	10X13	M20	337	105	30	165	130	200	12	3.5
100	160	198	205	140	105	63	28	M10	60	8	7	24	100	252	12X15	M20	369	105	26	215	180	250	15	4.0
112	190	220	229	140	112	70	28	M10	60	8	7	24	112	279	12X15	M25	395	112	32	215	180	250	15	4.0
132S	216	252	265	140	112	89	38	M12	80	10	8	33	132	318	12X15	M25	437	112	38	265	230	300	15	4.0
132M/L	216	252	265	178	112	89	38	M12	80	10	8	33	132	318	12X15	M25	475	112	38	265	230	300	15	4.0
160M/L	254	290	325	210	143	108	42	M16	110	12	8	37	160	384	15X19	M32	640	143	64	300	250	350	19	4.0

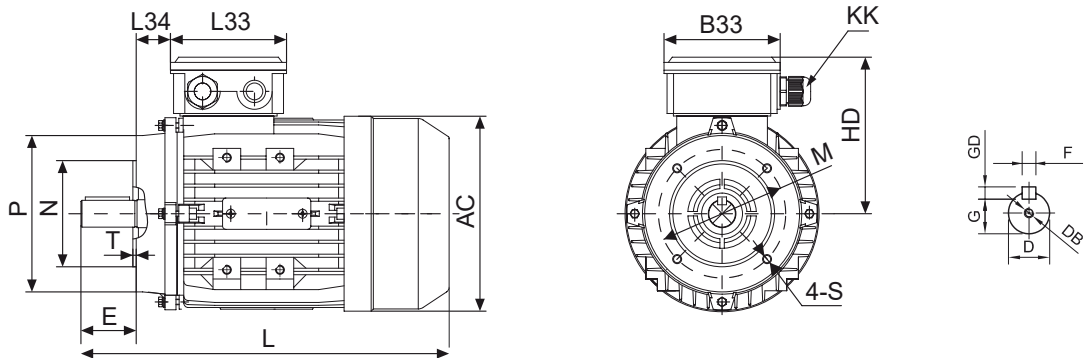
Flange mount B34

Frame size	A	AB	AC	B	B33	C	D	DB	E	F	GD	G	H	HD	K	KK	L	L33	L34	M	N	P	S	T
56	90	110	117	71	88	36	9	M3	20	3	3	7.2	56	156	5.8X8.8	-	196	88	14	65	50	80	M5	2.5
63	100	120	130	80	94	40	11	M4	23	4	4	8.5	63	171	7X10	M16	220	94	14	75	60	90	M5	2.5
71	112	132	147	90	94	45	14	M5	30	5	5	11	71	186	7X10	M20	241	94	20	85	70	105	M6	2.5
80	125	160	163	100	105	50	19	M6	40	6	6	15.5	80	213	10X13	M20	290	105	27	100	80	120	M6	3.0
90S	140	175	183	100	105	56	24	M8	50	8	7	20	90	229	10X13	M20	312	105	30	115	95	140	M8	3.0
90L	140	175	183	125	105	56	24	M8	50	8	7	20	90	229	10X13	M20	337	105	30	115	95	140	M8	3.0
100	160	198	205	140	105	63	28	M10	60	8	7	24	100	252	12X15	M20	369	105	26	130	110	160	M8	3.5
112	190	220	229	140	112	70	28	M10	60	8	7	24	112	279	12X15	M25	395	112	32	130	110	160	M8	3.5
132S	216	252	265	125	112	89	38	M12	80	10	8	33	132	318	12X15	M25	437	112	38	165	130	200	M10	4.0
132M/L	216	252	265	178	112	89	38	M12	80	10	8	33	132	318	12X15	M25	475	112	38	165	130	200	M10	4.0
160M/L	254	290	325	210	143	108	42	M16	110	12	8	37	160	384	15X19	M32	640	143	64	215	180	250	M12	4.0

Dimension foot - flange mount B5



Dimension foot - flange mount B14



Flange mount B5

Frame size	AC	B33	D	DB	E	F	G	H	HD	K	KK	L	L33	L34	M	N	P	S	T
56	117	88	9	M3	20	3	7.2	56	100	5.8X8.8	-	196	88	14	100	80	120	7	3.0
63	130	94	11	M4	23	4	8.5	63	108	7X10	M16	220	94	14	115	95	140	10	3.0
71	147	94	14	M5	30	5	11	71	115	7X10	M20	241	94	20	130	110	160	10	3.5
80	163	105	19	M6	40	6	15.5	80	133	10X13	M20	290	105	27	165	130	200	12	3.5
90S	183	105	24	M8	50	8	20	90	139	10X13	M20	312	105	30	165	130	200	12	3.5
90L	183	105	24	M8	50	8	20	90	139	10X13	M20	337	105	30	165	130	200	12	3.5
100	205	105	28	M10	60	8	24	100	152	12X16	M20	369	105	26	215	180	250	15	4.0
112	229	112	28	M10	60	8	24	112	167	12X16	M25	395	112	32	215	180	250	15	4.0
132S	265	112	38	M12	80	10	33	132	186	12X15	M25	437	112	38	265	230	300	15	4.0
132M/L	265	112	38	M12	80	10	33	132	186	12X15	M25	475	112	38	265	230	300	15	4.0
160M/L	325	143	42	M16	110	12	37	160	224	15X19	M32	640	143	64	300	250	350	19	5.0

Flange mount B14

Frame size	AC	B33	D	DB	E	F	G	H	HD	K	KK	L	L33	L34	M	N	P	S	T
56	117	88	9	M3	20	3	7.2	56	100	5.8X8.8	-	196	88	14	65	50	80	M5	2.5
63	130	94	11	M4	23	4	8.5	63	108	7X10	M16	220	94	14	75	60	90	M5	2.5
71	147	94	14	M5	30	5	11	71	115	7X10	M20	241	94	20	85	70	105	M6	2.5
80	163	105	19	M6	40	6	15.5	80	133	10X13	M20	290	105	27	100	80	120	M6	3.0
90S	183	105	24	M8	50	8	20	90	139	10X13	M20	312	105	30	115	95	140	M8	3.0
90L	183	105	24	M8	50	8	20	90	139	10X13	M20	337	105	30	115	95	140	M8	3.0
100	205	105	28	M10	60	8	24	100	152	12X16	M20	369	105	26	130	110	160	M8	3.5
112	229	112	28	M10	60	8	24	112	167	12X16	M25	395	112	32	130	110	160	M8	3.5
132S	265	112	38	M12	80	10	33	132	186	12X15	M25	437	112	38	165	130	200	M10	4.0
132M/L	265	112	38	M12	80	10	33	132	186	12X15	M25	475	112	38	165	130	200	M10	4.0
160M/L	325	143	42	M16	110	12	37	160	224	15X19	M32	640	143	64	215	180	250	M12	4.0

ESS - ESD SERIES

SINGLE-PHASE ALUMINIUM MOTORS

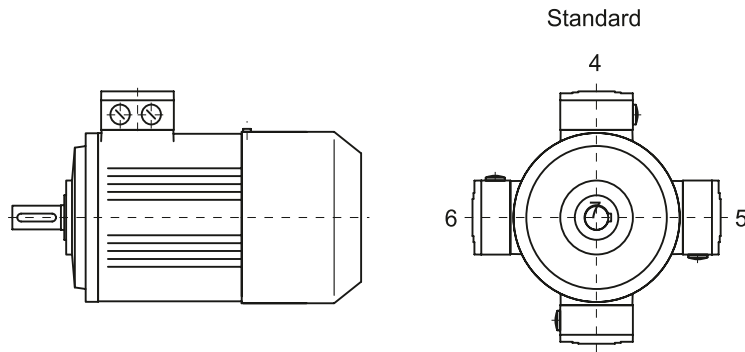




GENERAL SPECIFICATION

Terminal box

Aluminum terminal box: The terminal box is located on the top of the motor housing as standard, and can be rotated by 4 x 90°.



Bearing lubrication

The nominal bearing lifetime is defined acc. To standardized calculation procedures (DIN ISO 281) and is reached or even exceeded for 90% of the bearings when the motors are operated in compliance with the data provided in the catalog.

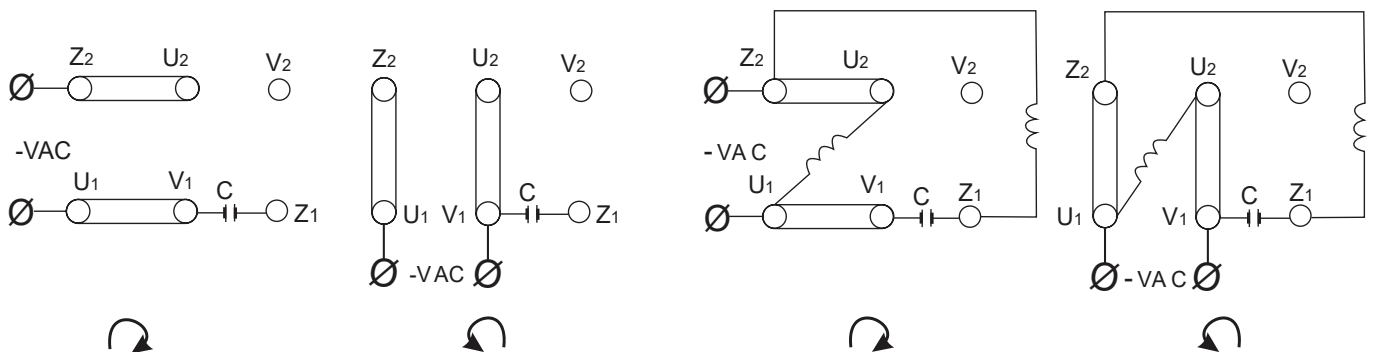
Under average operating conditions, a lifetime (L10h) of 100 000 hours can be achieved.

Generally, the bearing lifetime is defined by the bearing size, the bearing load, the operating conditions, the speed and the grease lifetime.

Connection

A motor's rated voltage must agree with the power supply line-to-line voltage. It is careful to Ensure the correct connection to the motor terminals.

Connection Diagram for ESS series:





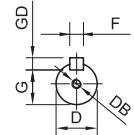
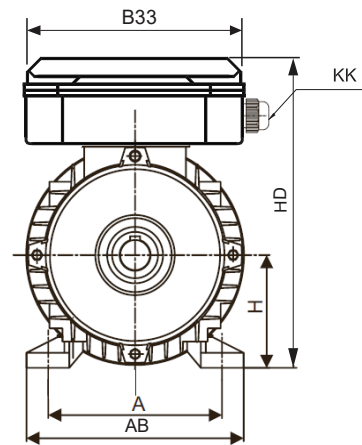
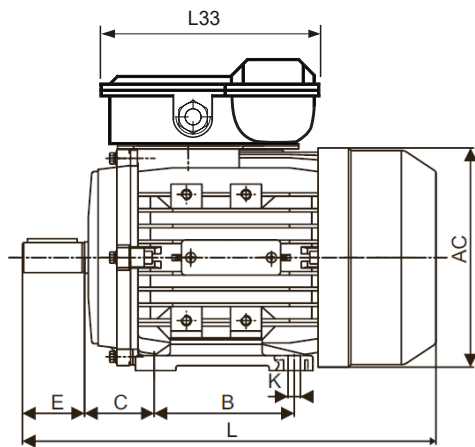
PERFORMANCE DATA of ESS

ESS-Single phase capacitor-run motors Asynchronous speed 50 Hz

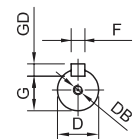
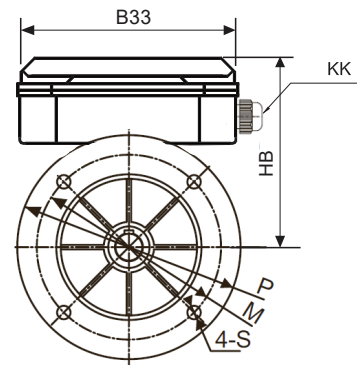
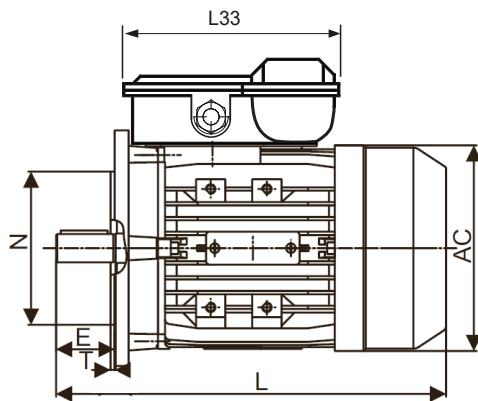
Frame size	Output (kW)	Full load speed (RPM)	Current Full load I_N (A)	Efficiency at 100% full load	Power factor $\cos \phi$ at 100% full load	Locked rotor I_L / I_N (A)	Torque			Noise level μF / (volts)	Weight of foot mount motor (kg)
							Full load torque T_N (Nm)	Locked rotor torque T_L / T_N	Break down torque T_B / T_N		
3000r/min = 2 poles											
63 1	0.18	2750	1.29	62	0.98	3.0	0.6	0.7	1.8	70	4.0
63 2	0.25	2750	1.71	65	0.98	3.2	0.87	0.65	1.75	70	4.7
71 1	0.37	2640	2.60	66	0.94	3.2	1.3	0.72	1.65	75	6.1
71 2	0.55	2760	3.52	71.5	0.95	4.0	1.9	0.7	1.8	75	7.7
80 1	0.75	2760	4.87	69	0.97	3.7	2.6	0.7	1.8	75	10.25
80 2	1.1	2780	6.53	74	0.99	3.9	3.78	0.7	1.8	78	11.6
90S	1.5	2755	8.56	77	0.99	3.7	5.2	0.65	1.8	80	14.55
90L	2.2	2765	12.39	78	0.99	4.2	7.6	0.65	1.8	80	17.8
100L	3	2765	17.11	77	0.99	4.0	10.3	0.55	1.75	83	23.7
1500r/min = 4 poles											
63	0.18	1380	1.35	59	0.98	2.5	1.25	0.6	1.65	65	5.05
71 1	0.25	1310	1.82	60.5	0.99	2.5	1.82	0.7	1.55	65	6.2
71 2	0.37	1325	2.48	65.5	0.99	2.7	2.67	0.7	1.52	68	7.3
80 1	0.55	1330	3.7	66	0.98	3.0	3.95	0.7	1.57	73	10.05
80 2	0.75	1355	4.82	69	0.98	3.4	5.29	0.7	1.57	73	11.4
90S	1.1	1355	6.94	72.5	0.95	3.3	7.73	0.68	1.8	75	14.4
90L	1.5	1360	9.28	74	0.95	3.5	10.53	0.68	1.8	78	17.5
100L 1	2.2	1390	12.64	78	0.97	4.0	15.12	0.48	1.75	80	24.5
100L 2	3	1380	16.57	79.5	0.99	4.0	20.76	0.45	1.6	80	32.0
1000r/min = 6 poles											
63 1	0.09	900	0.9	44.5	0.97	2.0	0.96	0.38	1.53	63	5.1
63 2	0.12	875	1.1	47.5	0.98	2.0	1.30	0.25	1.23	63	6.0
71 1	0.18	930	1.52	52	0.99	2.2	1.85	0.65	1.7	68	6.3
71 2	0.25	925	2.12	54	0.95	2.4	2.58	0.58	1.7	68	7.6
80 1	0.37	925	2.63	63	0.97	3.0	3.82	0.67	1.7	68	9.0
80 2	0.55	915	3.71	66.5	0.97	3.0	5.74	0.63	1.7	70	11.6
90S	0.75	890	4.93	67.5	0.98	2.4	8.05	0.65	1.5	70	13.5
90L	1.1	905	7.15	69	0.97	3.0	11.61	0.55	1.7	70	16.2



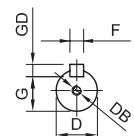
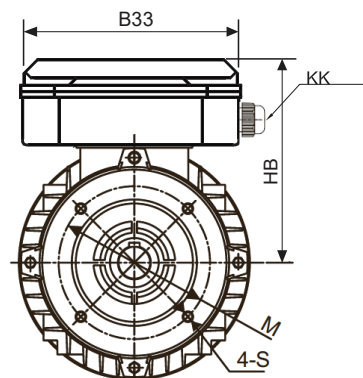
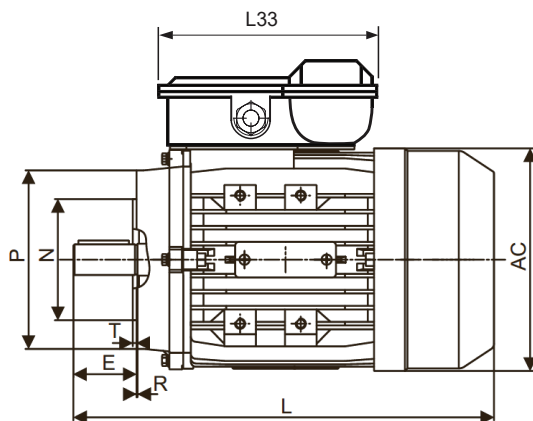
Dimensions foot mount B3



Dimensions flange mount B5 and V1



Dimensions face - flange B14



Foot mount B3

Frame size	A	AB	AC	B	B33	C	D	DB	E	F	GD	G	H	HB	HD	K	KK	L	L33
56	90	110	120	71	77	36	9	M3	20	3	3	7.2	56	88	144	5.8X8.8	-	196	99
63	100	120	130	80	116	40	11	M4	23	4	4	8.5	63	118	181	7X10	M20	220	92
71	112	132	145	90	116	45	14	M5	30	5	5	11	71	125	196	7X10	M20	241	92
80	125	160	165	100	144	50	19	M6	40	6	6	15.5	80	146	226	10X13	M20	290	141
90S	140	175	185	100	144	56	24	M8	50	8	7	20	90	153	243	10X13	M20	312	141
90L	140	175	185	125	144	56	24	M8	50	8	7	20	90	153	243	10X13	M20	337	141
100L	160	196	205	140	144	63	28	M10	60	8	7	24	100	165	265	12X16	M20	369	141

Foot mount B5

Frame size	AC	B33	D	DB	E	F	G	H	HB	K	KK	L	L33	M	N	P	S	T
56	120	77	9	M3	20	3	7.2	56	88	5.8X8.8	-	196	99	100	80	120	7	3.0
63	130	116	11	M4	23	4	8.5	63	118	7X10	M20	220	92	115	95	140	10	3.0
71	145	116	14	M5	30	5	11	71	125	7X10	M20	241	92	130	110	160	10	3.5
80	165	144	19	M6	40	6	15.5	80	146	10X13	M20	290	141	165	130	200	12	3.5
90S	185	144	24	M8	50	8	20	90	153	10X13	M20	312	141	165	130	200	12	3.5
90L	185	144	24	M8	50	8	20	90	153	10X13	M20	337	141	165	130	200	12	3.5
100L	205	144	28	M10	60	8	24	100	165	12X16	M20	369	141	215	180	250	15	4.0

Foot mount B14

Frame size	AC	B33	D	DB	E	F	G	H	HB	K	KK	L	L33	M	N	P	S	T
56	120	77	9	M3	20	3	7.2	56	88	5.8X8.8	-	196	99	65	50	80	M5	2.5
63	130	116	11	M4	23	4	8.5	63	118	7X10	M20	220	92	75	60	90	M5	2.5
71	145	116	14	M5	30	5	11	71	125	7X10	M20	241	92	85	70	105	M6	2.5
80	165	144	19	M6	40	6	15.5	80	146	10X13	M20	290	141	100	80	120	M6	3.0
90S	185	144	24	M8	50	8	20	90	153	10X13	M20	312	141	115	95	140	M8	3.0
90L	185	144	24	M8	50	8	20	90	153	10X13	M20	337	141	115	95	140	M8	3.0
100L	205	144	28	M10	60	8	24	100	165	12X16	M20	369	141	130	110	160	M8	3.5



ESD - Single phase dual capacitor motors Asynchronous speed 50 Hz

Frame size	Output (kW)	Full load speed (RPM)	Current Full load I_N (A)	Efficiency at 100% full load	Power factor $\cos \phi$ at 100% full load	Locked rotor I_L/I_N (A)	Torque			Noise level (μF /volts)	Weight of foot mount motor (kg)
							Full load torque T_N (Nm)	Locked rotor torque T_L/T_N	Break down torque T_B/T_N		

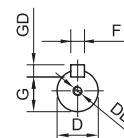
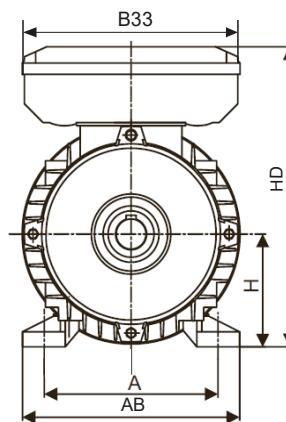
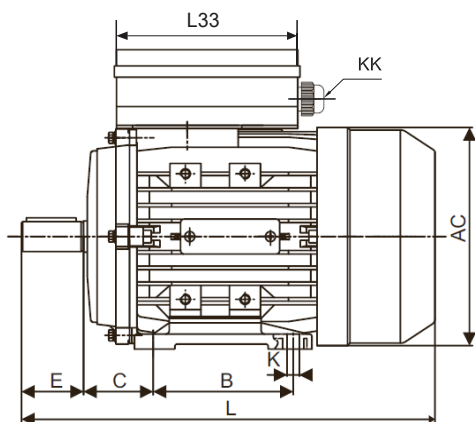
3000r/min = 2 poles

631	0.18	2820	1.36	62	0.93	4.8	0.60	1.9	1.8	70	3.9
632	0.25	2800	1.7	67.5	0.94	48	0.85	2.3	1.8	70	4.4
711	0.37	2780	2.4	70.5	0.95	5.2	1.27	2.5	1.6	75	6.1
712	0.55	2790	3.31	74.5	0.97	6.0	1.88	2.5	1.8	75	7.0
801	0.75	2840	4.25	77.5	0.99	6.5	2.52	2.5	1.8	75	9.0
802	1.1	2850	6.08	79.5	0.99	6.5	3.69	2.3	1.8	78	10.3
90S	1.5	2860	8.24	80	0.99	6.6	5.01	2.5	1.8	80	13.8
90L	2.2	2850	11.93	81	0.99	6.4	7.37	2.5	1.75	80	16.8
100L	3.0	2830	17.75	75	0.98	6.0	10.12	2.5	1.63	83	25
112M1	3.7	2900	19.90	82.5	0.98	7.6	12.18	2.5	1.8	84	33
112M2	4.0	2900	21.25	83.5	0.98	7.9	13.17	2.5	1.8	84	33.8

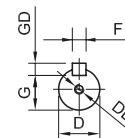
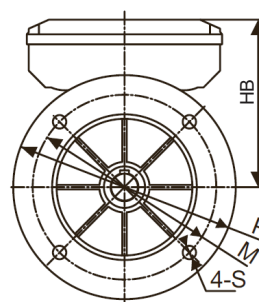
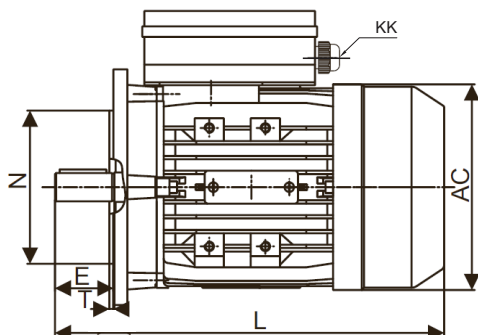
1500r/min = 4 poles

631	0.12	1380	1.0	54.5	0.95	5.5	0.83	2.5	1.65	65	4.1
632	0.18	1340	1.36	60	0.96	4.5	1.28	2.3	1.43	65	4.5
711	0.25	1415	1.78	63	0.97	4.8	1.69	2.5	1.7	65	5.9
712	0.37	1410	2.53	65.5	0.97	5.0	2.51	2.3	1.6	68	6.9
801	0.55	1420	3.52	71.5	0.95	5.8	3.70	2.5	1.8	70	9.6
802	0.75	1420	4.56	73	0.98	5.8	5.04	2.5	1.75	70	10.9
90S	1.1	1420	6.62	76.0	0.95	6.0	7.04	2.5	1.7	73	13.8
90L	1.5	1420	8.57	78.5	0.97	6.5	10.9	2.5	1.75	75	16.7
100L1	2.2	1440	12.12	80.5	0.98	6.5	14.59	2.5	1.65	78	22.8
100L2	3	1445	16.37	83	0.96	6.7	19.83	2.4	1.75	78	28.7
112M1	3.7	1430	19.66	83.5	0.98	6.8	24.71	2.4	1.75	79	31
112M2	4.0	1435	21.25	83.5	0.98	6.8	26.62	2.5	1.75	79	32.8

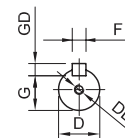
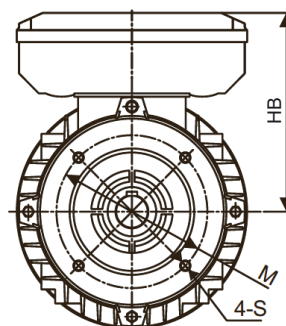
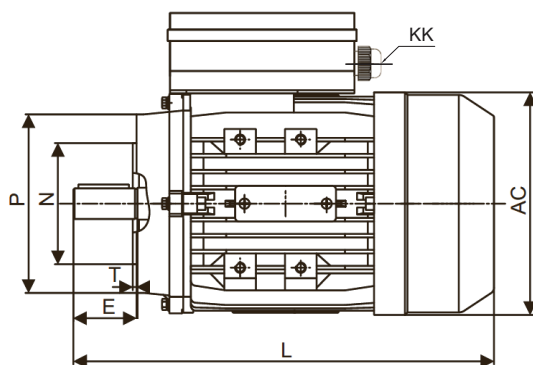
Dimensions foot mount B3



Dimensions flange mount B5 and V1



Dimensions face - flange B14



Foot mount B3

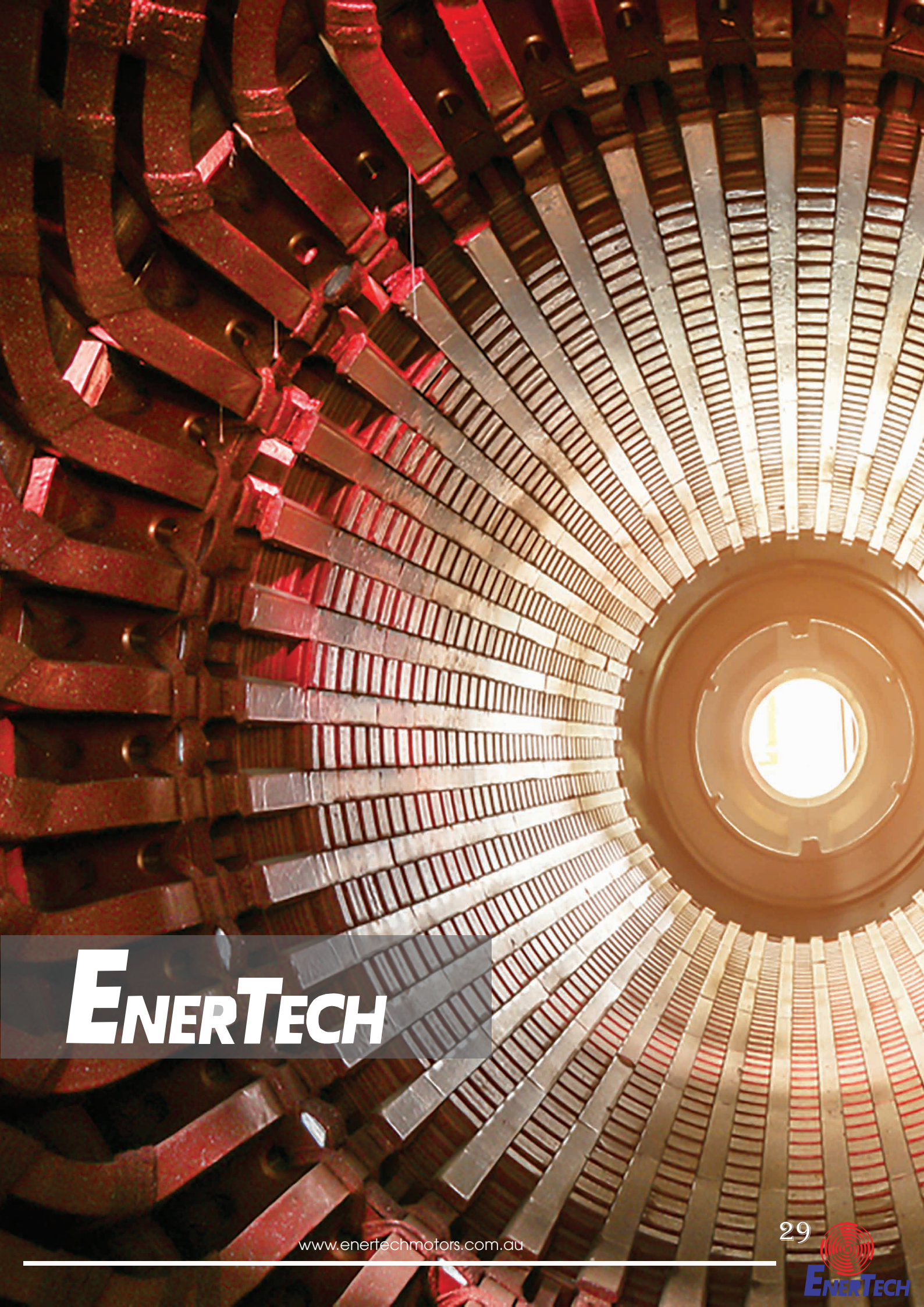
Frame size	A	AB	AC	B	B33	C	D	DB	E	F	GD	G	H	HB	HD	K	KK	L	L33
56	90	110	120	71	77	36	9	M3	20	3	3	7.2	56	88	144	5.8X8.8	-	196	99
63	100	120	130	80	116	40	11	M4	23	4	4	8.5	63	118	181	7X10	M20	220	92
71	112	132	145	90	116	45	14	M5	30	5	5	11	71	125	196	7X10	M20	241	92
80	125	160	165	100	144	50	19	M6	40	6	6	15.5	80	146	226	10X13	M20	290	141
90S	140	175	185	100	144	56	24	M8	50	8	7	20	90	153	243	10X13	M20	312	141
90L	140	175	185	125	144	56	24	M8	50	8	7	20	90	153	243	10X13	M20	337	141
100L	160	196	205	140	144	63	28	M10	60	8	7	24	100	165	265	12X16	M20	369	141
112M	190	222	230	140	148	70	28	M10	60	8	7	24	112	183	295	12X16	M25	416	150

Foot mount B5

Frame size	AC	B33	D	DB	E	F	G	H	HB	K	KK	L	L33	M	N	P	S	T
56	120	77	9	M3	20	3	7.2	56	88	5.8X8.8	-	196	99	100	80	120	7	3.0
63	130	116	11	M4	23	4	8.5	63	118	7X10	M20	220	92	115	95	140	10	3.0
71	145	116	14	M5	30	5	11	71	125	7X10	M20	241	92	130	110	160	10	3.5
80	165	144	19	M6	40	6	15.5	80	146	10X13	M20	290	141	165	130	200	12	3.5
90S	185	144	24	M8	50	8	20	90	153	10X13	M20	312	141	165	130	200	12	3.5
90L	185	144	24	M8	50	8	20	90	153	10X13	M20	337	141	165	130	200	12	3.5
100L	205	144	28	M10	60	8	24	100	165	12X16	M20	369	141	215	180	250	15	4.0
112M	230	148	28	M10	60	8	24	112	183	12X16	M25	416	150		180	250	15	4.0

Foot mount B14

Frame size	AC	B33	D	DB	E	F	G	H	HB	K	KK	L	L33	M	N	P	S	T
56	120	77	9	M3	20	3	7.2	56	88	5.8X8.8	-	196	99	65	50	80	M5	2.5
63	130	116	11	M4	23	4	8.5	63	118	7X10	M20	220	92	75	60	90	M5	2.5
71	145	116	14	M5	30	5	11	71	125	7X10	M20	241	92	85	70	105	M6	2.5
80	165	144	19	M6	40	6	15.5	80	146	10X13	M20	290	141	100	80	120	M6	3.0
90S	185	144	24	M8	50	8	20	90	153	10X13	M20	312	141	115	95	140	M8	3.0
90L	185	144	24	M8	50	8	20	90	153	10X13	M20	337	141	115	95	140	M8	3.0
100L	205	144	28	M10	60	8	24	100	165	12X16	M20	369	141	130	110	160	M8	3.5
112M	230	148	28	M10	60	8	24	112	183	12X16	M25	416	150	130	110	160	M8	3.5



ENERTECH



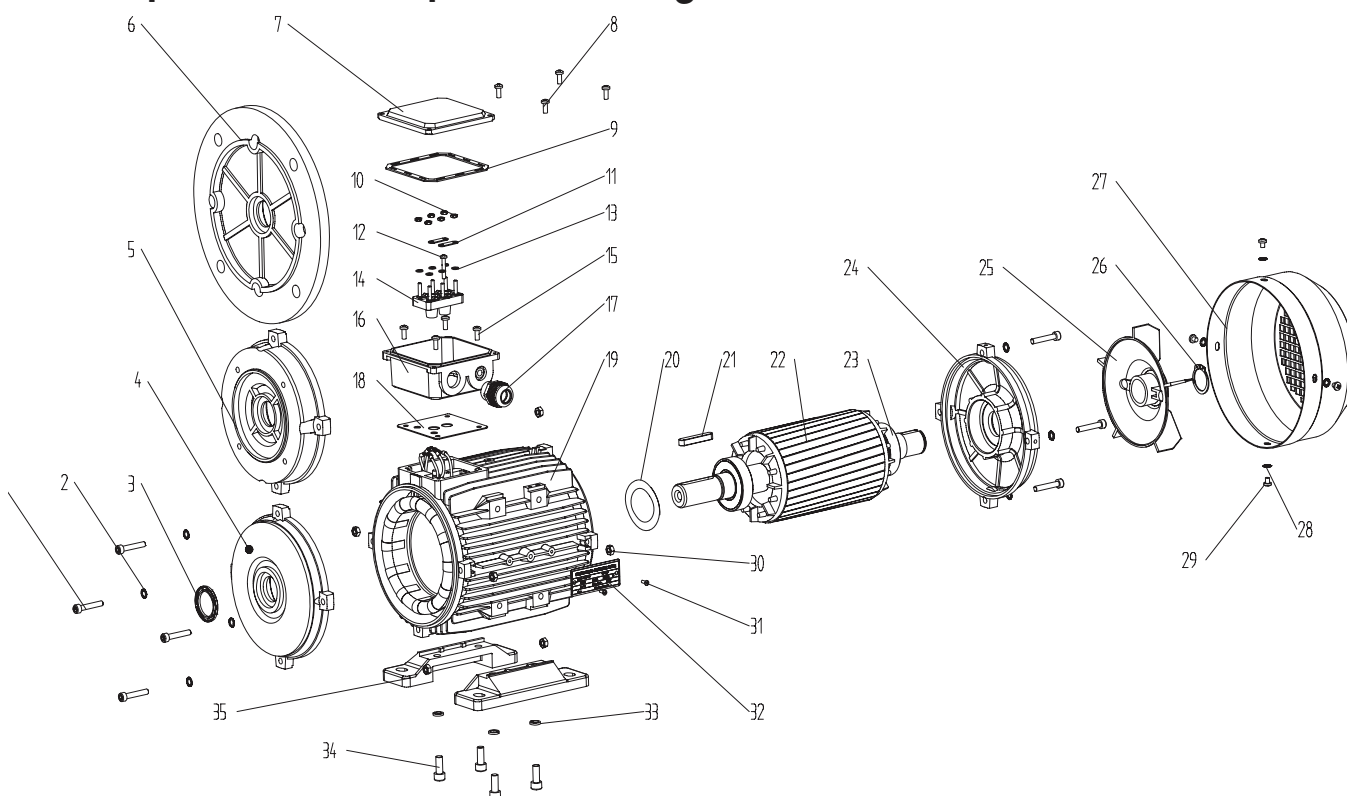
BEARING AND OIL SEAL

Aluminum Housing Electric Motors Bearings & Oil Seals

Frame	Bearings		Oil Seals	
	Drive End	Non-drive End	Drive End	Non-drive End
56	6201	6201	12x22x5	12x22x5
63	6201	6201	12x24x5	12x24x5
71	6202	6202	15x25x7	15x25x7
80	6204	6204	20x34x7	20x34x7
90S	6205	6205	25x37x7	25x37x7
90L	6205	6205	25x37x7	25x37x7
100L	6206	6206	30x44x7	30x44x7
112M	6306	6206	30x44x7	30x44x7
132S	6308	6208	40x58x7	40x58x7
132M/L	6308	6208	40x58x7	40x58x7
160M	6309	6309	45x65x8	45x65x8

Other standards are also available on request.

Motor Spare Part List "Exploded Drawing"



1. Screw
2. Gasket
3. Oil seal
4. Front endshield
5. B14 flange
6. B5 flange
7. TB cover
8. TB fixing screws
9. TB upper gasket
10. Terminal board fixing nut

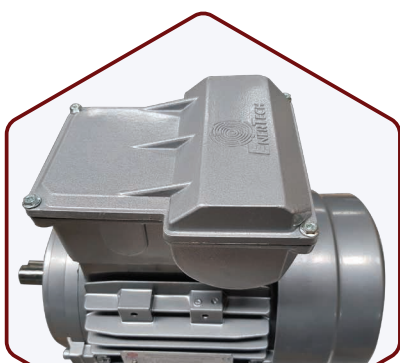
11. Terminal bridge
12. Terminal pin
13. Terminal shim
14. Terminal board
15. TB fixing screws
16. TB base
17. Cable gland
18. TB bottom gasket
19. Frame
20. Preload washer

21. Key
22. Rotor
23. Bearing
24. NDE endshield
25. Cooling fan
26. Fan circlip
27. Fan cover
28. Fan cover fixing shim
29. Fan cover fixing screws
30. Endshield fixing nut

31. Rivet
32. Nameplate
33. Foot fixing nut
34. Foot fixing screws
35. Foot



ESA



ESS



ESD



ALUMINIUM MOTORS

CATALOGUE

Edition 2.2

HEAD OFFICE



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