

Flameproof Motors

Aluminium 56-180



ORANGE1
HOLDING

A dynamic, strong and ambitious Group:

Orange1 Holding is an international renown Group, one of the most important European manufacturers of single-phase and three-phase asynchronous electric motors. It has an annual capacity of more than 1 million motors and 5 million electric stators with an annual turnover of approx 235 million euro and more than 1600 workers in 15 production facilities. The group, established in 1971 by Leone Donazzan, chaired today by his son Armando Donazzan, is strongly focused on technological innovation, performance and customization to meet individual clients requirements.

Orange1 Electric Motors, member of Orange1 Holding since 2011, is known worldwide for the production of explosion proof motors ATEX, IECEx, EAC for hazardous areas. It also offers products suitable for powerpack applications, lifting, garage equipments, compactors and hydraulic applications in general, encapsulated motors for ambient with high humidity as car wash systems, offshore applications and food industry, motors with integrated frequency drive to get very sophisticated controls minimizing the overall dimensions of the product. This peculiarity makes Orange1 Electric Motors world leader for the market in which maximum reliability, technological innovation and high quality are required.



Flameproof motors

Series of aluminium motors completely modular. The feet and flanges can be mounted without affecting the Ex type of protection. This permits a big advantage in the warehouse management. Applying feet and flanges it is possible to realize every requested mounting arrangement and this operation can be made without any problem for ATEX and IECEx motor approval.

New series

**Motors for
Hazardous Location
for North America
market**

Catalogue:
AC Explosion Proof Motors

Orange1 Electric Motors Explosion Proof Motors range approved by CSA in compliance with CSA and UL standard, Nema and IEC mounting

Class I Division 1 Groups C, D T4

Class II Division 1 Groups E, F, G

Tamb = -25 °C to +40 °C

From 80 to 160 IEC frame size and from 56 to 256 Nema frame size

1. Tolerances and standards of reference

1.1 Mechanical and Electrical tolerances

| Symbol | Description | Tolerance | |
|---|---|--|--------------------|
| A | Distance between centre-lines of fixing holes (end view) | ± 1 mm | |
| 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) | ± 1 mm | |
| C - CA | Distance from the shaft end shoulder to the centre-line of nearest mounting holes in the feet | ± 3 mm | |
| D - DA | Diameter of the shaft extension. | \varnothing 11 – 28 \varnothing 32 – 48 \varnothing ≥ 55 | j6 k6 m6 |
| E - EA | Length of the shaft extension from the shoulder | \varnothing < 55 mm \varnothing > 60 mm | 0,3 mm + 0,5 mm |
| F - FA | Width of the keyway of the shaft extension | h9 | |
| GA - GC | Distance from the top of the key to the opposite surface of the shaft extension | + 0,2 mm | |
| H | Distance between the centre-line of the shaft to the bottom of the feet | H ≤ 250 H ≤ 280 | - 0,5 mm - 1 mm |
| 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 | ± 0,8 mm | |
| N | Diameter of the spigot | \varnothing < 230 j6 \varnothing ≥ 250 h6 | |
| P | Outside diameter of the flange | ± 1 mm | |
| R | Distance from the shaft shoulder to the mounting surface of the flange | ± 3 mm | |
| 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 | ± 0,5 mm | |
| | Mass of the motor | - 5 a + 10 % | |
| Nominal voltage, V_N | | ± 5% | |
| Efficiency, η | | -15% of (1- η) | |
| Power factor, $\cos \phi$ | | -1/6 of (1-cos ϕ) min 0.02, max 0.07 | |
| Slip (rpm) (full load and nominal ambient temperature), P_N | | ± 20% if $P_N \geq 1$ kW ± 30% if $P_N < 1$ kW | |
| Locked rotor current, I_A | | +20% | |
| Locked rotor torque, M_A | | -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_{pFA} | | +3 dBA | |

1.2 Standards of reference

| Title | EU CENELEC | International IEC |
|--|-------------|-------------------|
| EU | EN 60034-1 | IEC 60034-1 |
| CENELEC | EN 60034-2 | IEC 60034-2 |
| International | EN 60034-5 | IEC 60034-5 |
| IEC | EN 60034 -6 | IEC 60034 -6 |
| Rotating electrical machines / Part 7: Classification of types of construction, mounting arrangements and terminal box position (IM Code) | EN 60034-7 | IEC 60034-7 |
| Rotating electrical machines / Part 9: Noise limits | EN 60034-9 | IEC 60034-9 |
| Rotating electrical machines / Part 12: Starting performance of single-speed three-phase cage induction motors | EN 60034-12 | IEC 60034-12 |
| Rotating electrical machines / Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher Measurement, evaluation and limits of vibration severity | EN 60034-14 | IEC 60034-14 |
| General purpose three-phase induction motors having standard dimensions and outputs. Frame numbers 56 to 315 and flange numbers 65 to 740 | EN 50347 | IEC 60072-1 |
| Degrees of protection provided by enclosures (IP Code) | EN 60259 | IEC 60529 |
| Electrical apparatus for explosive gas atmospheres / Part 0: General requirements | EN 60079-0 | IEC 60079-0 |
| Electrical apparatus for explosive gas atmospheres / Part 1: Flameproof enclosures 'db' | EN 60079-1 | IEC 60079-1 |
| Electrical apparatus for explosive gas atmospheres / Part 7: Increased safety "eb" and "ec" | EN 60079-7 | IEC 60079-7 |
| Explosive atmospheres / Part 31: Equipment dust ignition protection by enclosure "ta" | EN 60069-31 | IEC 60079-31 |

2. Guide to motor choice

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 60079-10-1 for gas and EN 60079-10-2 for dust. Here below we give you a synthetic step by step guide to the choice of the motors.

| Zone Classification (presence of explosive atmosphere) | | | Electrical apparatus ATEX marking | | | | |
|---|----|--|-----------------------------------|-----------------|--------------------------------------|--------------------------------|---|
| | | | (1) Group | (2) Category | (3) Type of protection | (4) Gas group Dust group | (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 eb 'increased safety' | IIA, IIB, IIC | T1=450°C T2=300°C T3=200°C T4=135°C T5=100°C T6=85°C |
| | | | | | Ex db 'flameproof enclosure' | | |
| | 2 | Rarely occur in normal operation and for short period | II | 3G | Ex ec 'non sparking' | IIA, IIB, IIC | T1=450°C T2=300°C T3=200°C T4=135°C T5=100°C T6=85°C |
| POUVERI | 20 | Present continuously o for long period | II | 1D | Electrical apparatus not allowed | | T125°C |
| | 21 | Occur in normal operation occasionally | II | 2D | Ex tb 'protection by enclosure t' | IIIC, IIIB, IIIA | |
| | 22 | Rarely occur in normal operation and for short period | II | 3D | Ex tc 'protection by enclosure t' | IIIB, IIIA | |

(1) Group II

Includes equipment intended for use in other places likely to become endangered by explosive atmospheres (surface plants different from mines).

(2) Group II is sub-divided into 3 categories:

Category 1: very high level of protection / **Category 2:** high level of protection / **Category 3:** normal level of protection

(3) Orange1 Electric Motors O-M series can have the following types of protection:

Ex db motor and terminal box (GAS)

Ex dbeb motor Ex d and terminal board Ex e (GAS)

Ex tb protection by enclosure t (DUST)

(4) GAS group

IIC Hydrogen, Acetylene, carbon disulfide

IIB Diethyl ether, Ethylene etc.

IIA Propane, Butane, pentane, natural gas etc.

DUST group

IIIC Conductive dust

IIIB Non-conductive dust

IIIA Combustible fibers

(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 T_{cl} with T_{cl} ignition temperature in °C of the dust cloud.

Tmax2 = T_I - 75 °C with T_I ignition temperature in °C of a 5mm layer of dust.

GAS- Main inflammable substances

| 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 |
| Propyl 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 |
| Bromoethane | 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 |
| Cyclohexane | IIA | 259 | T3 | Pyridine | IIA | 483 | T1 |
| Cyclohexanol | 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 |
| Chlorobutane | IIA | 240 | T3 | p-Xylene | 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 (µm) | LEL (g/m ³) | Cloud ignition temperature T _{cl} (°C) | Layer 5mm thick ignition temperature T _I (°C) |
|--|---------------------------------|-------------------------|---|--|
| 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 |
| 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 |
| 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 |

3. Motor characteristics

3.1 Range of motors

Ex Orange1 Electric 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) and IECEx Scheme. Here below in the table we show you the range of motors for each type of protection. In the following pages we will talk about testing and certificates, main features of these motors and possible options always depending on the type of protection.

| Type | Frame size | Pole N° | Output range (kW) | Type of protection | Temperature class Surface temperature | Tamb max range (°C) |
|---|------------|---------|---------------------|---------------------------|--|--|
| 3-ph (*) 1 speed | 56-180 | 2 | 0,12 – 30 | Ex db Ex dbeb Ex tb | T3 T4 T5 T125°C | Ta –40°C +60°C Ta –40°C +60°C Ta –40°C +40°C Ta –40°C +60°C |
| | 56-180 | 4 | 0,12 – 22 | | | |
| | 56-180 | 6 | 0,18 – 15 | | | |
| | 71-180 | 8 | 0,18 – 11 | | | |
| 3-ph 2 speeds Constant Torque | 71-180 | 4/2 | 0,22/0,33 – 18,5/22 | Ex db Ex dbeb Ex tb | T3 T4 T125°C | Ta –40°C +60°C Ta –40°C +60°C Ta –40°C +60°C |
| | 71-180 | 8/4 | 0,11/0,18 – 9,9/16 | | | |
| | 71-180 | 6/4 | 0,11/0,18 – 8,1/13 | | | |
| | 71-180 | 8/6 | 0,08/0,12 – 6/8 | | | |
| 3-ph 2 speeds Quadratic Torque | 71-180 | 4/2 | 0,06/0,25 – 6/24 | Ex db Ex dbeb Ex tb | T3 T4 T125°C | Ta –40°C +60°C Ta –40°C +60°C Ta –40°C +60°C |
| | 71-180 | 8/4 | 0,05/0,25 – 5,5/22 | | | |
| | 80-180 | 6/4 | 0,1/0,3 – 6,25/18,5 | | | |
| | 80-180 | 8/6 | 0,09/0,33 – 5,2/10 | | | |
| 1-ph (**) 1 speed | 56-112 | 2 | 0,09 – 4 | Ex db Ex dbeb Ex tb | T3 T4 T125°C | Ta –40°C +60°C Ta –40°C +60°C Ta –40°C +60°C |
| | 56-112 | 4 | 0,06 – 3 | | | |
| | 71-100 | 6 | 0,12 – 1,1 | | | |

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

(**) The capacitor of the single 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.

3.2 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 responsibility of the user to determine which group and which maximum surface temperature should be specified for the motor installation. The Ex motors manufactured by Orange1 Electric Motors are manufactured in compliance with all the European and International standards concerning equipments and protective systems for explosive atmosphere (European Directive 2014/34 EU better known as ATEX, and IECEx Scheme and EAC).

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

- EC Type Certificate , Product Quality assurance Notification (ATEX)
- CoC Certificate of Conformity, ExTR Test Report, QAR Quality assurance Report
- EAC certificate

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 evaluated by a Notified Body in order 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 / IECEx CoC copy / EAC certificate
- Installation manual and safety instructions where are written all the indication regarding the installations of the motors and the important instructions regarding the type/s of protection of the motors.

3.3 Main features

Orange1 Electric Motors Ex electric motors are manufactured and tested in compliance with all the EN/IEC standards and also in compliance with the main European Directives (2014/35 EU 'LVD', 2014/30 EU 'EMC Electro Magnetic Compatibility', 2006/42/EC 'Machinery', 2015/863 EU, RoHS III and with IECEx Scheme and EAC standards).

ATEX characteristics:

Suitable for Surface plants different from mines (Group II)

Presence of GAS:

Type of protection

GAS group

Temperature class

Ambient temperature range

Zone 1 and Zone 2

'Ex db' or 'Ex dbeb'

IIC (suitable IIB and IIA)

T3, T4 E T5 (suitable also for T2, T1)

-40°C +60°C for temperature class T3

-40°C +60°C for temperature class T4

-40°C +40°C for temperature class T5

Presence of DUST:

Type of protection

DUST groups

Surface Temperature

Ambient temperature range

Zone 21 and Zone 22

Ex tb IP66 (IP65 for Ex dbeb)

IIIC (suitable IIIB and IIIA)

T125°C

-40°C +60°C

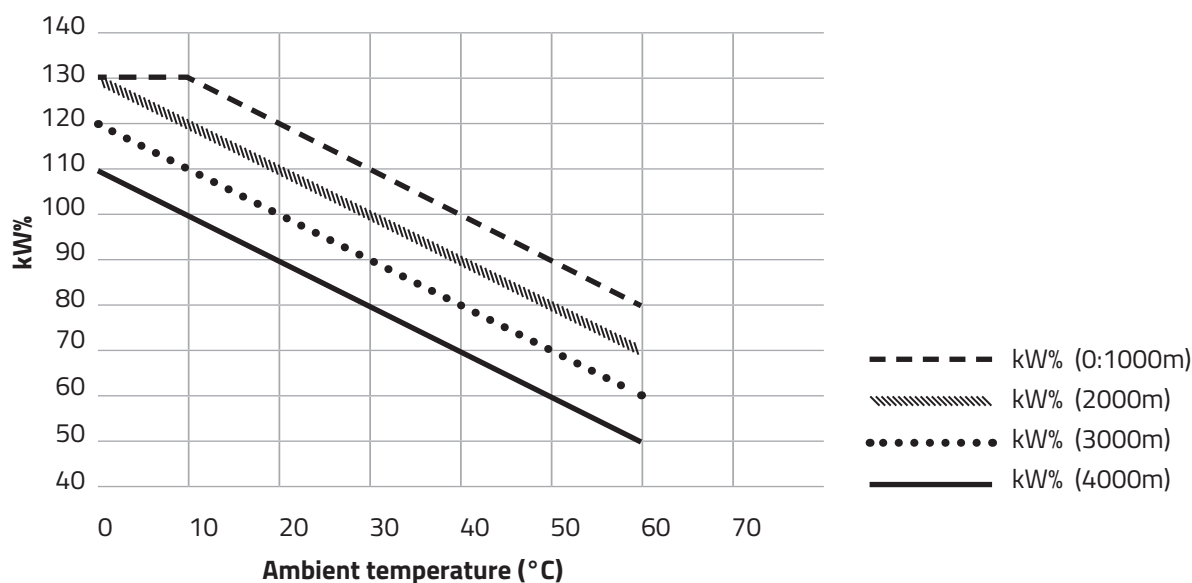
All the motors are asynchronous with squirrel cage rotor, wound stator, closed and externally ventilated in compliance with EN 60034-6 (IC 411).

The supply voltages allowed can exceed the nominal value of $\pm 5\%$. On demand $\pm 10\%$.

All the electrical and mechanical features and the testing methods comply with the standard EN 60034-1.

The power ratings of the motors is designed suitable for the following site operating (in according to EN 60034-1): ambient air temperature 40°C, altitude max 1000m above sea-level. For site operating conditions deviating from those values, below you find the diagram of the estimation of derating of the motor power (method 1a-Tab.9).

Derating of the Motor Power



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 IEC/EN 60034-5 and EN 60259.

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

The bearings are single row deep grooves ball bearings, preloaded by a wave spring.

Duty The motors are normally made for S1 duty; otherwise intermittent duties (S2, S3, S9 with motor protector).

Single-phase motors Capacitor placed in a safe Ex d cylindrical box fitted to the motor.

Windings Made using enamelled copper wires are 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 in case of motor B3, is normally on the top of the motor. As the feet are removable also on the sides of the frame it is possible to have the terminal box on both sides of the motor too.

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. On demand: forced ventilation motors (IC 416). See the drawing in the catalogue.

| | |
|----------------|-------------------------------------|
| Ex db, Ex dbeb | Plastic fan |
| Ex tb | Antistatic plastic or aluminium fan |

Fan cover Zinc-plated steel sheet.

Noise (in compliance with IEC/EN 60034-9)

3.4 Main Options

Axially locked shaft Motors with a locked bearing on the front 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 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 and 220 V, 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 avoids the reduction of the insulation properties of the windings.

Efficiency level (IE2 and IE3 level) The International Electrotechnical Commission (IEC) has introduced standards relating to energy efficient motors. IEC 60034-2-1 specifies rules concerning efficiency testing methods and IEC 60034-30 defines efficiency classes for a wide range of electric motors connected direct on line. High efficiency IE2 / Premium efficiency IE3.

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, as written on the certificates.

The maximum load of a converter-driven motor depends on:

- the kind of modulation, switching frequency of the converter and supply of the converter (single-phase or three-phase)
- design of the motor: temperature rise, level of magnet's flux, type of the forced ventilation.

See the table of the derating power on the electrical data section shows the estimation of the continuous torque of the motor as a function of frequency, with different cooling designation: IC 411 (self-ventilation) and IC 416 (forced ventilation).

Special voltages and frequencies - The standard three phase motors are produced at the following nominal voltages and frequencies: 230/400V-50 Hz and 265/460V-60Hz (Constant torque) up to MEC 112; 400/690V-50 Hz 460-60Hz (Constant torque) for MEC 132-180.

The standard single phase motors are produced at the following nominal voltages and frequencies: 230V-50Hz

The motors can run at a different nominal voltage with a tolerance of +/- 5%. On request ±10%. 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 - Due to the modular flange assembling is possible to have, on request special flanges.

Rain fan cover - 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 cuts off the motors supply in case the winding reaches the thermal probe limit temperature. On request will be available protectors with different temperature setting in respect of the maximum Temperature class or surface temperature of the motor.

Thermal cut-off (bimetallic probes) - Motors with 1 or 2 thermal protectors with normally closed contact in series connection.

The series of contact shall be connected to an appropriate tripping device that cuts off the motors supply in case the winding reaches the thermal probe limit temperature. On request will be available protectors with different temperature setting in respect of the maximum Temperature class or surface temperature of the motor.

PT100 - It is a device that increases its resistance according to the increasing of the temperature. It is useful for continuous measuring of the winding temperature, properly connected to an electronic equipment.

Painting (against corrosion) - The Orange1 Electric Motors have diecasted aluminium components and sandblasted. If it is not requested the motors are supplied unpainted. On specific request it is possible to have motors with epoxy paint, with the customer requested colour. Other paints with anti salt characteristics are available on request; contact our Technical Department.

3.5 Motors identification

| MOTOR TYPE | | | |
|------------|--------------------------|----|--------------------------|
| MD | Single phase Ex db | ME | Single phase Ex de |
| OD | Three phase Ex db | OE | Three phase Ex de |
| MX | IECEX Single phase Ex db | MY | IECEX Single phase Ex de |
| OX | IECEX Three phase Ex db | OY | IECEX Three phase Ex de |

| MOTOR SHAFT HEIGHT | |
|---|--|
| 56, 63, 71, 80, 90, 100, 112, 132, 160, 180 | |

| STATOR DIMENSION | |
|------------------|-----------------------|
| A, B | 56-63-71-80 |
| S, L | 90 – 132 – 160 - 180 |
| K, M | 100 – 132 – 160 - 180 |

| POLES | |
|------------|---|
| 2, 4, 6 | Single phase motors |
| 2, 4, 6, 8 | Three phase motors, 1 speed |
| 3, 5, 7, 9 | Three phase motors, 2 speed (2/4, 4/8, 4/6, 6/8 poles). Costant torque |
| C, D, E, F | Three phase motors, 2 speed (2/4, 4/8, 4/6, 6/8 poles). Quadratic torque |

| MOUNTING ARRANGEMENTS (SEE TABLE 1) | |
|-------------------------------------|--|
|-------------------------------------|--|

| SUPPLY VOLTAGE | |
|---|--|
| Indicated the lower voltage (i.e.: 230 for 230/400) | |

| FREQUENCY | |
|-----------|------|
| 5 | 50Hz |
| 6 | 60Hz |

| PROTECTION (IP AND EX) | |
|------------------------|-----------|
| P | Motor 2G |
| Q | Motor 2GD |

| TEMPERATURE CLASS | |
|-------------------|------------------------------|
| 3 | Temperature class T3 (200°C) |
| 4 | Temperature class T4 (135°C) |
| 5 | Temperature class T5 (100°C) |

| THERMAL PROTECTOR | |
|-------------------|----------------------------|
| - | without thermal protectors |
| P | PTC- temperature classe T3 |
| U | PTC- temperature classe T4 |
| V | PTC- temperature classe T5 |

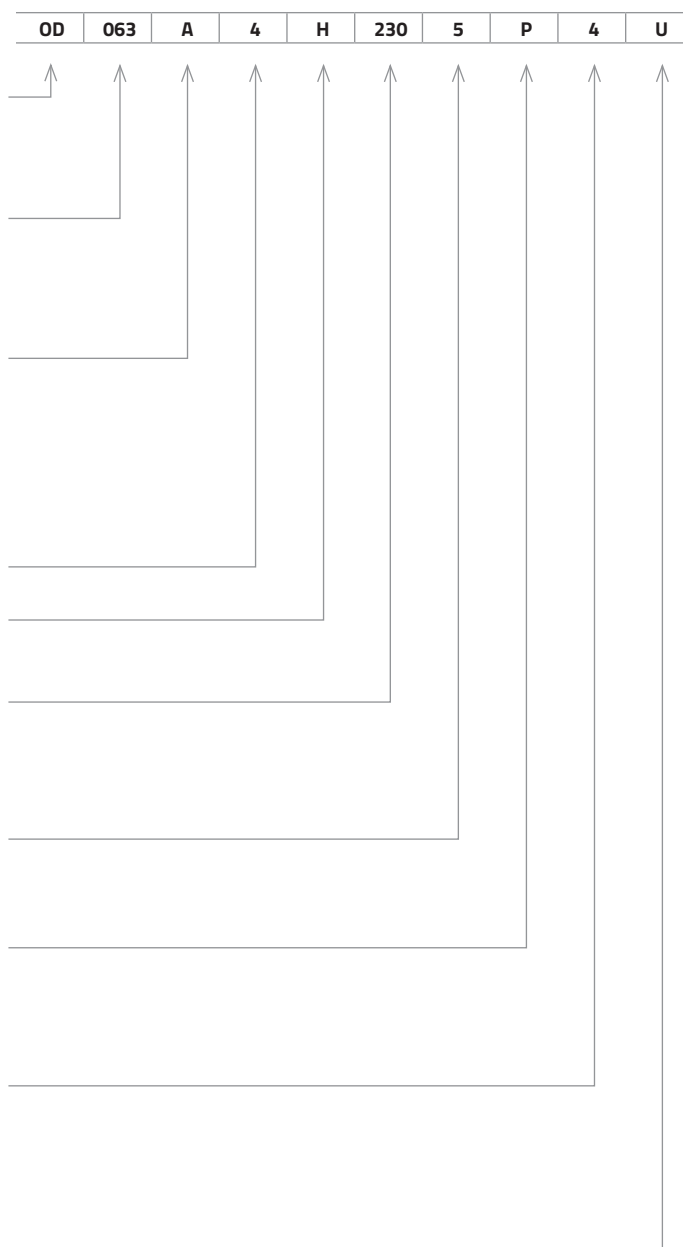
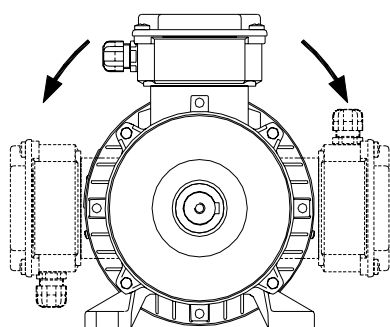


Table 1 (mounting arrangements)

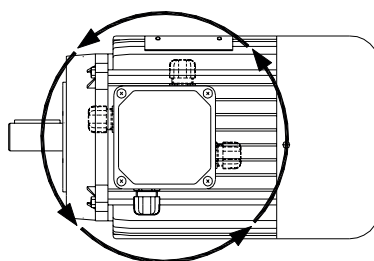
| | |
|---|---|
| A B14 rain canopy | R B3/B5 lateral left terminal box |
| B B3 lateral right terminal box | S B3 lateral left terminal box |
| C B14 Reduced standard shaft | T B3+B5 lateral left terminal box |
| D B14 Enlarged | V B14 reduced shaft |
| E B5 Reduced standard shaft | W B3/B14 |
| F B5 | X B3/B5 |
| G B5 rain canopy | Y B3/B5 Reduced flange and shaft |
| H B3 terminal box on the top | Z B14 Reduced flange and shaft |
| I B3/B14 Reduced flange and shaft | 0 Without flange and feet |
| J B B3/B14 lateral left terminal box | 1 B14 Enlarged two sizes |
| K B3/B14 reduced flange | 2 B14 reduced with reduced shaft |
| L B5 Reduced flange and shaft | 3 B3 rain canopy |
| M B3/B14 lateral right terminal box | 4 B3/B14 Enlarged flange |
| P B5 Reduced shaft | 5 B3/B14 rain canopy |
| Q B14 | 6 B14 Enlarged two sizes + rain canopy |

4. Terminal box, cable entries and connections

As the feet can be mounted on the frame, it is possible to fix them in 3 different positions so to have the possibility to have the terminal box on the top or on the right and left sides of the motor (see picture 1). At the same time the terminal box can be mounted on the motor so to have the cable entries where it is necessary. So the cable entries can be in the four different positions (see picture 2).



picture 1



picture 2

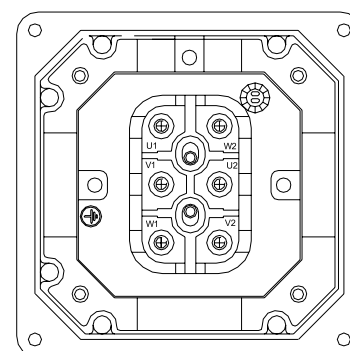
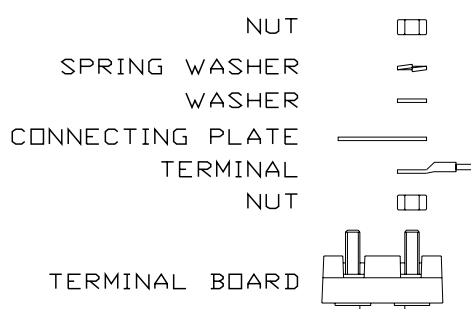
| Motor size | cable glands | | | |
|------------|--------------|-----|-------------|-----|
| | Ex d motor | | Ex de motor | |
| | Mains | Aux | Mains | Aux |
| 63 | M20 | M20 | M20 | M20 |
| 71 | M20 | M20 | M20 | M20 |
| 80 | M20 | M20 | M20 | M20 |
| 90 | M20 | M20 | M20 | M20 |
| 100 | M20 | M20 | M20 | M20 |
| 112 | M20 | M20 | M20 | M20 |
| 132 | M25/M32 | M20 | M25/M32 | M20 |
| 160 | M32 | M20 | M32 | M20 |
| 180 | M32 | M20 | M32 | M20 |

Cable connection on the terminal board

Motors 'Ex de' (only ATEX approved)

The flameproof motors with increased safety terminal box are built with a special terminal board and the cable glands shall be certified in compliance with EN 60079-7.

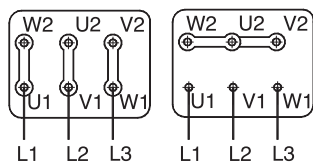
In the picture you can see the special terminal board complying with EN 60079-7. In case of motor fitted with thermal protection heaters etc. the wires of these devices will be connected when possible to the auxiliary pins of a 8 pins terminal board. If it is not possible they must be connected to the cable by welding the wires of the device to the cable wires and insulating them using a thermo sheath.



Motors 'Ex d'

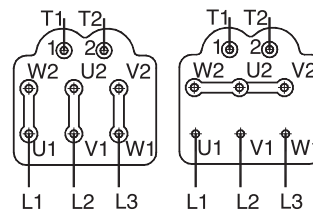
For these type of motors there is no need of a special terminal board and the cable glands shall be certified in compliance with IEC/EN 60079-1.

Three phase 1 speed 2 - 4 - 6 - 8 poles (6 wires)



Delta Connection (Lower voltage)

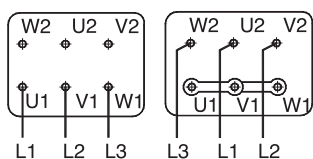
Star Connection (Higher voltage)



Delta Connection (Lower voltage)

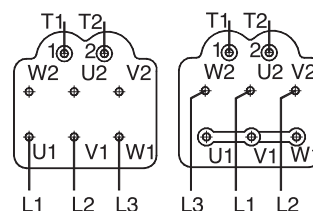
Star Connection (Higher voltage)

Three phase double speed 1 winding



Low speed

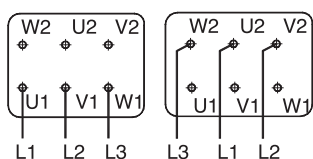
High speed



Low speed

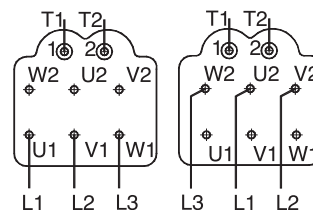
High speed

Three phase double speed 2 separate windings



Low speed

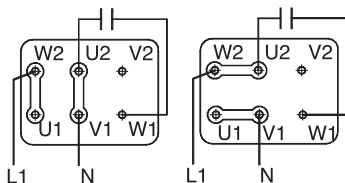
High speed



Low speed

High speed

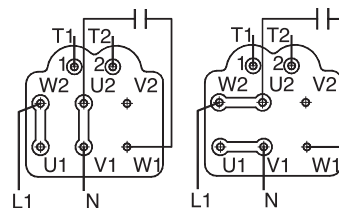
Single phase 4 wires



Clockwise rotation

Counter clockwise rotation

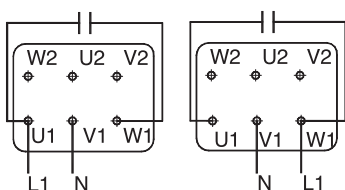
Single phase 4 wires with thermal protection



Clockwise rotation

Counter clockwise rotation

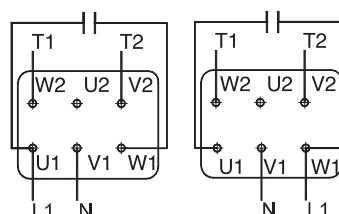
Single phase 3 wires



Clockwise rotation

Counter clockwise rotation

Single phase 3 wires with thermal protection



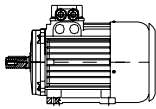
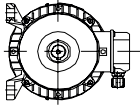
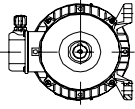
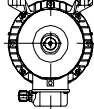
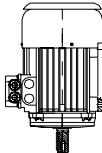
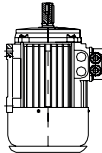
Clockwise rotation

Counter clockwise rotation

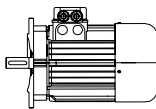
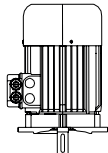
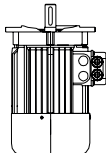
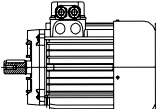
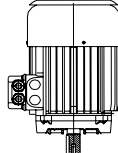
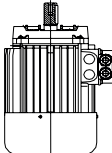
5. Mechanical Characteristics

Mounting arrangements

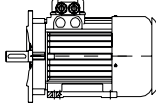
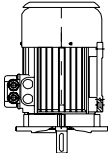
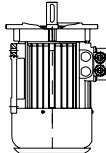
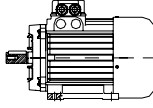
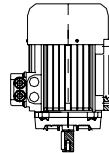
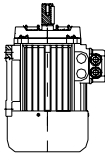
Foot mounted

| IM 1001 (IM B3) | IM 1051 (IM B6) | IM 1061 (IM B7) | IM 1071 (IM B8) | M 1011 (IM V5) | IM 1031 (IM V6) |
|---|---|---|---|---|---|
|  |  |  |  |  |  |

Flange mounted

| IM 3001 (IM B5) | IM 3011 (IM V1) | IM 3031 (IM V3) | IM 3601 (IM B14) | IM 3611 (IM V18) | IM 3631 (IM V19) |
|---|---|---|---|---|---|
|  |  |  |  |  |  |

Foot-flange mounted

| IM 2001 (IM B35) | IM 2011 (IM V15) | IM 2031 (IM V36) | IM 2101 (IM B34) | IM 2111 (IM V58) | IM 2131 (IM V69) |
|---|---|---|---|---|---|
|  |  |  |  |  |  |

Main components

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

| component | Material | Note |
|--------------|--|----------------------------|
| Frame | Aluminium | Removable feet (aluminium) |
| End- shields | Aluminium | |
| Flange B5 | Aluminium | |
| Flange B14 | Aluminium | |
| Terminal box | Aluminium | |
| Shaft | Steel C40 | |
| Rotor | Magnetic lamination die-cast aluminium | |
| Stator | Magnetic lamination | |
| Windings | enamelled copper wires (two 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) | |

| Motor size | Bearings | | Seals | |
|------------|-----------|---------------|------------|---------------|
| | Drive end | Non-drive end | Drive end | Non-drive end |
| 63 | 6202-ZZ | 6202-ZZ | v-Ring Ø15 | v-Ring Ø15 |
| 71 | 6202-ZZ | 6202-ZZ | v-Ring Ø15 | v-Ring Ø15 |
| 80 | 6204-ZZ | 6204-ZZ | v-Ring Ø20 | v-Ring Ø20 |
| 90 | 6205-ZZ | 6205-ZZ | v-Ring Ø25 | v-Ring Ø25 |
| 100 | 6206-ZZ | 6206-ZZ | v-Ring Ø30 | v-Ring Ø30 |
| 112 | 6306-ZZ | 6306-ZZ | v-Ring Ø30 | v-Ring Ø30 |
| 132 | 6308-ZZ | 6308-ZZ | v-Ring Ø40 | v-Ring Ø40 |
| 160 | 6309-ZZ | 6309-ZZ | v-Ring Ø45 | v-Ring Ø45 |
| 180 | 6310-ZZ | 6310-ZZ | v-Ring Ø50 | v-Ring Ø50 |

The motors are normally fitted with permanently greased bearings of type ZZ, lubricated with a special grease G-15 and have a service max temperature of 150°C.

The bearing life time for aluminium motors is approximately (depending on application and load conditions):

- 2 and 2/4 pole motors, 10 000 - 20 000 duty hours
- 4 to 8 pole motors, 20 000 - 40 000 duty hours

Both on drive end and non-drive end are mounted V-ring seals in order to have the IP66 protection.

5.1 Permissible radial and axial forces on the shaft end

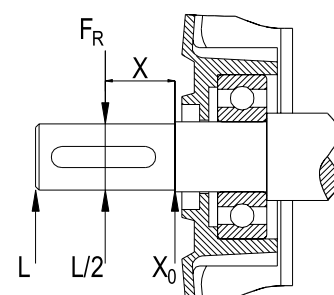
The following tables give the permissible radial and axial forces in Newton.

5.1.1 Permissible radial load

Here we show the permissible radial load (FR) that can be applied to three different positions (X0, L/2 and L where L is the length of the shaft axis) on the shaft-end, supposing motors running at 50Hz and bearings life time at least 20,000 hours for 2 poles motors and 40,000 hours for 4-6-8 poles. For service on 60Hz reduce values by 10%. Take the higher speed as reference for double pole motors.

This the formula to calculate FR in a point of the shaft with generic position X: $F_R = F_{X0} - (F_{X0} - F_L)X/L$

| Motor size | Shaft length L (mm) | 2 poles | | | 4 poles | | | 6 poles | | | 8 poles | | |
|------------|---------------------|---------|------|------|---------|------|------|---------|------|------|---------|------|------|
| | | X0 | L/2 | L | X0 | L/2 | L | X0 | L/2 | L | X0 | L/2 | L |
| 63 | 23 | 390 | 365 | 340 | 390 | 365 | 340 | 450 | 420 | 390 | - | - | - |
| 71 | 30 | 490 | 450 | 410 | 490 | 450 | 410 | 560 | 515 | 470 | 610 | 565 | 520 |
| 80 | 40 | 650 | 590 | 530 | 650 | 590 | 530 | 750 | 680 | 610 | 820 | 745 | 670 |
| 90S | 50 | 720 | 645 | 570 | 720 | 645 | 570 | 820 | 735 | 650 | 910 | 815 | 720 |
| 90L | 50 | 720 | 650 | 580 | 720 | 650 | 580 | 830 | 750 | 670 | 920 | 830 | 740 |
| 100 | 60 | 1020 | 920 | 820 | 1020 | 920 | 820 | 1160 | 1045 | 930 | 1290 | 1165 | 1040 |
| 112 | 60 | 1410 | 1280 | 1150 | 1410 | 1280 | 1150 | 1610 | 1455 | 1300 | 1780 | 1610 | 1440 |
| 132 | 80 | 1510 | 1345 | 1180 | 1510 | 1345 | 1180 | 1510 | 1430 | 1350 | 1910 | 1700 | 1490 |
| 160 | 110 | 2810 | 2465 | 2195 | 2810 | 2465 | 2195 | 3217 | 2821 | 2512 | 3541 | 3105 | 2765 |
| 180 | 110 | 3239 | 3000 | 2794 | 3239 | 3000 | 2794 | 3708 | 3434 | 3198 | 4081 | 3780 | 3520 |



For Belt drive applications the maximum radial load FR is given by:

FR = maximum radial load [N] = (P + F) where:

P = pulley weight [N]

F = belt tension [N] = $(2 \cdot K \cdot M)/D$ where:

K = belt tension factor (**K** = 3 for normal flat belt without idler pulley; **K** = 2,2 for V-belt; **K** = 2 for normal flat belt with idler pulley)

D = pulley diameter [m]

M = torque [Nm] = $9550 \cdot P/n$ where:

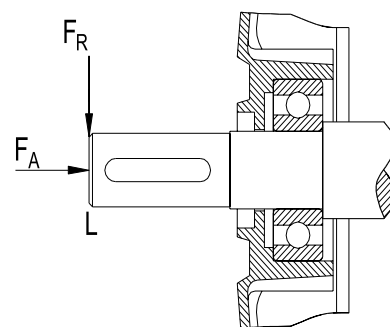
P = output [kW]

n = speed in [1/min]

5.1.2 Permissible axial load (with additional radial load applied at the end of the shaft)

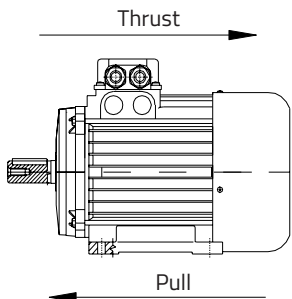
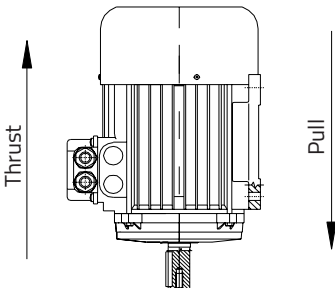
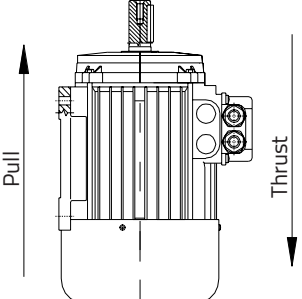
In the table below we show the additional axial load (F_A) allowable if the maximum radial load (F_R) is applied on L. The lower is radial load, the bigger is allowable axial load. Axial load calculations have been carried out in three different foot mounting operating conditions:

horizontal (**B3**), vertical shaft-down (**V5**) and vertical shaft-up (**V6**), supposing the case of thrust **T** or pull **P** force.



Permissible axial load (with maximum radial load applied on L)

Dimensions in mm

| IM 1001 (IM B3) | | | | | | | | M 1011 (IM V5) | | | | | | | | IM 1031 (IM V6) | | | | | | | |
|--|------|---------|------|---------|------|---------|------|--|-----|---------|-----|---------|------|---------|------|--|-----|---------|-----|---------|------|---------|------|
|  | | | | | | | |  | | | | | | | |  | | | | | | | |
| 2 poles | | 4 poles | | 6 poles | | 8 poles | | 2 poles | | 4 poles | | 6 poles | | 8 poles | | 2 poles | | 4 poles | | 6 poles | | 8 poles | |
| T | P | T | P | T | P | T | P | T | P | T | P | T | P | T | P | T | P | T | P | T | P | T | P |
| 240 | 110 | 240 | 110 | 280 | 120 | 290 | 120 | 230 | 120 | 130 | 120 | 270 | 130 | 280 | 130 | 230 | 120 | 130 | 120 | 270 | 130 | 280 | 130 |
| 300 | 140 | 300 | 130 | 350 | 160 | 380 | 170 | 280 | 160 | 280 | 150 | 330 | 180 | 360 | 190 | 280 | 160 | 280 | 150 | 330 | 180 | 360 | 190 |
| 400 | 190 | 400 | 180 | 460 | 210 | 510 | 240 | 370 | 220 | 360 | 220 | 420 | 250 | 470 | 280 | 370 | 220 | 360 | 220 | 420 | 250 | 470 | 280 |
| 430 | 200 | 430 | 210 | 500 | 230 | 550 | 260 | 400 | 230 | 390 | 250 | 460 | 270 | 510 | 300 | 400 | 230 | 390 | 250 | 460 | 270 | 510 | 300 |
| 440 | 200 | 440 | 200 | 510 | 240 | 560 | 260 | 400 | 240 | 390 | 250 | 460 | 290 | 510 | 310 | 400 | 240 | 390 | 250 | 460 | 290 | 510 | 310 |
| 620 | 290 | 610 | 290 | 710 | 330 | 780 | 370 | 560 | 350 | 530 | 370 | 630 | 410 | 700 | 450 | 560 | 350 | 530 | 370 | 630 | 410 | 700 | 450 |
| 860 | 400 | 850 | 400 | 980 | 460 | 1080 | 500 | 780 | 480 | 740 | 510 | 870 | 570 | 970 | 610 | 780 | 480 | 740 | 510 | 870 | 570 | 970 | 610 |
| 910 | 440 | 910 | 430 | 1040 | 500 | 1150 | 550 | 770 | 590 | 740 | 610 | 870 | 670 | 960 | 720 | 770 | 590 | 740 | 610 | 870 | 670 | 960 | 720 |
| 1058 | 1058 | 1333 | 1333 | 1525 | 1525 | 1679 | 1679 | 1401 | 714 | 1676 | 989 | 1869 | 1182 | 2022 | 1336 | 1401 | 714 | 1676 | 989 | 1869 | 1182 | 2022 | 1336 |
| 1065 | 1065 | 1342 | 1342 | 1536 | 1536 | 1691 | 1691 | 1498 | 615 | 1772 | 889 | 1965 | 1082 | 2118 | 1643 | 1498 | 615 | 1772 | 889 | 1965 | 1082 | 2118 | 1643 |

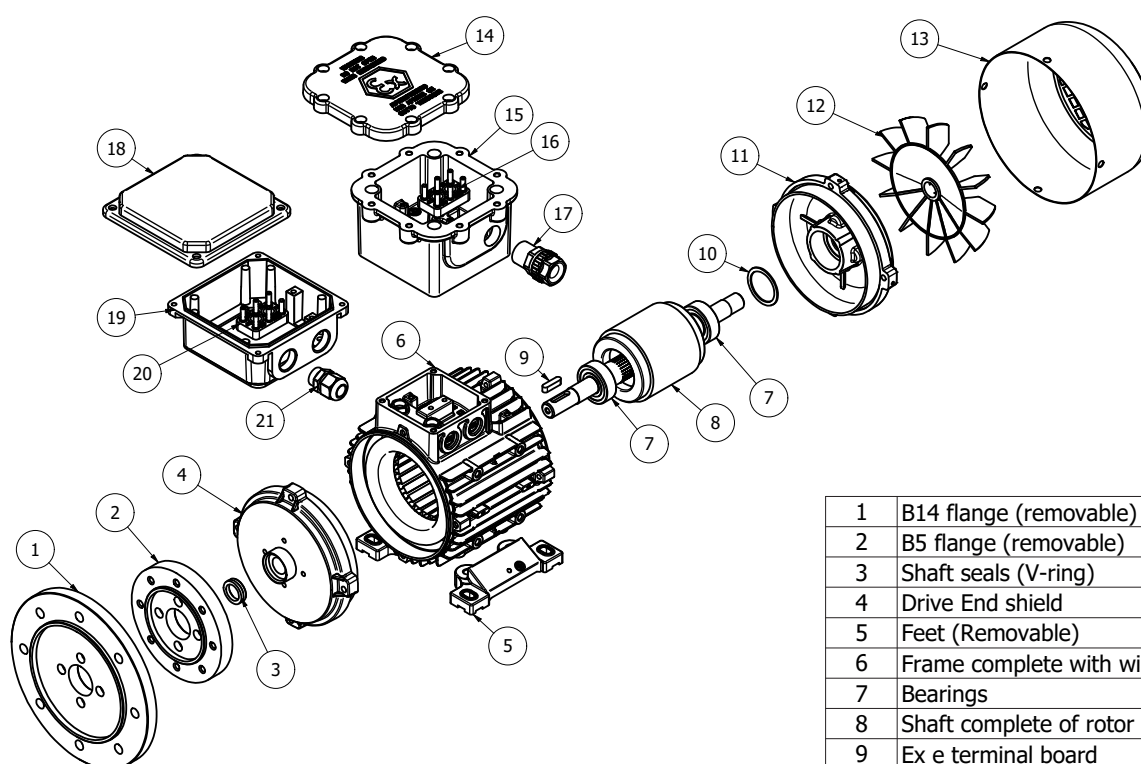
6. Spare parts, overhauls and repairs

6.1 Personnel qualification

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. Repairs must be made regarding the rules as define in EN 60079-19 standard. These repairs can only be done under the control or in agreement with Orange1 Electric Motors or by an ATEX and IECEx certified workshop. In case these rules are not respected, the product won't be covered by Orange1 Electric Motors ATEX and IECEx certifications anymore.

6.2 Spare parts

All motors components must be replaced with original spare parts. In these case contact Orange1 Electric Motors directly and provide the serial number of the motor in order to be authorized for the repair or the motor itself.



| | |
|----|---------------------------------|
| 1 | B14 flange (removable) |
| 2 | B5 flange (removable) |
| 3 | Shaft seals (V-ring) |
| 4 | Drive End shield |
| 5 | Feet (Removable) |
| 6 | Frame complete with winding |
| 7 | Bearings |
| 8 | Shaft complete of rotor and key |
| 9 | Ex e terminal board |
| 10 | Wave spring |
| 11 | Non Drive End shield |
| 12 | Fan (complete of fixing collar) |
| 13 | Fan cover |
| 14 | Ex db Terminal box cover |
| 15 | Ex db Terminal box |
| 16 | Ex db Terminal board |
| 17 | Ex db Cable gland (metallic) |
| 18 | Ex eb Terminal box cover |
| 19 | Ex eb Terminal box |
| 20 | Ex eb Terminal board |
| 21 | Ex eb Cable gland (plastic) |

7. 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.

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 and 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.

Normally the motors are 230/400V 50Hz but on request is possible to have special voltage and frequency.

THREE PHASE 2 SPEEDS

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

| | | CONSTANT TORQUE (GENERAL PURPOSE) | | QUADRATIC TORQUE (CENTRIFUGAL MACHINES) | |
|-----------|---------------------|-----------------------------------|-----------|---|-----------|
| Poles | Connections | High Speed | Low Speed | High Speed | Low Speed |
| 2/4 – 4/8 | Dahlander | YY | Δ | YY | Y |
| 4/6 – 6/8 | 2 Separate windings | Y | Y | Y | Y |

SINGLE-PHASE MOTORS 1 SPEED

- Asynchronous motor, squirrel cage rotor, self ventilated (IC411).
- Duty S1, Insulation class "F", 230V - 50 Hz.

The capacitor will be fitted inside a special 'Ex d' box and mounted on the motor.

In case of external capacitor, it must be placed in a safe area where an explosive atmosphere is not present.

Electrical data - Flameproof Motors

2 POLES - THREE PHASE MOTORS 1 SPEED 3000 - 400V 50Hz

| Type | Size | [kW] | rpm | $\eta(\%)$ | $\cos\phi$ | IN [A] | MN [Nm] | IA/IN | MA/MN | Mmax/MN | Jrotor [kgm ²] | [kg] |
|-------|------|------|------|------------|------------|--------|---------|-------|-------|---------|----------------------------|------|
| 56B2 | 56 | 0,12 | 2680 | 45 | 0,76 | 0,50 | 0,43 | 3 | 2 | 2,9 | 0,000 | 5 |
| 63A2 | 63 | 0,18 | 2825 | 56 | 0,76 | 0,62 | 0,61 | 3,9 | 2,6 | 3,6 | 0,000 | 5,5 |
| 63B2 | 63 | 0,25 | 2750 | 60 | 0,83 | 0,74 | 0,87 | 3,3 | 1,8 | 2,5 | 0,000 | 5,5 |
| 71A2 | 71 | 0,37 | 2900 | 71 | 0,70 | 1,2 | 1,2 | 5,7 | 4,5 | 5 | 0,000 | 7,5 |
| 71B2 | 71 | 0,55 | 2840 | 70 | 0,78 | 1,5 | 1,9 | 4,9 | 3,3 | 3,4 | 0,000 | 7,5 |
| 80A2 | 80 | 0,75 | 2870 | 73 | 0,72 | 2,0 | 2,5 | 5,3 | 3 | 4 | 0,001 | 10 |
| 80B2 | 80 | 1,1 | 2830 | 72 | 0,86 | 2,6 | 2,7 | 4,1 | 2 | 2,7 | 0,001 | 10 |
| 90S2 | 90S | 1,5 | 2870 | 73 | 0,80 | 3,7 | 5,1 | 4,3 | 2,6 | 2,6 | 0,001 | 13,5 |
| 90L2 | 90L | 2,2 | 2860 | 79 | 0,80 | 5,0 | 7,2 | 4,4 | 2,7 | 3,2 | 0,002 | 15,5 |
| 100L2 | 100 | 3,0 | 2840 | 76 | 0,86 | 6,6 | 10,0 | 4,7 | 1,8 | 3,1 | 0,003 | 20 |
| 112M2 | 112 | 4,0 | 2900 | 76 | 0,84 | 9,2 | 13,2 | 6,2 | 2,6 | 3,2 | 0,005 | 28 |
| 112L2 | 112 | 5,5 | 2900 | 86 | 0,84 | 11,0 | 18,3 | 6,6 | 3,7 | 2,7 | 0,006 | 31 |
| 132K2 | 132S | 5,5 | 2910 | 80 | 0,87 | 11,5 | 18,1 | 4,6 | 2,6 | 2,8 | 0,010 | 45 |
| 132S2 | 132S | 7,5 | 2920 | 88 | 0,80 | 15,3 | 24,7 | 6,2 | 2,6 | 3,3 | 0,013 | 48 |
| 132M2 | 132M | 9,3 | 2930 | 88 | 0,88 | 19,0 | 30,0 | 7,5 | 2,8 | 3 | 0,014 | 58 |
| 132L2 | 132M | 11,0 | 2940 | 88 | 0,88 | 21,4 | 36,0 | 7 | 2,6 | 3,6 | 0,015 | 61 |
| 160K2 | 160M | 11,0 | 2900 | 83 | 0,91 | 21,0 | 36,3 | 4,7 | 2,3 | 2,6 | 0,033 | 115 |
| 160M2 | 160M | 15,0 | 2930 | 88 | 0,85 | 29,0 | 48,9 | 5 | 1,8 | 2,8 | 0,045 | 120 |
| 160L2 | 160L | 18,5 | 2910 | 84 | 0,91 | 35,0 | 60,7 | 4,6 | 2 | 2,3 | 0,054 | 130 |
| 180M2 | 180L | 22,0 | 2930 | 90 | 0,87 | 41,7 | 71,7 | 7,6 | 2 | 2,7 | 0,062 | 160 |
| 180L2 | 180L | 30,0 | 2930 | 91 | 0,88 | 54,0 | 97,0 | 8,5 | 3,5 | 3,7 | 0,072 | 180 |

4 POLES - THREE PHASE MOTORS 1 SPEED 1500 - 400V 50Hz

| Type | Size | [kW] | rpm | $\eta(\%)$ | $\cos\phi$ | IN [A] | MN [Nm] | IA/IN | MA/MN | Mmax/MN | Jrotor [kgm ²] | [kg] |
|-------|------|------|------|------------|------------|--------|---------|-------|-------|---------|----------------------------|------|
| 56B4 | 56 | 0,09 | 1380 | 53 | 0,65 | 0,37 | 0,63 | 3,1 | 2,2 | 3 | 0,0002 | 5 |
| 63A4 | 63 | 0,12 | 1370 | 56 | 0,7 | 0,44 | 0,84 | 2,8 | 2,3 | 2,4 | 0,00021 | 5,5 |
| 63B4 | 63 | 0,18 | 1370 | 60 | 0,67 | 0,65 | 1,25 | 2,6 | 2,3 | 2,4 | 0,00029 | 5,5 |
| 71A4 | 71 | 0,25 | 1425 | 55 | 0,65 | 0,95 | 1,7 | 4,1 | 2,9 | 3,1 | 0,00073 | 7 |
| 71B4 | 71 | 0,37 | 1390 | 66 | 0,73 | 1,15 | 2,52 | 3,5 | 2,4 | 2,2 | 0,0008 | 7 |
| 80A4 | 80 | 0,55 | 1390 | 58 | 0,71 | 1,75 | 3,75 | 4,5 | 2,5 | 3,2 | 0,00092 | 10 |
| 80B4 | 80 | 0,75 | 1410 | 68 | 0,75 | 2,1 | 5,1 | 3,9 | 2,1 | 2,6 | 0,00128 | 11 |
| 90S4 | 90S | 1,1 | 1420 | 71 | 0,7 | 3,3 | 7,5 | 3,9 | 2,8 | 3,2 | 0,00203 | 13,5 |
| 90L4 | 90L | 1,5 | 1415 | 74 | 0,78 | 3,8 | 10,1 | 4,2 | 2,2 | 3,1 | 0,00265 | 16 |
| 100K4 | 100 | 2,2 | 1420 | 80 | 0,77 | 5,2 | 14,7 | 4,3 | 1,7 | 2,8 | 0,0045 | 20 |
| 100L4 | 100 | 3 | 1430 | 83 | 0,74 | 7,1 | 20 | 4,8 | 2 | 3,3 | 0,00599 | 23 |
| 112M4 | 112 | 4 | 1440 | 82 | 0,77 | 9,1 | 26,4 | 5,1 | 2 | 3,2 | 0,01112 | 30 |
| 132S4 | 132S | 5,5 | 1455 | 85 | 0,81 | 11,5 | 36,3 | 5,1 | 2,1 | 2,8 | 0,02311 | 42 |
| 132M4 | 132M | 7,5 | 1450 | 88 | 0,82 | 15,6 | 50 | 5,7 | 2,4 | 3 | 0,02953 | 56 |
| 132L4 | 132M | 9,3 | 1450 | 88 | 0,82 | 20,2 | 61,2 | 4,8 | 2 | 2,6 | 0,032 | 60 |
| 160M4 | 160M | 11 | 1465 | 88 | 0,75 | 24,1 | 72 | 5,4 | 2,3 | 2,7 | 0,06167 | 100 |
| 160L4 | 160L | 15 | 1455 | 89 | 0,78 | 31,2 | 100,2 | 5,2 | 2,1 | 2,6 | 0,08276 | 125 |
| 180M4 | 180L | 18,5 | 1460 | 89 | 0,79 | 38 | 121 | 6,3 | 3,5 | 2,8 | 0,1236 | 160 |
| 180L4 | 180L | 22 | 1460 | 91 | 0,84 | 42 | 143 | 5,9 | 2,1 | 2,6 | 0,1493 | 180 |

Electrical data - Flameproof Motors

6 POLES - THREE PHASE MOTORS 1 SPEED 1000 - 400V 50Hz

| Type | Size | [kW] | rpm | η (%) | Cos ϕ | IN [A] | MN [Nm] | IA/IN | MA/MN | Mmax/MN | Jrotor [kgm ²] | [kg] |
|-------|------|------|-----|------------|------------|--------|---------|-------|-------|---------|----------------------------|------|
| 63B6 | 63 | 0,12 | 900 | 40 | 0,6 | 0,8 | 1,32 | 1,8 | 2,4 | 2,6 | 0,000 | 6 |
| 71A6 | 71 | 0,18 | 900 | 62 | 0,7 | 0,61 | 1,95 | 3 | 2 | 2,3 | 0,001 | 7 |
| 71B6 | 71 | 0,25 | 900 | 66 | 0,71 | 0,77 | 2,7 | 3,3 | 2,7 | 5,4 | 0,001 | 7,5 |
| 80A6 | 80 | 0,37 | 940 | 56 | 0,65 | 1,4 | 3,8 | 3,2 | 2,4 | 3 | 0,002 | 10 |
| 80B6 | 80 | 0,55 | 930 | 63 | 0,65 | 2 | 5,72 | 2,7 | 2,3 | 2,4 | 0,003 | 11 |
| 90S6 | 90S | 0,75 | 920 | 64 | 0,73 | 2,3 | 7,8 | 3,4 | 2 | 2,3 | 0,003 | 13 |
| 90L6 | 90L | 1,1 | 920 | 66 | 0,8 | 3 | 11,5 | 3,5 | 1,8 | 2,1 | 0,003 | 16 |
| 100L6 | 100 | 1,5 | 950 | 76 | 0,65 | 4,4 | 15,3 | 4,1 | 2,2 | 3,1 | 0,010 | 22 |
| 112M6 | 112 | 2,2 | 940 | 78 | 0,73 | 5,6 | 22,6 | 3,6 | 2 | 2,2 | 0,016 | 37 |
| 132S6 | 132S | 3 | 970 | 81 | 0,73 | 7,8 | 29,6 | 5,3 | 1,7 | 2,7 | 0,032 | 45 |
| 132K6 | 132M | 4 | 960 | 84 | 0,74 | 9,2 | 40 | 5 | 2 | 2,9 | 0,038 | 51 |
| 132M6 | 132M | 5,5 | 950 | 85 | 0,74 | 12,5 | 54,2 | 5 | 1,6 | 2,2 | 0,045 | 55 |
| 160M6 | 160M | 7,5 | 970 | 89 | 0,76 | 16 | 74 | 5,7 | 2 | 3 | 0,093 | 100 |
| 160L6 | 160L | 11 | 960 | 89 | 0,8 | 22,5 | 109 | 5,4 | 1,9 | 3 | 0,127 | 120 |
| 180L6 | 180L | 15 | 960 | 88 | 0,86 | 29 | 149 | 5,4 | 1,7 | 2,2 | 0,226 | 160 |

8 POLES - THREE PHASE MOTORS 1 SPEED 750 - 400V 50Hz

| Type | Size | [kW] | rpm | η (%) | Cos ϕ | IN [A] | MN [Nm] | IA/IN | MA/MN | Mmax/MN | Jrotor [kgm ²] | [kg] |
|-------|------|------|-----|------------|------------|--------|---------|-------|-------|---------|----------------------------|------|
| 80A8 | 80 | 0,18 | 690 | 49 | 0,6 | 0,95 | 2,5 | 2,4 | 2,2 | 3 | 0,001 | 10 |
| 80B8 | 80 | 0,25 | 700 | 55 | 0,6 | 1,3 | 3,6 | 2,9 | 2,4 | 2,6 | 0,003 | 11 |
| 90S8 | 90S | 0,37 | 690 | 63 | 0,67 | 1,3 | 5,2 | 2,7 | 1,6 | 1,9 | 0,004 | 13 |
| 90L8 | 90L | 0,55 | 680 | 65 | 0,7 | 1,9 | 7,7 | 2,7 | 1,5 | 2,7 | 0,006 | 15 |
| 100K8 | 100L | 0,75 | 715 | 64 | 0,6 | 2,9 | 10 | 3,8 | 2,1 | 3,1 | 0,008 | 20 |
| 100L8 | 90S | 1,1 | 680 | 63 | 0,7 | 3,6 | 15,4 | 2,9 | 1,7 | 1,8 | 0,010 | 22 |
| 112M8 | 112M | 1,5 | 710 | 74 | 0,71 | 4,1 | 20,2 | 3,3 | 1,2 | 2 | 0,019 | 37 |
| 132S8 | 132S | 2,2 | 725 | 79 | 0,6 | 6,8 | 30 | 3,6 | 2,1 | 2,4 | 0,032 | 48 |
| 132L8 | 132M | 3 | 710 | 79 | 0,72 | 7,6 | 41 | 2,8 | 1,2 | 1,7 | 0,04 | 56 |
| 160S8 | 160M | 4 | 710 | 82 | 0,78 | 9 | 53,1 | 4,1 | 2 | 2,3 | 0,08 | 85 |
| 160M8 | 132M | 5,5 | 715 | 85 | 0,76 | 12,7 | 73 | 4 | 2 | 2,4 | 0,092 | 95 |
| 160L8 | 160L | 7,5 | 720 | 87 | 0,7 | 17,8 | 98,9 | 4 | 1,9 | 2,4 | 0,112 | 110 |
| 180L8 | 180L | 11 | 720 | 87 | 0,69 | 27 | 145 | 5,4 | 2,3 | 3,3 | 0,279 | 155 |

Electrical data - Flameproof Motors

2/4 POLES THREE PHASE MOTORS - 2 SPEEDS - CONSTANT TORQUE 1500/3000 - 400V 50Hz

| Type | Size | [kW] | Poles | rpm | η (%) | Cos ϕ | IN [A] | MN [Nm] | IA/IN | MA/MN | Jrotor [kgm ²] | [kg] |
|-------|------|------|-------|------|------------|------------|--------|---------|-------|-------|----------------------------|------|
| 71A3 | 71 | 0,22 | 4 | 1380 | 57 | 0,66 | 0,8 | 1,1 | 3,2 | 1,9 | 0,0005 | 7 |
| | | 0,33 | 2 | 2760 | 53 | 0,71 | 1 | 1,4 | 3,8 | 1,8 | | |
| 71B3 | 71 | 0,4 | 4 | 1380 | 68 | 0,62 | 1,2 | 1,6 | 3,2 | 1,9 | 0,0008 | 7,5 |
| | | 0,5 | 2 | 2800 | 60 | 0,7 | 1,25 | 2,1 | 4,2 | 1,8 | | |
| 80A3 | 80 | 0,45 | 4 | 1430 | 68 | 0,62 | 1,5 | 1,9 | 3,9 | 2 | 0,0014 | 9 |
| | | 0,6 | 2 | 2880 | 67 | 0,76 | 1,9 | 2,6 | 4,1 | 2 | | |
| 80B3 | 80 | 0,6 | 4 | 1450 | 67 | 0,71 | 2,2 | 2,6 | 4 | 2 | 0,0017 | 11 |
| | | 0,8 | 2 | 2890 | 72 | 0,81 | 2,6 | 3,9 | 4,3 | 2 | | |
| 90S3 | 90S | 0,8 | 4 | 1440 | 69 | 0,72 | 2,6 | 4,4 | 4,5 | 2,3 | 0,0033 | 13 |
| | | 1,1 | 2 | 2890 | 73 | 0,82 | 3,4 | 6,4 | 5 | 2 | | |
| 90L3 | 90L | 1,1 | 4 | 1420 | 69 | 0,76 | 3,2 | 5,6 | 4,3 | 2,4 | 0,004 | 15 |
| | | 1,6 | 2 | 2880 | 70 | 0,81 | 4,8 | 8,5 | 4,9 | 2,3 | | |
| 100M3 | 100 | 1,5 | 4 | 1430 | 75 | 0,79 | 4 | 10,5 | 6 | 2,4 | 0,0075 | 20 |
| | | 2,2 | 2 | 2850 | 77 | 0,85 | 5,7 | 16,8 | 6 | 2,3 | | |
| 100L3 | 100 | 2,2 | 4 | 1440 | 77 | 0,85 | 5,7 | 13,8 | 6,2 | 2,5 | 0,0086 | 25 |
| | | 3 | 2 | 2870 | 77 | 0,84 | 8,1 | 23 | 6 | 2,3 | | |
| 112M3 | 112 | 3,3 | 4 | 1450 | 78 | 0,87 | 7 | 1,1 | 6,2 | 2,5 | 0,013 | 30 |
| | | 4 | 2 | 2900 | 77 | 0,88 | 9,1 | 1,4 | 6 | 2,3 | | |
| 132S3 | 132S | 4,8 | 4 | 1450 | 84 | 0,87 | 9,5 | 32 | 6,3 | 2,2 | 0,02311 | 42 |
| | | 5,9 | 2 | 2840 | 84 | 0,85 | 12,1 | 19,5 | 7,1 | 2,3 | | |
| 132M3 | 132M | 5,5 | 4 | 1440 | 85 | 0,84 | 11,1 | 44 | 6,5 | 2,1 | 0,02953 | 56 |
| | | 7,5 | 2 | 2860 | 86 | 0,86 | 13,9 | 25 | 7,3 | 2,3 | | |
| 132L3 | 132M | 6 | 4 | 1450 | 85 | 0,84 | 12,1 | 50 | 6,2 | 2,2 | 0,032 | 60 |
| | | 8 | 2 | 2900 | 85 | 0,87 | 14,9 | 30,5 | 7,4 | 2,3 | | |
| 160M3 | 160M | 8,8 | 4 | 1460 | 88 | 0,85 | 17 | 58,5 | 6,4 | 2,2 | 0,0627 | 100 |
| | | 11 | 2 | 2915 | 82 | 0,89 | 22 | 36 | 7,2 | 2,2 | | |
| 160L3 | 160L | 12 | 4 | 1450 | 87 | 0,84 | 23,7 | 79 | 6,5 | 2,4 | 0,0801 | 110 |
| | | 15 | 2 | 2910 | 84 | 0,91 | 28,3 | 49 | 7,4 | 2,5 | | |
| 180M3 | 180L | 15 | 4 | 1460 | 83 | 0,88 | 29,5 | 98 | 5,6 | 2 | 0,127 | 160 |
| | | 18,5 | 2 | 2930 | 82 | 0,9 | 36 | 60 | 6,4 | 2,1 | | |
| 180L3 | 180L | 18,5 | 4 | 1460 | 90 | 0,78 | 38 | 121 | 5,8 | 2,1 | 0,1488 | 180 |
| | | v | 2 | 2960 | 89 | 0,84 | 42,5 | 71 | 6,6 | 2,2 | | |

4/8 POLES THREE PHASE MOTORS - 2 SPEEDS - CONSTANT TORQUE 750/1500 - 400V 50Hz

| Type | Size | [kW] | Poles | rpm | η (%) | Cos ϕ | IN [A] | MN [Nm] | IA/IN | MA/MN | Jrotor [kgm ²] | [kg] |
|-------|------|------|-------|------|------------|------------|--------|---------|-------|-------|----------------------------|------|
| 71A5 | 71 | 0,11 | 8 | 670 | 40 | 0,72 | 0,8 | 1,3 | 2,4 | 1,4 | 0,0018 | 7 |
| | | 0,18 | 4 | 1370 | 68 | 0,62 | 0,9 | 1,4 | 3,4 | 1,1 | | |
| 71B5 | 71 | 0,15 | 8 | 670 | 42 | 0,71 | 1,1 | 1,5 | 2,4 | 1,4 | 0,002 | 7,5 |
| | | 0,3 | 4 | 1370 | 70 | 0,75 | 1,2 | 1,5 | 3,5 | 1,1 | | |
| 80A5 | 80 | 0,22 | 8 | 700 | 50 | 0,67 | 1,3 | 2,2 | 2,4 | 1,6 | 0,0023 | 10 |
| | | 0,45 | 4 | 1420 | 71 | 0,75 | 1,4 | 2,3 | 3,5 | 1,5 | | |
| 80B5 | 80 | 0,37 | 8 | 700 | 54 | 0,69 | 2 | 3,1 | 2,6 | 1,6 | 0,003 | 11 |
| | | 0,55 | 4 | 1410 | 75 | 0,74 | 1,4 | 3,7 | 3,6 | 1,5 | | |
| 90S5 | 90S | 0,37 | 8 | 680 | 62 | 0,7 | 3 | 4,5 | 3,2 | 1,7 | 0,0035 | 13 |
| | | 0,75 | 4 | 1400 | 71 | 0,75 | 4,9 | 4,4 | 4 | 2 | | |
| 90L5 | 90L | 0,6 | 8 | 700 | 60 | 0,89 | 2,50 | 7,8 | 3,5 | 1,4 | 0,0043 | 15 |
| | | 1,1 | 4 | 1350 | 71 | 0,60 | 2,45 | 8,2 | 2,7 | 1,8 | | |
| 100M5 | 100 | 0,7 | 8 | 700 | 70 | 0,68 | 5 | 6,9 | 5 | 2,5 | 0,0077 | 20 |
| | | 1,1 | 4 | 1430 | 79 | 0,77 | 5,2 | 6,8 | 5,2 | 2,2 | | |
| 100L5 | 100 | 1,1 | 8 | 710 | 72 | 0,74 | 5,2 | 9,1 | 5,2 | 2,4 | 0,0086 | 22 |
| | | 1,8 | 4 | 1430 | 80 | 0,81 | 5,5 | 8,9 | 5,5 | 2,3 | | |
| 112M5 | 112 | 1,4 | 8 | 710 | 78 | 0,65 | 5,3 | 11,5 | 5,2 | 2,5 | 0,012 | 37 |
| | | 2,6 | 4 | 1430 | 81 | 0,85 | 5,7 | 12 | 5,5 | 2,3 | | |
| 132S5 | 132S | 1,85 | 8 | 700 | 82 | 0,75 | 4,4 | 25 | 4,1 | 1,6 | 0,03 | 50 |
| | | 3,3 | 4 | 1440 | 83 | 0,83 | 6,8 | 22 | 4,9 | 1,6 | | |
| 132M5 | 132M | 2,4 | 8 | 710 | 82 | 0,76 | 5,5 | 33 | 4,3 | 1,7 | 0,04 | 55 |
| | | 4,8 | 4 | 1430 | 85 | 0,81 | 10 | 32 | 5,2 | 1,7 | | |
| 132L5 | 132M | 3 | 8 | 720 | 84 | 0,75 | 7 | 40 | 4,5 | 1,8 | 0,045 | 59 |
| | | 5,5 | 4 | 1440 | 85 | 0,83 | 11,5 | 36 | 5,5 | 1,8 | | |
| 160M5 | 160M | 4,8 | 8 | 715 | 86 | 0,76 | 10,7 | 63 | 4,7 | 1,8 | 0,919 | 100 |
| | | 7,5 | 4 | 1450 | 87 | 0,84 | 17,1 | 49 | 5,7 | 1,9 | | |
| 160L5 | 160L | 6,6 | 8 | 720 | 86 | 0,87 | 12,8 | 88 | 5,6 | 1,9 | 0,1218 | 110 |
| | | 10 | 4 | 1450 | 83 | 0,84 | 20,7 | 66 | 6,8 | 1,9 | | |
| 180M5 | 180L | 8,1 | 8 | 730 | 85 | 0,61 | 22,5 | 84 | 5,3 | 2 | 0,2067 | 160 |
| | | 13 | 4 | 1460 | 81 | 0,87 | 26,5 | 105 | 6,6 | 2 | | |
| 180L5 | 180L | 9,9 | 8 | 730 | 87 | 0,61 | 27 | 129 | 5,3 | 1,9 | 0,2067 | 180 |
| | | 16 | 4 | 1460 | 85 | 0,88 | 31 | 104 | 6,5 | 1,9 | | |

Electrical data - Flameproof Motors



4/6 POLES - THREE PHASE MOTORS - 2 SPEEDS CONSTANT TORQUE 1000/1500 - 400V 50Hz

| Type | Size | [kW] | Poles | rpm | η (%) | Cos ϕ | IN [A] | MN [Nm] | IA/IN | MA/MN | Jrotor [kgm ²] | [kg] |
|-------|------|------|-------|------|------------|------------|--------|---------|-------|-------|----------------------------|------|
| 71BL | 71 | 0,1 | 6 | 900 | 53 | 0,71 | 0,38 | 1,1 | 2,4 | 1,4 | 0,001 | 7,5 |
| | | 0,2 | 4 | 1400 | 70 | 0,75 | 0,55 | 1,3 | 3,3 | 1,4 | | |
| 80AL | 80 | 0,2 | 6 | 905 | 62 | 0,72 | 0,65 | 2,1 | 2,5 | 1,5 | 0,002 | 9 |
| | | 0,4 | 4 | 1400 | 71 | 0,75 | 1,1 | 2,9 | 3,4 | 1,4 | | |
| 80BL | 80 | 0,3 | 6 | 910 | 66 | 0,73 | 0,9 | 3 | 3,1 | 1,5 | 0,003 | 10 |
| | | 0,5 | 4 | 1405 | 71 | 0,74 | 1,38 | 3,4 | 3,6 | 1,5 | | |
| 90SL | 90S | 0,45 | 6 | 910 | 70 | 0,73 | 1,26 | 4,6 | 4,3 | 1,5 | 0,003 | 13 |
| | | 0,65 | 4 | 1405 | 76 | 0,75 | 1,65 | 4,5 | 5,8 | 1,6 | | |
| 90LL | 90L | 0,6 | 6 | 910 | 70 | 0,74 | 1,66 | 6,3 | 3,6 | 1,6 | 0,003 | 16 |
| | | 0,95 | 4 | 1400 | 77 | 0,76 | 2,36 | 6,4 | 5,5 | 1,5 | | |
| 100ML | 100 | 0,9 | 6 | 910 | 74 | 0,74 | 2,4 | 9,3 | 4,1 | 1,7 | 0,008 | 22 |
| | | 1,4 | 4 | 1415 | 81 | 0,73 | 3,2 | 9,4 | 5,7 | 1,8 | | |
| 100LL | 100 | 1,1 | 6 | 910 | 74 | 0,74 | 2,9 | 12,1 | 2,9 | 1,6 | 0,010 | 26 |
| | | 1,85 | 4 | 1415 | 80 | 0,81 | 4,1 | 12,4 | 5,8 | 1,6 | | |
| 112ML | 112 | 1,6 | 6 | 940 | 81 | 0,77 | 3,66 | 16,2 | 4,3 | 1,7 | 0,016 | 37 |
| | | 2,4 | 4 | 1420 | 82 | 0,85 | 4,95 | 16,5 | 6,1 | 1,8 | | |
| 132KL | 132S | 2 | 6 | 940 | 81 | 0,8 | 4,46 | 20,2 | 3,9 | 1,6 | 0,032 | 48 |
| | | 3 | 4 | 1450 | 82 | 0,87 | 6 | 20 | 5,9 | 1,9 | | |
| 132SL | 132S | 2,6 | 6 | 940 | 83 | 0,77 | 5,8 | 25,9 | 4,5 | 1,8 | 0,036 | 54 |
| | | 4 | 4 | 1450 | 83 | 0,82 | 8,4 | 26,3 | 6,1 | 2 | | |
| 132ML | 132M | 3 | 6 | 960 | 80 | 0,8 | 6,6 | 30,3 | 4,4 | 1,7 | 0,038 | 59 |
| | | 4,4 | 4 | 1440 | 84 | 0,89 | 9 | 29 | 6,3 | 1,9 | | |
| 132LL | 132M | 3,3 | 6 | 940 | 85 | 0,76 | 7,3 | 33 | 4,7 | 1,7 | 0,04 | 62 |
| | | 5,15 | 4 | 1440 | 84 | 0,82 | 10,7 | 33,5 | 6,8 | 1,9 | | |
| 160ML | 160M | 4,4 | 6 | 950 | 82 | 0,79 | 9,9 | 43,9 | 4,4 | 1,8 | 0,919 | 100 |
| | | 6,6 | 4 | 1460 | 86 | 0,83 | 13,4 | 43 | 6,8 | 1,9 | | |
| 160LL | 160L | 5,9 | 6 | 950 | 81 | 0,8 | 13,2 | 58 | 4,9 | 1,8 | 0,122 | 110 |
| | | 8,8 | 4 | 1460 | 83 | 0,84 | 18,2 | 57,7 | 6,8 | 1,9 | | |
| 180ML | 180L | 7,5 | 6 | 970 | 84 | 0,7 | 18,5 | 73 | 5,2 | 1,9 | 0,207 | 160 |
| | | 11 | 4 | 1460 | 88 | 0,84 | 21,5 | 71 | 6,6 | 2 | | |
| 180LL | 180L | 8,8 | 6 | 960 | 86 | 0,72 | 20,5 | 86 | 5 | 1,8 | 0,207 | 180 |
| | | 13 | 4 | 1470 | 88 | 0,85 | 25 | 84 | 6,5 | 2 | | |

6/8 POLES - THREE PHASE MOTORS - 2 SPEEDS CONSTANT TORQUE 1000/1500 - 400V 50Hz

| Type | Size | [kW] | Poles | rpm | η (%) | Cos ϕ | IN [A] | MN [Nm] | IA/IN | MA/MN | Jrotor [kgm ²] | [kg] |
|-------|------|------|-------|-----|------------|------------|--------|---------|-------|-------|----------------------------|------|
| 71BM | 71 | 0,08 | 8 | 690 | 49 | 0,61 | 0,44 | 1,1 | 2,2 | 1,3 | 0,001 | 7,5 |
| | | 0,12 | 6 | 900 | 50 | 0,71 | 0,53 | 1,3 | 2,4 | 1,4 | | |
| 80BM | 80 | 0,13 | 8 | 690 | 52 | 0,6 | 0,63 | 1,9 | 2,1 | 1,5 | 0,002 | 9 |
| | | 0,15 | 6 | 935 | 50 | 0,71 | 0,68 | 1,5 | 2,6 | 1,5 | | |
| 80BM | 80 | 0,15 | 8 | 685 | 49 | 0,6 | 0,82 | 2,2 | 2,2 | 1,4 | 0,003 | 10 |
| | | 0,25 | 6 | 930 | 52 | 0,72 | 1 | 2,7 | 3,2 | 1,5 | | |
| 90SM | 90S | 0,25 | 8 | 650 | 60 | 0,6 | 1 | 3,8 | 3,1 | 2,5 | 0,003 | 13 |
| | | 0,35 | 6 | 910 | 55 | 0,74 | 1,35 | 3,6 | 3,8 | 1,4 | | |
| 90LM | 90L | 0,3 | 8 | 685 | 61 | 0,6 | 1,35 | 4,3 | 3,4 | 1,6 | 0,003 | 16 |
| | | 0,6 | 6 | 935 | 60 | 0,76 | 2 | 6,1 | 3,8 | 1,5 | | |
| 100MM | 100 | 0,55 | 8 | 700 | 68 | 0,63 | 1,9 | 7,4 | 3,6 | 1,6 | 0,008 | 22 |
| | | 0,8 | 6 | 920 | 65 | 0,77 | 2,35 | 8,2 | 4 | 1,5 | | |
| 100LM | 100 | 0,65 | 8 | 700 | 68 | 0,66 | 2,2 | 8,8 | 3,7 | 1,6 | 0,010 | 26 |
| | | 1 | 6 | 930 | 67 | 0,75 | 2,9 | 10,5 | 4,1 | 1,6 | | |
| 112MM | 112 | 1 | 8 | 710 | 65 | 0,7 | 3,3 | 13,4 | 3,9 | 1,6 | 0,016 | 37 |
| | | 1,5 | 6 | 960 | 75 | 0,72 | 4,2 | 15 | 4 | 1,7 | | |
| 132SM | 132S | 1,3 | 8 | 720 | 68 | 0,65 | 4,1 | 17,4 | 4 | 1,8 | 0,036 | 54 |
| | | 1,85 | 6 | 950 | 73 | 0,71 | 5,2 | 18,5 | 4,2 | 1,6 | | |
| 132MM | 132M | 1,85 | 8 | 720 | 70 | 0,67 | 5,9 | 24,7 | 4,2 | 1,8 | 0,038 | 59 |
| | | 2,55 | 6 | 960 | 75 | 0,73 | 6,9 | 25,2 | 4,1 | 1,8 | | |
| 132LM | 132M | 2 | 8 | 730 | 74 | 0,65 | 5,9 | 26,4 | 4,1 | 1,9 | 0,04 | 62 |
| | | 3 | 6 | 980 | 79 | 0,75 | 7,3 | 29,6 | 4,2 | 1,8 | | |
| 160MM | 160M | 2,8 | 8 | 725 | 78 | 0,7 | 7,5 | 37,2 | 4,2 | 1,9 | 0,919 | 100 |
| | | 4 | 6 | 980 | 82 | 0,75 | 9,4 | 39,3 | 4,3 | 1,9 | | |
| 160LM | 160L | 4 | 8 | 730 | 78 | 0,75 | 9,9 | 53 | 4,2 | 1,9 | 0,122 | 110 |
| | | 5,5 | 6 | 985 | 84 | 0,74 | 12,9 | 53,5 | 4,3 | 1,9 | | |
| 180MM | 180L | 5 | 8 | 720 | 77 | 0,75 | 12,5 | 66 | 4,3 | 1,8 | 0,207 | 160 |
| | | 6,5 | 6 | 970 | 83 | 0,75 | 15 | 64 | 4,1 | 1,7 | | |
| 180LM | 180L | 6 | 8 | 715 | 78 | 0,74 | 15 | 80 | 4,2 | 1,9 | 0,207 | 180 |
| | | 8 | 6 | 960 | 85 | 0,78 | 17,5 | 79 | 4,4 | 1,8 | | |

Electrical data - Flameproof Motors

2/4 POLES - THREE PHASE MOTORS - 2 SPEEDS QUADRATIC TORQUE 1500/3000 - 400V 50Hz

| Type | Size | [kW] | Poles | rpm | η (%) | Cos ϕ | IN [A] | MN [Nm] | IA/IN | MA/MN | Jrotor [kgm ²] | [kg] |
|-------|------|------|-------|------|------------|------------|--------|---------|-------|-------|----------------------------|------|
| 71AC | 71 | 0,09 | 4vv | 1410 | 33 | 0,7 | 0,4 | 0,6 | 2,8 | 1,8 | 0,005 | 72 |
| | | 0,37 | 2 | 2790 | 59 | 0,8 | 1,1 | 1,3 | 3,5 | 1,8 | | |
| 71BC | 71 | 0,14 | 4 | 1410 | 65 | 0,7 | 0,45 | 1 | 2,9 | 1,9 | 0,001 | 7,5 |
| | | 0,5 | 2 | 2800 | 60 | 0,7 | 1,9 | 1,7 | 3,6 | 1,8 | | |
| 80AC | 80 | 0,18 | 4 | 1415 | 66 | 0,79 | 0,5 | 1,2 | 3,5 | 2,2 | 0,001 | 10 |
| | | 0,75 | 2 | 2800 | 63 | 0,76 | 2,26 | 2,6 | 4 | 1,8 | | |
| 80BC | 80 | 0,25 | 4 | 1415 | 70 | 0,81 | 0,64 | 1,7 | 3,7 | 2,2 | 0,002 | 11 |
| | | 1,1 | 2 | 2810 | 66 | 0,81 | 3 | 3,7 | 4,1 | 1,8 | | |
| 90SC | 90S | 0,37 | 4 | 1420 | 64 | 0,81 | 1 | 2,5 | 3,9 | 2,2 | 0,003 | 13,5 |
| | | 1,5 | 2 | 2820 | 66 | 0,82 | 4 | 5,1 | 4,5 | 2 | | |
| 90LC | 90L | 0,55 | 4 | 1400 | 67 | 0,87 | 1,3 | 3,7 | 4,4 | 2,1 | 0,004 | 16,5 |
| | | 2,2 | 2 | 2860 | 70 | 0,89 | 5 | 7,5 | 4,4 | 1,9 | | |
| 100MC | 100 | 0,62 | 4 | 1420 | 73 | 0,89 | 1,42 | 4,2 | 5,3 | 2 | 0,005 | 20 |
| | | 2,6 | 2 | 2820 | 77 | 0,92 | 5,3 | 8,8 | 5,6 | 2,1 | | |
| 100LC | 100 | 0,75 | 4 | 1415 | 73 | 0,9 | 1,6 | 5,1 | 5 | 2 | 0,008 | 22 |
| | | 3,3 | 2 | 2800 | 78 | 0,92 | 6,64 | 11,3 | 5,6 | 2,1 | | |
| 112MC | 112 | 1,1 | 4 | 1425 | 79 | 0,85 | 2,4 | 7,5 | 5 | 2,3 | 0,009 | 37 |
| | | 4,4 | 2 | 2900 | 80 | 0,82 | 9,5 | 14,5 | 5,6 | 2,1 | | |
| 132SC | 132S | 2 | 4 | 1450 | 75 | 0,81 | 4,7 | 13,1 | 5,9 | 2,1 | 0,023 | 42 |
| | | 6,5 | 2 | 2890 | 83 | 0,92 | 12,4 | 21,5 | 6,1 | 2,2 | | |
| 132MC | 132M | 2,5 | 4 | 1440 | 89 | 0,8 | 4,9 | 16,5 | 6,4 | 2,3 | 0,030 | 56 |
| | | 8,5 | 2 | 2900 | 91 | 0,83 | 15,9 | 28,2 | 6,7 | 2,3 | | |
| 132LC | 132M | 2,8 | 4 | 1440 | 85 | 0,83 | 5,6 | 18,6 | 6,5 | 2,3 | 0,032 | 60 |
| | | 9,2 | 2 | 2900 | 88 | 0,85 | 17,4 | 30,5 | 6,8 | 2,4 | | |
| 160MC | 160M | 3 | 4 | 1450 | 69 | 0,82 | 7,9 | 19,6 | 4,3 | 2,2 | 0,036 | 100 |
| | | 12 | 2 | 2930 | 76 | 0,9 | 25,9 | 39 | 6,1 | 3,5 | | |
| 160LC | 160L | 4,4 | 4 | 1460 | 79 | 0,8 | 10,4 | 28,5 | 6,9 | 2 | 0,053 | 110 |
| | | 16 | 2 | 2930 | 86 | 0,94 | 28,4 | 52 | 7,3 | 2,1 | | |
| 180MC | 180L | 5 | 4 | 1460 | 75 | 0,85 | 11,4 | 32,6 | 7,1 | 2,3 | 0,075 | 160 |
| | | 18 | 2 | 2960 | 79 | 0,89 | 37 | 58 | 8,3 | 2,6 | | |
| 180LC | 180L | 6 | 4 | 1480 | 89 | 0,83 | 11,8 | 39 | 9,6 | 3,1 | 0,075 | 180 |
| | | 24 | 2 | 2960 | 90 | 0,87 | 44,5 | 77,4 | 9,6 | 3,3 | | |

4/8 POLES MOTORS - 2 SPEEDS QUADRATIC TORQUE 750/1500 - 400V 50Hz

| Type | Size | [kW] | Poles | rpm | η (%) | Cos ϕ | IN [A] | MN [Nm] | IA/IN | MA/MN | Jrotor [kgm ²] | [kg] |
|-------|------|------|-------|------|------------|------------|--------|---------|-------|-------|----------------------------|------|
| 71AD | 71 | 0,05 | 8 | 700 | 28 | 0,68 | 0,36 | 0,7 | 2,3 | 2,8 | 0,002 | 7 |
| | | 0,25 | 4 | 1400 | 70 | 0,75 | 0,69 | 1,7 | 3 | 2,2 | | |
| 71BD | 71 | 0,07 | 8 | 680 | 33 | 0,7 | 0,45 | 1,1 | 1,4 | 1,2 | 0,002 | 7,5 |
| | | 0,37 | 4 | 1380 | 59 | 0,8 | 1,1 | 2,6 | 2,5 | 1,2 | | |
| 80AD | 80 | 0,1 | 8 | 700 | 38 | 0,66 | 0,58 | 1,4 | 2 | 2,3 | 0,002 | 10 |
| | | 0,55 | 4 | 1405 | 75 | 0,74 | 1,43 | 3,7 | 4,4 | 2,2 | | |
| 80BD | 80 | 0,15 | 8 | 690 | 48 | 0,66 | 0,7 | 2,1 | 2,4 | 1,5 | 0,003 | 11 |
| | | 0,75 | 4 | 1410 | 70 | 0,76 | 1,9 | 5,1 | 4,1 | 1,7 | | |
| 90SD | 90S | 0,25 | 8 | 710 | 54 | 0,7 | 0,96 | 3,4 | 2,9 | 2,8 | 0,004 | 13,5 |
| | | 0,9 | 4 | 1415 | 77 | 0,75 | 2,75 | 6,1 | 4 | 2,3 | | |
| 90LD | 90L | 0,3 | 8 | 710 | 57 | 0,7 | 1,1 | 4 | 1,3 | 3 | 0,005 | 16,5 |
| | | 1,2 | 4 | 1420 | 80 | 0,79 | 3,4 | 8,1 | 4,2 | 2,3 | | |
| 100MD | 100 | 0,45 | 8 | 710 | 61 | 0,68 | 1,6 | 6,1 | 3 | 2 | 0,008 | 20 |
| | | 1,9 | 4 | 1390 | 80 | 0,8 | 4,1 | 13,1 | 5 | 3 | | |
| 100LD | 100 | 0,55 | 8 | 720 | 68 | 0,7 | 1,68 | 7,3 | 3 | 2,4 | 0,009 | 22 |
| | | 2,2 | 4 | 1440 | 84 | 0,85 | 4,86 | 14,6 | 6 | 2,5 | | |
| 112MD | 112 | 0,75 | 8 | 720 | 70 | 0,68 | 2,27 | 9,9 | 3 | 2,4 | 0,012 | 37 |
| | | 3 | 4 | 1450 | 83 | 0,85 | 6,6 | 19,8 | 6 | 2,6 | | |
| 132SD | 132S | 1,1 | 8 | 710 | 72 | 0,73 | 3,1 | 15 | 3,5 | 1,9 | 0,03 | 50 |
| | | 4,4 | 4 | 1450 | 85 | 0,82 | 9,2 | 29 | 5,8 | 2,2 | | |
| 132MD | 132M | 1,5 | 8 | 700 | 79 | 0,64 | 4,33 | 20 | 3,9 | 1,8 | 0,04 | 55 |
| | | 5,9 | 4 | 1440 | 86 | 0,84 | 11,9 | 39 | 6,2 | 2,1 | | |
| 132LD | 132M | 1,85 | 8 | 700 | 80 | 0,7 | 4,9 | 25 | 4,3 | 1,9 | 0,045 | 59 |
| | | 7,5 | 4 | 1450 | 87 | 0,84 | 14,9 | 50 | 6,7 | 2,1 | | |
| 160MD | 160M | 2,5 | 8 | 710 | 82 | 0,75 | 6 | 32,8 | 3,9 | 2,9 | 0,063 | 100 |
| | | 8,8 | 4 | 1450 | 83 | 0,84 | 18,4 | 58,3 | 6,8 | 2,2 | | |
| 160LD | 160L | 3,2 | 8 | 715 | 83,5 | 0,74 | 7,48 | 42,2 | 4 | 2,1 | 0,080 | 110 |
| | | 12 | 4 | 1460 | 88 | 0,85 | 23,3 | 78,6 | 6,8 | 2,2 | | |
| 180MD | 180L | 4 | 8 | 730 | 66 | 0,7 | 12,5 | 53,5 | 4,6 | 2 | 0,127 | 160 |
| | | 16 | 4 | 1460 | 89 | 0,85 | 30,5 | 103,5 | 7 | 2,6 | | |
| 180LD | 180L | 5,5 | 8 | 730 | 82 | 0,56 | 17,2 | 71,8 | 4,2 | 3,1 | 0,149 | 180 |
| | | 22 | 4 | 1460 | 89 | 0,8 | 45 | 143 | 6,7 | 3,7 | | |

Electrical data - Flameproof Motors



4/6 POLES - THREE PHASE MOTORS - 2 SPEEDS QUADRATIC TORQUE 1000/1500 - 400V 50Hz

| Type | Size | [kW] | Poles | rpm | η (%) | $\cos\phi$ | IN [A] | MN [Nm] | IA/IN | MA/MN | Jrotor [kgm ²] | [kg] |
|-------|------|------|-------|------|------------|------------|---------|---------|-------|-------|----------------------------|------|
| 71BE | 71 | 0,1 | 6 | 900 | 63 | 0,72 | 0,5 | 1,4 | 1,4 | 1,8 | 0,0008 | 7,5 |
| | | 0,3 | 4 | 1400 | 71 | 0,75 | 0,95 | 2,1 | 2,6 | 2 | | |
| 80AE | 80 | 0,13 | 6 | 900 | 33 | 0,7 | 0,5 | 1,4 | 1,7 | 1,1 | 0,0022 | 10 |
| | | 0,44 | 4 | 1405 | 59 | 0,8 | 1:02:00 | 3 | 3,2 | 1,5 | | |
| 80BE | 80 | 0,18 | 6 | 905 | 72 | 0,75 | 0,65 | 1,9 | 2,3 | 1,2 | 0,00282 | 11 |
| | | 0,59 | 4 | 1405 | 76 | 0,8 | 1,6 | 3,9 | 3,5 | 1,7 | | |
| 90SE | 90S | 0,3 | 6 | 900 | 68 | 0,76 | 0,83 | 3,1 | 3,1 | 1,6 | 0,00265 | 13,5 |
| | | 0,9 | 4 | 1400 | 77 | 0,75 | 2,25 | 6,1 | 4,1 | 2,1 | | |
| 90LE | 90L | 0,4 | 6 | 910 | 74 | 0,74 | 1,1 | 4,2 | 2,9 | 1,3 | 0,00342 | 16,5 |
| | | 1,15 | 4 | 1420 | 80 | 0,79 | 2,6 | 7,5 | 4,1 | 1,8 | | |
| 100ME | 100 | 0,6 | 6 | 930 | 80 | 0,75 | 1,44 | 6,1 | 3,9 | 1,8 | 0,00775 | 20 |
| | | 1,8 | 4 | 1410 | 80 | 0,83 | 3,67 | 12,1 | 5,1 | 2,1 | | |
| 100LE | 100 | 0,7 | 6 | 940 | 80 | 0,75 | 2,1 | 7,5 | 3 | 1,5 | 0,01033 | 22 |
| | | 2,2 | 4 | 1440 | 82 | 0,87 | 4,9 | 15,2 | 3,8 | 1,7 | | |
| 112ME | 112 | 0,9 | 6 | 940 | 81 | 0,79 | 2 | 9,1 | 4 | 1,9 | 0,01603 | 37 |
| | | 3 | 4 | 1450 | 84 | 0,82 | 6,3 | 19,8 | 5,5 | 2 | | |
| 132KE | 132S | 1,2 | 6 | 945 | 80 | 0,75 | 2,9 | 11,8 | 4,9 | 1,7 | 0,03223 | 48 |
| | | 4 | 4 | 1450 | 84 | 0,82 | 8,4 | 26 | 6,3 | 2,1 | | |
| 132SE | 132S | 1,4 | 6 | 970 | 69 | 0,6 | 5 | 14 | 5,2 | 1,9 | 0,036 | 54 |
| | | 4,8 | 4 | 1460 | 75 | 0,81 | 11,3 | 31,2 | 6,6 | 1,9 | | |
| 132ME | 132M | 1,7 | 6 | 960 | 64 | 0,62 | 6,4 | 17 | 4,8 | 1,9 | 0,038 | 59 |
| | | 5,5 | 4 | 1455 | 77 | 0,81 | 12,8 | 36 | 5,4 | 2,1 | | |
| 132LE | 132M | 2 | 6 | 950 | 78 | 0,55 | 7,9 | 20,1 | 5,2 | 1,9 | 0,04 | 62 |
| | | 6,6 | 4 | 1460 | 89 | 0,72 | 15,3 | 43,2 | 6,7 | 1,9 | | |
| 160ME | 160M | 2,5 | 6 | 985 | 72 | 0,72 | 7,2 | 24,2 | 5,9 | 2,3 | 0,0627 | 100 |
| | | 7,5 | 4 | 1470 | 81 | 0,85 | 16,4 | 49 | 7,2 | 2,2 | | |
| 160LE | 160L | 3,3 | 6 | 960 | 73 | 0,72 | 9,3 | 32 | 6,1 | 2,3 | 0,0801 | 110 |
| | | 11 | 4 | 1450 | 84 | 0,85 | 22,8 | 72 | 6,9 | 2,2 | | |
| 180ME | 180L | 5,2 | 6 | 960 | 65 | 0,57 | 21 | 51,7 | 6 | 1,6 | 0,127 | 160 |
| | | 15 | 4 | 1450 | 81 | 0,85 | 31,5 | 98,8 | 6,9 | 1,8 | | |
| 180LE | 180L | 6,25 | 6 | 960 | 66 | 0,62 | 22 | 61,8 | 6,2 | 1,6 | 0,1488 | 180 |
| | | 18,5 | 4 | 1450 | 84 | 0,88 | 36 | 122 | 7 | 1,8 | | |

6/8 POLES - THREE PHASE MOTORS - 2 SPEEDS QUADRATIC TORQUE 750/1000 - 400V 50Hz

| Type | [kW] | Poles | rpm | η (%) | $\cos\phi$ | IN [A] | MN [Nm] | IA/IN | MA/MN | Jrotor [kgm ²] | [kg] |
|-------|------|-------|-----|------------|------------|--------|---------|-------|-------|----------------------------|------|
| 80BF | 0,09 | 8 | 680 | 57 | 0,62 | 0,4 | 1,3 | 1,9 | 1,4 | 0,0022 | 10 |
| | 0,33 | 6 | 920 | 55 | 0,7 | 1,32 | 3,4 | 3,1 | 1,8 | | |
| 80BF | 0,12 | 8 | 685 | 55 | 0,63 | 0,5 | 1,7 | 2,1 | 1,4 | 0,00282 | 11 |
| | 0,4 | 6 | 935 | 58 | 0,7 | 1,48 | 4 | 2,9 | 1,8 | | |
| 90SF | 0,19 | 8 | 690 | 55 | 0,62 | 0,85 | 2,7 | 2,1 | 1,5 | 0,00265 | 13,5 |
| | 0,48 | 6 | 925 | 61 | 0,65 | 1,78 | 4,8 | 3,1 | 1,9 | | |
| 90LF | 0,25 | 8 | 700 | 52 | 0,62 | 1,2 | 3,5 | 2,3 | 1,7 | 0,00342 | 16,5 |
| | 0,66 | 6 | 900 | 60 | 0,8 | 2 | 7,1 | 3,2 | 2 | | |
| 100MF | 0,37 | 8 | 720 | 50 | 0,65 | 1,75 | 4,8 | 3,5 | 1,8 | 0,00775 | 20 |
| | 0,9 | 6 | 960 | 67 | 0,68 | 2,85 | 8,9 | 4,1 | 1,9 | | |
| 100LF | 0,45 | 8 | 720 | 52 | 0,64 | 2,1 | 5,9 | 3,4 | 1,4 | 0,01033 | 22 |
| | 1,1 | 6 | 950 | 70 | 0,7 | 3,35 | 11,2 | 3,9 | 1,6 | | |
| 112M | 0,75 | 8 | 720 | 61 | 0,68 | 2,8 | 10,1 | 3,5 | 1,7 | 0,01603 | 37 |
| | 1,5 | 6 | 970 | 75 | 0,74 | 3,9 | 15,1 | 4,4 | 2,1 | | |
| 132SF | 0,9 | 8 | 720 | 62 | 0,66 | 3,2 | 11,9 | 3,7 | 1,8 | 0,036 | 54 |
| | 2,2 | 6 | 960 | 75 | 0,75 | 5,6 | 22,2 | 4,4 | 2,2 | | |
| 132MF | 1,2 | 8 | 730 | 61 | 0,63 | 4,8 | 15,6 | 3,8 | 1,8 | 0,038 | 59 |
| | 3 | 6 | 970 | 77 | 0,82 | 6,9 | 29,7 | 4,8 | 2,1 | | |
| 132LF | 1,5 | 8 | 720 | 65 | 0,7 | 4,9 | 20,1 | 3,8 | 2,1 | 0,04 | 62 |
| | 3,7 | 6 | 970 | 80 | 0,77 | 8,8 | 36,5 | 5,1 | 2,1 | | |
| 160MF | 2,5 | 8 | 730 | 84 | 0,65 | 6,7 | 32,5 | 4,2 | 2,3 | 0,092 | 100 |
| | 5,5 | 6 | 980 | 88 | 0,75 | 12,3 | 53,5 | 5,5 | 2,2 | | |
| 160LF | 4 | 8 | 720 | 81 | 0,8 | 9,1 | 53,2 | 3,9 | 2,1 | 0,1218 | 110 |
| | 7,5 | 6 | 970 | 84 | 0,85 | 15,3 | 73,5 | 5,7 | 2,1 | | |
| 180MF | 4,5 | 8 | 725 | 80 | 0,75 | 11 | 59 | 4,3 | 2,2 | 0,2067 | 160 |
| | 9 | 6 | 960 | 83 | 0,78 | 20 | 89 | 5,8 | 2,3 | | |
| 180LF | 5,2 | 8 | 720 | 80 | 0,72 | 23,5 | 69 | 4,1 | 2 | 0,2067 | 180 |
| | 10 | 6 | 960 | 79 | 0,78 | 13 | 99 | 5,6 | 2,1 | | |

Electrical data - Flameproof Motors



2 POLES - SINGLE PHASE MOTORS - 1 SPEED RUNNING CAPACITOR 3000 - 230V 50Hz

| Type | Size | [kW] | rpm | η (%) | $\cos\varphi$ | I_N [A] | M_N [Nm] | I_A/I_N | M_A/M_N | M_{max}/M_N | C [μ F] | J_{rotor} [kgm ²] | [kg] |
|-------|------|------|------|------------|---------------|-----------|------------|-----------|-----------|---------------|--------------|---------------------------------|------|
| 56B2 | 56 | 0,12 | 2880 | 43 | 0,94 | 1,3 | 0,4 | 3,4 | 0,4 | 2,9 | 8 | 0,0003 | 6 |
| 63A2 | 63 | 0,18 | 2870 | 55 | 1:39:00 | 1:05:00 | 0,6 | 3,2 | 0,4 | 2,1 | 12,5 | 0,0003 | 6 |
| 63B2 | 63 | 0,25 | 2800 | 59 | 0,95 | 1,81 | 0,85 | 2,6 | 0,4 | 1,7 | 12,5 | 0,00035 | 6 |
| 71A2 | 71 | 0,37 | 2860 | 65 | 0,95 | 2,56 | 1,23 | 3,6 | 0,6 | 2 | 16 | 0,00046 | 7,5 |
| 71B2 | 71 | 0,55 | 2840 | 66 | 0,99 | 3,42 | 1,85 | 3,3 | 0,7 | 2 | 25 | 0,00056 | 8 |
| 80A2 | 80 | 0,75 | 2860 | 70 | 0,99 | 4,55 | 2,52 | 3,8 | 0,5 | 1,8 | 30 | 0,00097 | 9,5 |
| 80B2 | 80 | 1,1 | 2820 | 72 | 0,99 | 6,8 | 3,7 | 2,8 | 0,4 | 1,5 | 30 | 0,001 | 11 |
| 90S2 | 90S | 1,5 | 2810 | 67 | 0,99 | 9,75 | 5,1 | 2,7 | 0,6 | 1,7 | 70 | 0,0015 | 14 |
| 90L2 | 90L | 2,2 | 2815 | 67 | 0,99 | 14,5 | 7,6 | 2,8 | 0,3 | 2 | 90 | 0,0019 | 16 |
| 100M2 | 100 | 2,2 | 2710 | 63 | 0,99 | 14:04:00 | 7,4 | 2,5 | 0,7 | 1,5 | 95 | 0,0037 | 25 |
| 100L2 | 100 | 3 | 2815 | 72 | 0,99 | 17:08:00 | 10 | 2,5 | 0,6 | 1,5 | 120 | 0,0053 | 27 |

4 POLES - SINGLE PHASE MOTORS - 1 SPEED RUNNING CAPACITOR 1500 - 230V 50Hz

| Type | Size | [kW] | rpm | η (%) | $\cos\varphi$ | I_N [A] | M_N [Nm] | I_A/I_N | M_A/M_N | M_{max}/M_N | C [μ F] | J_{rotor} [kgm ²] | [kg] |
|-------|------|------|------|------------|---------------|-----------|------------|-----------|-----------|---------------|--------------|---------------------------------|------|
| 56B4 | 56 | 0,09 | 1420 | 50 | 0,97 | 0,8 | 0,59 | 3 | 0,7 | 2,1 | 6,3 | 0,00038 | 6 |
| 63A4 | 63 | 0,12 | 1380 | 50 | 0,95 | 1,1 | 0,84 | 2,2 | 0,7 | 1,5 | 8 | 0,0004 | 6 |
| 63B4 | 63 | 0,18 | 1355 | 57 | 0,99 | 1,38 | 1,27 | 1,8 | 0,6 | 1,2 | 10 | 0,00045 | 6 |
| 71A4 | 71 | 0,25 | 1450 | 58 | 0,96 | 2 | 1,66 | 4 | 0,5 | 2,5 | 16 | 0,0008 | 8 |
| 71B4 | 71 | 0,37 | 1430 | 63 | 0,99 | 2,55 | 2,5 | 2,9 | 1,1 | 1,7 | 20 | 0,0009 | 8,5 |
| 80A4 | 80 | 0,55 | 1440 | 66 | 0,96 | 3,7 | 3,7 | 3,5 | 0,6 | 2 | 25 | 0,00096 | 10 |
| 80B4 | 80 | 0,75 | 1410 | 70 | 0,99 | 4,74 | 5,1 | 2,6 | 0,6 | 1,5 | 30 | 0,0012 | 12 |
| 90S4 | 90S | 1,1 | 1440 | 67 | 0,94 | 7,6 | 7,4 | 3,4 | 0,4 | 2 | 40 | 0,0026 | 15 |
| 90L4 | 90L | 1,5 | 1430 | 70 | 0,99 | 9,4 | 10,1 | 2,6 | 0,4 | 1,5 | 45 | 0,0032 | 18 |
| 100K4 | 100 | 2,2 | 1430 | 75 | 0,99 | 12,6 | 14,9 | 2,7 | 0,4 | 1,3 | 55 | 0,0059 | 25 |
| 112M4 | 112 | 3 | 1410 | 76 | 0,99 | 17 | 20 | 3,2 | 0,4 | 1,5 | 70 | 0,012 | 37 |

6 POLES - SINGLE PHASE MOTORS - 1 SPEED RUNNING CAPACITOR 1000 - 230V 50Hz

| Type | Size | [kW] | rpm | η (%) | $\cos\varphi$ | I_N [A] | M_N [Nm] | I_A/I_N | M_A/M_N | M_{max}/M_N | C [μ F] | J_{rotor} [kgm ²] | [kg] |
|-------|------|------|-----|------------|---------------|-----------|------------|-----------|-----------|---------------|--------------|---------------------------------|------|
| 71A6 | 71 | 0,12 | 945 | 47 | 0,95 | 1,16 | 1,2 | 3 | 0,9 | 2,1 | 10 | 0,0008 | 8 |
| 71B6 | 71 | 0,18 | 930 | 61 | 0,95 | 1,6 | 1,8 | 2,7 | 0,6 | 1,4 | 12,5 | 0,0009 | 8,5 |
| 80A6 | 80 | 0,25 | 955 | 55 | 0,96 | 2,1 | 2,2 | 2,7 | 0,5 | 1,8 | 16 | 0,00096 | 10 |
| 80B6 | 80 | 0,37 | 920 | 60 | 0,99 | 2,75 | 3,2 | 2 | 0,5 | 1,3 | 20 | 0,0012 | 12 |
| 90S6 | 90S | 0,55 | 930 | 62 | 0,99 | 3,86 | 5,9 | 2,4 | 0,4 | 1,5 | 30 | 0,0026 | 15 |
| 90L6 | 90L | 0,75 | 920 | 68 | 0,99 | 4,81 | 7,8 | 2,2 | 0,4 | 1,4 | 35 | 0,0032 | 18 |
| 100L6 | 100 | 1,1 | 940 | 73 | 0,97 | 6,74 | 11,1 | 3 | 0,5 | 1,5 | 50 | 0,0059 | 25 |

| Motor type 2 Poles | P [kW] 50Hz | Mn | IC411 Self-ventilated | | | IC411 Self-ventilated | | |
|---------------------------|-------------|-------|--|-----------|---------|---|-----------|---------|
| | | | Constant Torque Range Frequency (Hz) 5÷50 Range Speed (rpm) 300÷3000 | | | Constant Torque Range Frequency (Hz) 10÷50 Range Speed (rpm) 600÷3000 | | |
| | | | P [kW] | | Mn [Nm] | P [kW] | | Mn [Nm] |
| | | | Min Speed | Max Speed | | Min Speed | Max Speed | |
| 63A2 | 0,18 | 0,61 | 0,012 | 0,12 | 0,39 | 0,024 | 0,12 | 0,4 |
| 63B2 | 0,25 | 0,87 | 0,016 | 0,16 | 0,56 | 0,034 | 0,17 | 0,6 |
| 71A2 | 0,37 | 1,24 | 0,024 | 0,24 | 0,79 | 0,054 | 0,27 | 0,9 |
| 71B2 | 0,55 | 1,85 | 0,035 | 0,35 | 1,18 | 0,077 | 0,39 | 1,3 |
| 80A2 | 0,75 | 2,5 | 0,048 | 0,48 | 1,6 | 0,108 | 0,54 | 1,8 |
| 80B2 | 1,1 | 3,68 | 0,07 | 0,70 | 2,33 | 0,16 | 0,79 | 2,65 |
| 90S2 | 1,5 | 5,1 | 0,096 | 0,96 | 3,26 | 0,218 | 1,09 | 3,7 |
| 90L2 | 2,2 | 7,2 | 0,14 | 1,41 | 4,61 | 0,318 | 1,59 | 5,2 |
| 100K2 | 3,0 | 10 | 0,19 | 1,92 | 6,4 | 0,432 | 2,16 | 7,2 |
| | | | | | | | | |
| 112M2 | 4,0 | 13,2 | 0,26 | 2,56 | 8,45 | 0,576 | 2,88 | 9,5 |
| 132K2 | 5,5 | 18,1 | 0,35 | 3,5 | 11,58 | 0,790 | 3,95 | 13 |
| 132S2 | 7,5 | 24,7 | 0,48 | 4,8 | 15,81 | 1,081 | 5,40 | 17,8 |
| 132M2 | 9,3 | 30 | 0,60 | 6,0 | 19,2 | 1,339 | 6,70 | 21,6 |
| 132L2 | 11,0 | 36 | 0,70 | 7,0 | 23,04 | 1,583 | 7,91 | 25,9 |
| | | | | | | | | |
| 160K2 | 11,0 | 36,2 | 0,70 | 7,0 | 23,1 | 1,579 | 7,90 | 26 |
| 160M2 | 15,0 | 48,9 | 0,96 | 9,6 | 31,2 | 2,160 | 10,80 | 35,2 |
| 160L2 | 18,5 | 60,7 | 1,18 | 11,8 | 38,7 | 2,621 | 13,10 | 43 |
| 180N2 | 22,0 | 71,7 | 1,40 | 14,0 | 45,7 | 3,160 | 15,80 | 51,5 |
| 180L2 | 30,0 | 97,8 | 1,92 | 19,2 | 62,5 | 4,265 | 21,32 | 69,5 |
| 4 Poles | | | Range Frequency (Hz) 5÷50 Range Speed (rpm) 150÷1500 | | | Range Frequency (Hz) 10÷50 Range Speed (rpm) 300÷1500 | | |
| 63A4 | 0,12 | 0,8 | 0,008 | 0,08 | 0,51 | 0,018 | 0,09 | 0,60 |
| 63B4 | 0,18 | 1,25 | 0,012 | 0,12 | 0,80 | 0,026 | 0,13 | 0,90 |
| 71A4 | 0,25 | 1,68 | 0,016 | 0,16 | 1,08 | 0,036 | 0,18 | 1,20 |
| 71B4 | 0,37 | 2,56 | 0,02 | 0,24 | 1,64 | 0,052 | 0,26 | 1,80 |
| 80A4 | 0,55 | 3,75 | 0,04 | 0,35 | 2,40 | 0,079 | 0,40 | 2,70 |
| 80B4 | 0,75 | 5,1 | 0,05 | 0,48 | 3,26 | 0,11 | 0,54 | 3,70 |
| 90S4 | 1,1 | 7,5 | 0,07 | 0,70 | 4,80 | 0,16 | 0,79 | 5,40 |
| 90L4 | 1,5 | 10,16 | 0,10 | 0,96 | 6,50 | 0,22 | 1,08 | 7,30 |
| 100K4 | 2,2 | 14,8 | 0,14 | 1,41 | 9,47 | 0,32 | 1,59 | 10,70 |
| 100L4 | 3,0 | 20,1 | 0,19 | 1,92 | 12,86 | 0,43 | 2,16 | 14,50 |
| 112M4 | 4,0 | 26,5 | 0,26 | 2,6 | 16,96 | 0,58 | 2,88 | 19,1 |
| 132S4 | 5,5 | 36,3 | 0,35 | 3,5 | 23,23 | 0,79 | 4,0 | 26,1 |
| 132M4 | 7,5 | 50 | 0,48 | 4,8 | 32,00 | 1,08 | 5,4 | 36,0 |
| 132L4 | 9,3 | 61,2 | 0,59 | 5,9 | 39,00 | 1,34 | 6,7 | 44,0 |
| 160M4 | 11,0 | 71,7 | 0,70 | 7,0 | 45,70 | 1,58 | 7,9 | 51,5 |
| 160L4 | 15,0 | 98,4 | 0,95 | 9,5 | 62,40 | 2,14 | 10,7 | 70,1 |
| 180M4 | 18,5 | 121 | 1,18 | 11,8 | 77,00 | 2,66 | 13,3 | 87,0 |
| 180L4 | 22,0 | 143,8 | 1,41 | 14,1 | 92,00 | 3,15 | 15,7 | 103,0 |

Table of the derating power on the electrical data section shows the estimation of the continuous torque of the motor as a function of frequency, with different cooling designation: IC 411 (self-ventilation) and IC 416 (forced ventilation).

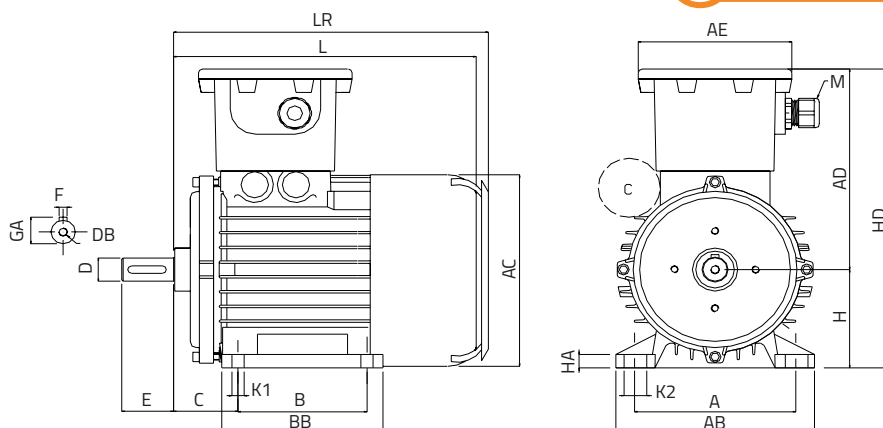
Derating of the power as a function of frequency

| IC411 Self-ventilated | | | IC 411 Self-ventilated or IC 416 Forced ventilation | | | IC 411 Self-ventilated or IC 416 Forced ventilation | | | IC411 Self-ventilated | |
|--|-----------|---------|---|-----------|---------|---|-----------|---------|---|---------|
| Constant Torque Range Frequency (Hz) 25÷50 Range Speed (rpm) 1500÷3000 | | | Constant Torque Range Frequency (Hz) 50÷87 Range Speed (rpm) 3000÷5200 Motor at 400V at Y and inverter supply 400Vac | | | Constant Torque Range Frequency (Hz) 50÷87 Range Speed (rpm) 3000÷5200 Motor at 230V at Δ and inverter supply 400Vac | | | Quadratic Torque Range Frequency (Hz) 5÷50 Range Speed (rpm) 300÷3000 | |
| P [kW] | | Mn [Nm] | P [kW] | | Mn [Nm] | P [kW] | | Mn [Nm] | P [kW] | Mn [Nm] |
| Min Speed | Max Speed | | Min Speed | Max Speed | | Min Speed | Max Speed | | | |
| 0,08 | 0,16 | 0,54 | 0,09 | 0,16 | 0,32 | 0,15 | 0,27 | 0,52 | 0,18 | 0,61 |
| 0,11 | 0,22 | 0,77 | 0,13 | 0,23 | 0,45 | 0,21 | 0,37 | 0,73 | 0,25 | 0,87 |
| 0,16 | 0,33 | 1,1 | 0,19 | 0,34 | 0,65 | 0,31 | 0,55 | 1,05 | 0,37 | 1,24 |
| 0,25 | 0,49 | 1,65 | 0,29 | 0,51 | 0,98 | 0,48 | 0,84 | 1,62 | 0,55 | 1,85 |
| 0,33 | 0,67 | 2,23 | 0,41 | 0,71 | 1,36 | 0,62 | 1,07 | 2,05 | 0,75 | 2,5 |
| 0,49 | 0,98 | 3,29 | 0,59 | 1,02 | 1,97 | 0,93 | 1,61 | 3,1 | 1,1 | 3,68 |
| 0,67 | 1,34 | 4,54 | 0,76 | 1,33 | 2,6 | 1,21 | 2,10 | 4,1 | 1,5 | 5,1 |
| 0,98 | 1,96 | 6,41 | 1,16 | 2,02 | 3,8 | 1,83 | 3,19 | 6 | 2,2 | 7,2 |
| 1,34 | 2,7 | 8,9 | 1,62 | 2,82 | 5,4 | 2,49 | 4,33 | 8,3 | 3,0 | 10 |
| | | | Range Frequency (Hz) 50-70 Range Speed (rpm) 3000÷4200 | | | Range Frequency (Hz) 50-70 Range Speed (rpm) 3000÷4200 | | | | |
| 1,78 | 3,6 | 11,75 | 2,94 | 4,12 | 9,7 | 3,67 | 5,13 | 12,1 | 4,0 | 13,2 |
| 2,4 | 4,9 | 16,11 | 4,07 | 5,70 | 13,4 | 5,20 | 7,27 | 17,1 | 5,5 | 18,1 |
| 3,3 | 6,7 | 21,98 | 5,50 | 7,69 | 18,1 | 7,04 | 9,86 | 23,2 | 7,5 | 24,7 |
| 4,1 | 8,3 | 26,7 | 6,82 | 9,55 | 22,0 | 8,80 | 12,33 | 28,4 | 9,3 | 30 |
| 4,9 | 9,8 | 32,04 | 8,04 | 11,25 | 26,3 | 10,36 | 14,50 | 33,9 | 11,0 | 36 |
| | | | Range Frequency (Hz) 50-60 Range Speed (rpm) 3000÷3600 | | | Range Frequency (Hz) 50-60 Range Speed (rpm) 3000÷3600 | | | | |
| 4,9 | 9,8 | 32,2 | 9,57 | 11,48 | 31,5 | 10,87 | 13,05 | 35,8 | 11,0 | 36,2 |
| 6,7 | 13,3 | 43,5 | 13,19 | 15,83 | 43,0 | 14,85 | 17,82 | 48,4 | 15,0 | 48,9 |
| 8,2 | 16,4 | 53,7 | 16,30 | 19,56 | 53,5 | 18,31 | 21,98 | 60,1 | 18,5 | 60,7 |
| 9,8 | 19,5 | 63,7 | 19,48 | 23,38 | 63,5 | 21,75 | 26,11 | 70,9 | 22,0 | 71,7 |
| 13,4 | 26,7 | 87,1 | 26,69 | 32,03 | 87,0 | 29,70 | 35,64 | 96,8 | 30,0 | 97,8 |
| 4 Poles | | | Range Frequency (Hz) 50÷87 Range Speed (rpm) 1500÷2600 | | | Range Frequency (Hz) 50÷87 Range Speed (rpm) 1500÷2600 | | | Range Frequency (Hz) 5÷50 Range Speed (rpm) 150÷1500 | |
| 0,053 | 0,11 | 0,71 | 0,066 | 0,11 | 0,44 | 0,10 | 0,17 | 0,66 | 0,12 | 0,8 |
| 0,055 | 0,11 | 0,77 | 0,10 | 0,18 | 0,72 | 0,15 | 0,26 | 1,03 | 0,18 | 1,25 |
| 0,082 | 0,16 | 1,10 | 0,13 | 0,23 | 0,90 | 0,21 | 0,36 | 1,38 | 0,25 | 1,68 |
| 0,12 | 0,24 | 1,65 | 0,20 | 0,34 | 1,35 | 0,30 | 0,53 | 2,10 | 0,37 | 2,56 |
| 0,16 | 0,33 | 2,23 | 0,29 | 0,51 | 2,01 | 0,45 | 0,79 | 3,08 | 0,55 | 3,75 |
| 0,22 | 0,45 | 3,05 | 0,40 | 0,70 | 2,72 | 0,61 | 1,07 | 4,18 | 0,75 | 5,1 |
| 0,33 | 0,67 | 4,54 | 0,59 | 1,03 | 4,03 | 0,90 | 1,57 | 6,2 | 1,1 | 7,5 |
| 0,47 | 0,95 | 6,41 | 0,80 | 1,39 | 5,42 | 1,23 | 2,14 | 8,3 | 1,5 | 10,16 |
| 0,66 | 1,32 | 8,90 | 1,17 | 2,0 | 7,9 | 1,80 | 3,14 | 12,1 | 2,2 | 14,8 |
| 0,88 | 1,75 | 11,75 | 1,6 | 2,8 | 10,7 | 2,5 | 4,3 | 16,5 | 3,0 | 20,1 |
| 1,22 | 2,4 | 16,11 | 2,2 | 3,8 | 14,3 | 3,3 | 5,7 | 21,7 | 4,0 | 26,5 |
| 1,67 | 3,3 | 21,98 | 2,9 | 5,1 | 19,3 | 4,5 | 7,8 | 29,7 | 5,5 | 36,3 |
| 2,21 | 4,4 | 29,50 | 4,0 | 6,9 | 26,5 | 6,2 | 10,7 | 41,0 | 7,5 | 50 |
| 2,43 | 4,9 | 32,04 | 5,0 | 8,6 | 32,6 | 7,6 | 13,2 | 50,0 | 8,8 | 59 |
| 4,9 | 9,8 | 63,70 | 5,9 | 10,2 | 38,2 | 9,0 | 15,7 | 58,7 | 11,0 | 71,7 |
| 6,6 | 13,2 | 86,90 | 8,1 | 14,1 | 53,1 | 12,2 | 21,2 | 80,1 | 15,0 | 98,4 |
| 8,2 | 16,4 | 107,00 | 10,0 | 17,3 | 65,2 | 15,2 | 26,4 | 99,1 | 18,5 | 121,0 |
| 9,7 | 19,4 | 127,00 | 11,7 | 20,4 | 76,8 | 17,9 | 31,1 | 117,0 | 22,0 | 143,9 |

8. Overall dimensions

IMB3 Ex db

Dimensions in mm

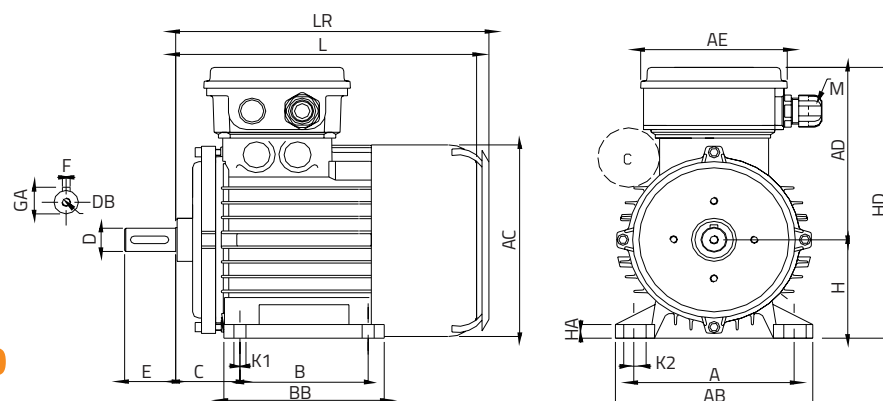


| Size | B | A | HA | BB | AB | AC | AD | AE | C | H | HD | L | LR | K1 | K2 | M | D | E | GA | F | DB |
|------|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|--------|----|-----|------|----|--------|
| 56 | * | * | * | * | * | 121 | 150 | 119 | * | * | * | 210 | 220 | * | * | M20 | 9 | 20 | 10,2 | 3 | M4x10 |
| 63 | 80 | 100 | 10 | 105 | 120 | 121 | 150 | 119 | 40 | 63 | 203 | 193 | 194 | 7 | 12 | M20 | 11 | 23 | 12,5 | 4 | M4x10 |
| 71 | 90 | 112 | 11 | 108 | 136 | 136 | 159 | 119 | 45 | 71 | 220 | 223 | 226 | 7 | 12 | M20 | 14 | 30 | 16 | 5 | M5x25 |
| 80 | 100 | 125 | 11 | 125 | 154 | 154 | 163 | 119 | 50 | 80 | 243 | 245 | 247 | 9,5 | 17,5 | M20 | 19 | 40 | 21,5 | 6 | M6x16 |
| 90S | 100 | 140 | 13 | 130 | 174 | 174 | 173 | 119 | 56 | 90 | 263 | 265 | 266 | 9,5 | 17,5 | M20 | 24 | 50 | 27 | 8 | M8x19 |
| 90L | 125 | 140 | 13 | 155 | 174 | 174 | 173 | 119 | 56 | 90 | 263 | 291 | 292 | 9,5 | 17,5 | M20 | 24 | 50 | 27 | 8 | M8x19 |
| 100 | 140 | 160 | 14 | 175 | 192 | 192 | 186 | 119 | 63 | 100 | 286 | 320 | 319 | 11,2 | 21,2 | M20 | 28 | 60 | 31 | 8 | M10x22 |
| 112 | 140 | 190 | 14 | 175 | 224 | 216 | 195 | 119 | 70 | 112 | 307 | 333 | 336 | 11,2 | 21,2 | M20 | 28 | 60 | 31 | 8 | M10x22 |
| 132S | 140 | 216 | 17 | 180 | 260 | 255 | 221 | 136 | 89 | 132 | 353 | 386 | 400 | 12,5 | 30 | M25 | 38 | 80 | 41 | 10 | M12x28 |
| 132L | 178 | 216 | 17 | 218 | 260 | 255 | 221 | 136 | 89 | 132 | 353 | 423 | 438 | 12,5 | 30 | M25/32 | 38 | 80 | 41 | 10 | M12x28 |
| 160M | 210 | 254 | 23 | 264 | 318 | 318 | 299 | 199 | 108 | 160 | 459 | 509 | 505 | 14,5 | 30 | M32 | 42 | 110 | 45 | 12 | M16x36 |
| 160L | 254 | 254 | 23 | 308 | 318 | 318 | 299 | 199 | 108 | 160 | 459 | 553 | 549 | 14,5 | 30 | M32 | 42 | 110 | 45 | 12 | M16x36 |
| 180M | 241 | 279 | 25 | 291 | 318 | 346 | 316 | 199 | 121 | 180 | 496 | 613 | 643 | 13 | 38 | M32 | 48 | 110 | 52 | 14 | M16x36 |
| 180L | 279 | 279 | 25 | 329 | 318 | 346 | 316 | 199 | 121 | 180 | 496 | 613 | 643 | 13 | 38 | M32 | 48 | 110 | 52 | 14 | M16x36 |

*: Size 56 only flanged motors

IMB3 Ex db eb

Dimensions in mm



| Size | B | A | HA | BB | AB | AC | AD | AE | C | H | HD | L | LR | K1 | K2 | M | D | E | GA | F | DB |
|------|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|--------|----|-----|------|----|--------|
| 56 | * | * | * | * | * | 121 | 113 | 101 | * | * | * | 210 | 220 | * | * | M20 | 9 | 20 | 10,2 | 3 | M4x10 |
| 63 | 80 | 100 | 10 | 105 | 120 | 121 | 113 | 101 | 40 | 63 | 176 | 193 | 194 | 7 | 12 | M20 | 11 | 23 | 12,5 | 4 | M4x10 |
| 71 | 90 | 112 | 11 | 108 | 136 | 136 | 122 | 101 | 45 | 71 | 193 | 223 | 226 | 7 | 12 | M20 | 14 | 30 | 16 | 5 | M5x25 |
| 80 | 100 | 125 | 11 | 125 | 154 | 154 | 143 | 114 | 50 | 80 | 223 | 245 | 247 | 9,5 | 17,5 | M20 | 19 | 40 | 21,5 | 6 | M6x16 |
| 90S | 100 | 140 | 13 | 130 | 174 | 174 | 144 | 114 | 56 | 90 | 238 | 265 | 266 | 9,5 | 17,5 | M20 | 24 | 50 | 27 | 8 | M8x19 |
| 90L | 125 | 140 | 13 | 155 | 174 | 174 | 144 | 114 | 56 | 90 | 238 | 291 | 292 | 9,5 | 17,5 | M20 | 24 | 50 | 27 | 8 | M8x19 |
| 100 | 140 | 160 | 14 | 175 | 192 | 192 | 159 | 114 | 63 | 100 | 259 | 320 | 319 | 11,2 | 21,2 | M20 | 28 | 60 | 31 | 8 | M10x22 |
| 112 | 140 | 190 | 14 | 175 | 224 | 216 | 171 | 114 | 70 | 112 | 283 | 333 | 336 | 11,2 | 21,2 | M20 | 28 | 60 | 31 | 8 | M10x22 |
| 132S | 140 | 216 | 17 | 180 | 260 | 255 | 194 | 124 | 89 | 132 | 326 | 386 | 400 | 12,5 | 30 | M25 | 38 | 80 | 41 | 10 | M12x28 |
| 132L | 178 | 216 | 17 | 218 | 260 | 255 | 194 | 124 | 89 | 132 | 326 | 423 | 438 | 12,5 | 30 | M25/32 | 38 | 80 | 41 | 10 | M12x28 |
| 160M | 210 | 254 | 23 | 264 | 318 | 318 | 244 | 186 | 108 | 160 | 404 | 509 | 505 | 14,5 | 30 | M32 | 42 | 110 | 45 | 12 | M16x36 |
| 160L | 254 | 254 | 23 | 308 | 318 | 318 | 244 | 186 | 108 | 160 | 404 | 553 | 549 | 14,5 | 30 | M32 | 42 | 110 | 45 | 12 | M16x36 |
| 180M | 241 | 279 | 25 | 291 | 318 | 346 | 270 | 186 | 121 | 180 | 450 | 613 | 643 | 13 | 38 | M32 | 48 | 110 | 52 | 14 | M16x36 |
| 180L | 279 | 279 | 25 | 329 | 318 | 346 | 270 | 186 | 121 | 180 | 450 | 613 | 643 | 13 | 38 | M32 | 48 | 110 | 52 | 14 | M16x36 |

*: Size 56 only iflanged motors

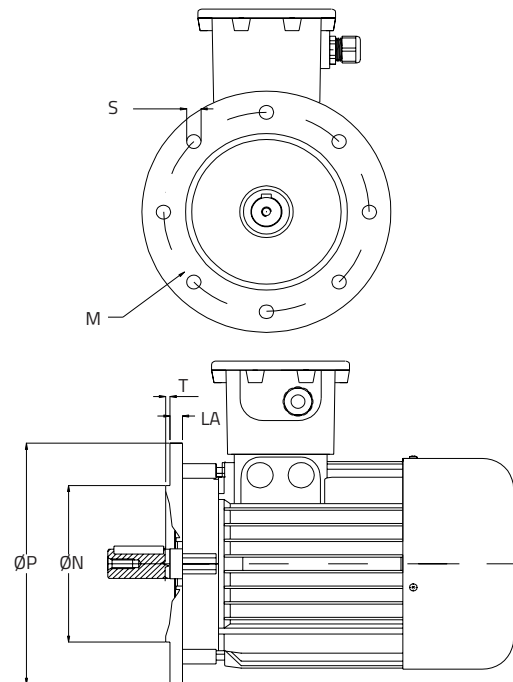
Overall dimensions

IMB5 Ex db - Ex db eb

Dimensions in mm

| Size | Ø P | Ø N | 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 |
| 132 | 250* | 180 | 20 | 215 | 4 | 13 |
| | 300 | 230 | 20 | 265 | 4 | 13 |
| 160 | 350 | 250 | 22 | 300 | 5 | 18 |
| 180 | 350 | 250 | 22 | 300 | 5 | 18 |

* Reduced or enlarged flange version

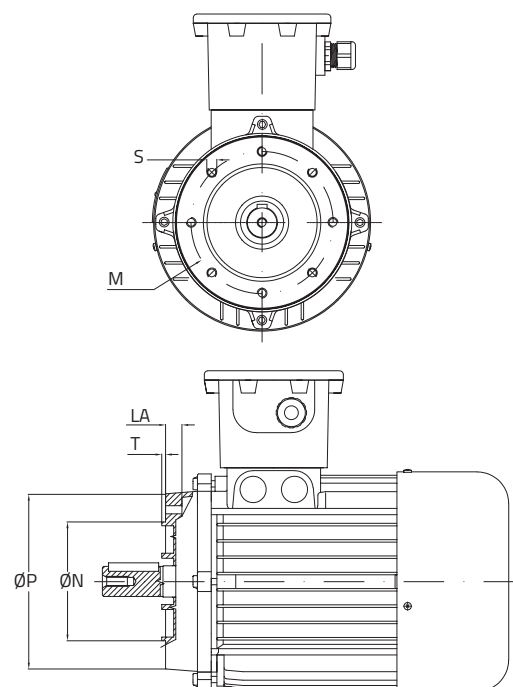


IMB14 Ex db - Ex db eb

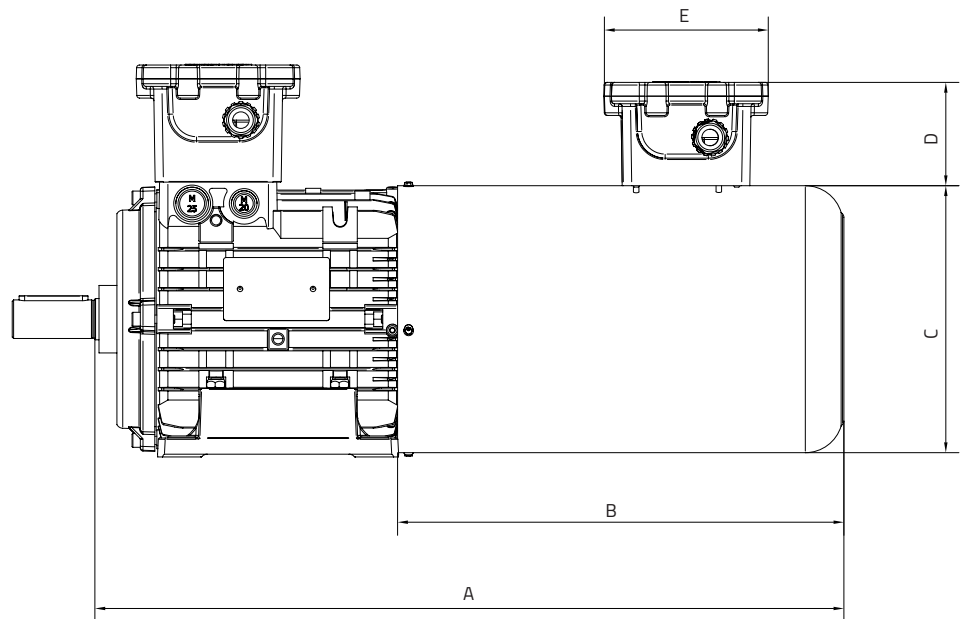
Dimensions in mm

| Size | Ø P | Ø N | 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 |
| 132 | 160 | 110 | 20 | 130 | 3,5 | M8 |
| | 200 | 130 | 20 | 165 | 4 | M10 |
| 160 | 250 | 180 | 24 | 215 | 4 | M12 |
| 180 | 250 | 180 | 24 | 215 | 4 | M12 |

* Reduced or enlarged flange version



Overall dimensions



Servoventilated motor Ex db

Dimensions in mm

| Size | A | B | C | D | E |
|------|-----|-----|------|----|-----|
| 80 | 481 | 317 | Ø154 | 75 | 119 |
| 90S | 492 | 317 | Ø174 | 75 | 119 |
| 90L | 517 | 317 | Ø174 | 75 | 119 |
| 100 | 544 | 324 | Ø192 | 75 | 119 |
| 112 | 559 | 327 | Ø216 | 75 | 119 |
| 132S | 599 | 342 | Ø255 | 75 | 119 |
| 132L | 639 | 342 | Ø255 | 75 | 119 |
| 160M | 814 | 455 | Ø309 | 75 | 119 |
| 160L | 864 | 455 | Ø309 | 75 | 119 |
| 180 | 904 | 455 | Ø346 | 75 | 119 |

Certifications

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

Certificate No.: IECEx EUT 14.0001X Issue No: 2 Certificate history: Issue No. 2 (2019-02-08)
Status: Current Issue No. 1 (2017-03-13)
Date of issue: 2019-02-08 Page 1 of 4 Issue No. 0 (2014-03-07)

Applicant: ORANGE1 ELECTRIC MOTORS S.p.A.
Via Mantova, 93
43122 Parma
Italy

Equipment: Series O-M three-phase and single-phase asynchronous squirrel cage motor motors, supplied by mains or inverter

Optional accessory: Terminal box and Capacitor box

Type of Protection: Flameproof enclosures "F", Equipment dust ignition protection by enclosure "T", increased safety "n"

Marking: Ex db IIC T3, T4 or T5 Gb
Ex to IIC T125°C Db
or
Ex db IIC T3, T4 or T5 Gb
Ex to IIC T125°C Db

Approved for issue on behalf of the IECEx Certification Body: Donato Buccioni
Position: Head of IECEx CB

Signature: (for printed version)
Date:

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by: Eurofins Product Testing Italy S.r.l.
Via Cuorgnè,
n.21 - 10156 Torino
Italy

eurofins Product Testing

eurofins Product Testing

EU-TYPE EXAMINATION CERTIFICATE

[1] Equipment and Protective System intended for use in potentially explosive atmospheres Directive 2014/34/EU - Annex II

[3] Certificate Number: EPT 17 ATEX 2588 X Issue 1

[4] Equipment: Electric motor
Series: O-M

[5] Manufacturer: ORANGE1 ELECTRIC MOTORS S.p.A.
Address: Via Mantova n° 93, 43122 Parma - Italy

[6] Address: Via Mantova n° 93, 43122 Parma - Italy

[7] This equipment and its accepted variations are specified in the annex to this Certificate.

[8] Eurofins Product Testing Italy S.r.l. Notified Body n. 0477 in accordance with Article 21 of the Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II of the Directive.

[9] The examination and test results are recorded in the confidential Report N° EPT_19_REL_02/56555

[10] Compliance with the essential health and safety requirements is assured through the verification of them and by compliance with the standards:
EN 60079-0:2012+A11:2013, EN 60079-1:2014, EN 60079-31:2014, EN 60079-7:2015

[11] If the sign "X" is placed after the Certificate number, it indicates that the equipment is subject to the special conditions for safe use specified in the annex to this Certificate.

[12] This EU-TYPE EXAMINATION CERTIFICATE relates only to the design, the exam and the tests of the specified equipment.

Further requirements of the Directive 2014/34/EU apply to the manufacture and supply of this equipment. These requirements are not object of this Certificate.

[12] The equipment shall include the sign and at least one of the following string:
II 2G Ex db IIC T3 Gb -40°C ≤ T_{amb} ≤ +60°C
II 2G Ex db IIC T3 Gb -40°C ≤ T_{amb} ≤ +60°C
II 2G Ex db IIC T4 Gb -40°C ≤ T_{amb} ≤ +60°C
II 2G Ex db IIC T4 Gb -40°C ≤ T_{amb} ≤ +60°C
II 2G Ex db IIC T5 Gb -40°C ≤ T_{amb} ≤ +40°C
II 2G Ex db IIC T5 Gb -40°C ≤ T_{amb} ≤ +40°C
II 2G Ex db IIC T125°C Db -40°C ≤ T_{amb} ≤ +60°C

Place and date of issue: Torino, 2019-02-08

CE

ACCREDITED

Donato Buccioni
Director Representative
Eurofins
Notified Body N. 0477

This Certificate has 4 pages and it is replaceable only in its entirety. Conditions of validity are reported below.

Eurofins Product Testing Italy S.r.l. - Via Cuorgnè, 21 - 10156 Torino - Italia
Notified Body N. 0477

ЕВРАЗИЙСКИЙ ЭКОНОМИЧЕСКИЙ СОЮЗ

СЕРТИФИКАТ СООТВЕТСТВИЯ

№ ЕАЭС RU С-IT-M062.B.00313/19
Серия RU № 0159106

Орган по сертификации: продукция Общество с ограниченной ответственностью «ПРОММАШ ТЕСТ»
Место нахождения: 119530, город Москва, улица Очаковский проезд, дом 34, помещение УП, комната 6. Адрес места осуществления деятельности: 115114, Российская Федерация, город Москва, Дербенская набережная, дом 11, помещение 60. Телефон: +7 (495) 481-33-80, адрес электронной почты: info@prommash-test.ru. Аттестат аккредитации регистрационный № РОСС RU.0001.11M062. Дата регистрации аттестата аккредитации 28.10.2013 года.

Заявитель: Общество с ограниченной ответственностью «Мир Технологии»
Основной государственный регистрационный номер: 11875640906.
Место нахождения: 117042, Российская Федерация, город Москва, улица Адмирала Руднева, дом 4, этаж 6, помещение IV, офис 613
Телефон: 89154152183, адрес электронной почты: MirTechnology@gmail.com

Изготовитель: «Orange 1 Electric Motors S.p.A.»
Место нахождения: ИТАЛИЯ, Piazza della Repubblica n.28, 20124 Milano (MI)
Адрес места осуществления деятельности: ИТАЛИЯ, Via Mantova 93, 43122, Parma (PR)

Производство: Электроприводы серии O-M
Маркировка изделия: приведены в приложении (базис № 0659254, 0659255, 0659256).
Оборудование выпускается по Директиве 2014/34/ЕС: «Оборудование и защитные системы, предназначенные для использования в потенциально взрывоопасных средах» и технической документации изготовителя для работы во взрывоопасных средах.
Серийный выпуск

КОД ТН ВЭД ЕАЭС: 8501 53 810 0

СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ: Технического регламента Таможенного союза ТР ТС 012/2011 «О безопасности оборудования для работы во взрывоопасных средах»

СЕРТИФИКАТ СООТВЕТСТВИЯ ВЫДАН НА ОСНОВАНИИ:
- акта о результатах анализа поставки продукции «Синтез 1 Electric Motors S.p.A.» от 23.01.2018 года;
- протокола испытаний № 160311MB от 03.04.2019 года, выданного испытательным центром Общества с ограниченной ответственностью «ПРОММАШ ТЕСТ»;
- факта с техническим описанием;
- вступлении в силу безотказного применения;
- чертежей.

Схема сертификации: 1с

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ:
Срок службы, срок и условия хранения указаны в Руководстве по эксплуатации. Стандарты, обеспечивающие соблюдение требований Технического регламента Таможенного союза ТР ТС 012/2011 «О безопасности оборудования для работы во взрывоопасных средах» согласно приложению - базис № 0659254, 0659255, 0659256.

СРОК ДЕЙСТВИЯ С: 10.04.2019 ПО: 09.04.2024

ВКЛЮЧИТЕЛЬНО

Руководитель (уполномоченный лицо) органа по сертификации: Галина Александровна
Эксперт (эксперт-аудитор) (эксперт (эксперты-аудиторы)): Татьяна Николаевна

CSA Group

Certificate of Compliance

Certificate: 70162622 Master Contract: 256222
Project: 70165136 Date Issued: March 12, 2018

Issued to: ELPROMech srl
Piazza della Repubblica 28
Milano (MI), 20124
Italy

Attention: E. Mignacco

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US (indicating that products have been manufactured to the requirements of both Canadian and US Standards) or with adjacent indicator 'US' for US only or without either indicator for Canada only

CSA **US**

Issued by: B Spencer

PRODUCTS

CLASS 4228 01 - MOTORS AND GENERATORS for Hazardous Locations

Class I Division 1 Groups C, D T4
Class II Division 1 Groups E, F, G
Tamb = -25 °C to +40 °C

Series S-T: Squirrel cage induction motors TEFC, Types SH and TH. Permanently connected. Continuously rated 0.18 to 18.5 kW (0.25 to 25 hp), 600V or less, 50 or 60 Hz; 2, 4 or 6 pole; Insulation Class F; IEC Frame Size 71 to 160; Nema Frame Size N48 to N256.

Conditions of Acceptability

- CAUTION: The motor shall not be used where the atmosphere contains methanol or acetic acid.
- The motor shall be supplied with an instruction sheet or a wiring diagram, or both, for the temperature-limiting device circuit on a plate or tag.
- The motor shall be provided with installation, operation and maintenance instructions.



ORANGE1
HOLDING

ORANGE1
Electric Motors Spa

Production plants

Via Mantova, 93
43122 Parma (IT)
T. +39 0521 272383
F. +39 0521 272686
P.iva: 02883470243

info@orange1.eu
www.orange1.eu

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