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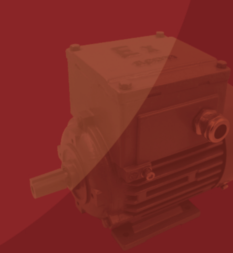
CEMEP
European Committee of Manufacturers of Electrical Machines and Power Electronics



for further details or information, please contact:

elprom industrial motors

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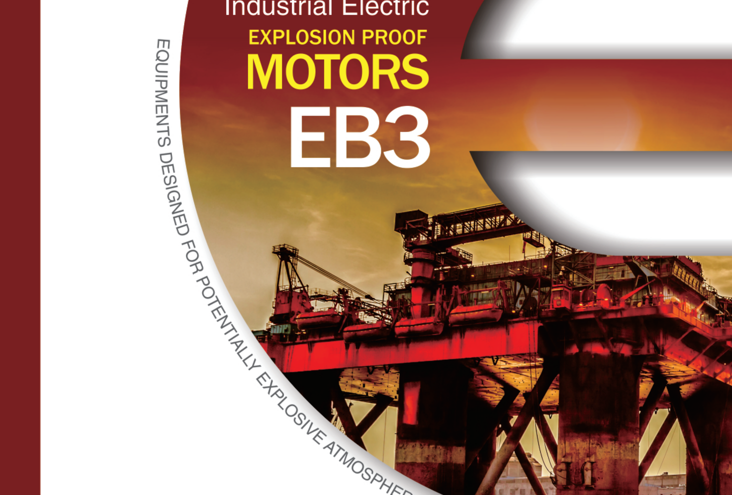
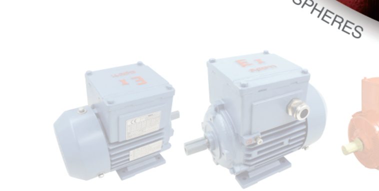
Industrial Electric

EXPLOSION PROOF MOTORS EB3

EQUIPMENTS DESIGNED FOR POTENTIALLY EXPLOSIVE ATMOSPHERES





ELPROM
Cast Iron Series Motor 71~355
Aluminium Series Motor 56~132

• II 2G Ex d • II 2G Ex de • II 2GD Ex d Ex tD A21 • II 2GD Ex de Ex tD A21 •

Mac. 2016 / EB3 Series (v1.0)

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ELPROM MOTORS
Guaranteed security against exploision of dangerous dusts & gasses at all industry field

1. PRODUCTS QUALITY & CERTIFICATES

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International Protection Rating certified by CONSORZIO EUROPEO CERTIFICAZIONE (ITALY)

Product Standard:

ATEX, Ex, CEMEP European Committee, UL, CSA, IECEx, IP55 IP66, TÜV, CE

2. TOLERANCES AND STANDARDS OF REFERENCE

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2.1 Mechanical & Electrical Tolerances

Symbol	Description	Tolerance
A	Distance between centre-lines of fixing holes (end view)	± 1mm
AB	Overall dimensions across the feet (end view)	+ 2%
AC	Diameter of the motor (without terminal box)	+ 2%
B	Distance between centre-lines of fixing holes (side view)	± 1mm
C-CA	Distance from the shaft end shoulder to the centre-line of nearest mounting holes in the feet	± 3mm
D-DA	Diameter of the shaft extension,	Ø11 ~ 28 j6; Ø32 ~ 48 k6; Ø ≥ 55 m6
E-EA	Length of the shaft extension from the shoulder	Ø < 55mm - 0,3mm; Ø > 60mm + 0,5mm
F-FA	Width of the key way of the shaft extension	h9
GA-GC	Distance from the top of the key to the opposite surface of the shaft extension	+0,2mm
H	Distance between the centre-line of the shaft to the bottom of the feet	Ø ≤ 250 - 0,5mm; Ø ≥ 280 - 1mm
HD	Distance from the top of the terminal box and to the bottom of the feet	+2%
K	Diameter of the holes or width of the slots in the feet of the motor	+3%
L	Overall length of the motor with a single shaft extension	+1%
M	Pitch circle diameter of the fixing holes	±0,8mm
N	Diameter of the spigot	Ø < 230 j6; Ø i 250 h6
P	Outside diameter of the flange	±1mm
R	Distance from the shaft shoulder to the mounting surface of the flange	±3mm
S	Diameter of the fixing holes in the mounting flange or nominal diameter of thread	+3%
	Distance from the shaft shoulder to the mounting surface of the flange with locked bearing	± 0,5mm
	Mass of motor	-5 a + 10%
Nominal voltage, V_n		± 5%
Efficiency, η		-15% of (1-η)
Power Factor, cosφ		-1/6 of (1-cosφ) min 0.02, max 0.07
Slip (rpm) (full load & nominal ambient temperature), P_N		±20% if PN i 1kW; ±30% if PN< 1kW
Locked rotor current, I_s		±20%
Locked rotor torque, M_s		-15% +25%
Breakdown torque, M_{max}		-10% con $M_{max}/M_n \geq 1.6$
Minimum torque, M_{min}		-15%
Moment of Inertia, J		±10%
Sound intensity level (sound pressure) L_{pA}		+3 dBA

2.2 Standards of reference

Title	Part	Description	EU CENELEC	International IEC
Rotating Electrical Machines	Part 01:	Rating & Performance	EN 60034-1	IEC 60034-1
	Part 02-1:	Standard methods for determining losses & efficiency from tests (excluding machines for traction vehicles)	EN 60034-2	IEC 60034-2
	Part 05:	Degrees of protection provided by the integral design of rotating electrical machines (IP code), Classification	EN 60034-5	IEC 60034-5
	Part 06:	Methods of cooling (IC code)	EN 60034-6	IEC 60034-6
	Part 07:	Classification of types of construction, mounting arrangements & terminal box position (IM code)	EN 60034-7	IEC 60034-7
	Part 09:	Noise limits	EN 60034-9	IEC 60034-9
	Part 12:	Starting performance of single-speed three-phase cage induction motors	EN 60034-12	IEC 60034-12
	Part 14:	Mechanical vibration of certain machines with shaft heights 56mm & higher - Measurement, evaluation & limits of vibration severity	EN 60034-14	IEC 60034-14
		General purpose three-phase induction motors having standard dimensions & output, Frame No. 56 to 315 & flange No. 65 to 740	EN 50347	IEC 60072-1
		Degree of protection provided by enclosures (IP code)	EN 60259	IEC 60529
Electrical apparatus for explosive gas atmospheres	Part 00:	General requirements	EN 60079-0	IEC 60079-0
	Part 01:	Flameproof enclosures "d"	EN 60079-1	IEC 60079-1
	Part 07:	Increased safety "e"	EN 60079-7	IEC 60079-7
Explosive atmospheres	Part 31:	Equipment dust ignition protection by enclosure "t"	EN 60079-31	IEC 60079-31

3. GUIDE TO MOTOR CHOICE

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First step is the classification of hazardous places in zones.
The end user shall classify the hazardous areas under his own responsibility.

Directive 1999/92/EC provides information regarding "Classification of places where explosive atmosphere may occur". The corresponding standards of reference are EN 60079-10 for gas & EN 61241-10 for dust.

Here below are the synthetic step-by-step guide to choice of the motors. *We will highlight all the characteristics of our motors.*

	ZONE CLASSIFICATION (presence of explosive atmosphere)		(1) Group	(2) Category	(3) Type of protection	(4) Gas group	IP Degree	(5) GAS Temperature Class (6) DUST Surface Temperature
GAS	0	Present continuously o for long period	II	1G	Electrical apparatus not allowed			
	1	Occur in normal operation occasionally	II	2G	Ex e : "Increased Safety" Ex d: "Frameproof Enclosure"	IIA, IIB, IIC	IP55	T1 = 450°C T2 = 300°C T3 = 200°C T4 = 135°C T5 = 100°C T6 = 85°C
	2	Rarely occur in normal operation & for short period	II	3G	Ex nA : "Non Sparking"	IIA, IIB, IIC	IP55	T1 = 450°C T2 = 300°C T3 = 200°C T4 = 135°C T5 = 100°C T6 = 85°C
POLVERI	20	Present continuously for long period	II	1D	Electrical apparatus not allowed			
	21	Occur in normal operation occasionally	II	2D	Ex tb : "protection by enclosure t"	IIIC, IIIB, IIIA	IP6X	T 125°C
	22	Rarely occur in normal operation & for short period	II	3D	Ex tc : "protection by enclosure t"	IIIB, IIIA	IP5X	

1.) **Group II** Comprises equipment intended for use in other places likely to become endangered by explosive atmosphere (surface plants different from mines).

2.) **Group II is sub-divided in to 3 categories:**

CATEGORY I Very high level of protection — **CATEGORY II** High level of protection — **CATEGORY III** Normal level of protection

G Explosive atmosphere consisting of a mixture with air & flammable substances in the form of gas, vapour or mist

D Explosive atmosphere in the form of a cloud of combustible dust in air

3.) **ELPROM Motors O ~ M series will have the following types of protection:**

Ex d Motor & Terminal box (GAS) — **Ex de** Motor Ex d & Terminal board Ex e (GAS) — **Ex tb** Protection by enclosure (DUST)

4.) **GAS Group**
IIC - Hydrogen, Acetylene, Carbon Disulfide
IIB - Diethyl Ether, Ethylene etc..
IIA - Propane, Butane, Pentane, Natural Gas etc..

DUST Group
IIIC - Typical Gases: Hydrogen, Acetylene
IIIB - Typical Gases: Diethyl Ether, Ethylene
IIIA - Typical Gases: Propane, Butane

5.) **(GAS)** In function of their maximum surface temperature the motors are classified in a **TEMPERATURE CLASS.**

6.) **(DUST)** The SURFACE TEMPERATURE must be less or equal than the minimum value between Tmax1 e Tmax2 where:

Tmax1 = 2/3. *Tcl* with *Tcl* ignition temperature in °C of the dust cloud.

Tmas2 = *Tl*-75°C with *Tl* ignition temperature in °C of a 5mm layer of dust.

Danger Explosive material

GAS - Main inflammable substances

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Inflammable substance	Group of GAS	Temperature of ignition	Temp. Class	Inflammable substance	Group of GAS	Temperature of ignition	Temp. Class
2-Methylpentane	IIA	300	T2	Ethyl formate	IIA	440	T2
Amyl acetate	IIA	360	T2	Methyl formate	IIA	450	T1
Butyl-n acetate	IIA	425	T2	Natural gas	IIA	482	T1
Ethyl acetate	IIA	426	T2	Isobutane	IIA	460	T1
Isobutyl acetate	IIA	420	T2	Isoheptane	IIA	220	T3
Methyl acetate	IIA	502	T1	Isohexane	IIA	264	T3
Propil acetate	IIA	430	T2	Isooctane	IIA	410	T2
Vinyl acetate	IIA	425	T2	Isoprene	IIA	220	T3
Acetone	IIA	465	T1	Methane	IIA	537	T1
Methanol	IIA	464	T1	Methylcyclopentane	IIA	258	T3
Brome thane	IIA	511	T1	Methylamine	IIA	430	T2
Butane	IIA	287	T3	Methylmetacrylate	IIA	430	T2
Butane - 1	IIA	384	T2	Paraldehyde	IIA	239	T3
Butane - 2	IIA	325	T2	Pentane	IIA	258	T3
Cycloexano	IIA	259	T3	Pyridine	IIA	483	T1
Cycloexanol	IIA	300	T2	Propane	IIA	470	T1
Cyclohexanone	IIA	419	T2	Propylamine	IIA	318	T2
Cyclohexene	IIA	244	T3	Propylbenzene	IIA	450	T1
Cyclopropane	IIA	498	T1	Propylene	IIA	455	T1
Cymene (p)	IIA	436	T2	Styrene	IIA	490	T1
Chloro-benzene	IIA	637	T1	Toluene	IIA	480	T1
Acetyl chloride	IIA	390	T2	m-Xylene	IIA	522	T1
Allyl chloride	IIA	390	T2	o-Xylene	IIA	464	T1
Chlorbutane	IIA	240	T3	p-Xilene	IIA	528	T1
Chloroethane	IIA	495	T1	1,2 Butadiene	IIB	430	T2
Vinyl chloride	IIA	472	T1	1,3 Butadiene	IIB	430	T2
Dichlorobenzene	IIA	648	T1	Dioxane	IIB	245	T3
Dichloroethylene 1,1	IIA	570	T1	Diethyl ether	IIB	160	T4
Dichloroethylene 1,2	IIA	441	T2	Ethyl vinyl ether	IIB	200	T3
Diethylamine	IIA	312	T2	Methyl vinyl ether	IIB	350	T2
Dimethylamine	IIA	400	T2	Acrylate ethyl	IIB	350	T2
Dimethylaniline	IIA	371	T2	Ethylene	IIB	425	T2
Dimethylbutane 2,3	IIA	405	T2	LPG	IIB	365	T2
Dimethylpentane 2,3	IIA	330	T2	Sulphurated Hydrogen	IIB	260	T3
Heptane	IIA	215	T3	Methylacrylate	IIB	415	T2
Hexane	IIA	233	T3	Carbon monoxide	IIB	605	T1
Heptane	IIA	515	T1	Ethylene oxide	IIB	435	T2
Ethylacetoacetate	IIA	350	T2	Propylene oxide	IIB	430	T2
Ethylamine	IIA	385	T2	Acetylene	IIC	305	T2
Ethylmercaptane	IIA	295	T3	Hydrogen	IIC	500	T1
Butyl formate	IIA	320	T2	Carbon disulfide	IIC	95	T6

DUST - Main inflammable substances

	Substance	Medium largeness particles (mm)	LEL (g/m3)	Cloud ignition Temp. Tcl (°C)	Layer 5mm thick ignition Temp. Tl (°C)
Metals, Alloys	Aluminium	10	60	560	430
	Bronze	18	750	390	260
	Iron	12	500	580	>450
	Graphite	7	30	600	680
	Lamp-black (carbon black)	13	15	620	435
	Sulphur	20	30	280	260
Wood, products of wood, fibres	Paper		100	620	370
	Cellulose (93% sweet wood, 6% hard wood)	14	15	420	335
	wood flour	60		470	305
	Wood (50% pear tree and 50% kernel)	35	100	500	340
	Wood (beech)	61		490	310
	Wood (pear tree)	27	100	500	320
	Sawdust of wood	65		470	290
	Cork	42	30	470	300
Agricultural products	Cacao	3	125	460-540	245
	Coffee	10	25	360	450
	Cereals (mixed powders)	37	125	510	300
	Wheat flour	56 - 125	60	480	>450
	Soy flour	20	200	620	280
	Gelatine	65	60	560	>450
	Wheat		100	470	220
	Dry milk	165	60	460	330
	Milk sugar	22	60 - 125	450	>450
	Rye			415-470	325
	Buttermilk	400		450	420
	Tobacco		60	485	290
	Black tea	76	125	510	300
	Sugar	32	30	360	>450
	Powdered sugar	17	60	350	>450

4. MOTORS CHARACTERISTICS

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4.1 Range of Motors

Ex ELPROM motors are manufactured in compliance with all the European standards concerning equipment and protective systems for potentially explosive atmosphere in compliance with the European Directive ATEX 94/9/CE (better known as ATEX).

In the table below are the range of motors for each type of protection.

In the following pages are the testing and certificates, main features of these motors and options available, subject to the type of protection.

Range of Motors

Type	Frame Size	Pole No	Output Range (kW)	Type of Protection	Temperature Class Surface Temperature	Tamb Max Range
3-ph (*) 1 Speed	56-132	2	0,12-11	Ex d Ex de	T3 T4 T5	Ta -40°C +60°C Ta -40°C +60°C Ta -40°C +60°C
	56.132	4	0,12-9,3			
	56-132	6	0,18-5,5	Ex tb	T125°C	Ta -40°C +50°C
	71-132	8	0,18-3			

(*) If provided of Terminal Protection (Normally PTC) inside the windings, can be driven by frequency converters.

(**) The capacitor of the phase motors is put inside a special Ex d cylindrical enclosure fitted on the motor itself. Otherwise it must be placed in a safe area.

4.2 Testing and certificates

Motors for hazardous areas have to be officially approved by a recognized test organization, authorized to issue test certificates, to ensure compliance with standards for this type of equipment.

Motors are defined and classified according to the categories and protection type which are defined in the corresponding standards.

Depending on the nature of the atmosphere, it is the responsibility of the user to determine which group and which maximum surface temperature should be specified for the motor installation.

The Ex motors built by ELPROM are manufactured in compliance with all the European standards concerning equipments & protective systems for explosive atmosphere as requested by the European Directive 94/9/CE (better known as ATEX Directive).

The motors have been tested by a Notified Laboratory which released:

EC Type Certificate — **Product Quality assurance Notification**

It means that all the Ex motors are manufactured in compliance with the technical drawings and documents approved by the Notified Body after testing the motors (performing type test as written in the EN standards) and the production of such motors follows all the procedures requested by the Directive. Every year the Production of Ex motors is valuated by a Notified body to verify that all the procedures are constantly respected.

Each motor or batch of motors will be despatched together with the following documents:

EC Declaration of Conformity

Installation Manual and Safety Instructions, stating all important notes on the type/s of protection of the motors.

4.3 Main Features

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ELPROM Ex electric motors are manufactured and tested in compliance with all the EN/IEC standards and also in campaince with the main European Directives. First of all the directive 94/9/EC (ATEX as already explained), 2004/108/EC (EMC Electro Magnetic Compatibility), 2006/42/EC (Machinery Directive), 2002/95/EC (RoHS).

ATEX Characteristics:
Suitable for Surface plants different from mines (Group II)

Presence of GAS : Zone 1
Type of protection : 'Ex d' or 'Ex de'
Gas group : IIC, IIB and IIA
Temperature class : T3, T4, T5 (also suitable for T2, T1)
Ambient temperature range : -40°C +60°C for temperature class T3; -40°C +60°C for temperature class T4; -40°C +60°C for temperature class T5

Presence of DUST : Zone 21 and Zone 22
Dust group : IIIC, IIIB, IIIA
Type of protection : Ex tb IP66 (IP65 for Ex de)
Surface Temperature : T125°C
Ambient temperature range : -40°C +60°C

All the motors are asynchronous with squirrel cage rotor, wound stator, closed and externally ventilated in compliance with EN 60034-6 (IC 411).

The Supply Voltages
allowed to exceed the nominal value of ±5%.. All the electrical and mechanical features & the testing methods comply with the standard EN 60034-1.

The Power Ratings & the Dimensions
of the motors comply with EN 50347 and IEC 60072-1, the mounting arrangements B3, B5, B14 comply with EN 60034-7. All the geometrical dimensions are unified according to the tables UNEL 13113-71; 13117-71; 13118- 7; IEC 60072-1.

The IP Degrees of Protection
of the motors comply with EN 60034-5 and EN 60259.

Insulation Class
All the motors have an insulation class F in compliance with EN 60034-1. Insulation class H on request.

The Bearings
are high-quality single raw deep grooves ball bearings, pre-loaded by a wave spring.

Duty
The motors are normally made for S1 duty; otherwise intermittent duties can be provided on request after performing the heating tests.

Windings
Made of enamelled copper wires, insulated with two layers (insulation class H). They are painted with another layer of varnish and after this placed in an oven for the drying process.
It is also possible to tropicalize the windings using special additional varnish with high hygroscopic characteristics so to be used in places with an humidity >60% (see options)

Rotors
Die-cast aluminium squirrel cage or aluminium alloy (Al-Si Silumin).

The Shafts
of the motors and the keys-shaft comply IEC 60072-1. Special shaft are made on request (see options).

Frame
(in compliance with EN 50347)
Die-cast aluminium with high mechanical strength, with a good thermal conductivity and light weight.
The feet can be mounted on the motor frame in 3 different positions, in the bottom or on right and left side.

Terminal Box
The terminal box of motor B3 is fixed on the top of the motor. At the same time, the terminal box has cable entries in four different positions"

Flanges and Shields
(in compliance with EN 503471)
Die-cast aluminium, with dimensions as per standard IEC 60072-1, or with special shapes on request:
The motor is completely modular so that the flanges can be mounted or removed depending on the needs without affecting the Ex type of protection (as the flange are mounted on the front shield).

Ventilation
(in compliance with EN 60034-6)
Self-ventilated motors IC 411. Depending on the type of protection the fan can be in plastic or in aluminium.
Ex d, Ex de : Plastic fan
Ex tD A21 : Antistatic plastic or aluminium fan

Fan Cover
Zinc-plated steel sheet.

Noise
in compliance with EN 60034-9

4.4 Main Options

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Axially Locked Shaft
Motors with a locked bearing on the font shield using an elastic metal ring. This solution is necessary in case of alternative axial stress (ie. Bevel gear pinion with alternative load or motion, frequent start-up under load or with high inertia) so to create axial movement of the shaft and bumps on the bearings.

Low Temperatures Motors *(-40°C)*
They have to be fitted with special bearing, metallic fan, metallic cable gland and plugs or made with special plastic materials.
In these cases, if there is a risk of condensation, it is better to fit the motors with "anti-condensation heaters".

Anti-Condensation Heaters *(Option)*
For motors installed in cold and wet places, with significant temperature ranges, moisture condensation can be dangerous for the resistance of the winding insulation.
Upon request, we can apply appropriate heaters directly on the heads of winding.
The terminals are connected to a terminal board inside the connection box of the motor.
The heaters are available at 110V & 220V, with a tolerance of +/- 10%.

Tropicalization of Windings
If the motors are installed outdoors or in high humidity areas, the windings may be tropicalized with a special varnish with high hygroscopic characteristics in order to protect the insulation materials by the condensation. This protection avoid the reduction of the insulation properties of the windings.

Inverter Duty Motors
All these motors can be driven by a converter.
In this case they must be fitted with thermal protections inside the windings.

Special Voltages & Frequencies
The standard three phase motors are produced at the following nominal voltages and frequencies:
230 / 400 V, 50 Hz.
The motors can run at a different nominal voltage with a tolerance of +/- 5%.
On customer request, we can produce motors with special voltage and frequency.

Special Shafts
On customer request, it is possible to supply motors with special shaft (according to the customer drawing).
It is necessary to send the drawing to our Technical Department for a feasibility study.
It is possible to supply motors with shaft of different material from the standard (C40), using Stainless Steel or others with standard or special dimensions.

Special Flanges
Special flange available upon request, due to the modular flange assembling allows it.

Rain Fan Cover *(Option)*
For outdoor applications, vertical mounting, DE shaft down (V5, V1, V18).
It is suggested to assemble a special cowl with a rain cover. It is available for all the frame sizes.

Thermistors *(PTC Positive Temperature Coefficient)*
They must be used in case of motors driven by inverters.
They are fitted inside the windings in number of 3 with a series connection to be connected to an appropriate tripping device that cut off the motors supply in case the winding reach the thermal probe limit temperature.
Protectors will be available upon request, with different temperature setting in respect of the maximum Temperature class or surface temperature of the motor.

Thermal Cut-off *(Option) (Bimetallic Probes)*
Motors with 1 or 2 thermal protectors with normally closed contact in series connection into the winding.
The series of contact shall be connected to an appropriate tripping device that cut off the motors supply in case the winding reach the thermal probe limit temperature.
On request protectors will be available with different temperature setting in respect of the maximum Temperature class or surface temperature of the motor.

PT100 *(Option)*
It is a device that increase its resistance according with the increasing of the temperature.
It is useful for continuous measuring of the winding temperature, properly connected to an electronic equipment.

Casing Material *(Against Corrosion)*
The ELPROM motors have die-casted aluminium components & sandblasted. If it is not requested, the motors are supplied unpainted.

4.5 Motor Identification

EM3 71 S 4P

Model of Motor Type: Three-phase Ex d
Frame Size: 56, 63, 71, 80, 90, 100, 112, 132, 160, 180, 200, 225, 280, 315, 355
Stator Dimension: S: Short Housing; M: Medium Housing; L: Long Housing
Poles: 2, 4, 6, 8 poles
Supply Voltage: 50 Hz 380V AC to 455V AC; 60 Hz 440V AC to 460V AC
Temperature Class: T3 (200°C), T4 (135°C), T5 (100°C)
Ingress Protection: IP55
Thermal Protector: PTC Glass T4 (build in) & other option available

5. TERMINAL BOX, CABLE ENTRIES & CONNECTIONS

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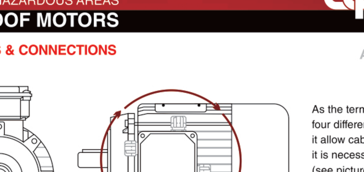
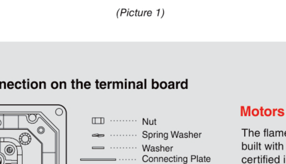
The terminal box is fixed on the motor top. (see picture 1).



(Picture 1) (Picture 2)

As the terminal box has four different entries position, it allow cable entry where it is necessary. (see picture 2).

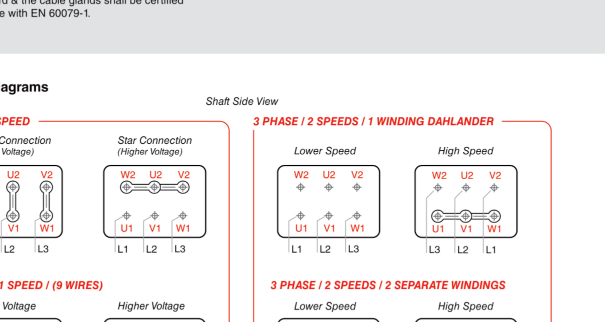
5.1 Cable connection on the terminal board



Motors 'Ex d'
For these type of motors there is no need of a special terminal board & the cable glands shall be certified in compliance with EN 60079-1.

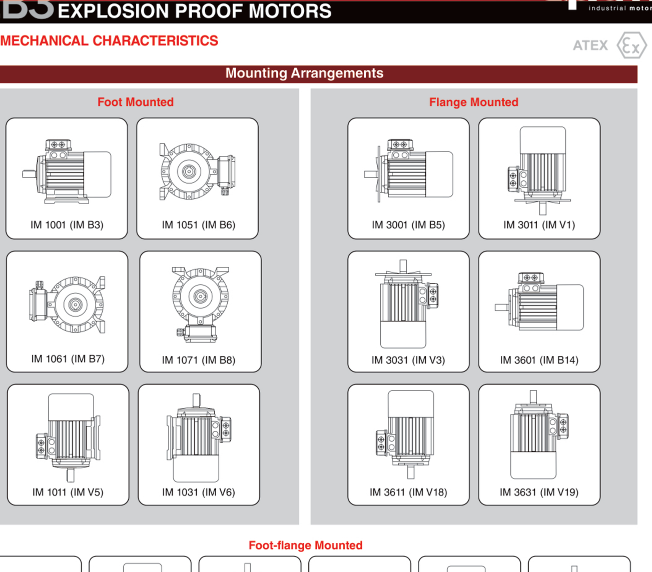
Motors 'Ex de'
The flameproof motors with increased safety terminal box are built with a special terminal board & the cable glands shall be certified in compliance with EN 60079-7.
In the picture you can see the special terminal board complying with EN 60079-7.
In case of motor fitted with thermal protection heaters etc, the wires of these devices will be connected when possible to the auxiliary pins of a 8 pins terminal board.
If it is not possible, they must be connected to the cable by welding the wires of the device to the cable wires and insulating them using a thermos sheath.

5.2 Wiring Diagrams



6. MECHANICAL CHARACTERISTICS

ATEX



In the table here below we show the main components of the motors and the material they are made of.

Main Components

Component	Material	Note
Frame	Cast Iron / Aluminium	Removable feet (Aluminium)
End-Shields	Cast Iron / Aluminium	
Flange B5	Cast Iron / Aluminium	
Flange B14	Cast Iron / Aluminium	
Terminal box	Cast Iron / Aluminium	
Shaft	Steel C40	
Rotor	Magnetic Lamination die-cast Aluminium	
Stator	Magnetic Lamination	
Windings	Enamelled Copper Wires (2 layers)	
V-Ring	NBR Rubber	Special Material: VITON
Bearings	Deep Groove Ball Bearings	See below
Fan	Plastic (Ex D, Ex de), Aluminium or antistatic plastic (Ex tb)	

7. SPARE PARTS, OVERHAULS & REPAIRS

ATEX

7.1 Personnel qualification

Overhauls and repairs must be carried out only by qualified people in accordance with the standard EN 60079-17 or national standards (last edition). Qualified people must have knowledge about explosion protection.

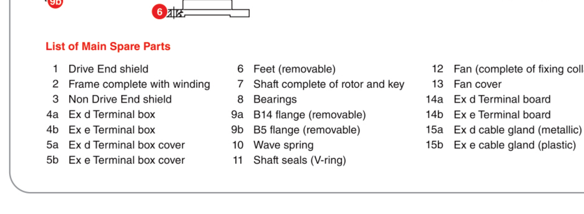
These repairs can only be done under the control or in agreement with ELPROM or by an ATEX certified workshop.

In case these rules are not complied, the product will not be covered by ELPROM ATEX certification anymore.

Repairs must be made regarding ehe rules asdefine in EN 60079-19 standard.

7.2 Spare parts

All motors components must be replaced with original spare parts. Please contact ELPROM directly & provide the serial number of the motor in order to be authorized for the repairs.



List of Main Spare Parts

1 Drive End shield
2 Frame complete with winding
3 Non Drive End shield
4a Ex d Terminal box
4b Ex e Terminal box
5a Ex d Terminal box cover
5b Ex e Terminal box cover
6 Feet (removable)
7 Shaft complete of rotor and key
8 Bearings
9a B14 flange (removable)
9b B5 flange (removable)
10 Wave spring
11 Shaft seals (V-ring)
12 Fan (complete of fixing collar)
13 Fan cover
14a Ex d Terminal board
14b Ex e Terminal board
15a Ex d cable gland (metallic)
15b Ex e cable gland (plastic)

8 ELECTRICAL DATA

Here below we give some information about all the types of motors.

Three Phase 1 Speed
- Asynchronous motor, squirrel cage rotor, self ventilated (IC411).
- Duty S1, Insulation class "F", 230/400V - 50 Hz.

Three Phase 2 Speeds
- Asynchronous motor, squirrel cage rotor, self ventilated (IC411).
- Duty S1, Insulation class "F", 400V - 50 Hz

Poles	Connections	CONSTANT TORQUE (General Purpose) High Speed	Low Speed	QUADRATIC TORQUE (Centrifugal Machines) High Speed	Low Speed
2/4 4/8	Dahlander	YY	Δ	YY	Y
4/6 6/8	2 Separate windings	Y	Y	Y	Y

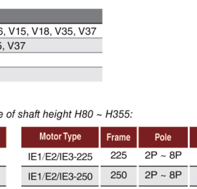
In case of motors driven by INVERTER:
- Motor must be equipped with PTC thermistor.
- Motor driven by frequency converter means not to have a voltage & current not perfectly sinusoidal with consequently increase of losses and heating of the motor.
- Speed variation affects also the ventilation.
- The stress on the bearings increases and they shall be checked more frequently; for this reason the operating period with a speed above 3600 rpm shall never exceed 10% of the complete working cycle.

9. CAST IRON SERIES MOTORS

ATEX

Ex d / Ex de - Explosion Proof Motors

Cast Iron Frame



ELPROM Explosion Proof Cast Iron Motor (Ex d-IP55-IP66)

Motor Features:
Three-phase, multi voltage, IP55, TEFC

Output : 0.37 up to 315kW
Voltage : 220 ~240/380-415V 380~415/660V
Continuous duty : S1
Performance : According to IEC 34
Degree of Protection : IP56, IP65 or IP66

Suitable for applications:
- Pumps, Fans, Crushers
- Conveyor belts
- Mills
- Centrifugal machines
- Presses
- Elevators
- Packaging equipment
- Grinders and etc...

Frame Size	Sample of Constructions & Mounting Arrangements (IM)
80 ~ 112	B3, B5, B6, B7, B8, B14, B34, B35, V1, V3, V5, V6, V15, V18, V35, V37
132 ~ 160	B3, B5, B6, B7, B8, B35, V1, V3, V5, V6, V15, V35, V37
180 ~ 280	B3, B5, B35, V1
315 ~ 355	B3, B35, V1

9.2 Bearing Type

The bearing type of shaft height H80 ~ H355:

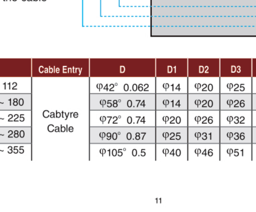
Motor Type	Frame	Pole	Drive-End	Non Drive-End	Motor Type	Frame	Pole	Drive-End	Non Drive-End
IE1/E2/IE3-80	80	2P ~ 8P	6204 2RZC3	6204 2RZC3	IE1/E2/IE3-225	225	2P ~ 8P	6313 C3	6313 C3
IE1/E2/IE3-90	90	2P ~ 8P	6205 2RZC3	6205 2RZC3	IE1/E2/IE3-250	250	2P ~ 8P	6314 C3	6314 C3
IE1/E2/IE3-100	100	2P ~ 8P	6206 2RZC3	6206 2RZC3	IE1/E2/IE3-280	280	2P	6314 C3	6314 C3
IE1/E2/IE3-112	112	2P ~ 8P	6206 2RZC3	6206 2RZC3	IE1/E2/IE3-280	280	4P ~ 8P	6317 C3	6317 C3
IE1/E2/IE3-132	132	2P ~ 8P	6308 2RZC3	6308 2RZC3	IE1/E2/IE3-315	315	2P	6317 C3	6317 C3
IE1/E2/IE3-160	160	2P ~ 8P	6309 C3	6309 C3	IE1/E2/IE3-315	315	4P ~ 8P	6319 C3	6319 C3
IE1/E2/IE3-180	180	2P ~ 8P	6311 C3	6311 C3	IE1/E2/IE3-355	355	2P	6319 C3	6319 C3
IE1/E2/IE3-200	200	2P ~ 8P	6312 C3	6312 C3	IE1/E2/IE3-355	355	4P ~ 8P	6322 C3	6322 C3

10. DIAGRAM OF SEAL RING

10.1 Dimension of Sealing Ring
(external diameter of entry cable for uses)

The diameter of the cable led into the terminal box should be in accordance with that of the hole of seal ring. Seal ring for cabtyre cable & armor cabtyre cable have many concentric grooves & the inner diameter of the seal ring can be selected according to the diameter of the cable. it should be ensure that there is no clearance between the seal ring & the cable, the seal ring & the base of the terminal box after the cable gland is pressed.

Schematic diagram of seal ring



*** Cables should be selected correctly according to rated current & operation condition of the motor.*

Type	Cable Entry	D	D1	D2	D3	D4	D5	b	b1
EB3 80 ~ 112	Cabtyre Cable	φ42° 0.062	φ14	φ20	φ25	---	---	25	24
EB3 132 ~ 180		φ58° 0.74	φ14	φ20	φ26	φ31	φ35	26	24
EB3 200 ~ 225		φ72° 0.74	φ20	φ26	φ32	φ38	φ42	32	30
EB3 250 ~ 280		φ90° 0.87	φ25	φ31	φ36	φ45	φ50	38	36
EB3 315 ~ 355		φ105° 0.5	φ40	φ46	φ51	φ57	φ64	45	42

11. ELECTRICAL DATA (IP55) Cast Iron (EB3 Series)

ATEX

3000 (2P) Voltage: 400V 50Hz

Type	Power (kW)	Speed (rpm)	Full load / Current A V380	V400	V415	Locked Rotor Current (Current Rated)	Eff. (%)	Power Factor (Cosφ)	Rated Torque (Nm)	Locked Rotor Torque	Breakdown Torque rated	Moment of Inertia (kgm²)	Noise LP dB (A)	Net Weight (kg)
EB3-80M1-2	0.75	2850	1.8	1.7	1.7		75.5	0.83	2.4			0.0010	57	28
EB3-80M2-2	1.1	2852	2.5	2.4	2.4	7.0	79.6	0.84	3.5			0.0013	58	31
EB3-90S-2	1.5	2866	3.3	3.2	3.1		81.3	0.84	4.8			0.0020	61	36
EB3-90L-2	2.2	2868	4.6	4.5	4.4		83.2	0.85	7			0.0026	61	40
EB3-100L-2	3	2892	6.1	5.9	5.8		84.6	0.87	9.5		2.3	0.0036	65	50
EB3-112M-2	4	2941	7.9	7.6	7.5		85.8	0.88	12.7			0.0068	67	66
EB3-132S1-2	5.5	2922	10.7	10.4	10.2		87.0	0.88	17.5			0.0126	70	82
EB3-132S2-2	7.5	2925	14.3	13.8	13.6		88.1	0.88	23.9			0.0145	70	87
EB3-160M1-2	11	2952	20.5	20.0	19.7		89.4	0.88	35			0.048	72	149
EB3-160M2-2	15	2954	27.27	26.9	26.6		90.3	0.89	47.7	2.0	2.4	0.0569	72	159
EB3-160L-2	18.5	2955	34.0	33.0	32.5	7.5	90.9	0.89	58.9			0.064	72	172
EB3-180M-2	22	2954	40.2	39.1	38.5		91.3	0.9	70		2.3	0.0982	75	232
EB3-200L1-2	30	2969	54.4	52.9	52.1		92.0	0.9	95.5		2.4	0.161	81	289
EB3-200L2-2	37	2969	66.8	64.9	64.0		92.5	0.9	117.8			0.191	81	307
EB3-225M-2	45	2974	80.9	78.6	77.5		92.9	0.9	143.2			0.271	81	351
EB3-250M-2	55	2974	98.5	95.7	94.4		93.2	0.9	175.1		2.3	0.338	84	510
EB3-280S-2	75	2977	133.8	129.7	127.9		93.8	0.9	238.7			0.647	85	639
EB3-280M-2	90	2978	159.7	155.1	152.9		94.1	0.91	286.5			0.765	85	695
EB3-315S-2	110	2982	192.6	187.1	184.4		94.3	0.91	350.1			1.358	88	1075
EB3-315M-2	132	2984	230.4	223.8	220.6		94.6	0.91	420.2			1.499	88	1182
EB3-315L1-2	160	2987	275.7	267.7	263.8		94.8	0.91	509.3			1.697	88	1280
EB3-315L2-2	200	2988	343.9	333.9	329.1		95.0	0.91	636.6	1.8		1.923	88	1440
EB3-355S1-2	(185)	2988	318.1	308.9	304.4		95.0	0.91	588.9			2.317	88	1680
EB3-355S2-2	(200)	2988	343.9	333.9	329.1	7.4	95.0	0.92	636.6		2.2	2.317	88	1740
EB3-355M1-2	(220)	2989	378.3	367.3	362.0		95.0	0.92	700.3			2.670	88	1790
EB3-355M2-2	250	2990	429.9	417.4	411.4		95.0	0.92	795.8			2.670	89	1840
EB3-355L1-2	(280)	2990	481.5	467.5	460.8		95.0	0.92	891	1.6		3.141	89	2040
EB3-355L2-2	315	2991	541.7	525.9	518.3		95.0	0.92	1003			3.770	89	2060

** Note: The value with ( ) is not recommended.*

3600 (2P) Voltage: 460V 60Hz

Type	Power (kW)	Speed (rpm)	Full load / Current A V440	V460	V480	Locked Rotor Current (Current Rated)	Eff. (%)	Power Factor (Cosφ)	Rated Torque (Nm)	Locked Rotor Torque	Breakdown Torque rated	Moment of Inertia (kgm²)	Noise LP dB (A)	Net Weight (kg)
EB3-80M1-2	0.75	3458	1.8	1.7	1.7		77.4	0.88	2.4			0.0010	60	28
EB3-80M2-2	1.1	3458	2.4	2.3	2.3	7.0	82.5	0.88	3.5			0.0013	61	31
EB3-90S-2	1.5	3458	3.1	3.1	3.0		84.0	0.87	4.8			0.0020	64	36
EB3-90L-2	2.2	3464	4.4	4.3	4.3		85.5	0.86	7			0.0026	64	40
EB3-100L-2	3	3470	5.8	5.7	5.5		87.5	0.89	9.5		2.3	0.0036	68	50
EB3-112M-2	4	3470	7.6	7.5	7.3		87.5	0.91	12.7			0.0068	70	66
EB3-132S1-2	5.5	3500	10.3	10.1	9.9		88.6	0.90	17.5			0.0126	73	82
EB3-132S2-2	7.5	3494	13.8	13.5	13.2		89.5	0.91	23.9			0.0145	73	87
EB3-160M1-2	11	3530	20.2	19.7	19.4		90.5	0.91	35			0.048	75	149
EB3-160M2-2	15	3530	27.5	26.9	26.4		90.3	0.91	47.7	2.0	2.4	0.0569	75	159
EB3-160L-2	18.5	3524	33.6	32.8	32.2	7.5	91.0	0.91	58.9			0.064	75	172
EB3-180M-2	22	3548	39.39	39.0	38.2		91.0	0.90	70		2.3	0.0982	78	232
EB3-200L1-2	30	3554	54.0	52.8	51.7		92.0	0.91	95.5		2.4	0.161	84	289
EB3-200L2-2	37	3554	66.1	64.7	63.4		93.3	0.91	117.8			0.191	84	307
EB3-225M-2	45	3554	79.9	78.1	76.6		93.7	0.90	143.2			0.271	84	351
EB3-250M-2	55	3554	97.6	95.5	93.6		94.0	0.91	175.1		2.3	0.338	87	570
EB3-280S-2	75	3572	132.2	129.3	126.7		94.6	0.91	238.7			0.647	88	639
EB3-280M-2	90	3560	157.1	153.6	150.6		95	0.91	286.5			0.765	88	695
EB3-315S-2	110	3572	189.9	185.7	181.9		95	0.92	350.1			1.358	91	1075
EB3-315M-2	132	3752	226.7	221.6	217.2		95.4	0.92	420.2			1.499	91	1182
EB3-315L1-2	160	3572	271.8	265.7	260.3		95.4	0.93	509.3			1.697	91	1280
EB3-315L2-2	200	3572	338.4	330.7	324.0		95.4	0.93	636.6	1.8		1.923	91	1440
EB3-355S1-2	(185)	3572	313.0	305.9	299.7		95.4	0.93	588.9			2.317	91	1680
EB3-355S2-2	(200)	3572	338.4	330.7	324.0	7.4	95.4	0.93	636.6		2.2	2.317	91	1740
EB3-355M1-2	(220)	3572	372.2	363.8	356.4		95.5	0.93	700.3			2.670	91	1790
EB3-355M2-2	250	3578	422.9	413.4	405.0		95.5	0.915	795.8			2.670	92	1840
EB3-355L1-2	(280)	3578	473.6	463.0	453.6		95.8	0.915	891	1.6		3.141	92	2040
EB3-355L2-2	315	3578	533.0	520.9	570.4		95.8	0.915	1003			3.770	92	2060

** Note: The value with ( ) is not recommended.*

11. ELECTRICAL DATA (IP55) Cast Iron (EB3 Series)

ATEX

1400 (4P) Voltage: 400V 50Hz

Type	Power (kW)	Speed (rpm)	Full load / Current A V380	V400	V415	Locked Rotor Current (Current Rated)	Eff. (%)	Power Factor (Cosφ)	Rated Torque (Nm)	Locked Rotor Torque	Breakdown Torque rated	Moment of Inertia (kgm²)	Noise LP dB (A)	Net Weight (kg)
EB3-80M1-4	0.55	1420	1.3	1.3	1.3		80.7	0.75	3.5			0.0019	46	29
EB3-80M2-4	0.75	1425	1.8	1.8	1.8	7.0	82.3	0.76	4.8			0.0023	46	30
EB3-90S-4	1.1	1429	2.6	2.5	2.5		83.3	0.77	7.0		2.3	0.0031	52	37
EB3-90L-4	1.5	1431	3.4	3.4	3.3		85	0.78	9.5			0.0041	52	40
EB3-100L1-4	2.2	1440	4.8	4.7	4.7		86.4	0.81	14			0.0099	53	51
EB3-100L2-4	3	1442	6.4	6.3	6.2		87.4	0.82	19.1			0.0131	56	56
EB3-112M-4	4	1457	8.5	8.2	8.1		88.3	0.82	25.5			0.016	56	72
EB3-132S-4	5.5	1464	11.3	11.0	10.9		89.2	0.83	35		2.4	0.0339	59	89
EB3-132M-4	7.5	1466	15.1	14.7	14.5		90.1	0.84	47.7			0.0424	59	102
EB3-160M-4	11	1474	21.9	21.3	21.0		91	0.84	70	2.0		0.0917	66	146
EB3-160L-4	15	1476	29.3	28.4	28.1	7.5	91.8	0.85	95.5			0.118	66	166
EB3-180M-4	18.5	1476	35.4	34.4	34.0		92.2	0.85	117.8			0.164	66	217
EB3-180L-4	22	1477	41.9	40.8	40.3		92.6	0.85	140.1		2.3	0.177	66	289
EB3-200L-4	30	1480	56.8	55.2	54.5		93.2	0.86	191			0.288	71	360
EB3-225S-4	37	1485	68.9	67.0	66.1		93.6	0.87	235.5			0.536	73	405
EB3-225M-4	45	1485	83.5	81.1	80.1		93.9	0.87	286.5			0.613	73	503
EB3-250M-4	55	1485	101.6	98.7	97.4		94.2	0.87	350.1		2.4	0.758	76	663
EB3-280S-4	75	1490	136.2	132.4	130.6		95.0	0.87	477.5			1.544	78	719
EB3-280M-4	90	1490	161.3	156.7	145.6		95.0	0.87	572.9			2.504	78	751
EB3-315S-4	110	1491	194.4	188.8	186.1		95.4	0.88	700.3			3.122	80	1091
EB3-315M-4	132	1491	232.7	226.1	222.9		95.4	0.88	840.3			3.493	80	1146
EB3-315L1-4	160	1492	278.4	270.4	266.5		95.4	0.89	1019			3.969	86	1267
EB3-315L2-4	200	1492	347.3	337.3	332.5		95.4	0.89	1273	1.9		4.657	86	1437
EB3-355S1-4	(185)	1492	321.3	312.0	307.6		95.4	0.90	1178			4.98	86	1700
EB3-355S2-4	(200)	1492	347.3	337.3	332.5	7.4	95.4	0.90	1273		2.2	5.346	86	1760
EB3-355M1-4	(220)	1492	382.0	371.0	365.8		95.5	0.90	1401			6.005	86	1800
EB3-355M2-4	250	1493	434.2	421.6	415.6		95.5	0.90	1591			6.518	87	1883
EB3-355L1-4	(280)	1493	486.2	472.2	465.5		95.8	0.90	1782	1.8		7.323	87	2050
EB3-355L2-4	315	1494	547.0	531.2	523.7		95.8	0.90	2005			8.202	87	2080

** Note: The value with ( ) is not recommended.*

1800 (4P) Voltage: 460V 60Hz

Type	Power (kW)	Speed (rpm)	Full load / Current A V440	V460	V480	Locked Rotor Current (Current Rated)	Eff. (%)	Power Factor (Cosφ)	Rated Torque (Nm)	Locked Rotor Torque	Breakdown Torque rated	Moment of Inertia (kgm²)	Noise LP dB (A)	Net Weight (kg)
EB3-80M1-4	0.55	1713	1.2	1.2	1.2		80.7	0.75	3.5			0.0019	49	29
EB3-80M2-4	0.75	1718	1.7	1.7	1.7	7.0	82.5	0.76	4.8			0.0023	49	30
EB3-90S-4	1.1	1718	2.4	2.4	2.3		84	0.77	7.0		2.3	0.0031	55	37
EB3-90L-4	1.5	1724	3.4	3.4	3.4		85	0.78	9.5			0.0041	55	40
EB3-100L1-4	2.2	1742	4.6	4.6	4.4		87.5	0.81	14			0.0099	56	51
EB3-100L2-4	3	1742	6.2	6.2	6.0		87.5	0.82	19.1			0.0131	56	56
EB3-112M-4	4	1742	8.3	8.3	8.0		88.3	0.82	25.5			0.016	59	72
EB3-132S-4	5.5	1748	11.0	11.0	10.6		89.5	0.83	35		2.4	0.0339	62	89
EB3-132M-4	7.5	1748	14.8	14.8	14.2		90.1	0.84	47.7			0.0424	62	102
EB3-160M-4	11	1760	21.4	21.4	20.6		91	0.84	70	2.0		0.0917	69	146
EB3-160L-4	15	1760	28.8	28.8	27.7	7.5	91.8	0.85	95.5			0.118	69	166
EB3-180M-4	18.5	1760	34.6	34.6	33.2		92.4	0.85	117.8			0.164	69	217
EB3-180L-4	22	1766	41.1	41.1	39.4		91.6	0.85	140.1		2.3	0.177	69	289
EB3-200L-4	30	1766	55.6	55.6	53.4		93.2	0.86	191			0.288	74	360
EB3-225S-4	37	1778	67.9	67.9	65.2		93.6	0.87	235.5			0.536	76	405
EB3-225M-4	45	1778	82.1	82.1	78.8		93.9	0.87	286.5			0.613	76	503
EB3-250M-4	55	1778	99.7	99.7	95.8		94.2	0.87	350.1		2.4	0.758	79	663
EB3-280S-4	75	1784	133.9	133.9	128.5		95.0	0.87	477.5			1.544	81	719
EB3-280M-4	90	1784	158.8	158.8	152.3		95.0	0.87	572.9			2.504	81	751
EB3-315S-4	110	1784	191.0	191.0	183.1		95.0	0.88	700.3			3.122	83	1091
EB3-315M-4	132	1784	229.2	229.2	219.7		95.0	0.88	840.3			3.493	83	1146
EB3-315L1-4	160	1784	274.8	274.8	263.2		95.0	0.89	1019			3.969	89	1267
EB3-315L2-4	200	1784	342.0	342.0	327.7		95.0	0.89	1273	1.9		4.657	89	1437
EB3-355S1-4	(185)	1784	316.4	316.4	303.1		95.0	0.90	1178			4.98	89	1700
EB3-355S2-4	(200)	1784	342.0	342.0	327.7	7.4	95.0	0.90	1273		2.2	5.346	89	1760
EB3-355M1-4	(220)	1784	376.2	376.2	360.4		95.0	0.90	1401			6.005	89	1800
EB3-355M2-4	250	1784	427.5	427.5	409.6		95.5	0.90	1591			6.518	90	1883
EB3-355L1-4	(280)	1784	478.8	478.8	458.8		95.8	0.90	1782	1.8		7.323	90	2050
EB3-355L2-4	315	1784	538.7	538.7	516.2		95.8	0.90	2005			8.202	90	2080

** Note: The value with ( ) is not recommended.*

11. ELECTRICAL DATA (IP55) Cast Iron (EB3 Series)

ATEX

1000 (6P) Voltage: 400V 50Hz

Type	Power (kW)	Speed (rpm)	Full load / Current A V380	V400	V415	Locked Rotor Current (Current Rated)	Eff. (%)	Power Factor (Cosφ)	Rated Torque (Nm)	Locked Rotor Torque	Breakdown Torque rated	Moment of Inertia (kgm²)	Noise LP dB (A)	Net Weight (kg)
EB3-80M1-6	0.37	926	1.3	1.2	1.2		63.0	0.70	3.5	1.9		0.0021	61	27.6
EB3-80M2-6	0.55	928	1.6	1.5	1.5	6.5	74.0	0.72	5.3			0.0031	61	30
EB3-90S-6	0.75	933	2.1	2.0	2.0		77.7	0.72	7.2			0.0043	56	35
EB3-90L-6	1.1	933	2.9	2.8	2.8		79.9	0.73	10.5		2.1	0.0058	56	40
EB3-100L-6	1.5	936	3.9	3.8	3.7	6.8	81.5	0.75	14.3			0.0109	60	48
EB3-112M-6	2.2	959	5.5	5.4	5.3		83.4	0.76	21.0			0.015	64	62
EB3-132S-6	3	974	7.4	7.2	7.2		84.9	0.76	28.6			0.0341	68	87
EB3-132M1-6	4	974	9.5	9.2	9.1		86.1	0.76	38.2			0.041	68	95
EB3-132M2-6	5.5	974	12.6	12.3	12.2	7	87.4	0.77	52.5		2.4	0.0529	68	103
EB3-160M-6	7.5	978	16.3	15.9	15.7		89.0	0.77	71.6			0.105	72	147
EB3-160L-6	11	979	23.3	22.7	22.4		90.0	0.78	105.0			0.138	72	175
EB3-180L-6	15	983	30.2	29.4	29.1		91.0	0.81	143.2		2.1	0.22	71	230
EB3-200L1-6	18.5	985	37.9	36.9	36.5		91.5	0.81	176.7	2.0		0.349	74	279
EB3-200L2-6	22	985	44.3	43.1	42.6		92.0	0.83	210.1			0.399	74	284
EB3-225M-6	30	987	59.2	57.6	56.9		92.5	0.86	286.5		2.4	0.653	74	356
EB3-250M-6	37	988	71.7	69.8	68.9		93.0	0.86	353.3			0.941	72	465
EB3-280S-6	45	991	84.8	82.4	81.4		93.5	0.86	429.7			1.63	73	589
EB3-280M-6	55	992	102.0	99.2	97.8		93.8	0.86	525.2		2.2	1.868	73	655
EB3-315S-6	75	993	141.4	137.5	135.8		94.2	0.86	716.2			3.657	77.5	1074
EB3-315M-6	90	993	167.2	162.6	160.5	7.2	94.5	0.86	859.4			4.149	77.5	1170
EB3-315L1-6	110	994	203.7	198.1	195.5		94.5	0.87	1050			5.063	77.5	1295
EB3-315L2-6	132	994	240.9	234.2	231.1		94.5	0.87	1260			5.977	76.5	1450
EB3-355S-6	160	994	291.4	283.3	279.5		94.5	0.87	1528		2.0	11.64	83	1770
EB3-355M1-6	(185)	994	336.9	327.6	323.2		95.0	0.88	1767			12.513	83	1820
EB3-355M2-6	200	995	363.5	353.3	348.7		95.0	0.88	1910	1.9		13.386	83	1850
EB3-355L1-6	(220)	995	400.0	388.6	383.6		95.0	0.88	2101			15.132	83	2070
EB3-355L2-6	250	995	454.4	441.7	435.9		95.0	0.88	2387			16.878	83	2130

** Note: The value with ( ) is not recommended.*

1170 (6P) Voltage: 460V 60Hz

Type	Power (kW)	Speed (rpm)	Full load / Current A V380	V400	V415	Locked Rotor Current (Current Rated)	Eff. (%)	Power Factor (Cosφ)	Rated Torque (Nm)	Locked Rotor Torque	Breakdown Torque rated	Moment of Inertia (kgm²)	Noise LP dB (A)	Net Weight (kg)
EB3-80M1-6	0.37	1125	1.2	1.2	1.2		63.0	0.70	3.5	1.9		0.0021	61	27.6
EB3-80M2-6	0.55	1128	1.5	1.4	1.4	6.5	75.4	0.72	5.3			0.0031	61	30
EB3-90S-6	0.75	1136	1.9	1.9	1.9		77.7	0.72	7.2			0.0043	56	35
EB3-90L-6	1.1	1136	2.6	2.6	2.5		79.9	0.73	10.5		2.1	0.0058	56	40
EB3-100L-6	1.5	1142	3.5	3.5	3.4	6.8	81.5	0.75	14.3			0.0109	60	48
EB3-112M-6	2.2	1118	5.1	5.0	4.9		83.4	0.76	21.0			0.015	64	62
EB3-132S-6	3	1166	6.9	6.8	6.7		84.9	0.76	28.6			0.0341	68	87
EB3-132M1-6	4	1166	9.0	8.9	8.7		86.1	0.76	38.2			0.041	68	95
EB3-132M2-6	5.5	1166	12.0	11.8	11.6	7	87.4	0.77	52.5		2.4	0.0529	68	103
EB3-160M-6	7.5	1172	15.7	15.4	15.2		89.0	0.76	71.6			0.105	72	147
EB3-160L-6	11	1172	22.7	22.2	21.9		90.0	0.78	105.0			0.138	72	175
EB3-180L-6	15	1172	29.8	29.2	28.7		91.0	0.81	143.2		2.1	0.22	71	230
EB3-200L1-6	18.5	1178	36.9	36.2	35.6		91.5	0.81	176.7	2.0		0.349	74	279
EB3-200L2-6	22	1178	43.4	42.5	41.7		92.0	0.83	210.1			0.399	74	284
EB3-225M-6	30	1172	57.6	56.2	55.4		92.5	0.84	286.5		2.4	0.653	74	356
EB3-250M-6	37	1184	70.3	68.9	67.6		93.0	0.86	353.3			0.941	72	465
EB3-280S-6	45	1184	83.3	81.2	79.7		93.5	0.86	429.7			1.63	73	589
EB3-280M-6	55	1184	100.3	98.1	96.3		93.8	0.86	525.2		2.2	1.868	73	655
EB3-315S-6	75	1190	139.1	136.2	133.7		94.2	0.86	716.2			3.657	77.5	1074
EB3-315M-6	90	1190	164.9	161.5	158.4	7.2	94.5	0.86	859.4			4.149	77.5	1170
EB3-315L1-6	110	1190	199.7	195.5	191.8		95.0	0.86	1050			5.063	77.5	1295
EB3-315L2-6	132	1190	236.9	231.9	227.5		95.0	0.87	1260			5.977	76.5	1450
EB3-355S-6	160	1190	287.2	281.0	275.7		95.0	0.88	1528		2.0	11.64	83	1770
EB3-355M1-6	(185)	1190	332.1	324.9	318.8		95.0	0.88	1767			12.513	83	1820
EB3-355M2-6	200	1190	359.0	351.3	344.6		95.0	0.88	1910	1.9		13.386	83	1850
EB3-355L1-6	(220)	1190	394.9	386.4	379.1		95.0	0.88	2101			15.132	83	2070
EB3-355L2-6	250	1190	448.7	439.1	430.8		95.0	0.88	2387			16.878	83	2130

** Note: The value with ( ) is not recommended.*

11. ELECTRICAL DATA (IP55) Cast Iron (EB3 Series)

ATEX

750 (8P) Voltage: 400V 50Hz

Type	Power (kW)	Speed (rpm)	Full load / Current A V380	V400	V415	Locked Rotor Current (Current Rated)	Eff. (%)	Power Factor (Cosφ)	Rated Torque (Nm)	Locked Rotor Torque	Breakdown Torque rated	Moment of Inertia (kgm²)	Noise LP dB (A)	Net Weight (kg)
EB3-80M1-8	0.18	650	0.86	0.82	0.76		52	0.61	2.6		1.9	0.0027	60	29
EB3-80M2-8	0.25	650	1.14	1.08	1.04	3.3	55	0.61	3.7			0.0032	60	30
EB3-90S-8	0.37	670	1.44	1.37	1.32		63	0.62	5.3			0.0043	56	37
EB3-90L-8	0.55	670	2.07	1.97	1.90		64	0.63	7.8			0.0055	56	40
EB3-100L1-8	0.75	690	2.36	2.24	2.16	4	71	0.68	10.4	1.8	2.0	0.0067	59	45
EB3-100L2-8	1.1	690	3.32	3.15	3.04		73	0.69	15.2			0.0093	59	49
EB3-112M-8	1.5	690	4.4	4.2	4.0		75	0.69	20.8			0.0143	61	65
EB3-132S-8	2.2	710	5.8	5.5	5.3	5.5	79	0.73	30			0.032	65	83
EB3-132M-8	3	710	7.7	7.3	7.0		81	0.73	40.4			0.055	65	94
EB3-160M1-8	4	720	10.3	9.8	9.4		81	0.73	53.1			0.067	68	132
EB3-160M2-8	5.5	720	13.4	12.8	12.3	6	83	0.75	73	1.9		0.097	68	144
EB3-160L-8	7.5	730	17.7	16.8	16.2		85	0.76	98.1		2.2	0.134	68	166
EB3-180L-8	11	730	25.3	24.4	23.1		87	0.76	143.9			0.258	70	223
EB3-200L-8	15	730	33.7	32.0	30.8		89	0.76	196.2			0.410	72	279
EB3-225S-8	18.5	740	40.0	38.0	36.6	6.5	90	0.78	238.8	2.0		0.620	72	332
EB3-225M-8	22	740	47.4	45.0	43.4		90.5	0.78	283.9			0.670	72	363
EB3-250M-8	30	740	63.4	60.2	58.0		91	0.79	387.2	1.9		1.120	72	478
EB3-280S-8	37	740	77.8	73.9	71.2	6	91.5	0.79	477.5			1.300	73	585
EB3-280M-8	45	740	94.1	84.4	94.1		92	0.79	580.7			1.600	72	648
EB3-315S-8	55	740	111.2	105.6	101.8		92.8	0.81	709.8			4.850	76	972
EB3-315M-8	75	740	150.4	142.9	137.7		93.5	0.81	967.9			6.000	76	1080
EB3-315L1-8	90	740	177.8	168.9	162.8		93.8	0.82	1161.5	1.8	2.0	6.900	76	1226
EB3-315L2-8	110	740	216.8	206.0	198.6	6.5	94	0.82	1420			7.800	76	1310
EB3-355S-8	132	740	260.0	246.7	237.8		94.2	0.82	1703.5			11.800	83	1405
EB3-355M-8	160	742	314.7	299.0	288.2		94.2	0.82	2059.3			11.800	83	1880
EB3-355L1-8	185	742	363.9	345.7	333.2		94.2	0.82	2381.1			14.800	83	1978
EB3-355L2-8	200	742	387.4	368.0	354.7		94.25	0.83	2574.1			17.400	83	2130

** Note: The value with ( ) is not recommended.*

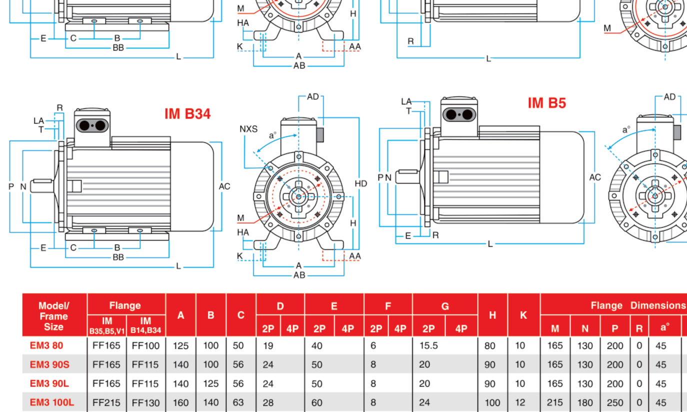
850 (8P) Voltage: 460V 60Hz

Type	Power (kW)	Speed (rpm)	Full load / Current A V340	V460	V480	Locked Rotor Current (Current Rated)	Eff. (%)	Power Factor (Cosφ)	Rated Torque (Nm)	Locked Rotor Torque	Breakdown Torque rated	Moment of Inertia (kgm²)	Noise LP dB (A)	Net Weight (kg)
EB3-80M1-8	0.18	775	0.87	0.83	0.80		52	0.61	2.6		1.9	0.0027	60	29
EB3-80M2-8	0.25	775	1.13	1.08	1.04	3.3	55	0.61	3.7			0.0032	60	30
EB3-90S-8	0.37	805	1.44	1.38	1.32		63	0.62	5.3			0.0043	56	37
EB3-90L-8	0.55	805	2.05	1.96	1.88		64	0.63	7.8			0.0055	56	40
EB3-100L1-8	0.75	815	2.34	2.24	2.15	4	71	0.68	10.4	1.8	2.0	0.0067	59	45
EB3-100L2-8	1.1	815	3.31	3.17	3.03		73	0.69	15.2			0.0093	59	49
EB3-112M-8	1.5	815	4.4	4.2	4.0		75	0.69	20.8			0.0143	61	65
EB3-132S-8	2.2	845	5.8	5.5	5.3	5.5	79	0.73	30			0.032	65	83
EB3-132M-8	3	845	7.7	7.4	7.1		81	0.73	40.4			0.055	65	94
EB3-160M1-8	4	865	10.2	9.8	9.4		81	0.73	53.1			0.067	68	132
EB3-160M2-8	5.5	865	13.3	12.7	12.2	6	83	0.75	73	1.9		0.094	68	144
EB3-160L-8	7.5	875	17.5	16.8	16.1		85	0.76	98.1		2.2	0.134	68	166
EB3-180L-8	11	875	25.2	24.1	23.1		87	0.79	143.9			0.258	70	223
EB3-200L-8	15	875	33.5	32.0	30.7		89	0.76	196.2			0.410	72	279
EB3-225S-8	18.5	880	39.8	38.1	36.5	6.5	90	0.78	238.8	2.0		0.620	72	332
EB3-225M-8	22	880	47.0	45.0	43.1		90.5	0.78	283.9			0.670	72	363
EB3-250M-8	30	880	63.0	60.2	57.8		91	0.79	387.2	1.9		1.120	72	478
EB3-280S-8	37	880	77.3	73.9	70.9	6	91.5	0.79	477.5			1.300	73	585
EB3-280M-8	45	880	93.5	89.5	85.7		92	0.79	580.7			1.600	72	648
EB3-315S-8	55	880	110.5	105.7	101.3		92.8	0.81	709.8			4.850	76	972
EB3-315M-8	75	880	149.5	143.0	137.0		93.5	0.81	967.9			6.000	76	1080
EB3-315L1-8	90	880	176.6	168.9	161.9		93.8	0.82	1161.5	1.8	2.0	6.900	76	1226
EB3-315L2-8	110	880	215.3	206.0	197.4	6.5	94	0.82	1420			7.800	76	1310
EB3-355S-8	132	880	257.9	246.7	236.4		94.2	0.82	1703.5			11.800	83	1405
EB3-355M-8	160	890	312.6	299.0	286.6		94.2	0.82	2059.3			11.800	83	1880
EB3-355L1-8	185	890	361.5	345.8	331.4		94.2	0.82	2381.1			14.800	83	1978
EB3-355L2-8	200	890	384.8	368.0	352.7		94.5	0.83	2574.1			17.400	83	2130

** Note: The value with ( ) is not recommended.*

12. EB3 SERIES FLAMEPROOF 3 PHASE INDUCTION MOTORS (IP55) Cast Iron (Square box)

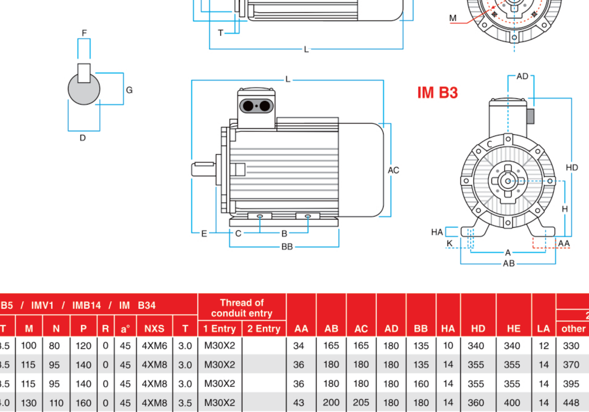
ATEX



Model/ Frame Size	Flange IM B35,B5,V1	Flange IM B14,B34	A	B	C	D 2P	D 4P	E 2P	E 4P	F 2P	F 4P	G 2P	G 4P	H	K	IMB35/IMB5/IMV1 M	N	P	R	a°	NXS	T	IMB14/IMB34 M	N	P	R	a°	NXS	T	Thread of conduit entry 1 Entry	2 Entry	AA	AB	AC	AD	BB	HA	HD	HE	LA	L 2P other	L 2P V1	L 4P other	L 4P V1
EM3 80	FF165	FF100	125	100	50	19		40		6		15.5		80	10	165	130	200	0	45	4xF12	3.5	100	80	120	0	45	4XM6	3.0	M30X2		34	165	165	180	135	10	340	340	12	330	375	330	375
EM3 90S	FF165	FF115	140	100	56	24		50		8		20		90	10	165	130	200	0	45	4xF12	3.5	115	95	140	0	45	4XM8	3.0	M30X2		36	180	180	180	135	14	355	355	14	370	415	370	415
EM3 90L	FF165	FF115	140	125	56	24		50		8		20		90	10	165	130	200	0	45	4xF12	3.5	115	95	140	0	45	4XM8	3.0	M30X2		36	180	180	180	160	14	355	355	14	395	440	395	440
EM3 100L	FF215	FF130	160	140	63	28		60		8		24		100	12	215	180	250	0	45	4xF14.5	4.0	130	110	160	0	45	4XM8	3.5	M30X2		43	200	205	180	180	14	360	400	14	448	485	448	485
EM3 112M	FF215	FF130	190	140	70	28		60		8		24		112	12	215	180	250	0	45	4xF14.5	4.0	130	110	160	0	45	4XM8	3.5	M30X2		50	245	225	200	180	16	380	420	14	500	560	500	560
EM3 132S	FF265		216	140	89	38		80		10		33		132	12	265	230	300	0	45	4xF14.5	4.0								M30X2		60	280	265	200	190	18	470	490	14	550	610	550	610
EM3 132M	FF265		216	178	89	38		80		10		33		132	12	265	230	300	0	45	4xF14.5	4.0								M30X2		60	280	265	200	230	18	470	490	14	600	660	600	660
EM3 160M	FF300		254	210	108	42		110		12		37		160	14.5	300	250	350	0	45	4xF18.5	5.0								M36X2		70	330	320	220	260	20	500	520	15	720	710	720	780
EM3 160L	FF300		254	254	108	42		110		12		37		160	14.5	300	250	350	0	45	4xF18.5	5.0								M36X2		70	330	320	220	310	20	500	520	15	750	810	750	810
EM3 180M	FF300		279	241	121	48		110		14		42.5		180	14.5	300	250	350	0	45	4xF18.5	5.0								M36X2		70	355	360	220	315	25	540	540	18	770	830	770	830
EM3 180L	FF300		279	279	121	48		110		14		42.5		180	14.5	300	250	350	0	45	4xF18.5	5.0								M36X2		70	355	360	220	355	25	540	540	18	790	830	770	830
EM3 200L	FF350		318	305	133	55		110		16		49		200	18.5	350	300	400	0	45	4xF18.5	5.0								M48X2		70	390	400	250	370	25	650	650	18	850	920	850	920
EM3 225S	FF400		356	286	149	55	60	110	140	16	18	49	53	225	18.5	400	350	450	0	22.5	4xF18.5	5.0								M48X2		75	435	450	250	360	28	695	695	18	890	960	890	960
EM3 225M	FF400		356	311	149	55	60	110	140	16	18	49	53	225	18.5	400	350	450	0	22.5	4xF18.5	5.0								M48X2		75	435	450	250	385	28	695	695	18	920	990	920	990
EM3 250M	FF500		406	349	168	60	65	140	140	18	18	53	58	250	24	500	450	550	0	22.5	4xF18.5	5.0								M64X2	M48X2	80	490	500	275	430	30	730	755	20	965	1055	965	1055
EM3 280S	FF500		457	368	190	65	75	140	140	18	20	58	67.5	280	24	500	450	550	0	22.5	4xF18.5	5.0								M64X2	M48X2	85	545	560	275	455	35	800	795	22	1010	1100	1010	1100
EM3 280M	FF500		457	419	190	65	75	140	140	18	20	58	67.5	280	24	500	450	550	0	22.5	4xF18.5	5.0								M64X2	M48X2	85	545	560	275	505	35	800	795	22	1060	1150	1060	1150
EM3 315S	FF600		508	406	216	65	80	140	170	18	22	58	71	315	28	600	550	660	0	22.5	8xF24	6.0									M64X2	120	635	630	350	630	45	960	975	25	1240	1340	1270	1370
EM3 315M	FF600		508	457	216	65	80	140	170	18	22	58	71	315	28	600	550	660	0	22.5	8xF24	6.0									M64X2	120	635	630	350	630	45	960	975	25	1240	1340	1270	1370
EM3 315L	FF600		508	508	216	65	80	140	170	18	22	58	71	315	28	600	550	660	0	22.5	8xF24	6.0									M64X2	120	635	630	350	780	45	960	975	25	1390	1490	1420	1520
EM3 355S	FF740		610	500	254	75	95	140	170	20	25	67.5	86	355	28	740	680	800	0	22.5	8xF24	6.0									M72X2	150	735	710	350	710	52	1030	1145	25	1450	1590	1480	1620
EM3 355M	FF740		610	560	254	75	95	140	170	20	25	67.5	86	355	28	740	680	800	0	22.5	8xF24	6.0									M72X2	150	735	710	350	710	52	1030	1145	25	1450	1590	1480	1620
EM3 355L	FF740		610	630	254	75	95	140	170	20	25	67.5	86	355	28	740	680	800	0	22.5	8xF24	6.0									M72X2	150	735	710	350	810	52	1030	1145	25	1550	1690	1580	1720

12. EB3 SERIES FLAMEPROOF 3 PHASE INDUCTION MOTORS (IP55) Cast Iron (Square box)

ATEX



13. ELECTRICAL DATA (IP66) Aluminium (OD Series)

ATEX

3000 3 PHASE•1 SPEED Voltage: 400V 50Hz

Type	Power (kW)	Speed (rpm)	Eff. (%)	Power Factor (Cosφ)	Full Load Amps I_n (A)	Rated Torque (Nm)	Locked Rotor Current (I_s/I_n)	Locked Rotor Torque (M_s/M_n)	Breakdown Torque (M_{max}/M_n)	Moment of Inertia (kgm²)	Mass Weight (kg)
OD-56B2	0.12	2850	50%	0.76	0.5	0.43	4.8	3.6	3.8	0.00016	3.5
OD-63A2	0.18	2825	56%	0.76	0.62	0.61	3.9	2.6	3.6	0.00017	4
OD-63B2	0.25	2750	60%	0.83	0.74	0.87	3.3	1.8	2.5	0.00022	4
OD-71A2	0.37	2850	71%	0.78	1	1.24	4.5	2.4	2.7	0.00035	6
OD-71B2	0.55	2840	70%	0.78	1.45	1.85	4.9	3.3	3.4	0.00045	6.5
OD-80A2	0.75	2870	73%	0.72	2	2.5	5.3	3	4	0.00068	9
OD-80B2	1.1	2830	72%	0.86	2.6	2.7	4.1	2	2.7	0.00088	11
OD-90S2	1.5	2850	68%	0.83	3.95	5.1	4.2	2.4	2.6	0.00118	13
OD-90L2	2.2	2840	70%	0.85	5.4	7.2	5.1	3.7	3.9	0.00180	15
OD-100L2	3	2900	75%	0.8	7.3	10	5.4	2.2	3.8	0.00279	20
OD-112M2	4	2910	78%	0.83	9.2	13.2	8.2	2.4	2.8	0.00544	28

1500 3 PHASE•1 SPEED Voltage: 400V 50Hz

Type	Power (kW)	Speed (rpm)	Eff. (%)	Power Factor (Cosφ)	Full Load Amps I_n (A)	Rated Torque (Nm)	Locked Rotor Current (I_s/I_n)	Locked Rotor Torque (M_s/M_n)	Breakdown Torque (M_{max}/M_n)	Moment of Inertia (kgm²)	Mass Weight (kg)
OD-56A4	0.09	1450	50%	0.63	0.46	0.63	2.4	2.7	3.1	0.00020	3.5
OD-63A4	0.12	1420	50%	0.53	0.71	0.8	2.7	3.3	3.9	0.00021	4
OD-63B4	0.18	1380	53%	0.65	0.76	1.25	2.6	2.1	2.5	0.00029	4
OD-71A4	0.25	1400	55%	0.81	0.84	1.7	3.8	2.4	2.8	0.00073	6.5
OD-71B4	0.37	1410	66%	0.68	1.2	2.52	3.9	2.5	2.9	0.00080	7
OD-80A4	0.55	1430	68%	0.71	1.75	3.75	4.3	2.7	3.2	0.00092	8
OD-80B4	0.75	1410	72%	0.75	2.1	5.1	3.9	2.3	2.4	0.00128	11
OD-90S4	1.1	1420	71%	0.7	3.3	7.5	3.7	2.8	3.2	0.00203	12
OD-90L4	1.5	1415	75%	0.78	3.8	10.16	4.2	2.2	3.1	0.00265	14
OD-100K4	2.2	1440	77%	0.77	5.8	14.5	4.9	2	2.3	0.00450	20
OD-100L2	3	1420	79%	0.81	6.8	20.3	4.4	1.9	2.7	0.00599	23
OD-112M4	4	1450	84%	0.76	9.1	26.4	4.8	2.2	3.5	0.01112	30

1000 3 PHASE•1 SPEED Voltage: 400V 50Hz

Type	Power (kW)	Speed (rpm)	Eff. (%)	Power Factor (Cosφ)	Full Load Amps I_n (A)	Rated Torque (Nm)	Locked Rotor Current (I_s/I_n)	Locked Rotor Torque (M_s/M_n)	Breakdown Torque (M_{max}/M_n)	Moment of Inertia (kgm²)	Mass Weight (kg)
OD-71A6	0.18	900	62%	0.7	0.61	1.95	3	2	2.3	0.00060	7
OD-71B6	0.25	910	63%	0.6	1	2.7	2.9	3.1	3.3	0.00080	7.5
OD-80A6	0.37	940	58%	0.66	1.4	3.76	4	2.7	3.2	0.00220	9
OD-80B6	0.55	930	65%	0.65	2	5.72	2.7	2.3	2.4	0.00282	11
OD-90S6	0.75	930	71%	0.7	2.2	7.9	3.5	2.3	2.4	0.00265	13
OD-90L6	1.1	910	67%	0.75	3.2	11.6	3.7	2.3	2.5	0.00342	16
OD-100L6	1.5	940	78%	0.68	4	15.3	4.1	2.6	2.9	0.01033	22
OD-112M6	2.2	930	78%	0.78	5.2	22.6	5	3.2	3.4	0.01603	37

750 3 PHASE•1 SPEED Voltage: 400V 50Hz

Type	Power (kW)	Speed (rpm)	Eff. (%)	Power Factor (Cosφ)	Full Load Amps I_n (A)	Rated Torque (Nm)	Locked Rotor Current (I_s/I_n)	Locked Rotor Torque (M_s/M_n)	Breakdown Torque (M_{max}/M_n)	Moment of Inertia (kgm²)	Mass Weight (kg)
OD-80A8	0.18	960	49%	0.6	0.95	2.5	2.8	2.7	3	0.00141	10
OD-80B8	0.25	700	55%	0.55	1.2	3.6	2.9	2.8	3.2	0.00251	11
OD-90S8	0.37	680	60%	0.67	1.3	5.2	3	1.6	2	0.00376	13
OD-90L8	0.55	690	65%	0.65	1.9	7.7	3	2.4	2.7	0.00551	15
OD-100K8	0.75	700	65%	0.65	2.6	10	3.4	2.3	2.5	0.00775	20
OD-100L8	1.1	700	63%	0.69	3.6	15.2	3.7	2.2	2.6	0.01033	22
OD-112M8	1.5	710	77%	0.72	3.9	20.2	3.7	1.3	2.2	0.01870	37

14. ELECTRICAL DATA (IP66) Aluminium (MD Series) (Running Capacitor)

ATEX

3000 SINGLE PHASE•1 SPEED Voltage: 230V 50Hz

Type	Power (kW)	Speed (rpm)	Eff. (%)	Power Factor (Cosφ)	Full Load Amps I_n (A)	Rated Torque (Nm)	Locked Rotor Current (I_s/I_n)	Locked Rotor Torque (M_s/M_n)	Breakdown Torque (M_{max}/M_n)	Capacitor (µF)	Moment of Inertia (kgm²)	Mass Weight (kg)
MD-56B2	0.12	2770	46%	0.95	1.17	0.4	2.3	1	1.9	4	0.00030	4.5
MD-63A2	0.18	2870	55%	0.99	1.5	0.6	2.3	0.6	2.1	12.5	0.00030	5.5
MD-63B2	0.25	2780	60%	0.95	1.8	0.85	2.6	0.6	1.7	12.5	0.00035	6
MD-71A2	0.37	2860	65%	0.95	2.56	1.23	3.6	0.7	2.0	16	0.00046	7.5
MD-71B2	0.55	2840	66%	0.99	3.42	1.85	3.3	0.7	2.0	25	0.00056	8
MD-80A2	0.75	2860	70%	0.99	4.55	2.52	3.8	0.7	1.8	30	0.00097	9.5
MD-80B2	1.1	2880	70%	0.99	6.6	3.7	4.1	0.7	2.0	50	0.01000	11
MD-90S2	1.5	2810	67%	0.99	9.75	5.1	2.7	0.6	1.7	70	0.00150	13
MD-90L2	1.5	2720	69%	0.99	13.9	7.62	2.4	0.7	1.5	90	0.00190	15
MD-100M2	2.2	2850	71%	0.9	15	7.4	3.5	0.55	1.7	100	0.00370	25
MD-100L2	3	2850	66%	0.9	22	10	3.6	0.6	1.8	110	0.00530	27
MD-112M2	4	2890	69%	0.97	26	13.2	3.6	0.65	1.8	120	0.00700	40

1500 SINGLE PHASE•1 SPEED Voltage: 230V 50Hz

Type	Power (kW)	Speed (rpm)	Eff. (%)	Power Factor (Cosφ)	Full Load Amps I_n (A)	Rated Torque (Nm)	Locked Rotor Current (I_s/I_n)	Locked Rotor Torque (M_s/M_n)	Breakdown Torque (M_{max}/M_n)	Capacitor (µF)	Moment of Inertia (kgm²)	Mass Weight (kg)
MD-56B4	0.09	1420	55%	0.97	0.8	0.59	3.0	0.7	2.1	6.3	0.00038	5
MD-63A4	0.12	1380	55%	0.99	1.07	0.84	2.2	0.7	2.5	8	0.00040	5
MD-63B4	0.18	1360	59%	0.99	1.38	1.27	1.8	0.6	1.2	10	0.00045	5.5
MD-71A4	0.25	1450	59%	0.99	2	1.66	4	0.55	2.5	16	0.00080	8
MD-71B4	0.37	1430	65%	0.99	2.55	2.5	3.1	1.1	1.7	20	0.00090	8.5
MD-80A4	0.55	1440	69%	0.96	3.7	3.7	3.5	0.6	2.0	25	0.00096	10
MD-80B4	0.75	1410	70%	0.99	4.74	5.1	2.6	0.6	1.5	30	0.00120	12
MD-90S4	1.1	1440	68%	0.94	7.6	7.4	3.4	0.5	2	40	0.00260	15
MD-90L4	1.5	1430	69%	0.99	9.6	10.1	2.6	0.5	1.5	45	0.00320	18
MD-100M4	2.2	1415	70%	0.96	15.6	14.9	3.8	0.55	1.6	45	0.00590	25
MD-112M4	3	1430	75%	0.98	20	20	3.9	0.45	1.8	70	0.01200	37

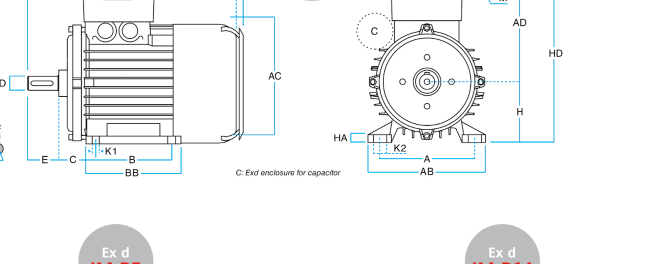
1000 SINGLE PHASE•1 SPEED Voltage: 230V 50Hz

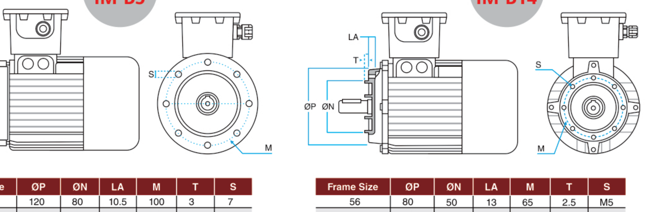
Type	Power (kW)	Speed (rpm)	Eff. (%)	Power Factor (Cosφ)	Full Load Amps I_n (A)	Rated Torque (Nm)	Locked Rotor Current (I_s/I_n)	Locked Rotor Torque (M_s/M_n)	Breakdown Torque (M_{max}/M_n)	Capacitor (µF)	Moment of Inertia (kgm²)	Mass Weight (kg)
MD-71A6	0.12	910	61%	0.83	1.30	1.2	2.5	0.6	1.4	8	0.00080	8
MD-71B6	0.18	930	61%	0.91	1.60	1.8	2.7	0.6	1.4	12.5	0.00090	8.5
MD-80A6	0.25	920	62%	0.92	2.40	2.2	2.8	0.6	1.4	16	0.00096	10
MD-80B6	0.37	920	65%	0.85	2.90	3.2	2.9	0.7	1.8	20	0.00120	12
MD-90S6	0.55	910	65%	0.85	4.20	5.9	2.9	0.7	1.7	25	0.00260	15
MD-90L6	0.75	920	68%	0.90	5.90	8.1	3.1	0.7	1.9	32	0.00320	18
MD-100M6	1.10	920	69%	0.90	8.10	11.5	3.1	0.7	1.9	45	0.00590	25

15. OVERALL DIMENSIONS (IP66) Aluminium (OD / MD Series)

ATEX

Frame Size	B	A	HA	BB	AB	AC	AD	AE	C	H	HD	L	LR	K1	K2	M	D	E	GA	F	DB
63	80	100	10	105	120	121	150	119	40	63	203	200	210	7	12	M20	11	23	12.5	4	M4X10
71	90	112	11	108	136	136	159	119	45	71	220	225	235	7	12	M20	14	30	16	5	M5X25
80	100	125	11	125	154	154	163	119	50	80	243	245	255	9.5	17.5	M20	19	40	21.5	6	M6X16
90S	100	140	13	130	174	174	173	119	56	90	263	260	270	9.5	17.5	M20	24	50	27	8	M8X19
90L	125	140	13	155	174	174	173	119	56	90	263	285	295	9.5	17.5	M20	24	50	27	8	M8X19
100	140	160	14	175	192	192	186	119	63	100	286	315	327	11.2	21.2	M20	28	60	31	8	M10X22
112	140	190	14	175	224	216	195	119	70	112	307	338	352	11.2	21.2	M20	28	60	31	8	M10X22





Frame Size	ØP	ØN	LA	M	T	S
56	120	80	10.5	100	3	7
63	140	95	10.5	115	3	9
	160*	110	10.5	130	3.5	9
71	140*	95	10.5	115	3	9
	160	110	10.5	130	3.5	9
	200*	130	11.5	165	3.5	12
80	160*	110	10.5	130	3.5	9
	200	130	11.5	165	3.5	12
90	160*	110	10.5	130	3.5	9
	200	130	11.5	165	3.5	12
100	200*	130	11.5	165	3.5	12
	250	180	15	215	4	13
112	200*	110	10.5	130	3.5	9
	250	180	15	215	4	13

**Reduced or enlarged flange version*

Frame Size	ØP	ØN	LA	M	T	S
56	80	50	13	65	2.5	M5
63	90	60	13	75	2.5	M5
	105*	70	13	85	2.5	M6
71	90*	60	13	75	2.5	M5
	105	70	13	85	2.5	M6
	120*	80	13	100	3	M6
80	105*	70	15	85	2.5	M6
	120	80	15	100	3	M6
	140*	95	15	115	3	M8
90	120*	80	15	100	3	M6
	140	95	15	115	3	M8
	160*	110	16	130	3.5	M8
100	140*	95	15	115	3	M8
	160	110	16	130	3.5	M8
112	140*	95	15	115	3	M8
	160	110	16	130	3.5	M8

16. TERMINAL BOXES

ATEX

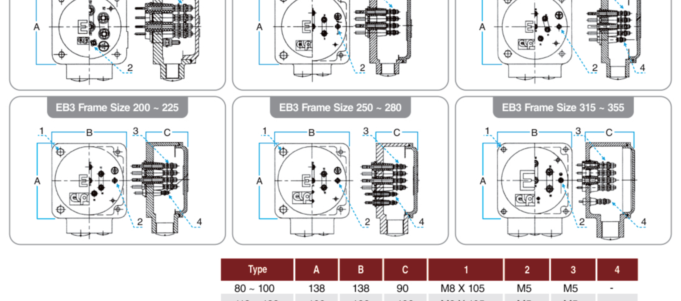
16.1 The power supply's connecting terminals number & earthing terminal specification

Type	Connection Terminals	Spec of Connection Terminals	Spec of Earthing Terminals
EB3 80 ~ 112	6	M5	M5
EB3 132 ~ 180	6	M6	M6
EB3 200 ~ 225	6	M8	M8
EB3 250 ~ 280	6	M10	M10
EB3 315 ~ 355	6	M16	M12

16.2 Specification of Terminal Box

Terminal Box	Frame Size	No. of Entry	Inlet's Thread	Scope of Supply
M5	80~100	1	M25X1.5	Normal
M5	112	1	M25X1.5	Normal
M5	132	1	M40X1.5	Normal
M6	160~180	2	M40X1.5 M20X1.5	Normal
M8	200~225	2	M50X1.5 M20X1.5	Normal
M10	250~280	2	M63X1.5 M20X1.5	Normal
M16	315~355	3	2-M63X1.5 M20X1.5	Normal

16.3 The structural representation & Schematic diagram of terminal box (EB3)



Type	A	B	C	1	2	3	4
80 ~ 100	138	138	90	M8 X 105	M5	M5	-
112 ~ 132	166	166	100	M8 X 105	M6	M5	-
160 ~ 180	180	180	106	M10 X 125	M6	M6	M5
200 ~ 225	212	212	122	M12 X 135	M8	M8	M5
250 ~ 280	286	286	140	M16 X 165	M10	M10	M5
315 ~ 355	371	371	226	M16 X 240	M12	M16	M5