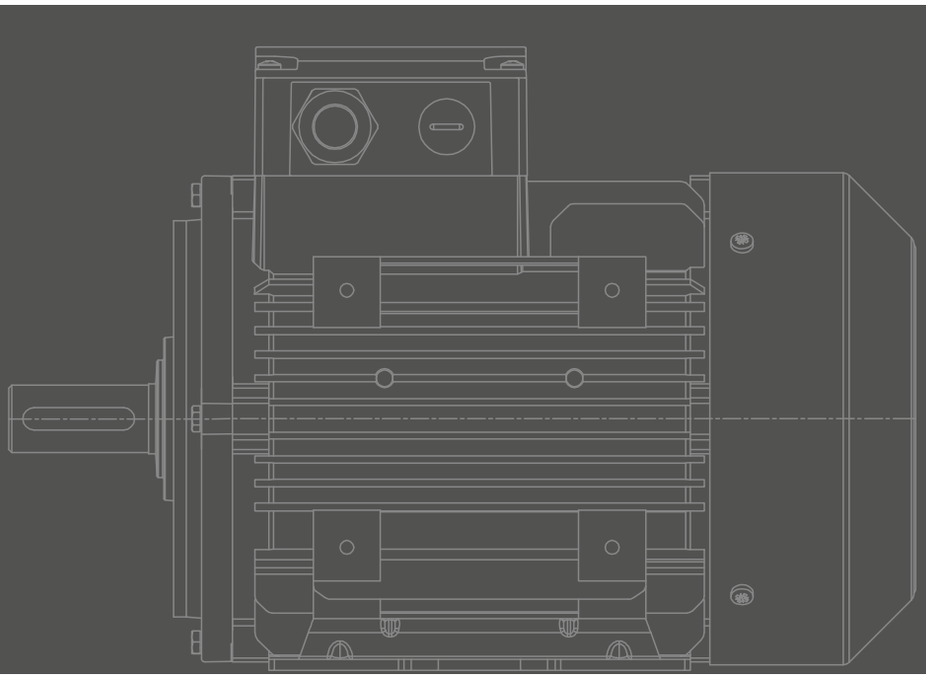
ELK MOTOR

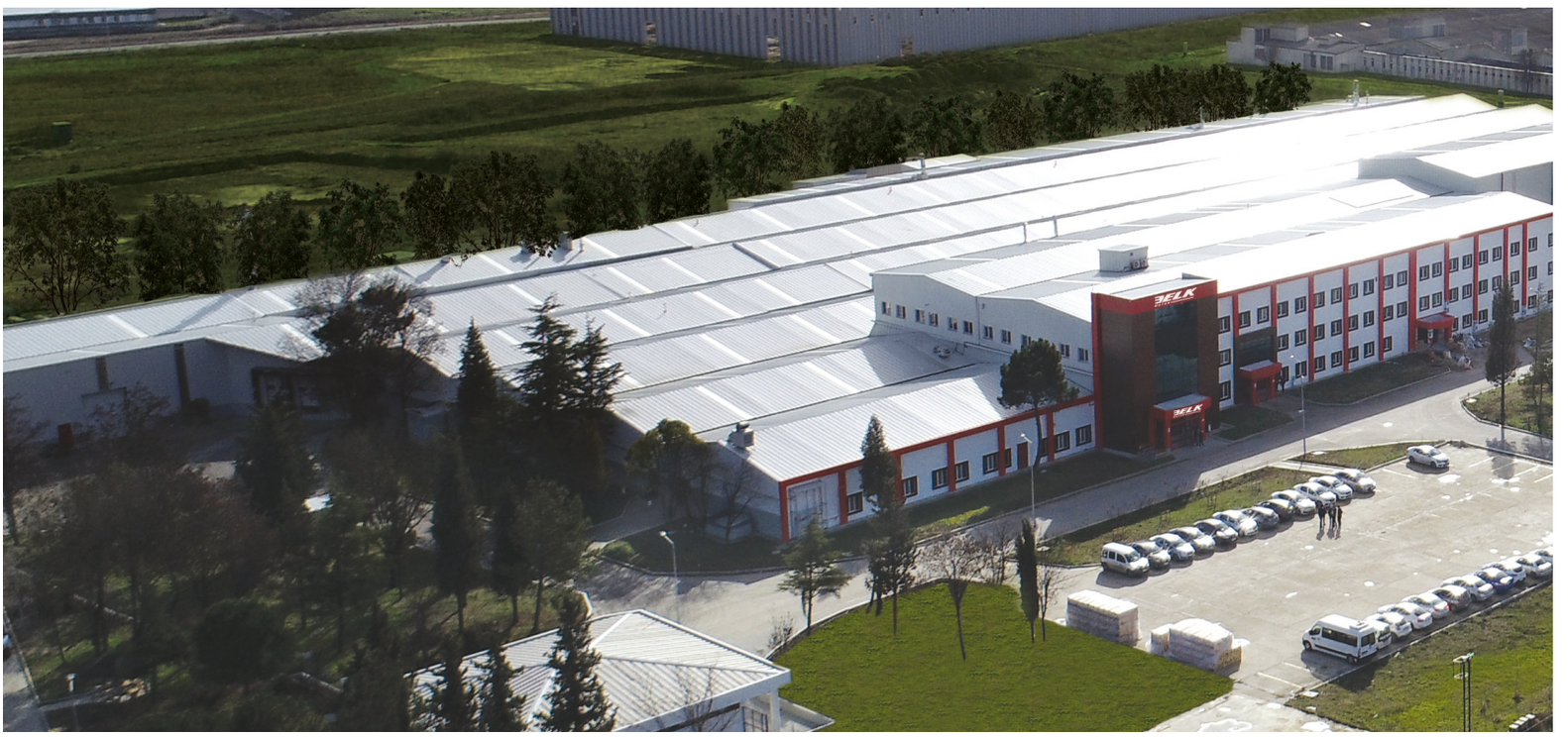
PRODUCT CATALOGUE

ELK 1000-0624

www.elkmotor.com.tr



ELK MOTOR



ELK Motor is on a mission to establish itself as a global brand by embracing its core values of environmental and human sensitivity, innovation, and technology. This mission is driven by a commitment to sustainability and the careful consideration of limited global resources. ELK Motor strives to achieve this by delivering eco-friendly, innovative, competitive, and highly efficient products.

Founded by the major shareholders of Yılmaz Redüktör A.Ş., ELK Motor was established in the Çerkezköy Organized Industrial Zone to expand their product line. The company operates on a 135,000 m² open area, with 50,000 m² of enclosed space, dedicated to the production of electric motors ranging from IEC 63 to 315 frame sizes.

Our product portfolio includes three-phase motors in the IEC 63 to 315 frame size range, single-phase motors in the IEC 63 to 90 frame size range (offering options with run or run + start capacitor), Zone 2/22 Exproof motors in the IEC 63 to 315 frame size, and Zone 1/21 Exproof motors in the IEC 160 frame size, with plans to expand this range soon.

All motor series are designed in accordance with European standards and are available in IE2, IE3, and IE4 efficiency classes, ensuring they meet customer requirements. Moreover, our motors were initially designed to meet the IE3 efficiency class, enabling a seamless transition from IE2 to IE3 without altering the mechanical dimensions, providing users with consistent performance and compatibility.

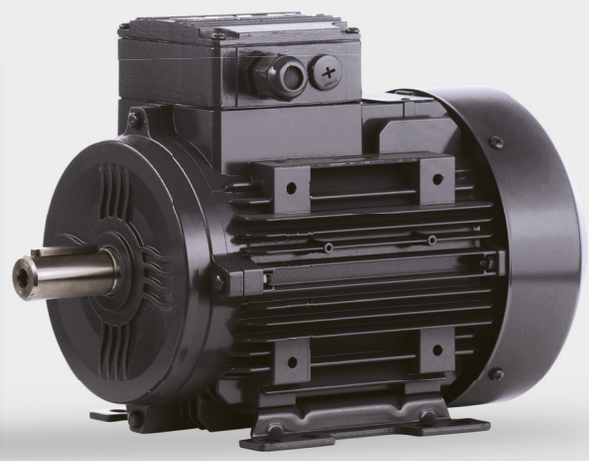
In addition to our standard motors, we also offer custom-designed motors tailored to meet specific performance and compatibility needs of our customers.

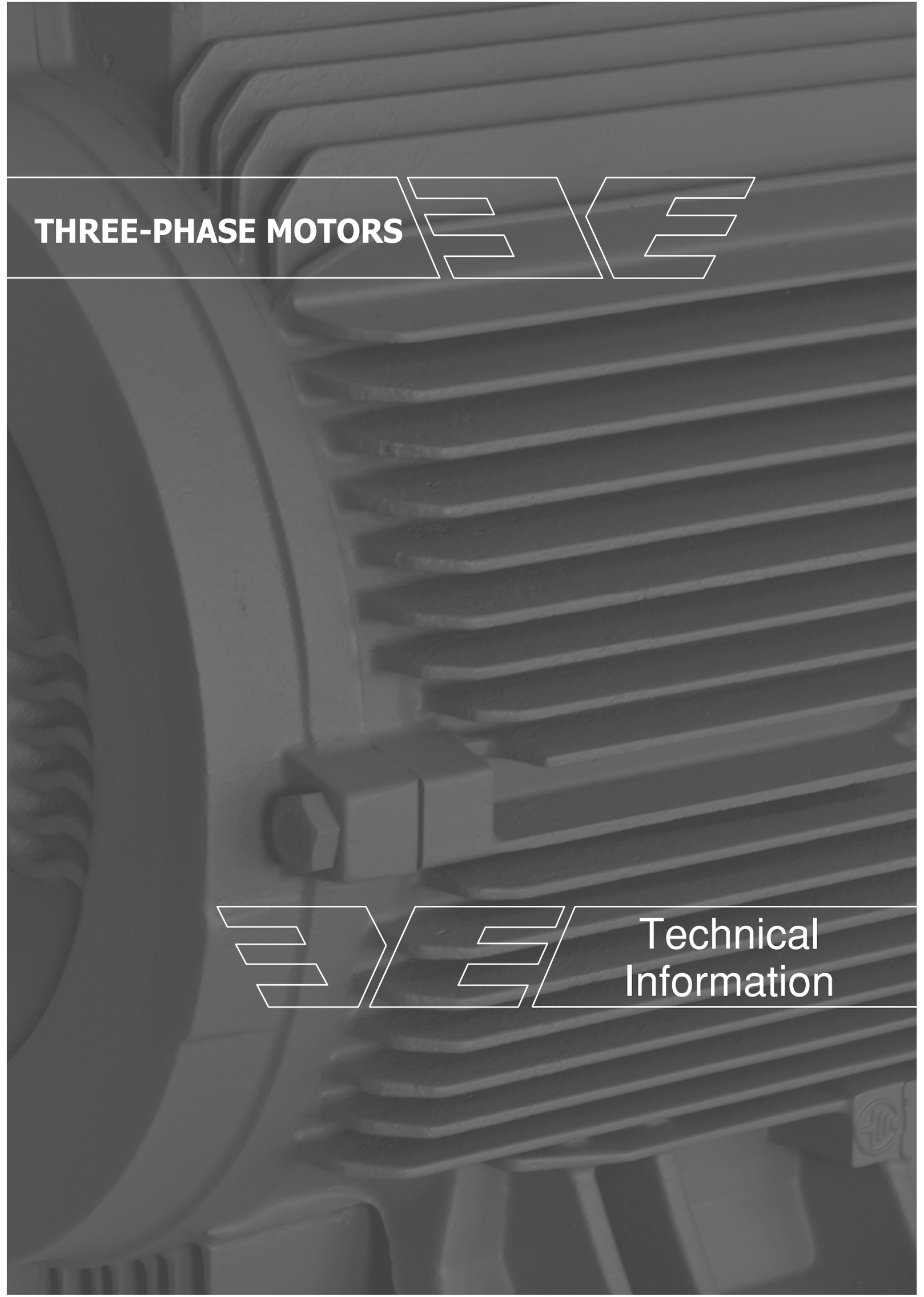
Produced entirely at our Çerkezköy factory, ELK Motors undergo a comprehensive production process that includes engineering, machining, casting, sheet metal work, and motor winding. Each motor is subjected to 100% final inspection and testing to ensure the highest levels of quality and performance upon delivery.

Finally, ELK Motor adheres to strict quality management systems and holds the necessary product certifications to meet customer demands. Our quality system is certified to ISO 9001, and our products carry UL certification.

CONTENTS

CONTENTS




THREE-PHASE MOTORS
Technical
Information

IEC/EN/UL Compatibility

Our standard products are designed, manufactured, and tested in full compliance with the standards listed below.

IEC 60034-1	Rating and Performance
IEC 60034-2-1	Methods for Determining Losses and Efficiency
IEC 60034-5	Classification of Degrees of Protection
IEC 60034-6	Methods of Cooling
IEC 60034-7	Symbols of Construction and Mounting Arrangements
IEC 60034-8	Terminal Markings and Direction of Rotation
IEC 60034-9	Noise Limits
IEC 60034-11	Built-in Thermal Protection
IEC 60034-14	Vibration Limits
IEC 60034-18-1	Functional Evaluation of Insulation Systems
IEC 60034-30	Efficiency Classes (IE Code)
IEC 60038	Standard Voltages
EN 50347	Dimensions and Output Powers for Electrical Machines

EN 55014-1	
EN 61000-3-2	Electromagnetic Compatibility
EN 61000-3-3	

UL1004-1	Rotating Electrical Machines – General Requirements
CSA C22.2 No. 100	Motors and Generators

All electric motors featuring the logo on their nameplate are UL certified and manufactured under file number E496161 in accordance with UL 1004-1 and CSA C22.2 No. 100 standards.

Our products may deviate from the nominal values specified in our catalog by the amounts or percentages permitted under IEC 60034-1, as outlined below.

Motor Speed (n)	$\Delta n = \pm 20\% (ns - n_N)$, $P_N \Rightarrow 1$ kW $\Delta n = \pm 30\% (ns - n_N)$, $P_N < 1$ kW
Efficiency %(η)	$\Delta\eta = -15\% (100 - \eta_N)$
Power factor (ϕ)	$\cos\varphi = -1/6 (1-\cos\varphi)$
Locked rotor current (I_{LN})	$\Delta (I_{LN}) = +20\%(I_{LN})$
Starting torque (M_L/M_N)	min. $(M_L/M_N) = -15\% (M_L/M_N)$ max. $(M_L/M_N) = +25\% (M_L/M_N)$
Breakdown torque (M_K/M_N)	$(M_K/M_N) = -10\% (M_K/M_N)$
Torque of inertia (J) [kgm^2]	$\Delta J = \pm 10\% J$
Sound pressure level (L_{PA}) [dB(A)]	$L_{PA} = +3$ dB (A)

Electrical Construction

Our standard motors have an F class (155°C) electrical insulation system. However, all standard motors in our product range operate within B class temperature rise limits. This ensures that the provided temperature class has a safety margin, allowing our motors to operate under more demanding conditions than specified or to have a longer service life under normal conditions. Motors with H class insulation can be manufactured according to customer requirements.

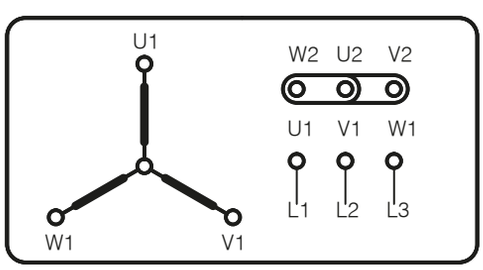
Electrical Connections

Cable Gland and Blind Cap														
Frame Size	063	071	080	090	100	112	132	160	180	200	225	250	280	315
Cable Glands	M16x1,5	M20x1,5			M25x1,5			2 x M32x1,5		1 x M12x1,5 2 x M40x1,5	1 x M12x1,5 2 x M50x1,5		2 x M63x1,5	
Blind Cap	M16x1,5				M25x1,5			-		-	-		-	

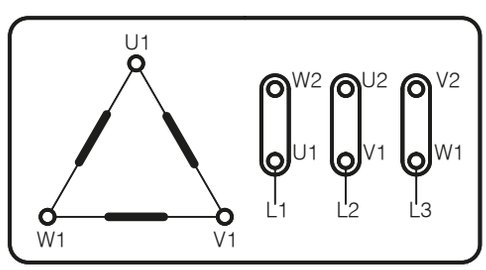
Terminal Connections														
Frame Size	063	071	080	090	100	112	132	160	180	200	225	250	280	315
Terminal Size	M4				M5			M6			M8	M10		M16

The motors shall be connected in star or delta according to rated voltage given in their nameplate and the network voltage that they will be connected. For phase to phase 400V supply the motors with 230/400V nameplate values shall be connected in star and the motors with 400/690V nameplates values shall be connected in delta.
The connection types given below should be applied for single phase motors, depending on the direction of rotation.

Terminal Connections for Three-Phase Motors

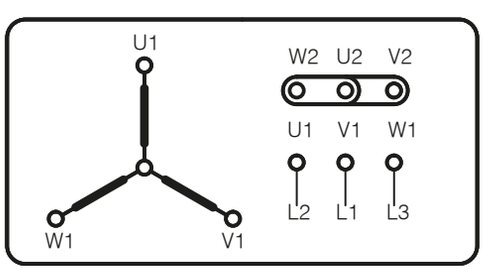


Y Star Connection
Clockwise

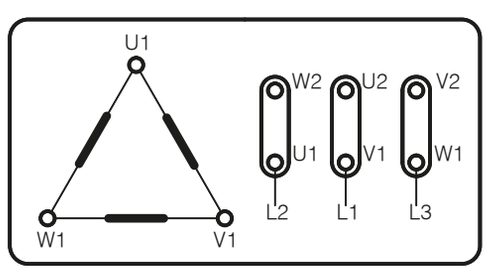


Δ Delta Connection
Clockwise

Standard ELK Motors are manufactured to rotate in a clockwise direction. To change the rotation direction, the positions of any two phases on the terminal can be swapped. For an example, please refer to the schematic below.



Y Star Connection
Counter-Clockwise



Δ Delta Connection
Counter-Clockwise

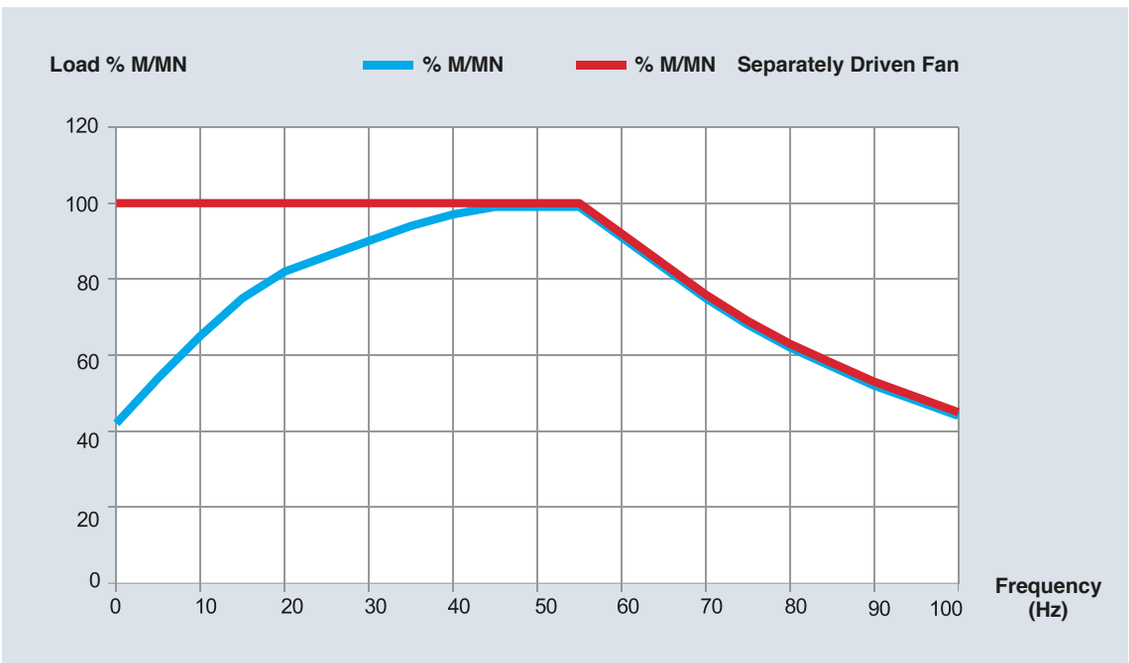
Motors at 60Hz Network

Standard ELK Motors that have been manufactured for 50 Hz power supply can be used at 60Hz network. The ratios given below indicate changes in the given rated values.

50 Hz Rated Voltage	60 Hz Rated Voltage	Rated Speed	Rated Power	Rated Torque	Rated Current	Starting Torque	Break Down Torque	Starting Current
230V	220V	1.193	1	0.84	0.97	0.77	0.8	0.8
400V	380V	1.193	1	0.84	0.97	0.77	0.8	0.8
400V	440V	1.20	1.16	0.97	0.98	0.87	0.9	0.9

Operating Motors with Variable Speed Drives

Standard ELK Motors are designed to be compatible with drives. When operated with an internal fan or a force cooling fan, the torque capacity of the motors is as shown in the frequency-torque curve below. An external force cooling fan must be sed when operating at low speed for prolonged time. The power cables between the VSD and the motor should be kept as short as possible.



Operating Motors in Various Environmental Conditions

The performance values of our motors specified in the catalogue are valid for use at an ambient temperature of 40°C and altitudes up to 1000 meters, as specified in IEC 60034-1. For other ambient temperatures, the output power of our motors will vary according to the ratios given in the table below.

Ambient Temperature	<30 °C	35 °C	40 °C	45 °C	50 °C	55 °C	60 °C
%Power Ratio	105	102	100	97	93	87	82

Operating Motors in Various Environmental Conditions

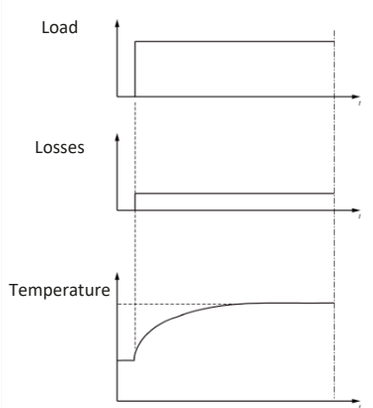
Nominal Power Changes According to Altitude							
Altitude	Up to 1000 m	Up to 1500 m	Up to 2000 m	Up to 2500 m	Up to 3000 m	Up to 3500 m	Up to 4000 m
%Power Ratio	100	98	95	91	87	83	78

Duty Cycle

Our standard motors have an S1 Duty Cycle, and the types of operation specified in IEC 60034-1 are listed below:

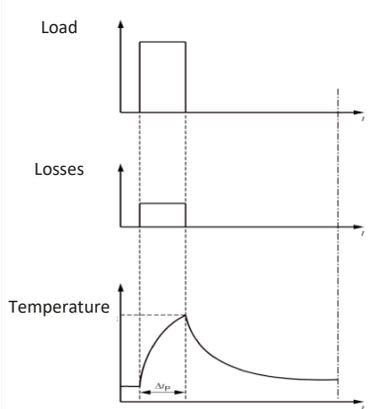
S1 Continuous Duty

The motor operates at a constant load long enough to reach thermal equilibrium



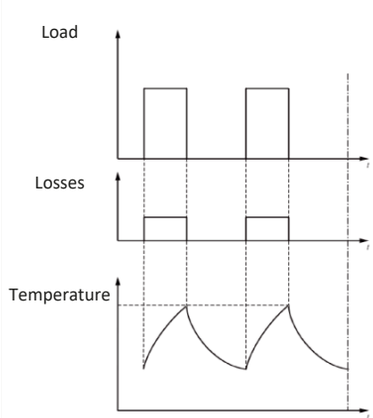
S2 Short-Time Duty

The motor runs at a constant load for a limited time, shorter than the time needed to reach thermal equilibrium, followed by a rest period. In general, 10, 30, 60, and 90-minute operating times are recommended.



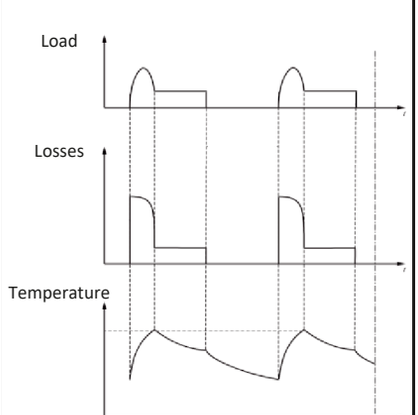
S3 Intermittent Periodic Duty

The motor operates in a sequence of identical cycles, each consisting of a period of constan load and a rest period. The rest period is long enough to prevent the motor from reaching thermal equilibrium. The operating period duration is typically 10 minutes, with relative operating times of 15%, 25%, 40%, and 60%.



S4 Intermittent Periodic Duty with Starting

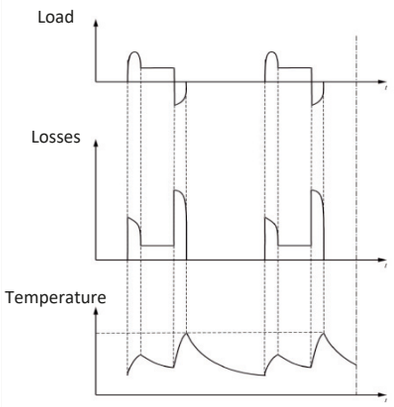
Similar to S3, but includes a significant starting period where the motor starts with a load, followed by a period of constant load and a rest period. In general, 10, 30, 60, and 90-minute operating times are recommended.



Duty Cycle

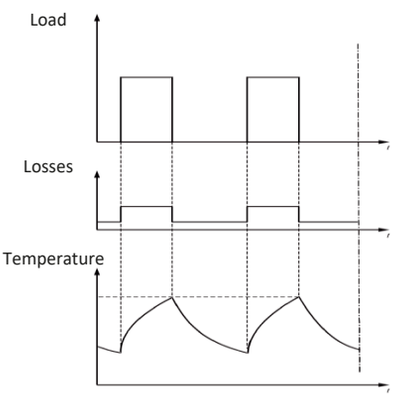
S5 Intermittent Periodic Duty with Electrical Braking

The motor operates in a sequence of identical duty cycles, each cycle consisting of a starting time, a time of operation at constant load, a time of electric braking and a time de-energized and at a rest.



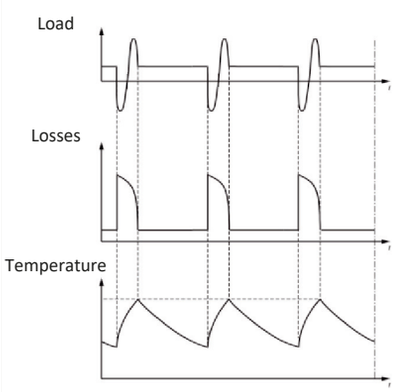
S6 Continuous Operation Periodic Duty

The motor operates in a sequence of identical cycles, each consisting of a period of constant load followed by a period of no load. There is no rest period, so motor should be operated in such a way that it does not reach thermal equilibrium at full load. Typically, relative operating times of 5%, 25%, 40%, and 60% are used.



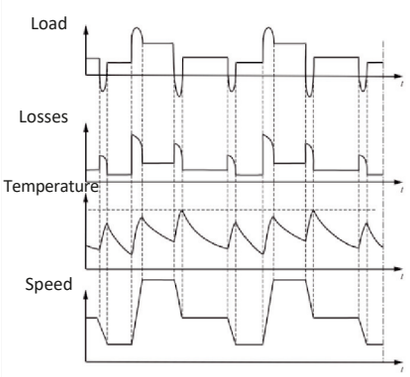
S7 Continuous Operation Periodic Duty with Electrical Braking

This is a sequence of identical duty cycles, each consisting of a period of start, a period of operation at constant load and a period of electric braking. Operating periods are designed in a way that the motor does not reach thermal equilibrium.There is no rest and de-energizing periods.



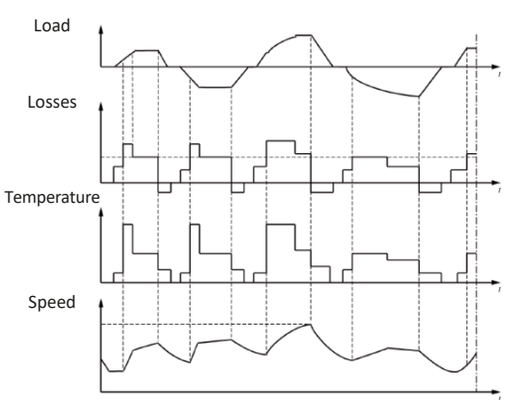
S8 Continuous Operation Periodic Duty with Load Variations

This is a sequence of identical duty cycles, each consisting of a period of operation at constant load, corresponding to a determined speed of rotation, followed immediately by a period of operation at another load, corresponding to another speed of rotation. There is no rest and de-energizing period



S9 Non-periodic Duty

The motor operates under varying loads and speeds, which can be non-periodic. It includes overloads beyond the rated values.

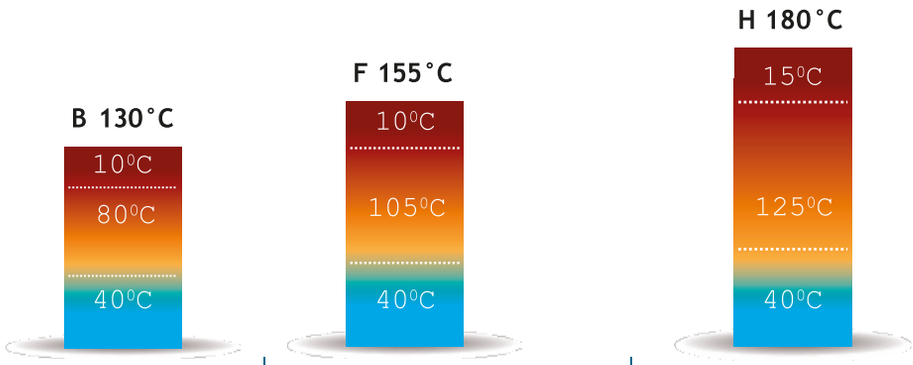


Winding Insulation / Temperature Rise Classes

All standard motors in the ELK Motor range have F (155 ° C) class electrical insulation system. However, by means of its superior design features, the temperature rise of all standard motors remain within the Class B temperature rise limits when operating under rated conditions. Depending on the safety margin of the temperature rise class provided, our motors can provide 15% higher rated output power with a service factor of 1.15 (SF).

INSULATION CLASS

- Maximum Winding Temperature
- Tolerance
- Limits of Winding Temperature
- Ambient Temperature



B

Class B insulation system is shown for reference purposes only. Class B insulation system is not used in ELK motors

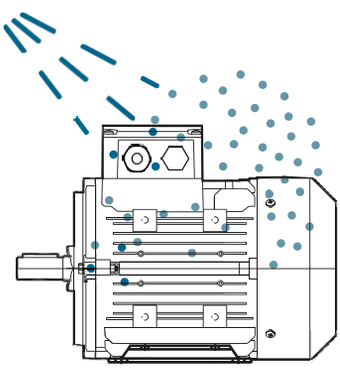
F (Standard)

Our standard motors have an F-class electrical insulation system. The maximum permissible winding temperature at an ambient temperature of 40°C is 155°C.

H (Optional)

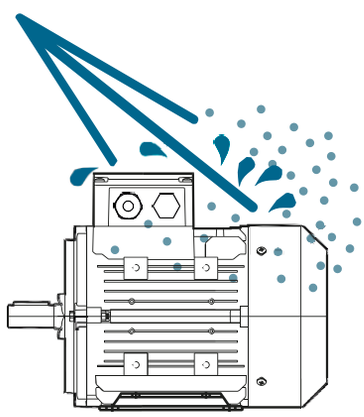
H class insulation is provided on special request. At 40°C ambient temperature, the maximum permissible winding temperature is 180°C

Protection Classes



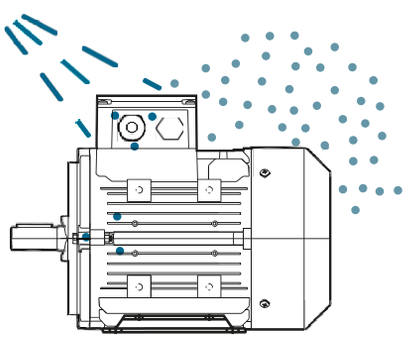
IP55 (Standard)

Ingress of dust in amounts that could be harmful has been prevented, and ingress of water in amounts that could be harmful is prevented in case of water spray from any direction.



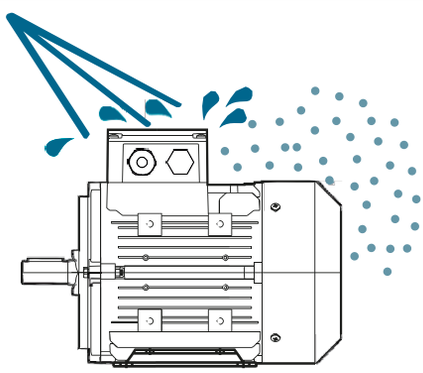
IP56

Ingress of dust in amounts that could be harmful has been prevented, and ingress of water in amounts that could be harmful is prevented in case of pressurized water spray from any direction.



IP65

Ingress of dust is completely prevented, and ingress of water in amounts that could be harmful is prevented in case of water spray from any direction.



IP66

Ingress of dust is completely prevented, and ingress of water in amounts that could be harmful is prevented in case of pressurized water spray from any direction..

Protection Classes

It is the classification of the protection degrees provided by the motor's external enclosure against Mechanical / Physical impacts. ELK Motors provide standard protection with an IK08 rating.

Protection Class	Impact Energy (Joule)
IK00	No Protection
IK01	0,14
IK02	0,2
IK03	0,35
IK04	0,5
IK05	0,7
IK06	1
IK07	2
IK08	5 (ELK Motor Standard)
IK09	10
IK10	20

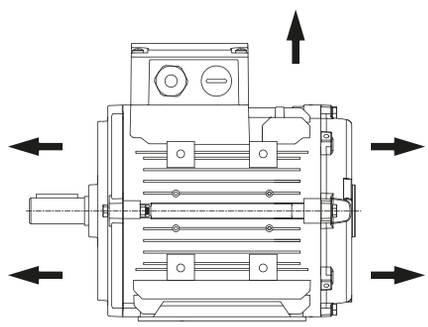
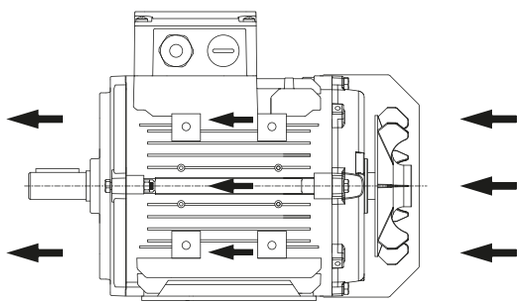
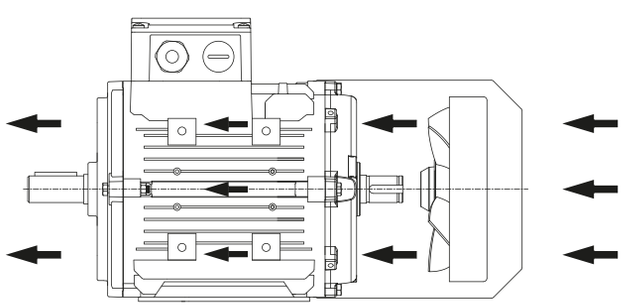
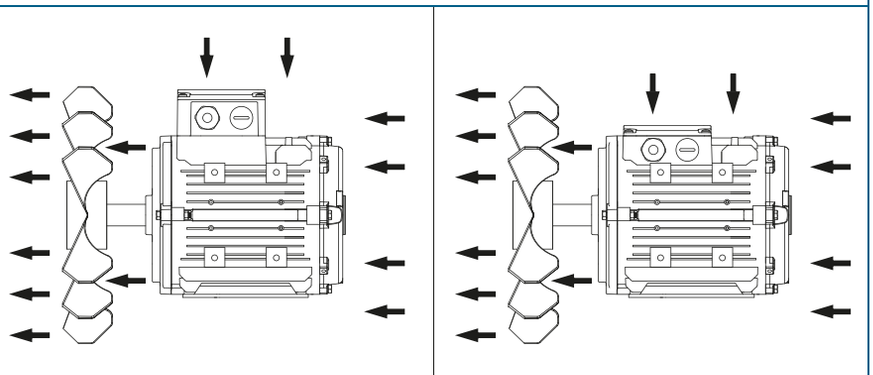
Vibration Classes

In ELK motors, shaft balancing and vibration measurements are performed with a half key, and vibration levels are detected. Based on the IEC 60034-14 standard, we guarantee an A-class (free suspension) vibration level for our motors. The declared maximum vibration values are as shown in the table.

Vibration Grade	Shaft Height (mm)	56 ≤ H ≤ 132			132 < H ≤ 280			H > 280		
	Mounting	Displacement	Speed	Acceleration	Displacement	Speed	Acceleration	Displacement	Speed	Acceleration
		(mm)	(mm/s)	(m/s^2)	(mm)	(mm/s)	(m/s^2)	(mm)	(mm/s)	(m/s^2)
A	Freely Suspended	25	1,6	2,5	35	2,2	3,5	45	2,8	4,4
	Rigidly Mounted	21	1,3	2	29	1,8	2,8	37	2,3	3,6
B	Freely Suspended	11	0,7	1,1	18	1,1	1,7	29	1,8	2,8
	Rigidly Mounted		-		14	0,9	1,4	24	1,5	2,4

Cooling Classes

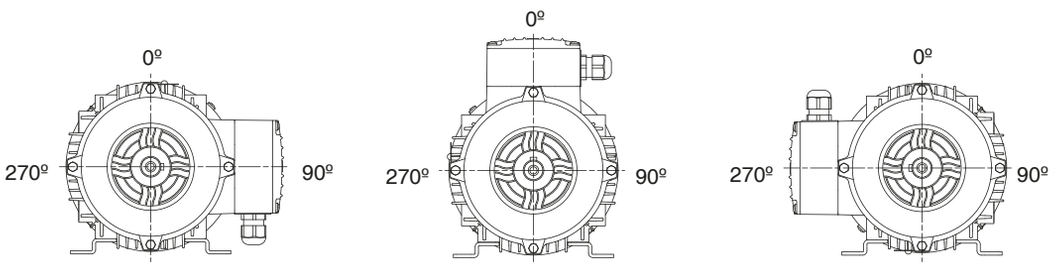
ELK Motors can be produced with the following cooling options in accordance with the IEC 60034-6 standard.
Our standard motors are manufactured using the IC411 method.

IC410 - TENV	
IC411 - TEFC	
IC416 - TEBC	
IC418 - TEAO	

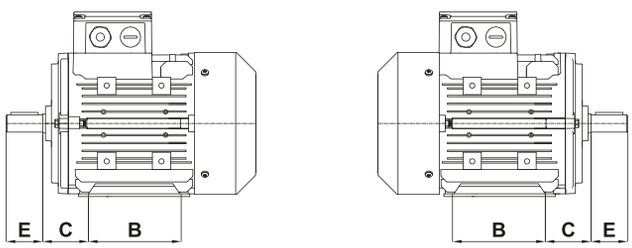
Mechanical Construction

ELK Motors feature a detachable foot structure in all frame sizes, on top of that, the foot can also be attached to three sides of the body. This allows users to easily configure the motor with the terminal box on the right, top, or left by changing the feet position. In standard motors, the terminal box is positioned on the top.

MOTOR SIZE 63-315



Additionally, due to the symmetric frame and foot structure of ELK Motors, the C dimension remains constant when the DE end-shield, NDE end-shield, and the shaft direction are changed. This allows the terminal box to be positioned closer to either the DE or NDE side (fan) side.

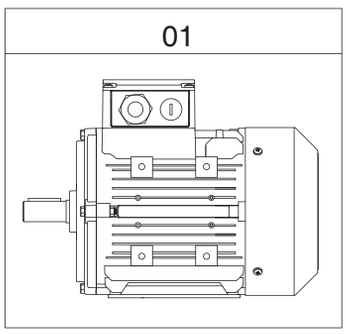


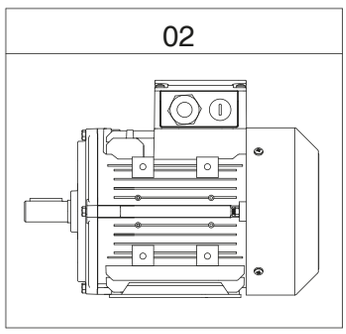
The materials used in our products are as specified below.

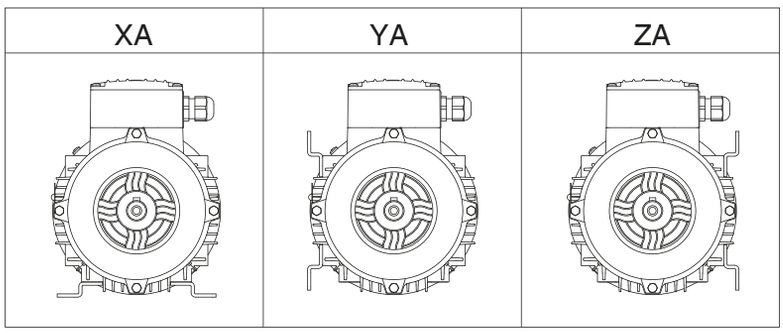
Frame Size	Housing	End Shield DE	End Shield NDE	Terminal Box & Cover	Feet	Fan Cover	Fan
63	Aluminum	Aluminum	Aluminum	Aluminum	Steel Sheet	Steel Sheet	Plastic
71	Aluminum	Aluminum	Aluminum	Aluminum	Steel Sheet	Steel Sheet	Plastic
80	Aluminum	Aluminum	Aluminum	Aluminum	Steel Sheet	Steel Sheet	Plastic
90	Aluminum	Aluminum	Aluminum	Aluminum	Steel Sheet	Steel Sheet	Plastic
100	Aluminum	Aluminum	Aluminum	Aluminum	Steel Sheet	Steel Sheet	Plastic
112	Aluminum	Aluminum	Aluminum	Aluminum	Steel Sheet	Steel Sheet	Plastic
132	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Steel Sheet Cast Iron	Steel Sheet	Plastic
160	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Steel Sheet	Plastic
180	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Steel Sheet	Plastic
200	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Steel Sheet	Plastic
225	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Steel Sheet	Plastic
250	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Steel Sheet	Plastic
280	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Steel Sheet	Plastic
315	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Steel Sheet	Plastic

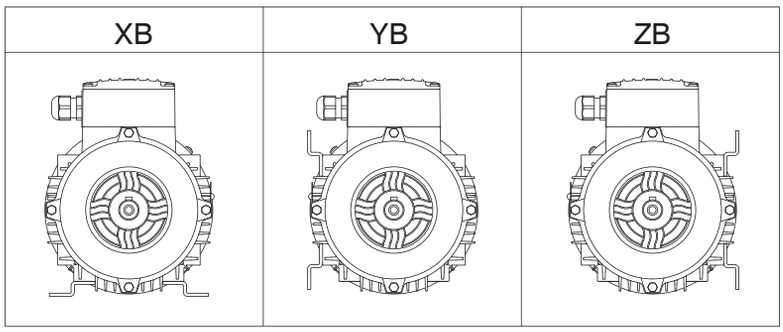
* Motors that do not have a symmetric frame structure are indicated in the efficiency tables.

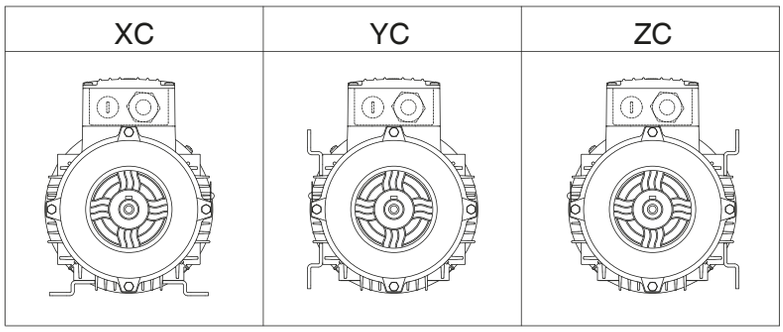
Construction Types

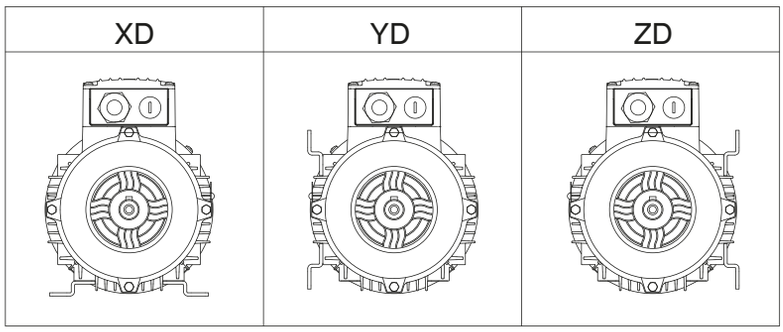












Standard ELK motors can be positioned with the terminal box on the drive side or the fan side. Depending on these options, the motor foot and flange orientation options are as shown in the table.

01: Terminal box on the drive side
02: Terminal box on the fan side

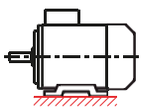
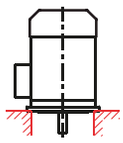
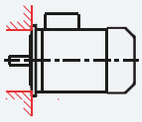
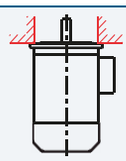
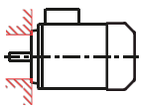
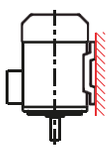
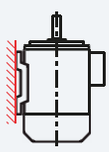
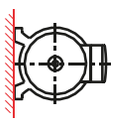
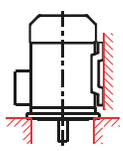
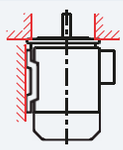
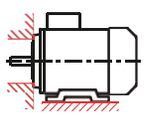
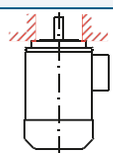
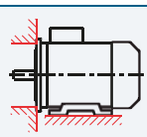
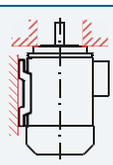
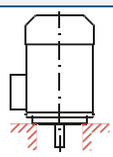
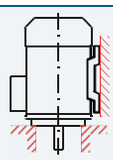
X: Feet on the ground when viewed from the drive side
Y: Feet on the left when viewed from the drive side
Z: Feet on the right when viewed from the drive side

A: Cable gland on the right when viewed from the drive side
B: Cable gland on the left when viewed from the drive side
C: Cable gland at the rear when viewed from the drive side
D: Cable gland at the front when viewed from the drive side

Optionally, if feet are not desired on the motor, mounting positions other than X, Y, and Z are available.

Construction Types

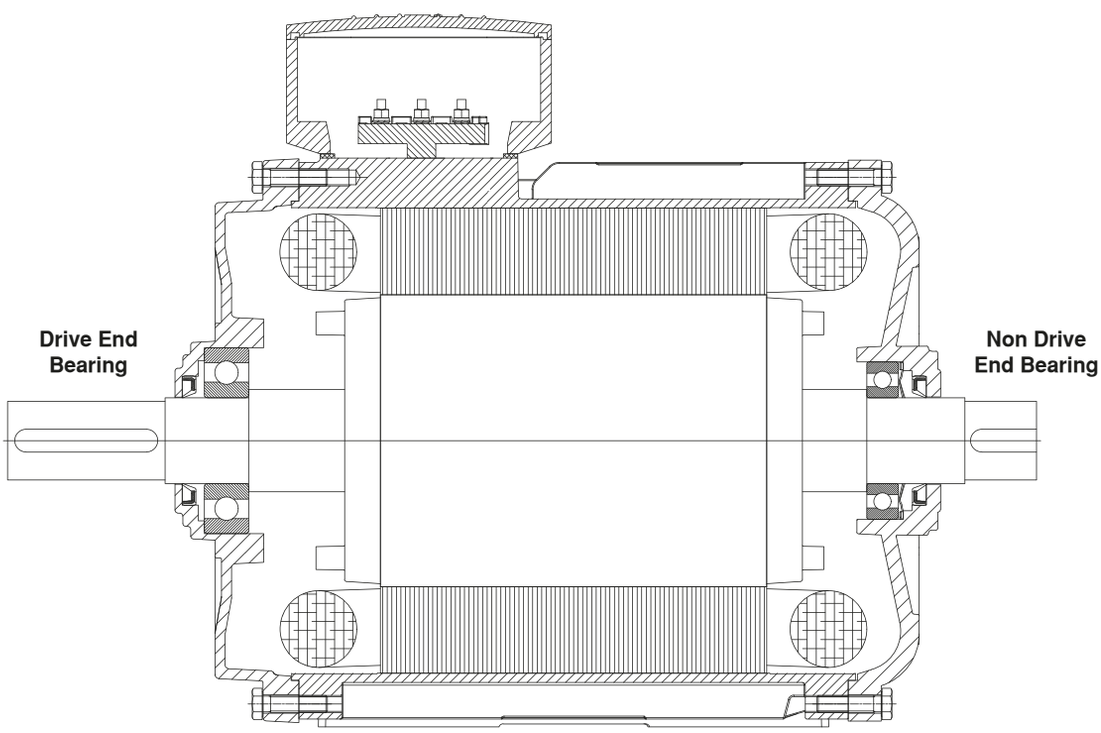
ELK motors are manufactured in accordance with International Mounting Standard IEC 60034-7.

Mounting codes and diagrams according to IEC 60034-7					
	Horizontal Mounting Codes			Vertical Mounting Codes	
	I	II		I	II
	IM B3	IM 1001		IM V1	IM 3011
	IM B5	IM 3001		IM V3	IM 3031
	IM B14	IM 3601		IM V5	IM 1011
	IM B7	IM 1061		IM V6	IM 1031
	IM B6	IM 1051		IM V15	IM 2011
	IM B8	IM 1071		IM V35	IM 2031
	IM B34	IM 2101		IM V19	IM 3631
	IM B35	IM 2001		IM V37	IM 2131
				IM V18	IM 3611
				IM V17	IM 2111

Bearings

Standard ELK Motors are equipped with the ball bearings specified in the table, and optional NUP and NJ type bearings can also be used.

Frame Size	Number of Poles	Drive End Bearing	Non-Drive End Bearing
63	2-4-6-8	6201 ZZ C3	6201 ZZ C3
71	2-4-6-8	6202 ZZ C3	6202 ZZ C3
80	2-4-6-8	6204 ZZ C3	6204 ZZ C3
90	2-4-6-8	6205 ZZ C3	6205 ZZ C3
100	2-4-6-8	6206 ZZ C3	6206 ZZ C3
112	2-4-6-8	6206 ZZ C3	6206 ZZ C3
132	2-4-6-8	6208 ZZ C3	6208 ZZ C3
160	2-4-6-8	6309 ZZ C3	6209 ZZ C3
180	2-4-6-8	6310 ZZ C3	6210 ZZ C3
200	2-4-6-8	6312 ZZ C3	6212 ZZ C3
225	2-4-6-8	6313 ZZ C3	6213 ZZ C3
250	2-4-6-8	6315 ZZ C3	6215 ZZ C3
280	2 4-6-8	6315 C3 6317 C3	6315 C3 6317 C3
315	2 4-6-8	6316 C3 6319 C3	6316 C3 6319 C3



Lubrication

In open bearing applications, axial and radial loads, along with temperature and motor speed factors, affect the lubrication intervals and quantities. The lubrication intervals and quantities are theoretically calculated and specified based on the permissible maximum radial and axial Loads given in the catalog, considering temperature and speed factors. In open bearing lubrication applications, it is important to use the type and brand of grease specified by the manufacturer.
ELK Motors uses MOBIL Polyrex EM for open lubrication applications. The lubrication intervals for the relevant bearings are also indicated on the motor nameplate.

50 Hz Deep Groove Ball Bearing Lubrication Intervals

Frame	Pole	45°C < T ≤ 65°C				65°C < T ≤ 80°C				80°C < T ≤ 95°C			
		DE		NDE		DE		NDE		DE		NDE	
		Amount [g]	Time [h]	Amount [g]	Time [h]	Amount [g]	Time [h]	Amount [g]	Time [h]	Amount [g]	Time [h]	Amount [g]	Time [h]
112	2	5	14000	5	14000	5	6900	5	6900	5	3500	5	3500
	4	5	14000	5	20000	5	7100	5	10000	5	3600	5	5100
	6	5	16000	5	23000	5	8100	5	12000	5	4100	5	5800
132	2	7	11000	7	11000	7	5500	7	5500	7	2700	7	2700
	4	7	13000	7	18000	7	6300	7	9000	7	3200	7	4500
	6	7	15000	7	21000	7	7500	7	11000	7	3700	7	5400
160	2	13	8800	8	10000	13	4400	8	5000	13	2200	13	2500
	4	13	11000	8	17000	13	5700	8	8700	13	2800	13	4300
	6	13	14000	8	21000	13	7000	8	10000	13	3500	13	5200
180	2	15	7800	9	9200	15	3900	9	4600	15	1900	15	2300
	4	15	11000	9	17000	15	5300	9	8300	15	2700	15	4200
	6	15	13000	9	20000	15	6700	9	10000	15	3300	15	5100
200	2	20	6000	12	7200	20	3000	12	3600	20	1500	12	1800
	4	20	9400	12	15000	20	4700	12	7300	20	2400	12	3700
	6	20	12000	12	19000	20	6200	12	9300	20	3100	12	4700
225	2	23	5300	14	6300	23	2700	14	3200	23	1300	14	1600
	4	23	8900	14	14000	23	4400	14	6900	23	2200	14	3400
	6	23	12000	14	18000	23	5900	14	8900	23	3000	14	4500
250	2	30	4100	16	5300	30	2100	16	2700	30	1000	16	1300
	4	30	7800	16	13000	30	3900	16	6300	30	1900	16	3200
	6	30	11000	16	17000	30	5400	16	8400	30	2700	16	4200
280	2	30	4100	30	4100	30	2100	30	2100	30	1000	30	1000
	4	37	6900	37	9800	37	3400	37	4900	37	1700	37	2500
	6	37	10000	37	14000	37	5000	37	7100	37	2500	37	3600
315	2	33	3600	33	3600	33	1800	33	1800	33	910	33	910
	4	45	6100	45	8700	45	3000	45	4300	45	1500	45	2200
	6	45	9200	45	13000	45	4600	45	6500	45	2300	45	3300

* The "T" value specified in the table is the bearing temperature.

60 Hz Deep Groove Ball Bearing Lubrication Intervals

Frame	Pole	45°C < T ≤ 65°C				65°C < T ≤ 80°C				80°C < T ≤ 95°C			
		DE		NDE		DE		NDE		DE		NDE	
		Amount [g]	Time [h]	Amount [g]	Time [h]	Amount [g]	Time [h]	Amount [g]	Time [h]	Amount [g]	Time [h]	Amount [g]	Time [h]
112	2	5	12000	5	12000	5	5900	5	5900	5	3000	5	3000
	4	5	13000	5	19000	5	6600	5	9400	5	3300	5	4700
	6	5	15000	5	22000	5	7700	5	11000	5	3800	5	5500
132	2	7	8900	7	8900	7	4500	7	4500	7	2200	7	2200
	4	7	11000	7	16000	7	5700	7	8200	7	2900	7	4100
	6	7	14000	7	20000	7	7000	7	10000	7	3500	7	5000
160	2	13	6900	8	8100	13	3500	8	4000	13	1700	8	2000
	4	13	10000	8	16000	13	5000	8	7800	13	2500	8	3900
	6	13	13000	8	19000	13	6400	8	9700	13	3200	8	4800
180	2	15	5900	9	7300	15	3000	9	3600	15	1500	9	1800
	4	15	9300	9	15000	15	4700	9	7400	15	2300	9	3700
	6	15	12000	9	19000	15	6100	9	9400	15	3100	9	4700
200	2	20	4400	12	5400	20	2200	12	2700	20	1100	12	1300
	4	20	8000	12	13000	20	4000	12	6300	20	2000	12	3200
	6	20	11000	12	17000	20	5500	12	8500	20	2800	12	4200
225	2	23	3800	14	4600	23	1900	14	2300	23	940	14	1200
	4	23	7400	14	12000	23	3700	14	5900	23	1900	14	2900
	6	23	11000	14	16000	23	5300	14	8000	23	2600	14	4000
250	2	30	2800	16	3800	30	1400	16	1900	30	700	16	940
	4	30	6400	16	11000	30	3200	16	5300	30	1600	16	2700
	6	30	9500	16	15000	30	4800	16	7500	30	2400	16	3800
280	2	30	2800	30	2800	30	1400	30	1400	30	700	30	700
	4	37	5500	37	7900	37	2700	37	3900	37	1400	37	2000
	6	37	8600	37	12000	37	4300	37	6100	37	2100	37	3100
315	2	33	2400	33	2400	33	1200	33	1200	33	600	33	600
	4	45	4700	45	6700	45	2400	45	3400	45	1200	45	1700
	6	45	7800	45	11000	45	3900	45	5500	45	1900	45	2800

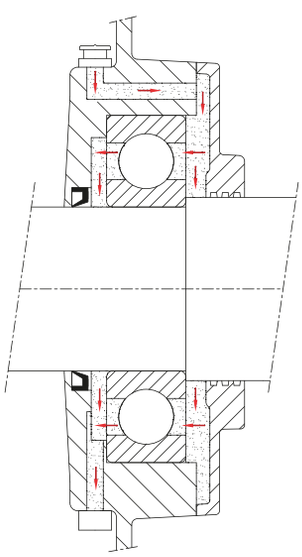
* The "T" value specified in the table is the bearing temperature.

50 Hz Cylindrical Roller Bearing Lubrication Intervals

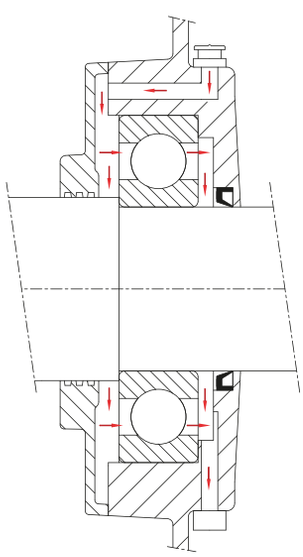
Frame	Pole	45°C < T ≤ 65°C DE		65°C < T ≤ 80°C DE		80°C < T ≤ 95°C DE	
		Amount [g]	Time [h]	Amount [g]	Time [h]	Amount [g]	Time [h]
132	2	10	2000	10	1000	10	510
	4	10	4600	10	2300	10	1200
	6	10	6100	10	3000	10	1500
160	2	13	1700	13	840	13	420
	4	13	4200	13	2100	13	1000
	6	13	5700	13	2800	13	1400
180	2	15	1400	15	700	15	350
	4	15	3800	15	1900	15	1000
	6	15	5300	15	2700	15	1300
200	2	20	950	20	480	20	240
	4	20	3200	20	1600	20	800
	6	20	4700	20	2400	20	1200
225	2	23	800	23	400	23	200
	4	23	3000	23	1500	23	750
	6	23	4400	23	2200	23	1100
250	2	30	540	30	270	30	130
	4	30	2400	30	1200	30	600
	6	30	4000	30	2000	30	1000
280	2	30	540	30	270	30	130
	4	30	2400	30	1200	30	600
	6	30	3900	30	1900	30	970
315	2	33	440	33	220	33	110
	4	33	2200	33	1100	33	540
	6	33	3700	33	1800	33	920

* The "T" value specified in the table is the bearing temperature.

Bearing Lubrication Schematic



Drive Side

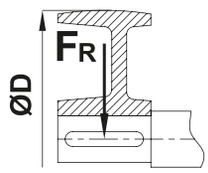


Non Drive Side

Radial Loads

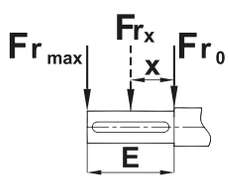
Radial Load on the Shaft (FR):
The radial load can be calculated using the following formula.
The calculated radial load should not exceed the permissible values specified in the tables (FR < Frx).
If it does, please consult us.

$$F_R = k \cdot \frac{P}{D \cdot n} \cdot 10^7 \ (N)$$



Correction of Permissible Radial Load (Frx):
If the radial load acting on the shaft is between the x0 and xmax values, the permissible value should be corrected using the following formula.

$$Fr_X = Fr_0 - \frac{x}{E}(Fr_0 - Fr_{\max})$$



P: Motor Power (kW)
D: Shaft Diameter (mm)
n: Motor Speed (rpm)
k: Radial Load Factor

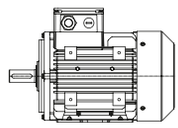
- Spur Gears, chain drives with low speed = 2.1
- Trigger Belts = 2,5
- V type belts = 5

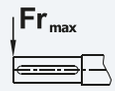
FR<Frx : The radial load on the shaft must be less than the permissible maximum radial load.

Fa: Axial load acting on the shaft.
Fr0: Permissible maximum radial load on the shaft.
Fr max: Permissible maximum radial load at the end of the shaft.
Permissible load calculations are based on a bearing life of Lh10 20,000 hours according to ISO 281.

Radial Loads

HORIZONTAL MOUNTING - Permissible Radial Loads
Mounting Positions IM: B3, B5, B6, B7, B8, B14, B34, B35

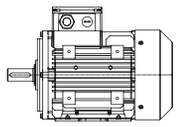


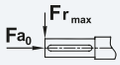
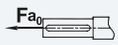
Frame Size	Fa = 0	
		
2 Poles 3000 rpm	**Fr_0 [N]**	**Fr_{max} [N]**
63	350	300
71	380	340
80	640	550
90	750	660
100	1050	900
112	1050	910
132	1520	1220
160	2800	2300
180	3250	2650
200	4340	3560
225	4950	4000
250	6050	4800
280	6300	5100
315	6400	5550
4 Poles 1500 rpm	**Fr_0 [N]**	**Fr_{max} [N]**
63	430	390
71	520	440
80	800	700
90	950	780
100	1300	1050
112	1300	1050
132	1950	1600
160	3540	2825
180	4100	3400
200	5500	4550
225	6200	4900
250	7500	6000
280	8200	7500
315	8500	8000
6 Poles 1000 rpm	**Fr_0 [N]**	**Fr_{max} [N]**
71	580	500
80	870	800
90	1090	900
100	1500	1250
112	1500	1250
132	2200	1800
160	4050	3190
180	4720	3830
200	6350	5150
225	7350	5650
250	8950	7200
280	9500	8500
315	9800	8700

Fa0 : Permissible maximum axial load
Fr : Radial force acting on the shaft
Fr0 : Permissible maximum radial load at the end of the shaft
Fr max : Permissible maximum radial load at the shaft end
Permissible load calculations are based on a bearing life of Lh10 20,000 hours according to ISO 281.

Axial Loads

HORIZONTAL MOUNTING - Permissible Axial Loads
Mounting Positions IM: B3, B5, B6, B7, B8,B14, B34, B35

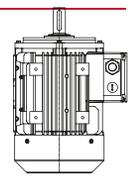


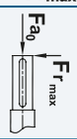
Frame Size	Push			Pull
	Fr =0	Fr =Fr_0	Fr =Fr_{max}	Fr =0
				
2 Poles 3000 rpm	**Fa_0 [N]**	**Fa0 [N]**	**Fa0 [N]**	**Fa0 [N]**
63	90	90	90	220
71	110	110	110	250
80	190	190	190	395
90	210	210	210	400
100	270	270	270	580
112	270	270	270	580
132	380	380	370	800
160	2280	1060	1020	1670
180	2660	1250	1250	1970
200	3150	1500	1390	2600
225	3850	1850	1760	2750
250	4150	2180	2250	3350
280	4500	2500	2500	3350
315	5200	2700	2700	3410
4 Poles 1500 rpm	**Fa0 [N]**	**Fa0 [N]**	**Fa0 [N]**	**Fa0 [N]**
63	90	90	90	330
71	110	110	110	360
80	190	190	190	560
90	210	210	210	585
100	300	300	300	830
112	300	300	300	830
132	400	400	400	1200
160	2280	1400	1400	2350
180	3100	1570	1500	2800
200	4400	1770	1770	3810
225	4950	2150	2200	4300
250	6050	2400	2400	4500
280	7200	3000	3000	5500
315	7800	4000	3700	5800
6 Poles 1000 rpm	**Fa0 [N]**	**Fa0 [N]**	**Fa0 [N]**	**Fa0 [N]**
71	110	110	110	430
80	190	190	190	700
90	210	210	210	740
100	290	290	290	1020
112	290	290	290	1020
132	380	380	380	1470
160	3050	1540	1520	2900
180	3540	1780	1700	3410
200	4800	2200	2250	4400
225	5050	2580	2800	5200
250	6050	3100	3150	6500
280	7000	3700	3400	7150
315	8500	4200	3800	6900

Fa0 : Permissible maximum axial load
Fr : Radial force acting on the shaft
Fr0 : Permissible maximum radial load at the end of the shaft
Fr max : Permissible maximum radial load at the shaft end
Permissible load calculations are based on a bearing life of Lh10 20,000 hours according to ISO 281.

Axial Loads

VERTICAL MOUNTING - Shaft Pointing Upwards - Permissible Axial Loads
Mounting Positions IM: V3, V6, V19, V35, V37

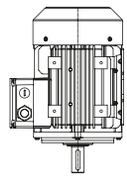


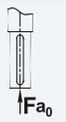
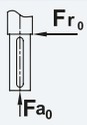
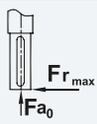
Frame Size	Push			Pull
	Fr = 0	Fr = Fr_0	Fr = Fr_{max}	Fr = 0
				
2 Poles 3000 rpm	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**
63	90	90	90	230
71	100	100	100	265
80	170	170	170	425
90	180	180	180	450
100	250	250	250	650
112	250	250	250	660
132	300	300	300	970
160	2080	1060	990	1950
180	2410	1190	1050	2350
200	2900	1265	1265	3000
225	3250	1310	1295	3575
250	3950	1460	1450	4350
280	4100	1500	1500	4700
315	4380	1420	1420	5250
4 Poles 1500 rpm	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**
63	90	90	90	345
71	95	95	95	380
80	160	160	160	600
90	170	170	170	650
100	210	210	210	930
112	210	210	210	950
132	240	240	240	1430
160	2500	1250	1220	2160
180	2900	1400	1370	2570
200	3900	1360	1530	3500
225	4450	1570	1680	4000
250	5400	1870	1910	4300
280	6500	2250	2250	7100
315	6000	2050	1600	8850
6 Poles 1000 rpm	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**
71	95	95	95	455
80	160	160	160	745
90	170	170	170	800
100	230	230	230	1120
112	210	210	210	1150
132	250	250	250	1690
160	2980	1490	1450	3300
180	3400	1670	1670	3800
200	4250	1850	1860	5100
225	4800	1980	2080	5800
250	5300	2200	2260	6200
280	6300	2200	2050	7500
315	6800	2290	2200	10750

Fa0 : Permissible maximum axial load
Fr : Radial force acting on the shaft
Fr0 : Permissible maximum radial load at the end of the shaft
Fr max : Permissible maximum radial load at the shaft end
Permissible load calculations are based on a bearing life of Lh10 20,000 hours according to ISO 281.

Axial Loads

VERTICAL MOUNTING – Shaft Pointing Downwards - Permissible Axial Loads
Mounting Positions IM: V1, V5, V15, V17, V18

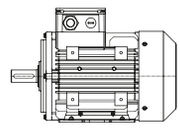


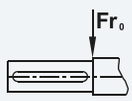
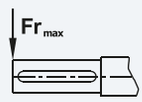
Frame Size	Push			Pull
	Fr = 0	Fr = Fr_0	Fr = Fr_{max}	Fr = 0
				
2 Poles 3000 rpm	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**
63	110	110	110	210
71	130	130	130	235
80	220	220	220	385
90	250	250	250	375
100	330	330	330	535
112	340	340	340	520
132	490	550	550	680
160	2600	1550	1500	1500
180	3070	1850	1750	1700
200	3550	2300	2300	2315
225	4250	2680	2670	2630
250	5200	3200	3280	3100
280	6000	3900	3900	2750
315	7320	4370	4350	2825
4 Poles 1500 rpm	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**
63	120	110	120	300
71	130	130	130	340
80	220	220	220	540
90	260	260	260	545
100	380	370	370	760
112	410	400	400	740
132	580	570	570	1040
160	3500	1910	1840	2100
180	4000	2300	2170	2450
200	4250	2870	2850	2200
225	5000	3350	3380	3740
250	6200	4200	4000	4440
280	8900	4850	4850	4600
315	10900	6950	6500	3900
6 Poles 1000 rpm	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**
71	130	130	130	415
80	220	220	220	675
90	250	250	250	700
100	360	360	360	960
112	390	390	390	930
132	560	560	560	1310
160	3100	2130	2120	2650
180	3600	2600	2490	3030
200	5000	3260	3300	4000
225	5550	3710	3810	4650
250	6200	4510	4550	5500
280	7500	5300	5200	5750
315	12800	7400	7800	5500

Fa0 : Permissible maximum axial load
Fr : Radial force acting on the shaft
Fr0 : Permissible maximum radial load at the end of the shaft
Fr max : Permissible maximum radial load at the shaft end
Permissible load calculations are based on a bearing life of Lh10 20,000 hours according to ISO 281.

Radial Loads (NUP)

HORIZONTAL MOUNTING - Permissible Radial Loads
Mounting Positions IM: B3, B5, B6, B7, B8, B14, B34, B35



Frame Size	Fa = 0	
		
2 Poles 3000 rpm	**Fr_0 [N]**	**Fr_{max} [N]**
132	6800	5200
160	8200	4500
180	9500	7300
200	12700	10400
225	15500	11300
250	20500	13600
280	20500	17000
315	22000	18500
4 Poles 1500 rpm	**Fr_0 [N]**	**Fr_{max} [N]**
132	8500	6500
160	10000	6300
180	11500	9300
200	15500	12800
225	19000	14500
250	25000	17500
280	31000	26000
315	35000	30000
6 Poles 1000 rpm	**Fr_0 [N]**	**Fr_{max} [N]**
132	9500	7600
160	11500	7100
180	13000	10500
200	17500	14500
225	21500	16500
250	28500	19500
280	35000	29000
315	40000	34000

Fa0 : Permissible maximum axial load
Fr : Radial force acting on the shaft
Fr0 : Permissible maximum radial load at the end of the shaft
Fr max : Permissible maximum radial load at the shaft end
Permissible load calculations are based on a bearing life of Lh10 20,000 hours according to ISO 281.

Product Type Codes of Three-Phase Motors

4	EL	160	L	4	F	PD	BA	000

4 ----→ Motor Efficiency Classes:
2: IE2
3: IE3
4: IE4

EL ----→ Basic Motor Type
EL : Aluminum housing standard three-phase motors
EG : Cast iron housing standard three-phase motors
EC : Aluminum housing three-phase compact motors
ED : Cast iron housing three-phase compact motors

160 ----→ Frame Size: 63, 71, 80, 90, 100, 112, 132, 160, 180, 200, 225, 250, 280, 315
Height of the shaft axis from feet base of motor (mm)

L ----→ Housing Length
S : Short
M: Medium
L : Long

4 ----→ Number of Poles
2: 2 Poles 3000 rpm
4: 4 Poles 1500 rpm
6: 6 Poles 1000 rpm
8: 8 Poles 750 rpm

F ----→ Core Length: A, B, C, D, E, F, G

PD ----→ Construction Types Flange Types
PD : B3 Foot Mounted
FA : B5 Flange
FB : B14/2 Flange
PB : B14/2 Feet
FC : B14 Flange
FS : Special Flange
PA : B35
PC : B34
PS : Foot mounted with special flange
Y0..Y9 : With flange for gearbox connection
PX : Foot mounted without drive end shield
XX : Without foot and drive end shield
Z0-Z9 : Foot mounted Yılmaz type

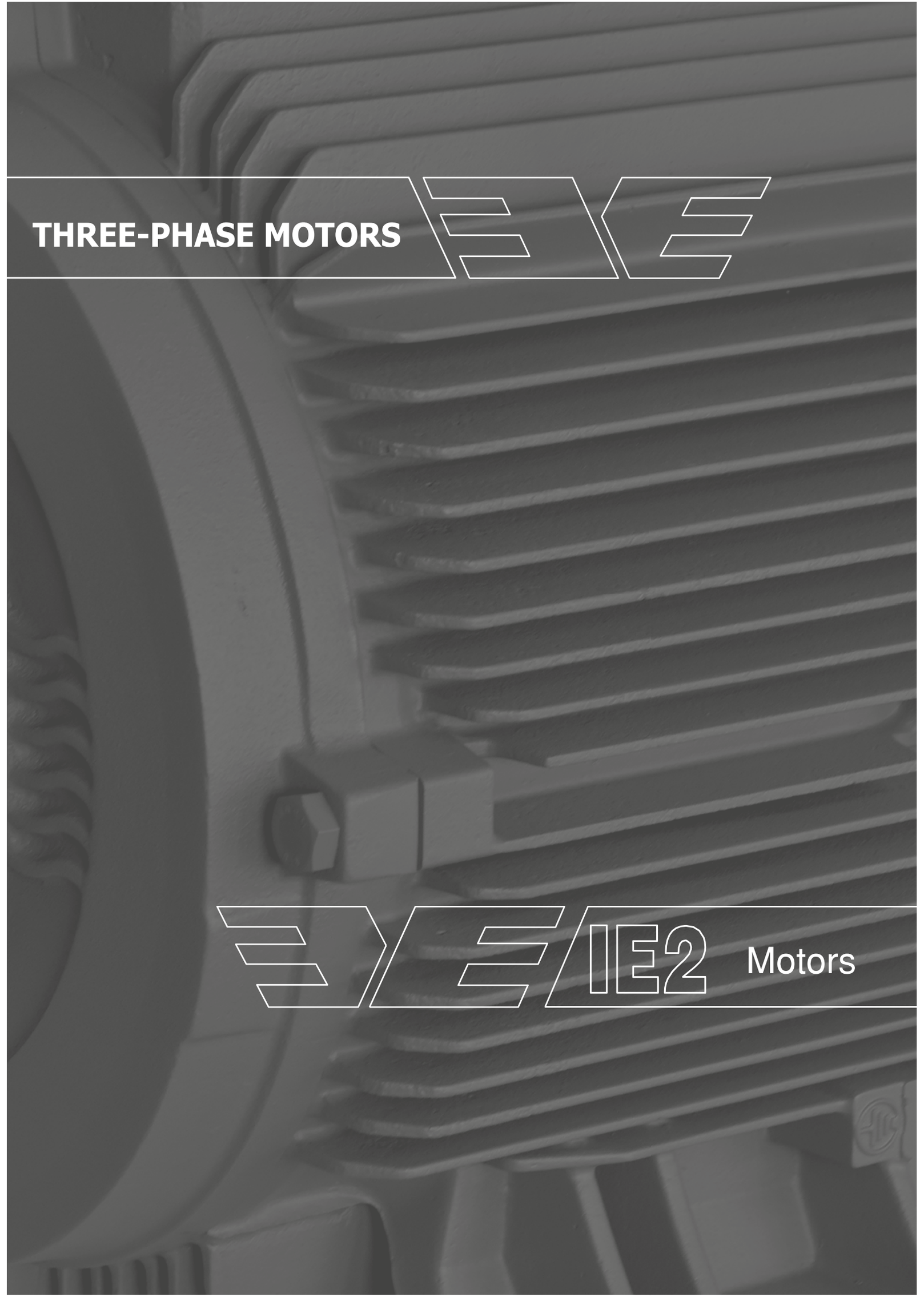
BA ----→ Electrical Specifications
AA..ZZ Voltage, Frequency and electrical features

1st digit : Voltage and Frequency
A : 230/400V 50Hz
B : 400/690V 50Hz
C : 240/415V 50Hz
D : 415/720V 50Hz
E : 230/400V 60Hz
F : 400/690V 60Hz
G : 220V 60Hz
H : 290/500V 50Hz
I : 220/380V 60Hz
J : 380/660V 60Hz

2nd digit : Additional electrical features
0: Standard motor, basic version
A: Motors with thermistor
B: Motors with anti-condensation heater
C: Motors with thermal switch
D: Motors with PT100 Temperature sensor
J: Motors with PT1000 Temperature sensor
K: Motors with thermistor and anti-condensation heater

000 ----→ Additional Motor Features
000 : Standard Motor

THREE-PHASE MOTORS



IE2 Motors

Electrical Characteristics

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)
Temperature Raise : B (80°K)

400V 50Hz 3000 d/d

IE2

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
230/400	2EL063M2A	0,18	2800	0,50	0,61	0,77	67,5	66,0	62,0	4,5	2,9	3,0	0,00012	3,80	51
	2EL063M2B	0,25	2800	0,67	0,85	0,78	69,0	68,0	63,5	4,5	2,9	3,0	0,00015	4,00	51
	2EL071M2A	0,37	2790	0,90	1,26	0,80	74,2	74,5	72,5	5,0	2,5	2,8	0,00031	5,70	54
	2EL071M2B	0,55	2790	1,27	1,88	0,82	75,8	77,0	76,0	5,0	2,8	2,9	0,00037	6,20	54

Our UL approved motors have the cULus logo on their nameplates.

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)
Temperature Raise : B (80°K)

400V 50Hz 1500 d/d

IE2

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
230/400	2EL063M4B	0,12	1400	0,42	0,82	0,70	60,1	60,5	54,5	3,0	2,1	2,3	0,00018	4,00	42
	2EL063M4C	0,18	1400	0,56	1,23	0,71	64,7	65,8	61,5	3,0	2,1	2,3	0,00022	4,40	42
	2EL071M4B	0,25	1425	0,71	1,68	0,69	74,0	73,5	70,5	4,4	2,0	3,0	0,00067	6,30	46
	2EL071M4C	0,37	1425	1,00	2,47	0,70	76,1	75,5	71,5	4,6	2,0	3,0	0,00082	7,00	46
	2EL080M4B	0,55	1440	1,45	3,65	0,71	77,1	76,7	75,0	5,2	2,0	3,0	0,00175	9,70	50

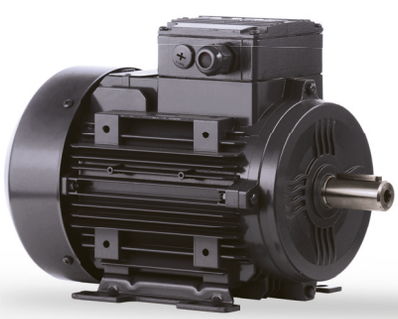
Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)
Temperature Raise : B (80°K)

400V 50Hz 1000 d/d

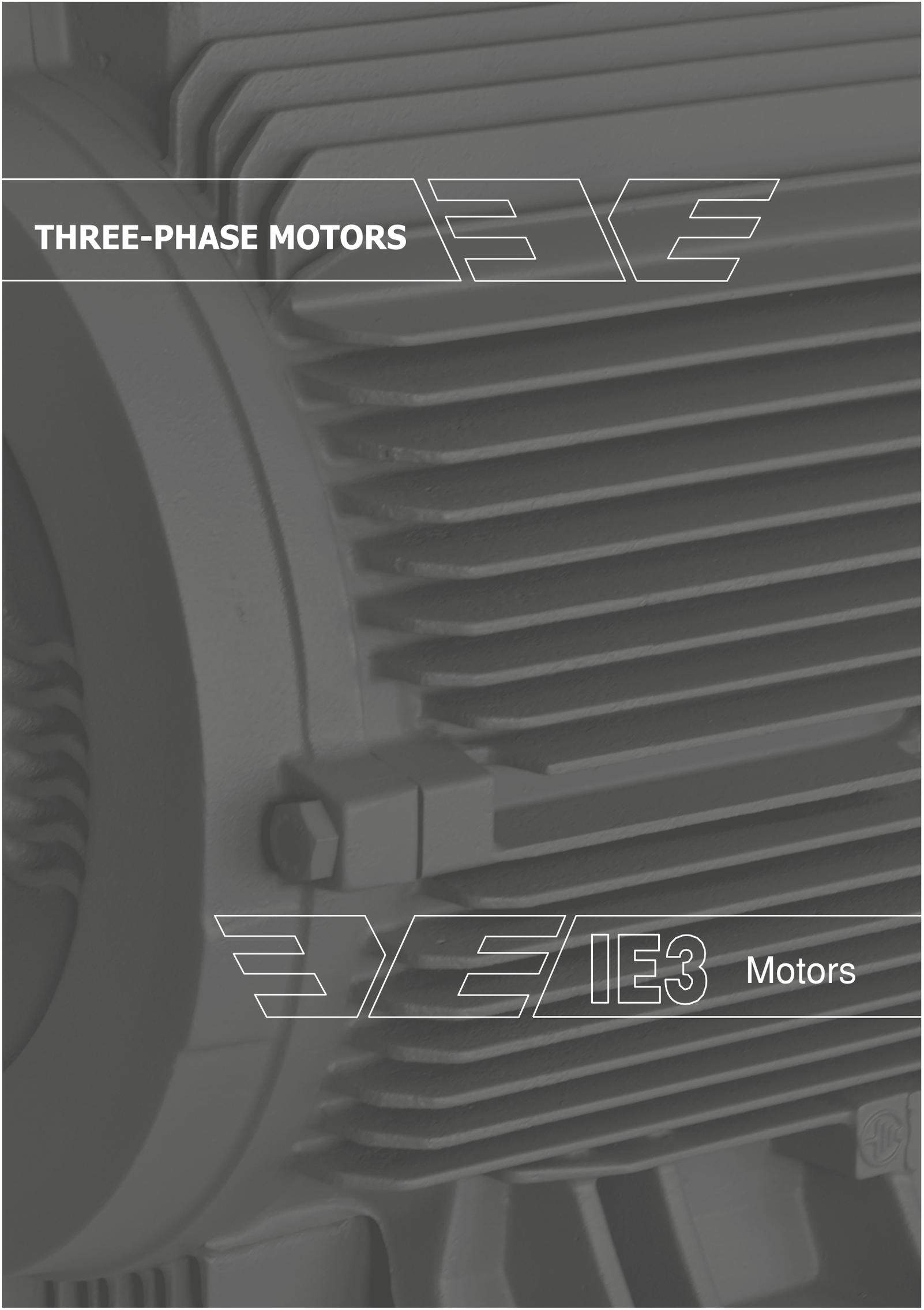
IE2

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
230/400	2EL71M6B	0,18	920	0,60	1,87	0,67	64,5	63,0	57,0	3,2	1,9	2,3	0,00076	6,10	42
	2EL71M6C	0,25	920	0,78	2,59	0,69	66,5	66,0	61,0	3,3	1,9	2,3	0,00096	6,70	42
	2EL80M6A	0,37	925	1,08	3,82	0,69	71,4	71,5	70,0	4,0	2,0	2,6	0,00176	9,10	45
	2EL80M6B	0,55	932	1,50	5,64	0,72	73,5	74,0	71,0	4,2	2,1	2,6	0,00202	9,80	45

Our UL approved motors have the cULus logo on their nameplates.



THREE-PHASE MOTORS



IE3 Motors

Electrical Characteristics

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)
Temperature Raise : B (80°K)

400V 50Hz 3000 d/d

IE3

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
230/400	3EL063M2A	0,18	2805	0,48	0,61	0,77	70,0	68,5	62,8	4,5	3,0	3,1	0,00012	4,00	51
	3EL063M2B	0,25	2805	0,65	0,85	0,79	71,0	69,7	64,2	4,6	3,0	3,1	0,00015	4,20	51
	3EL071M2B	0,37	2830	0,84	1,25	0,82	76,6	77,0	75,0	6,0	2,8	3,0	0,00037	6,30	53
	3EL071M2C	0,55	2830	1,19	1,86	0,84	79,4	80,2	78,8	6,1	2,9	3,3	0,00046	7,00	53
	3EL080M2B	0,75	2880	1,59	2,49	0,84	80,7	82,0	81,5	6,7	3,0	3,6	0,00103	9,60	54
	3EL080M2C	1,10	2880	2,26	3,64	0,85	82,7	83,0	82,4	6,8	3,1	3,8	0,00124	10,9	54
	3EL090S2B	1,50	2900	2,97	4,94	0,86	84,8	85,4	84,2	7,6	3,1	3,9	0,00178	15,2	59
	3EL090L2C	2,20	2900	4,25	7,24	0,87	85,9	86,8	86,1	7,2	3,0	3,8	0,00221	17,5	59
	3EL100L2C	3,00	2910	5,58	9,85	0,89	87,1	87,6	86,9	7,9	3,0	4,1	0,00450	23,8	62
400/690	3EL112M2C	4,00	2915	7,28	13,1	0,90	88,1	88,8	88,2	7,5	2,6	3,9	0,00618	29,4	65
	3EL132S2B	5,50	2945	9,90	17,8	0,90	89,2	89,0	88,6	8,9	2,9	3,9	0,01732	45,7	67
	3EL132S2C	7,50	2945	13,2	24,3	0,91	90,1	90,5	89,7	8,4	2,6	4,0	0,02104	52,0	67
	3EL160M2B	11,0	2950	19,7	35,6	0,88	91,2	91,0	90,5	8,5	2,6	3,9	0,03318	79,7	69
	3EL160M2C	15,0	2950	26,5	48,6	0,89	91,9	92,1	91,6	8,9	3,1	4,2	0,03913	87,8	69
	3EL160L2D	18,5	2945	31,7	60,0	0,91	92,4	92,7	92,3	8,9	3,1	4,2	0,04409	95,2	69
	3EL180M2B	22,0	2957	38,1	71,1	0,90	92,7	92,9	92,0	8,6	3,1	3,9	0,06299	131	70
	3EL200L2B	30,0	2965	52,0	96,6	0,89	93,6	93,8	93,6	8,6	3,2	3,5	0,16168	181	72
	3EL200L2C	37,0	2965	63,3	119	0,90	93,7	94,1	93,8	8,6	3,2	3,4	0,17458	191	72
	3EG225M2C	45,0	2970	76,8	145	0,90	94,0	94,4	94,2	8,6	3,3	3,1	0,25353	335	74
	3EG250M2C	55,0	2970	93,3	177	0,90	94,4	94,8	94,5	8,6	3,3	3,4	0,38000	425	75

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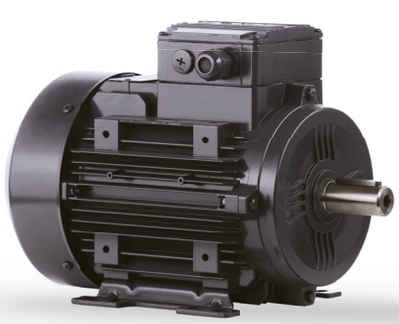

Electrical Characteristics

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)
Temperature Raise : B (80°K)

400V 50Hz 1500 d/d

IE3

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
230/400	3EL063M4B	0,12	1405	0,37	0,82	0,70	66,0	64,9	58,2	3,7	2,3	2,7	0,00018	4,10	42
	3EL063M4C	0,18	1405	0,52	1,22	0,71	69,9	68,8	63,6	3,8	2,3	2,8	0,00022	4,50	42
	3EL071M4C	0,25	1435	0,67	1,66	0,71	76,0	75,4	71,5	5,4	2,1	2,8	0,00082	7,10	45
	3EL071M4D	0,37	1435	0,97	2,46	0,70	78,5	78,2	75,0	5,5	2,2	2,9	0,00093	7,80	45
	3EL080M4C	0,55	1450	1,34	3,62	0,73	80,8	80,4	77,0	5,9	2,1	3,0	0,00200	10,5	50
	3EL080M4D	0,75	1450	1,77	4,94	0,74	82,5	82,3	80,0	6,2	2,5	3,1	0,00227	11,6	50
	3EL090S4C	1,10	1450	2,51	7,25	0,75	84,5	84,3	82,0	7,0	2,6	3,4	0,00355	16,3	51
	3EL090L4D	1,50	1445	3,30	9,91	0,77	85,3	85,2	83,0	7,2	2,8	3,4	0,00411	18,0	51
	3EL100L4C	2,20	1450	4,65	14,5	0,79	86,7	87,2	86,0	7,2	2,8	3,6	0,00775	24,4	53
	3EL100L4D	3,00	1450	6,26	19,8	0,79	87,7	88,0	87,0	7,2	2,8	3,6	0,00888	27,0	53
400/690	3EL112M4D	4,00	1460	8,05	26,2	0,81	88,6	88,4	87,5	7,4	2,8	3,8	0,01437	32,6	58
	3EL132S4C	5,50	1465	10,9	36,0	0,81	89,6	90,2	90,0	7,0	3,0	3,3	0,03059	53,4	61
	3EL132M4D	7,50	1465	14,8	48,9	0,81	90,4	90,4	89,4	7,8	3,2	3,4	0,03418	56,6	61
	3EL160M4C	11,0	1465	21,0	71,7	0,83	91,5	92,1	91,7	7,6	2,8	3,3	0,07011	89,2	63
	3EL160L4E	15,0	1465	28,7	97,8	0,82	92,1	92,4	91,9	7,8	2,8	3,5	0,08579	97,5	63
	3EL180M4C	18,5	1475	35,0	120	0,82	92,6	93,2	92,9	7,7	3,0	3,3	0,12901	128	64
	3EL180L4D	22,0	1470	41,4	143	0,82	93,0	93,7	93,7	8,0	3,0	3,4	0,14667	141	64
	3EL200L4D	30,0	1475	54,5	194	0,85	93,6	94,1	94,0	8,0	3,0	3,4	0,28413	193	65
	3EG225S4C	37,0	1478	65,7	239	0,87	93,9	94,5	94,5	8,3	3,2	3,3	0,38229	320	66
	3EG225M4D	45,0	1477	80,0	291	0,86	94,2	94,7	94,7	8,6	3,3	3,2	0,44100	350	67
	3EG250M4D	55,0	1482	95,3	354	0,88	94,6	95,1	95,2	8,7	3,3	3,2	0,73000	460	68

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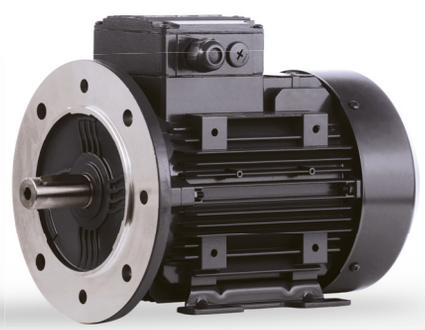

Electrical Characteristics

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)
Temperature Raise : B (80°K)

400V 50Hz 1000 d/d

IE3

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
230/400	3EL071M6C	0,18	930	0,55	1,85	0,69	68,0	67,4	62,6	3,6	2,0	2,4	0,00096	6,80	41
	3EL071M6D	0,25	930	0,77	2,57	0,67	70,0	69,7	66,0	3,6	2,2	2,5	0,00116	7,50	41
	3EL080M6B	0,37	930	1,03	3,80	0,70	74,0	73,8	70,0	4,4	2,1	2,6	0,00202	9,90	43
	3EL080M6C	0,55	935	1,47	5,62	0,70	77,2	77,3	74,4	4,3	2,2	2,7	0,00228	11,0	43
	3EL090S6B	0,75	945	1,96	7,58	0,70	78,9	79,2	77,6	4,7	2,2	2,7	0,00354	16,0	46
	3EL090L6C	1,10	940	2,75	11,2	0,71	81,0	80,8	79,4	5,0	2,2	2,7	0,00428	16,8	46
	3EL100L6B	1,50	955	3,50	15,0	0,75	82,5	82,7	81,4	5,3	2,1	2,8	0,00821	22,5	50
	3EL112M6B	2,20	960	4,95	21,9	0,76	84,3	84,5	83,5	5,5	2,2	3,0	0,01319	29,6	56
400/690	3EL132S6B	3,00	970	6,55	29,4	0,77	85,6	85,5	84,5	6,2	2,1	3,0	0,03051	46,7	58
	3EL132M6C	4,00	970	8,52	39,4	0,78	86,8	87,0	85,5	6,2	2,2	2,9	0,03493	50,9	58
	3EL132M6D	5,50	965	11,6	54,4	0,78	88,0	88,9	88,5	6,2	2,2	2,8	0,03934	57,3	58
	3EL160M6D	7,50	972	15,6	73,7	0,78	89,1	89,4	88,4	6,3	2,6	3,0	0,07870	96,0	61
	3EL160L6E	11,0	972	23,1	108	0,76	90,3	90,9	90,5	6,6	2,9	3,1	0,08580	104	62
	3EL180L6E	15,0	975	30,8	147	0,77	91,2	91,6	91,0	6,7	2,9	3,1	0,15264	141	63
	3EL200L6C	18,5	977	36,4	181	0,80	91,7	91,8	91,8	6,1	2,6	2,6	0,36100	164	64
	3EL200L6D	22,0	978	42,5	215	0,81	92,2	92,9	93,0	6,2	2,6	2,6	0,39355	180	64
	3EG225S6C	30,0	985	57,6	291	0,81	92,9	92,9	92,6	6,6	2,9	2,7	0,60000	340	65
	3EG250M6C	37,0	988	68,8	358	0,83	93,4	93,6	93,5	7,3	2,9	2,8	0,82000	435	65
	3EG280S6B	45,0	989	83,5	435	0,83	93,7	93,9	93,2	6,8	2,9	2,8	1,45000	590	65
	3EG280M6C	55,0	989	102	531	0,83	94,1	94,4	93,5	6,9	2,9	2,8	1,65000	620	65

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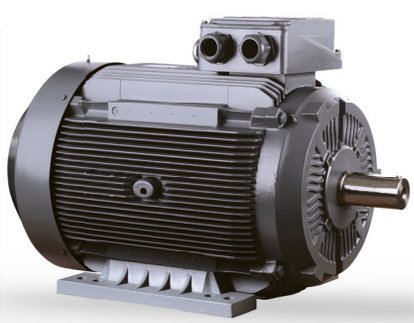


Electrical Characteristics

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)
Temperature Raise : B (80°K)

400V 50Hz 3000 d/d

Compact IE3

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
230/400	3EC071M2C	0,75	2810	1,66	2,55	0,81	80,7	81,0	80,3	5,0	2,6	3,1	0,00046	7,20	55
	3EC080M2D	1,50	2850	3,06	5,03	0,84	84,2	84,8	84,2	6,4	3,2	3,6	0,00135	11,8	59
	3EC090L2D	3,00	2875	5,92	9,96	0,84	87,1	87,7	87,5	7,3	3,2	3,8	0,00234	19,2	63
400/690	3EC100L2D	4,00	2900	7,53	13,2	0,87	88,1	89,1	88,6	8,4	3,2	4,2	0,00503	25,4	66
	3EC112M2D	5,50	2940	10,4	17,9	0,86	90,0	90,3	89,3	8,9	3,2	4,4	0,00734	32,0	68
	3EC112M2E**	7,50	2930	14,0	24,4	0,86	90,1	90,6	90,0	9,2	3,3	4,4	0,00920	40,5	69
	3EC132M2D	11,0	2940	19,8	35,7	0,88	91,2	91,9	91,5	8,9	3,2	4,4	0,02290	55,5	69
	3EC132M2F**	15,0	2945	26,9	48,6	0,88	91,9	92,6	92,4	9,4	3,6	4,6	0.02910	69,0	70
	3EC160L2E	22,0	2940	38,1	71,5	0,90	92,7	93,2	92,8	8,9	3,3	4,4	0,04710	114	70
	3EC180M2C	30,0	2955	51,0	96,9	0,91	93,3	93,9	93,8	9,0	3,5	4,4	0,08800	150	74
	3EC200L2D	45,0	2970	78,1	145	0,89	94,0	94,9	94,7	9,0	3,6	3,5	0,18700	200	77
	3ED225M2C	55,0	2970	94,6	177	0,89	94,3	94,8	94,6	9,0	3,6	3,5	0,25300	335	78
	3ED315L2F*	250	2982	414	801	0,91	95,8	95,6	95,2	8,7	3,0	3,3	2,80000	1410	81

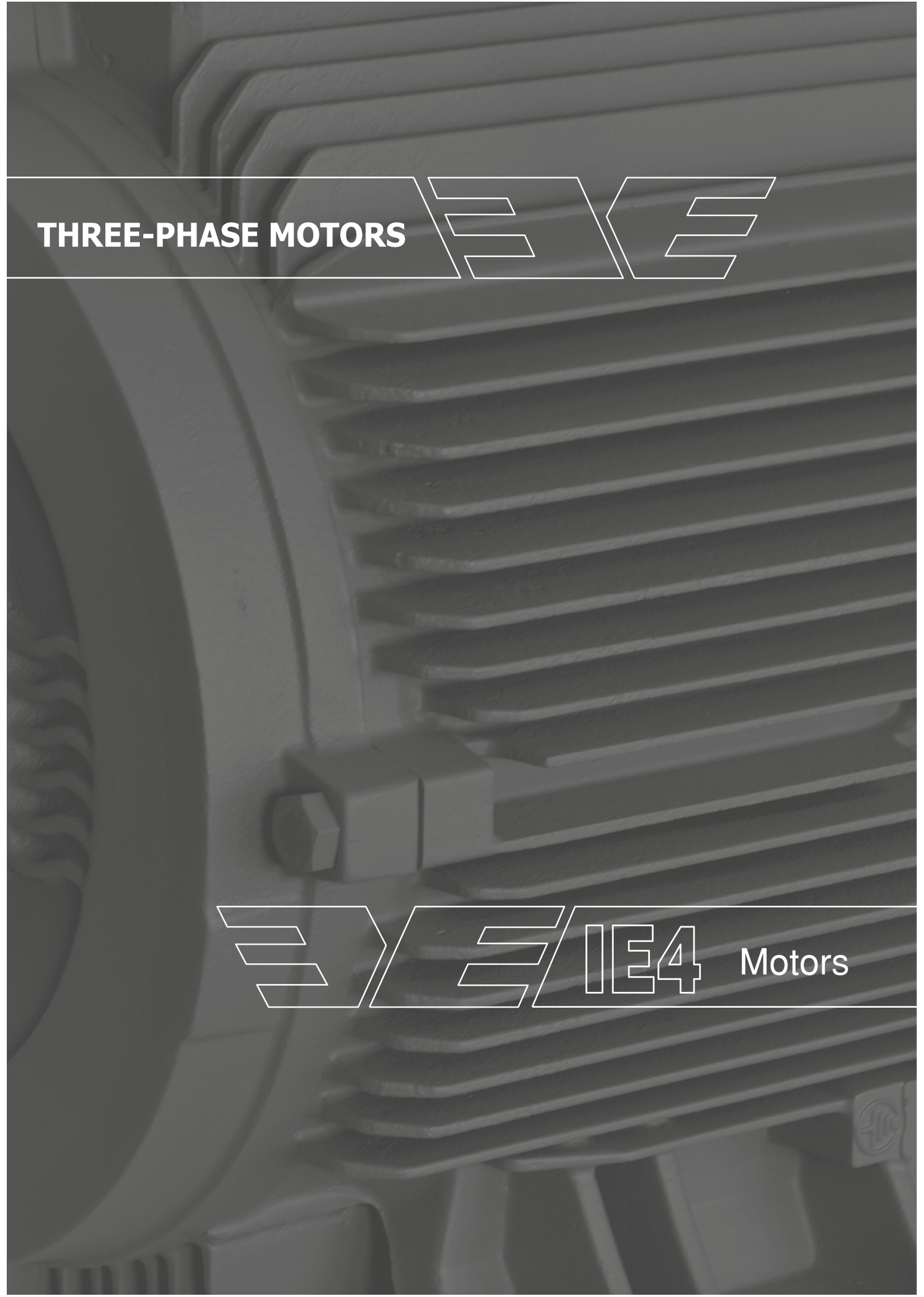
Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)
Temperature Raise : B (80°K)

400V 50Hz 1500 d/d

Compact IE3

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
400/690	3EC112M4F**	5,50	1455	11,1	36,1	0,80	89,6	90,2	89,6	7,4	3,1	3,8	0,01620	38,6	64
	3EC132M4E	9,00	1460	17,9	58,9	0,80	90,8	91,6	91,2	7,4	3,1	3,4	0,03600	61,4	64
	3EC132M4F**	11,0	1465	21,7	71,7	0,80	91,4	91,6	91,5	7,4	3,1	3,4	0,04320	72,5	64
	3EC160L4F	18,5	1465	35,8	121	0,81	92,6	93,1	92,8	7,4	3,1	3,4	0,09300	113	65
	3EC180L4E	30,0	1470	58,0	195	0,80	93,6	94,1	93,9	7,8	3,2	3,4	0,16400	164	66
	3EC200L4D	37,0	1475	66,1	240	0,86	93,9	94,7	94,9	7,8	3,2	3,4	0,28400	194	68
	3ED225M4E	55,0	1480	97,7	355	0,86	94,6	95,2	95,4	8,0	3,6	3,5	0,50200	370	70
	3ED315L4G*	250	1492	442	1600	0.85	96.0	96.1	95.6	8.1	3.0	3.4	5.47000	1530	75

Motors marked with * have Class H insulation and Class F temperature rise values.
Motors marked with ** do not have a symmetrical frame structure.


THREE-PHASE MOTORS
IE4
Motors

Electrical Characteristics

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)
Temperature Raise : B (80°K)

400V 50Hz 3000 d/d

IE4

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
230/400	4EL071M2B	0,37	2825	0,83	1,25	0,82	78,1	78,3	76,5	5,7	2,8	3,2	0,00037	6,50	58
	4EL071M2C	0,55	2825	1,17	1,86	0,83	81,5	81,9	79,5	6,2	2,9	3,5	0,00046	7,50	58
	4EL080M2C	0,75	2875	1,56	2,49	0,83	83,5	84,0	81,0	6,8	2,9	3,5	0,00124	11,0	59
	4EL080M2D	1,10	2880	2,19	3,65	0,85	85,2	85,5	84,9	7,5	2,9	3,7	0,00135	12,0	59
	4EL090S2C	1,50	2900	2,95	4,94	0,85	86,5	86,9	85,7	7,8	2,9	3,7	0,00221	17,2	64
	4EL090L2D	2,20	2900	4,20	7,24	0,86	88,0	88,5	87,6	8,2	3,0	3,8	0,00234	20,0	64
	4EL100L2D	3,00	2910	5,50	9,85	0,88	89,1	89,5	88,5	8,5	3,0	4,0	0,00503	25,9	67
400/690	4EL112M2D	4,00	2940	7,30	13,0	0,88	90,0	90,3	89,7	8,7	3,0	4,2	0,00734	32,2	70
	4EL132S2C	5,50	2945	9,60	17,8	0,91	90,9	90,9	90,0	8,9	3,2	4,2	0,02104	52,5	72
	4EL132S2D	7,50	2945	13,0	24,5	0,91	91,7	92,2	91,8	8,5	3,2	4,2	0,02290	55,6	72
	4EL160M2C	11,0	2950	18,9	35,6	0,91	92,6	92,7	91,2	8,5	3,3	4,3	0,03913	89,0	74
	4EL160M2D	15,0	2950	25,6	48,6	0,91	93,3	93,6	92,8	8,5	3,3	4,3	0,04409	96,8	74
	4EL160L2E	18,5	2955	31,4	59,8	0,91	93,7	93,8	92,9	8,7	3,2	4,3	0,05000	114	74
	4EL180M2C	22,0	2960	37,2	71,1	0,91	94,0	94,4	93,5	8,9	3,0	4,0	0,07000	158	74
	4EL200L2C	30,0	2970	51,0	96,5	0,90	94,5	94,7	94,0	8,3	3,2	3,7	0,17500	215	74
	4EL200L2D	37,0	2970	63,3	120	0,89	94,8	95,0	94,2	8,3	3,2	4,0	0,20000	235	74
	4EG225M2D	45,0	2975	76,0	145	0,90	95,0	95,2	94,9	9,0	3,4	4,2	0,29000	355	74
	4EG250M2D	55,0	2975	92,6	177	0,90	95,3	95,5	94,9	8,2	3,4	3,7	0,52000	445	74
	4EG280S2C	75,0	2982	126	240	0,90	95,6	95,6	95,2	7,7	2,7	3,2	0,98000	620	76
	4EG280M2D	90,0	2985	151	288	0,90	95,8	95,9	95,0	7,7	2,8	3,5	1,10000	640	77
	4EG315S2C	110	2985	184	352	0,90	96,0	96,0	95,7	7,8	3,1	4,0	1,60000	1110	77
	4EG315M2D	132	2986	220	422	0,90	96,2	96,3	96,0	8,0	3,1	4,0	2,00000	1070	77
	4EG315L2E	160	2986	267	512	0,90	96,3	96,5	96,0	8,0	3,2	4,0	2,20000	1230	78
	4EG315L2F	200	2987	332	639	0,90	96,5	96,7	96,2	8,1	3,2	4,0	2,70000	1340	78

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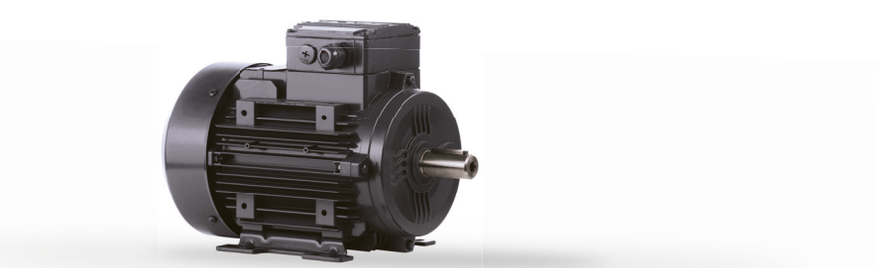


Electrical Characteristics

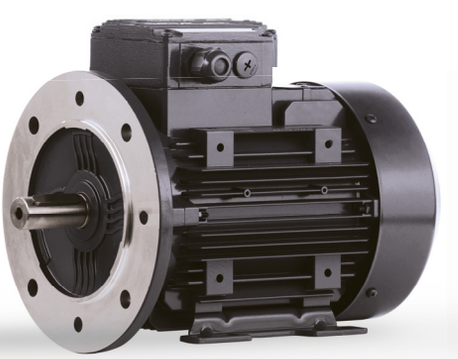
Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)
Temperature Raise : B (80°K)

400V 50Hz 1500 d/d

IE4

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
400/690	4EL132S4D	5,50	1470	11,1	35,7	0,78	91,9	91,8	90,6	7,7	3,8	3,7	0,03418	56,7	61
	4EL132M4F*	7,50	1470	14,6	48,7	0,80	92,6	92,7	91,5	7,7	3,8	4,0	0,04316	72,8	62
	4EL160M4E	11,0	1470	21,0	71,5	0,81	93,3	93,5	93,3	7,7	3,0	3,6	0,08600	99,5	64
	4EL160L4F	15,0	1475	28,9	97,5	0,80	93,9	94,1	93,8	8,7	3,7	4,3	0,12000	112	64
	4EL180M4D	18,5	1475	34,6	120	0,82	94,2	94,4	94,0	8,0	3,1	3,5	0,14700	142	64
	4EL180L4E	22,0	1475	41,0	142	0,82	94,5	94,7	94,2	8,2	3,2	3,8	0,17000	168	64
	4EL200L4E	30,0	1480	53,0	194	0,86	94,9	95,3	95,2	8,3	3,3	3,8	0,35000	235	64
	4EG225S4D	37,0	1480	65,0	239	0,86	95,2	95,7	95,0	8,1	3,3	3,3	0,44100	350	70
	4EG225M4E	45,0	1480	79,2	290	0,86	95,4	95,6	95,6	8,2	3,5	3,3	0,52000	370	70
	4EG250M4E	55,0	1485	94,3	354	0,88	95,7	96,0	96,0	8,5	3,3	3,4	1,05000	490	70
	4EG280S4D	75,0	1487	127	482	0,89	96,0	96,3	96,2	8,7	3,0	3,2	1,50000	670	70
	4EG280M4E	90,0	1488	152	578	0,89	96,1	96,3	96,3	8,9	3,1	3,2	1,95000	720	71
	4EG315S4D	110	1491	187	705	0,88	96,3	96,5	96,0	8,9	2,8	3,3	2,80000	1200	73
	4EG315M4E	132	1492	225	845	0,88	96,4	96,7	96,2	8,9	2,9	3,3	3,30000	1270	73
	4EG315L4F	160	1492	272	1024	0,88	96,6	96,9	96,5	8,9	3,1	3,4	4,40000	1370	76
	4EG315L4G	200	1492	339	1280	0,88	96,7	97,0	96,6	8,8	3,3	3,5	5,20000	1520	76

Our UL approved motors have the logo on their nameplates.



Motors marked with ** do not have a symmetrical frame structure.

Electrical Characteristics

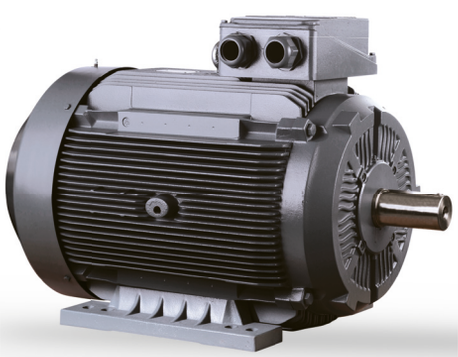
Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)
Temperature Raise : B (80°K)

400V 50Hz 1000 d/d

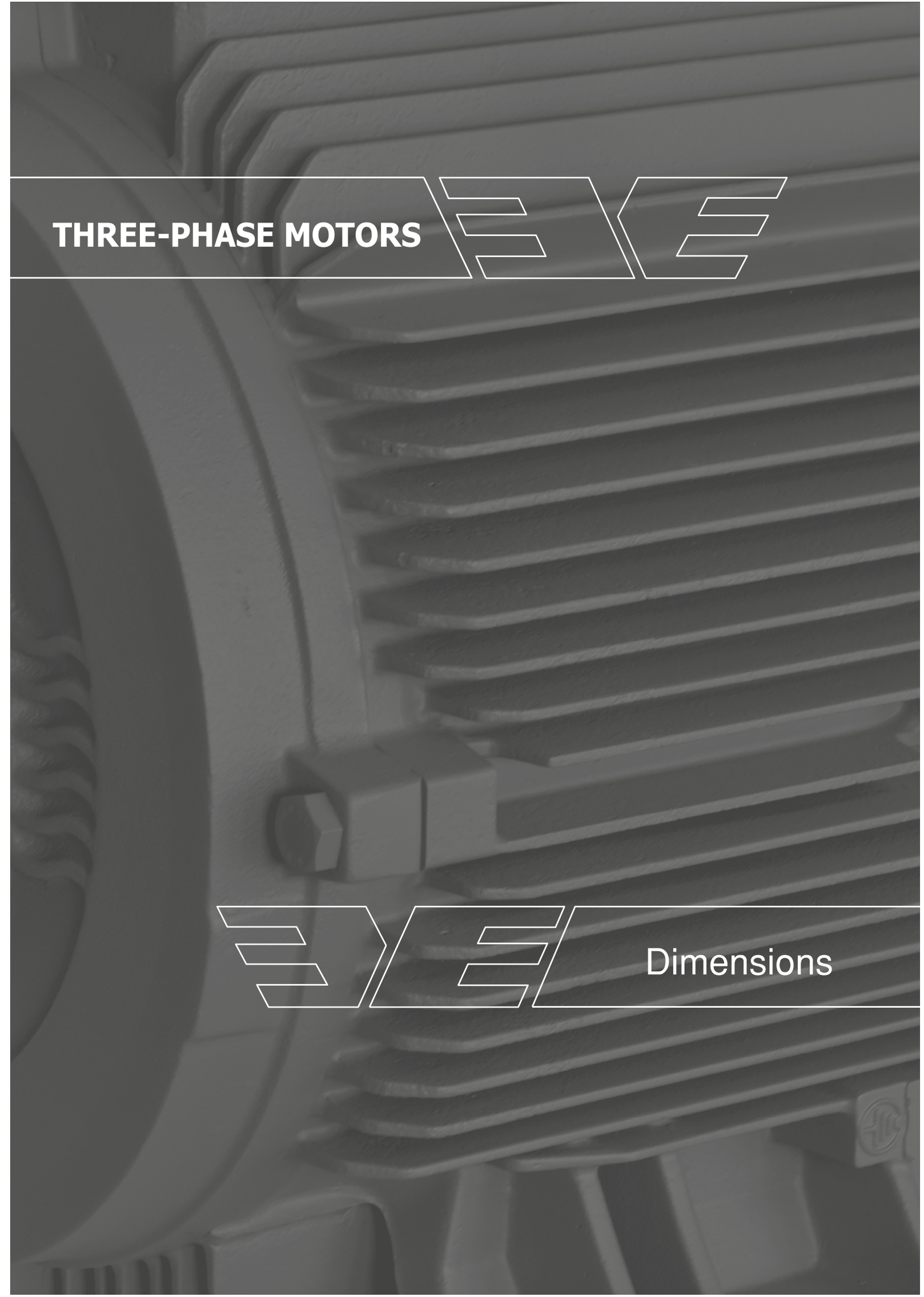
IE4

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
400/690	4EG315S6C	75,0	994	133	721	0,85	95,4	95,5	95,2	8,80	2,80	3,50	3,50000	1215	67
	4EG315M6D	90,0	994	160	865	0,85	95,6	95,7	95,4	8,80	2,80	3,70	3,80000	1250	67
	4EG315L6E	110	995	193	1056	0,86	95,8	96,1	95,7	8,60	2,80	3,70	4,50000	1280	68
	4EG315L6F	132	995	231	1267	0,86	96,0	96,2	95,8	8,50	2,80	3,70	5,20000	1350	68
	4EG315L6G	160	995	280	1536	0,86	96,2	96,4	96,3	7,70	2,90	3,80	5,55000	1446	70

Our UL approved motors have the logo on their nameplates.

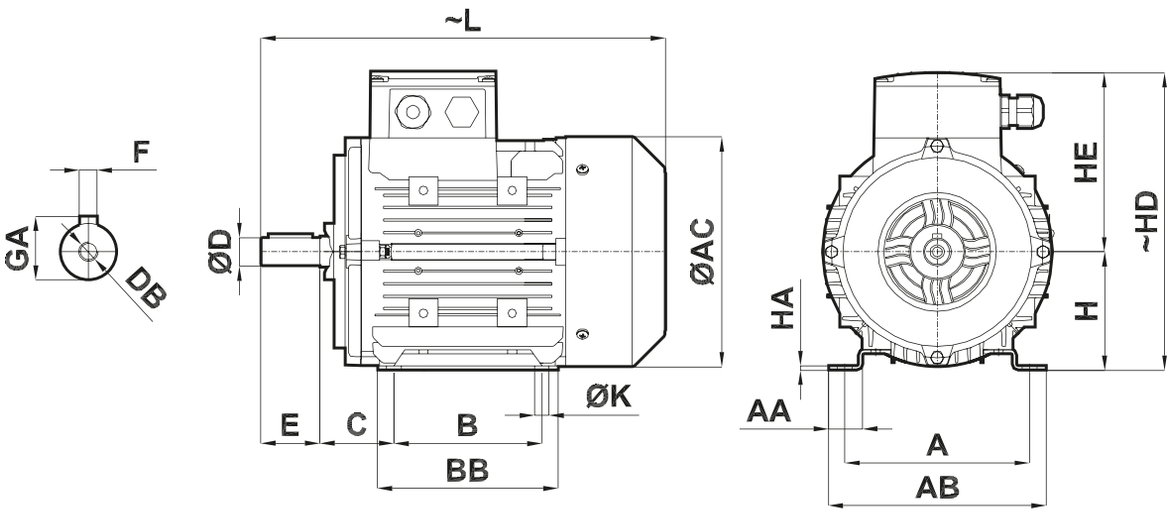


THREE-PHASE MOTORS



Dimensions

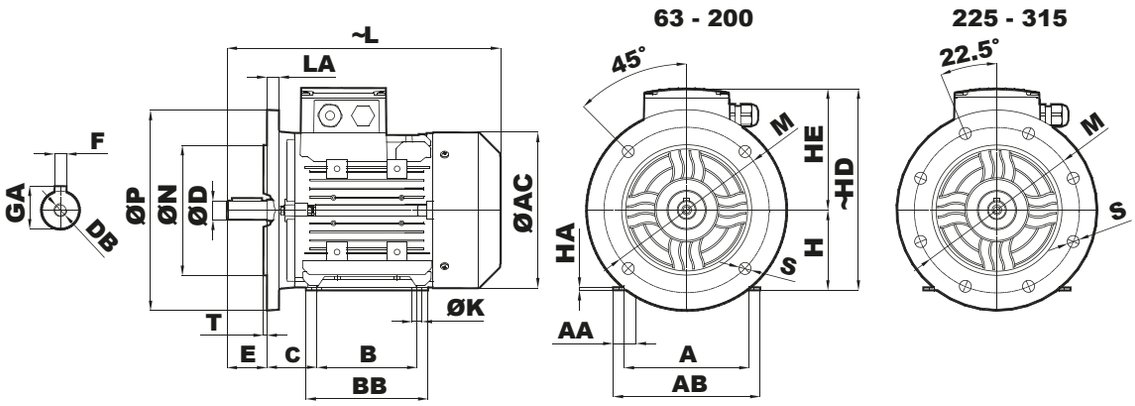
B3 Construction Type



Frame Size	Efficiency Class	Number of Poles	D[1]	E	L	AC	H[2]	HE	HD	F	GA	DB	C	ØK	B	BB	HA	AA	A	AB
063M	IE2/IE3	2-4	11	23	213	119	63	101	164	4	12,5	M4	40	7	80	104	3	18	100	115
071M	IE2/IE3/IE4	2-4-6-8	14	30	242	137	71	118	189	5	16	M5	45	7	90	110	3	19	112	128
080M	IE2/IE3/IE4	2-4-6-8	19	40	274	155	80	127	207	6	21,5	M6	50	10	100	122	3	25	125	148
090S	IE3/IE4	2-4-6-8	24	50	325	176	90	136	226	8	27	M8	56	10	100	151	4	27	140	167
090L	IE3/IE4	2-4-6-8	24	50	325	176	90	136	226	8	27	M8	56	10	125	151	4	27	140	167
100L	IE3/IE4	2-4-6-8	28	60	369	193	100	149	249	8	31	M10	63	12	140	170	4	31	160	191
112M	IE3/IE3C/IE4	2-4-6-8	28	60	392	215	112	161	273	8	31	M10	70	12	140	177	4	36	190	217
112M[3]	IE3C	2-4	28	60	430	215	112	161	273	8	31	M10	70	12	140	177	4	36	190	217
132S	IE3/IE4	2-4-6-8	38	80	495	257	132	182	314	10	41	M12	89	12	140	212	5	34	216	246
132M	IE3/IE3C/IE4	2-4-6-8	38	80	495	257	132	182	314	10	41	M12	89	12	178	212	5	34	216	246
132M[4]	IE3C/IE4	2-4	38	80	543	257	132	182	314	10	41	M12	89	12	178	212	5	34	216	246
160M	IE3/IE4	2-4-6-8	42	110	605	316	160	226	386	12	45	M16	108	14,5	210	328	15	65	254	293
160L	IE3/IE4	2-4-6-8	42	110	605	316	160	226	386	12	45	M16	108	14,5	254	328	15	65	254	293
180M	IE3/IE4	2-4-6-8	48	110	696	348	180	242	422	14	51,5	M16	121	14,5	241	319	15	63	279	316
180L	IE3/IE4	2-4-6-8	48	110	696	348	180	242	422	14	51,5	M16	121	14,5	279	319	15	63	279	316
200M	IE3/IE4	2-4-6-8	55	110	737	396	200	294	494	16	59	M20	133	18,5	267	350	20	76	318	372
200L	IE3/IE4	2-4-6-8	55	110	737	396	200	294	494	16	59	M20	133	18,5	305	350	20	76	318	372
225S	IE3/IE4	2	55	110	800	438	225	311,5	536,5	16	59	M20	149	18,5	286	360	20	90	356	417
		4-6-8	60	140	830					18	64									
225M	IE3/IE4	2	55	110	800	438	225	311,5	536,5	16	59	M20	149	18,5	311	360	20	90	356	417
		4-6-8	60	140	830					18	64									
250S	IE3/IE4	2	60	140	896	481	250	337	587	18	64	M20	168	24	311	433	32	105	406	475
		4-6-8	65								69									
250M	IE3/IE4	2	60	140	896	481	250	337	587	18	64	M20	168	24	349	433	32	105	406	475
		4-6-8	65								69									
280S	IE3/IE4	2	65	140	1012	547	280	402	682	18	69	M20	190	24	368	500	35	105	457	531
		4-6-8	75							20	79,5									
280M	IE3/IE4	2	65	140	1012	547	280	402	682	18	69	M20	190	24	419	500	35	105	457	531
		4-6-8	75							20	79,5									
315S	IE3/IE4	2	65	140	1242	622	315	499	814	18	69	M20	216	28	406	636	33	157	508	626
		4-6-8	80	170	1272					22	85									
315M	IE3/IE4	2	65	140	1242	622	315	499	814	18	69	M20	216	28	457	636	33	157	508	626
		4-6-8	80	170	1272					22	85									
315L	IE3/IE4	2	65	140	1389	622	315	499	814	18	69	M20	216	28	508	800	35	145	508	623
		4-6-8	90	170	1419					25	95									

[1] Tolerance “j6” up to 28mm, “k6” from 28mm to 48mm, “m6” over 48mm TS EN 50347
[2] Tolerance 063-250 “-0.5mm” / 280-315 “-1mm” TS EN 50347
[3] 7.50kW 2Pole IE3 Compact Motors / 5.50kW 4Pole IE3 Compact Motors
[4] 15.0kW 2Pole IE3 Compact /11.0kW 4Pole IE3 Compact / 7.50kW 4Pole IE4 Motors

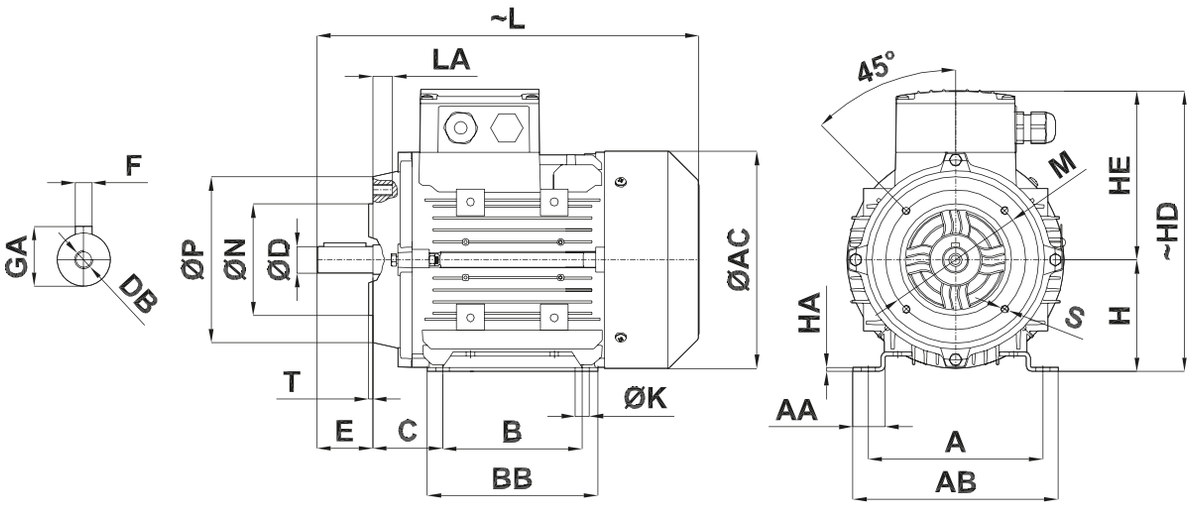
B5- B35 Construction Types



Frame Size	Efficiency Class	Number of Poles	D[1]	E	N[2]	P	T	LA	L	AC	S	M	H[3]	HE	HD	F	GA	DB	C	ØK	B	BB	HA	AA	A	AB
063M	IE2/IE3	2-4	11	23	95	140	3	8	213	119	10	115	63	97	160	4	12,5	M4	40	7	80	104	3	18	100	115
071M	IE2/IE3/IE4	2-4-6-8	14	30	110	160	3,5	8	242	137	10	130	71	112	183	5	16	M5	45	7	90	110	3	19	112	128
080M	IE2/IE3/IE4	2-4-6-8	19	40	130	200	3,5	12	274	155	12	165	80	127	207	6	21,5	M6	50	10	100	122	3	25	125	148
090S	IE3/IE4	2-4-6-8	24	50	130	200	3,5	12	325	176	12	165	90	136	226	8	27	M8	56	10	100	151	4	27	140	167
090L	IE3/IE4	2-4-6-8	24	50	130	200	3,5	12	325	176	12	165	90	136	226	8	27	M8	56	10	125	151	4	27	140	167
100L	IE3/IE4	2-4-6-8	28	60	180	250	4	15	369	193	14,5	215	100	148	248	8	31	M10	63	12	140	170	4	31	160	191
112M	IE3/IE3C/IE4	2-4-6-8	28	60	180	250	4	15	392	215	14,5	215	112	161	273	8	31	M10	70	12	140	177	4	36	190	217
112M[4]	IE3C	2-4	28	60	180	250	4	15	430	215	14,5	215	112	161	273	8	31	M10	70	12	140	177	4	36	190	217
132S	IE3/IE4	2-4-6-8	38	80	230	300	4	20	495	257	14,5	265	132	180	312	10	41	M12	89	12	140	212	5	34	216	246
132M	IE3/IE3C/IE4	2-4-6-8	38	80	230	300	4	20	495	257	14,5	265	132	180	312	10	41	M12	89	12	178	212	5	34	216	246
132M[5]	IE3C/IE4	2-4	38	80	230	300	4	20	543	257	14,5	265	132	180	312	10	41	M12	89	12	178	212	5	34	216	246
160M	IE3/IE4	2-4-6-8	42	110	250	350	5	20	605	316	18,5	300	160	220	380	12	45	M16	108	14,5	210	328	15	65	254	293
160L	IE3/IE4	2-4-6-8	42	110	250	350	5	20	605	316	18,5	300	160	220	380	12	45	M16	108	14,5	254	328	15	65	254	293
180M	IE3/IE4	2-4-6-8	48	110	250	350	5	14	696	348	18,5	300	180	239	419	14	51,5	M16	121	14,5	241	319	15	63	279	316
180L	IE3/IE4	2-4-6-8	48	110	250	350	5	14	696	348	18,5	300	180	239	419	14	51,5	M16	121	14,5	279	319	15	63	279	316
200M	IE3/IE4	2-4-6-8	55	110	300	400	5	14	737	396	18,5	350	200	294	494	16	59	M20	133	18,5	267	350	20	76	318	372
200L	IE3/IE4	2-4-6-8	55	110	300	400	5	14	737	396	18,5	350	200	294	494	16	59	M20	133	18,5	305	350	20	76	318	372
225S	IE3/IE4	2	55	110	350	450	5	20	800	438	18,5	400	225	312	537	16	59	M20	149	18,5	286	360	20	90	356	417
		4-6-8	60	140					830							18	64									
225M	IE3/IE4	2	55	110	350	450	5	20	800	438	18,5	400	225	312	537	16	59	M20	149	18,5	311	360	20	90	356	417
		4-6-8	60	140					830							18	64									
250S	IE3/IE4	2	60	140	450	550	5	20	896	481	18,5	500	250	337	587	18	64	M20	168	24	311	433	32	105	406	475
		4-6-8	65														69									
250M	IE3/IE4	2	60	140	450	550	5	20	896	481	18,5	500	250	337	587	18	64	M20	168	24	349	433	32	105	406	475
		4-6-8	65														69									
280S	IE3/IE4	2	65	140	450	550	5	20	1012	547	18,5	500	280	402	682	18	69	M20	190	24	368	500	35	105	457	531
		4-6-8	75													20	79,5									
280M	IE3/IE4	2	65	140	450	550	5	20	1012	547	18,5	500	280	402	682	18	69	M20	190	24	419	500	35	105	457	531
		4-6-8	75													20	79,5									
315S	IE3/IE4	2	65	140	550	660	6	25	1242	622	24	600	315	499	814	18	69	M20	216	28	406	636	33	157	508	626
		4-6-8	80	170					1272							22	85									
315M	IE3/IE4	2	65	140	550	660	6	22	1242	622	24	600	315	499	814	18	69	M20	216	28	457	636	33	157	508	626
		4-6-8	80	170					1272							22	85									
315L	IE3/IE4	2	65	140	550	660	6	22	1389	622	24	600	315	499	814	18	69	M20	216	28	508	800	35	145	508	623
		4-6-8	90	170					1419							25	95									

[1] Tolerance “j6” up to 28mm, “k6” from 28mm to 48mm, “m6” over 48mm TS EN 50347
[2] Tolerance “j6” up to 250mm, “h6” over 250mm TS EN 50347
[3] Tolerance 063-250 “-0.5mm” / 280-315 “-1mm” TS EN 50347
[4] 7.50kW 2Pole IE3 Compact Motors / 5.50kW 4Pole IE3 Compact Motors
[5] 15.0kW 2Pole IE3 Compact /11.0kW 4Pole IE3 Compact / 7.50kW 4Pole IE4 Motors

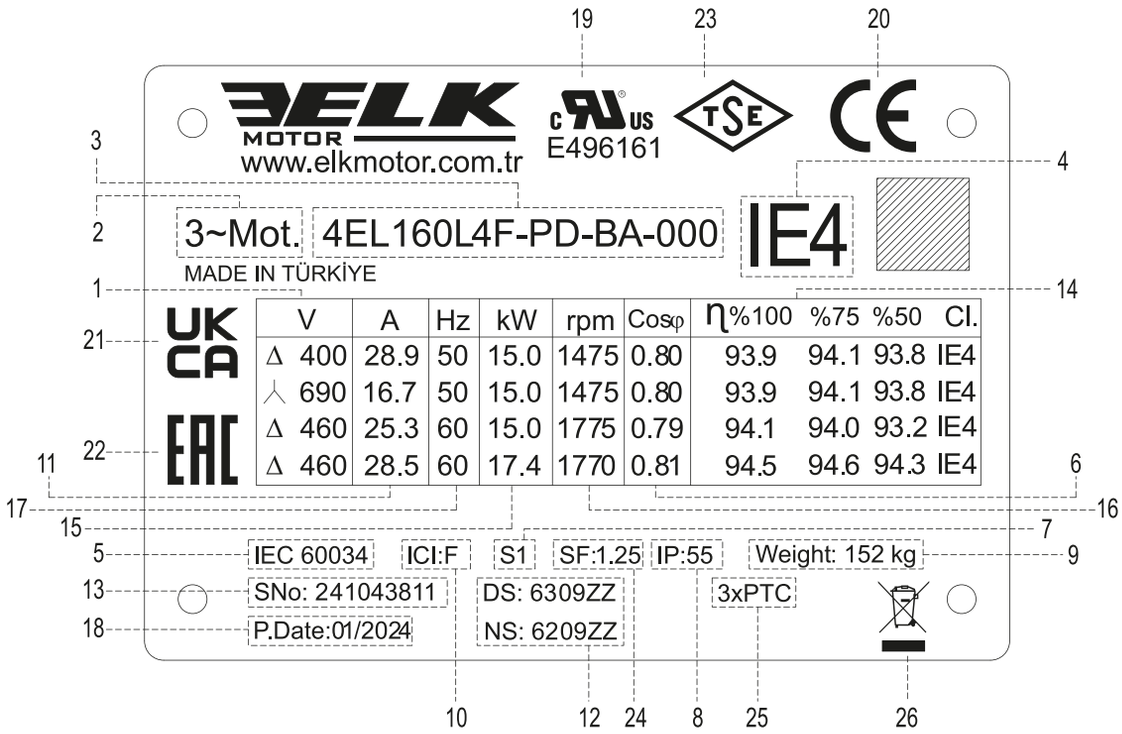
B14 - B34 Construction Types



Frame Size	Efficiency Class	Number of Poles	D[1]	N[2]	P	E	T	LA	L	AC	S	M	H[3]	HE	HD	F	GA	DB	C	ØK	B	BB	HA	AA	A	AB
063M	IE2/IE3	2-4	11	60	90	23	2,5	10	213	119	M5	75	63	101	164	4	12,5	M4	40	7	80	104	3	18	100	115
071M	IE2/IE3/IE4	2-4-6-8	14	70	105	30	2,5	12	242	137	M6	85	71	118	189	5	16	M5	45	7	90	110	3	19	112	128
080M	IE2/IE3/IE4	2-4-6-8	19	80	119	40	3	12	274	155	M6	100	80	127	207	6	21,5	M6	50	10	100	122	3	25	125	148
090S	IE3/IE4	2-4-6-8	24	95	137	50	3	15	325	176	M8	115	90	136	226	8	27	M8	56	10	100	151	4	27	140	167
090L	IE3/IE4	2-4-6-8	24	95	137	50	3	15	325	176	M8	115	90	136	226	8	27	M8	56	10	125	151	4	27	140	167
100L	IE3/IE4	2-4-6-8	28	110	160	60	3,5	17	369	193	M8	130	100	149	249	8	31	M10	63	12	140	170	4	31	160	191
112M	IE3/IE3C/IE4	2-4-6-8	28	110	160	60	3,5	17	392	215	M8	130	112	161	273	8	31	M10	70	12	140	177	4	36	190	217
112M[4]	IE3C	2-4	28	110	160	60	3,5	17	430	215	M8	130	112	161	273	8	31	M10	70	12	140	177	4	36	190	217
132S	IE3/IE4	2-4-6-8	38	130	200	80	3,5	20	495	257	M10	165	132	182	314	10	41	M12	89	12	140	212	5	34	216	246
132M	IE3/IE3C/IE4	2-4-6-8	38	130	200	80	3,5	20	495	257	M10	165	132	182	314	10	41	M12	89	12	178	212	5	34	216	246
132M[5]	IE3C/IE4	2-4	38	130	200	80	3,5	20	543	257	M10	165	132	182	314	10	41	M12	89	12	178	212	5	34	216	246
160M	IE3/IE4	2-4-6-8	42	180	250	110	4	23	605	316	M12	215	160	226	386	12	45	M16	108	14,5	210	323	15	65	254	295
160L	IE3/IE4	2-4-6-8	42	180	250	110	4	23	605	316	M12	215	160	226	386	12	45	M16	108	14,5	254	323	15	65	254	295

[1] Tolerance “j6” up to 28mm, “k6” over 28mm TS EN 50347
[2] Tolerance “j6” TS EN 50347
[3] Tolerance “-0.5mm” TS EN 50347
[4] 7.50kW 2Pole IE3 Compact Motors / 5.50kW 4Pole IE3 Compact Motors
[5] 15.0kW 2Pole IE3 Compact /11.0kW 4Pole IE3 Compact / 7.50kW 4Pole IE4 Motors

Three-Phase Motor Nameplate Description

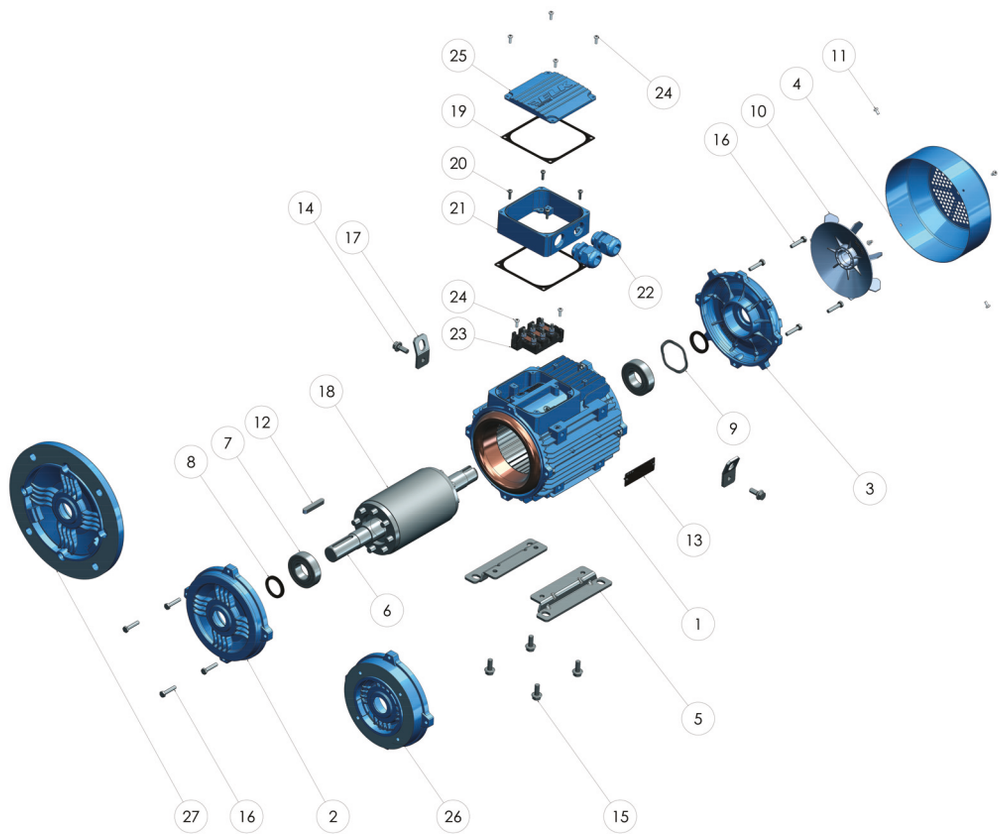


1.	Rated Voltage	14.	Efficiency
2.	Motor Type: 3 Phase Asynchronous	15.	Output Power
3.	Motor Code	16.	Speed
4.	Efficiency Class	17.	Frequency
5.	Manufacture Standard	18.	Production Date
6.	Power Factor	19.	UL Logo
7.	Duty Cycle	20.	CE Mark
8.	Protection Class	21.	UKCA Mark
9.	Motor Weight	22.	EAC Logo
10.	Insulation Class	23.	TSE Logo
11.	Rated Current	24.	Service Factor
12.	Bearing Type	25.	3xPTC Thermistor
13.	Serial Number	26.	WEEE Symbol

The nameplate shows the identification, and the most important technical data. The nameplate also defines the limits of proper usage, and manufacturing year of the motors. The first two digits in the serial number, shows the manufacturing year. For example, 24XXXXXXX shows that the product is manufactured in 2024.

Three-Phase Motors Spare Parts

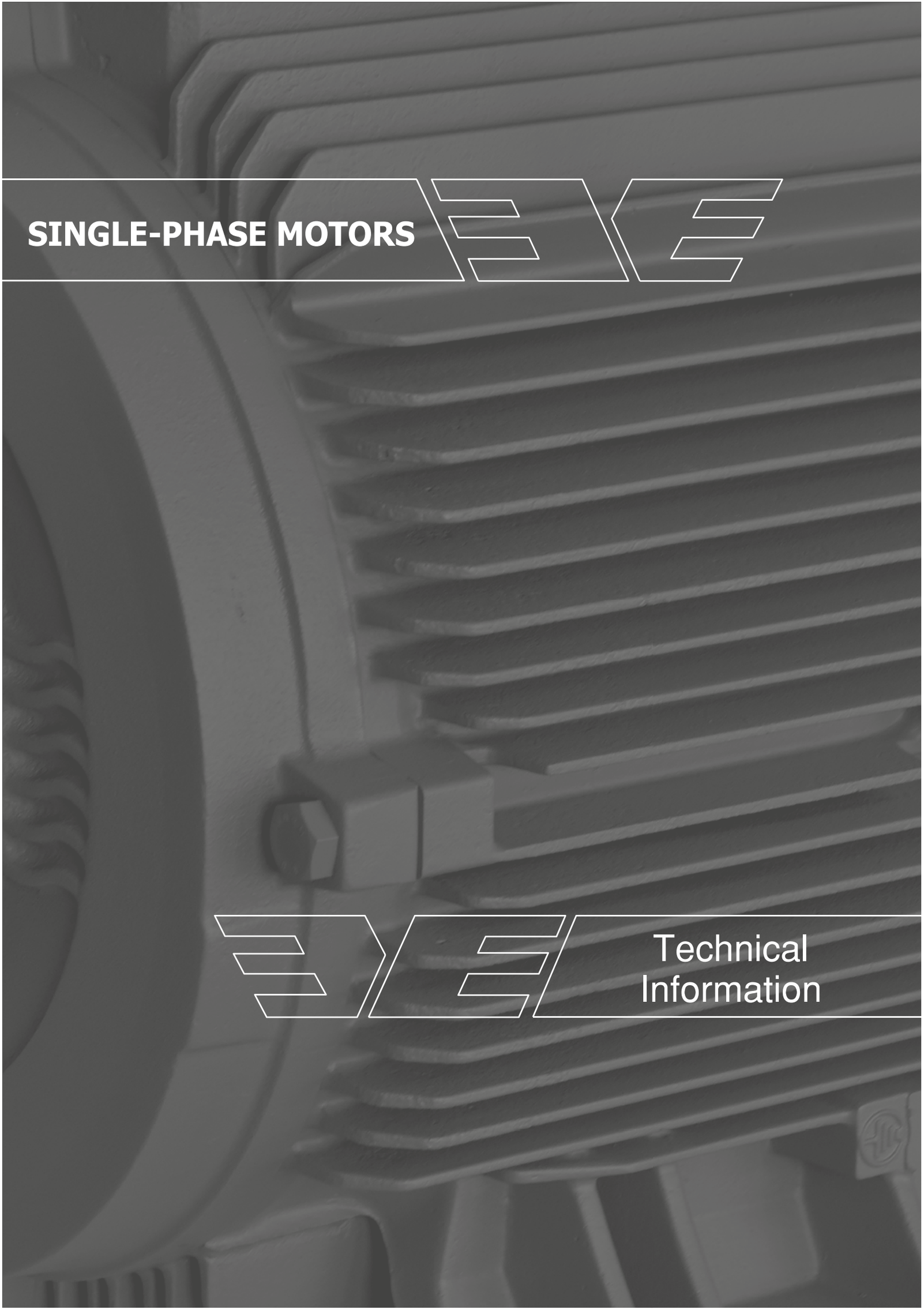
All standard three-phase motors manufactured by ELK MOTOR consist of the following main components:



1.	Housing	15.	Screw
2.	End Shield (DE)	16.	Bolt
3.	End Shield (NDE)	17.	Lifting Lug
4.	Fan Cover	18.	Squirrel Cage Rotor
5.	Mounting Foot	19.	Terminal Box Gasket
6.	Shaft	20.	Screw
7.	Bearing	21.	Terminal Box
8.	Shaft Sealing	22.	Cable Gland
9.	Spring Washer	23.	Terminal
10.	Fan	24.	Screw
11.	Screw	25.	Terminal Box Cover
12.	Key	26.	Flange B14
13.	Nameplate	27.	Flange B5
14.	Screw		

While ordering spare parts, the motor serial number, full type designation and product code, as stated on the nameplate, must be specified. For field service, spare parts and additional information, please contact us.

SINGLE-PHASE MOTORS



Technical Information

Electrical Construction

Electrical Construction
Our single phase standard motors have an F class (155°C) electrical insulation system. However, all standard motors in our product range operate within B class temperature rise limits. This ensures that the provided temperature class has a safety margin, allowing our motors to operate under more demanding conditions than specified or to have a longer service life under normal conditions.
Motors with H class insulation can be manufactured according to customer requirements.

Electrical Connections

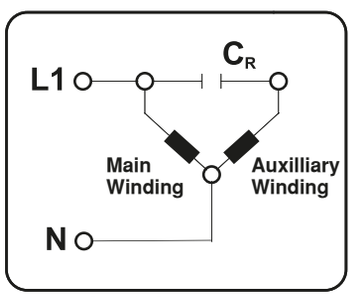
Cable Gland and Blind Cap				
Frame Size	063	071	080	090
Cable Glands	M16x1,5	M20x1,5		

Terminal Connections				
Frame Size	063	071	080	090
Terminal Size	M4			

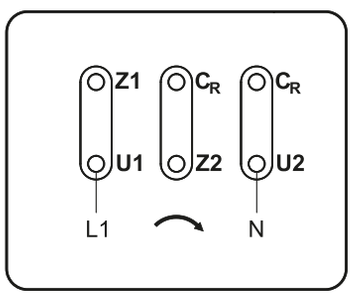
Our single-phase motors are manufactured with a standard voltage of 230V 50Hz and are wired to rotate clockwise when viewed from the drive end. For counterclockwise rotation, the terminal connections should be configured as specified below.

Terminal Marking Information	
U1 , U2	Main Winding Terminals
Z1 , Z2	Auxiliary Winding Terminals
Cr , Cs	Capacitor Terminals

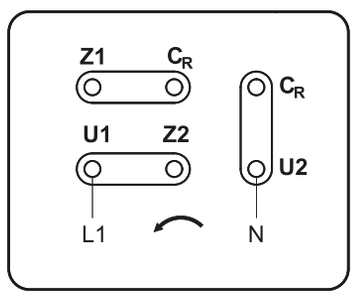
Terminal Connections for Single-Phase Run Capacitor Motors



Circuit Connection

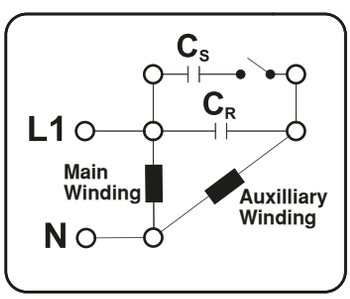


Clockwise Rotation

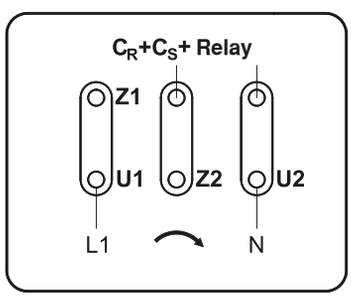


Counter-Clockwise Rotation

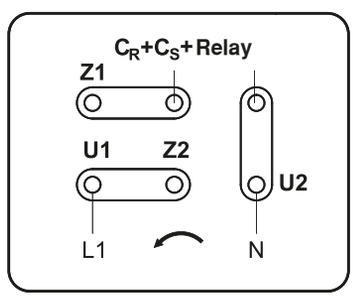
Terminal Connections for Single-Phase Run and Start Capacitor Motors



Circuit Connection



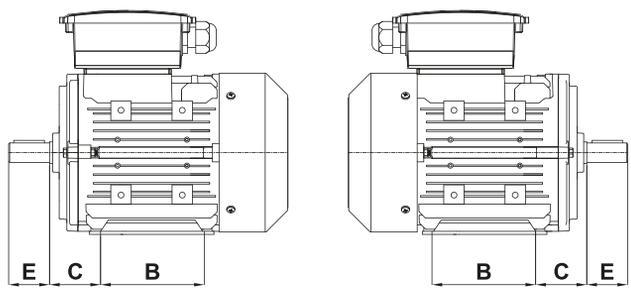
Clockwise Rotation



Counter-Clockwise Rotation

Mechanical Structure

Single-phase ELK motors are equipped with a removable foot structure for the corresponding frame sizes. Due to the dimensions of the terminal box, the feet can only be mounted on the underside of the frame. Additionally, the symmetrical frame and foot design of single-phase ELK motors ensure that the C dimension remains constant when the shaft-side cover, rear cover, and shaft direction are altered. This design allows for the terminal box to be positioned either near the shaft side or the fan side.



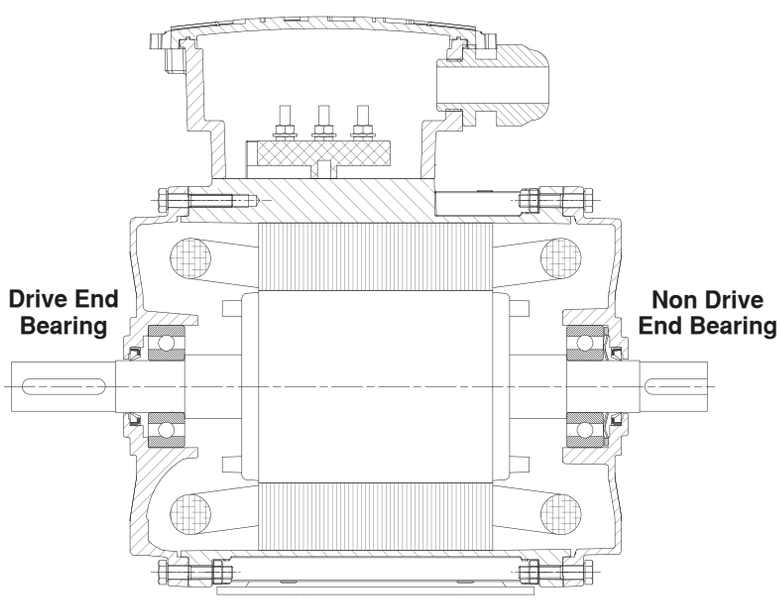
The materials used in our products are specified below.

Frame Size	Housing	End Shield DE	End Shield NDE	Terminal Box & Cover	Feet	Fan Cover	Fan
63	Aluminum	Aluminum	Aluminum	Aluminum	Steel Sheet	Steel Sheet	Plastic
71	Aluminum	Aluminum	Aluminum	Aluminum	Steel Sheet	Steel Sheet	Plastic
80	Aluminum	Aluminum	Aluminum	Aluminum	Steel Sheet	Steel Sheet	Plastic
90	Aluminum	Aluminum	Aluminum	Aluminum	Steel Sheet	Steel Sheet	Plastic

Bearings

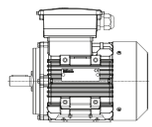
Single-phase ELK motors utilize deep groove ball bearings as specified in the table.

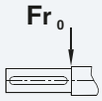
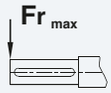
Frame Size	Number of Poles	Drive End Bearing	Non Drive end Bearing
63	2-4	6201 ZZ C3	6201 ZZ C3
71	2-4	6202 ZZ C3	6202 ZZ C3
80	2-4	6204 ZZ C3	6204 ZZ C3
90	2-4	6205 ZZ C3	6205 ZZ C3



Radial Loads

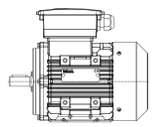
HORIZONTAL MOUNTING - Permissible Axial Loads
Mounting Positions IM: B3, B5, B6, B7, B8, B14, B34, B35

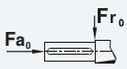
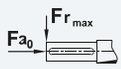


Frame Size	Fa = 0	
	Fr_0 	Fr_{max} 
2 Poles 3000 rpm	**Fr_0 [N]**	**Fr_{max} [N]**
63	350	300
71	380	340
80	640	550
90	750	660
4 Poles 1500 rpm	**Fr_0 [N]**	**Fr_{max} [N]**
63	430	390
71	520	440
80	800	700
90	950	780

Axial Loads

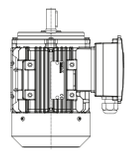
HORIZONTAL MOUNTING - Permissible Axial Loads
Mounting Positions IM: B3, B5, B6, B7, B8, B14, B34, B35



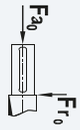
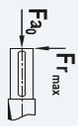
Frame Size	Push			Pull
	Fr = 0	$Fr = Fr_0$	$Fr = Fr_{max}$	Fr = 0
	Fa_0 	Fa_0 Fr_0 	Fa_0 Fr_{max} 	Fa_0 
2 Poles 3000 rpm	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**
63	90	90	90	220
71	110	110	110	250
80	190	190	190	395
90	210	210	210	400
4 Poles 1500 rpm	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**
63	90	90	90	330
71	110	110	110	360
80	190	190	190	560
90	210	210	210	585

Fa0 : Permissible maximum axial load
Fr : Radial force acting on the shaft
Fr0 : Permissible maximum radial load at the end of the shaft
Fr max : Permissible maximum radial load at the shaft end
Permissible load calculations are based on a bearing life of Lh10 20,000 hours according to ISO 281.

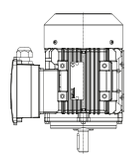
Axial Loads



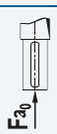
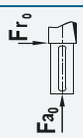
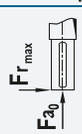
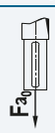
VERTICAL MOUNTING - Shaft Up - Permissible Axial Loads
Mounting Positions IM: V3, V6, V19, V35, V37

Frame Size	Push			Pull
	Fr = 0	Fr = Fr_0	Fr = Fr_{max}	Fr = 0
				
2 Poles 3000 rpm	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]
63	90	90	90	230
71	100	100	100	265
80	170	170	170	425
90	180	180	180	450
4 Poles 1500 rpm	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]
63	90	90	90	345
71	95	95	95	380
80	160	160	160	600
90	170	170	170	650

Axial Loads



VERTICAL MOUNTING - Shaft Down - Permissible Axial Loads
Mounting Positions IM: V1, V5, V15, V17, V18

Frame Size	Push			Pull
	Fr = 0	Fr = Fr_0	Fr = Fr_{max}	Fr = 0
				
2 Poles 3000 rpm	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]
63	110	110	110	210
71	130	130	130	235
80	220	220	220	385
90	250	250	250	375
4 Poles 1500 rpm	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]
63	120	110	120	300
71	130	130	130	340
80	220	220	220	540
90	260	260	260	545

Fa0 : Permissible maximum axial load
Fr : Radial force acting on the shaft
Fr0 : Permissible maximum radial load at the end of the shaft
Fr max : Permissible maximum radial load at the shaft end
Permissible load calculations are based on a bearing life of Lh10 20,000 hours according to ISO 281.

Product Type Codes of Single-Phase Motors

2	MD	071	M	4	C	PD	M8	000

2 → Motor Efficiency Class
2: IE2

MD → Basic Motor Types
MD : Single-Phase Motors with Start Capacitor
MS : Single-Phase Motors with Start and Run Capacitor

071 → Frame Size: 63, 71, 80, 90
Height of the shaft axis from feet base of motor(mm)

M → Housing Lenght
S : Short
M: Medium
L : Long

4 → Number of Poles
2: 2 Poles 3000 rpm
4: 4 Poles 1500 rpm

C → Core Lenght: A, B, C, D, E

PD → Construction Types/Flange Types
PD: B3 Foot Mounted
FA: B5 Flange
FB: B14/2 Flange
PB: B14/2 Feet
FC : B14 Flange
FS : Special Flange
PA : B35
PC : B34
PS : Foot mounted with special flange
Y0..Y9 : With flange for gearbox connection
PX : Foot mounted without drive end shield
XX : Without foot and drive end shield
Z0-Z9 : Foot mounted Yılmaz type

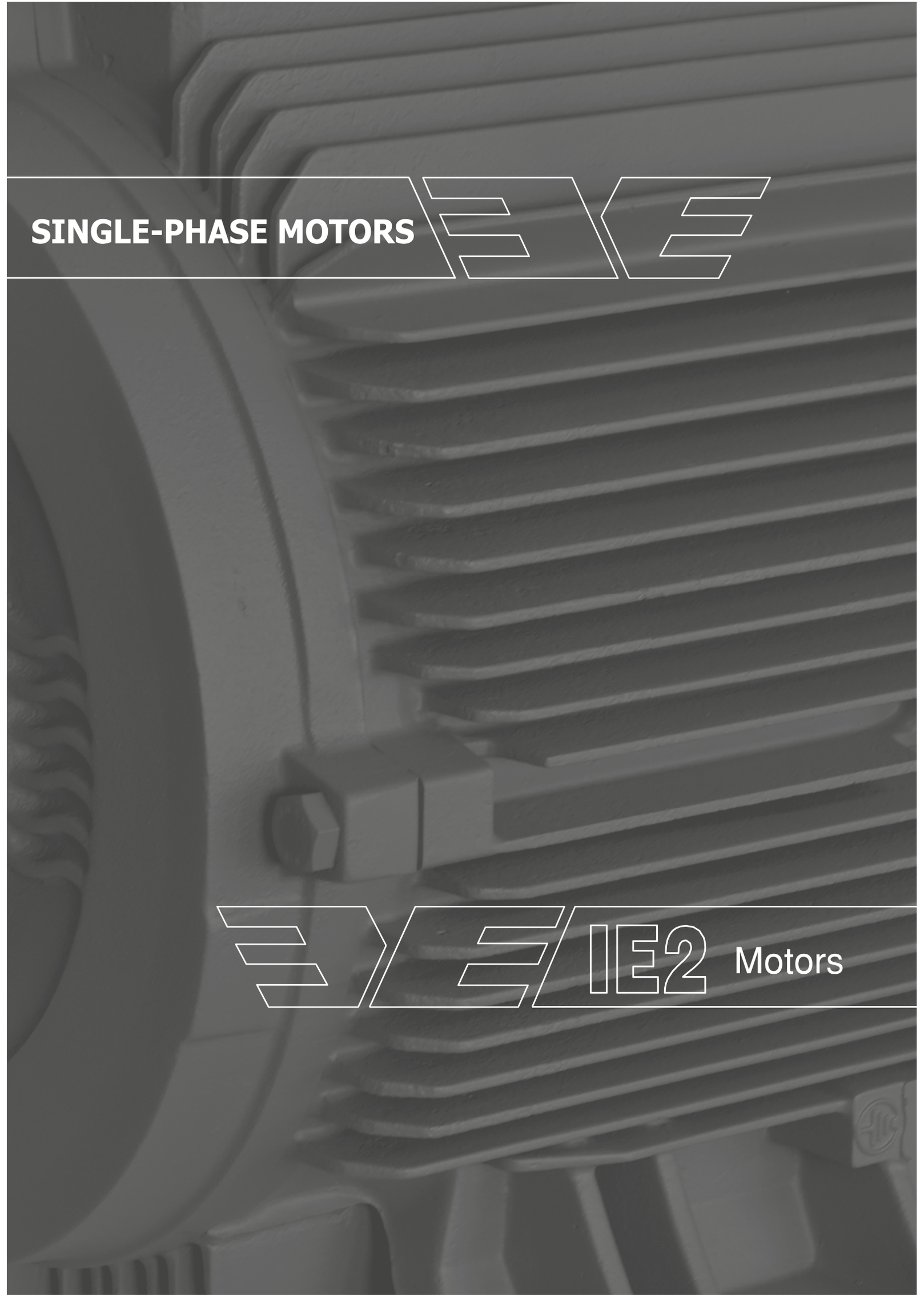
M8 → Electrical Specifications
AA..ZZ Voltage, Frequency and Electrical features

M8 : 230V 50Hz
70 : 220V 50Hz
Y0: 220V 60Hz
Y2: 230V 60Hz

000 → Additional Motor Features
000 : Standard Motor

SINGLE-PHASE MOTORS

IE2 Motors



Electrical Characteristics

230V 50Hz 3000 rpm with Run Capacitor

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)
Temperature Rise : B (80°K)

IE2

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Run Capacitor Capacity	Moment of Inertia	B3 Motor Weight
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	µF	kgm²	kg
1~ 230V 50Hz	2MD063M2A	0,18	2785	1,25	0,62	0,98	64,0	61,0	55,2	3,00	0,60	1,90	10	0,00013	4,10
	2MD063M2B	0,25	2820	1,68	0,85	0,97	67,0	63,1	57,1	3,30	0,65	2,00	15	0,00016	4,30
	2MD071M2B	0,37	2840	2,20	1,24	0,98	74,4	73,0	64,5	3,70	0,60	1,90	20	0,00032	6,60
	2MD071M2C	0,55	2845	3,18	1,85	0,98	76,5	75,2	68,0	3,80	0,60	2,00	25	0,00039	7,60
	2MD080M2B	0,75	2800	4,31	2,56	0,98	77,4	74,4	67,3	3,80	0,60	2,10	30	0,00094	9,90
	2MD080M2C	1,10	2810	6,05	3,74	0,99	79,6	78,6	73,0	3,80	0,57	2,10	40	0,00108	11,6
	2MD090S2B	1,50	2810	8,20	5,10	0,98	81,3	81,2	76,0	4,00	0,52	2,00	60	0,00160	16,2
	2MD090L2D	2,20	2850	11,8	7,37	0,98	83,2	82,0	75,7	4,40	0,52	2,10	80	0,00234	19,0

230V 50Hz 1500 rpm with Run Capacitor

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)
Temperature Rise : B (80°K)

IE2

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Run Capacitor Capacity	Moment of Inertia	B3 Motor Weight
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	µF	kgm²	kg
1~ 230V 50Hz	2MD063M4B	0,12	1415	0,91	0,81	0,97	59,1	50,8	40,5	2,30	0,58	1,75	10	0,00019	4,40
	2MD063M4C	0,18	1420	1,27	1,21	0,95	64,7	57,2	44,0	2,50	0,60	1,90	15	0,00023	5,00
	2MD071M4C	0,25	1445	1,73	1,65	0,93	68,5	61,4	49,8	3,50	0,60	2,00	15	0,00071	7,40
	2MD071M4D	0,37	1440	2,36	2,45	0,94	72,7	65,8	54,3	3,20	0,50	2,00	20	0,00086	8,20
	2MD080M4C	0,55	1415	3,20	3,71	0,97	77,1	72,0	63,1	3,50	0,55	2,00	30	0,00184	10,6
	2MD080M4D	0,75	1400	4,18	5,12	0,98	79,6	77,2	69,5	3,50	0,55	1,90	30	0,00210	12,4
	2MD090S4D	1,10	1420	6,00	7,40	0,98	81,4	79,2	71,8	4,00	0,45	1,90	40	0,00295	18,1
	2MD090L4E	1,50	1420	8,20	10,1	0,96	82,8	81,0	74,2	4,00	0,45	1,70	60	0,00373	18,7

Electrical Characteristics

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)
Temperature Rise : B (80°K)

IE2

230V 50Hz 3000 rpm with Run and Start Capacitors

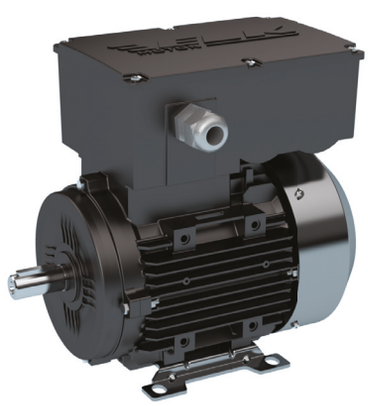
Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Capacitor		Moment of Inertia	B3 Motor Weight
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque		Run	Start		
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	µF	µF	kgm²	kg
1~ 230V 50Hz	2MS063M2A	0,18	2785	1,25	0,62	0,98	64,0	61,0	55,2	4,80	2,70	1,90	10	36-43	0,00013	4,30
	2MS063M2B	0,25	2820	1,68	0,85	0,97	67,0	63,1	57,1	4,90	2,80	2,00	15	43-52	0,00016	4,50
	2MS071M2B	0,37	2840	2,20	1,24	0,98	74,4	73,0	64,5	4,90	2,60	1,90	20	53-64	0,00032	6,80
	2MS071M2C	0,55	2845	3,18	1,85	0,98	76,5	75,2	68,0	4,90	2,60	2,00	25	72-86	0,00039	7,80
	2MS080M2B	0,75	2800	4,31	2,56	0,98	77,4	74,4	67,3	5,30	2,60	2,10	30	88-106	0,00094	10,1
	2MS080M2C	1,10	2810	6,05	3,74	0,99	79,6	78,6	73,0	5,30	2,70	2,10	40	145-174	0,00108	11,8
	2MS090S2B	1,50	2810	8,20	5,10	0,98	81,3	81,2	76,0	5,00	2,20	2,00	60	189-227	0,00160	16,4
	2MS090L2D	2,20	2850	11,8	7,37	0,98	83,2	82,0	75,7	4,80	1,50	2,10	80	189-227	0,00234	19,2

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)
Temperature Rise : B (80°K)

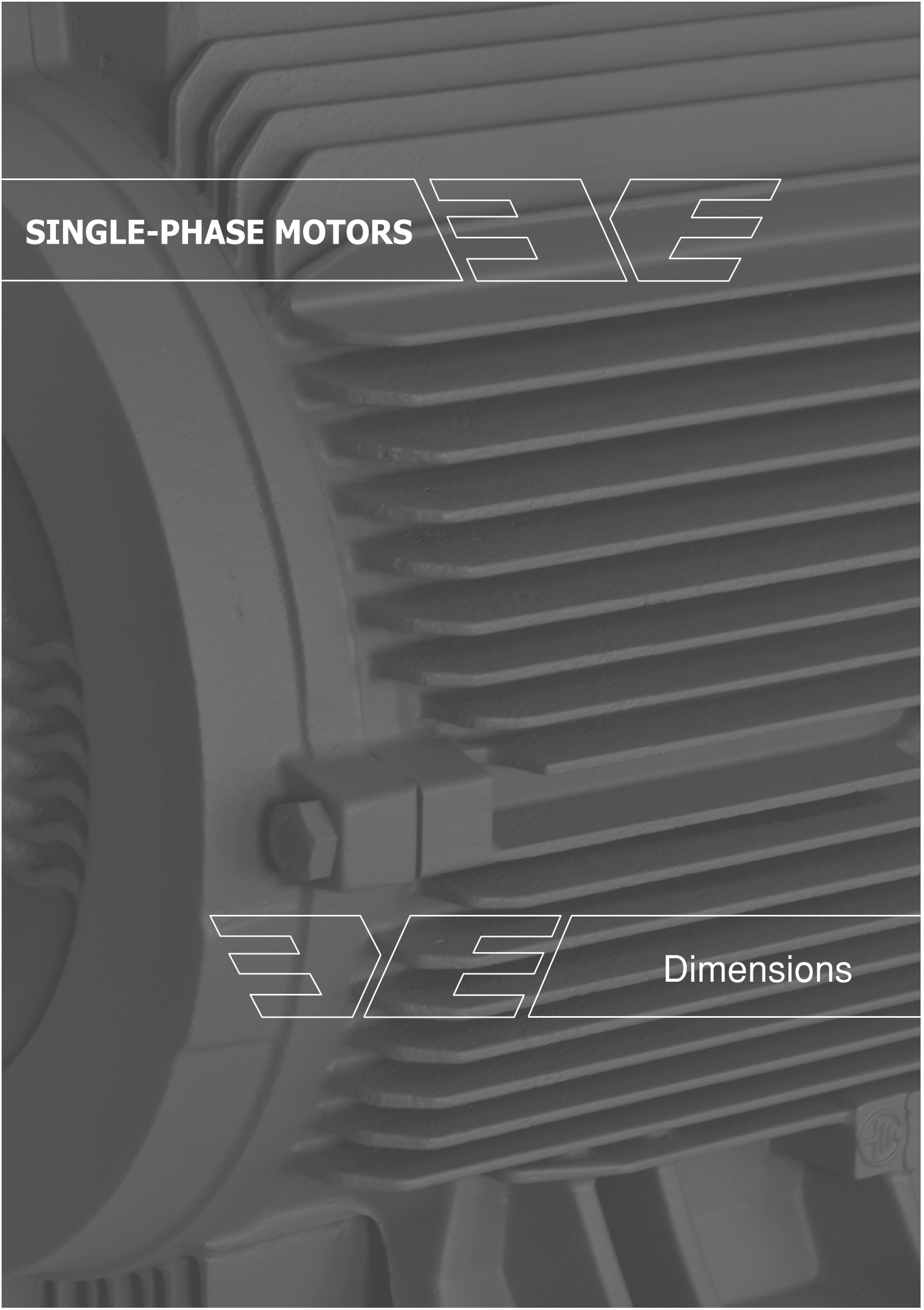
IE2

230V 50Hz 1500 rpm with Run and Start Capacitors

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Capacitor		Moment of Inertia	B3 Motor Weight
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque		Run	Start		
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	µF	µF	kgm²	kg
1~ 230V 50Hz	2MS063M4B	0,12	1415	0,91	0,81	0,97	59,1	50,8	40,5	4,90	2,60	1,75	10	30-36	0,00019	4,60
	2MS063M4C	0,18	1420	1,27	1,21	0,95	64,7	57,2	44,0	4,80	2,70	1,90	15	30-36	0,00023	5,20
	2MS071M4C	0,25	1445	1,73	1,65	0,93	68,5	61,4	49,8	4,90	2,70	2,00	15	36-43	0,00071	7,60
	2MS071M4D	0,37	1440	2,36	2,45	0,94	72,7	65,8	54,3	4,70	2,50	2,00	20	53-64	0,00086	8,40
	2MS080M4C	0,55	1415	3,20	3,71	0,97	77,1	72,0	63,1	4,60	2,60	2,00	30	64-77	0,00184	10,8
	2MS080M4D	0,75	1400	4,18	5,12	0,98	79,6	77,2	69,5	4,50	2,60	1,90	30	72-86	0,00210	12,6
	2MS090S4D	1,10	1420	6,00	7,40	0,98	81,4	79,2	71,8	5,10	2,60	1,90	40	145-174	0,00295	18,3
	2MS090L4E	1,50	1420	8,20	10,1	0,96	82,8	81,0	74,2	4,50	2,10	1,70	60	161-193	0,00373	18,9



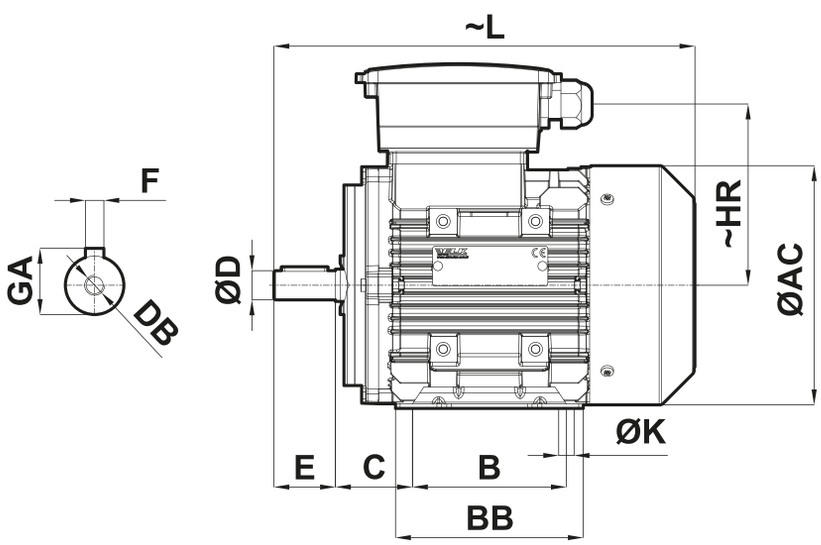
SINGLE-PHASE MOTORS

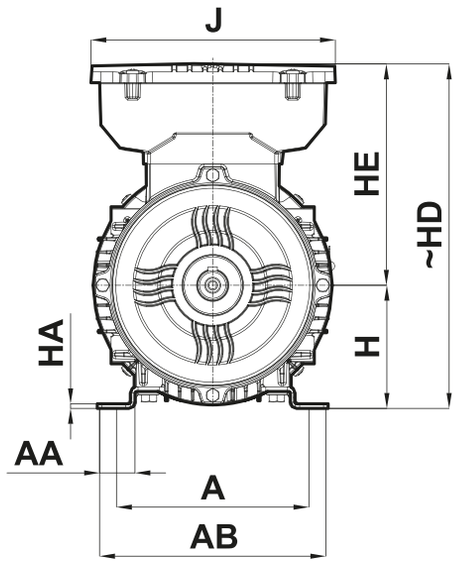


Dimensions

Motors with Run Capacitor

B3 Construction Type

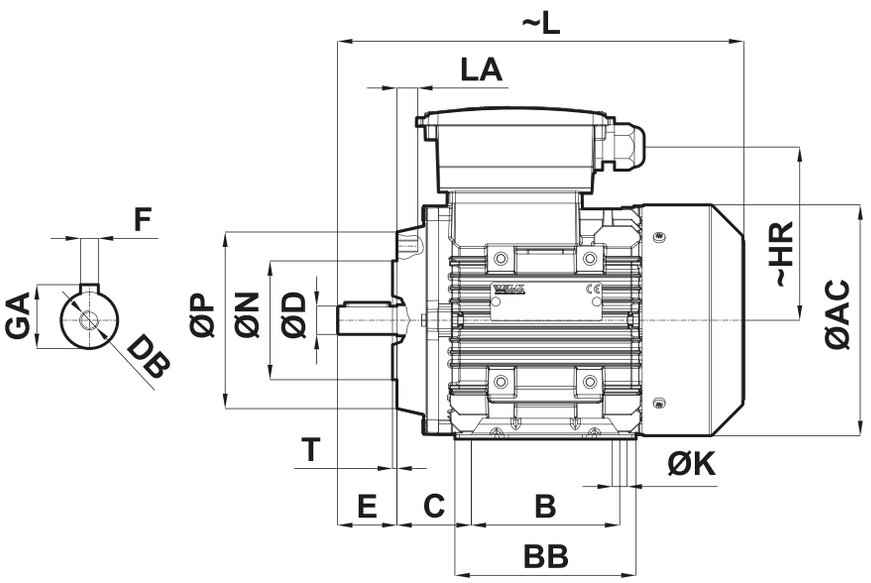




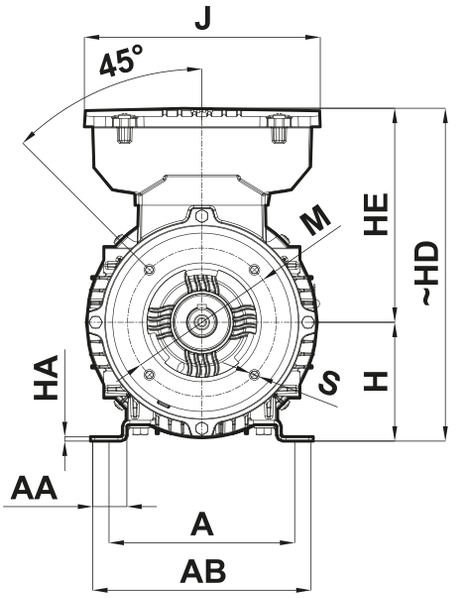
Frame Size	Number of Poles	D[1]	E	L	AC	HR	H[2]	HE	HD	F	GA	DB	C	ØK	B	BB	HA	AA	A	AB	J
063M	2-4	11	23	213	119	92	63	118	181	4	12,5	M4	40	7	80	104	3	18	100	115	153
071M	2-4	14	30	242	137	108	71	135	206	5	16	M5	45	7	90	110	3	19	112	128	159
080M	2-4	19	40	274	155	117	80	144	224	6	21,5	M6	50	10	100	122	3	25	125	148	159
090S	2-4	24	50	325	176	133	90	170	260	8	27	M8	56	10	125	151	4	27	140	167	173
090L	2-4	24	50	325	176	133	90	170	260	8	27	M8	56	10	125	151	4	27	140	167	173

[1] Tolerance “j6” TS EN 50347
[2] Tolerance “-0.5mm” TS EN 50347

Motors with Run Capacitor



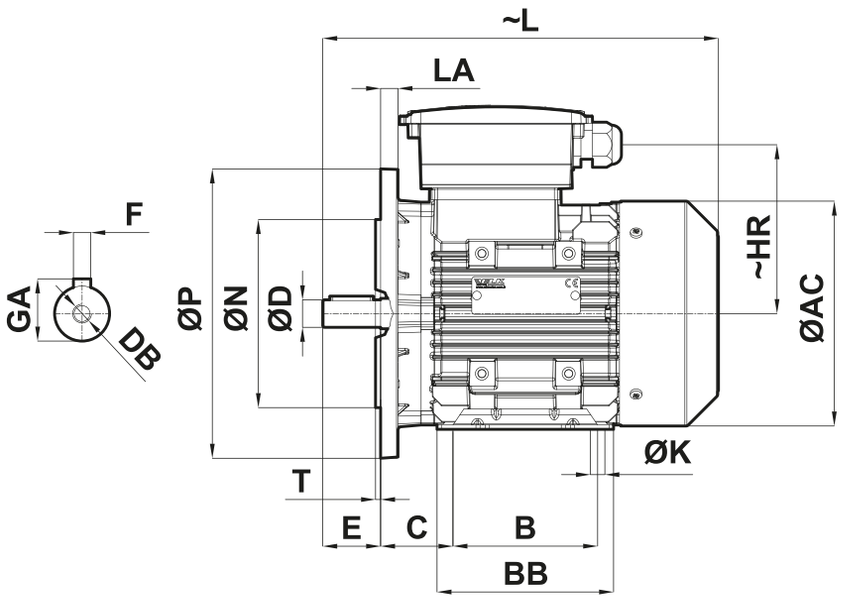
B14 - B34 Construction Types



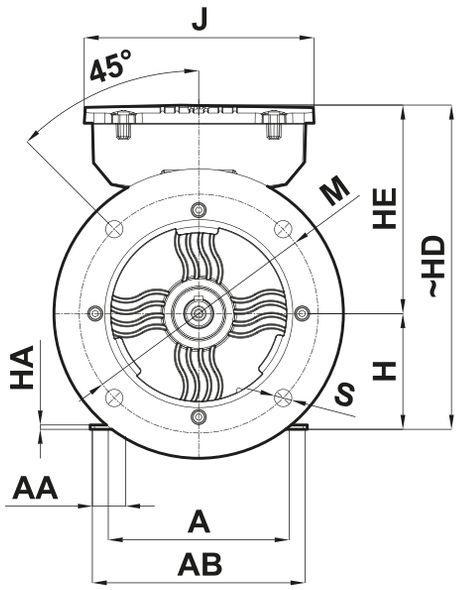
Frame Size	Number of Poles	D[1]	N[2]	P	E	T	LA	L	AC	S	M	HR	H[3]	HE	HD	F	GA	DB	C	ØK	B	BB	HA	AA	A	AB	J
063M	2-4	11	60	90	23	2,5	10	213	119	M5	75	92	63	118	181	4	12,5	M4	40	7	80	104	3	18	100	115	153
071M	2-4	14	70	105	30	2,5	12	242	137	M6	85	108	71	135	206	5	16	M5	45	7	90	110	3	19	112	128	159
080M	2-4	19	80	119	40	3	12	274	155	M6	100	117	80	144	224	6	21,5	M6	50	10	100	122	3	25	125	148	159
090S	2-4	24	95	137	50	3	15	325	176	M8	115	133	90	170	260	8	27	M8	56	10	125	151	4	27	140	167	173
090L	2-4	24	95	137	50	3	15	325	176	M8	115	133	90	170	260	8	27	M8	56	10	125	151	4	27	140	167	173

[1] Tolerance “j6” TS EN 50347
[2] Tolerance “j6” TS EN 50347
[3] Tolerance “-0.5mm” TS EN 50347

Motors with Run Capacitor



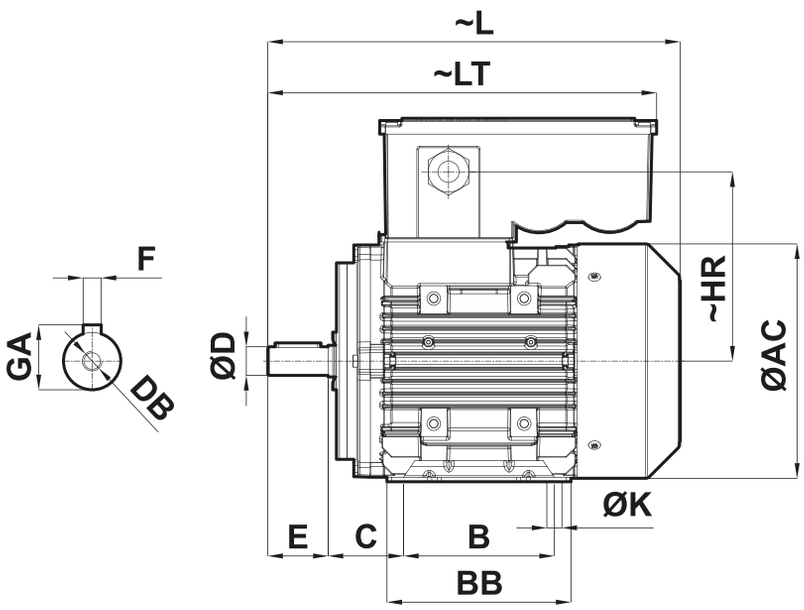
B5 – B35 Construction Types



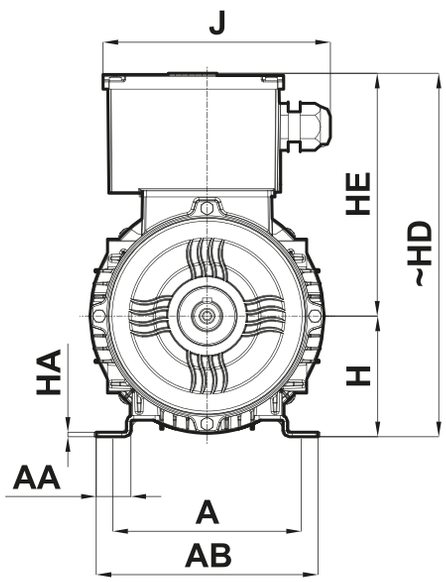
Frame Size	Number of Poles	D[1]	E	N[2]	P	T	LA	L	AC	S	M	HR	H[3]	HE	HD	F	GA	DB	C	ØK	B	BB	HA	AA	A	AB	J
063M	2-4	11	23	95	140	3,0	8	213	119	10	115	92	63	118	181	4	12,5	M4	40	7	80	104	3	18	100	115	153
071M	2-4	14	30	110	160	3,5	8	242	137	10	130	108	71	135	206	5	16	M5	45	7	90	110	3	19	112	128	159
080M	2-4	19	40	130	200	3,5	12	274	155	12	165	117	80	144	224	6	21,5	M6	50	10	100	122	3	25	125	148	159
090S	2-4	24	50	130	200	3,5	12	325	176	12	165	133	90	170	260	8	27	M8	56	10	125	151	4	27	140	167	173
090L	2-4	24	50	130	200	3,5	12	325	176	12	165	133	90	170	260	8	27	M8	56	10	125	151	4	27	140	167	173

[1] Tolerance “j6” TS EN 50347
[2] Tolerance “j6” TS EN 50347
[3] Tolerance “-0.5mm” TS EN 50347

Motors with Run and Start Capacitors



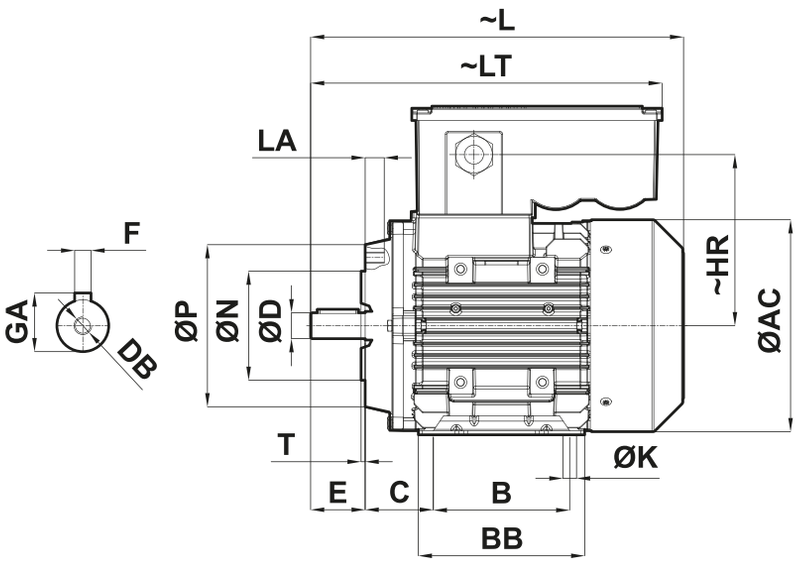
B3 Construction Type



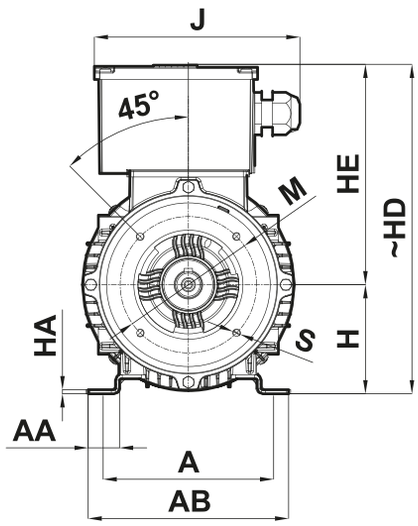
Frame Size	Number of Poles	D[1]	E	L	LT	AC	HR	H[2]	HE	HD	F	GA	DB	C	ØK	B	BB	HA	AA	A	AB	J
063M	2-4	11	23	213	208	119	94	63	160	223	4	12,5	M4	40	7	80	104	3	18	100	115	128
071M	2-4	14	30	242	258	137	117	71	159	230	5	16	M5	45	7	90	110	3	19	112	128	169
080M	2-4	19	40	274	271	155	126	80	168	248	6	21,5	M6	50	10	100	122	3	25	125	148	169
090S	2-4	24	50	325	304	176	135	90	177	267	8	27	M8	56	10	125	151	4	27	140	167	158
090L	2-4	24	50	325	304	176	135	90	177	267	8	27	M8	56	10	125	151	4	27	140	167	158

[1] Tolerance “j6” TS EN 50347
[2] Tolerance “-0.5mm” TS EN 50347

Motors with Run and Start Capacitors



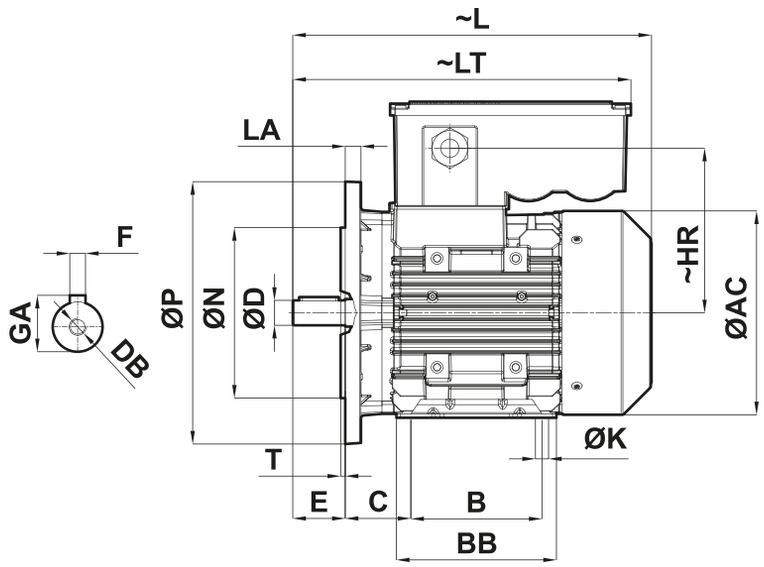
B14 – B34 Construction Types



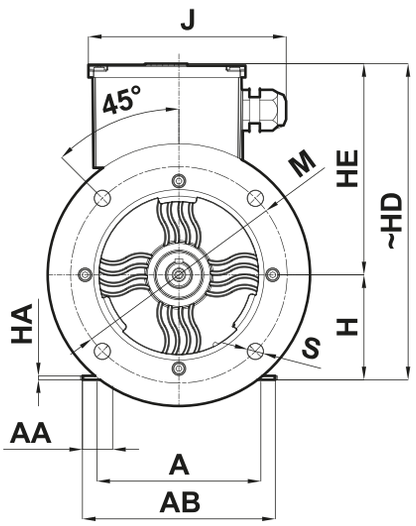
Frame Size	Number of Poles	D[1]	N[2]	P	E	T	LA	L	LT	AC	S	M	HR	H[3]	HE	HD	F	GA	DB	C	ØK	B	BB	HA	AA	A	AB	J
063M	2-4	11	60	90	23	2,5	10	213	208	119	M5	75	94	63	160	223	4	12,5	M4	40	7	80	104	3	18	100	115	128
071M	2-4	14	70	105	30	2,5	12	242	258	137	M6	85	117	71	159	230	5	16	M5	45	7	90	110	3	19	112	128	169
080M	2-4	19	80	119	40	3	12	274	271	155	M6	100	126	80	168	248	6	21,5	M6	50	10	100	122	3	25	125	148	169
090S	2-4	24	95	137	50	3	15	325	304	176	M8	115	135	90	177	267	8	27	M8	56	10	125	151	4	27	140	167	158
090L	2-4	24	95	137	50	3	15	325	304	176	M8	115	135	90	177	267	8	27	M8	56	10	125	151	4	27	140	167	158

[1] Tolerance “j6” TS EN 50347
[2] Tolerance “j6” TS EN 50347
[3] Tolerance “-0.5mm” TS EN 50347

Motors with Run and Start Capacitors



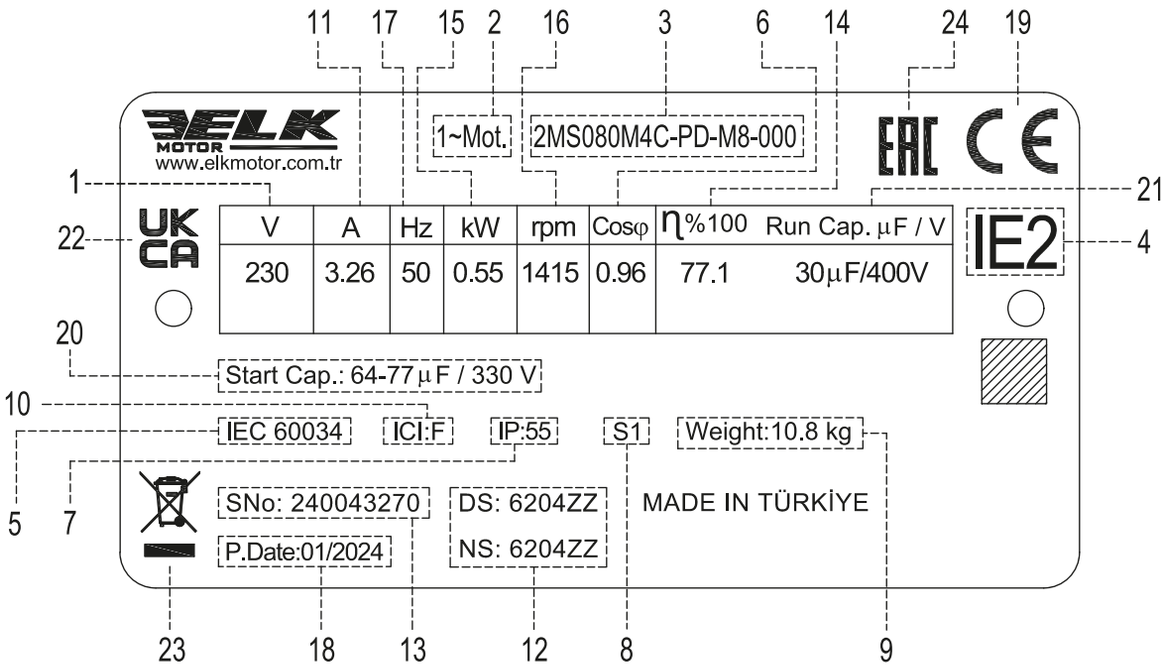
B5 – B35 Construction Types



Frame Size	Number of Poles	D[1]	E	N[2]	P	T	LA	L	LT	AC	S	M	HR	H[3]	HE	HD	F	GA	DB	C	ØK	B	BB	HA	AA	A	AB	J
063M	2-4	11	23	95	140	3,0	8	213	208	119	10	115	94	63	160	223	4	12,5	M4	40	7	80	104	3	18	100	115	128
071M	2-4	14	30	110	160	3,5	8	242	258	137	10	130	117	71	159	230	5	16	M5	45	7	90	110	3	19	112	128	169
080M	2-4	19	40	130	200	3,5	12	274	271	155	12	165	126	80	168	248	6	21,5	M6	50	10	100	122	3	25	125	148	169
090S	2-4	24	50	130	200	3,5	12	325	304	176	12	165	135	90	177	267	8	27	M8	56	10	125	151	4	27	140	167	158
090L	2-4	24	50	130	200	3,5	12	325	304	176	12	165	135	90	177	267	8	27	M8	56	10	125	151	4	27	140	167	158

[1] Tolerance “j6” TS EN 50347
[2] Tolerance “j6” TS EN 50347
[3] Tolerance “-0.5mm” TS EN 50347

Motor Nameplate Example

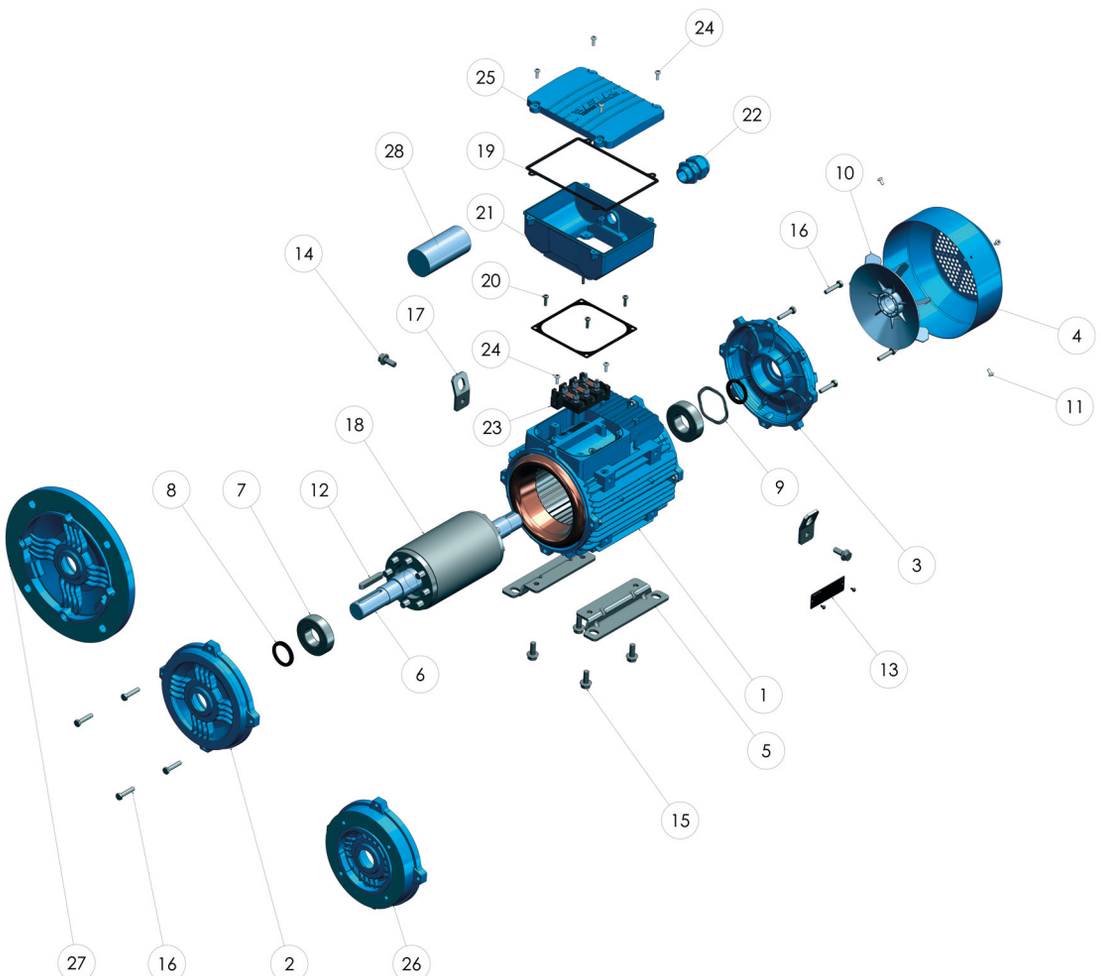


1.	Rated Voltage	13.	Serial Number
2.	Motor Type: Single Phase Motor	14.	Efficiency
3.	Motor Code	15.	Output Power
4.	Efficiency Class	16.	Speed
5.	Manufacture Standard	17.	Frequency
6.	Power Factor	18.	Production Date
7.	Protection Class	19.	CE Logo
8.	Duty Cycle	20.	Start Capacitor Specifications
9.	Motor Weight	21.	Run Capacitor Specifications
10.	Insulation Class	22.	UKCA Logo
11.	Rated Current	23.	WEEE Symbol
12.	Bearing Type	24.	EAC Logo

The nameplate shows the identification, and the most important technical data. The nameplate also defines the limits of proper usage, and manufacturing year of the motors. The first two digits in the serial number, shows the manufacturing year. For example, 24XXXXXXX shows that the product is manufactured in 2024.

Single-Phase Motor with Run Capacitor Spare Parts

All standard single-phase permanent capacitor motors manufactured by ELK MOTOR consist of the following main components:

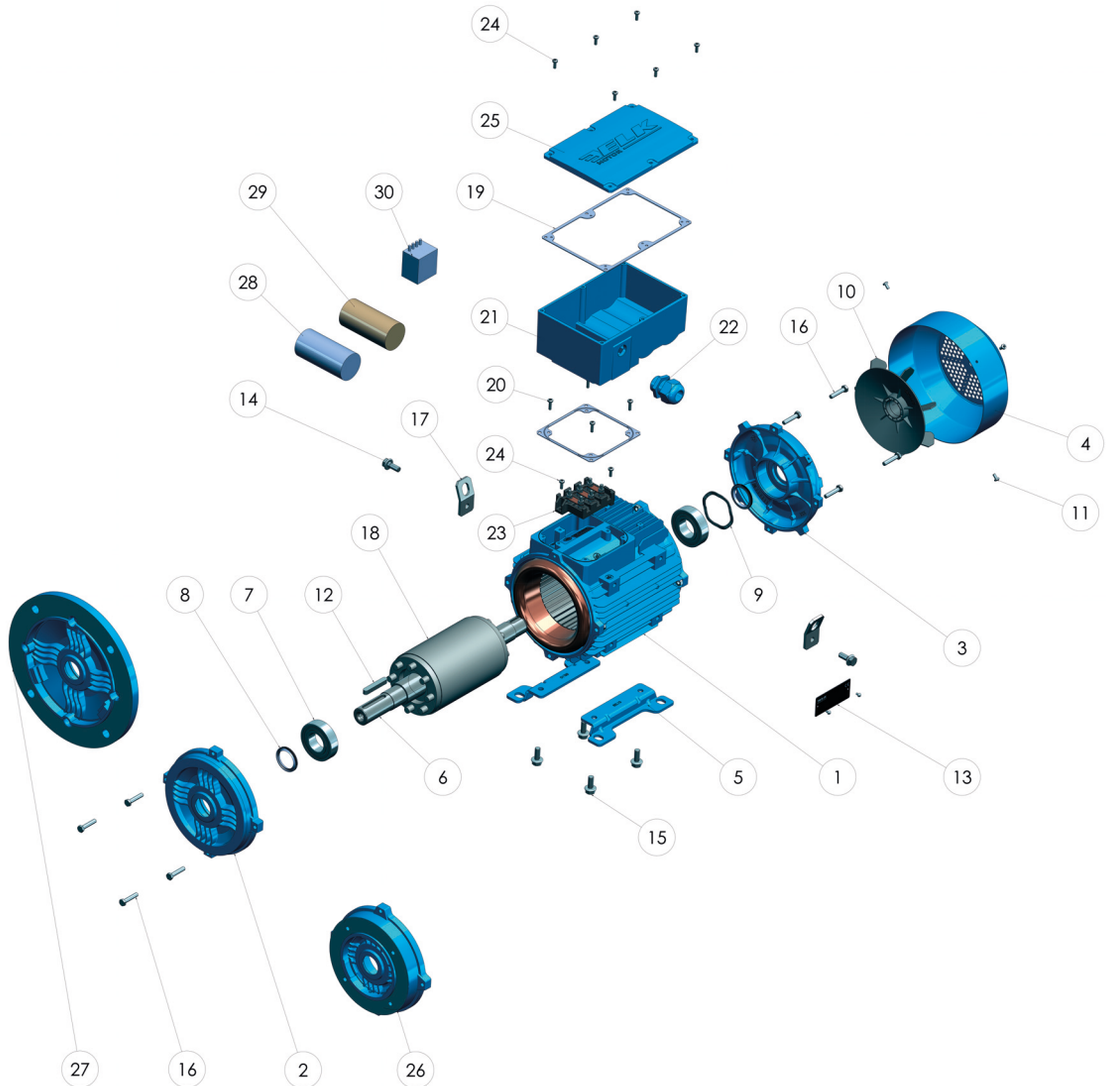


1.	Housing	15.	Screw
2.	End Shield (DE)	16.	Bolt
3.	End Shield (NDE)	17.	Lifting Lug
4.	Fan Cover	18.	Squirrel Cage Rotor
5.	Mounting Foot	19.	Terminal Box Gasket
6.	Shaft	20.	Screw
7.	Bearing	21.	Terminal Box
8.	Shaft Seal	22.	Cable Gland
9.	Spring Washer	23.	Terminal
10.	Fan	24.	Screw
11.	Screw	25.	Terminal Box Cover
12.	Key	26.	B14 Flange
13.	Nameplate	27.	B5 Flange
14.	Screw	28.	Run Capacitor

While ordering spare parts, the motor serial number, full type designation and product code, as stated on the nameplate, must be specified. For field service, spare parts and additional information, please contact us.

Single-Phase Motor with Run + Start Capacitors Spare Parts

All standard single-phase permanent and start capacitor motors manufactured by ELK MOTOR consist of the following main components:



1.	Housing	16.	Bolt
2.	End Shield (DE)	17.	Lifting Lug
3.	End Shield (NDE)	18.	Squirrel Cage Rotor
4.	Fan Cover	19.	Terminal Box Gasket
5.	Mounting Foot	20.	Screw
6.	Shaft	21.	Terminal Box
7.	Bearing	22.	Cable Gland
8.	Shaft Seal	23.	Terminal
9.	Spring Washer	24.	Screw
10.	Fan	25.	Terminal Box Cover
11.	Screw	26.	B14 Flange
12.	Key	27.	B5 Flange
13.	Nameplate	28.	Run Capacitor
14.	Screw	29.	Start Capacitor
15.	Screw	30.	Starter Relay

While ordering spare parts, the motor serial number, full type designation and product code, as stated on the nameplate, must be specified. For field service, spare parts and additional information, please contact us.

EXPROOF MOTORS

Technical Specifications

Overview

Electrical equipment and devices can pose risks to the environment and human health when they come into contact with flammable and explosive substances such as fumes, dust, and smoke present in the surroundings. To ensure maximum safety, international ATEX regulations and standards have been implemented to define the essential health and safety requirements and conformity assessment procedures for equipment and protective systems used in potentially explosive environments. Exproof equipment is designed to prevent explosions when used correctly. These devices can be designed to meet various protection types. The types of protection and areas are determined based on the likelihood of the presence of a potentially explosive atmosphere. Equipment categories are assigned to these areas, which are then subdivided into potential protection types and thus into potential equipment (product) types. Depending on the specific area and related hazard, operational equipment must comply with the minimum requirements specified for the protection type. Different protection types require specific measures to prevent ignition and ensure safety in environments with explosive atmospheres.

Typical Applications

Oil and Gas Industry
Chemical industry
Pharmaceutical industry
Oil and petrochemical plants
Food and Beverage Industry
Paint and Coating Industry
Natural gas facilities
Wastewater Treatment Plants
Iron-steel industry

**Proper motor selection according to the application's needs is the responsibility of the application/system engineer.*

IEC/EN Compatibility

All of standard ELK Motors are designed, manufactured and tested according to the IEC and EN standards given below.

IEC 60079-0	General Terms	Explosive atmospheres
IEC 60079-7	Increased Safety "e"	
IEC 60079-31	Equipment Dust Ignition Protection by Enclosure "t"	
IEC 60034-1	Rating and Performance	
IEC 60034-2-1	Determining Losses and Efficiency From Tests	
IEC 60034-5	Protection Degree Classification (IP)	
IEC 60034-6	Cooling Methods	
IEC 60034-7	Classification of Construction Types and Mounting Arrangements	
IEC 60034-8	Terminal Markings and Direction of Rotation	
IEC 60034-9	Noise Limits	
IEC 60034-11	Thermal Protection	
IEC 60034-14	Mesurement, Evaluation and Limits of Vibration Severity	
IEC 60034-18-1	Functional evoluation of İnsulation System	
IEC 60034-30	Efficiency Classes (IE Code)	
IEC 60038	Standard Voltages	
EN 50347	Standart Dimensions and Output Powers	
EN 55014-1	Electromagnetic Compatibility	
EN 61000-3-2		
EN 61000-3-3		

According to IEC 60034-1, catalogue values are permitted to deviate from the real values as follows:

Motor Speed (n)	$\Delta n = \pm 20\%$ (ns - n_N), P_N => 1 kW $\Delta n = \pm 30\%$ (ns - n_N), P_N < 1 kW
Efficiency %(η)	$\Delta\eta$ = -15% (100 - η_N)
Power factor (φ)	Cosφ = -1/6 (1-Cos φ)
Locked rotor current (I_{LN})	Δ (I_{LN})= +20%(I_{LN})
Starting torque (M_L/M_N)	min. (M_L/M_N) = -15% (M_L/M_N) max. (M_L/M_N) = +25% (M_L/M_N)
Breakdown torque (M_K/M_N)	(M_K/M_N) = -10% (M_K/M_N)
Moment of inertia (J) [kgm²]	Δ J = ± 10% J
Sound pressure level (L_{PA}) [dB(A)]	L_{PA} = +3 dB (A)

Explosive Atmospheres Protection Directive 2014/34/EU

Explosion protection has been fully aligned with Directive 2014/34/EU. The requirements of the new regulation came into effect on April 20, 2016. Since that date, only devices and protection systems compliant with Directive 2014/34/EU are permitted to be placed on the market. Directive 2014/34/EU and Directive 1999/92/EC specify that only certain electrical equipment and devices are permitted in designated zones. Devices are assigned to equipment groups and categories.

Example Increased Protection	CE	2284	Ex	II II	3 3	G D	Ex Ex	ec tc	IIC IIIC	T4 T120°C~T140°C	Gc Dc

CE marking

Notified Body Number

Symbol for Explosion Protection

Equipment Group
I: Mining
II: Non-mining

Equipment Category
2: Zone 1/21
3: Zone 2/22

Environment
G: Gas
D: Dust

Explosion Protection

Type of Protection
Ex db, db eb, eb, ec, tb veya tc

Environment Sub Category
II: Gas (IIA, IIB veya IIC)
III: Dust (IIIA, IIIB veya IIIC)

Temperature Class (Maximum Surface Temperature)

T1 = 450 °C	T4 = 135 °C
T2 = 300 °C	T5 = 100 °C
T3 = 200 °C	T6 = 85 °C

Equipment Protection Level (G: Gas - D: Dust)

Ga: Very High Protection	Da: Very High Protection
Gb: High Protection	Db: High Protection
Gc: Enhanced Protection	Dc: Enhanced Protection

Electrical Construction

Our Exproof motors feature an F-class (155°C) Insulation Class. Additionally, all Zone 2/22 motors in our product range remain within the B-class Temperature Rise limits.

Electrical Connections

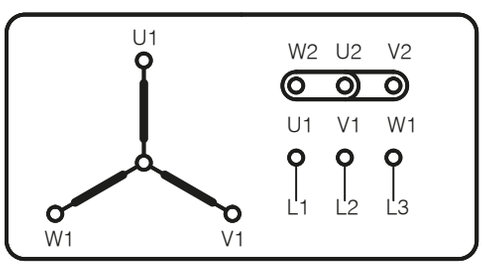
Cable Gland														
Frame Size	63	71	80	90	100	112	132	160	180	200	225	250	280	315
Cable Glands	2 x M16x1,5	1 x M20x1,5 + 1 x M16x1,5			1 x M20x1,5 1 x M25x1,5			2 x M32x1,5		1 x M40x1,5 + 1 x M12x1,5	1 x M50x1,5 + 1 x M12x1,5		2 x M63x1,5	

The cable glands are Ex-certified and unarmored. They can be provided with armor upon request.

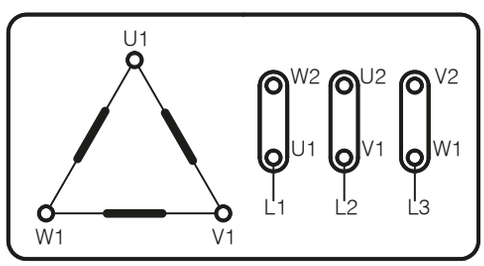
Terminal Connections														
Frame Size	063	071	080	090	100	112	132	160	180	200	225	250	280	315
Terminal Size	M4				M5			M6			M8	M10		M16

Three-phase EX motors should be connected in either star or delta configuration, depending on the voltage specified on the motor nameplate and the supply voltage. Motors with a 230/400V nameplate should be connected in star configuration, while motors with a 400/690V nameplate should be connected in delta configuration on a 400V network. Star-Delta starting can also be applied to 400/690V motors on a 400V network. The terminal connections for three-phase motors are provided below.

Terminal Connections for Three-Phase Motors

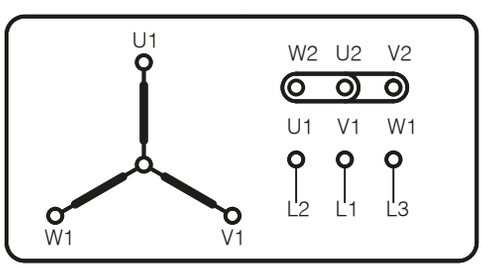


Y Star Connection
Clockwise Rotation

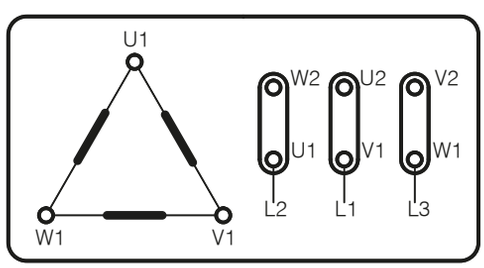


Δ Delta Connection
Clockwise Rotation

Standard ELK motors are manufactured to rotate clockwise. To change the direction of rotation, the positions of any two phases on the terminal can be swapped. For an illustrative example, refer to the schematic below.



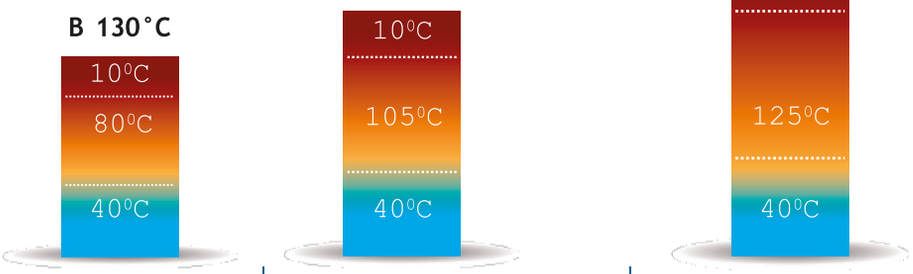
Y Star Conection
Counter-clockwise Rotation



Δ Delta Connection
Counter-clockwise Rotation

Winding Insulation / Temperature Rise Classes

INSULAION CLASS	B	F (Standart)	H (Optional)
Maximum Winding Temperature	130°C	155°C	180°C
Tolerance	10°C	10°C	15°C
Limits of Winding Temperature	80°C	105°C	125°C
Ambient Temperature	40°C	40°C	40°C



B

Class B insulation system is shown for reference purposes only. Class B insulation system is not used in ELK motor.

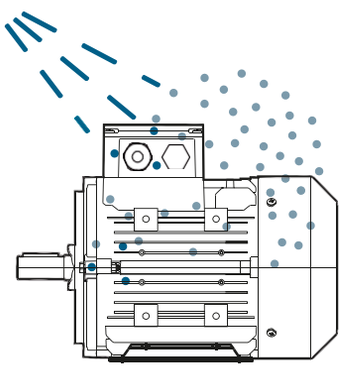
F (Standart)

Our standard motors have class F electrical insulation system. The maximum permissible winding temperature at 40°C ambient temperature is 155°C.

H (Optional)

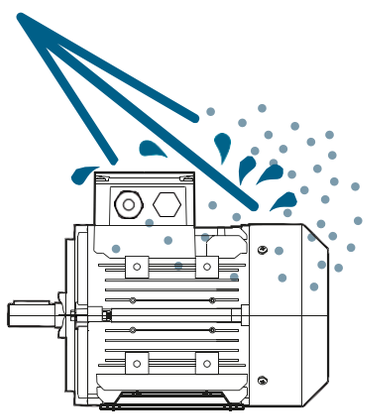
H class insulation is provided on special request. At 40°C ambient temperature, the maximum permissible winding temperature is 180°C

Protection Classes



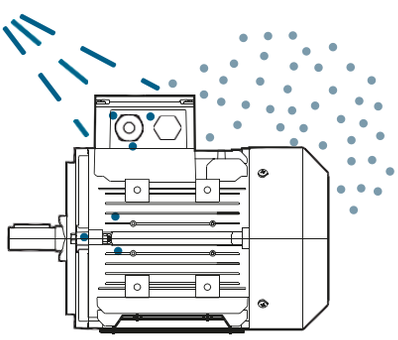
IP55 (Standart)

Limited protection against dust ingress and protected against low pressure water jets from any directio.



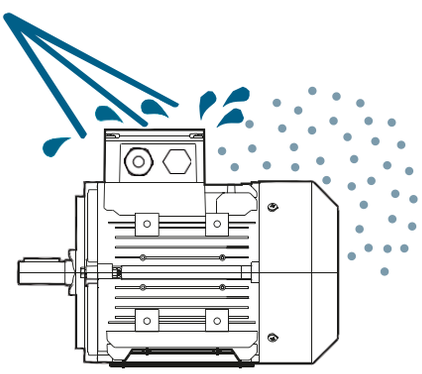
IP56

Limited protection against dust ingress and protected against high pressure water jets from any direction.



IP65

Totally protected against dust ingress and protected against low pressure water jets from any direction.



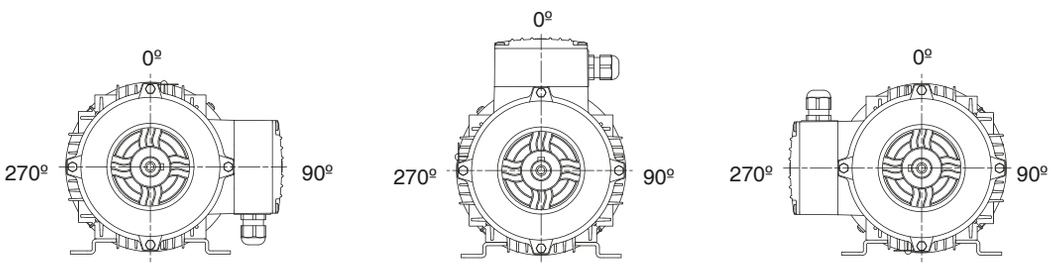
IP66

Totally protected against dust ingress and protected against high pressure water jets from any direction.

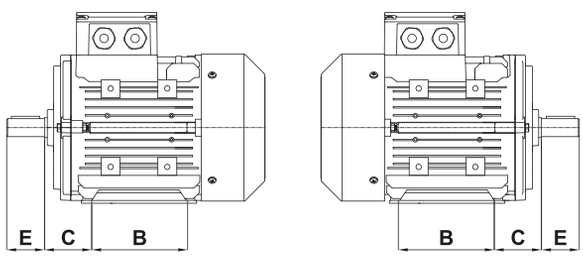
Mechanical Construction

Exproof ELK motors feature a removable foot structure for all frame sizes, with the feet capable of being attached to three sides of the frame. This allows users to adjust the foot position to easily configure the terminal box to be on the right, top, or left side of the motor. In standard motors, the terminal box is positioned at the top.

FRAME SIZE 63-315



Additionally, Exproof ELK motors, thanks to their symmetrical frame and foot design, maintain a constant C dimension when the DE end-shield, NDE end-shield, and shaft direction are changed. This allows the terminal box to be positioned either close to the DE side or close to the NDE (fan) side.

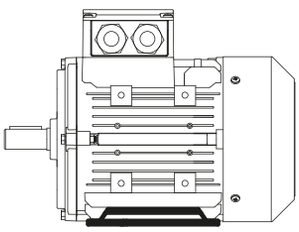
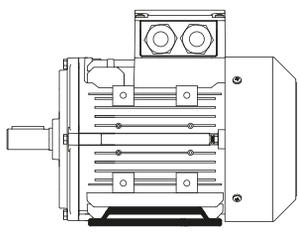


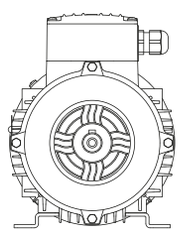
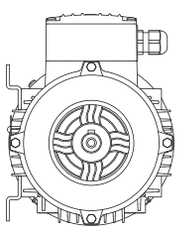
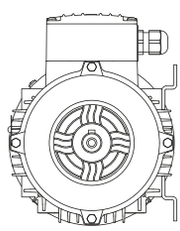
The raw materials that are used in our motors depending on the frame size are listed below.

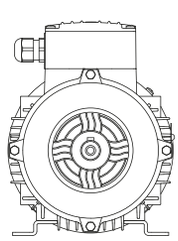
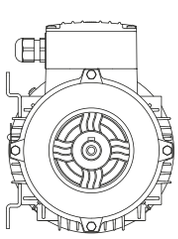
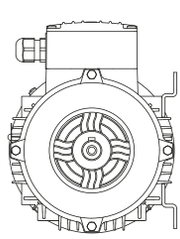
Frame Size	Housing	End Shield DE	End Shield NDE	Terminal Box & Cover	Feet	Fan Cover	Fan*
63	Aluminum	Aluminum	Aluminum	Aluminum	Steel Sheet	Steel Sheet	Plastic
71	Aluminum	Aluminum	Aluminum	Aluminum	Steel Sheet	Steel Sheet	Plastic
80	Aluminum	Aluminum	Aluminum	Aluminum	Steel Sheet	Steel Sheet	Plastic
90	Aluminum	Aluminum	Aluminum	Aluminum	Steel Sheet	Steel Sheet	Plastic
100	Aluminum	Aluminum	Aluminum	Aluminum	Steel Sheet	Steel Sheet	Plastic
112	Aluminum	Aluminum	Aluminum	Aluminum	Steel Sheet	Steel Sheet	Plastic
132	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Steel Sheet Cast Iron	Steel Sheet	Plastic
160	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Steel Sheet	Plastic
180	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Steel Sheet	Plastic
200	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Steel Sheet	Plastic
225	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Aluminum Cast Iron	Steel Sheet	Plastic
250	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Steel Sheet	Plastic
280	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Steel Sheet	Plastic
315	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Steel Sheet	Plastic

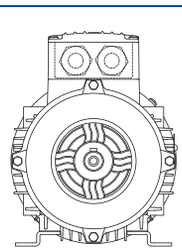
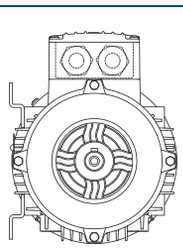
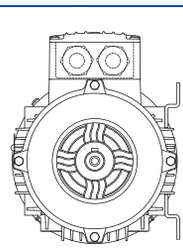
• The fan material is flame retardant (V0), antistatic, and halogen-free, in compliance with the relevant standards.

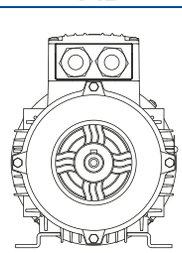
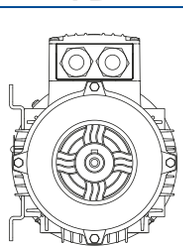
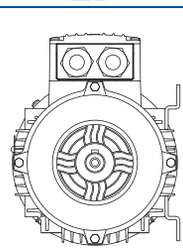
Construction Types

01	02
	

XA	YA	ZA
		

XB	YB	ZB
		

XC	YC	ZC
		

XD	YD	ZD
		

Exproof ELK motors can be positioned with the terminal box on the drive side or the fan side. Depending on these options, the motor foot and cable gland orientation options are as shown in the table.

01: Terminal box on the drive side
02: Terminal box on the fan side

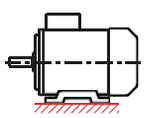
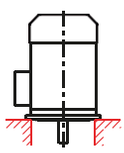
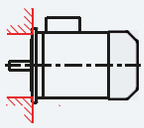
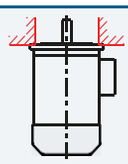
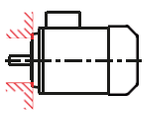
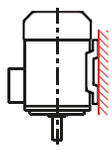
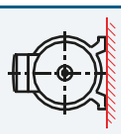
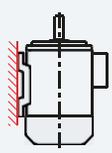
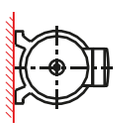
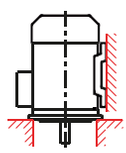
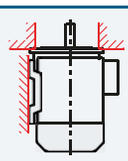
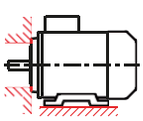
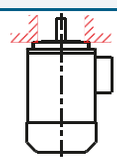
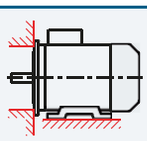
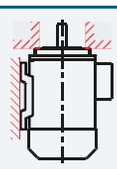
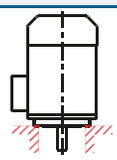
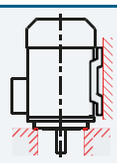
X: Feet on the ground when viewed from the drive side
Y: Feet on the left when viewed from the drive side
Z: Feet on the right when viewed from the drive side

A: Cable gland on the right when viewed from the drive side
B: Cable gland on the left when viewed from the drive side
C: Cable gland at the back when viewed from the drive side
D: Cable gland at the front when viewed from the drive side

In cases where feet are not required on the motor, mounting positions other than X, Y, nd Z are applicable.

Construction Types

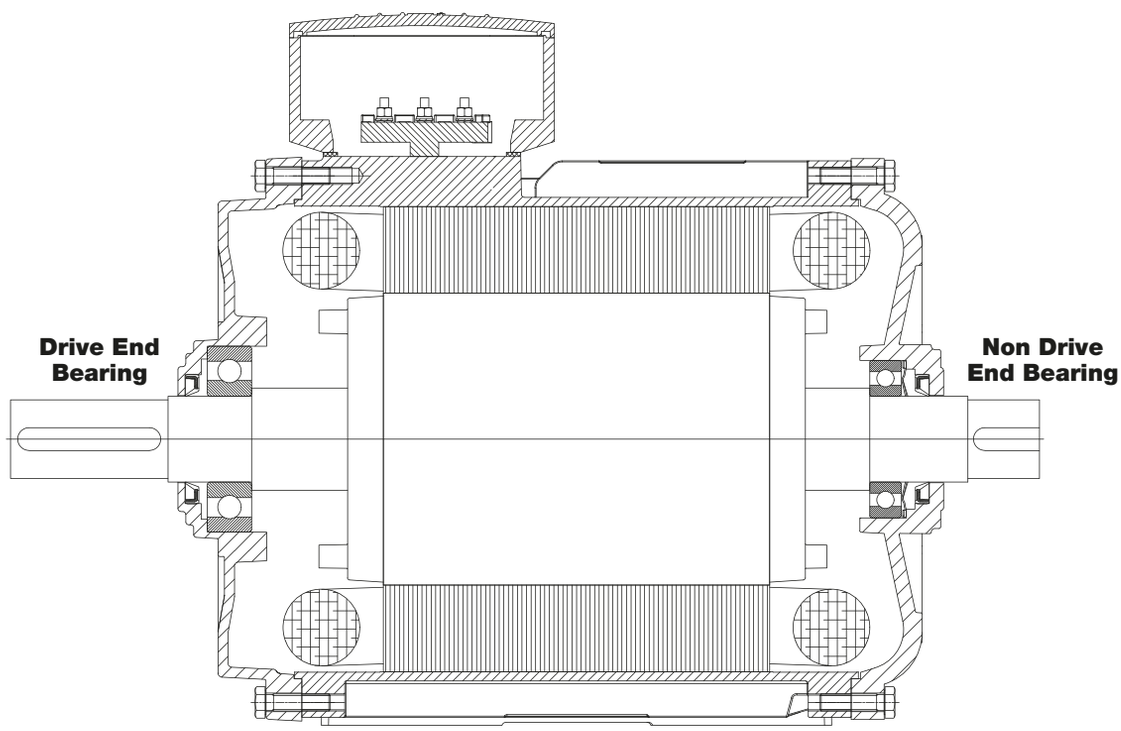
Exproof ELK motors are manufactured in accordance with international mounting standards IEC 60034-7.

Mounting Codes and Diagrams According to IEC 60034-7					
	Horizontal Mounting Codes			Vertical Mounting Codes	
	I	II		I	II
	IM B3	IM 1001		IM V1	IM 3011
	IM B5	IM 3001		IM V3	IM 3031
	IM B14	IM 3601		IM V5	IM 1011
	IM B7	IM 1061		IM V6	IM 1031
	IM B6	IM 1051		IM V15	IM 2011
	IM B8	IM 1071		IM V35	IM 2031
	IM B34	IM 2101		IM V19	IM 3631
	IM B35	IM 2001		IM V37	IM 2131
				IM V18	IM 3611
				IM V17	IM 2111

Bearings

Ex ELK motors use the deep groove ball bearings specified in the table. Cylindrical roller bearings (NUP) are optional.

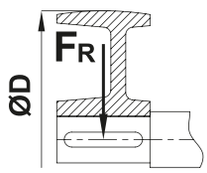
Frame Size	Number of Poles	End Shield DE	End Shield NDE
63	2-4-6-8	6201 ZZ C3	6201 ZZ C3
71	2-4-6-8	6202 ZZ C3	6202 ZZ C3
80	2-4-6-8	6204 ZZ C3	6204 ZZ C3
90	2-4-6-8	6205 ZZ C3	6205 ZZ C3
100	2-4-6-8	6206 ZZ C3	6206 ZZ C3
112	2-4-6-8	6206 ZZ C3	6206 ZZ C3
132	2-4-6-8	6208 ZZ C3	6208 ZZ C3
160	2-4-6-8	6309 ZZ C3	6209 ZZ C3
180	2-4-6-8	6310 ZZ C3	6210 ZZ C3
200	2-4-6-8	6312 ZZ C3	6212 ZZ C3
225	2-4-6-8	6313 ZZ C3	6213 ZZ C3
250	2-4-6-8	6315 ZZ C3	6215 ZZ C3
280	2 4-6-8	6315 C3 6317 C3	6315 C3 6317 C3
315	2 4-6-8	6316 C3 6319 C3	6316 C3 6319 C3



Radial Loads

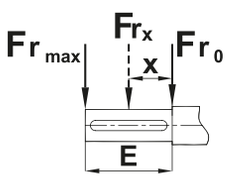
Radial Load on the Shaft (FR):
The radial load on the shaft can be calculated using the formula below.
The calculated radial load must not exceed the permissible values specified in the tables (FR < Frx). If it does, please consult us.

$$F_R = k \cdot \frac{P}{D \cdot n} \cdot 10^7 \, (N)$$



Correction of the Permissible Radial Load (Frx):
If the radial load acting on the shaft is between points x0 and xmax, the permissible value should be corrected using the following formula.

$$Fr_X = Fr_0 - \frac{x}{E}(Fr_0 - Fr_{\max})$$



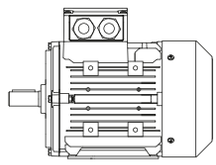
P: Motor Power (kW)
D: Shaft Diameter (mm)
n: Motor Speed (rpm)
k: Radial Load Factor
- Spur Gears, chain drives with low speed = 2.1
- Trigger Belts = 2.5
- V type belts = 5

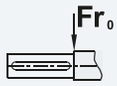
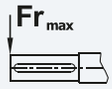
FR<Frx : The radial load on the shaft must be less than the permissible maximum radial load.

Fa: Axial load acting on the shaft.
Fr0: Permissible maximum radial load on the shaft.
Fr max: Permissible maximum radial load at the end of the shaft.
Permissible load calculations are based on bearing lifetimes according to ISO 281, with an Lh10 of 20,000 hours.

Radial Loads

HORIZONTAL MOUNTING - Permissible Radial Loads
Mounting Positions IM: B3, B5, B6, B7, B8, B14, B34, B35

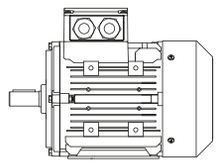


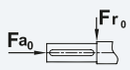
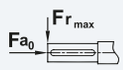
Frame Size	Fa = 0	
		
2 Poles 3000 rpm	Fr_0 [N]	Fr_{max} [N]
63	350	300
71	380	340
80	640	550
90	750	660
100	1050	900
112	1050	910
132	1520	1220
160	2800	2300
180	3250	2650
200	4340	3560
225	4950	4000
250	6050	4800
280	6300	5100
315	6400	5550
4 Poles 1500 d/d	Fr_0 [N]	Fr_{max} [N]
63	430	390
71	520	440
80	800	700
90	950	780
100	1300	1050
112	1300	1050
132	1950	1600
160	3540	2825
180	4100	3400
200	5500	4550
225	6200	4900
250	7500	6000
280	8200	7500
315	8500	8000
6 Poles 1000 d/d	Fr_0 [N]	Fr_{max} [N]
71	580	500
80	870	800
90	1090	900
100	1500	1250
112	1500	1250
132	2200	1800
160	4050	3190
180	4720	3830
200	6350	5150
225	7350	5650
250	8950	7200
280	9500	8500
315	9800	8700

Fa0 : Permissible maximum axial load
Fr : Radial force acting on the shaft
Fr0 : Permissible maximum radial load at the end of the shaft
Fr max : Permissible maximum radial load at the shaft end
Permissible load calculations are based on a bearing life of Lh10 20,000 hours according to ISO 281.

Axial Loads

HORIZONTAL MOUNTING - Permissible Axial Loads
Mounting Positions IM: B3, B5, B6, B7, B8, B14, B34, B35

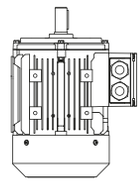


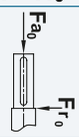
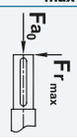
Frame Size	Push			Pull
	Fr =0	Fr =Fr_0	Fr =Fr_{max}	Fr =0
				
2 Poles 3000 rpm	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**
63	90	90	90	220
71	110	110	110	250
80	190	190	190	395
90	210	210	210	400
100	270	270	270	580
112	270	270	270	580
132	380	380	370	800
160	2280	1060	1020	1670
180	2660	1250	1250	1970
200	3150	1500	1390	2600
225	3850	1850	1760	2750
250	4150	2180	2250	3350
280	4500	2500	2500	3350
315	5200	2700	2700	3410
4 Poles 1500 rpm	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**
63	90	90	90	330
71	110	110	110	360
80	190	190	190	560
90	210	210	210	585
100	300	300	300	830
112	300	300	300	830
132	400	400	400	1200
160	2280	1400	1400	2350
180	3100	1570	1500	2800
200	4400	1770	1770	3810
225	4950	2150	2200	4300
250	6050	2400	2400	4500
280	7200	3000	3000	5500
315	7800	4000	3700	5800
6 Poles 1000 rpm	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**	**Fa_0 [N]**
71	110	110	110	430
80	190	190	190	700
90	210	210	210	740
100	290	290	290	1020
112	290	290	290	1020
132	380	380	380	1470
160	3050	1540	1520	2900
180	3540	1780	1700	3410
200	4800	2200	2250	4400
225	5050	2580	2800	5200
250	6050	3100	3150	6500
280	7000	3700	3400	7150
315	8500	4200	3800	6900

Fa0 : Permissible maximum axial load
Fr : Radial force acting on the shaft
Fr0 : Permissible maximum radial load at the end of the shaft
Fr max : Permissible maximum radial load at the shaft end
Permissible load calculations are based on a bearing life of Lh10 20,000 hours according to ISO 281.

Axial Loads

VERTICAL MOUNTING - Shaft Up - Permissible Axial Loads
Mounting Positions IM: V3, V6, V19, V35, V37

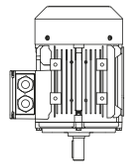


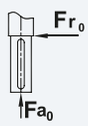
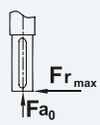
Frame Size	Push			Pull
	Fr = 0	Fr = Fr_0	Fr = Fr_{max}	Fr = 0
				
2 Poles 3000 rpm	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]
63	90	90	90	230
71	100	100	100	265
80	170	170	170	425
90	180	180	180	450
100	250	250	250	650
112	250	250	250	660
132	300	300	300	970
160	2080	1060	990	1950
180	2410	1190	1050	2350
200	2900	1265	1265	3000
225	3250	1310	1295	3575
250	3950	1460	1450	4350
280	4100	1500	1500	4700
315	4380	1420	1420	5250
4 Poles 1500 rpm	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]
63	90	90	90	345
71	95	95	95	380
80	160	160	160	600
90	170	170	170	650
100	210	210	210	930
112	210	210	210	950
132	240	240	240	1430
160	2500	1250	1220	2160
180	2900	1400	1370	2570
200	3900	1360	1530	3500
225	4450	1570	1680	4000
250	5400	1870	1910	4300
280	6500	2250	2250	7100
315	6000	2050	1600	8850
6 Poles 1000 rpm	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]
71	95	95	95	455
80	160	160	160	745
90	170	170	170	800
100	230	230	230	1120
112	210	210	210	1150
132	250	250	250	1690
160	2980	1490	1450	3300
180	3400	1670	1670	3800
200	4250	1850	1860	5100
225	4800	1980	2080	5800
250	5300	2200	2260	6200
280	6300	2200	2050	7500
315	6800	2290	2200	10750

Fa0 : Permissible maximum axial load
Fr : Radial force acting on the shaft
Fr0 : Permissible maximum radial load at the end of the shaft
Fr max : Permissible maximum radial load at the shaft end
Permissible load calculations are based on a bearing life of Lh10 20,000 hours according to ISO 281.

Axial Loads

VERTICAL MOUNTING - Shaft Down - Permissible Axial Loads
Mounting Positions IM: V1, V5, V15, V17, V18



Frame Size	Push			Pull
	Fr = 0	Fr = Fr_0	Fr = Fr_{max}	Fr = 0
				
2 Poles 3000 rpm	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]
63	110	110	110	210
71	130	130	130	235
80	220	220	220	385
90	250	250	250	375
100	330	330	330	535
112	340	340	340	520
132	490	550	550	680
160	2600	1550	1500	1500
180	3070	1850	1750	1700
200	3550	2300	2300	2315
225	4250	2680	2670	2630
250	5200	3200	3280	3100
280	6000	3900	3900	2750
315	7320	4370	4350	2825
4 Poles 1500 rpm	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]
63	120	110	120	300
71	130	130	130	340
80	220	220	220	540
90	260	260	260	545
100	380	370	370	760
112	410	400	400	740
132	580	570	570	1040
160	3500	1910	1840	2100
180	4000	2300	2170	2450
200	4250	2870	2850	2200
225	5000	3350	3380	3740
250	6200	4200	4000	4440
280	8900	4850	4850	4600
315	10900	6950	6500	3900
6 Poles 1000 rpm	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]	Fa_0 [N]
71	130	130	130	415
80	220	220	220	675
90	250	250	250	700
100	360	360	360	960
112	390	390	390	930
132	560	560	560	1310
160	3100	2130	2120	2650
180	3600	2600	2490	3030
200	5000	3260	3300	4000
225	5550	3710	3810	4650
250	6200	4510	4550	5500
280	7500	5300	5200	5750
315	12800	7400	7800	5500

Fa0 : Permissible maximum axial load
Fr : Radial force acting on the shaft
Fr0 : Permissible maximum radial load at the end of the shaft
Fr max : Permissible maximum radial load at the shaft end
Permissible load calculations are based on a bearing life of Lh10 20,000 hours according to ISO 281.

Ex-Proof Motorlar Ürün Tip Kodu Gösterimi

4	ZL	160	M	4	E	PD	BA	162

4

Motor Efficiency Classes:
2: IE2
3: IE3
4: IE4

ZL

Basic Motor Types:
TG : Cast iron housing ATEX Zone 1-21 motors
ZL : Aluminum housing ATEX Zone 2-22 motors
ZG : Cast iron housing ATEX Zone 2-22 motors

160

Frame Size: 63, 71, 80, 90, 100, 112, 132, 160, 180, 200, 225, 250, 280, 315 Height of the Shaft axis from feet base of motor (mm)

M

Housing Length
S : Short
M: Medium
L : Long

4

Number of Poles
2 : 2 Poles 3000 rpm
4 : 4 Poles 1500 rpm
6 : 6 Poles 1000 rpm

E

Core Length: A, B, C, D, E, F, G

PD

Construction Types / Flange Types

PD : B3 Foot Mounted
FA : B5 Flange
FC : B14 Flange
FS : Special Flange
PA : B35
PC : B34
PS : Foot mounted with special flange
Y0..Y9 : With Flange for gearbox connection
PX : Foot mounted without drive end shield
XX : Without foot and drive end shield
Z0-Z9 : Foot mounted Yılmaz type

BA

Electrical Specifications
AA..ZZ Voltage, Frequency and Electrical features

1st digit: Voltage and Frequency
A : 230/400V 50Hz
B : 400/690V 50Hz
C : 240/415V 50Hz
D : 415/720V 50Hz
E : 230/400V 60Hz
F : 400/690V 60Hz
G : 220V 60Hz
H : 290/500V 50Hz
I : 220/380V 60Hz
J : 380/660V 60Hz

2nd digit: Additional Electrical features
0: Standard motor, basic version
A: Motors with thermistor
C: Motors with thermal switch
K: Motors with thermistor and anti-condensation heater

162

Additional Motor Features
162 : IP66 (All EX motors have a minimum of IP66 protection.)

ZONE 2-22
EX MOTORS

IE2 Motors

Zone 2-22 Ex-Proof Motors
Electrical Characteristics

II 3G Ex ec IIC T4 Gc

II 3D Ex tc IIIC (T120°C ~ T140°C) Dc

400V 50Hz 3000 rpm

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)

IE2

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
230/400	2ZL063M2A	0,18	2800	0,50	0,61	0,77	67,5	66,0	62,0	4,5	2,9	3,0	0,00012	3,80	51
	2ZL063M2B	0,25	2800	0,67	0,85	0,78	69,0	68,0	63,5	4,5	2,9	3,0	0,00015	4,00	51
	2ZL071M2A	0,37	2790	0,90	1,26	0,80	74,2	74,5	72,5	5,0	2,5	2,8	0,00031	5,70	54
	2ZL071M2B	0,55	2790	1,27	1,88	0,82	75,8	77,0	76,0	5,0	2,8	2,9	0,00037	6,20	54

400V 50Hz 1500 rpm

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)

IE2

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
230/400	2ZL063M4B	0,12	1400	0,42	0,82	0,70	60,1	60,5	54,5	3,0	2,1	2,3	0,00018	4,00	42
	2ZL063M4C	0,18	1400	0,56	1,23	0,71	64,7	65,8	61,5	3,0	2,1	2,3	0,00022	4,40	42
	2ZL071M4B	0,25	1425	0,71	1,68	0,69	74,0	73,5	70,5	4,4	2,0	3,0	0,00067	6,30	46
	2ZL071M4C	0,37	1425	1,00	2,47	0,70	76,1	75,5	71,5	4,6	2,0	3,0	0,00082	7,00	46
	2ZL080M4B	0,55	1440	1,45	3,65	0,71	77,1	76,7	75,0	5,2	2,0	3,0	0,00175	9,70	50

400V 50Hz 1000 rpm

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)

IE2

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency % η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
230/400	2ZL71M6B	0,18	920	0,60	1,87	0,67	64,5	63,0	57,0	3,2	1,9	2,3	0,00076	6,10	42
	2ZL71M6C	0,25	920	0,78	2,59	0,69	66,5	66,0	61,0	3,3	1,9	2,3	0,00096	6,70	42
	2ZL80M6A	0,37	925	1,08	3,82	0,69	71,4	71,5	70,0	4,0	2,0	2,6	0,00176	9,10	45
	2ZL80M6B	0,55	932	1,50	5,64	0,72	73,5	74,0	71,0	4,2	2,1	2,6	0,00202	9,80	45

ZONE 2-22
EX MOTORS

IE3 Motors

Zone 2-22 Ex-Proof Motors
Electrical Characteristics

II 3G Ex ec IIC T4
Gc II 3D Ex tc IIIC (T120°C ~ T140°C) Dc

400V 50Hz 3000 rpm

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)

IE3

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
230/400	3ZL063M2A	0,18	2805	0,48	0,61	0,77	70,0	68,5	62,8	4,5	3,0	3,1	0,00012	4,00	51
	3ZL063M2B	0,25	2805	0,65	0,85	0,79	71,0	69,7	64,2	4,6	3,0	3,1	0,00015	4,20	51
	3ZL071M2B	0,37	2830	0,84	1,25	0,82	76,6	77,0	75,0	6,0	2,8	3,0	0,00037	6,30	53
	3ZL071M2C	0,55	2830	1,19	1,86	0,84	79,4	80,2	78,8	6,1	2,9	3,3	0,00046	7,00	53
	3ZL080M2B	0,75	2880	1,59	2,49	0,84	80,7	82,0	81,5	6,7	3,0	3,6	0,00103	9,60	54
	3ZL080M2C	1,10	2880	2,26	3,64	0,85	82,7	83,0	82,4	6,8	3,1	3,8	0,00124	10,9	54
	3ZL090S2B	1,50	2900	2,97	4,94	0,86	84,8	85,4	84,2	7,6	3,1	3,9	0,00178	15,2	59
	3ZL090L2C	2,20	2900	4,25	7,24	0,87	85,9	86,8	86,1	7,2	3,0	3,8	0,00221	17,5	59
	3ZL100L2C	3,00	2910	5,58	9,85	0,89	87,1	87,6	86,9	7,9	3,0	4,1	0,00450	23,8	62
400/690	3ZL112M2C	4,00	2915	7,28	13,1	0,90	88,1	88,8	88,2	7,5	2,6	3,9	0,00618	29,4	65
	3ZL132S2B	5,50	2945	9,90	17,8	0,90	89,2	89,0	88,6	8,9	2,9	3,9	0,01732	45,7	67
	3ZL132S2C	7,50	2945	13,2	24,3	0,91	90,1	90,5	89,7	8,4	2,6	4,0	0,02104	52,0	67
	3ZL160M2B	11,0	2950	19,7	35,6	0,88	91,2	91,0	90,5	8,5	2,6	3,9	0,03318	79,7	69
	3ZL160M2C	15,0	2950	26,5	48,6	0,89	91,9	92,1	91,6	8,9	3,1	4,2	0,03913	87,8	69
	3ZL160L2D	18,5	2945	31,7	60,0	0,91	92,4	92,7	92,3	8,9	3,1	4,2	0,04409	95,2	69
	3ZL180M2B	22,0	2957	38,1	71,1	0,90	92,7	92,9	92,0	8,6	3,1	3,9	0,06299	131	70
	3ZL200L2B	30,0	2965	52,0	96,6	0,89	93,6	93,8	93,6	8,6	3,2	3,5	0,16168	181	72
	3ZL200L2C	37,0	2965	63,3	119	0,90	93,7	94,1	93,8	8,6	3,2	3,4	0,17458	191	72
	3ZG225M2C	45,0	2970	76,8	145	0,90	94,0	94,4	94,2	8,6	3,3	3,1	0,25353	335	74
	3ZG250M2C	55,0	2970	93,3	177	0,90	94,4	94,8	94,5	8,6	3,3	3,4	0,38000	425	75

Zone 2-22 Ex-Proof Motors
Electrical Characteristics

II 3G Ex ec IIC T4 Gc
II 3D Ex tc IIIC (T120°C ~ T140°C) Dc

400V 50Hz 1500 rpm

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)

IE3

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
230/400	3ZL063M4B	0,12	1405	0,37	0,82	0,70	66,0	64,9	58,2	3,7	2,3	2,7	0,00018	4,10	42
	3ZL063M4C	0,18	1405	0,52	1,22	0,71	69,9	68,8	63,6	3,8	2,3	2,8	0,00022	4,50	42
	3ZL071M4C	0,25	1435	0,67	1,66	0,71	76,0	75,4	71,5	5,4	2,1	2,8	0,00082	7,10	45
	3ZL071M4D	0,37	1435	0,97	2,46	0,70	78,5	78,2	75,0	5,5	2,2	2,9	0,00093	7,80	45
	3ZL080M4C	0,55	1450	1,34	3,62	0,73	80,8	80,4	77,0	5,9	2,1	3,0	0,00200	10,5	50
	3ZL080M4D	0,75	1450	1,77	4,94	0,74	82,5	82,3	80,0	6,2	2,5	3,1	0,00227	11,6	50
	3ZL090S4C	1,10	1450	2,51	7,25	0,75	84,5	84,3	82,0	7,0	2,6	3,4	0,00355	16,3	51
	3ZL090L4D	1,50	1445	3,30	9,91	0,77	85,3	85,2	83,0	7,2	2,8	3,4	0,00411	18,0	51
	3ZL100L4C	2,20	1450	4,65	14,5	0,79	86,7	87,2	86,0	7,2	2,8	3,6	0,00775	24,4	53
	3ZL100L4D	3,00	1450	6,26	19,8	0,79	87,7	88,0	87,0	7,2	2,8	3,6	0,00888	27,0	53
400/690	3ZL112M4D	4,00	1460	8,05	26,2	0,81	88,6	88,4	87,5	7,4	2,8	3,8	0,01437	32,6	58
	3ZL132S4C	5,50	1465	10,9	36,0	0,81	89,6	90,2	90,0	7,0	3,0	3,3	0,03059	53,4	61
	3ZL132M4D	7,50	1465	14,8	48,9	0,81	90,4	90,4	89,4	7,8	3,2	3,4	0,03418	56,6	61
	3ZL160M4C	11,0	1465	21,0	71,7	0,83	91,5	92,1	91,7	7,6	2,8	3,3	0,07011	89,2	63
	3ZL160L4E	15,0	1465	28,7	97,8	0,82	92,1	92,4	91,9	7,8	2,8	3,5	0,08579	97,5	63
	3ZL180M4C	18,5	1475	35,0	120	0,82	92,6	93,2	92,9	7,7	3,0	3,3	0,12901	128	64
	3ZL180L4D	22,0	1470	41,4	143	0,82	93,0	93,7	93,7	8,0	3,0	3,4	0,14667	141	64
	3ZL200L4D	30,0	1475	54,5	194	0,85	93,6	94,1	94,0	8,0	3,0	3,4	0,28413	193	65
	3ZG225S4C	37,0	1478	65,7	239	0,87	93,9	94,5	94,5	8,3	3,2	3,3	0,38229	320	66
	3ZG225M4D	45,0	1477	80,0	291	0,86	94,2	94,7	94,7	8,6	3,3	3,2	0,44100	350	67
	3ZG250M4D	55,0	1482	95,3	354	0,88	94,6	95,1	95,2	8,7	3,3	3,2	0,73000	460	68

Zone 2-22 Ex-Proof Motors
Electrical Characteristics

II 3G Ex ec IIC T4 Gc

II 3D Ex tc IIIC (T120°C ~ T140°C) Dc

400V 50Hz 1000 rpm

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)

IE3

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
230/400	3ZL071M6C	0,18	930	0,55	1,85	0,69	68,0	67,4	62,6	3,6	2,0	2,4	0,00096	6,80	41
	3ZL071M6D	0,25	930	0,77	2,57	0,67	70,0	69,7	66,0	3,6	2,2	2,5	0,00116	7,50	41
	3ZL080M6B	0,37	930	1,03	3,80	0,70	74,0	73,8	70,0	4,4	2,1	2,6	0,00202	9,90	43
	3ZL080M6C	0,55	935	1,47	5,62	0,70	77,2	77,3	74,4	4,3	2,2	2,7	0,00228	11,0	43
	3ZL090S6B	0,75	945	1,96	7,58	0,70	78,9	79,2	77,6	4,7	2,2	2,7	0,00354	16,0	46
	3ZL090L6C	1,10	940	2,75	11,2	0,71	81,0	80,8	79,4	5,0	2,2	2,7	0,00428	16,8	46
	3ZL100L6B	1,50	955	3,50	15,0	0,75	82,5	82,7	81,4	5,3	2,1	2,8	0,00821	22,5	50
	3ZL112M6B	2,20	960	4,95	21,9	0,76	84,3	84,5	83,5	5,5	2,2	3,0	0,01319	29,6	56
400/690	3ZL132S6B	3,00	970	6,55	29,4	0,77	85,6	85,5	84,5	6,2	2,1	3,0	0,03051	46,7	58
	3ZL132M6C	4,00	970	8,52	39,4	0,78	86,8	87,0	85,5	6,2	2,2	2,9	0,03493	50,9	58
	3ZL132M6D	5,50	965	11,6	54,4	0,78	88,0	88,9	88,5	6,2	2,2	2,8	0,03934	57,3	58
	3ZL160M6D	7,50	972	15,6	73,7	0,78	89,1	89,4	88,4	6,3	2,6	3,0	0,07870	96,0	61
	3ZL160L6E	11,0	972	23,1	108	0,76	90,3	90,9	90,5	6,6	2,9	3,1	0,08580	104	62
	3ZL180L6E	15,0	975	30,8	147	0,77	91,2	91,6	91,0	6,7	2,9	3,1	0,15264	141	63
	3ZL200L6C	18,5	977	36,4	181	0,80	91,7	91,8	91,8	6,1	2,6	2,6	0,36100	164	64
	3ZL200L6D	22,0	978	42,5	215	0,81	92,2	92,9	93,0	6,2	2,6	2,6	0,39355	180	64
	3ZG225S6C	30,0	985	57,6	291	0,81	92,9	92,9	92,6	6,6	2,9	2,7	0,60000	340	65
	3ZG250M6C	37,0	988	68,8	358	0,83	93,4	93,6	93,5	7,3	2,9	2,8	0,82000	435	65
	3ZG280S6B	45,0	989	83,5	435	0,83	93,7	93,9	93,2	6,8	2,9	2,8	1,45000	590	65
	3ZG280M6C	55,0	989	102	531	0,83	94,1	94,4	93,5	6,9	2,9	2,8	1,65000	620	65

ZONE 2-22
EX MOTORS

IE4 Motors

Zone 2-22 Ex-Proof Motors
Electrical Characteristics

II 3G Ex ec IIC T4 Gc

II 3D Ex tc IIIC (T120°C ~ T140°C) Dc

400V 50Hz 3000 rpm

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)

IE4

Voltage (V)	Type	Rated Values								Starting Values		Brake Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	d/d	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
230/400	4ZL071M2B	0,37	2825	0,83	1,25	0,82	78,1	78,3	76,5	5,7	2,8	3,2	0,00037	6,50	58
	4ZL071M2C	0,55	2825	1,17	1,86	0,83	81,5	81,9	79,5	6,2	2,9	3,5	0,00046	7,50	58
	4ZL080M2C	0,75	2875	1,56	2,49	0,83	83,5	84,0	81,0	6,8	2,9	3,5	0,00124	11,0	59
	4ZL080M2D	1,10	2880	2,19	3,65	0,85	85,2	85,5	84,9	7,5	2,9	3,7	0,00135	12,0	59
	4ZL090S2C	1,50	2900	2,95	4,94	0,85	86,5	86,9	85,7	7,8	2,9	3,7	0,00221	17,2	64
	4ZL090L2D	2,20	2900	4,20	7,24	0,86	88,0	88,5	87,6	8,2	3,0	3,8	0,00234	20,0	64
	4ZL100L2D	3,00	2910	5,50	9,85	0,88	89,1	89,5	88,5	8,5	3,0	4,0	0,00503	25,9	67
400/690	4ZL112M2D	4,00	2940	7,30	13,0	0,88	90,0	90,3	89,7	8,7	3,0	4,2	0,00734	32,2	70
	4ZL132S2C	5,50	2945	9,60	17,8	0,91	90,9	90,9	90,0	8,9	3,2	4,2	0,02104	52,5	72
	4ZL132S2D	7,50	2945	13,0	24,5	0,91	91,7	92,2	91,8	8,5	3,2	4,2	0,02290	55,6	72
	4ZL160M2C	11,0	2950	18,9	35,6	0,91	92,6	92,7	91,2	8,5	3,3	4,3	0,03913	89,0	74
	4ZL160M2D	15,0	2950	25,6	48,6	0,91	93,3	93,6	92,8	8,5	3,3	4,3	0,04409	96,8	74
	4ZL160L2E	18,5	2955	31,4	59,8	0,91	93,7	93,8	92,9	8,7	3,2	4,3	0,05000	114	74
	4ZL180M2C	22,0	2960	37,2	71,1	0,91	94,0	94,4	93,5	8,9	3,0	4,0	0,07000	158	74
	4ZL200L2C	30,0	2970	51,0	96,5	0,90	94,5	94,7	94,0	8,3	3,2	3,7	0,17500	215	74
	4ZL200L2D	37,0	2970	63,3	120	0,89	94,8	95,0	94,2	8,3	3,2	4,0	0,20000	235	74
	4ZG225M2D	45,0	2975	76,0	145	0,90	95,0	95,2	94,9	9,0	3,4	4,2	0,29000	355	74
	4ZG250M2D	55,0	2975	92,6	177	0,90	95,3	95,5	94,9	8,2	3,4	3,7	0,52000	445	74
	4ZG280S2C	75,0	2982	126	240	0,90	95,6	95,6	95,2	7,7	2,7	3,2	0,98000	620	76
	4ZG280M2D	90,0	2985	151	288	0,90	95,8	95,9	95,0	7,7	2,8	3,5	1,10000	640	77
	4ZG315S2C	110	2985	184	352	0,90	96,0	96,0	95,7	7,8	3,1	4,0	1,60000	1110	77
	4ZG315M2D	132	2986	220	422	0,90	96,2	96,3	96,0	8,0	3,1	4,0	2,00000	1070	77
	4ZG315L2E	160	2986	267	512	0,90	96,3	96,5	96,0	8,0	3,2	4,0	2,20000	1230	78
	4ZG315L2F	200	2987	332	639	0,90	96,5	96,7	96,2	8,1	3,2	4,0	2,70000	1340	78

Zone 2-22 Ex-Proof Motors
Electrical Characteristics

II 3G Ex ec IIC T4 Gc

II 3D Ex tc IIIC (T120°C ~ T140°C) Dc

400V 50Hz 1500 rpm

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)

IE4

Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
400/690	4ZL132S4D	5,50	1470	11,1	35,7	0,78	91,9	91,8	90,6	7,7	3,8	3,7	0,03418	56,7	61
	4ZL132M4F*	7,50	1470	14,6	48,7	0,80	92,6	92,7	91,5	7,7	3,8	4,0	0,04316	72,8	62
	4ZL160M4E	11,0	1470	21,0	71,5	0,81	93,3	93,5	93,3	7,7	3,0	3,6	0,08600	99,5	64
	4ZL160L4F	15,0	1475	28,9	97,5	0,80	93,9	94,1	93,8	8,7	3,7	4,3	0,12000	112	64
	4ZL180M4D	18,5	1475	34,6	120	0,82	94,2	94,4	94,0	8,0	3,1	3,5	0,14700	142	64
	4ZL180L4E	22,0	1475	41,0	142	0,82	94,5	94,7	94,2	8,2	3,2	3,8	0,17000	168	64
	4ZG200L4E	30,0	1480	53,0	194	0,86	94,9	95,3	95,2	8,3	3,3	3,8	0,35000	235	64
	4ZG225S4D	37,0	1480	65,0	239	0,86	95,2	95,7	95,0	8,1	3,3	3,3	0,44100	350	70
	4ZG225M4E	45,0	1480	79,2	290	0,86	95,4	95,6	95,6	8,2	3,5	3,3	0,52000	370	70
	4ZG250M4E	55,0	1485	94,3	354	0,88	95,7	96,0	96,0	8,5	3,3	3,4	1,05000	490	70
	4ZG280S4D	75,0	1487	127	482	0,89	96,0	96,3	96,2	8,7	3,0	3,2	1,50000	670	70
	4ZG280M4E	90,0	1488	152	578	0,89	96,1	96,3	96,3	8,9	3,1	3,2	1,95000	720	71
	4ZG315S4D	110	1491	187	705	0,88	96,3	96,5	96,0	8,9	2,8	3,3	2,80000	1200	73
	4ZG315M4E	132	1492	225	845	0,88	96,4	96,7	96,2	8,9	2,9	3,3	3,30000	1270	73
	4ZG315L4F	160	1492	272	1024	0,88	96,6	96,9	96,5	8,9	3,1	3,4	4,40000	1370	76
	4ZG315L4G	200	1492	339	1280	0,88	96,7	97,0	96,6	8,8	3,3	3,5	5,20000	1520	76

Motors marked with * do not have a symmetrical housing structure.

Zone 2-22 Ex-Proof Motors
Electrical Characteristics

II 3G Ex ec IIC T4 Gc

II 3D Ex tc IIIC (T120°C ~ T140°C) Dc

400V 50Hz 1000 rpm

Duty Cycle : S1 (Continuous Operation)
Insulation Class : F (155°C)

IE4

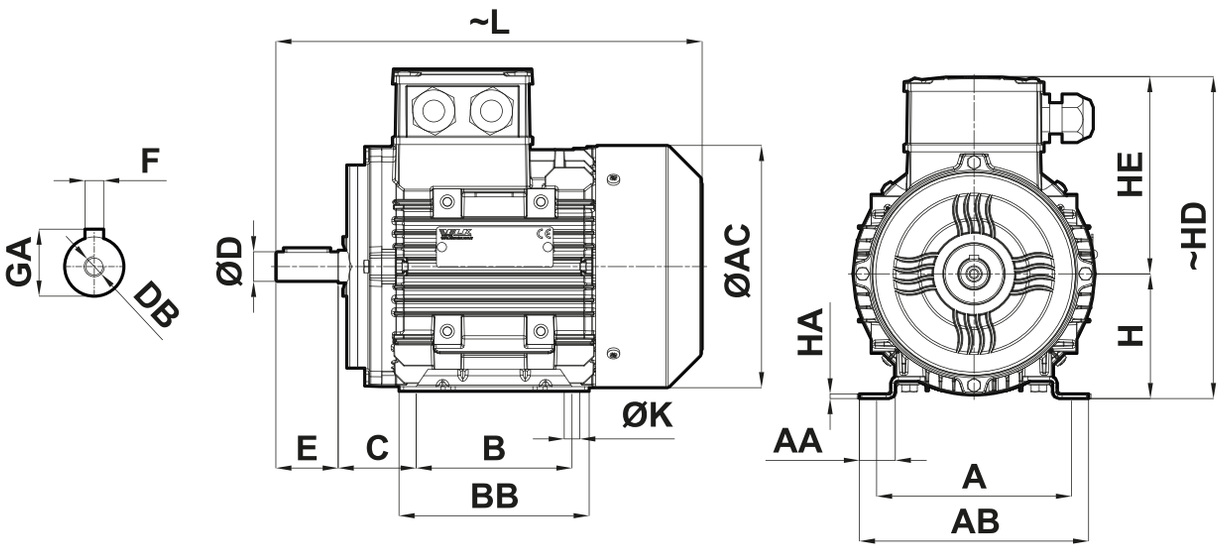
Voltage (V)	Type	Rated Values								Starting Values		Break Down Torque	Moment of Inertia	B3 Motor Weight	Sound Pressure Level
		Power	Speed	Current	Torque	Power Factor	Efficiency %η			Current	Torque				
		kW	rpm	A	Nm	Cos ϕ	4/4	3/4	1/2	I_A/I_N	M_A/M_N	M_K/M_N	kgm²	kg	dB(A)
400/690	4ZG315S6C	75,0	994	133	721	0,85	95,4	95,5	95,2	8,80	2,80	3,50	3,50000	1215	67
	4ZG315M6D	90,0	994	160	865	0,85	95,6	95,7	95,4	8,80	2,80	3,70	3,80000	1250	67
	4ZG315L6E	110	995	193	1056	0,86	95,8	96,1	95,7	8,60	2,80	3,70	4,50000	1280	68
	4ZG315L6F	132	995	231	1267	0,86	96,0	96,2	95,8	8,50	2,80	3,70	5,20000	1350	68
	4ZG315L6G	160	995	280	1536	0,86	96,2	96,4	96,3	7,70	2,90	3,80	5,55000	1446	70

ZONE 2-22
EX MOTORS

Dimensions

Zone 2-22 Ex-Proof Motors

B3 Construction Type

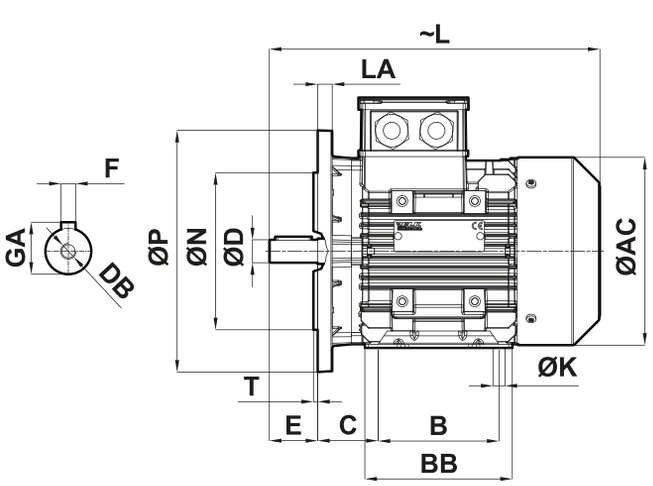


Frame Size	Efficiency Class	Number of Poles	D[1]	E	L	AC	H[2]	HE	HD	F	GA	DB	C	ØK	B	BB	HA	AA	A	AB
063M	IE2/IE3	2-4-6-8	11	23	213	119	63	101	164	4	12,5	M4	40	7	80	104	3	18	100	115
071M	IE2/IE3/IE4	2-4-6-8	14	30	242	137	71	118	189	5	16	M5	45	7	90	110	3	19	112	128
080M	IE2/IE3/IE4	2-4-6-8	19	40	274	155	80	127	207	6	21,5	M6	50	10	100	122	3	25	125	148
090S	IE3/IE4	2-4-6-8	24	50	325	176	90	136	226	8	27	M8	56	10	100	151	4	27	140	167
090L	IE3/IE4	2-4-6-8	24	50	325	176	90	136	226	8	27	M8	56	10	125	151	4	27	140	167
100L	IE3/IE4	2-4-6-8	28	60	369	193	100	149	249	8	31	M10	63	12	140	170	4	31	160	191
112M	IE3/IE4	2-4-6-8	28	60	392	215	112	161	273	8	31	M10	70	12	140	177	4	36	190	217
132S	IE3/IE4	2-4-6-8	38	80	495	257	132	182	314	10	41	M12	89	12	140	212	5	34	216	246
132M	IE3/IE4	2-4-6-8	38	80	495	257	132	182	314	10	41	M12	89	12	178	212	5	34	216	246
132M[3]	IE4	4	38	80	543	257	132	182	314	10	41	M12	89	12	178	212	5	34	216	246
160M	IE3/IE4	2-4-6-8	42	110	605	316	160	226	386	12	45	M16	108	14,5	210	328	15	65	254	293
160L	IE3/IE4	2-4-6-8	42	110	605	316	160	226	386	12	45	M16	108	14,5	254	328	15	65	254	293
180M	IE3/IE4	2-4-6-8	48	110	696	348	180	242	422	14	51,5	M16	121	14,5	241	319	15	63	279	316
180L	IE3/IE4	2-4-6-8	48	110	696	348	180	242	422	14	51,5	M16	121	14,5	279	319	15	63	279	316
200M	IE3/IE4	2-4-6-8	55	110	737	396	200	294	494	16	59	M20	133	18,5	267	350	20	76	318	372
200L	IE3/IE4	2-4-6-8	55	110	737	396	200	294	494	16	59	M20	133	18,5	305	350	20	76	318	372
225S	IE3/IE4	2	55	110	800	438	225	311,5	536,5	16	59	M20	149	18,5	286	360	20	90	356	417
		4-6-8	60	140	830					18	64									
225M	IE3/IE4	2	55	110	800	438	225	311,5	536,5	16	59	M20	149	18,5	311	360	20	90	356	417
		4-6-8	60	140	830					18	64									
250S	IE3/IE4	2	60	140	896	481	250	337	587	18	64	M20	168	24	311	433	32	105	406	475
		4-6-8	65								69									
250M	IE3/IE4	2	60	140	896	481	250	337	587	18	64	M20	168	24	349	433	32	105	406	475
		4-6-8	65								69									
280S	IE3/IE4	2	65	140	1012	547	280	402	682	18	69	M20	190	24	368	500	35	105	457	531
		4-6-8	75							20	79,5									
280M	IE3/IE4	2	65	140	1012	547	280	402	682	18	69	M20	190	24	419	500	35	105	457	531
		4-6-8	75							20	79,5									
315S	IE3/IE4	2	65	140	1242	622	315	499	814	18	69	M20	216	28	406	636	33	157	508	626
		4-6-8	80	170	1272					22	85									
315M	IE3/IE4	2	65	140	1242	622	315	499	814	18	69	M20	216	28	457	636	33	157	508	626
		4-6-8	80	170	1272					22	85									
315L	IE3/IE4	2	65	140	1389	622	315	499	814	18	69	M20	216	28	508	800	35	145	508	623
		4-6-8	90	170	1419					25	95									

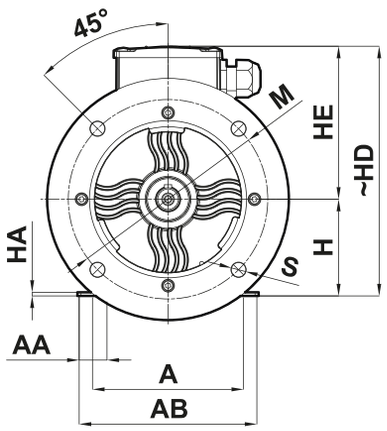
[1] Tolerance “j6” up063-250 to 28mm, “k6” from 28mm to 48mm, “m6” over 48mm TS EN 50347
[2] Tolerance “-0.5mm” / 280-315 “-1mm” TS EN 50347
[3] Extended motor housing

Zone 2-22 Ex-Proof Motors

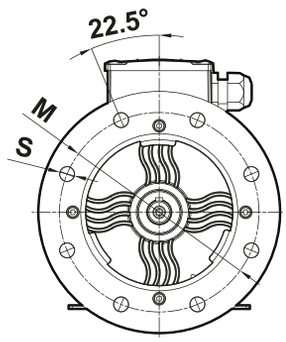
B5 - B35 Construction Type



63 - 200



225 - 315

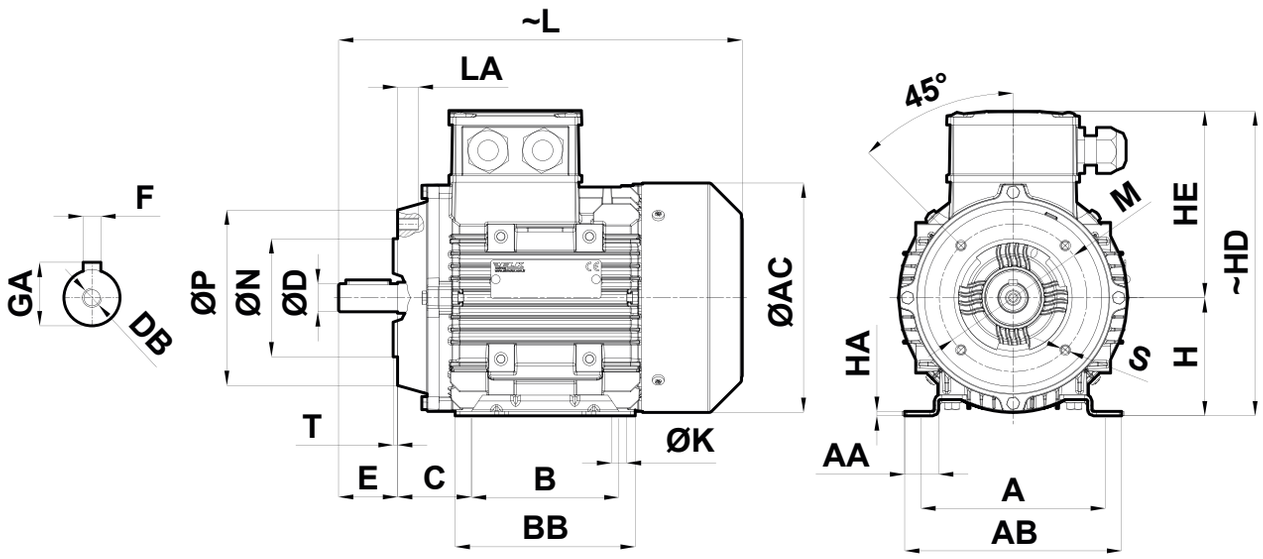


Frame Size	Efficiency Class	Number of Poles	D[1]	E	N[2]	P	T	LA	L	AC	S	M	H[3]	HE	HD	F	GA	DB	C	ØK	B	BB	HA	AA	A	AB
063M	IE2/IE3	2-4-6-8	11	23	95	140	3	8	213	119	10	115	63	97	160	4	12,5	M4	40	7	80	104	3	18	100	115
071M	IE2/IE3/IE4	2-4-6-8	14	30	110	160	3,5	8	242	137	10	130	71	112	183	5	16	M5	45	7	90	110	3	19	112	128
080M	IE2/IE3/IE4	2-4-6-8	19	40	130	200	3,5	12	274	155	12	165	80	127	207	6	21,5	M6	50	10	100	122	3	25	125	148
090S	IE3/IE4	2-4-6-8	24	50	130	200	3,5	12	325	176	12	165	90	136	226	8	27	M8	56	10	100	151	4	27	140	167
090L	IE3/IE4	2-4-6-8	24	50	130	200	3,5	12	325	176	12	165	90	136	226	8	27	M8	56	10	125	151	4	27	140	167
100L	IE3/IE4	2-4-6-8	28	60	180	250	4	15	369	193	14,5	215	100	148	248	8	31	M10	63	12	140	170	4	31	160	191
112M	IE3/IE4	2-4-6-8	28	60	180	250	4	15	392	215	14,5	215	112	161	273	8	31	M10	70	12	140	177	4	36	190	217
132S	IE3/IE4	2-4-6-8	38	80	230	300	4	20	495	257	14,5	265	132	180	312	10	41	M12	89	12	140	212	5	34	216	246
132M	IE3/IE4	2-4-6-8	38	80	230	300	4	20	495	257	14,5	265	132	180	312	10	41	M12	89	12	178	212	5	34	216	246
132M[4]	IE4	4	38	80	230	300	4	20	543	257	14,5	265	132	180	312	10	41	M12	89	12	178	212	5	34	216	246
160M	IE3/IE4	2-4-6-8	42	110	250	350	5	20	605	316	18,5	300	160	220	380	12	45	M16	108	14,5	210	328	15	65	254	293
160L	IE3/IE4	2-4-6-8	42	110	250	350	5	20	605	316	18,5	300	160	220	380	12	45	M16	108	14,5	254	328	15	65	254	293
180M	IE3/IE4	2-4-6-8	48	110	250	350	5	14	696	348	18,5	300	180	239	419	14	51,5	M16	121	14,5	241	319	15	63	279	316
180L	IE3/IE4	2-4-6-8	48	110	250	350	5	14	696	348	18,5	300	180	239	419	14	51,5	M16	121	14,5	279	319	15	63	279	316
200M	IE3/IE4	2-4-6-8	55	110	300	400	5	14	737	396	18,5	350	200	294	494	16	59	M20	133	18,5	267	350	20	76	318	372
200L	IE3/IE4	2-4-6-8	55	110	300	400	5	14	737	396	18,5	350	200	294	494	16	59	M20	133	18,5	305	350	20	76	318	372
225S	IE3/IE4	2	55	110	350	450	5	20	800	438	18,5	400	225	312	537	16	59	M20	149	18,5	286	360	20	90	356	417
		4-6-8	60	140					830							18	64									
225M	IE3/IE4	2	55	110	350	450	5	20	800	438	18,5	400	225	312	537	16	59	M20	149	18,5	311	360	20	90	356	417
		4-6-8	60	140					830							18	64									
250S	IE3/IE4	2	60	140	450	550	5	20	896	481	18,5	500	250	337	587	18	64	M20	168	24	311	433	32	105	406	475
		4-6-8	65														69									
250M	IE3/IE4	2	60	140	450	550	5	20	896	481	18,5	500	250	337	587	18	64	M20	168	24	349	433	32	105	406	475
		4-6-8	65														69									
280S	IE3/IE4	2	65	140	450	550	5	20	1012	547	18,5	500	280	402	682	18	69	M20	190	24	368	500	35	105	457	531
		4-6-8	75													20	79,5									
280M	IE3/IE4	2	65	140	450	550	5	20	1012	547	18,5	500	280	402	682	18	69	M20	190	24	419	500	35	105	457	531
		4-6-8	75													20	79,5									
315S	IE3/IE4	2	65	140	550	660	6	25	1242	622	24	600	315	499	814	18	69	M20	216	28	406	636	33	157	508	626
		4-6-8	80	170					1272							22	85									
315M	IE3/IE4	2	65	140	550	660	6	22	1242	622	24	600	315	499	814	18	69	M20	216	28	457	636	33	157	508	626
		4-6-8	85	170					1272							22	85									
315L	IE3/IE4	2	60	140	550	660	6	22	1389	622	24	600	315	499	814	18	69	M20	216	28	508	800	35	145	508	623
		4-6-8	90	170					1419							25	95									

[1] Tolerance “j6” up to 28mm, “k6” from 28mm to 48mm, “m6” over 48mm TS EN 50347
[2] Tolerance “j6” up to 250mm, “h6” over 250mm TS EN 50347
[3] Tolerance 063-250 “-0.5mm” / 280-315 “-1mm” TS EN 50347
[4] Extended motor housing

Zone 2-22 Ex-Proof Motors

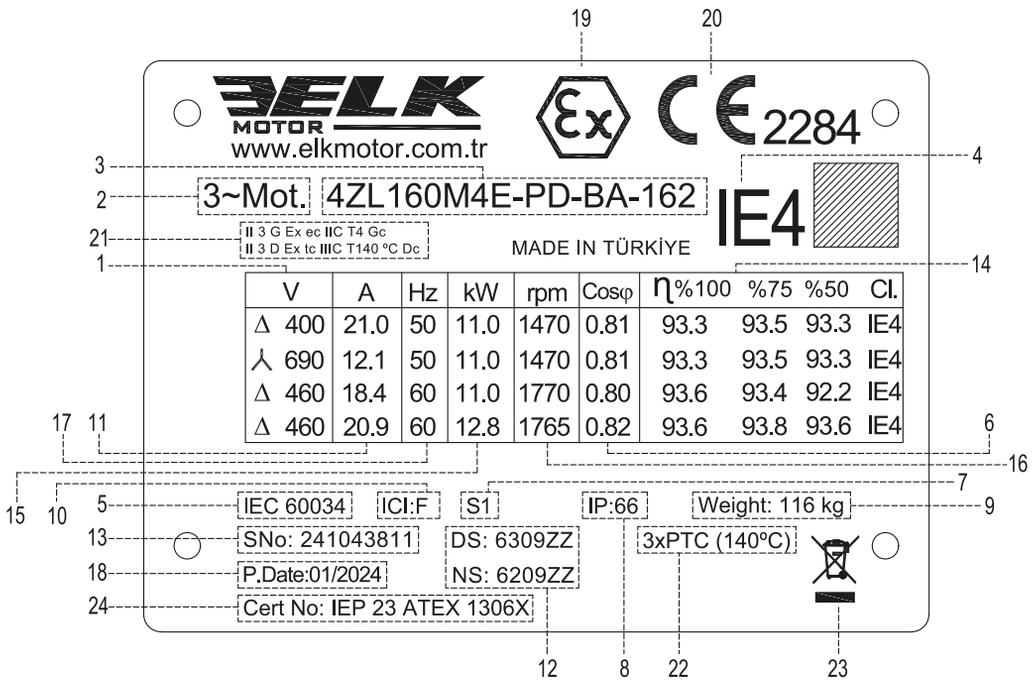
B14 - B34 Construction Type



Frame Size	Efficiency Class	Number of Poles	D[1]	N[2]	P	E	T	LA	L	AC	S	M	H[3]	HE	HD	F	GA	DB	C	ØK	B	BB	HA	AA	A	AB
063M	IE2/IE3	2-4-6-8	11	60	90	23	2,5	10	213	119	M5	75	63	101	164	4	12,5	M4	40	7	80	104	3	18	100	115
071M	IE2/IE3/IE4	2-4-6-8	14	70	105	30	2,5	12	242	137	M6	85	71	118	189	5	16	M5	45	7	90	110	3	19	112	128
080M	IE2/IE3/IE4	2-4-6-8	19	80	119	40	3	12	274	155	M6	100	80	127	207	6	21,5	M6	50	10	100	122	3	25	125	148
090S	IE3/IE4	2-4-6-8	24	95	137	50	3	15	325	176	M8	115	90	136	226	8	27	M8	56	10	100	151	4	27	140	167
090L	IE3/IE4	2-4-6-8	24	95	137	50	3	15	325	176	M8	115	90	136	226	8	27	M8	56	10	125	151	4	27	140	167
100L	IE3/IE4	2-4-6-8	28	110	160	60	3,5	17	369	193	M8	130	100	149	249	8	31	M10	63	12	140	170	4	31	160	191
112M	IE3/IE4	2-4-6-8	28	110	160	60	3,5	17	392	215	M8	130	112	161	273	8	31	M10	70	12	140	177	4	36	190	217
132S	IE3/IE4	2-4-6-8	38	130	200	80	3,5	20	495	257	M10	165	132	182	314	10	41	M12	89	12	140	212	5	34	216	246
132M	IE3/IE4	2-4-6-8	38	130	200	80	3,5	20	495	257	M10	165	132	182	314	10	41	M12	89	12	178	212	5	34	216	246
132M[4]	IE4	4	38	130	200	80	3,5	20	543	257	M10	165	132	182	314	10	41	M12	89	12	178	212	5	34	216	246
160M	IE3/IE4	2-4-6-8	42	180	250	110	4	23	605	316	M12	215	160	226	386	12	45	M16	108	14,5	210	323	15	65	254	295
160L	IE3/IE4	2-4-6-8	42	180	250	110	4	23	605	316	M12	215	160	226	386	12	45	M16	108	14,5	254	323	15	65	254	295

[1] Tolerance “j6” up to 28mm, “k6” over 28mm TS EN 50347
[2] Tolerance “j6” TS EN 50347
[3] Tolerance “-0.5mm” TS EN 50347
[4] Extended motor housing

Zone 2-22 Ex-Proof Motor Nameplate Example

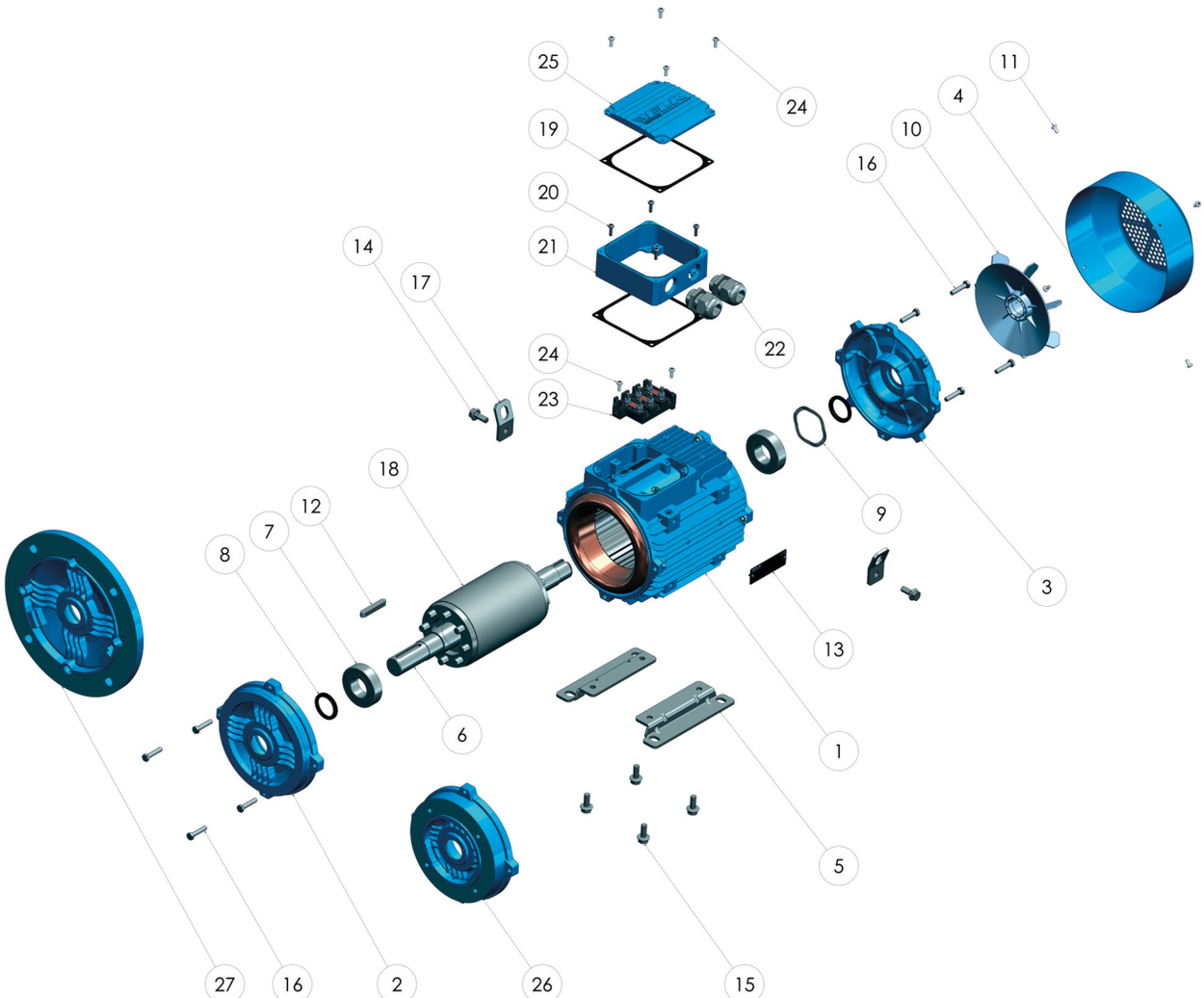


1.	Rated Voltage	13.	Serial Number
2.	Motor Type: 3 Phase Asynchronous	14.	Efficiency
3.	Motor Code	15.	Output Power
4.	Efficiency Class	16.	Speed
5.	Manufacture Standard	17.	Frequency
6.	Power Factor	18.	Production Date
7.	Duty Cycle	19.	Ex-Proof Logo
8.	Protection Class	20.	CE Mark
9.	Motor Weight	21.	ATEX Classification Codes
10.	Insulation Class	22.	3xPTC Thermistor
11.	Rated Current	23.	WEEE Symbol
12.	Bearing Type	24.	Certificate Number

The nameplate shows the identification, and the most important technical data. The nameplate also defines the limits of proper usage, and manufacturing year of the motors. The first two digits in the serial number, shows the manufacturing year. For example, 24XXXXXXX shows that the product is manufactured in 2024.

Zone 2-22 Exproof Motors Spare Parts

All the standard three phase motors are produced by ELK MOTOR consist of the following main parts;



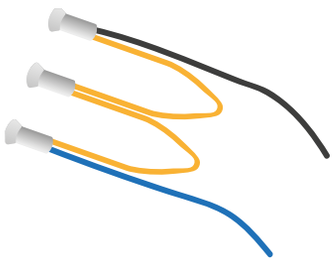
1.	Housing	15.	Screw
2.	End Shield (DE)	16.	Bolt
3.	End Shield (NDE)	17.	Lifting Lug
4.	Fan Cover	18.	Squirrel Cage Rotor
5.	Mounting Foot	19.	Terminal Box Gasket
6.	Shaft	20.	Screw
7.	Bearing	21.	Terminal Box
8.	Shaft Seal	22.	ATEX Cable Gland (Metal)
9.	Spring Washer	23.	Terminal
10.	Fan	24.	Screw
11.	Screw	25.	Terminal Box Cover
12.	Key	26.	B14 Flange
13.	Nameplate	27.	B5 Flange
14.	Screw		

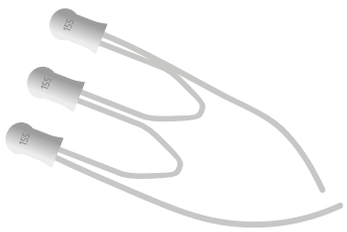
While ordering spare parts, the motor serial number, full type designation and product code, as stated on the nameplate, must be specified. For field service, spare parts and additional information, please contact us.

In an Ex-Proof motor, spare parts that protect the internal volume must not be replaced by individuals or organizations without a module E certificate. Replacement of these critical parts should be carried out by authorized companies or manufacturers with the relevant certification.

ACCESSORIES

PTC Thermistor and Thermal Switch





Thermistor

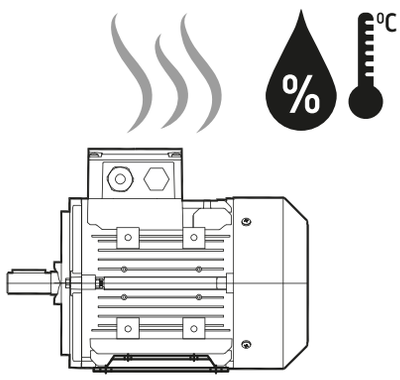
Thermistor (PTC) is a temperature-dependent resistor.
Its resistance increases after defined threshold temperature value to signal outside of an over-heating and/or over-loading condition. The thermistor must be evaluated with a proper electronics and/or a VSD with thermistor inputs.

Thermostat

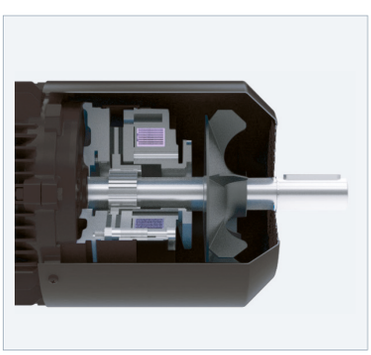
A thermostat (PTO) functions in a way that is fundamentally similar to PTC thermistors; however, unlike PTC thermistors, thermostats provide voltage-free contacts that can be directly used to switch off a circuit, provided the current capacity of the thermostat is not exceeded.

Anti-Condensation Space Heater and Drainage

In environments with high humidity, condensation may occur inside the motor.
To prevent this, space heaters are wrapped around the motor windings to maintain a consistent temperature.
Additionally, drainage holes are provided in the motor body to prevent water accumulation and mitigate the risk of condensation.



NDE Shaft and Canopy



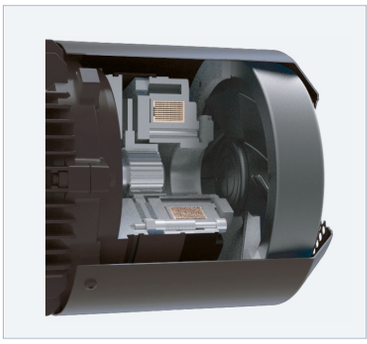
NDE Shaft Extension

Non drive end shaft is used when it is desired to transfer the motor power to a second load or to manually rotate it when the motor is notenergized

Canopy

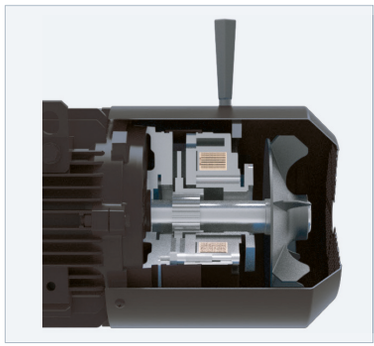
It is used for operation in the outside environment where the motor fan is pointing upwards. This prevents the rainwater from entering the motor housing.

Brake, Hand Release, Separately Driven Fan Encoder and Backstop



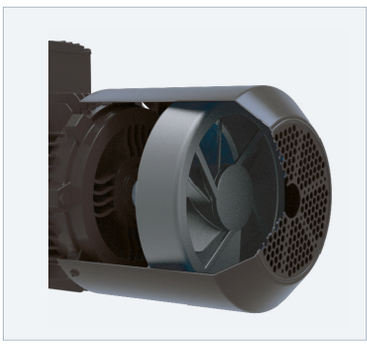
Electromagnetic Brake

For each motor size, we offer a NDE mounted electromagnetic brake option. Brakes with supply voltages of 24V, 230V, and 400V DC, ranging from 5Nm to 1600Nm, are available and can be selected according to the specific needs.



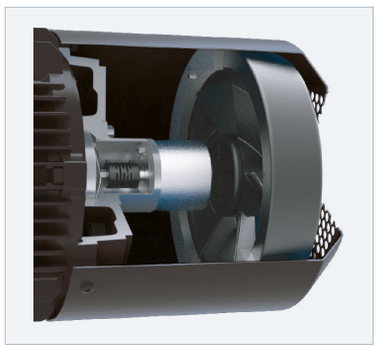
Brake with Hand Release

In case of a power failure or when the brake needs to be released without applying electricity, it is used to release the system by overcoming the braking force through the lever on the brake.



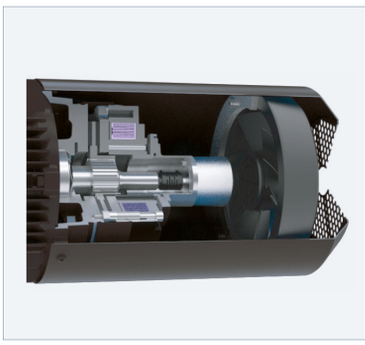
Separately Driven Fan

In applications with variable-speed drives where the motor's speed is reduced, the efficiency of the motor fan's cooling decreases. The required cooling airflow is provided by a force cooling fan connected to the motor casing.



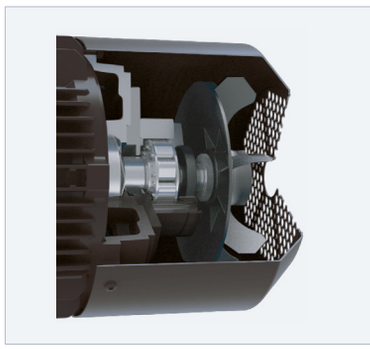
Separetely Driven Fan with Encoder

In applications where closed loop speed/torque control is required, a NDE mounted encoder can be used. Since the encoder is mounted on the motor's NDE end-shield, the motor fan cannot be used. Therefore, force cooling fan is also provided for the motor.



Separately Driven Fan with Brake and Encoder

In applications requiring both braking and synchronous operation, the brake, encoder, and forced fan options are all provided as rear-mounted components on the motor.



Backstop

Backstop is used in situations where movement is desired in one direction and must be prevented in the opposite direction when the motor stops. The backstop option integrated into the rear motor housing is commonly used.

Notes

ELK MOTOR

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