

EXPLOSION PROTECTED 3-PHASE INDUCTION MOTORS



ATEX – INCREASED SAFETY MOTORS



POWER OF EXPERIENCE INDIVIDUAL PROFESSIONAL APPROACH
 PROFESSIONAL APPROACH ENERGY TOP QUALITY
DRIVING PROFESSIONAL APPROACH ENERGY TOP QUALITY
 INTO **YOUR** ENERGY BUSINESS GROWTH
 ENERGY **BUSINESS** GROWTH SOLID PARTNER
 CHALLENGING PROJECTS MOST DEMANDING APPLICATIONS
 MORE ENERGY EFFICIENT
 SOLID PARTNER **CANTONI**  [®] EFFICIENT
 EXPERIENCE TOP QUALITY INDIVIDUAL APPROACH PROFESSIONAL

Product Catalogue

Product range

| | | | |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LOW VOLTAGE GENERAL PURPOSE 3-PHASE INDUCTION MOTORS | <p>Three-phase motors with squirrel-cage rotor series (2)Sg(m), Sh, SIE-K</p> <p>HIGH (IE2), PREMIUM (IE3) and SUPER PREMIUM (IE4) efficiency motors</p> | <p>from 0,04kW up to 2200kW</p> | <p>for general purpose applications like pumps, fans, compressors; complying with the newest efficiency requirements</p> |
| GENERAL PURPOSE 1-PHASE INDUCTION MOTORS | <p>Single-phase motors with squirrel-cage rotor series SEh, SEMh</p> <p>Single-phase motors PREMIUM (IE3) efficiency class, series 3SSIE</p> | <p>from 0,04kW up to 2,2kW</p> | <p>for general purpose applications like pumps, fans, compressors, woodworking machines, devices for food processing, concrete mixers etc.</p> |
| HIGH VOLTAGE INDUCTION MOTORS UP TO 11kV | <p>Three-phase squirrel-cage high voltage and high efficiency motors series Sh with cast-iron housing.</p> <p>High voltage motors with module construction (steel/welded housing) series Sf (-E), Sfw, Sfr.</p> | <p>from 160kW up to 7000kW</p> | <p>for general industrial use, drives used for own needs of power plants (pumps, fans, coal mills, conveyors)</p> |
| BRAKE MOTORS | <p>Three-phase and single-phase brake motors with AC and DC brakes</p> | <p>from 0,04kW up to 200kW</p> | <p>for applications with high safety requirements or where immediate stopping of the drive is required e.g.: theatres, concert, halls, lifts, platforms, etc.</p> |
| MOTORS WITH FORCED VENTILATION | <p>Three-phase induction motors with forced ventilation.</p> | <p>from 0,06kW up to 2500kW</p> | <p>for variable frequency drives with very wide speed regulation</p> |
| EXPLOSION-PROOF MOTORS | <p>Standard and PREMIUM (IE3) efficiency increased safety motors</p> | <p>from 0,06kW up to 22kW</p> | <p>adapted for operation in areas endangered by explosion (without methane)</p> |
| NEMA MOTORS | <p>Low voltage NEMA motors SIE series (in compliance with the NEMA PREMIUM requirements).</p> | <p>from 1HP up to 350HP</p> | <p>for general industrial applications like pumps (including JM and JP), fans, compressors also for Hazardous Locations up to 250HP (Class I Div 2, Class II Div 2) with CSA certificate</p> |
| TRACTION MOTORS | <p>Traction motors and traction generators.</p> | <p>from 50kW up to 1500kW</p> | <p>various traction vehicles: trams (including low-deck trams), trolleybusses, subway and locomotives</p> |

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Efficiency of motors

Efficiency classes for the low-voltage three-phase motors (IE = International Efficiency).

Along with the international discussion on energy efficiency a worldwide harmonized energy efficiency standard classification system has been established for low-voltage three-phase asynchronous motors. For many years low-voltage three-phase motors in the European Union have been sold in three efficiency classes EFF3, EFF2 and EFF1 (CEMEP classification). Aside from this, many different efficiency classification systems have been introduced and well-proven in many countries all over the world.

This was the reason for the International Electrotechnical Commission IEC to develop and publish an energy efficiency standard which replaces all previous national issues. In parallel IEC developed and issued a new standard for determining motor efficiency. The standard IEC 60034-30-1 defines and harmonizes worldwide the efficiency classes IE1, IE2, IE3 and IE4 for low-voltage three-phase motors in the power range from 0,12 kW to 1000 kW (2p=2, 4, 6, 8).

IE1 = Standard Efficiency

IE2 = High Efficiency

IE3 = Premium Efficiency

IE4 = Super Premium Efficiency

Complying with IEC 60034-30-1 standard the efficiency has to be determined in accordance with the requirements given in the IEC 60034-2-1 standard.

EU Commission Regulation 2019/1781 & 2021/341 regarding minimum efficiency of electric motors.

Motors covered by new Regulation

| | |
|------------------------|-----------------------------------------|
| Type | general purpose, geared, with brake, Ex |
| Voltage | >50V ÷ 1000V |
| Frequency | 50 Hz, 60 Hz or 50/60 Hz |
| Number of poles | 2, 4, 6, 8 |
| Rated power | 0,12kW ÷ 1000kW |
| Duty | continuous (S1, S3≥80 % or S6≥80%) |

Motors excluded from new Regulation

| | |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type | <ul style="list-style-type: none"> • multi-speed, slip-ring and with mechanical commutators • motors completely integrated into a product whose efficiency cannot be tested independently from the product • motors with an integrated variable speed drive (compact drives) whose efficiency cannot be tested independently from the variable speed drive • motors with an integrated brake which forms an integral part of the inner motor construction and can neither be removed nor powered by a separate power source during the testing of the motor efficiency • motors specifically designed and specified to operate wholly immersed in a liquid • motors specifically qualified for the safety of nuclear installations, as defined in Article 3 of Council Directive 2009/71/EURATOM • explosion-protected motors specifically designed and certified for mining, as defined in Annex I, point 1 of Directive 2014/34/EU • motors in cordless or battery-operated equipment and motors in hand-held equipment whose weight is supported by hand during operation • motors in hand-guided mobile equipment moved while in operation • Totally Enclosed Non-Ventilated (TENV) motors • motors placed on the market before 1 July 2029 as substitutes for identical motors integrated in products placed on the market before 1 July 2021 (Annex I.1 (a)) and before 1 July 2023 (Annex I.1 (b)), and specifically marketed as such • motors designed specifically for the traction of electric vehicles |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Designed for altitudes > 4000 m a.s.l.

Designed for ambient temperatures < -30°C or > 60°C

With maximum operating temperatures > 400°C

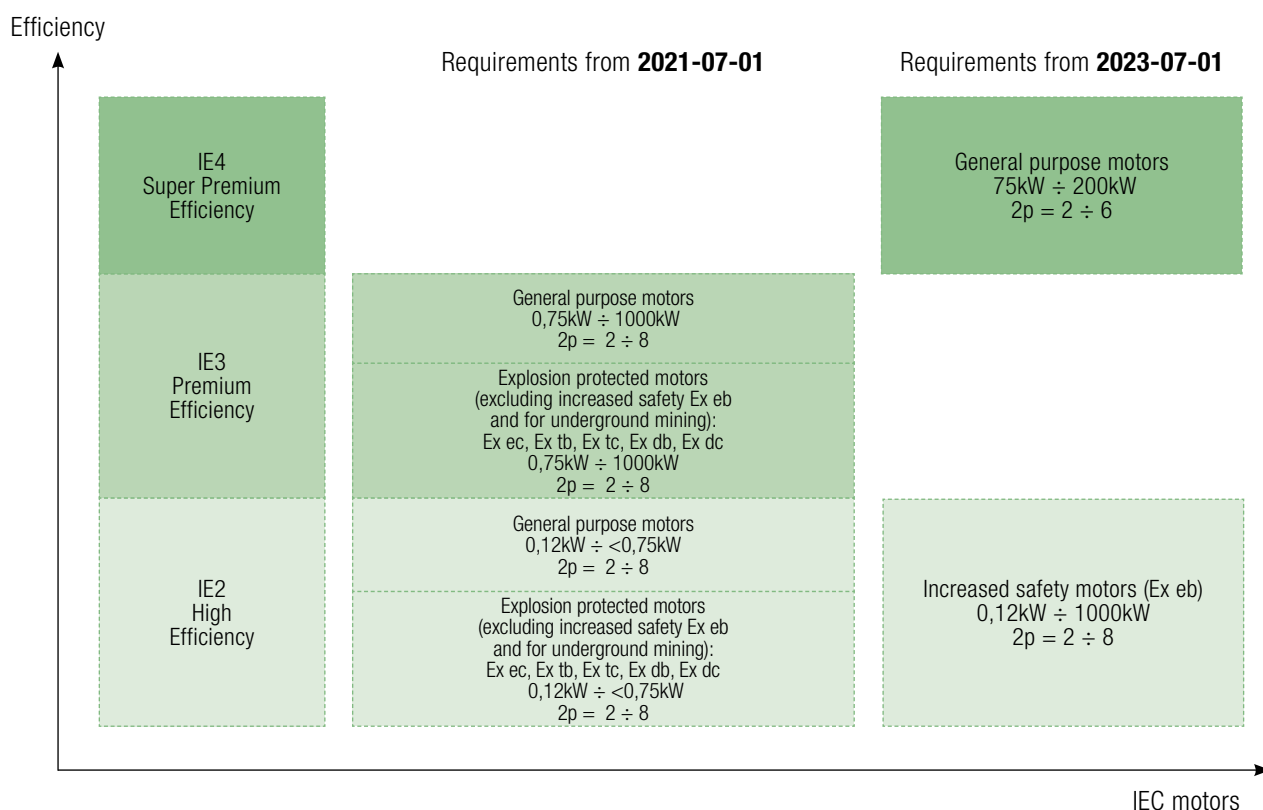
The Commission Regulation (EC) No 2019/1781 & 2021/341 describes efficiency requirements which have been implemented on **2021-07-01** and on **2023-07-01**. The required efficiency class of three phase induction motors has to be as follows:

| Required efficiency class of three phase induction motors | General purpose motors | Explosion protected motors except motors dedicated for underground mining | |
|-----------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------|
| | | Increased safety (Ex eb) | Others (Ex ec, Ex tb, Ex tc, Ex db, Ex dc) |
| IE2 | 0,12kW ÷ <0,75kW 2p = 2 ÷ 8 from 2021-07-01 | 0,12kW ÷ 1000kW 2p = 2 ÷ 8 from 2023-07-01 | 0,12kW ÷ <0,75kW 2p = 2 ÷ 8 from 2021-07-01 |
| IE3 | 0,75kW ÷ 1000kW 2p = 2 ÷ 8 from 2021-07-01 | — | 0,75kW ÷ 1000kW 2p = 2 ÷ 8 from 2021-07-01 |
| IE4 | 75kW ÷ 200kW 2p = 2 ÷ 6 from 2023-07-01 | — | — |

Cantoni Group pursuing a policy of continuous development of its products, back in the past already took actions to extend offer of high efficiency motors including also explosion-proof motors.

Moreover, at this point, **we can deliver to our Customers motors with higher efficiencies or in wider range than defined in Regulation 2019/1781 & 2021/341.**

A graph representation of the above table:



Ratings – Tolerances

Tolerances of motor parameters

Permissible deviations between catalogue values and real values are according to the IEC 60034-1:

| | |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Power factor $\cos \varphi$ | $\Delta \cos \varphi = -1/6 (1 - \cos \varphi_N)$ |
| Efficiency η | $\Delta \eta = -15\% (100 - \eta_N)$ for $P_N \leq 150 \text{ kW}$ $\Delta \eta = -10\% (100 - \eta_N)$ for $P_N > 150 \text{ kW}$ |
| Speed n | $\Delta n = \pm 20\% (n_s - n_N)$ for $P_N > 1 \text{ kW}$ $\Delta n = \pm 30\% (n_s - n_N)$ for $P_N \leq 1 \text{ kW}$ |
| Locked rotor current ratio I_L/I_N | $\Delta(I_L/I_N) = +20\% (I_L/I_N)$ |
| Locked rotor torque ratio T_L/T_N | $\min (T_L/T_N) = -15\% (T_L/T_N)$ $\max (T_L/T_N) = +25\% (T_L/T_N)$ |
| Breakdown torque ratio T_B/T_N | $\Delta(T_B/T_N) = -10\% (T_B/T_N)$ |
| Moment of inertia J [kgm ²] | $\Delta J = \pm 10\% J$ |
| Sound pressure level L_{pA} [dB] | $\Delta L_{pA} = +3 \text{ dB / A}$ |

Tolerances of supply voltage value and frequency

Motors comply in standard with voltage value and voltage frequency variations within zone A according to the IEC 60034-1:

| | |
|-----------------------|----------------------|
| Voltage value U | $\Delta U = \pm 5\%$ |
| Voltage frequency f | $\Delta f = \pm 2\%$ |

Other extended tolerances of supply voltage and their frequency are available on request.

Standards

The electric motors are manufactured according to the international standards:

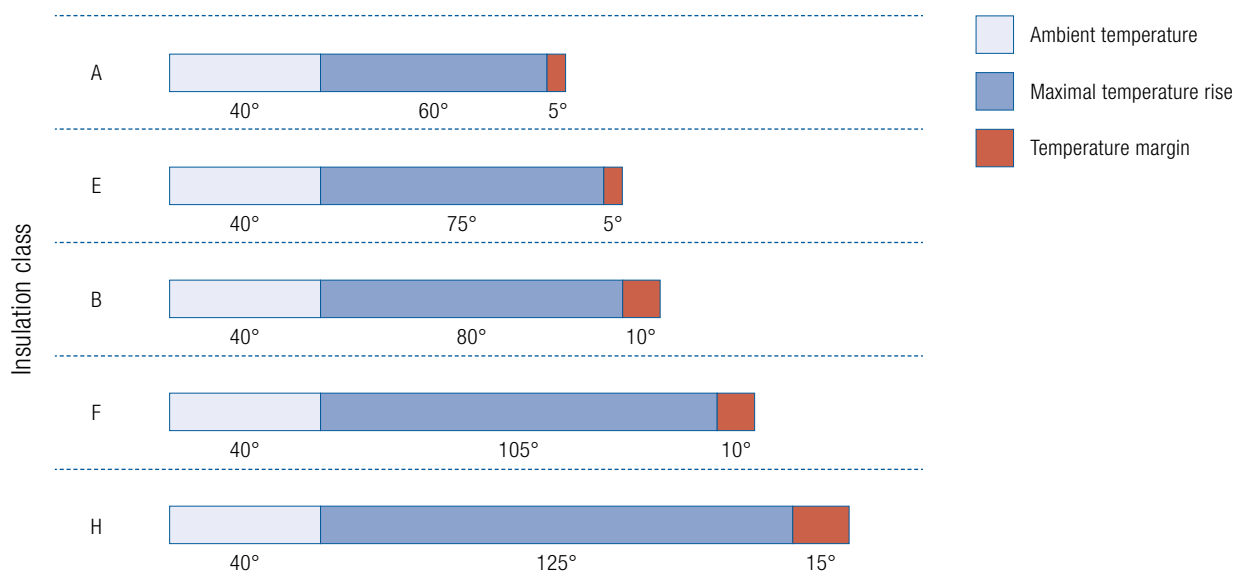
| | |
|--------------------------------------------------------------------------------------|---------------|
| Rating and performance | IEC 60034-1 |
| Methods for determining losses and efficiency | IEC 60034-2-1 |
| Classification of degrees of protection | IEC 60034-5 |
| Methods of cooling | IEC 60034-6 |
| Symbols of construction and mounting arrangements | IEC 60034-7 |
| Terminal markings and direction of rotation | IEC 60034-8 |
| Noise limits | IEC 60034-9 |
| Dimensions and output of electric machines | IEC 60072-1 |
| Vibration limits | IEC 60034-14 |
| Explosive atmospheres – Part 0: Equipment – General requirements | IEC 60079-0 |
| Explosive atmospheres – Part 7: Equipment protection by increased safety "e" | IEC 60079-7 |
| Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure "t" | IEC 60079-31 |

Insulation classification

The insulation system of an electric motor is determined by a given insulation class on the basis of its thermal resistance. This thermal resistance should be guaranteed by the entire set of electric insulating materials used in the motor insulating system.

Thermal resistance classification is related to the temperature of the hotspot in the insulation occurring during rated operating conditions of the electric motor, allowing for the highest permissible rise in average temperature.

This rise should be selected so that at the highest permissible ambient temperature, the temperature of the hotspot in insulation will not exceed the value assigned to a given thermal resistance class.



Insulation class F in an electric motor means that at ambient temperature of 40°C the temperature rise of the winding may be max. 105°C with the additional temperature margin of 10°C (under specified measuring conditions in accordance with the IEC 60034-1 standard).

Symbols of thermal resistance classes (permissible insulation temperatures at 40°C ambient temperature)

| Symbol | Temperature [°C] |
|--------|------------------|
| A | 105 |
| E | 120 |
| B | 130 |
| F | 155 |
| H | 180 |

Class F/B

The standard motors made by Cantoni Motor in their basic version have the insulation class F while the temperature rise is for class B. This means longer life for motors.

For special request we can deliver motors equipped with insulation class H.

Strengthened insulation system gives possibility to safe operation with frequency converters.

Hazardous Area Classification



Hazardous areas include any area in which explosive atmosphere may occur under specific conditions.

An explosive atmosphere is a mixture of dangerous substances with air, under atmospheric conditions, in the form of gases, vapours, mist or dust in which, after ignition has occurred, combustion spreads to the entire unburned mixture.

Potentially explosive atmospheres are classified according to the Zone system (defined in European directive 1999/92/EC) on the basis of the frequency and duration of the occurrence of an explosive atmosphere.

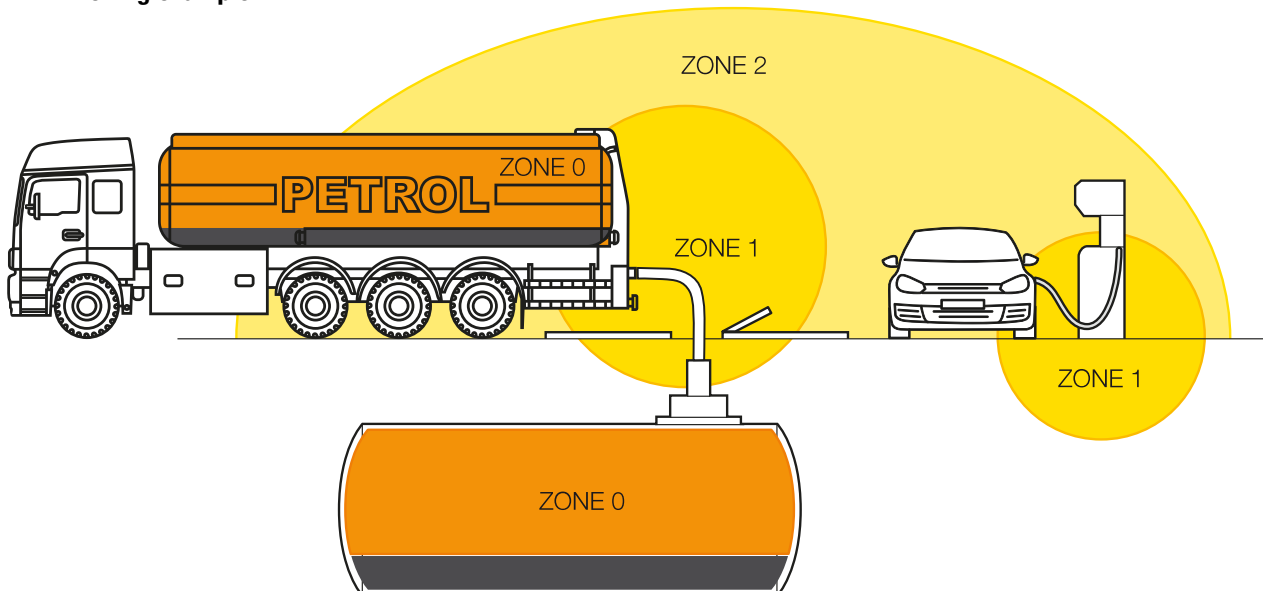
Zone classification

| European and IEC Classification | | Definition of zone |
|---------------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| GAS, VAPOUR, MIST | Zone 0 | An area in which an explosive mixture is present continuously or for long periods or frequently |
| | Zone 1 | An area in which an explosive mixture is likely to occur in normal operation occasionally |
| | Zone 2 | An area in which an explosive mixture is unlikely to occur in normal operation but, if it does occur, will persist for a short period only |
| DUST | Zone 20 | An area in which an explosive mixture is present continuously or for long periods or frequently |
| | Zone 21 | An area in which an explosive mixture is likely to occur in normal operation occasionally |
| | Zone 22 | An area in which an explosive mixture is unlikely to occur in normal operation but, if it occurs it will persist for a short period only |

'Normal operation' means the situation when installations are used within their design parameters.

Zones are normally determined by the Authorities, but that can also be performed by a third party, a notified body or other experts. It is the owner's responsibility to ensure that the classification of their site is performed before suitable products can be installed at the location.

ATEX zoning example:



REMARK: Electric motors are not used in case of Zone 0 (gases) and Zone 20 (dusts).

Gas and dust subgroups

Different explosive atmospheres (gases, vapours and dusts) have different properties like for example flame temperature, ignition energy, explosive limits, and molecular weight. These properties will determine the likelihood and severity of an explosion. Taking into consideration above, gases and dusts can be grouped in order to select the right equipment for explosive areas.

| Subgroup | Environment | Typical substance |
|----------|--------------------------|---------------------|
| IIA | Gases, Vapours and Mists | Propane |
| IIB | | Ethylene |
| IIC | | Hydrogen, Acetylene |
| IIIA | Combustible Dusts | Combustible flyings |
| IIIB | | Non-conductive |
| IIIC | | Conductive |

REMARK: Any equipment which is marked as IIC can be used in atmospheres that contain Group IIA and IIB gases

Any equipment which is marked as IIIC can be used in atmospheres that contain Group IIIA and IIIB dusts

Temperature classes for gases

Temperature classes (T-rating) are defined for equipment based on its maximum surface temperature. When selecting equipment for a potentially explosive atmosphere, the equipment's maximum surface temperature must be lower than the ignition temperature of the possible potential gas mixture.

| Temperature class | Maximum surface temperature of electrical equipment [°C] |
|-------------------|----------------------------------------------------------|
| T1 | 450 |
| T2 | 300 |
| T3 | 200 |
| T4 | 135 |
| T5 | 100 |
| T6 | 85 |

REMARK: Any equipment which is marked as T5 comply with requirements of T1,T2,T3 and T4 classes.

Example of gases with their ignition temperature

| Subgroup of gases | Gas example | Ignition temperature °C |
|-------------------|-------------------|-------------------------|
| IIA | methane | 537 |
| | propane | 470 |
| | n-butane | 365 |
| | n-hexane | 240 |
| | ethyl ether | 160 |
| IIB | ethyl nitrate | 90 |
| | ethylene | 425 |
| | hydrogen sulfide | 270 |
| IIC | hydrogen | 560 |
| | acetylene | 305 |
| | carbon disulphide | 102 |

Equipment groups, safety categories and level of protection

Electrical equipments are divided into two groups according to ATEX Directive 2014/34/EU:

- Group I: products are intended for use in the underground parts of mines and in those parts of surface installations of such mines that are likely to become endangered by firedamp and/or combustible dust
- Group II: products are intended for use in other environments (other than mines) that are likely to become endangered by explosive atmospheres.

Standard EN IEC 60079-0 defines additional subgroup of mentioned above Group II:

- Group III: products intended for use in other environments (other than mines) that are likely to become endangered by explosive dust atmospheres

| Equipment Group | Definition | According to |
|-----------------|-------------------------------------------------------------------------------------------------------------|---------------------------|
| Group I | Electrical equipment intended for use in underground mines susceptible to fire damp and/or combustible dust | ATEX Directive 2014/34/EU |
| Group II | Electrical equipment intended for use in explosive atmospheres (other than mines) | ATEX Directive 2014/34/EU |
| Group III | Electrical equipment intended for use in explosive dust atmospheres (other than mines) | Standard EN IEC 60079-0 |

Equipment groups are divided into equipment safety categories according to ATEX Directive 2014/34/EU with different level of protection EPL according to EN IEC 60079-0:

- category 1 / protection level a: with very high level of protection and thus a very high degree of safety
- category 2 / protection level b: with high level of protection and therefore a high degree of safety
- category 3 / protection level c: with normal level of protection and therefore a conventional degree of safety

| Safety Category | Protection level | Degree of safety |
|-----------------|------------------|------------------|
| Category 1 | very high | very high |
| Category 2 | high | high |
| Category 3 | normal | normal |

The table below presents the safety level of the equipment according to EN IEC 60079-0 and ATEX Directive 2014/34/EU.

| EN IEC 60079-0 | | Flammable substances | Zone | ATEX Directive 2014/34/EU | | |
|----------------|--------------|----------------------|-------------------|---------------------------|-------------|----------|
| EPL | Group | | | Protection level | Group | Category |
| Ma | I (mine) | methan, coal dust | N/A | very high | I (mine) | M1 |
| Mb | | | | high | | M2 |
| Ga | II (others) | G | gas, vapour, mist | 0 | II (others) | 1G |
| Gb | | | | 1 | | 2G |
| Gc | | | | 2 | | 3G |
| Da | | | | 20 | | 1D |
| Db | III (others) | D | dust | 21 | | 2D |
| Dc | | | | 22 | | 3D |

REMARK: Equipment from higher category (higher protection level) can also be installed instead of equipment from lower category (with lower protection level)

The table below lists the typical protection methods and basic concepts of protection used in electric motors according to ATEX Directive and EN / IEC standards.

| Symbol | Type of protection | Basic concept of protection | Suitable for Zones | | | | | | Equipment protection level (EPL) | | | | | EN / IEC Standard | | |
|--------|---------------------------------------|-----------------------------------------------------------|--------------------|---|---|----|----|----|----------------------------------|-----------|-------------|----------------|-----------|-------------------|-------------|----------|
| | | | 0 | 1 | 2 | 20 | 21 | 22 | Ga (very high) | Gb (high) | Gc (normal) | Da (very high) | Db (high) | | Dc (normal) | |
| e | Increased safety | No arcs, sparks or hot surfaces, enclosure IP54 or better | | • | • | | | | | | | | | | | 60079-7 |
| n | Type 'n' (non-sparking) | | | | • | | | | | • | | | | | | 60079-15 |
| d | Flameproof | Containment of the explosion | | • | • | | | | | • | | | | | | 60079-1 |
| px | Pressurised enclosure | Keep the flammable substances out | | • | • | | | | | • | | | | | | 60079-2 |
| py | | | | • | • | | | | | • | | | | | | |
| pz | | | | | | • | | | | | | • | | | | |
| tb | Dust ignition protection by enclosure | Dust-tight enclosure | | | | | • | • | | | | | • | | | 60079-31 |
| tc | | | | | | | | • | | | | | | • | | |

Cooling

Flameproof motors from Cantoni Group are equipped with standard IC411 cooling according to IEC 60034-6. Other cooling methods (for example motors with external/separate cooling) are available on request.

| IC code according to IEC 60034-6 | Description | Drawing |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| IC410 | <ul style="list-style-type: none"> – Enclosed machine – Surface cooled by natural convection and radiation – Without internal or external fan | |
| IC411 | <ul style="list-style-type: none"> – Enclosed machine – Smooth or finned casing – External shaft-mounted fan – Often called TEFC motor | |
| IC416A | <ul style="list-style-type: none"> – Enclosed machine – Smooth or finned casing – External motorized axial fan integrated with the motor | |
| IC416R | <ul style="list-style-type: none"> – Enclosed machine – Smooth or finned casing – External motorized radial fan integrated with the motor | |

Standard terminal box equipment

| Motor frame size | Number of terminals | Number of cable glands | Optional rotation of terminal box | Temperature sensors in the winding |
|------------------|---------------------|------------------------|-----------------------------------|--------------------------------------|
| 56 | 6 | 1 | no | (standard in "-D" execution) |
| 63 | 6 | 1 | no | (standard in "-D" execution) |
| 71 | 6 | 1 | no | (standard in "-D" execution) |
| 80 | 6 | 1 | no | (standard in "-D" execution) |
| 90 | 6 | 1 | 4x90° | (standard in "-f" or "-D" execution) |
| 100 | 6 | 1 | 4x90° | (standard in "-f" or "-D" execution) |
| 112 | 6 | 1 | 4x90° | (standard in "-f" or "-D" execution) |
| 132 | 6 | 1 | 4x90° | (standard in "-f" or "-D" execution) |
| 160 | 6 | 1 | 4x90° | (standard in "-f" or "-D" execution) |
| 180 | 6 | 1 | 4x90° | (standard in "-f" or "-D" execution) |

Vibration level

The rotor balancing method guarantees that a standard vibration level A is maintained in accordance with the IEC 60034-14. On customer's demand the motors can be produced with reduced vibration level (B).

Limits of maximum vibration velocity (r.m.s.) for shaft height H according to IEC 60034-14

| Vibration level | Shaft height | 56 ≤ H ≤ 132 | H > 132 |
|-----------------|-----------------|--------------|---------|
| | Fitting type | mm/s | mm/s |
| A | Free suspension | 2.8 | 2.8 |
| | Rigid setting | – | 2.3 |
| B | Free suspension | 1.1 | 1.8 |
| | Rigid setting | – | 1.5 |

Remark:

Limits stated in the table mentioned above are applicable for uncoupled (disconnected from the driven machine) and operating at no load motors.

Noise level

Motors in standard comply with a permissible sound power level according to IEC 60034-9.

On customer's demand the motors can be delivered with reduced noise level by using special cooling systems.

Terminal box

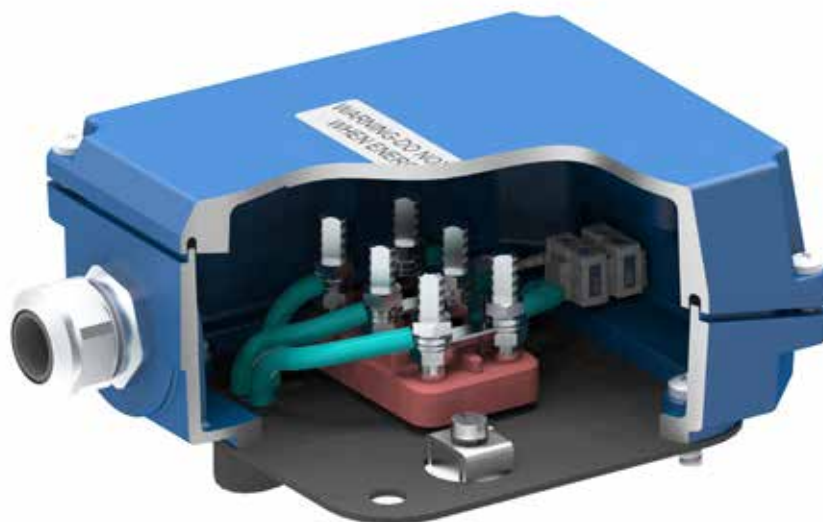
The terminal box is equipped with a terminal board with 6 terminals.

Terminal boxes are equipped with one cable gland.

Motors adapted for inverter power supply (-f) are equipped with winding temperature sensors and the terminals are placed on a special terminal connector.

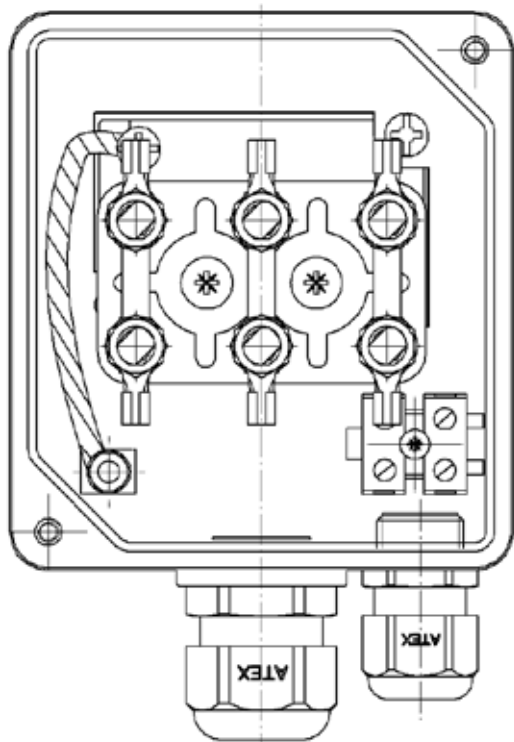
Motors with temperature sensors are equipped with an additional cable gland (for connecting sensors).

For motors frame size 56 to 80 second cable gland available upon request.

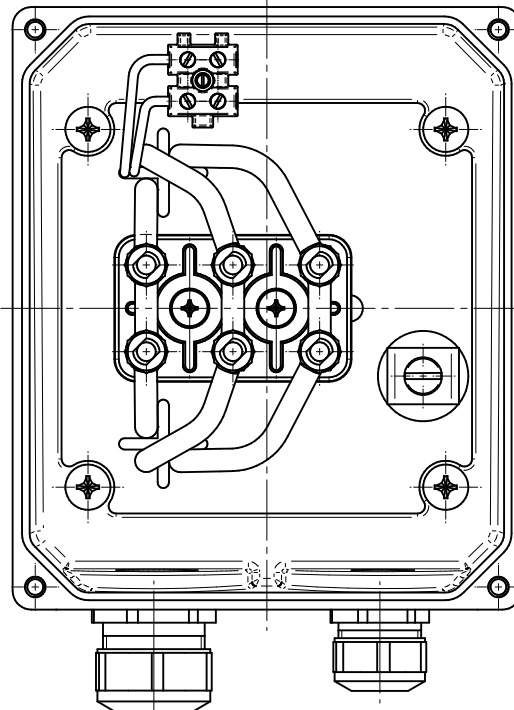


Standard terminal box view:

Frame size
Ex3SIE, Ex2SIE, ExSh56-80




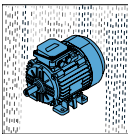

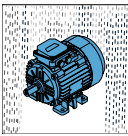

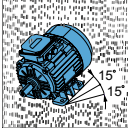
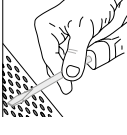
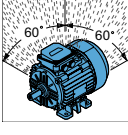
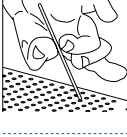
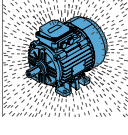
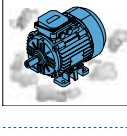

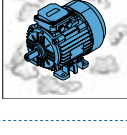

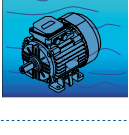
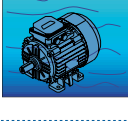
Frame size
Ex3SIE90-180



Degree of protection IP

IP 55

Motors in standard execution comply with IP55 requirements according to IEC 60034-5

| Protection against penetration of solid matter | | | Protection against penetration of fluids | | |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 1st digit | Description | | 2nd digit | Description | |
| 0 |  Not protected | | 0 |  Not protected | |
| 1 |  Protected against solid bodies larger than 50 mm | | 1 |  Protected against vertically falling drops of water | |
| 2 |  Protected against solid bodies larger than 12 mm | | 2 |  Protected against vertically falling drops of water up to 15° | |
| 3 |  Protected against solid bodies larger than 2,5 mm | | 3 |  Protected against rain up to 60° | |
| 4 |  Protected against solid bodies larger than 1 mm | | 4 |  Protected against rain falling from any direction | |
| 5 |  Protected against deposition of dust | | 5 |  Protected against sprayed water from any direction | |
| 6 |  Totally protected against deposition of dust | | 6 |  Protected against temporary immersion | |
| | | | 7 |  Protected against immersion between 0,15 and 1 m | |
| | | | 8 |  Protected against immersion at preset pressure and time | |

Higher degree of protection is available on request.

Painting and corrosivity classes

Standard painting system with RAL5010 color used in all our motors comply with C3 corrosion class according to ISO 12944.

For special request motors can be painted with other colors and with alternative painting systems (up to C5 corrosion class).

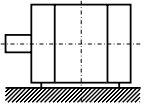
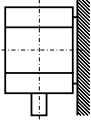
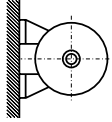
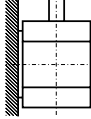
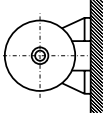
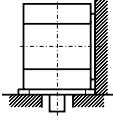
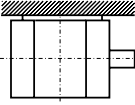
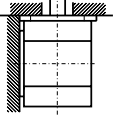
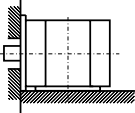
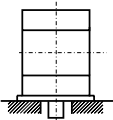
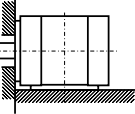
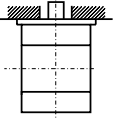
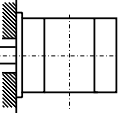
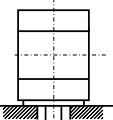
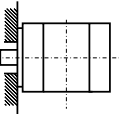
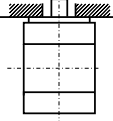
RAL 5010/C3



| Corrosion class | Environment | |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| | Interior | Exterior |
| C1 (very low) | Heated buildings with a clean atmosphere such as hotels, offices, shops, schools. | N/A |
| C2 (low) | Unheated buildings, where condensation may occur e.g. storehouses, sports halls. | Atmosphere contaminated to a small extent, mostly rural regions. |
| C3 (medium) | Production space of high humidity and certain air contamination e.g. foodstuff plants, laundries, breweries, dairies. | Industrial and urban atmosphere with an average Sulphur oxide (IV) contamination level. Inshore areas of low salinity. |
| C4 (high) | Chemical plants, swimming pools, ship repair yards. | Industrial areas and inshore areas of medium salinity. |
| C5 (very high) | Buildings and areas of almost constant condensation and high contamination. | Industrial areas with high humidity and aggressive atmosphere and coastal areas with high salinity. |

Mounting arrangements

According to the IEC 60034-7 standard

| Horizontal shaft | | | | Vertical shaft | | | |
|-------------------------------------------------------------------------------------|---------|------------|----------|-------------------------------------------------------------------------------------|--------------------------|------------|----------|
| Designation | | | | Designation | | | |
| Code II | Code I | Frame size | | Code II | Code I | Frame size | |
|  | IM 1001 | IM B3 | 56 ÷ 180 |  | IM 1011 | IM V5 | 56 ÷ 180 |
|  | IM 1051 | IM B6 | 56 ÷ 180 |  | IM 1031 | IM V6 | 56 ÷ 180 |
|  | IM 1061 | IM B7 | 56 ÷ 180 |  | IM 2011 or IM 2111 | IM V15 | 56 ÷ 180 |
|  | IM 1071 | IM B8 | 56 ÷ 180 |  | IM 2031 or IM 2131 | IM V36 | 56 ÷ 180 |
|  | IM 2001 | IM B35 | 56 ÷ 180 |  | IM 3011 | IM V1 | 56 ÷ 180 |
|  | IM 2101 | IM B34 | 56 ÷ 132 |  | IM 3031 | IM V3 | 80 ÷ 180 |
|  | IM 3001 | IM B5 | 56 ÷ 180 |  | IM 3611 | IM V18 | 56 ÷ 160 |
|  | IM 3601 | IM B14 | 56 ÷ 132 |  | IM 3631 | IM V19 | 56 ÷ 160 |

*Other mounting arrangements available on special request

Definitions

Relation between rated output power and rated torque on motor shaft:

$$T = \frac{9,55 \times P}{n}$$

where:

- T [Nm] is rated output torque on motor shaft
- P [W] is rated output power on motor shaft
- n [rpm] is rated speed of motor shaft

Relation between rated output power on shaft and rated consumed power from mains:

$$P_1 = \frac{P}{\eta} \times 100$$

where:

- P_1 [kW] is rated consumed power from mains by motor
- P [kW] is rated output power on motor shaft
- η [%] is rated efficiency of motor

Relation between rated consumed power from mains and rated voltage, current, power factor:

$$P_1 = \sqrt{3} \times U \times I \times \cos\varphi$$

where:

- P_1 [W] is rated consumed power from mains by motor
- U [V] is rated supply voltage of motor
- I [A] is rated current consumed from mains by motor
- $\cos\varphi$ is rated power factor of motor

Units of measurement

| Parameter name | Symbol | Unit name | Symbol |
|----------------------|----------------|-----------|--------|
| Frequency | f | Hertz | Hz |
| Active power | P | Watt | W |
| Voltage | U | Volt | V |
| Electric Current | I | Amper | A |
| Power factor | cosφ | N/A | N/A |
| Resistance | R | Ohm | Ω |
| Sound power level | L _w | decibel | dB |
| Sound pressure level | L _p | decibel | dB |

Permissible shaft end loads

| Frame size | Horizontal operation | | Vertical operation | | |
|----------------|----------------------|---------------|--------------------|----------|----------|
| | $F_R(x=0)$ | $F_R(x=\max)$ | F_P | F_{a1} | F_{a2} |
| | [kN] | | | [kN] | |
| ExSh(2SIE)56-2 | 0,20 | 0,16 | 0,04 | 0,03 | 0,05 |
| ExSh56-4 | 0,25 | 0,20 | 0,05 | 0,04 | 0,06 |
| Ex2SIE63-2 | 0,20 | 0,16 | 0,04 | 0,04 | 0,06 |
| Ex2SIE63-4 | 0,25 | 0,20 | 0,06 | 0,05 | 0,07 |
| ExSh63-6 | 0,27 | 0,22 | 0,06 | 0,05 | 0,07 |
| Ex2SIE71-2 | 0,29 | 0,24 | 0,07 | 0,05 | 0,09 |
| Ex2SIE71-4 | 0,36 | 0,30 | 0,09 | 0,07 | 0,11 |
| Ex2SIE71-6 | 0,40 | 0,35 | 0,10 | 0,08 | 0,12 |
| Ex3SIE80-2 | 0,33 | 0,27 | 0,09 | 0,06 | 0,12 |
| Ex3SIE80-4 | 0,44 | 0,37 | 0,12 | 0,09 | 0,15 |
| Ex2SIE80-6 | 0,51 | 0,42 | 0,14 | 0,11 | 0,17 |
| Ex3SIE90S2 | 0,79 | 0,66 | 0,64 | 0,44 | 0,84 |
| Ex3SIE90L2 | 0,79 | 0,66 | 0,64 | 0,44 | 0,84 |
| Ex3SIE90S4 | 1,00 | 0,83 | 0,80 | 0,65 | 1,05 |
| Ex3SIE90L4 | 1,00 | 0,83 | 0,80 | 0,65 | 1,05 |
| Ex3SIE90S6 | 1,15 | 0,95 | 0,90 | 0,77 | 1,17 |
| Ex3SIE90L6 | 1,15 | 0,95 | 0,90 | 0,77 | 1,17 |
| Ex3SIE100L2 | 1,11 | 0,89 | 0,90 | 0,61 | 1,17 |
| Ex3SIE100L4A | 1,39 | 1,12 | 1,12 | 0,90 | 1,46 |
| Ex3SIE100L4B | 1,39 | 1,12 | 1,12 | 0,90 | 1,46 |
| Ex3SIE100L6 | 1,60 | 1,29 | 1,26 | 1,08 | 1,64 |
| Ex3SIE112M2 | 1,56 | 1,22 | 1,23 | 0,84 | 1,60 |
| Ex3SIE112M4 | 1,92 | 1,58 | 1,50 | 1,19 | 1,96 |
| Ex3SIE112M6 | 2,20 | 1,80 | 1,69 | 1,26 | 2,20 |
| Ex3SIE132S2A | 2,11 | 1,65 | 1,82 | 0,98 | 2,37 |
| Ex3SIE132S2B | 2,11 | 1,65 | 1,82 | 0,98 | 2,37 |
| Ex3SIE132S4 | 2,67 | 2,08 | 2,31 | 1,36 | 3,00 |
| Ex3SIE132M4 | 2,67 | 2,08 | 2,31 | 1,36 | 3,00 |
| Ex3SIE132S6 | 3,06 | 2,39 | 2,51 | 1,40 | 3,26 |
| Ex3SIE132M6B | 3,06 | 2,39 | 2,51 | 1,40 | 3,26 |
| Ex3SIE160M2A | 2,43 | 1,88 | 1,97 | 1,00 | 2,56 |
| Ex3SIE160M2B | 2,43 | 1,88 | 1,97 | 1,00 | 2,56 |
| Ex3SIE160L2 | 2,43 | 1,88 | 1,97 | 1,00 | 2,56 |
| Ex3SIE160M4 | 3,06 | 2,38 | 2,54 | 1,43 | 3,31 |
| Ex3SIE160L4 | 3,06 | 2,38 | 2,54 | 1,43 | 3,31 |
| Ex3SIE160M6 | 3,54 | 2,81 | 2,83 | 1,80 | 3,68 |
| Ex3SIE160L6 | 3,54 | 2,81 | 2,83 | 1,80 | 3,68 |
| Ex3SIE180M2 | 2,61 | 2,13 | 2,20 | 1,00 | 2,87 |
| Ex3SIE180M4 | 3,30 | 2,68 | 2,83 | 1,37 | 3,68 |
| Ex3SIE180L4 | 3,30 | 2,68 | 2,83 | 1,37 | 3,68 |
| Ex3SIE180L6 | 3,78 | 3,07 | 3,17 | 1,93 | 4,12 |

Value of radial force F_R acting on the shaft end for a given belt pulley diameter is calculated according to the following formula:

$$F_R = \frac{19\,600 \times P \times k}{D_k \times n} \text{ [N]}$$

where: P – motor output [kW]
 D_k – belt pulley diameter [m]
 n – speed [rpm]
 k – belt tension factor:
 for V-belts $k=2,2$
 for flat belts $k=3$

Value of force F_R acting on any point of the shaft end (between points $X=\max$ and $X=0$) may be calculated according to the following formula:

$$F_R = F_{X0} - \frac{X}{E} \times (F_{X0} - F_{XMAX}) \text{ [N]}$$

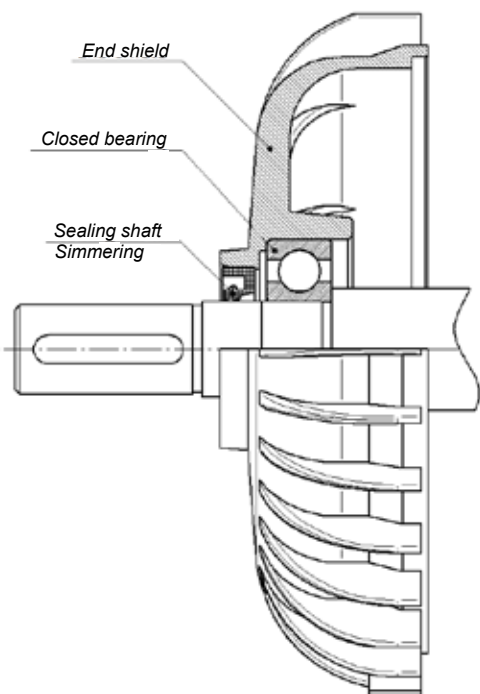
where: F_{X0} – value of F_R force acting on the beginning of the shaft end
 F_{XMAX} – value of F_R force acting on the end of the shaft end
 E – length of the shaft end

Bearing types and bearing nodes

| Frame size | Number of poles | Bearings | |
|------------|-----------------|------------|------------|
| | | DE | NDE |
| 56 | 2÷6 | 6201 2Z C3 | 6201 2Z C3 |
| 63 | 2÷6 | 6202 2Z C3 | 6202 2Z C3 |
| 71 | 2÷6 | 6203 2Z C3 | 6203 2Z C3 |
| 80 | 2÷6 | 6204 2Z C3 | 6204 2Z C3 |
| 90 | 2÷6 | 6205 2Z C3 | 6205 2Z C3 |
| 100 | 2÷6 | 6206 2Z C3 | 6206 2Z C3 |
| 112 | 2÷6 | 6306 2Z C3 | 6306 2Z C3 |
| 132 | 2÷6 | 6308 2Z C3 | 6308 2Z C3 |
| 160 | 2÷6 | 6309 2Z C3 | 6309 2Z C3 |
| 180 | 2÷6 | 6311 2Z C3 | 6311 2Z C3 |

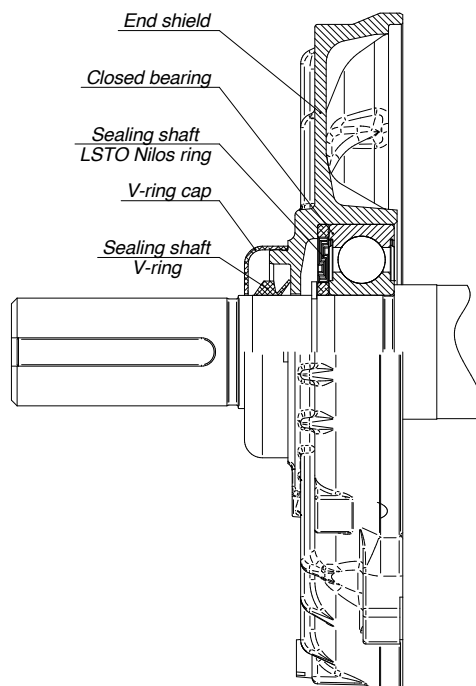
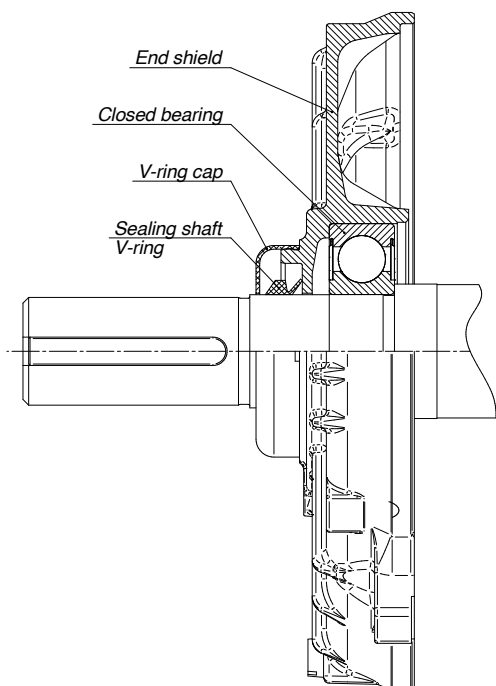
Bearing types and bearing nodes

Frame size
Ex3SIE, Ex2SIE, ExSh56-80



Frame size
Ex3SIE90-180

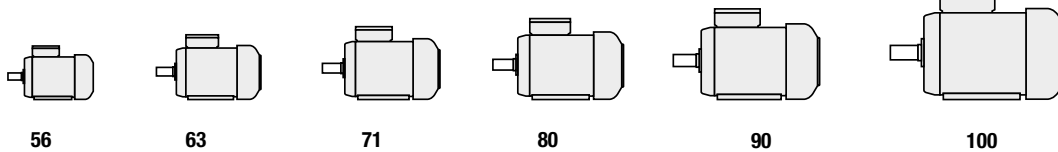
Types of sealings of bearing nodes



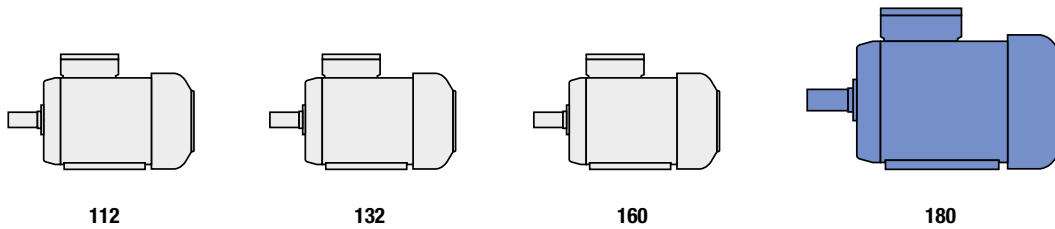
Material of housing, end shields and feet

| Frame size [mm] | Motor housing | End shields | Feet |
|-----------------|---------------|----------------------------|---------------------|
| Ex56 | Aluminium | Aluminium | Aluminium – screwed |
| Ex63 | Aluminium | Aluminium | Aluminium – screwed |
| Ex71 | Aluminium | Aluminium | Aluminium – screwed |
| Ex80 | Aluminium | Aluminium | Aluminium – screwed |
| Ex3SIE90 | Aluminium | Aluminium / Cast iron (B5) | Aluminium – screwed |
| Ex3SIE100 | Aluminium | Aluminium / Cast iron (B5) | Aluminium – screwed |
| Ex3SIE112 | Aluminium | Cast iron | Aluminium – screwed |
| Ex3SIE132 | Aluminium | Cast iron | Aluminium – screwed |
| Ex3SIE160 | Aluminium | Cast iron | Aluminium – screwed |
| Ex3SIE180 | Cast iron | Cast iron | Cast iron – screwed |

aluminium

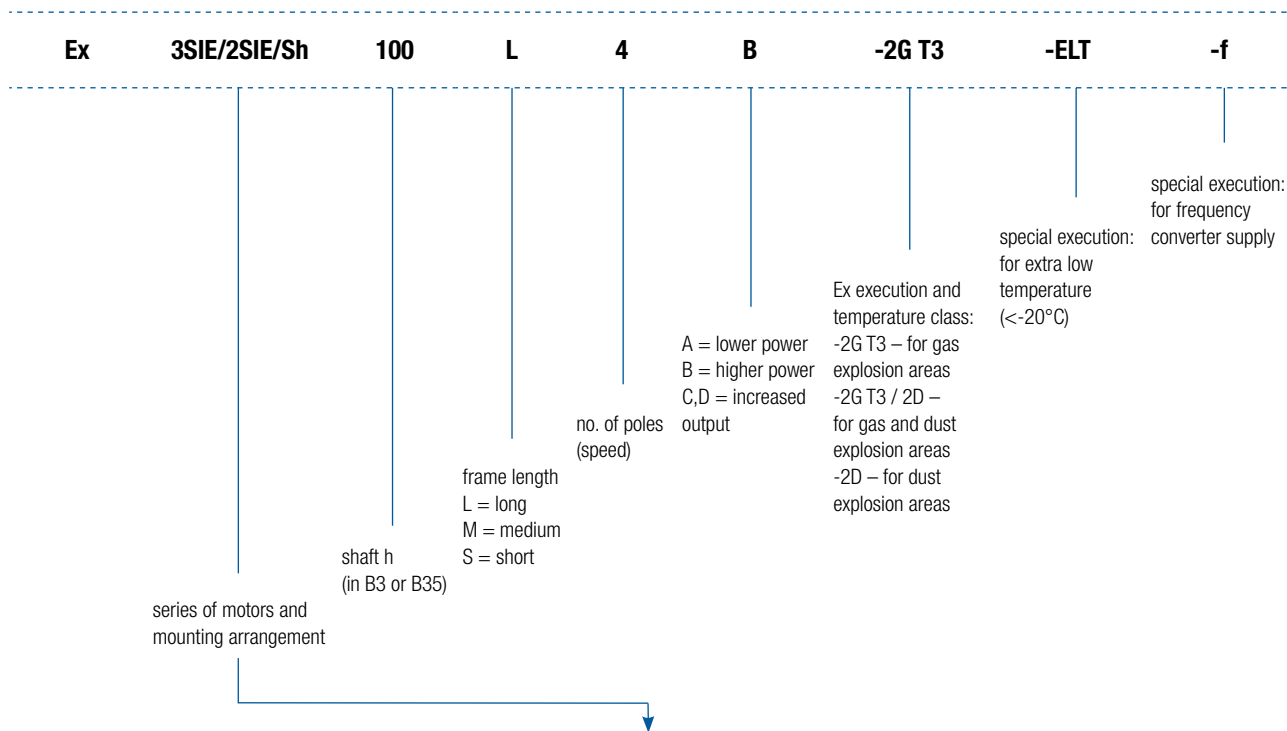


cast iron



aluminium
cast iron

Nomenclature



Ex marking

| Type of motor | ATEX marking |
|------------------------------------|------------------------------------------------------------------------------------|
| Ex(3SIE,2SIE,Sh)...-2G T3/T4* | II 2G Ex eb IIC T3 Gb (-20°C...+40°C) |
| Ex(3SIE,2SIE,Sh)...-2G T3/T4* / 2D | II 2G Ex eb IIC T3 Gb (-20°C...+40°C) / II 2D Ex tb IIIC T125°C Db (-20°C...+40°C) |
| Ex3SIE...-2D | II 2D Ex tb IIIC T125°C Db (-20°C...+40°C) |
| Ex3SIE...-2G T3-ELT | II 2G Ex eb IIC T3 Gb (-40°C...+40°C) |
| Ex3SIE...-2G T3 / 2D-ELT | II 2G Ex eb IIC T3 Gb (-40°C...+40°C) / II 2D Ex tb IIIC T125°C Db (-40°C...+40°C) |
| Ex3SIE...-2D-ELT | II 2D Ex eb IIIC T125°C Db (-40°C...+40°C) |

*Temperature class T4 available for frame size 56-80

REMARK: The overload protection of increased safety motor must have the time-current characteristic which guarantees that the motor will be disconnected from supply voltage in a time shorter than specified time t_E (please check rated parameters on next pages) when the current is equal to starting current. The second equivalent type of protection are PTC sensors in winding (if motors equipped with it) which prevent exceeding max temperature in case of unexpected disturbances.

Frequency converter operation (VSD)

Electronic speed control is carried out using a frequency converter (VSD) that adjusts the speed of the motor – and therefore the torque produced – based on the energy needed.

Our increased safety motors (frame size 90-180) can be ordered in special execution designed for the frequency converter supply ("-f"). Permissible output parameters of frequency converter and speed control range have to be established individually.

Totally Enclosed Motors IP 55 $f=50\text{Hz}$ RPM=3000 min^{-1}

| Item | Type | Rated output | | Rated speed | Rated torque | Efficiency | Power factor | Full load current at 400V | Locked rotor torque ratio | Locked rotor current ratio | Breakdown torque ratio | Moment of Inertia | Time | Weight (MB3) |
|------|----------------|--------------|-------|-----------------------|--------------|------------------------------------------|----------------|---------------------------|---------------------------|----------------------------|------------------------|--------------------|-------|--------------|
| | | P_N | P_N | n_N | T_N | η_N | $\cos \varphi$ | I_N | T_L/T_N | I_L/I_N | T_B/T_N | J | t_E | |
| | | [kW] | [HP] | [min^{-1}] | [Nm] | [%] | [-] | [A] | [-] | [-] | [-] | [kgm^2] | [s] | [kg] |
| | | | | 2p=2 | | $n_s=3000 \text{ rpm}$ | | | | | | | | |
| 1 | ExSh56-2A | 0,09 | 0,12 | 2760 | 0,31 | 54,0 | 0,60 | 0,4 | 2,5 | 3,1 | 2,5 | – | 45 | 3 |
| 2 | Ex2SIE56-2B | 0,12 | 0,17 | 2750 | 0,42 | 62,0 | 0,70 | 0,4 | 2,3 | 3,3 | 2,3 | – | 34 | 3,3 |
| 3 | Ex2SIE63-2A | 0,18 | 0,25 | 2820 | 0,61 | 64,0 | 0,70 | 0,6 | 3,1 | 4,8 | 3,2 | – | 22 | 4,4 |
| 4 | Ex2SIE63-2B | 0,25 | 0,33 | 2870 | 0,83 | 67,0 | 0,60 | 0,9 | 4,9 | 5,7 | 4,8 | – | 14 | 5,2 |
| 5 | Ex2SIE71-2A | 0,37 | 0,5 | 2870 | 1,23 | 70,5 | 0,80 | 0,95 | 2,9 | 5,2 | 2,2 | – | 15 | 6,0 |
| 6 | Ex2SIE71-2B | 0,55 | 0,75 | 2850 | 1,84 | 74,5 | 0,82 | 1,3 | 2,9 | 5,1 | 2,1 | – | 18 | 7,8 |
| 7 | Ex3SIE80-2A | 0,75 | 1 | 2890 | 2,48 | 80,7 | 0,76 | 1,8 | 5,3 | 7,3 | 2,6 | – | 7 | 9,5 |
| 8 | Ex3SIE80-2B | 1,1 | 1,5 | 2890 | 3,62 | 82,7 | 0,77 | 2,5 | 4,5 | 9,0 | 2,6 | – | 6 | 11,8 |
| 9 | Ex3SIE90S2.. | 1,5 | 2 | 2925 | 4,9 | 84,2 | 0,85 | 3,0 | 2,4 | 9,3 | 3,5 | 0,0014 | 8,5 | 16,5 |
| 10 | Ex3SIE90L2.. | 2,2 | 3 | 2910 | 7,2 | 85,9 | 0,86 | 4,3 | 2,7 | 9,2 | 4,0 | 0,0019 | 9,5 | 18,5 |
| 11 | Ex3SIE100L2.. | 3 | 4 | 2915 | 9,8 | 87,1 | 0,85 | 5,8 | 3,0 | 7,8 | 4,1 | 0,0039 | 13,5 | 25 |
| 12 | Ex3SIE112M2.. | 4 | 5,5 | 2925 | 13,0 | 88,1 | 0,89 | 7,4 | 2,3 | 8,4 | 3,2 | 0,0075 | 14 | 35,5 |
| 13 | Ex3SIE132S2A.. | 5,5 | 7,5 | 2940 | 17,9 | 89,2 | 0,89 | 10,0 | 2,6 | 8,9 | 3,4 | 0,014 | 12 | 55 |
| 14 | Ex3SIE132S2B.. | 7,5 | 10 | 2940 | 24,4 | 90,1 | 0,90 | 13,3 | 2,8 | 8,9 | 3,8 | 0,017 | 7,7 | 64 |
| 15 | Ex3SIE160M2A.. | 11 | 15 | 2945 | 35,7 | 91,2 | 0,90 | 19,3 | 2,1 | 7,9 | 3,2 | 0,048 | 10 | 90 |
| 16 | Ex3SIE160M2B.. | 15 | 20 | 2945 | 48,6 | 91,9 | 0,90 | 26,2 | 2,4 | 8,0 | 3,3 | 0,059 | 5,9 | 99 |
| 17 | Ex3SIE160L2.. | 18,5 | 25 | 2950 | 59,9 | 92,4 | 0,87 | 33,2 | 2,7 | 8,8 | 4,0 | 0,072 | 5,7 | 106 |
| 18 | Ex3SIE180M2.. | 22 | 30 | 2955 | 71,1 | 92,7 | 0,90 | 38,1 | 3,0 | 8,9 | 3,4 | 0,095 | 6,7 | 190 |

Totally Enclosed Motors IP 55 $f=50\text{Hz}$ RPM=1500 min^{-1}

| | | | | | | | | | | | | | | |
|----|----------------|------|------|-------------|-------|------------------------------------------|------|------|-----|-----|-----|--------|-----|------|
| | | | | 2p=4 | | $n_s=1500 \text{ rpm}$ | | | | | | | | |
| 1 | ExSh56-4A | 0,06 | 0,08 | 1380 | 0,42 | 48,0 | 0,57 | 0,31 | 2,3 | 2,7 | 2,5 | – | 64 | 3,0 |
| 2 | ExSh56-4B | 0,09 | 0,12 | 1370 | 0,63 | 60,0 | 0,59 | 0,37 | 1,9 | 2,8 | 2,1 | – | 64 | 3,3 |
| 3 | Ex2SIE63-4A | 0,12 | 0,17 | 1400 | 0,82 | 66,0 | 0,65 | 0,4 | 2,8 | 4,5 | 3,1 | – | 75 | 5,3 |
| 4 | Ex2SIE63-4B | 0,18 | 0,25 | 1380 | 1,25 | 67,5 | 0,70 | 0,55 | 2,5 | 3,8 | 2,5 | – | 80 | 6,1 |
| 5 | Ex2SIE71-4A | 0,25 | 0,33 | 1410 | 1,69 | 70,0 | 0,62 | 0,85 | 2,8 | 3,7 | 2,9 | – | 55 | 7,7 |
| 6 | Ex2SIE71-4B | 0,37 | 0,5 | 1410 | 2,51 | 72,5 | 0,64 | 1,15 | 2,9 | 4,1 | 3,1 | – | 34 | 8,1 |
| 7 | Ex2SIE80-4A | 0,55 | 0,75 | 1420 | 3,7 | 78,5 | 0,68 | 1,5 | 3,2 | 5,4 | 3,2 | – | 21 | 9,9 |
| 8 | Ex3SIE80-4B | 0,75 | 1 | 1430 | 5,01 | 82,5 | 0,63 | 2,1 | 3,8 | 5,7 | 3,7 | – | 21 | 11,8 |
| 9 | Ex3SIE90S4.. | 1,1 | 1,5 | 1450 | 7,2 | 84,1 | 0,77 | 2,5 | 2,3 | 6,9 | 3,5 | 0,0036 | 18 | 18 |
| 10 | Ex3SIE90L4.. | 1,5 | 2 | 1450 | 9,9 | 85,3 | 0,78 | 3,3 | 2,5 | 7,4 | 3,4 | 0,004 | 21 | 21 |
| 11 | Ex3SIE100L4A.. | 2,2 | 3 | 1465 | 14,3 | 86,7 | 0,80 | 4,6 | 2,5 | 7,3 | 3,3 | 0,0076 | 19 | 27,5 |
| 12 | Ex3SIE100L4B.. | 3 | 4 | 1465 | 19,6 | 87,7 | 0,79 | 6,3 | 2,5 | 7,1 | 3,5 | 0,0086 | 15 | 31 |
| 13 | Ex3SIE112M4.. | 4 | 5,5 | 1455 | 26,3 | 88,6 | 0,80 | 8,1 | 2,1 | 6,9 | 3,0 | 0,0115 | 12 | 41,5 |
| 14 | Ex3SIE132S4.. | 5,5 | 7,5 | 1465 | 35,7 | 89,6 | 0,85 | 10,4 | 2,5 | 9,2 | 3,4 | 0,036 | 14 | 63 |
| 15 | Ex3SIE132M4.. | 7,5 | 10 | 1465 | 49,1 | 90,4 | 0,83 | 14,4 | 2,9 | 9,5 | 3,8 | 0,042 | 12 | 67 |
| 16 | Ex3SIE160M4.. | 11 | 15 | 1470 | 71,5 | 91,4 | 0,83 | 20,9 | 2,6 | 6,8 | 2,8 | 0,088 | 13 | 90 |
| 17 | Ex3SIE160L4.. | 15 | 20 | 1475 | 97,1 | 92,1 | 0,83 | 28,3 | 2,7 | 7,8 | 3,2 | 0,104 | 8,8 | 121 |
| 18 | Ex3SIE180M4.. | 18,5 | 25 | 1475 | 120,2 | 92,6 | 0,85 | 33,9 | 2,9 | 9,3 | 3,0 | 0,162 | 12 | 190 |
| 19 | Ex3SIE180L4.. | 22 | 30 | 1475 | 142,4 | 93,0 | 0,86 | 39,7 | 3,0 | 9,4 | 3,4 | 0,185 | 7,5 | 200 |

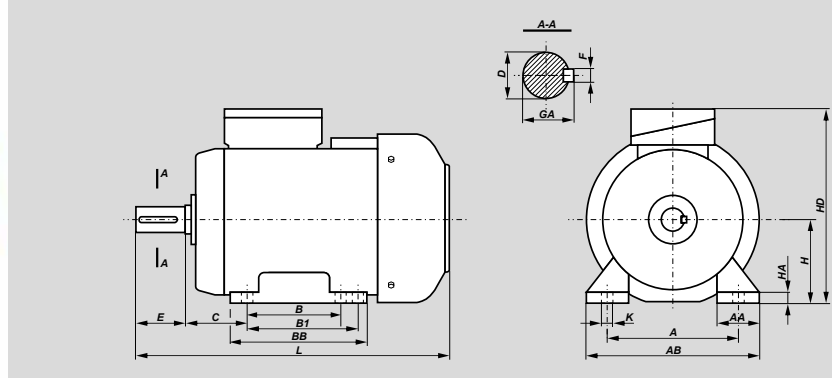
As part of our development program, we reserve the right to alter or amend any of the specifications without giving prior notice.

Totally Enclosed Motors IP 55 $f=50\text{Hz}$ $\text{RPM}=1000\text{ min}^{-1}$

| Item | Type | Rated output | | Rated speed | Rated torque | Efficiency | Power factor | Full load current at 400V | Locked rotor torque ratio | Locked rotor current ratio | Breakdown torque ratio | Moment of Inertia | Time | Weight (IMB3) |
|------|----------------|--------------|-------|-----------------------|--------------|-----------------------|----------------|---------------------------|---------------------------|----------------------------|------------------------|--------------------|-------|---------------|
| | | P_N | P_N | n_N | T_N | η_N | $\cos \varphi$ | I_N | T_L/T_N | I_L/I_N | T_B/T_N | J | t_E | |
| | | [kW] | [HP] | [min^{-1}] | [Nm] | [%] | [-] | [A] | [-] | [-] | [-] | [kgm^2] | [s] | [kg] |
| | | | | 2p=6 | | $n_s=1000\text{ rpm}$ | | | | | | | | |
| 1 | ExSh63-6B | 0,06 | 0,08 | 940 | 0,61 | 40,0 | 0,39 | 0,55 | 2,9 | 2,4 | 3,0 | – | 110 | 5,0 |
| 2 | Ex2SIE71-6A | 0,18 | 0,25 | 910 | 1,89 | 63,5 | 0,64 | 0,65 | 2,7 | 3,1 | 2,7 | – | 70 | 7,5 |
| 3 | Ex2SIE71-6B | 0,25 | 0,33 | 910 | 2,62 | 64,0 | 0,65 | 0,9 | 2,6 | 2,9 | 2,5 | – | 40 | 8,1 |
| 4 | Ex2SIE80-6A | 0,37 | 0,5 | 920 | 3,84 | 72,0 | 0,76 | 1,0 | 1,9 | 3,5 | 2,2 | – | 55 | 9,5 |
| 5 | Ex2SIE80-6B | 0,55 | 0,75 | 950 | 5,53 | 73,2 | 0,57 | 1,9 | 3,4 | 4,3 | 3,6 | – | 25 | 12,5 |
| 6 | Ex3SIE90S6.. | 0,75 | 1 | 940 | 7,6 | 78,9 | 0,70 | 2,0 | 1,7 | 4,3 | 2,4 | 0,0032 | 21 | 16 |
| 7 | Ex3SIE90L6.. | 1,1 | 1,5 | 940 | 11,1 | 81,0 | 0,70 | 2,8 | 2,1 | 4,5 | 2,6 | 0,009 | 23 | 19 |
| 8 | Ex3SIE100L6.. | 1,5 | 2 | 960 | 14,9 | 82,5 | 0,74 | 3,5 | 2,0 | 5,5 | 2,7 | 0,01 | 24 | 23,5 |
| 9 | Ex3SIE112M6.. | 2,2 | 3 | 965 | 21,8 | 84,3 | 0,76 | 5,0 | 2,1 | 6,4 | 2,6 | 0,0177 | 23 | 34 |
| 10 | Ex3SIE132S6.. | 3 | 4 | 965 | 29,7 | 87,0 | 0,81 | 6,2 | 2,2 | 6,6 | 2,9 | 0,044 | 17 | 54 |
| 11 | Ex3SIE132M6A.. | 4 | 5,5 | 965 | 39,8 | 88,0 | 0,81 | 8,1 | 2,3 | 7,0 | 3,0 | 0,0579 | 19 | 62 |
| 12 | Ex3SIE132M6B.. | 5,5 | 7,5 | 960 | 54,7 | 88,0 | 0,81 | 11,1 | 2,4 | 6,9 | 3,1 | 0,0637 | 15 | 66 |
| 13 | Ex3SIE160M6.. | 7,5 | 10 | 970 | 73,8 | 89,1 | 0,80 | 15,2 | 2,1 | 6,6 | 2,9 | 0,102 | 16 | 101 |
| 14 | Ex3SIE160L6.. | 11 | 15 | 970 | 108,3 | 90,3 | 0,80 | 22,0 | 2,2 | 6,8 | 3,0 | 0,123 | 14 | 114 |
| 15 | Ex3SIE180L6.. | 15 | 20 | 980 | 146,2 | 91,2 | 0,80 | 29,6 | 3,3 | 7,9 | 2,8 | 0,276 | 12 | 198 |

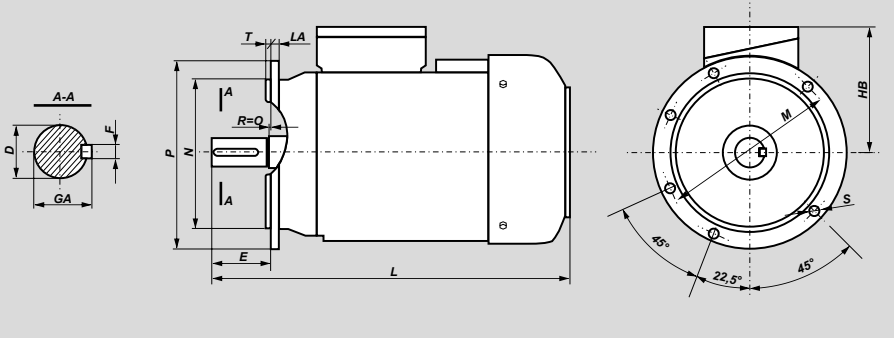
Other voltage and frequency available on special request

Dimensions of Foot Mounted Motors – IM B3



| Size | A | B | B1 | C | D | E | F | GA | H | HA | K | AA | AB | AC | BB | HD | L |
|----------------|-----|-----|-----|-----|----|-----|----|------|-----|-----|-----|----|-----|-----|-----|-----|-----|
| 56-2A,2B,4A,4B | 90 | 71 | — | 36 | 9 | 20 | 3 | 10,2 | 56 | 7 | 5,8 | 30 | 110 | 117 | 92 | 179 | 193 |
| 63-2A | 100 | 80 | — | 40 | 11 | 23 | 4 | 12,5 | 63 | 8,5 | 7 | 35 | 124 | 126 | 106 | 191 | 210 |
| 63-2B,4A,6B | 100 | 80 | — | 40 | 11 | 23 | 4 | 12,5 | 63 | 8,5 | 7 | 35 | 124 | 126 | 106 | 191 | 225 |
| 63-4B | 100 | 80 | — | 40 | 11 | 23 | 4 | 12,5 | 63 | 8,5 | 7 | 35 | 124 | 126 | 106 | 191 | 245 |
| 71-2A | 112 | 90 | — | 45 | 14 | 30 | 5 | 16 | 71 | 8 | 7 | 45 | 142 | 134 | 116 | 206 | 245 |
| 71-4A,6A | 112 | 90 | — | 45 | 14 | 30 | 5 | 16 | 71 | 8 | 7 | 45 | 142 | 134 | 116 | 206 | 263 |
| 71-2B,4B,6B | 112 | 90 | — | 45 | 14 | 30 | 5 | 16 | 71 | 8 | 7 | 45 | 142 | 134 | 116 | 206 | 284 |
| 80-2A,4A,6A | 125 | 100 | — | 50 | 19 | 40 | 6 | 21,5 | 80 | 9 | 10 | 55 | 160 | 157 | 130 | 222 | 278 |
| 80-2B,4B | 125 | 100 | — | 50 | 19 | 40 | 6 | 21,5 | 80 | 9 | 10 | 55 | 160 | 157 | 130 | 222 | 306 |
| 80-6B | 125 | 100 | — | 50 | 19 | 40 | 6 | 21,5 | 80 | 9 | 10 | 55 | 160 | 157 | 130 | 222 | 318 |
| 90S-2,4,6;L2 | 140 | 100 | 125 | 56 | 24 | 50 | 8 | 27 | 90 | 10 | 10 | 47 | 182 | 200 | 153 | 238 | 331 |
| 90L-4,6 | 140 | 100 | 125 | 56 | 24 | 50 | 8 | 27 | 90 | 10 | 10 | 47 | 182 | 200 | 153 | 238 | 356 |
| 100L-2,6 | 160 | 140 | — | 63 | 28 | 60 | 8 | 31 | 100 | 12 | 12 | 52 | 202 | 215 | 170 | 257 | 377 |
| 100L-4A,4B | 160 | 140 | — | 63 | 28 | 60 | 8 | 31 | 100 | 12 | 12 | 52 | 202 | 215 | 170 | 257 | 417 |
| 112M-2,6 | 190 | 140 | — | 70 | 28 | 60 | 8 | 31 | 112 | 14 | 12 | 52 | 222 | 248 | 170 | 280 | 398 |
| 112M4 | 190 | 140 | — | 70 | 28 | 60 | 8 | 31 | 112 | 14 | 12 | 52 | 222 | 248 | 170 | 280 | 425 |
| 132S-2A,2B,4,6 | 216 | 140 | 178 | 89 | 38 | 80 | 10 | 41 | 132 | 18 | 12 | 61 | 266 | 288 | 220 | 329 | 512 |
| 132M-4,6A,6B | 216 | 140 | 178 | 89 | 38 | 80 | 10 | 41 | 132 | 18 | 12 | 61 | 266 | 288 | 220 | 329 | 512 |
| 160M-2A,2B,4,6 | 254 | 210 | 254 | 108 | 42 | 110 | 12 | 45 | 160 | 25 | 15 | 81 | 320 | 340 | 300 | 383 | 643 |
| 160L-2,4,6 | 254 | 210 | 254 | 108 | 42 | 110 | 12 | 45 | 160 | 25 | 15 | 81 | 320 | 340 | 300 | 383 | 643 |
| 180M-2,4;L4,6 | 279 | 241 | 279 | 121 | 48 | 110 | 14 | 51,5 | 180 | 27 | 15 | 92 | 353 | 360 | 320 | 414 | 723 |

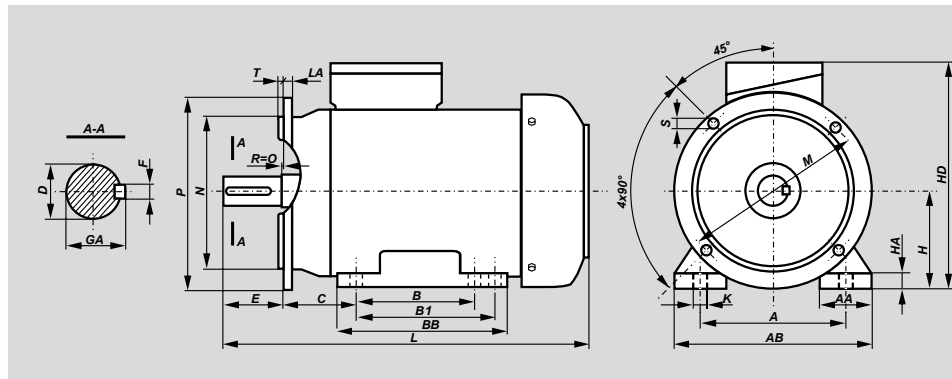
Dimensions of Flange Mounted Motors – IM B5



| Size | D | E | F | GA | AC | M | N | P | LA | T | HB | L | S | |
|----------------|----|-----|----|------|-----|-----|-----|-----|----|-----|-----|-----|----|-------|
| | | | | | | | | | | | | | ∅ | holes |
| 56-2A,2B,4A,4B | 9 | 20 | 3 | 10,2 | 117 | 100 | 80 | 120 | 8 | 3 | 123 | 193 | 7 | 4 |
| 63-2A | 11 | 23 | 4 | 12,5 | 126 | 115 | 95 | 140 | 9 | 3 | 128 | 210 | 10 | 4 |
| 63-2B,4A,6B | 11 | 23 | 4 | 12,5 | 126 | 115 | 95 | 140 | 9 | 3 | 128 | 225 | 10 | 4 |
| 63-4B | 11 | 23 | 4 | 12,5 | 126 | 115 | 95 | 140 | 9 | 3 | 128 | 245 | 10 | 4 |
| 71-2A | 14 | 30 | 5 | 16 | 134 | 130 | 110 | 160 | 10 | 3,5 | 135 | 245 | 10 | 4 |
| 71-4A,6A | 14 | 30 | 5 | 16 | 134 | 130 | 110 | 160 | 10 | 3,5 | 135 | 263 | 10 | 4 |
| 71-2B,4B,6B | 14 | 30 | 5 | 16 | 134 | 130 | 110 | 160 | 10 | 3,5 | 135 | 284 | 10 | 4 |
| 80-2A,4A,6A | 19 | 40 | 6 | 21,5 | 157 | 165 | 130 | 200 | 10 | 3,5 | 142 | 278 | 12 | 4 |
| 80-2B,4B | 19 | 40 | 6 | 21,5 | 157 | 165 | 130 | 200 | 10 | 3,5 | 142 | 306 | 12 | 4 |
| 80-6B | 19 | 40 | 6 | 21,5 | 157 | 165 | 130 | 200 | 10 | 3,5 | 142 | 318 | 12 | 4 |
| 90S-2,4,6;L2 | 24 | 50 | 8 | 27 | 200 | 165 | 130 | 200 | 8 | 3,5 | 148 | 331 | 12 | 4 |
| 90L-4,6 | 24 | 50 | 8 | 27 | 200 | 165 | 130 | 200 | 8 | 3,5 | 148 | 356 | 12 | 4 |
| 100L-2,6 | 28 | 60 | 8 | 31 | 215 | 215 | 180 | 250 | 11 | 4 | 157 | 377 | 15 | 4 |
| 100L-4A,4B | 28 | 60 | 8 | 31 | 215 | 215 | 180 | 250 | 11 | 4 | 157 | 417 | 15 | 4 |
| 112M-2,6 | 28 | 60 | 8 | 31 | 248 | 215 | 180 | 250 | 12 | 4 | 168 | 398 | 15 | 4 |
| 112M4 | 28 | 60 | 8 | 31 | 248 | 215 | 180 | 250 | 12 | 4 | 168 | 425 | 15 | 4 |
| 132S-2A,2B,4,6 | 38 | 80 | 10 | 41 | 288 | 265 | 230 | 300 | 12 | 4 | 197 | 512 | 15 | 4 |
| 132M-4,6A,6B | 38 | 80 | 10 | 41 | 288 | 265 | 230 | 300 | 12 | 4 | 197 | 512 | 15 | 4 |
| 160M-2A,2B,4,6 | 42 | 110 | 12 | 45 | 340 | 300 | 250 | 350 | 13 | 5 | 223 | 643 | 19 | 4 |
| 160L-2,4,6 | 42 | 110 | 12 | 45 | 340 | 300 | 250 | 350 | 13 | 5 | 223 | 643 | 19 | 4 |
| 180M-2,4;L4,6 | 48 | 110 | 14 | 51,5 | 360 | 300 | 250 | 350 | 13 | 5 | 234 | 723 | 19 | 4 |

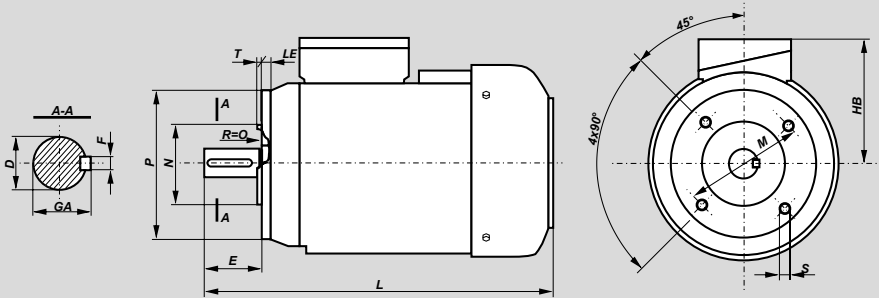
As part of our development program, we reserve the right to alter or amend any of the specifications without giving prior notice.

Dimensions of Foot / Flange Mounted Motors – IM B35



| Size | A | B | B1 | C | D | E | F | GA | H | HA | K | M | N | P | LA | T | S ø holes | AA | AB | AC | BB | HD | L | |
|-----------------|-----|-----|-----|-----|----|-----|----|------|-----|-----|-----|-----|-----|-----|----|-----|--------------|----|----|-----|-----|-----|-----|-----|
| 56-2A,2B,4A,4B | 90 | 71 | — | 36 | 9 | 20 | 3 | 10,2 | 56 | 7 | 5,8 | 100 | 80 | 120 | 8 | 3 | 7 | 4 | 30 | 110 | 117 | 92 | 179 | 193 |
| 63-2A | 100 | 80 | — | 40 | 11 | 23 | 4 | 12,5 | 63 | 8,5 | 7 | 115 | 95 | 140 | 9 | 3 | 10 | 4 | 35 | 124 | 126 | 106 | 191 | 210 |
| 63-2B,4A,6B | 100 | 80 | — | 40 | 11 | 23 | 4 | 12,5 | 63 | 8,5 | 7 | 115 | 95 | 140 | 9 | 3 | 10 | 4 | 35 | 124 | 126 | 106 | 191 | 225 |
| 63-4B | 100 | 80 | — | 40 | 11 | 23 | 4 | 12,5 | 63 | 8,5 | 7 | 115 | 95 | 140 | 9 | 3 | 10 | 4 | 35 | 124 | 126 | 106 | 191 | 245 |
| 71-2A | 112 | 90 | — | 45 | 14 | 30 | 5 | 16 | 71 | 8 | 7 | 130 | 110 | 160 | 10 | 3,5 | 10 | 4 | 45 | 142 | 134 | 116 | 206 | 245 |
| 71-4A,6A | 112 | 90 | — | 45 | 14 | 30 | 5 | 16 | 71 | 8 | 7 | 130 | 110 | 160 | 10 | 3,5 | 10 | 4 | 45 | 142 | 134 | 116 | 206 | 263 |
| 71-2B,4B,6B | 112 | 90 | — | 45 | 14 | 30 | 5 | 16 | 71 | 8 | 7 | 130 | 110 | 160 | 10 | 3,5 | 10 | 4 | 45 | 142 | 134 | 116 | 206 | 284 |
| 80-2A,4A,6A | 125 | 100 | — | 50 | 19 | 40 | 6 | 21,5 | 80 | 9 | 10 | 165 | 130 | 200 | 10 | 3,5 | 12 | 4 | 55 | 160 | 157 | 130 | 222 | 278 |
| 80-2B,4B | 125 | 100 | — | 50 | 19 | 40 | 6 | 21,5 | 80 | 9 | 10 | 165 | 130 | 200 | 10 | 3,5 | 12 | 4 | 55 | 160 | 157 | 130 | 222 | 306 |
| 80-6B | 125 | 100 | — | 50 | 19 | 40 | 6 | 21,5 | 80 | 9 | 10 | 165 | 130 | 200 | 10 | 3,5 | 12 | 4 | 55 | 160 | 157 | 130 | 222 | 318 |
| 90S-2,4,6;L2 | 140 | 100 | 125 | 56 | 24 | 50 | 8 | 27 | 90 | 10 | 10 | 165 | 130 | 200 | 8 | 3,5 | 12 | 4 | 47 | 182 | 200 | 153 | 238 | 331 |
| 90L-4,6 | 140 | 100 | 125 | 56 | 24 | 50 | 8 | 27 | 90 | 10 | 10 | 165 | 130 | 200 | 8 | 3,5 | 12 | 4 | 47 | 182 | 200 | 153 | 238 | 356 |
| 100L-2,6 | 160 | 140 | — | 63 | 28 | 60 | 8 | 31 | 100 | 12 | 12 | 215 | 180 | 250 | 11 | 4 | 15 | 4 | 52 | 202 | 215 | 170 | 257 | 377 |
| 100L-4A,4B | 160 | 140 | — | 63 | 28 | 60 | 8 | 31 | 100 | 12 | 12 | 215 | 180 | 250 | 11 | 4 | 15 | 4 | 52 | 202 | 215 | 170 | 257 | 417 |
| 112M-2,6 | 190 | 140 | — | 70 | 28 | 60 | 8 | 31 | 112 | 14 | 12 | 215 | 180 | 250 | 12 | 4 | 15 | 4 | 52 | 222 | 248 | 170 | 280 | 398 |
| 112M4 | 190 | 140 | — | 70 | 28 | 60 | 8 | 31 | 112 | 14 | 12 | 215 | 180 | 250 | 12 | 4 | 15 | 4 | 52 | 222 | 248 | 170 | 280 | 425 |
| 132S-2A,2B,4,6 | 216 | 140 | 178 | 89 | 38 | 80 | 10 | 41 | 132 | 18 | 12 | 265 | 230 | 300 | 12 | 4 | 15 | 4 | 61 | 266 | 288 | 220 | 329 | 512 |
| 132M-4,6A,6B | 216 | 140 | 178 | 89 | 38 | 80 | 10 | 41 | 132 | 18 | 12 | 265 | 230 | 300 | 12 | 4 | 15 | 4 | 61 | 266 | 288 | 220 | 329 | 512 |
| 160M-2A, 2B,4,6 | 254 | 210 | 254 | 108 | 42 | 110 | 12 | 45 | 160 | 25 | 15 | 300 | 250 | 350 | 13 | 5 | 19 | 4 | 81 | 320 | 340 | 300 | 383 | 643 |
| 160L-2,4,6 | 254 | 210 | 254 | 108 | 42 | 110 | 12 | 45 | 160 | 25 | 15 | 300 | 250 | 350 | 13 | 5 | 19 | 4 | 81 | 320 | 340 | 300 | 383 | 643 |
| 180M-2,4;L4,6 | 279 | 241 | 279 | 121 | 48 | 110 | 14 | 51,5 | 180 | 27 | 15 | 300 | 250 | 350 | 13 | 5 | 19 | 4 | 92 | 353 | 360 | 320 | 414 | 723 |

Dimensions of Flange Mounted Motors – IM B14

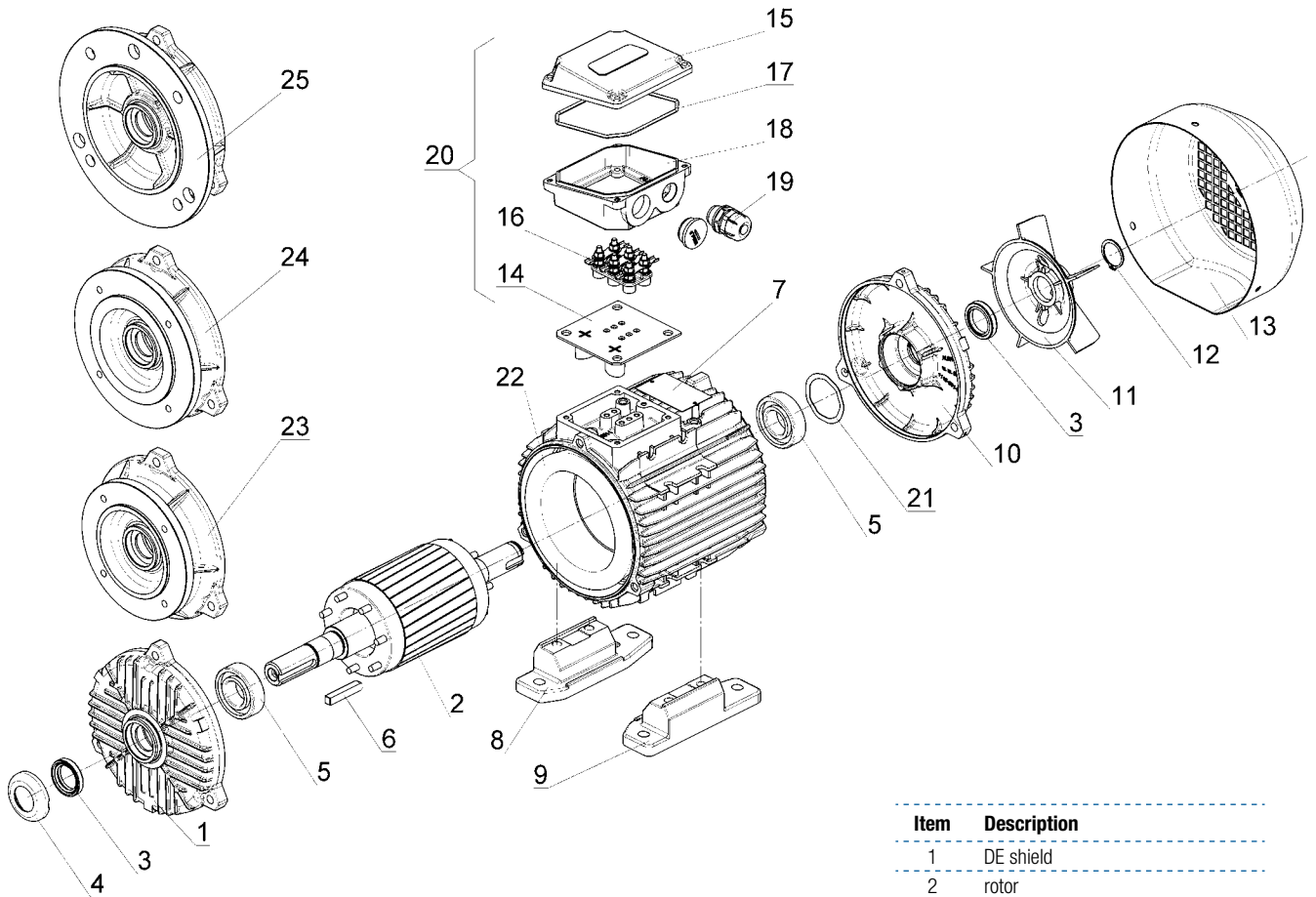


| Size | Flange | D | E | F | GA | M | N | P | LA | T | S | | AC | HB | L |
|----------------|--------|----|-----|----|------|-----|-----|-----|------|-----|-----|-------|-----|-----|-----|
| | | | | | | | | | | | ø | holes | | | |
| 56-2A,2B,4A,4B | C1 | 9 | 20 | 3 | 10,2 | 85 | 70 | 105 | 15 | 2,5 | M6 | 4 | 117 | 123 | 193 |
| | C2 | 9 | 20 | 3 | 10,2 | 65 | 50 | 80 | 12,5 | 2,5 | M5 | 4 | 117 | 123 | 193 |
| 63-2A | C1 | 11 | 23 | 4 | 12,5 | 100 | 80 | 120 | 14 | 3 | M6 | 4 | 126 | 128 | 210 |
| | C2 | 11 | 23 | 4 | 12,5 | 75 | 60 | 90 | 9,5 | 2,5 | M5 | 4 | 126 | 128 | 210 |
| 63-2B,4A,6B | C1 | 11 | 23 | 4 | 12,5 | 100 | 80 | 120 | 14 | 3 | M6 | 4 | 126 | 128 | 225 |
| | C2 | 11 | 23 | 4 | 12,5 | 75 | 60 | 90 | 9,5 | 2,5 | M5 | 4 | 126 | 128 | 225 |
| 63-4B | C1 | 11 | 23 | 4 | 12,5 | 100 | 80 | 120 | 14 | 3 | M6 | 4 | 126 | 128 | 245 |
| | C2 | 11 | 23 | 4 | 12,5 | 75 | 60 | 90 | 9,5 | 2,5 | M5 | 4 | 126 | 128 | 245 |
| 71-2A | C1 | 14 | 30 | 5 | 16 | 115 | 95 | 140 | 14 | 3 | M8 | 4 | 134 | 135 | 245 |
| | C2 | 14 | 30 | 5 | 16 | 85 | 70 | 105 | 12 | 2,5 | M6 | 4 | 134 | 135 | 245 |
| 71-4A,6A | C1 | 14 | 30 | 5 | 16 | 115 | 95 | 140 | 14 | 3 | M8 | 4 | 134 | 135 | 263 |
| | C2 | 14 | 30 | 5 | 16 | 85 | 70 | 105 | 12 | 2,5 | M6 | 4 | 134 | 135 | 263 |
| 71-2B,4B,6B | C1 | 14 | 30 | 5 | 16 | 115 | 95 | 140 | 14 | 3 | M8 | 4 | 134 | 135 | 284 |
| | C2 | 14 | 30 | 5 | 16 | 85 | 70 | 105 | 12 | 2,5 | M6 | 4 | 134 | 135 | 284 |
| 80-2A,4A,6A | C1 | 19 | 40 | 6 | 21,5 | 130 | 110 | 160 | 14 | 3,5 | M8 | 4 | 157 | 142 | 278 |
| | C2 | 19 | 40 | 6 | 21,5 | 100 | 80 | 120 | 12 | 3 | M6 | 4 | 157 | 142 | 278 |
| 80-2B,4B | C1 | 19 | 40 | 6 | 21,5 | 130 | 110 | 160 | 14 | 3,5 | M8 | 4 | 157 | 142 | 306 |
| | C2 | 19 | 40 | 6 | 21,5 | 100 | 80 | 120 | 12 | 3 | M6 | 4 | 157 | 142 | 306 |
| 80-6B | C1 | 19 | 40 | 6 | 21,5 | 130 | 110 | 160 | 14 | 3,5 | M8 | 4 | 157 | 142 | 318 |
| | C2 | 19 | 40 | 6 | 21,5 | 100 | 80 | 120 | 12 | 3 | M6 | 4 | 157 | 142 | 318 |
| 90S-2,4,6;L2 | C1 | 24 | 50 | 8 | 27 | 130 | 110 | 160 | 10 | 3,5 | M8 | 4 | 200 | 148 | 331 |
| | C2 | 24 | 50 | 8 | 27 | 115 | 95 | 140 | 10 | 3 | M8 | 4 | 200 | 148 | 331 |
| 90L-4,6 | C1 | 24 | 50 | 8 | 27 | 130 | 110 | 160 | 10 | 3,5 | M8 | 4 | 200 | 148 | 356 |
| | C2 | 24 | 50 | 8 | 27 | 115 | 95 | 140 | 10 | 3 | M8 | 4 | 200 | 148 | 356 |
| 100L-2,6 | C1 | 28 | 60 | 8 | 31 | 165 | 130 | 200 | 12 | 3,5 | M10 | 4 | 215 | 157 | 377 |
| | C2 | 28 | 60 | 8 | 31 | 130 | 110 | 160 | 12 | 3,5 | M8 | 4 | 215 | 157 | 377 |
| 100L-4A,4B, | C1 | 28 | 60 | 8 | 31 | 165 | 130 | 200 | 12 | 3,5 | M10 | 4 | 215 | 157 | 417 |
| | C2 | 28 | 60 | 8 | 31 | 130 | 110 | 160 | 12 | 3,5 | M8 | 4 | 215 | 157 | 417 |
| 112M-2,6 | C1 | 28 | 60 | 8 | 31 | 165 | 130 | 200 | 12 | 3,5 | M10 | 4 | 248 | 168 | 398 |
| | C2 | 28 | 60 | 8 | 31 | 130 | 110 | 160 | 12 | 3,5 | M8 | 4 | 248 | 168 | 398 |
| 112M4 | C1 | 28 | 60 | 8 | 31 | 165 | 130 | 200 | 12 | 3,5 | M10 | 4 | 248 | 168 | 425 |
| | C2 | 28 | 60 | 8 | 31 | 130 | 110 | 160 | 12 | 3,5 | M8 | 4 | 248 | 168 | 425 |
| 132S-2A,2B,4,6 | C1 | 38 | 80 | 10 | 41 | 215 | 180 | 250 | 12 | 4 | M12 | 4 | 288 | 197 | 512 |
| | C2 | 38 | 80 | 10 | 41 | 165 | 130 | 200 | 12 | 3,5 | M10 | 4 | 288 | 197 | 512 |
| 132M-4,6A,6B | C1 | 38 | 80 | 10 | 41 | 215 | 180 | 250 | 12 | 4 | M12 | 4 | 288 | 197 | 512 |
| | C2 | 38 | 80 | 10 | 41 | 165 | 130 | 200 | 12 | 3,5 | M10 | 4 | 288 | 197 | 512 |
| 160M-2A,2B,4,6 | C1 | 42 | 110 | 12 | 45 | 265 | 230 | 300 | 13 | 4 | M12 | 4 | 340 | 223 | 643 |
| | C2 | 42 | 110 | 12 | 45 | 215 | 180 | 250 | 13 | 4 | M12 | 4 | 340 | 223 | 643 |
| 160L-2,4,6 | C1 | 42 | 110 | 12 | 45 | 265 | 230 | 300 | 13 | 4 | M12 | 4 | 340 | 223 | 643 |
| | C2 | 42 | 110 | 12 | 45 | 215 | 180 | 250 | 13 | 4 | M12 | 4 | 340 | 223 | 643 |

As part of our development program, we reserve the right to alter or amend any of the specifications without giving prior notice.

List of Motor parts

Frame Size: 56÷112

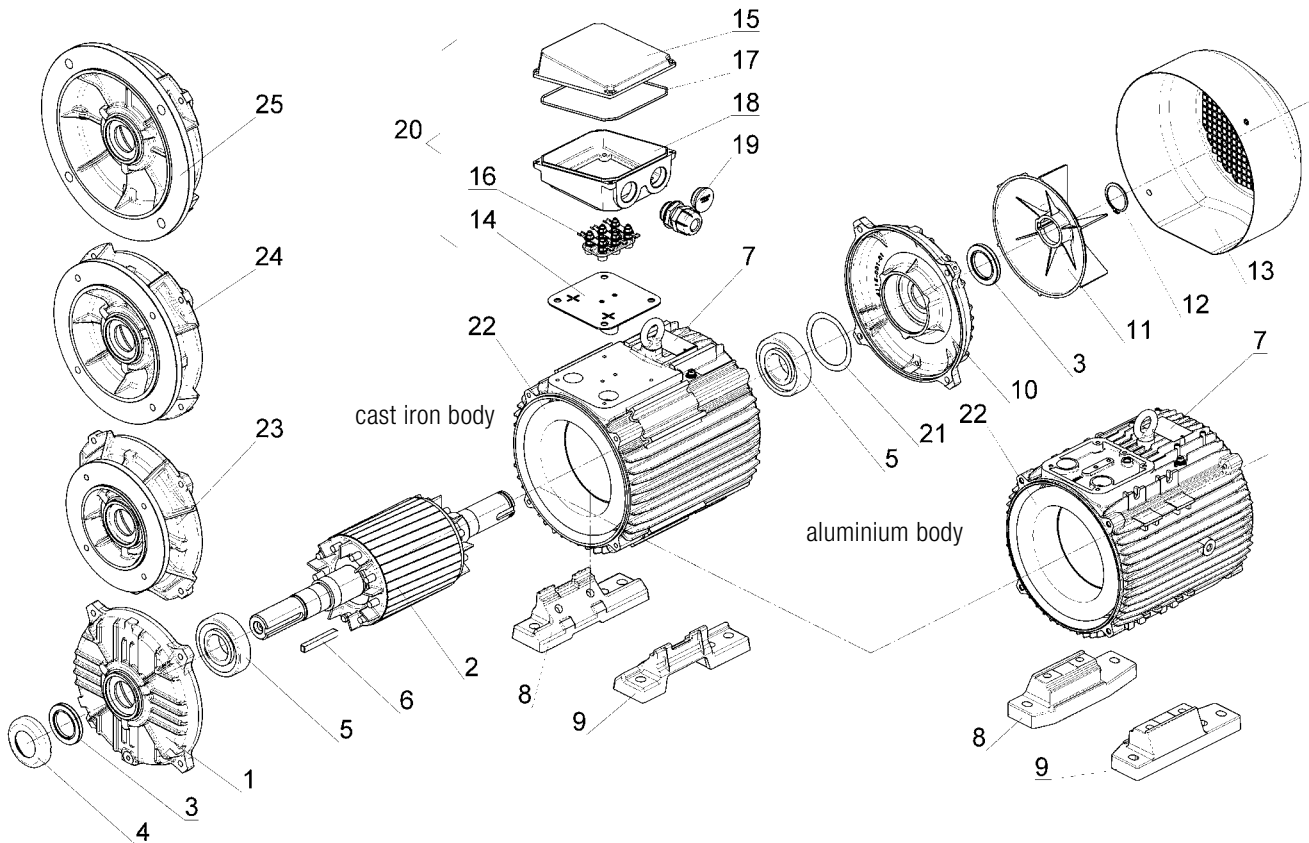


| Item | Description |
|------|-----------------------|
| 1 | DE shield |
| 2 | rotor |
| 3 | shaft seal |
| 4 | shaft seal cover |
| 5 | bearing |
| 6 | key |
| 7 | name plate |
| 8 | sx foot |
| 9 | dx foot |
| 10 | NDE shield |
| 11 | fan |
| 12 | seeger ring |
| 13 | fan cover |
| 14 | rubber gasket |
| 15 | terminal box cover |
| 16 | terminal board |
| 17 | rubber gasket |
| 18 | terminal box |
| 19 | gland |
| 20 | terminal box complete |
| 21 | spring washer |
| 22 | stator |
| 23 | flange B14/C2 |
| 24 | flange B14/C1 |
| 25 | flange B5 |

DE – drive end
 NDE – non drive end

List of Motor parts

Frame Size: 132÷180



| Item | Description |
|-----------------|-----------------------|
| 1 | DE shield |
| 2 | rotor |
| 3 | shaft seal |
| 4 | shaft seal cover |
| 5 | bearing |
| 6 | key |
| 7 | name plate |
| 8 ¹ | sx foot |
| 9 ¹ | dx foot |
| 10 | NDE shield |
| 11 | fan |
| 12 | seeger ring |
| 13 | fan cover |
| 14 | rubber gasket |
| 15 | terminal box cover |
| 16 | terminal board |
| 17 | rubber gasket |
| 18 | terminal box |
| 19 | gland |
| 20 | terminal box complete |
| 21 | spring washer |
| 22 ² | stator |
| 23 | flange B14/C2 |
| 24 | flange B14/C1 |
| 25 | flange B5 |

DE – drive end

NDE – non drive end

Ordering information

In order to select the proper motor and provide you the most accurate offer as the requirements of customer's applications are various, we ask you to specify below motor details:

Orders for motors should specify

- » ambient temperature,
- » rated output,
- » rated speed,
- » operating duty,
- » supply voltage and connection,
- » frequency,
- » mounting arrangements,
- » degree of protection,
- » type of driven machine,
- » number of cable glands,
- » other details regarding special requests,

and information concerning additional accessories e.g.

- » thermal protection,
- » anticondensation heaters,
- » vibration sensors,
- » method of start-up (DOL, Y/Δ, VSD, Soft-Start),
- » method of coupling with the driven unit (gears, dimensions of belt pulleys, etc.).

When ordering spare parts one should specify:

- » full designation of the motor type including its serial number (provided on the nameplate),
- » degree of protection,
- » mounting arrangement,
- » name of part,
- » number of pieces.

As part of our development program, we reserve the right to alter or amend any of the specifications without giving prior notice.

Order form

Company name Contact person

Country City

Address

Phone E-mail

Subject

Message

Frame size Poles kW Voltage Hz

Number of pieces

Mounting IP Insulation class

RAL Zone Ambient temperature

PTC Yes No Group Starting and supply method (DOL, Y/Δ, VSD, Soft-Start)

PT100 Yes No Temperature class

Additional information



Dear Customer,
Please complete the above Order Form and send it to motor@cantonigroup.com. In case you need assistance, do not hesitate to contact us at phone number: 0048 33 813 87 00. It will be our pleasure to help you.

Cantoni Motor Team

Download editable .pdf file from the website.

Certifications

Cantoni Group's factory, Celma Indukta was one of the first companies obtaining ISO 9001 certificate in Poland

All Cantoni Group manufacturing plants comply with the most important standards.

ISO 9001 is based on a number of quality management principles including a strong customer focus, the motivation and involvement of top management, the process approach and continuous improvement. Using ISO 9001 helps to ensure that customers get consistent, good quality products and services. Our aim is to produce high quality products certified according to the most important standards. We always focus our work to provide a product that meets the customer requirements, define the approach to continuous improvement and monitor

customer satisfaction. All employees in our Group are fully engaged and motivated to provide the top quality products. We achieve this thanks to skilled technicians, trained workers and customer oriented attitude.

As a demonstration of our aim to meet all high level international standard requirements, we are also certified ISO 14001 and OHSAS 18001 to prove our internal processes and behaviour.

ISO 14001 certification confirms that the organization manages their environmental responsibilities in an effective and internationally accepted way.

In Cantoni Group we know that taking care of the environment means taking care of our present and future.



With **OHSAS 18001** certificate, Cantoni Group confirms the necessity of controlling and improving health and safety aspects within the organization.

Employees are Cantoni Group's main asset, thus, their well-being and safety are our priority.

Our laboratory Celma Indukta is also **ISO 17025** certified by Canadian Standard Association (CSA) for two aspects: safety and energy efficiency verification requirements as independent unit.

The safety part – Supervised Manufacturers Testing Certification (SMTC) confirms that our laboratory is allowed for supervised manufactured safety certification program.

The energy efficiency part confirms that energy verification program for motors operating as SMTC can be performed according to CSA 390 standard at our facilities.

All our prototype motors are tested and approved before series production and samples of our final products are tested periodically to check compliance with all parameters defined. Our production range has also different types of products certifications based on specific technical requirements, like UL-CSA, GOST, EAC, ATEX, IEC Ex, CCC, Bureau Veritas, DNV-GL, etc.

Our technicians are constantly updated, informed and trained about every new regulation in order to provide all possible solutions to meet final customer requirements and also study and engineer ad-hoc products with customers developers.



Top quality electric motors

Cantoni Group's electric motors are manufactured in such a way as to provide a durable product that our customers can rely on:

- motors manufactured using high quality raw materials and components
- long-life bearings
- robust and tough construction
- raw materials only from European qualified suppliers
- production process from the beginning to the end at our facilities
- proven electrical performance

Our motors for many applications

Our motors are produced with the aim to be flexible and adaptable to many different applications. The long tradition and experience of our technical departments, supported by a flexible and strong organization, can assure an engineering of the motor series that meet the most common requirements and the more and more specific requests from the manufacturers of cutting-edge machines.

Our long collaboration with some of the most important players in the global industrial market has built a strong and stable organization that is able to support the customer in the development of the best solutions for its applications.

Cantoni Group continuous investments

The strategy of Cantoni Group is to realize a strong and continuous plan of investments with the aim to constantly increase the range of products, quality level and high productivity. Cantoni Group international market leadership has been created thanks to such open and future oriented attitude. Investments into the new professional machinery, equipment and infrastructure increase the quality control, capacity and save the environment.

The use of world class CNC, automatic and semi-automatic machinery guarantees precision, repeatability and accuracy. Such considerable development plan of Cantoni Group enhances the already wide range of production, maximizes the quality of offered products and has led to a growing number of innovations (new series for specific applications, new design and solutions) and international approvals.



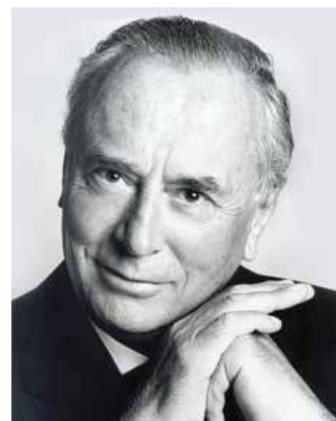
Cantoni Group



Giampiero Cantoni, Founder of Cantoni Group

Since almost a century, the Cantoni Group has been known worldwide as a leader in manufacturing and supplying electric motors, components and tools.

Thanks to the entrepreneurial commitment and great talent, the founder of the Group, **Prof. Giampiero Cantoni**, created diversified Group Enterprise that has gained outstanding success on the Domestic and International markets, placing us among the most important European manufacturers.



Cantoni Motor



Cantoni Motor, the International Sales Office and Headquarters, coordinates the sales and purchasing for the whole Cantoni Group.

The history of Cantoni Motor goes back to 1945 when Elektrim Export Office in Poland was created. Through the next years, many internal changes had occurred, the Office changed its name to Elektrim Motor, to become finally in the year 2000 – Cantoni Motor S.A. – a company with Italian ownership.

Cantoni Motor provides complete customer service, from offer submission until shipment, after-sales and full technical support. Thanks to the flexible organization, our technical and sales team

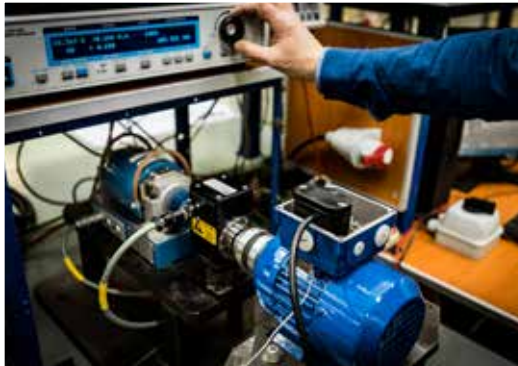
is able to face all requirements of modern market and realize the most challenging projects.

As the Headquarters, the company not only coordinates the sales and purchasing of key materials for the production of electric motors in the Group, but also is responsible for marketing and promotion actions as well as for certification processes, trademarks and patents.

Cantoni Group produces and exports high quality industrial electric motors – from 0,04 kW up to 7000 kW, in standard and special executions. Our motors are tough and reliable and operate in almost all industrial segments from pumps, fans, compressors, conveyors, mining, processing to power plants, etc.



From the project to the application



Driving Your Business





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