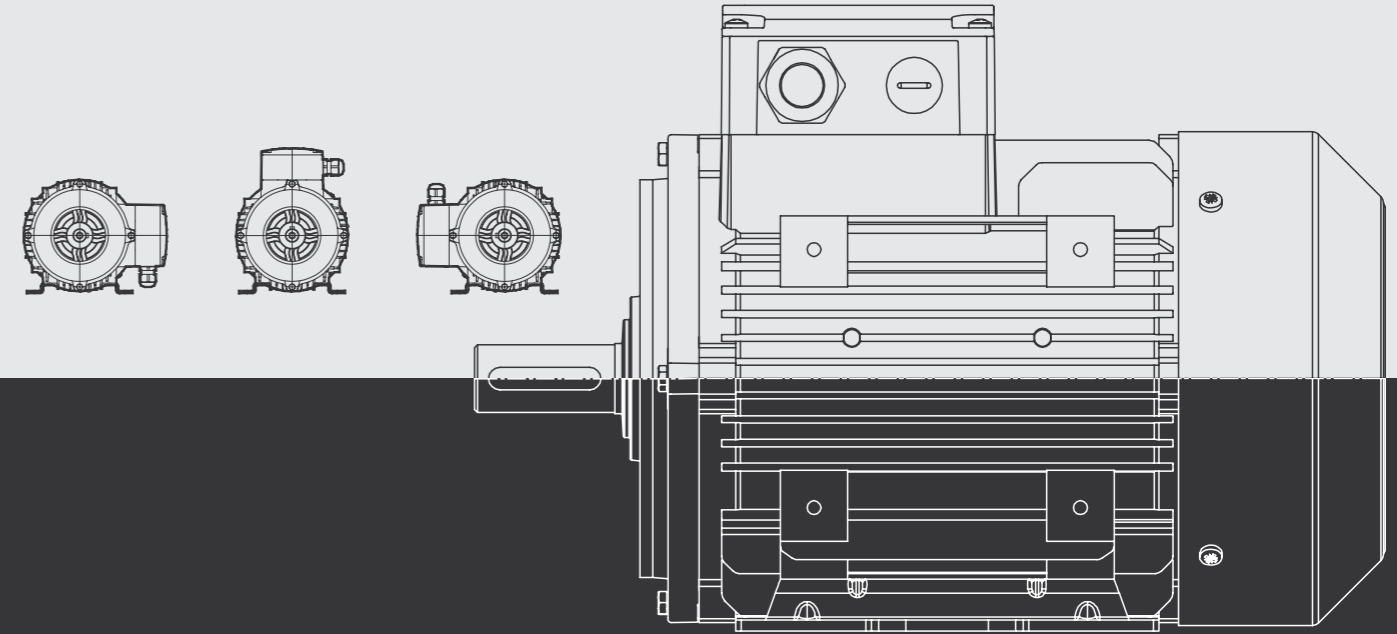


# ELK MOTOR



 ELK  
MOTOR

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**PRODUCT CATALOGUE**  
ELK 0701-0121

[www.elkmotor.com.tr](http://www.elkmotor.com.tr)



ELK Motor has been founded by major shareholders of Yılmaz Reduktor, as a continuation of the product family. ELK Motor manufactures electric motors from 63 up to 315 frame size in a 50.000m<sup>2</sup> closed area built on a 135.000 m<sup>2</sup> open area.

All motor series are designed and manufactured in accordance with European standards and in IE2, IE3 and IE4 efficiency classes.

The main design and technology of ELK Motor is completely suitable to the IE3 efficiency class. Since the outside dimensions of the IE3 and IE2 design are completely same, the replacement of the IE2 motor with IE3 motors will be done easily.

In addition to the motors according to the European standards, ELK Motor also manufactures special motors for its customers to decrease the cost and increase the productivity.

ELK Motors, from engineering to manufacturing processes, are completely manufactured in our factory located in Çerkezköy. Motor shafts and end shields are manufactured by fully automatic CNC machines under a continuous quality control. The rotor and stator cores are manufactured in our fully automatic punching and interlocking lines.

After injecting the pure aluminum into the rotor cores in a fully automatic rotor injection line, the rotor cores become ready for assembly. In automatic winding lines, stator cores are wound and varnished either by automatic dipping method or VPI (Vacuum Pressure Impregnation) method according to the needs and usage area. So the products are always in the best levels of quality and performance.

After all of these operations, our motors which are assembled in accordance with product prescriptions are being tested and controlled fully for the last time and shipped to the customers after packaging.

In addition, ELK Motor has the quality management system and final product certificates, that customers need. Our quality system is certified with ISO 9001 and our products have UL approval.

## CONTENTS

<b>TECHNICAL INFORMATION</b>	5
IEC/EN/UL Compatibility	6
Mechanical Construction	7
Electrical Construction	8
Motors With Variable Speed Drives	9
Motors in Several Environmental Conditions	9
Winding Insulation/ Temperature Rise Classes	10
Protection Classes	10
Construction Types	11
Bearings	12
Radial Loads	13
Axial Loads	15
<b>PRODUCT TYPE CODES</b>	19
<b>IE2 MOTORS</b>	21
<b>IE2 COMPACT MOTORS</b>	24
<b>IE3 MOTORS</b>	27
<b>IE4 MOTORS</b>	31
<b>DIMENSIONS</b>	33
<b>ADDITIONAL INFORMATION</b>	37
Nameplate Description	38
Spare Parts	39
PTC Thermistor and Thermal Switch	40
Anti-Condensation Heater and Drain Hole	40
Non Drive End Shaft Extension and Canopy	40
Brake, Hand Release, Separately Driven Fan, Encoder and Backstop	41



**Three Phase Squirrel Cage  
Asynchronous Motors**  
Technical Information

## IEC / EN / UL Compatibility

All of standard ELK Motors are designed, manufactured and tested according to the IEC and EN standards given 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 system
IEC 60034-30	Efficiency classes (IE Code)
IEC 60038	Standard voltages
EN 50347	Dimensions and output for electrical machines

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

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



All of our motors, which have that UL logo on nameplate are approved by UL and manufactured according to UL1004-1 and CSA C22.2 No. 100 standards with E496161 file number.

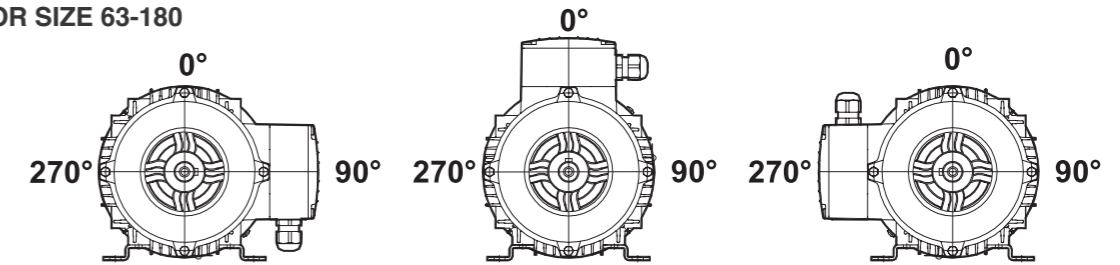
According to IEC 60034-1, catalogue values are permitted to deviate from the real values as follows:

<b>Speed (n)</b>	$\Delta n = \pm 20\% (n_s - n_N), P_N > 1 \text{ kW}$ $\Delta n = \pm 30\% (n_s - n_N), P_N \leq 1 \text{ kW}$
<b>Efficiency %(<math>\eta</math>)</b>	$\Delta \eta = -15\% (100 - \eta_N), P_N \leq 150 \text{ kW}$ $\Delta \eta = -10\% (100 - \eta_N), P_N > 150 \text{ kW}$
<b>Power Factor (Cos <math>\phi</math>)</b>	$\text{Cos } \phi = -1/6 (1 - \text{Cos } \phi)$
<b>Locked rotor current (<math>I_{LN}</math>)</b>	$\Delta (I_{LN}) = +20\% (I_{LN})$
<b>Starting torque (<math>M_I/M_N</math>)</b>	min. $(M_I/M_N) = -15\% (M_I/M_N)$ max. $(M_I/M_N) = +25\% (M_I/M_N)$
<b>Break down torque (<math>M_K/M_N</math>)</b>	$(M_K/M_N) = -10\% (M_K/M_N)$
<b>Moment of inertia (J) [<math>\text{kgm}^2</math>]</b>	$\Delta J = \pm 10\% J$
<b>Sound pressure level (<math>L_{PA}</math>) [dB(A)]</b>	$L_{PA} = +3 \text{ dB (A)}$

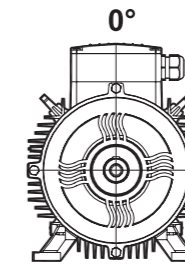
## Mechanical Construction

63-180 frame size ELK Motors provides flexibility for different mounting types through their detachable feet which can be mounted on three sides. This feature allows terminal box assembly on the desired side. Terminal box is on the top for standard motors. 200-315 frame size motors have fixed feet construction.

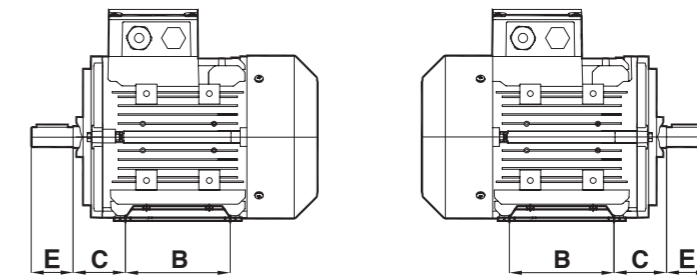
### MOTOR SIZE 63-180



### MOTOR SIZE 200-315



Additionally the housing and end shields are designed symmetrically for all the frame sizes, so that the drive and non-drive side end shields can be replaced and the direction of the rotor shaft group can be changed. By making this end shields and rotor shaft group modifications, the user can have a motor with terminal box is at the non-drive side keeping the distance C according to the standards.



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	Aluminum	Aluminum	Aluminum	Steel Sheet	Steel Sheet	Plastic
160	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Steel Sheet	Plastic
180	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Steel Sheet	Plastic
200	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Steel Sheet	Plastic
225	Cast Iron	Cast Iron	Cast Iron	Cast Iron	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

## Electrical Construction

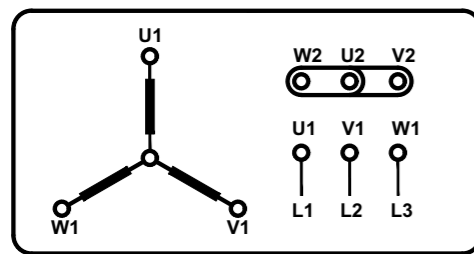
Standard ELK Motors have insulation Class F while the temperature rise is Class B. This means the motors will have a longer service life and work under hard conditions. Upon the customer's request, Class H insulation motors are manufactured.

## Electrical Connections

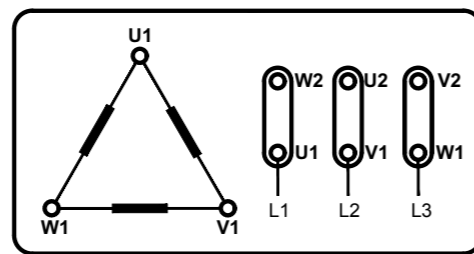
Cable Gland and Blind Cap															
Frame Size	063	071	080	090	100	112	132	160	180	200	225	250	280	315	
Cable Glands	M16x1,5	M20x1,5			M25x1,5			2 x M32x1,5		2 x M40x1,5		2 x M50x1,5		2 x M63x1,5	
Blind Cap	M16x1,5				M25x1,5				-		-		-		

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.



Y Star Connection



Δ Delta Connection

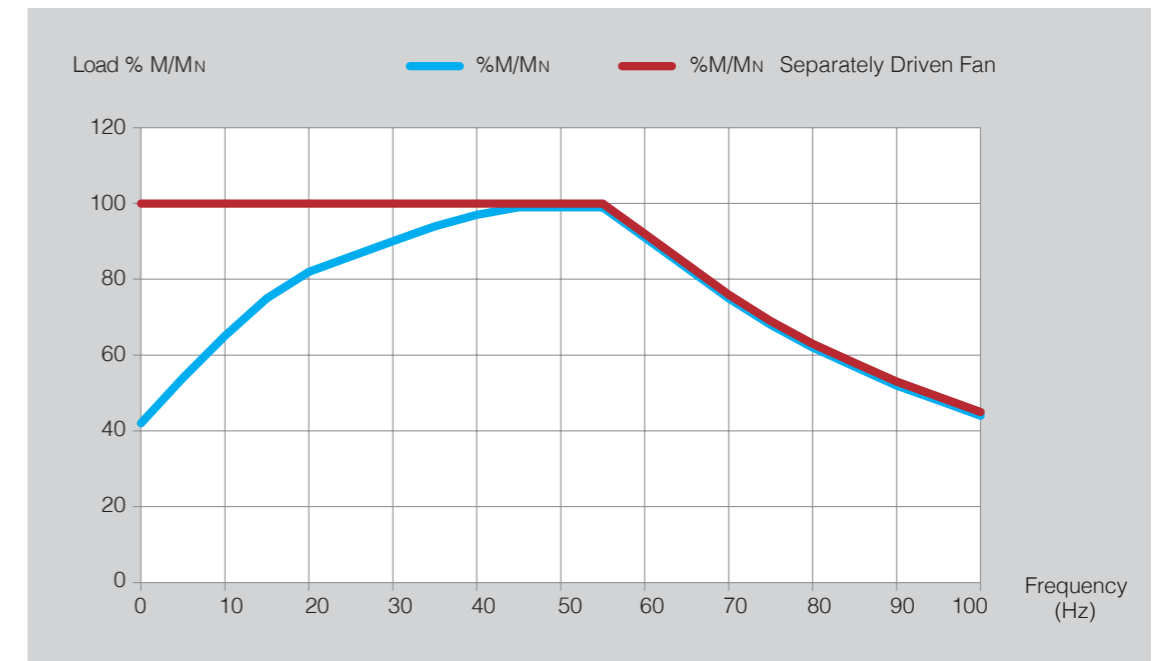
## Motors at 60Hz Network

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

## Motors With Variable Speed Drives

Standard ELK Motors are suitable for variable speed drives. The frequency range that the motor can be driven with their fan is given below with blue line. If the motor will be driven in a wider range then a separately driven fan is necessary. By using a separately driven fan, the motors can be driven in the range defined by red line.



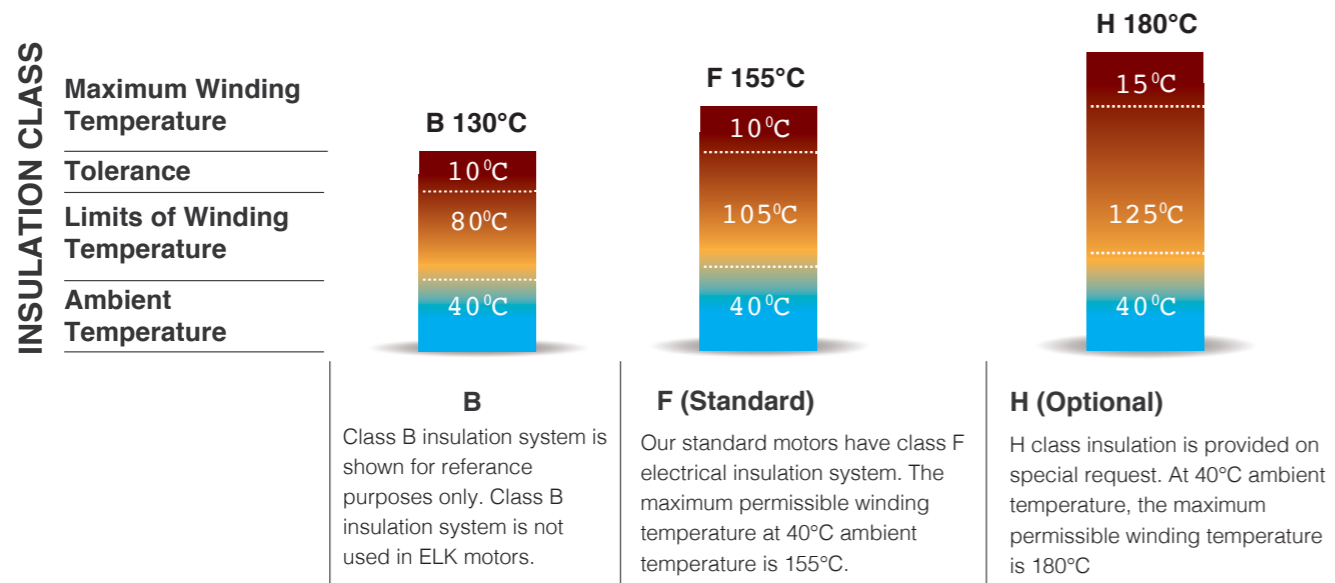
## Motors In Several Environmental Conditions

ELK Motors are designed to operate at ambient temperature up to 40°C according to IEC 60034-1. Rated output will change at the % ratings given below for different ambient temperatures.

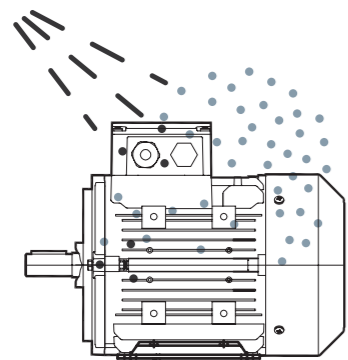
Ambient Temperature	<30 °C	35 °C	40 °C	45 °C	50 °C	55 °C	60 °C
% Power Ratio	105	102	100	97	93	87	82

## 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).

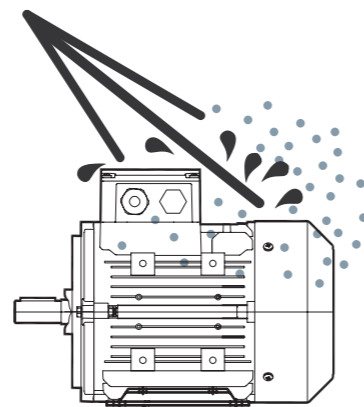


## Protection Classes



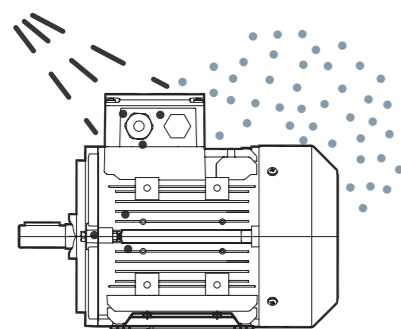
### IP55 (Standard)

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



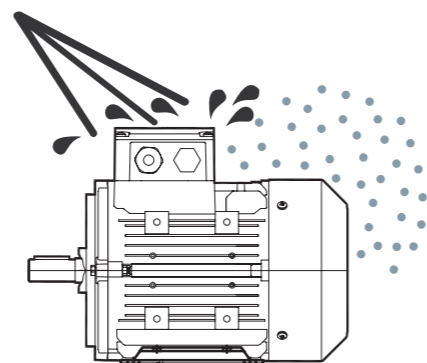
### IP56

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.

## Construction Types

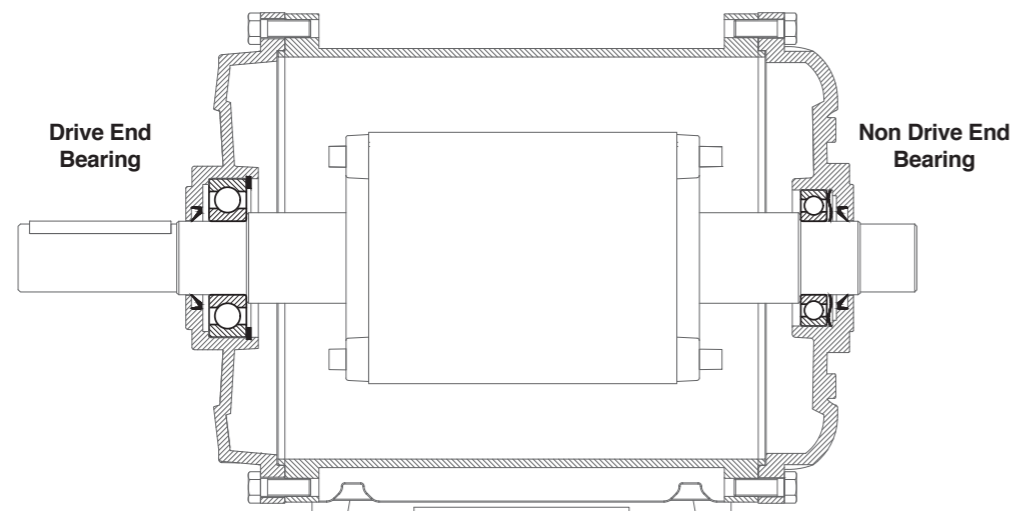
ELK Motors are manufactured according to International Mounting Standard IEC 60034-7.

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 B35	IM 2001			

## Bearings

Standard ELK Motors are equipped with ball bearings with ZZ shields as listed below, according to frame size. NU-NJ bearings are optional.

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



## Radial Loads

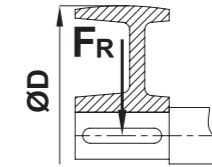
Radial Load ( $F_R$ ):

Radial load can be calculated according to below written formula.

Calculated radial load must be below permissible radial loads given at tables.

If above, please contact with us.

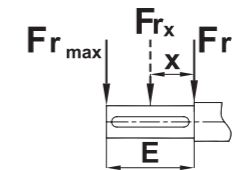
$$F_R = k \cdot \frac{P}{D \cdot n} \cdot 10^7 (N)$$



Correction of Permissible Radial Load

If the radial load is applied between points  $x_0$  and  $x_{max}$ , the permissible radial load can be corrected with the following formula.

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



P: Motor Power (kW)

D: Pulley 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

$Fr < Fr_x$  : Calculated radial load must be below permissible radial loads given at tables.

Fa: Axial load

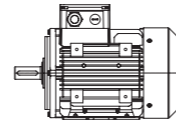
$Fr_0$ : Permissible radial load at shaft spigot.

$Fr_{max}$ : Permissible radial load at shaft end point.

Permissible loads are calculated for  $L_{h10}$  20000 h bearing lifetimes according to ISO 281.

## Radial Loads

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

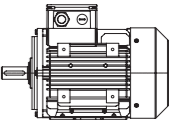


Frame Size	Fa = 0	
	Fr <sub>0</sub>	Fr <sub>max</sub>
<b>2 Poles 3000 rpm</b>	<b>Fr<sub>0</sub> [N]</b>	<b>Fr<sub>max</sub> [N]</b>
63	350	300
71	380	340
80	640	550
90	750	660
100	1050	900
112	1050	910
132	1520	1220
160	2800	2300
180	3250	2650
200	4340	3560
225	4950	4000
250	6050	4800
280	6300	5100
315	6400	5550
<b>4 Poles 1500 rpm</b>	<b>Fr<sub>0</sub> [N]</b>	<b>Fr<sub>max</sub> [N]</b>
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
<b>6 Poles 1000 rpm</b>	<b>Fr<sub>0</sub> [N]</b>	<b>Fr<sub>max</sub> [N]</b>
63	500	400
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

Fa<sub>0</sub> : Permissible axial load  
Fr : Radial load  
Fr<sub>0</sub> : Permissible radial load at shaft spigot.  
Fr<sub>max</sub> : Permissible radial load at shaft end point.  
Permissible loads are calculated for L<sub>n10</sub> 20000 h bearing lifetimes according to ISO 281.

## Axial Loads

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



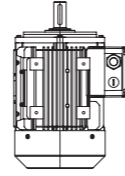
Frame Size	Push			Pull
	Fr = 0	Fr = Fr <sub>0</sub>	Fr = Fr <sub>max</sub>	Fr = 0
	Fa <sub>0</sub>	Fa <sub>0</sub> , Fr <sub>0</sub>	Fa <sub>0</sub> , Fr <sub>max</sub>	Fa <sub>0</sub>
<b>2 Poles 3000 rpm</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>
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
<b>4 Poles 1500 rpm</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>
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
<b>6 Poles 1000 rpm</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>
63	90	90	90	370
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

Fa<sub>0</sub> : Permissible axial load  
Fr : Radial load  
Fr<sub>0</sub> : Permissible radial load at shaft spigot.  
Fr<sub>max</sub> : Permissible radial load at shaft end point.  
Permissible loads are calculated for L<sub>n10</sub> 20000 h bearing lifetimes 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 <sub>0</sub>	Fr = Fr <sub>max</sub>	Fr = 0
<b>2 Poles 3000 rpm</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>
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
<b>4 Poles 1500 rpm</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>
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	5800	2000	1600	7100
315	6000	2050	1600	8850
<b>6 Poles 1000 rpm</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>
63	85	85	85	395
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

Fa<sub>0</sub> : Permissible axial load

Fr : Radial load

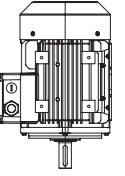
F<sub>r0</sub> : Permissible radial load at shaft spigot.

F<sub>rmax</sub> : Permissible radial load at shaft end point.

Permissible loads are calculated for L<sub>n10</sub> 20000 h bearing lifetimes 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 <sub>0</sub>	Fr = Fr <sub>max</sub>	Fr = 0
<b>2 Poles 3000 rpm</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>
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
<b>4 Poles 1500 rpm</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>
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	4400
315	10900	6950	6500	3900
<b>6 Poles 1000 rpm</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>	<b>Fa<sub>0</sub> [N]</b>
63	110	110	110	360
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

Fa<sub>0</sub> : Permissible axial load

Fr : Radial load

F<sub>r0</sub> : Permissible radial load at shaft spigot.

F<sub>rmax</sub> : Permissible radial load at shaft end point.

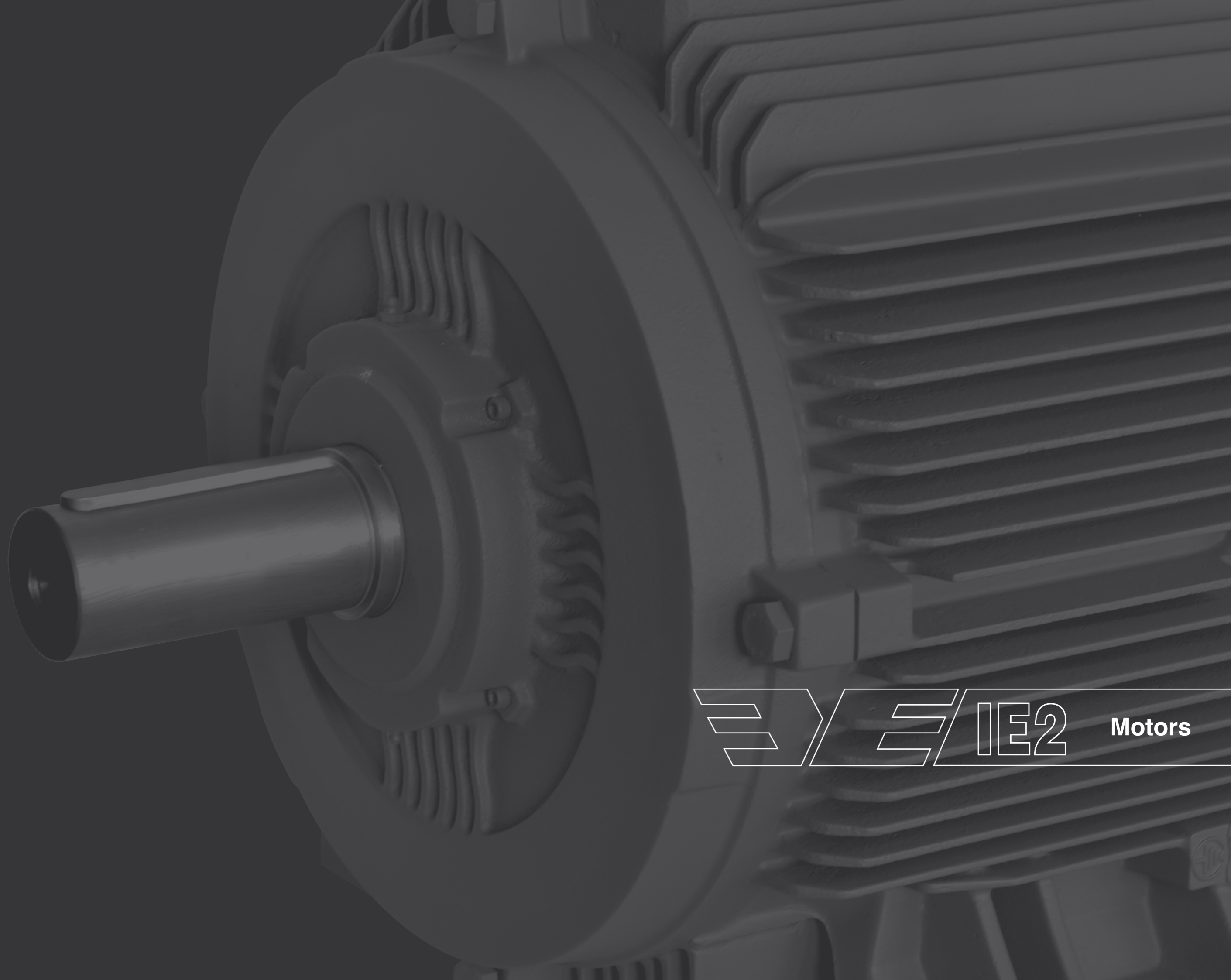
Permissible loads are calculated for L<sub>n10</sub> 20000 h bearing lifetimes according to ISO 281.



## Product Type Codes

## Product Type Codes

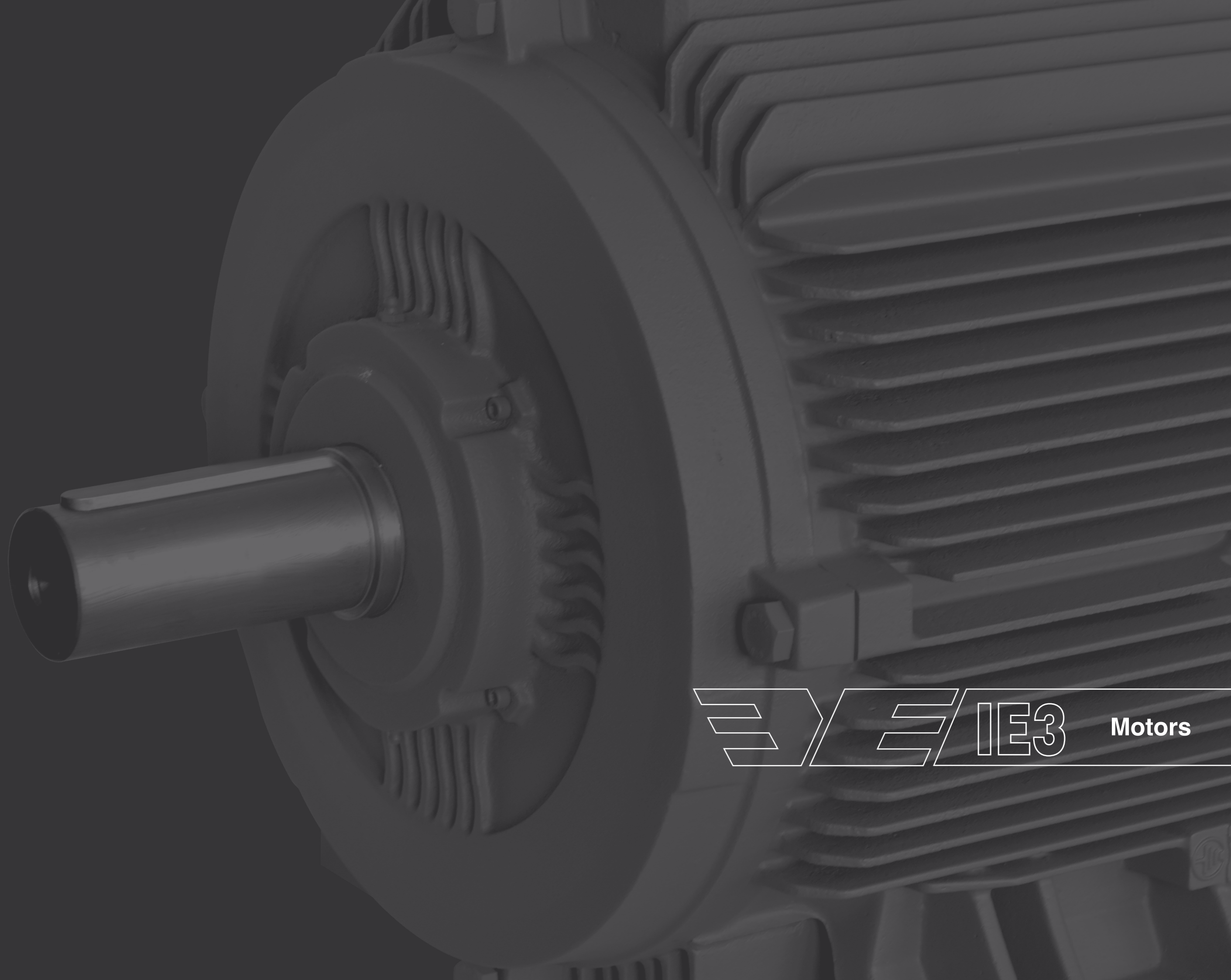
3	EL	132	S	4	C	FC	B0	000	
3								Motor Efficiency Classes 2: IE2 3: IE3 4: IE4	
	EL							Basic Motor Type EL : Aluminum housing standard motors EG : Cast iron housing standard motors EC : Aluminum housing compact motors ED : Cast iron housing compact motors	
		132						Frame Size: 63, 71, 80, 90, 100, 112, 132, 160, 180, 200, 225, 250, 280, 315 Height of the shaft axis from feet base of motor (mm)	
			S					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 D: dahlander 4/2 poles constant torque 1500/3000 rpm E: dahlander 4/2 poles square-law torque 1500/3000 rpm F: dahlander 8/4 poles constant torque 750/1500 rpm G: dahlander 8/4 poles square-law torque 750/1500 rpm S: separate windings 6/4 poles 1000/1500 rpm T: separate windings 12/4 poles 500/1500 rpm U: separate windings 12/2 poles 500/3000 rpm Z: 12 poles 500 rpm	
					C			Core Length: A, B, C, D, E, F, G	
						FC		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 Yilmaz type	
							B0	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 1,16 increased rated output power F : 400/690V 60Hz 1,16 increased rated output power G : 220V 60Hz H : 290/500V 50Hz I : 220/380V 60Hz 1,16 increased rated output power J : 380/660V 60Hz 1,16 increased rated output power  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 K: Motors with thermistor anti-condensation heater	
								000	Additional Motor Features 000.....999 000 : Standard Motor



**E/E/IE2** Motors







**E/E IE3 Motors**



## Electrical Characteristics

400V 50Hz 1000 rpm

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



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 % $\eta$			Current					Torque
		kW	rpm	A	Nm	Cos $\varphi$	4/4	3/4	1/2	$I_A/I_N$					$M_A/M_N$
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	6,70	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	9,8	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	10,6	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	14,6	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	17,0	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	27,2	56
	3EL132S6B	3,00	970	6,55	29,4	0,77	85,6	85,5	84,5	6,2	2,1	3,0	0,03051	46,5	58
400/690	3EL132M6C	4,00	970	8,52	39,4	0,78	86,8	87,0	85,5	6,2	2,2	3,0	0,03493	51,0	58
	3EL132M6D	5,50	965	11,6	54,4	0,78	88,0	88,9	88,5	6,2	2,2	3,0	0,03934	56,0	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	22,9	108	0,77	90,3	90,9	90,5	6,6	2,9	3,3	0,08580	104	62
	3EG180L6E	15,0	975	30,8	147	0,77	91,2	91,6	91,0	6,7	2,9	3,1	0,15264	187	63
	3EG200L6C	18,5	977	36,4	181	0,80	91,7	91,8	91,8	6,1	2,6	2,6	0,36100	225	64
	3EG200L6D	22,0	978	42,5	215	0,81	92,2	92,9	93,0	6,2	2,6	2,7	0,39355	245	64
	3EG225S6C	30,0	985	57,6	291	0,81	92,9	92,9	92,6	6,6	2,6	2,7	0,60000	326	65
	3EG250M6C	37,0	988	68,8	358	0,83	93,4	93,6	93,5	6,8	2,9	2,8	0,82000	432	65
	3EG280S6B	45,0	989	83,5	435	0,83	93,7	93,9	93,2	6,8	2,9	2,8	1,45000	540	65
	3EG280M6C	55,0	989	102	531	0,83	94,1	94,4	93,5	6,9	2,9	2,8	1,65000	575	65
	3EG315S6B	75,0	990	136	723	0,84	94,6	94,8	94,2	7,2	2,7	3,0	2,70000	760	67
	3EG315M6C	90,0	991	163	867	0,84	94,9	95,0	94,5	7,2	2,7	3,0	3,50000	890	67
	3EG315M6D	110	991	197	1060	0,85	95,1	95,2	94,9	7,2	2,8	3,0	3,80000	1010	68
	3EG315L6E	132	991	235	1272	0,85	95,4	95,5	95,2	7,2	2,8	3,1	4,50000	1160	68
	3EG315L6F	160	992	288	1542	0,84	95,6	95,7	95,3	7,2	3,0	3,2	4,90000	1200	68

UL approved motors have  logo on nameplate



**IE4 Motors**



## Electrical Characteristics

400V 50Hz 3000 rpm

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

**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 % $\eta$			Current	Torque				
		kW	rpm	A	Nm	cos $\varphi$	4/4	3/4	1/2	$I_A/I_N$	$M_A/M_N$				
400/690	4EL160M2C	11,0	2950	18,9	35,6	0,91	92,6	92,7	91,2	8,5	3,3	4,3	0,03913	133	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	135	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	145	74
	4EG180M2C	22,0	2960	37,2	71,1	0,91	94,0	94,4	93,5	8,9	3,0	4,0	0,07000	195	74
	4EG200L2C	30,0	2970	51,0	96,5	0,90	94,5	94,7	94,0	8,3	3,2	3,7	0,17500	272	74
	4EG200L2D	37,0	2970	63,3	120	0,89	94,8	95,0	94,2	8,3	3,2	4,0	0,20000	295	74
	4EG225M2D	45,0	2975	76,0	145	0,90	95,0	95,2	94,9	9,0	3,4	4,2	0,29000	385	74
	4EG250M2D	55,0	2975	90,5	177	0,92	95,3	95,5	94,9	8,2	3,4	3,7	0,52000	520	74
	4EG280S2C	75,0	2982	124	240	0,91	95,6	95,6	95,2	7,7	2,7	3,2	0,98000	640	76
	4EG280M2D	90,0	2985	149	288	0,91	95,8	95,9	95,0	7,7	2,8	3,5	1,10000	720	77
	4EG315S2C	110	2985	182	352	0,91	96,0	96,0	95,7	7,8	2,6	3,3	1,60000	905	77
	4EG315M2D	132	2986	217	422	0,91	96,2	96,3	96,0	8,0	2,6	3,3	2,00000	1085	77
	4EG315L2E	160	2986	260	512	0,92	96,3	96,5	96,0	8,0	2,7	3,4	2,20000	1195	78
	4EG315L2F	200	2987	325	639	0,92	96,5	96,7	96,2	8,1	2,9	3,5	2,70000	1310	78



400V 50Hz 1500 rpm

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

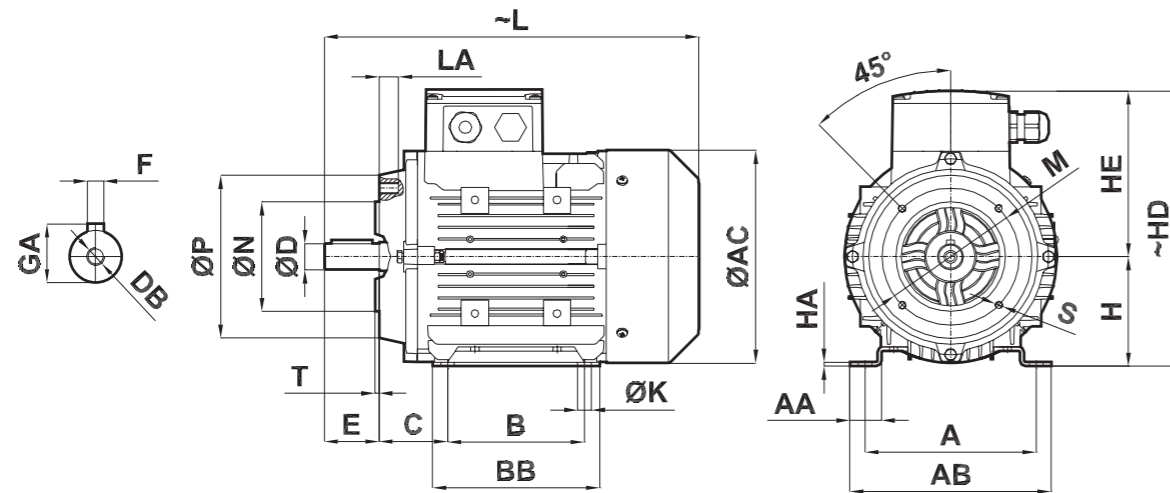
**IE4**

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 % $\eta$			Current	Torque				
		kW	rpm	A	Nm	cos $\varphi$	4/4	3/4	1/2	$I_A/I_N$	$M_A/M_N$				
400/690	4EL160M4E	11,0	1470	21,0	71,5	0,81	93,3	93,5	93,3	7,7	3,0	3,6	0,08600	137	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	152	64
	4EG180M4D	18,5	1475	34,6	120	0,82	94,2	94,4	94,0	8,0	3,1	3,5	0,14700	190	64
	4EG180L4E	22,0	1475	41,0	142	0,82	94,5	94,7	94,2	8,2	3,2	3,8	0,17000	212	64
	4EG200L4E	30,0	1480	53,0	194	0,86	94,9	95,3	95,2	8,3	3,3	3,8	0,35000	310	64
	4EG225S4D	37,0	1480	65,0	239	0,86	95,2	95,7	95,0	8,1	3,3	3,3	0,44100	355	70
	4EG225M4E	45,0	1480	79,2	290	0,86	95,4	95,6	95,6	8,2	3,5	3,3	0,52000	405	70
	4EG250M4E	55,0	1485	94,3	354	0,88	95,7	96,0	96,0	8,3	3,3	3,4	1,05000	522	70
	4EG280S4D	75,0	1487	127	482	0,89	96,0	96,3	96,2	7,6	3,0	3,2	1,50000	670	70
	4EG280M4E	90,0	1488	152	578	0,89	96,1	96,3	96,3	7,6	3,1	3,2	1,95000	790	71
	4EG315S4D	110	1490	187	705	0,88	96,3	96,5	96,0	7,8	2,8	3,3	2,80000	975	73
	4EG315M4E	132	1490	225	846	0,88	96,4	96,7	96,2	8,0	2,9	3,3	3,30000	1050	73
	4EG315L4F	160	1490	269	1026	0,89	96,6	96,9	96,5	8,2	3,1	3,4	4,40000	1250	76
	4EG315L4G	200	1490	335	1282	0,89	96,7	97,0	96,6	8,3	3,3	3,5	5,20000	1490	76





## B14 - B34 Construction Types



Frame Size	Efficiency Class	Number of Poles	D <sup>[1]</sup>	N <sup>[2]</sup>	P	E	T	LA	L	AC	S	M	H <sup>[3]</sup>	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	97	160	4	12,5	M4	40	7	80	104	3	18	100	115
071M	IE2/IE3	2-4-6-8	14	70	105	30	2,5	12	244	137	M6	85	71	112	183	5	16	M5	45	7	90	110	3	19	112	128
080M	IE2/IE3	2-4-6-8	19	80	118,5	40	3	12	274	155	M6	100	80	123	203	6	21,5	M6	50	10	100	122	3	25	125	148
090S	IE2	2-4-6-8	24	95	136,5	50	3	15	272	176	M8	115	90	132	222	8	27	M8	56	10	100	126	4	27	140	167
090S	IE3	2-4-6-8	24	95	136,5	50	3	15	325	176	M8	115	90	132	222	8	27	M8	56	10	100	151	4	27	140	167
090L	IE2/IE3	2-4-6-8	24	95	136,5	50	3	15	325	176	M8	115	90	132	222	8	27	M8	56	10	125	151	4	27	140	167
100L	IE2/IE3	2-4-6-8	28	110	159,5	60	3,5	17	370,5	193	M8	130	100	149	249	8	31	M10	63	12	140	170	4	31	160	192
112M	IE2/IE3	2-4-6-8	28	110	159,5	60	3,5	17	390	215	M8	130	112	161	273	8	31	M10	70	12	140	177	4	36	190	217
132S	IE2/IE3	2-4-6-8	38	130	200	80	3,5	20	495	257	M10	165	132	181	313	10	41	M12	89	12	140	212	5	34	216	254
132M	IE2/IE3	2-4-6-8	38	130	200	80	3,5	20	495	257	M10	165	132	181	313	10	41	M12	89	12	178	212	5	34	216	254
160M	IE2/IE3/IE4	2-4-6-8	42	180	250	110	4	23	605	316	M12	215	160	224	384	12	45	M16	108	14,5	210	323	15	65	254	295
160L	IE2/IE3/IE4	2-4-6-8	42	180	250	110	4	23	605	316	M12	215	160	224	384	12	45	M16	108	14,5	254	323	15	65	254	295

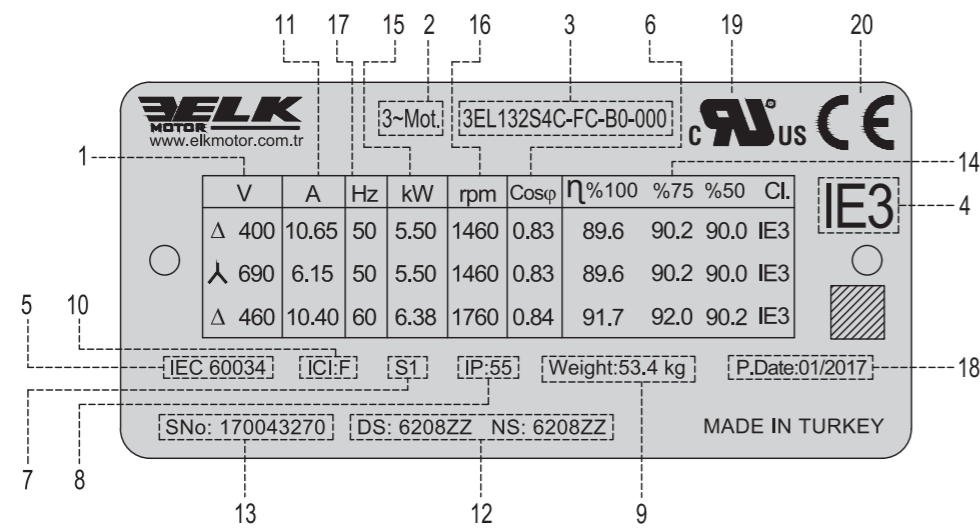
[1] Tolerance "j6" up to 28mm, "k6" over 28mm TS EN 50347

[2] Tolerance "j6" TS EN 50347

[3] Tolerance "-0.5mm" TS EN 50347



## Nameplate Description



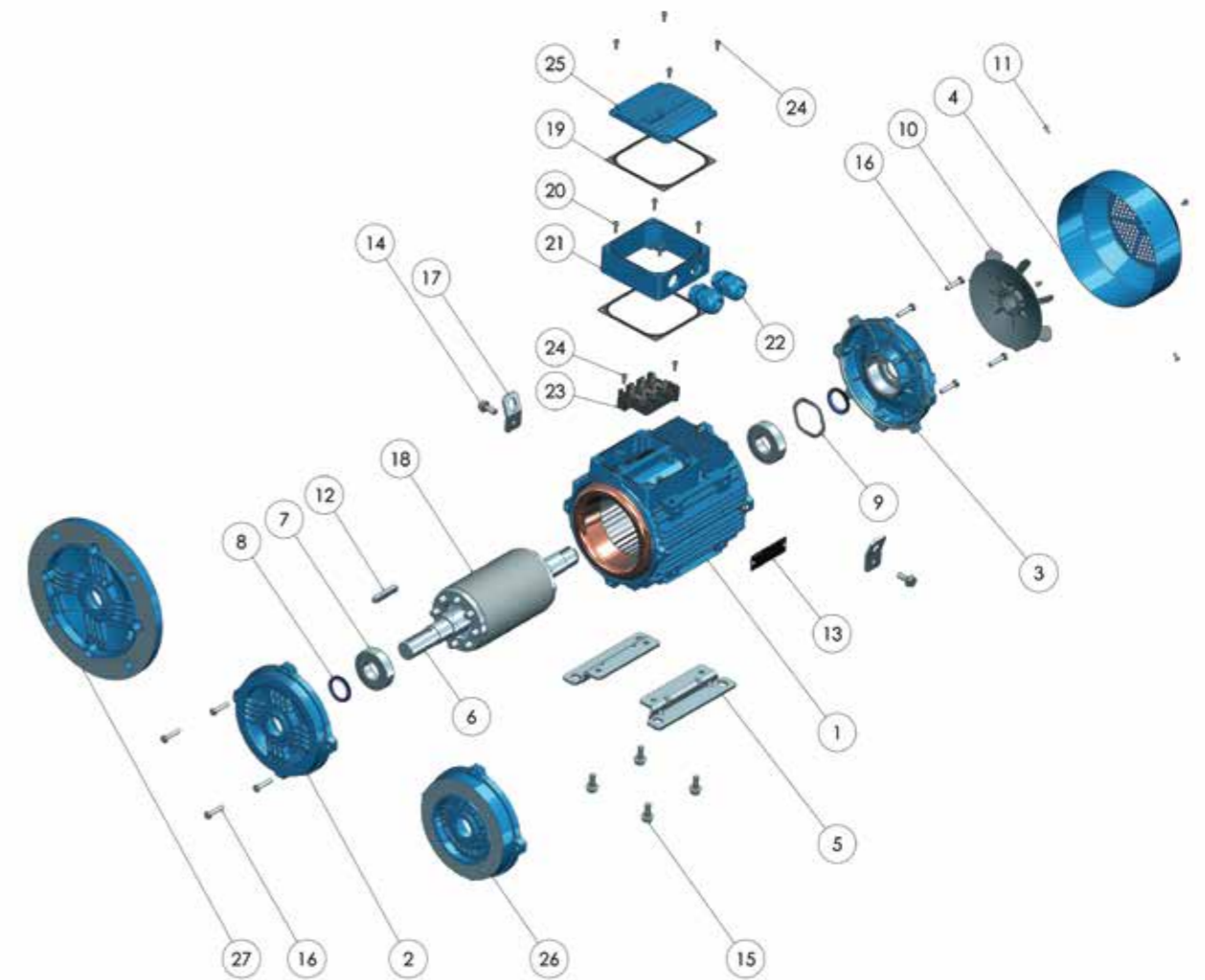
- |                                     |                     |
|-------------------------------------|---------------------|
| 1. Rated Voltage                    | 11. Rated Current   |
| 2. Motor Type: 3 Phase Asynchronous | 12. Bearing Type    |
| 3. Motor Code                       | 13. Serial Number   |
| 4. Efficiency Class (IEC 60034-30)  | 14. Efficiency      |
| 5. Manufacture Standard             | 15. Output Power    |
| 6. Power Factor                     | 16. Speed           |
| 7. Duty Cycle                       | 17. Frequency       |
| 8. Protection Class                 | 18. Production Date |
| 9. Motor Weight                     | 19. UL Logo         |
| 10. Insulation Class                | 20. CE Mark         |



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, 17XXXXXXX shows that the product is manufactured in 2017.

## Spare Parts

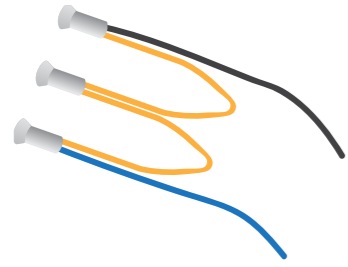
All the standard motors are produced by ELK MOTOR consist of the following main parts;



- |                     |                         |
|---------------------|-------------------------|
| 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 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           |                         |

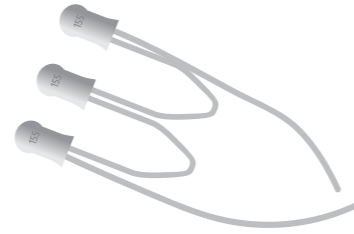
When ordering spare parts, the motor serial number, full type designation, and product code, as stated on the nameplate, must be specified. For field service, spare parts and additional information, please contact with us.

## PTC Thermistor and Thermal Switch



### PTC Thermistor

If the motor is exposed to excessive load, the internal resistance of the thermistor attached to the motor windings increases due to the heating of the motor windings and opens the circuit when the insulation class limit value is reached. This prevents the winding from being damaged by cutting off the current in the windings. Only can be used with an electronic circuit.



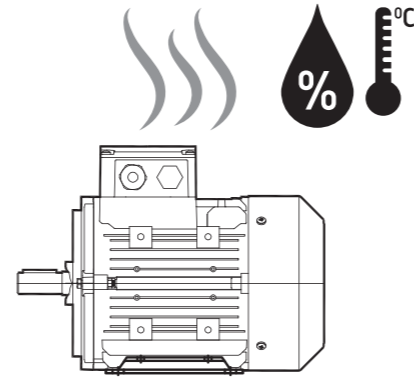
### Thermal Switch

When the motor is overloaded winding temperature exceeds the insulation class limit value, and the thermal switch assembled to the winding opens the circuit. In many applications, thermal switch can be connected in series to the main contactor coil. Depending on the opening of the thermal switch, the main contactor is released and damage to the motor is prevented.

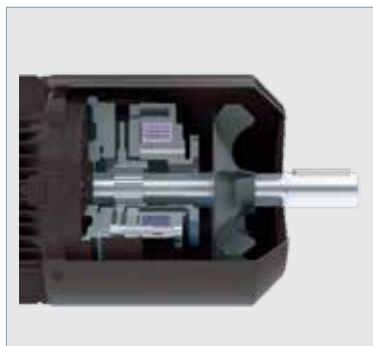
## Anti-Condensation Heater and Drain Hole

Water condensation inside the motor can occur in high humidity environments. To prevent this, heaters anti-condensation heaters are assembled to the motor windings to maintain a certain temperature.

In addition, drain holes are opened to prevent water from accumulating in the motor body in the event of water condensation inside the motor.



## Non Drive End Shaft Extension and Canopy



### Non Drive End 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 not energized.



### Canopy

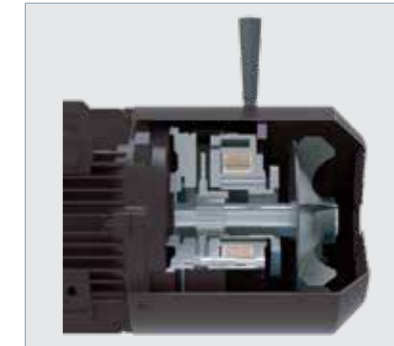
It is used for operation in the outside environment where the motor fan is pointing upwards. This prevents the rainwater from entering the motor housing.

## Brake, Hand Release, Separately Driven Fan Encoder and Backstop



### Electromagnetic Brake

For each motor size we have the option of electromagnetic brake. Brakes with 24 Volt, 230 Volt and 400 Volt DC from 5Nm to 1600Nm are alternatively can be used as needed.



### Brake with Hand Release

Hand release on the brake is used to release the system when the power is cut off or the power is not turned on.



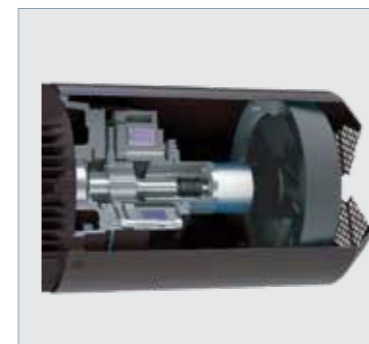
### Separately Driven Fan

Separately driven fan is used particularly in applications where the motor is driven by variable speed drives to keep the air flow at a constant level.



### Separately Driven Fan with Encoder

In applications where synchronous operation is desired, encoder application is used. The motor fan cannot be used since the encoder is mounted on the non drive end cover. For this reason, the motor is cooled by a separately driven fan.



### Separately driven fan with brake and encoder

In applications where both brake and synchronous operation are desired, brake, encoder and separately driven fan options are all mounted to the non drive side of the motor.



### Backstop

Backstop is used when the motor should rotate only in one direction and the motor should not rotate in the other direction. The backstop option in the fan cover is widely used.

