

# EXPLOSION PROTECTED 3-PHASE INDUCTION MOTORS



## ATEX – FLAMEPROOF MOTORS



POWER OF EXPERIENCE  
PROFESSIONAL APPROACH  
**DRIVING** PROFESSIONAL  
INTO **YOUR** ENERGY  
ENERGY **BUSINESS**  
CHALLENGING PROJECTS  
MORE ENERGY  
SOLID PARTNER  
EXPERIENCE TOP QUALITY

INDIVIDUAL PROFESSIONAL  
ENERGY TOP QUALITY  
A TURNED INTO  
CONTINUOUS  
SOLID PARTNER  
MOST DEMANDING APPLICATIONS  
EFFICIENT  
POWER OF  
INDIVIDUAL APPROACH PROFESSIONAL

**CANTONI**  
**MOTOR**



Product Catalogue

# Product range

<b>LOW VOLTAGE GENERAL PURPOSE 3-PHASE INDUCTION MOTORS</b>	<p>Three-phase motors with squirrel-cage rotor series (2)Sg(m), Sh.</p> <p>High efficiency motors series 2SIE, 3SIE and 4SIE (efficiency classes IE2, IE3, IE4)</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>
<b>GENERAL PURPOSE 1-PHASE INDUCTION MOTORS</b>	<p>Single-phase motors with squirrel-cage rotor series SEh(R), SEMh(R).</p> <ul style="list-style-type: none"> <li>– motors with standard starting torque</li> <li>– motors with increased starting torque</li> <li>– motors with high starting torque.</li> </ul>	<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>
<b>HIGH VOLTAGE INDUCTION MOTORS UP TO 11kV</b>	<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 6000kW</p>	<p>for general industrial use, drives used for own needs of power plants (pumps, fans, coal mills, conveyors)</p>
<b>BRAKE MOTORS</b>	<p>Three-phase and single-phase brake motors with AC and DC brakes</p>	<p>from 0,04kW up to 160kW</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>
<b>MOTORS WITH FORCED VENTILATION</b>	<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>
<b>EXPLOSION-PROOF MOTORS</b>	<p>Increased safety motors</p>	<p>from 0,06kW up to 22kW</p>	<p>adapted for operation in areas endangered by explosion (without methane)</p>
	<p>Flameproof motors</p>	<p>from 0,55kW up to 3200kW</p>	<p>for applications in chemical and mining industry where explosive atmosphere of gases, vapours or dust can occur</p>
<b>NEMA MOTORS</b>	<p>Low voltage NEMA motors SIE series (in compliance with the NEMA PREMIUM requirements).</p>	<p>from 1HP up to 250HP</p>	<p>for general industrial applications like pumps (including JM and JP), fans, compressors also for Hazardous Locations (Class I Div 2, Class II Div 2) with CSA certificate</p>
<b>TRACTION MOTORS</b>	<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

New 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 new 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 new requirements given in the IEC 60034-2-1 standard.

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

Motors covered by new Regulation

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

Motors excluded from new Regulation

<b>Type</b>	<ul style="list-style-type: none"> <li>multi-speed, slip-ring and with mechanical commutators</li> <li>motors completely integrated into a product whose efficiency cannot be tested independently from the product</li> <li>motors with an integrated variable speed drive (compact drives) whose efficiency cannot be tested independently from the variable speed drive</li> <li>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</li> <li>motors specifically designed and specified to operate wholly immersed in a liquid</li> <li>motors specifically qualified for the safety of nuclear installations, as defined in Article 3 of Council Directive 2009/71/EURATOM</li> <li>explosion-protected motors specifically designed and certified for mining, as defined in Annex I, point 1 of Directive 2014/34/EU</li> <li>motors in cordless or battery-operated equipment and motors in hand-held equipment whose weight is supported by hand during operation</li> <li>motors in hand-guided mobile equipment moved while in operation</li> <li>Totally Enclosed Non-Ventilated (TENV) motors</li> <li>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</li> <li>motors designed specifically for the traction of electric vehicles</li> </ul>
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**Designed for altitudes** > 4000 m a.s.l.

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

**With maximum operating temperatures** > 400°C

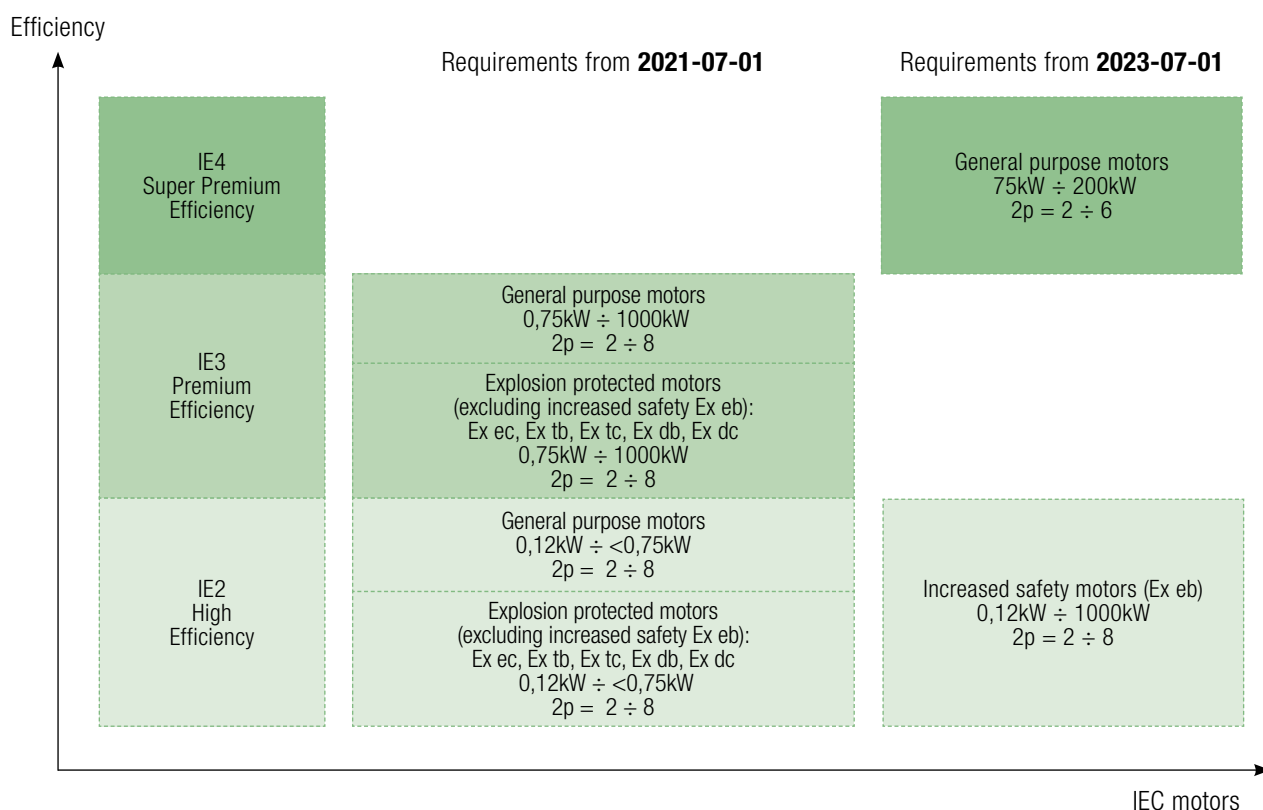
The Commission Regulation (EC) No 2019/1781 & 2021/341 describes efficiency requirements which have been implemented on **2021-07-01** and which will come into force on **2023-07-01**. The required efficiency class of three phase induction motors has to be as follows:

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 – we are ready for the new requirements.

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 $\eta$	$\Delta \eta = -15\% (100 - \eta_N)$ 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 <sup>2</sup> ]	$\Delta J = \pm 10\% J$
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:

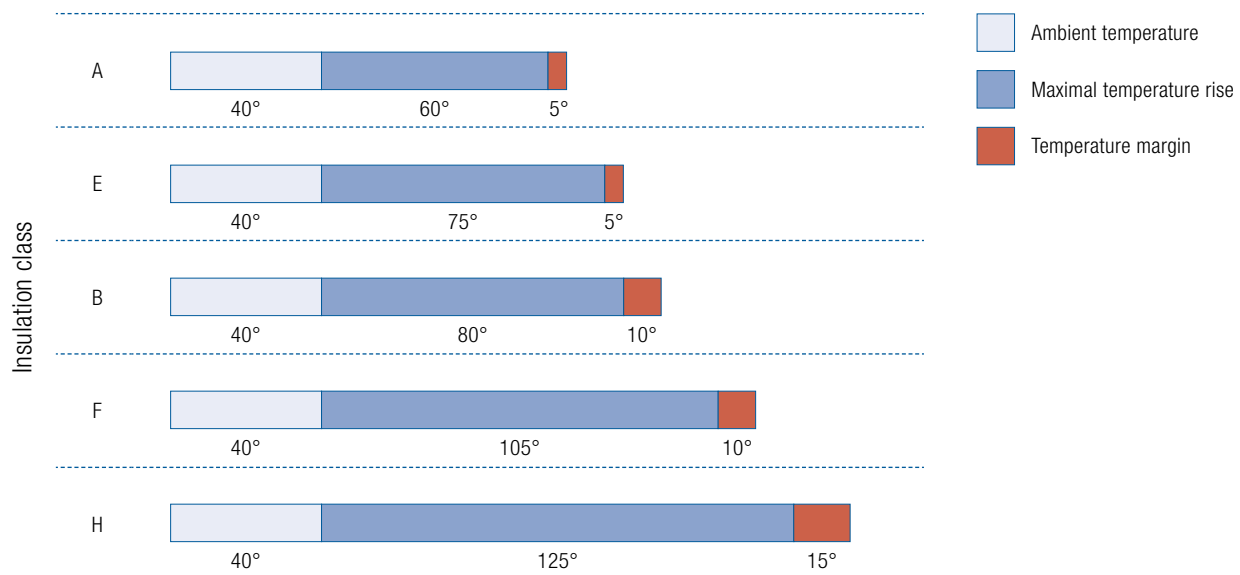
Rating and performance	IEC 60034-1
Methods for determining losses and efficiency	IEC 60034-2-1
Classification of degrees of protection	IEC 60034-5
Methods of cooling	IEC 60034-6
Symbols of construction and mounting arrangements	IEC 60034-7
Terminal markings and direction of rotation	IEC 60034-8
Noise 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 1: Equipment protection by flameproof enclosures "d"	IEC 60079-1
Explosive atmospheres – Part 7: Equipment protection by increased safety "e"	IEC 60079-7

## 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.**

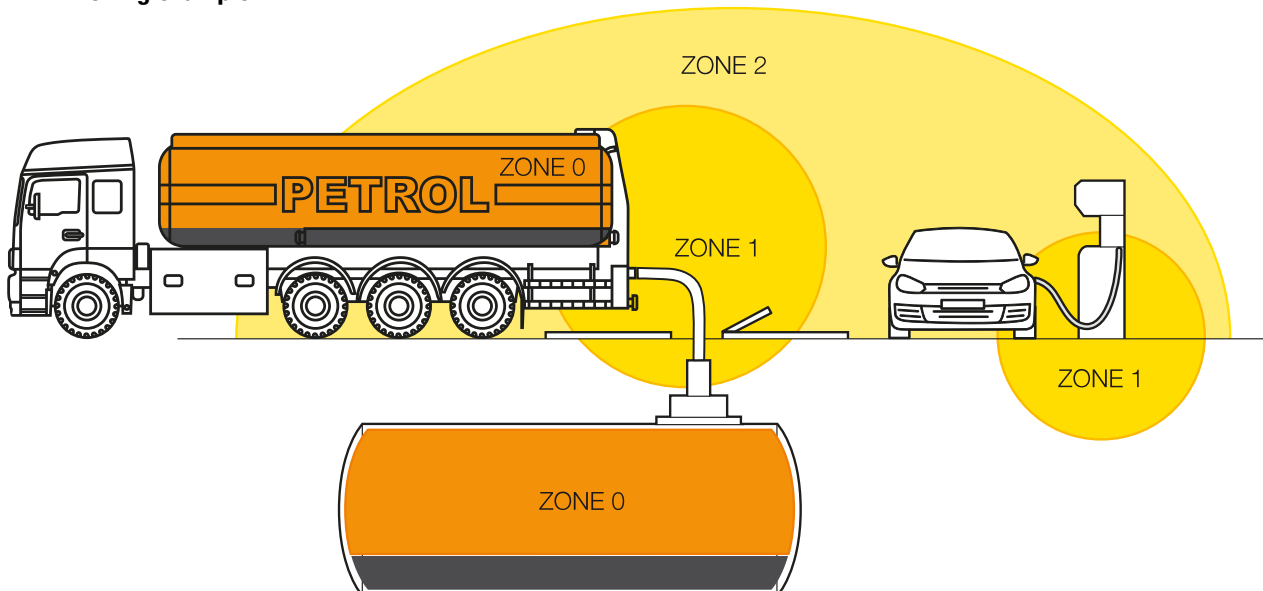
## Zone classification

European and IEC Classification		Definition of zone
GAS, VAPOUR, MIST	Zone 0	An area in which an explosive mixture is present <b>continuously</b> or for long periods or frequently
	Zone 1	An area in which an explosive mixture is <b>likely</b> to occur in normal operation occasionally
	Zone 2	An area in which an explosive mixture is <b>unlikely</b> 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 <b>continuously</b> or for long periods or frequently
	Zone 21	An area in which an explosive mixture is <b>likely</b> to occur in normal operation occasionally
	Zone 22	An area in which an explosive mixture is <b>unlikely</b> 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"> <li>– Enclosed machine</li> <li>– Surface cooled by natural convection and radiation</li> <li>– Without internal or external fan</li> </ul>	
IC411	<ul style="list-style-type: none"> <li>– Enclosed machine</li> <li>– Smooth or finned casing</li> <li>– External shaft-mounted fan</li> <li>– Often called TEFC motor</li> </ul>	
IC416A	<ul style="list-style-type: none"> <li>– Enclosed machine</li> <li>– Smooth or finned casing</li> <li>– External motorized axial fan integrated with the motor</li> </ul>	
IC416R	<ul style="list-style-type: none"> <li>– Enclosed machine</li> <li>– Smooth or finned casing</li> <li>– External motorized radial fan integrated with the motor</li> </ul>	

## Standard terminal box equipment

Motor frame size	Number of terminals	Number of cable glands	Optional rotation of terminal box	Temperature sensors in the winding	Thermal protection of bearings
80	3	1	4x90°	on request	on request
90	3	1	4x90°	on request	on request
100	3	1	4x90°	on request	on request
112	3	1	4x90°	on request	on request
132	3	1	4x90°	on request	on request
160	3	1	4x90°	on request	on request
180	3	1	4x90°	on request	on request
200	3	1	4x90°	on request	on request
225	3	1	4x90°	on request	on request
250	3	1	4x90°	on request	on request
280	3	1	4x90°	on request	on request
315	3	1	4x90°	on request	on request

## 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

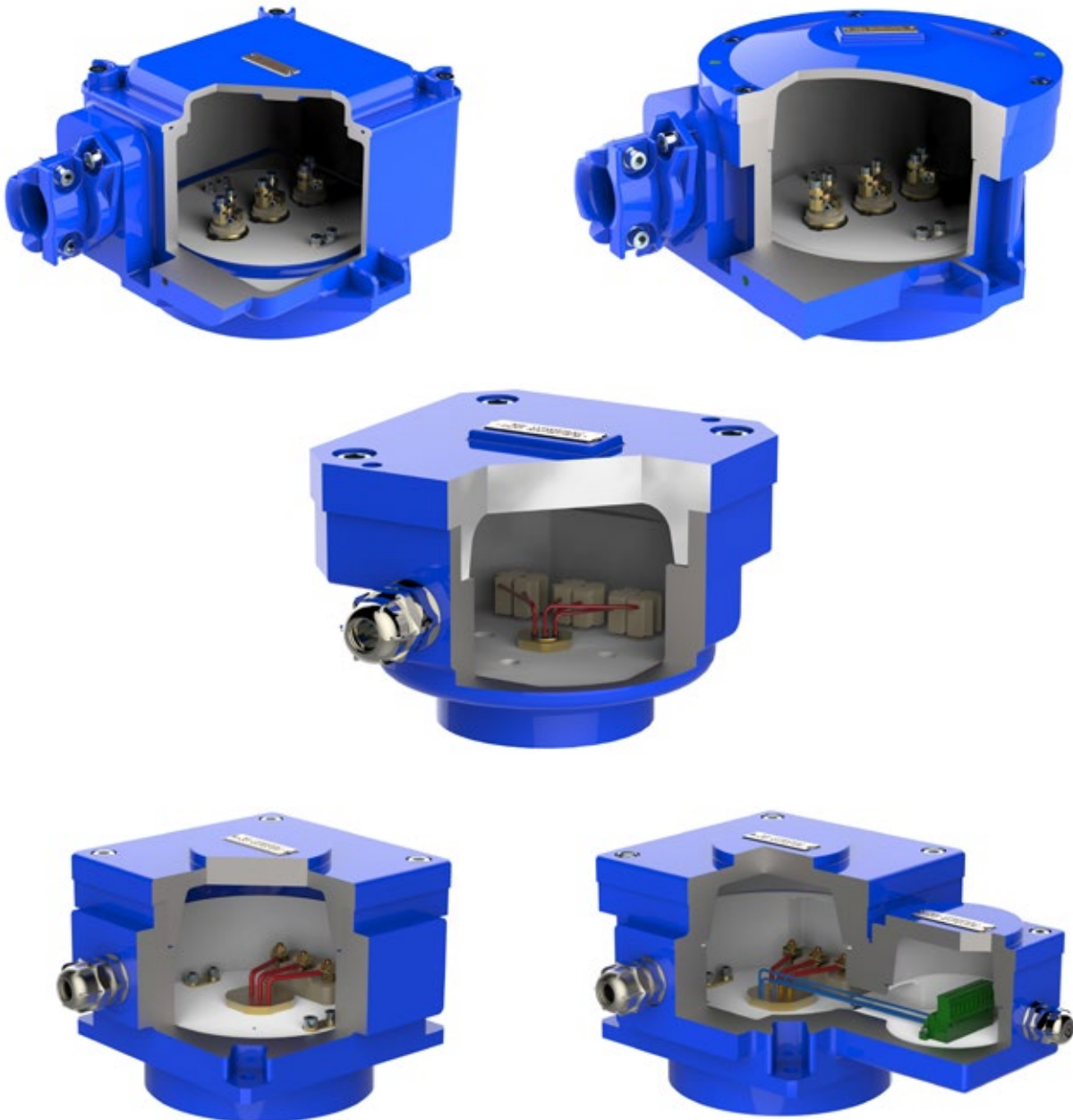
Motors in standard comply with a permissible sound power level according to IEC 60034-9.

On customer's demand the motors can be delivered with reduced noise level by using special cooling systems or additional external sound-absorbing covers.

## Terminal box

In standard execution main terminal box is in increased safety design (Ex eb) equipped with 3 supply terminals for DOL or VSD ("-f" execution) supply and one cable gland. On request motors can be equipped with fully flameproof main terminal box (Ex db).

If the motor is equipped with temperature sensors or winding heaters, they can be lead out to the main terminal box or to separate auxiliary terminal box.

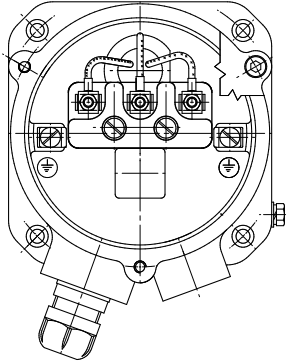


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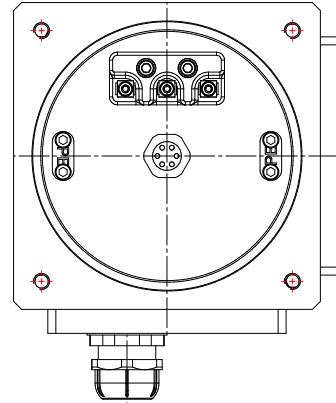
**In standard all motors are equipped with terminal box mounted on top. On request motors size 200...315 can be equipped with terminal box installed on right or left side.**

**Standard terminal box view:**

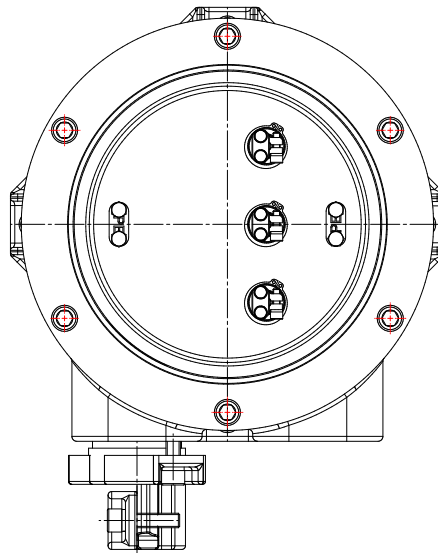
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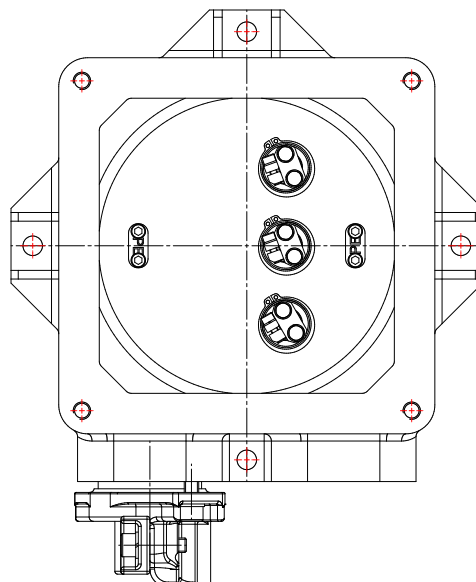
Frame size  
(E)cSTe90-132



Frame size  
(E)cSTe160-180




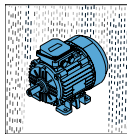

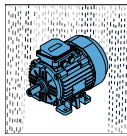
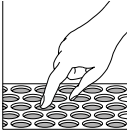
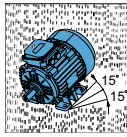
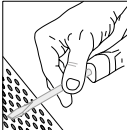
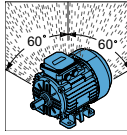
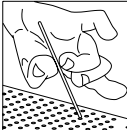
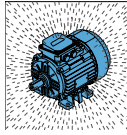
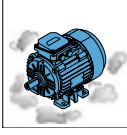
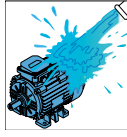
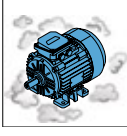

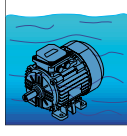
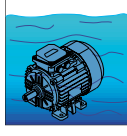
Frame size  
(E)cSTe200-315



# 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	

Each size 80 to 132 motor is equipped with V-ring on drive side and on non drive side. Labyrinth seals protect the motors from size 160 and above.

**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 C5M corrosion class).

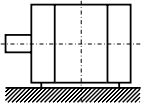
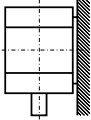
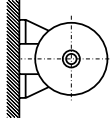
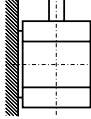
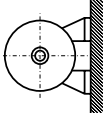
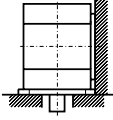
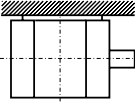
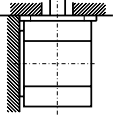
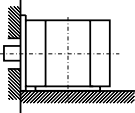
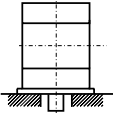
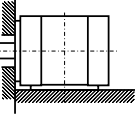
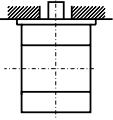
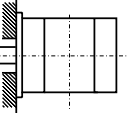
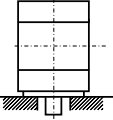
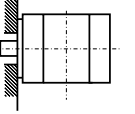
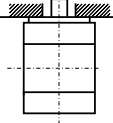
# RAL 5010/C3



Corrosion class	Environment	
	Interior	Exterior
<b>C1 (very low)</b>	Heated buildings with a clean atmosphere such as hotels, offices, shops, schools.	N/A
<b>C2 (low)</b>	Unheated buildings, where condensation may occur e.g. storehouses, sports halls.	Atmosphere contaminated to a small extent, mostly rural regions.
<b>C3 (medium)</b>	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.
<b>C4 (high)</b>	Chemical plants, swimming pools, ship repair yards.	Industrial areas and inshore areas of medium salinity.
<b>C5I (very high – industrial)</b>	Buildings and areas of almost constant condensation and high contamination.	Industrial areas of high humidity and aggressive atmosphere.
<b>C5M (very high – marine)</b>	Buildings and areas of almost constant condensation and high contamination.	Coast and offshore areas with high salt content.

# 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	80 ÷ 315		IM 1011	IM V5	80 ÷ 315
	IM 1051	IM B6	80 ÷ 280		IM 1031	IM V6	80 ÷ 315
	IM 1061	IM B7	80 ÷ 280		IM 2011 or IM 2111	IM V15	80 ÷ 315
	IM 1071	IM B8	80 ÷ 280		IM 2031 or IM 2131	IM V36	80 ÷ 315
	IM 2001	IM B35	80 ÷ 315		IM 3011	IM V1	80 ÷ 315
	IM 2101	IM B34	80 ÷ 132		IM 3031	IM V3	80 ÷ 280
	IM 3001	IM B5	80 ÷ 315		IM 3611	IM V18	80 ÷ 132
	IM 3601	IM B14	80 ÷ 132		IM 3631	IM V19	80 ÷ 132

\*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
- $\eta$  [%] 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

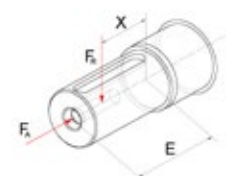
### Units of measurement

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 <sub>w</sub>	decibel	dB
Sound pressure level	L <sub>p</sub>	decibel	dB

## Permissible shaft end loads

Size	Max radial force		Horizontal [N]	Max axial force		Weight of rotor [kg]
	x=0 [N]	x=E [N]		Vertical		
				Down [N]	Up [N]	
80-2A	500	410	420	390	450	3
80-2B	490	420	410	380	460	4
80-4A	630	530	530	500	560	3
80-4B	630	540	530	490	570	4
90S2	590	520	420	380	480	5
90S4	740	650	590	540	660	6
90S6	880	770	680	630	750	6
90S8	1010	890	770	720	820	5
90L2	570	500	410	360	480	6
90L2A	550	480	410	360	480	6
90L4	700	610	570	520	660	7
90L4A	650	570	560	480	660	9
90L6	850	740	670	610	750	7
90L6A	790	700	650	590	750	8
90L8	970	850	750	700	820	6
100L2	820	710	580	520	660	7
100L2A	780	680	570	500	660	8
100L4A	1010	870	800	720	920	10
100L4B	970	830	790	700	920	11
100L4C	890	770	760	640	920	14
100L6	1210	1050	940	850	1050	10
100L6A	1170	1010	920	830	1050	11
100L8A	1390	1200	1050	980	1160	9
100L8B	1310	1140	1030	930	1150	11
112M2	1210	1050	850	780	960	9
112M2A	1190	1040	850	770	950	9
112M2B	1130	980	830	730	950	11
112M4	1490	1290	1180	1080	1320	12
112M4A	1390	1200	1150	1020	1320	15
112M6	1770	1540	1370	1270	1510	12
112M6A	1740	1510	1360	1250	1510	13
112M8	1980	1720	1520	1420	1660	12
132S2A	1750	1470	1210	1100	1300	13
132S2B	1680	1420	1190	1060	1380	16
132S4	2130	1800	1670	1490	1910	21
132S6	2540	2140	1950	1770	2190	21
132S8	2900	2440	2180	2040	2380	17
132M2	1640	1390	1180	1030	1370	17
132M2A	1620	1370	1170	1020	1380	18
132M4	2100	1770	1660	1470	1910	22
132M4A	2060	1740	1650	1440	1920	24
132M4B	2030	1710	1640	1420	1920	25
132M6A	2450	2070	1920	1720	2200	24
132M6B	2420	2040	1910	1700	2200	25
132M6C	2380	2010	1890	1660	2200	27
132M8	2820	2380	2160	1980	2400	21
160M2A	2090	1760	1500	1290	1770	24
160M2B	2030	1710	1490	1260	1780	26
160M4	2540	2140	2070	1780	2460	34
160M6	2960	2490	2390	2070	2810	37
160M8A	3530	2970	2710	2490	3010	26

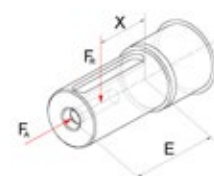
1. Permissible load as a function of X is linear in the range from X=0 to X=E.
2.  $L_n$  – calculated lifetime of bearings 30000h
3. For calculated lifetime  $L_n = 40000h$  above permissible load decrease by 20%



## Permissible shaft end loads

Size	Max radial force		Max axial force			Weight of rotor [kg]
	x=0	x=E	Horizontal [N]	Vertical		
	[N]	[N]		Down [N]	Up [N]	
160M8B	3440	2890	2690	2420	3040	31
160L2	1990	1670	1470	1230	1790	28
160L4	2410	2030	2030	1690	2490	40
160L6	2850	2400	2360	1990	2830	42
160L8	3310	2780	2650	2330	3070	37
180M2	2630	2220	1980	1610	2450	42
180M4	3350	2830	2780	2330	3370	52
180L4	3240	2740	2750	2260	3400	57
180L6	3770	3180	3160	2590	3930	67
180L8	4360	3670	3550	3010	4250	62
200L2A	3010	2590	2270	1750	2950	60
200L2B	2940	2530	2250	1700	2960	63
200L2C	2910	2500	2240	1680	2980	65
200L2D	2780	2390	2210	1590	3010	71
200L4	3720	3200	2840	2140	3740	80
200L4C	3720	3200	2840	2140	3740	80
200L4D	3440	2960	2760	1930	3850	96
200L6A	4440	3820	3670	2950	4630	84
200L6B	4180	3600	3580	2730	4710	99
200L8	5080	4370	4090	3400	5020	81
225S4	4240	3530	3200	2430	4210	89
225S8	5570	4630	4550	3780	5580	90
225M2	3360	2900	2540	1940	3320	69
225M2C	3150	2720	2480	1780	3380	80
225M4	4020	3350	3140	2260	4280	101
225M4C	3900	3240	3110	2160	4320	108
225M6	4630	3860	4000	2960	5380	121
225M6C	4330	3600	3910	2680	5520	142
225M8	5500	4580	4530	3640	5720	104
250M2	4140	3500	3120	2270	4210	97
250M2C	4140	3500	3120	2270	4210	97
250M4	5070	4280	3820	2610	5430	141
250M4C	4770	4030	3800	2460	5540	154
250M6	6030	5090	4990	3770	6630	143
250M6C	5690	4800	4880	3450	6790	167
250M8	6750	5700	5530	4240	7260	151
280S2	4120	3470	5410	4370	6870	125
280S4	6510	5480	5000	3610	6750	157
280S6	7670	6450	6440	5010	8270	163
280S8	8730	7340	7180	5820	8900	154
280M2	4020	3380	5310	4220	6900	134
280M2C	3860	3250	5130	3920	6960	152
280M4	6190	5210	4770	3080	6980	195
280M6	7530	6330	6360	4800	8360	178
280M6C	7230	6080	6100	4250	8590	217
280M8	8480	7130	7050	5490	9050	178
315S2	4510	3880	3570	2150	5410	163
315S4	7600	6330	6020	3890	8750	243
315S6	9510	7920	7020	5010	9650	232
315S8	10630	8850	8630	6570	11390	241
315M2A	3970	3410	3480	1790	5650	193

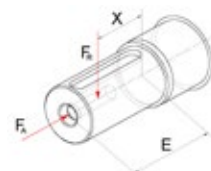
1. Permissible load as a function of X is linear in the range from X=0 to X=E.
2.  $L_n$  – calculated lifetime of bearings 30000h
3. For calculated lifetime  $L_n = 40000$ h above permissible load decrease by 20%



## Permissible shaft end loads

Size	Max radial force		Max axial force			Weight of rotor [kg]
	x=0	x=E	Horizontal [N]	Vertical		
	[N]	[N]		Down [N]	Up [N]	
315M2B	3720	3240	3340	1470	5790	216
315M2C	3460	3020	3040	1070	5570	225
315M4A	7480	6350	5900	3650	8830	259
315M4B	7210	6120	5820	3380	9000	281
315M4C	6420	5520	5670	2740	9460	336
315M6A	9030	7520	6880	4540	9940	270
315M6B	8550	7250	6740	4010	10310	315
315M6C	7750	6670	6620	3420	10760	367
315M6D	7590	6530	6580	3250	10870	381
315M8A	10470	8720	8580	6390	11510	256
315M8B	9870	8370	7560	4860	11080	311
315M8C	8930	7690	7390	4120	11620	375
315M8D	8780	7560	7360	3990	11710	386

1. Permissible load as a function of X is linear in the range from X=0 to X=E.
2.  $L_n$  – calculated lifetime of bearings 30000h
3. For calculated lifetime  $L_n = 40000h$  above permissible load decrease by 20%



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  $X=\text{max}$  and  $X=0$ ) may be calculated according to the following formula:

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

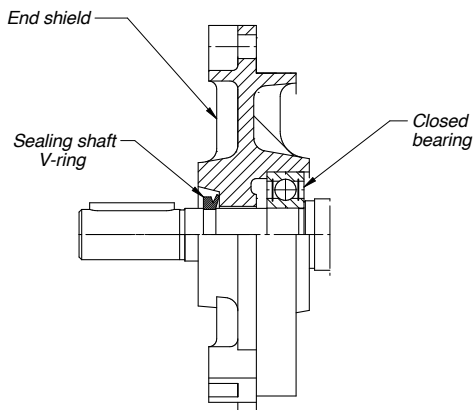
where:  $F_{R_{X0}}$  – value of  $F_R$  force acting on the beginning of the shaft end  
 $F_{R_{XMAX}}$  – value of  $F_R$  force acting on the end of the shaft end  
 E – length of the shaft end

## Bearing types and bearing nodes

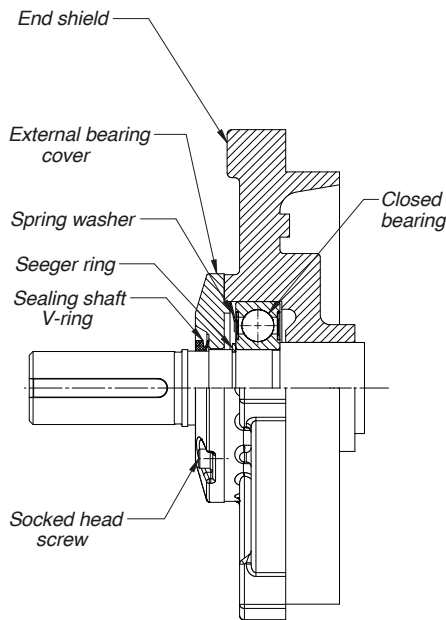
Frame size	Number of poles	Bearings	
		DE	NDE
80	2÷8	6204 2Z C3	6204 2Z C3
90	2÷8	6205 2Z C3	6205 2Z C3
100	2÷8	6206 2Z C3	6206 2Z C3
112	2÷8	6306 2Z C3	6306 2Z C3
132	2÷8	6308 2Z C3	6308 2Z C3
160	2÷8	6309 2Z C3	6309 2Z C3
180	2÷8	6311 2Z C3	6311 2Z C3
200	2÷8	6312C3	6312C3
225	2÷8	6313C3	6313C3
250	2÷8	6315C3	6315C3
280	2	6315C3	6315C3
280	4÷8	6317C3	6317C3
315	2	6317C3	6317C3
315	4÷8	6320C3	6320C3

# Bearing types and bearing nodes

Frame size  
(E)cSTe80

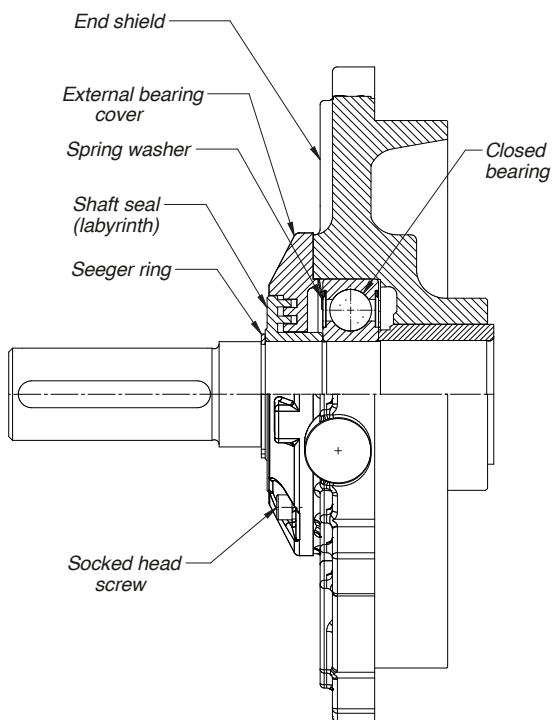


Frame size  
(E)cSTe90-132

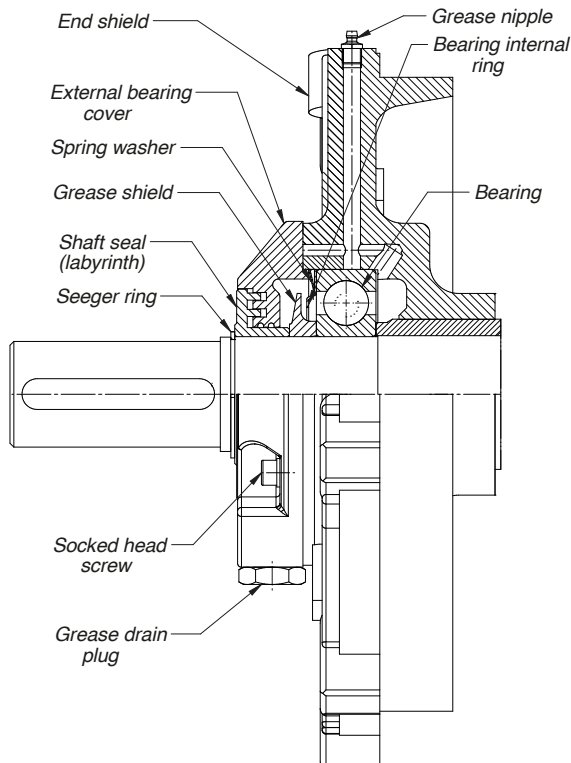


Motor frame size	Bearings lubrication on the run
80	no
90	no
100	no
112	no
132	no
160	on request
180	on request
200	yes
225	yes
250	yes
280	yes
315	yes

Frame size  
(E)cSTe160-180



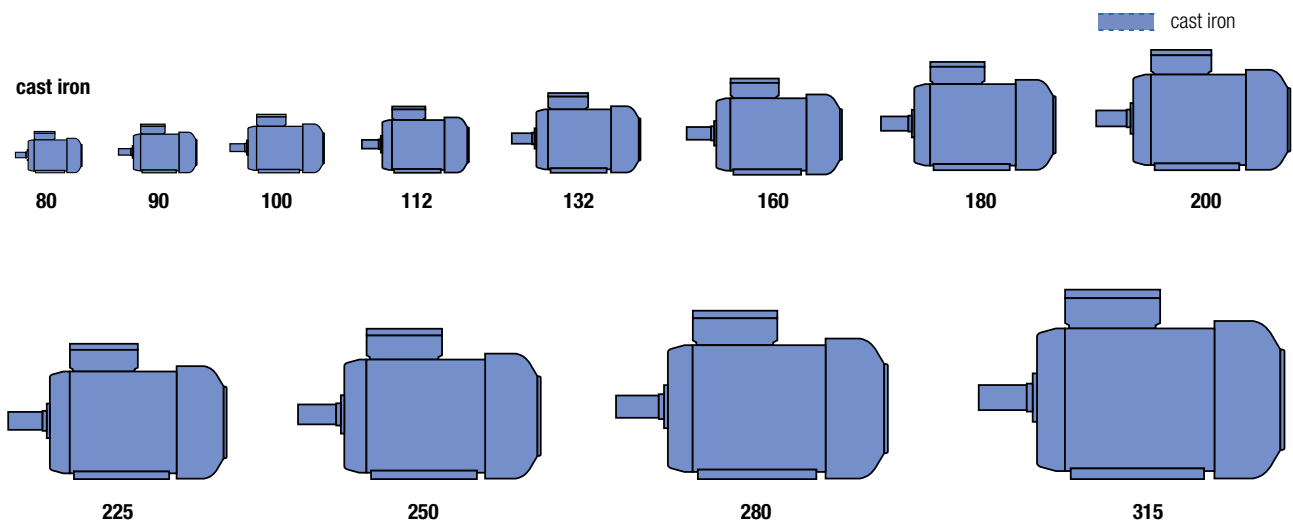
Frame size  
(E)cSTe200-315



Flameproof paths/joints on shaft in motors size 90...315 are placed inside of motor housing (assures very high lifetime of flameproof path/joint).

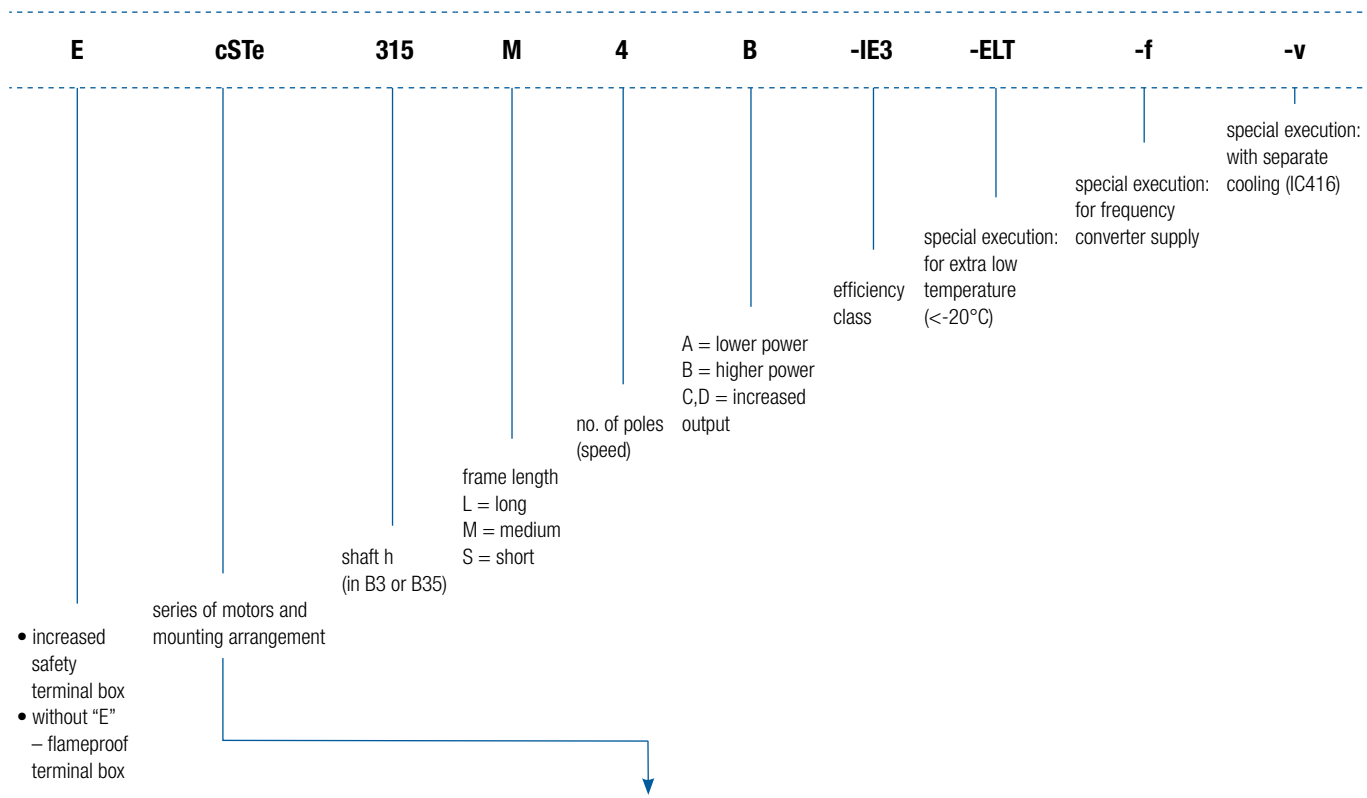
# Material of housing, end shields and feet

Frame size [mm]	Motor housing	End shields	Feet
(E)cSTe80	Cast iron	Cast iron	Cast iron – screwed
(E)cSTe90	Cast iron	Cast iron	Cast iron – screwed
(E)cSTe100	Cast iron	Cast iron	Cast iron – screwed
(E)cSTe112	Cast iron	Cast iron	Cast iron – screwed
(E)cSTe132	Cast iron	Cast iron	Cast iron – screwed
(E)cSTe160	Cast iron	Cast iron	Cast iron – screwed
(E)cSTe180	Cast iron	Cast iron	Cast iron – screwed
(E)cSTe200	Cast iron	Cast iron	Cast iron – screwed
(E)cSTe225	Cast iron	Cast iron	Cast iron – screwed
(E)cSTe250	Cast iron	Cast iron	Cast iron – screwed
(E)cSTe280	Cast iron	Cast iron	Cast iron – screwed
(E)cSTe315	Cast iron	Cast iron	Cast iron – screwed





# Nomenclature



**(E)cSTe**



**(E)cSTKe**



**(E)cSTLe**



## Ex marking

Type of motor	Frame size 80	Frame size 90 ÷ 315
<b>EcST(K,L)e...</b>	<b>Motor with flame-proof enclosure and with increased safety terminal box</b>	
	II 2G Ex <b>db eb</b> IIC T5 Gb (-20°C ÷ +40°C)	
<b>cST(K,L)e...</b>	<b>Motor and terminal box with flame-proof enclosure</b>	
	II 2G Ex <b>db</b> IIB+H <sub>2</sub> T5 Gb (-20°C ÷ +40°C)	II 2G Ex <b>db</b> IIC T5 Gb (-20°C ÷ +40°C)

## 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 flameproof motors 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 $f=50\text{Hz}$ $\text{RPM}=3000 \text{ min}^{-1}$

Item	Type	Rated output		Rated speed	Rated torque	Efficiency	Power factor	Full load current		Locked rotor torque ratio	Locked rotor current ratio	Breakdown torque ratio	Moment of inertia	Weight (MIB3)
		$P_N$	$P_N$	$n_N$	$T_N$	$\eta_N$	$\cos \varphi$	$I_N$ at rated voltage [A]		$T_L/T_N$	$I_L/I_N$	$T_B/T_N$	J	
		[kW]	[HP]	[min <sup>-1</sup> ]	[Nm]	[%]	[-]	400V	500V	[-]	[-]	[-]	[kgm <sup>2</sup> ]	[kg]
				<b>2p=2</b>		<b><math>n_s=3000 \text{ rpm}</math></b>								
1	(E)cSTe80-2A-IE3	0,75	1	2890	2,48	82,0	0,79	1,7	1,3	4,0	7,5	4,2	0,001	33
2	(E)cSTe80-2B-IE3	1,1	1,5	2890	3,63	83,0	0,77	2,5	2,0	5,1	9,5	4,8	0,00142	32
3	(E)cSTe90S2-IE3	1,5	2	2925	4,9	84,2	0,85	3,0	2,4	2,4	7,3	3,5	0,0014	46
4	(E)cSTe90L2-IE3	2,2	3	2910	7,2	85,9	0,86	4,3	3,4	2,7	8,0	4,0	0,0019	50
5	(E)cSTe90L2A-IE3	3	4	2920	9,81	87,1	0,85	5,8	4,7	2,6	9,0	3,9	0,0019	53
6	(E)cSTe100L2-IE3	3	4	2915	9,8	87,1	0,85	5,8	4,7	3,1	8,5	4,1	0,0039	69
7	(E)cSTe100L2A-IE3	4	5,5	2920	13,1	88,1	0,85	7,7	6,2	3,2	9,0	4,1	0,0039	73
8	(E)cSTe112M2-IE3	4	5,5	2925	13,1	88,1	0,89	7,4	5,9	2,3	8,4	3,2	0,0075	95
9	(E)cSTe112M2A-IE3	5,5	7,5	2925	17,9	89,2	0,87	10,2	8,2	2,0	7,4	3,2	0,0075	98
10	(E)cSTe132S2A-IE3	5,5	7,5	2940	17,9	89,2	0,89	10,0	8,0	2,6	8,2	3,4	0,014	140
11	(E)cSTe132S2B-IE3	7,5	10	2940	24,4	90,1	0,90	13,3	10,7	2,8	8,5	3,8	0,017	148
12	(E)cSTe132M2-IE3	9,2	12,3	2935	30	90,7	0,88	16,6	13,3	3,2	9,7	3,8	0,02	155
13	(E)cSTe132M2A-IE3	11	15	2925	36	91,2	0,89	19,6	15,6	2,6	8,1	3,8	0,021	160
14	(E)cSTe160M2A-IE3	11	15	2945	36	91,2	0,90	19,3	15,5	2,1	7,9	3,0	0,048	244
15	(E)cSTe160M2B-IE3	15	20	2945	49	91,9	0,90	26,2	20,9	2,4	8,0	3,3	0,059	251
16	(E)cSTe160L2-IE3	18,5	25	2940	60	92,4	0,90	32	25,7	2,3	7,7	3,0	0,072	258
17	(E)cSTe180M2-IE3	22	30	2955	71	92,7	0,90	38	30,5	3,2	9,2	3,7	0,095	304
18	(E)cSTe200L2A-IE3	30	40	2965	97	93,5	0,90	51	41	2,4	7,0	2,8	0,19	438
19	(E)cSTe200L2B-IE3	37	50	2955	120	93,7	0,90	63	51	2,2	6,3	2,6	0,2	470
20	(E)cSTe200L2C-IE3	45	60	2962	145	94,0	0,90	77	61	2,6	7,3	2,5	0,21	475
21	(E)cSTe225M2-IE3	45	60	2972	145	94,2	0,88	78	63	2,3	7,8	3,5	0,26	480
22	(E)cSTe225M2C-IE3	55	75	2970	177	94,5	0,89	94	76	2,1	7,1	3,1	0,33	530
23	(E)cSTe250M2-IE3	55	75	2969	177	94,5	0,91	92	74	2,2	6,9	2,9	0,42	630
24	(E)cSTe250M2C-IE3	75	100	2969	241	94,7	0,88	130	104	2,3	7,2	3,2	0,42	630
25	(E)cSTe280S2-IE3	75	100	2978	241	94,7	0,91	126	100	1,8	6,7	2,9	0,76	800
26	(E)cSTe280M2-IE3	90	125	2979	289	95,0	0,91	150	120	1,8	7,3	3,1	0,95	830
27	(E)cSTe280M2C-IE3	110	150	2978	353	95,2	0,92	181	145	1,9	6,9	2,9	0,98	905
28	(E)cSTe315S2-IE3	110	150	2978	353	95,2	0,92	181	145	1,9	6,9	2,9	0,98	1000
29	(E)cSTe315M2A-IE3	132	175	2977	423	95,6	0,92	217	173	2,0	7,3	2,7	1,28	1100
30	(E)cSTe315M2B-IE3	160	220	2978	513	95,8	0,92	262	210	2,2	8,2	3,1	1,57	1250
31	(E)cSTe315M2C-IE3	200	270	2980	641	95,8	0,93	324	260	2,3	8,1	3,1	1,74	1360

# Totally Enclosed Motors IP 55 $f=50\text{Hz}$ RPM=1500 min<sup>-1</sup>

Item	Type	Rated output		Rated speed	Rated torque	Efficiency	Power factor	Full load current		Locked rotor torque ratio	Locked rotor current ratio	Breakdown torque ratio	Moment of inertia	Weight (MIB3)
		$P_N$	$P_N$	$n_N$	$T_N$	$\eta_N$	$\cos \varphi$	$I_N$ at rated voltage [A]		$T_L/T_N$	$I_L/I_N$	$T_B/T_N$	J	
		[kW]	[HP]	[min <sup>-1</sup> ]	[Nm]	[%]	[-]	400V	500V	[-]	[-]	[-]	[kgm <sup>2</sup> ]	[kg]
		<b>2p=4 <math>n_s=1500</math> rpm</b>												
32	(E)cSTe80-4A-IE3	0,55	0,75	1420	3,7	81,5	0,64	1,6	1,3	3,0	5,1	3,1	0,00208	29
33	(E)cSTe80-4B-IE3	0,75	1	1430	5,0	82,5	0,64	2,1	1,6	4,1	6,3	3,9	0,00265	33
34	(E)cSTe90S4-IE3	1,1	1,5	1450	7,2	84,1	0,77	2,5	2,0	2,3	7,2	3,5	0,0036	53
35	(E)cSTe90L4-IE3	1,5	2	1450	9,9	85,3	0,78	3,3	2,6	2,5	7,4	3,4	0,004	56
36	(E)cSTe90L4A-IE3	2,2	3	1455	14,4	86,7	0,77	4,8	3,8	2,9	8,1	3,9	0,004	59
37	(E)cSTe100L4A-IE3	2,2	3	1465	14,3	86,7	0,80	4,6	3,7	2,5	7,1	3,3	0,0076	70
38	(E)cSTe100L4B-IE3	3	4	1465	19,6	87,7	0,79	6,3	5,0	2,5	7,4	3,5	0,0086	73
39	(E)cSTe100L4C-IE3	4	5,5	1465	26,1	88,6	0,79	8,2	6,6	3,0	8,3	4,1	0,0086	79
40	(E)cSTe112M4-IE3	4	5,5	1460	26,3	88,6	0,80	8,1	6,5	2,1	7,0	3,0	0,0115	98
41	(E)cSTe112M4A-IE3	5,5	7,5	1460	36	89,6	0,80	11,1	8,9	2,5	7,2	3,3	0,0115	107
42	(E)cSTe132S4-IE3	5,5	7,5	1465	36	89,6	0,85	10,4	8,3	2,5	8,5	3,4	0,036	145
43	(E)cSTe132M4-IE3	7,5	10	1465	49	90,4	0,83	14,4	11,5	2,9	8,8	3,5	0,042	150
44	(E)cSTe132M4A-IE3	9,2	12,3	1460	60	91,0	0,83	17,6	14,1	3,1	9,0	4,1	0,05	155
45	(E)cSTe132M4B-IE3	11	15	1460	72	91,4	0,83	20,9	16,7	3,2	9,5	4,4	0,057	158
46	(E)cSTe160M4-IE3	11	15	1470	72	91,4	0,83	20,9	16,7	2,6	7,3	3,0	0,088	258
47	(E)cSTe160L4-IE3	15	20	1470	97	92,1	0,83	28,3	22,7	2,7	7,9	3,2	0,104	290
48	(E)cSTe180M4-IE3	18,5	25	1475	120	92,6	0,85	34	27,1	2,9	8,3	3,5	0,162	312
49	(E)cSTe180L4-IE3	22	30	1475	142	93,0	0,83	41	33	3,2	8,5	3,6	0,185	320
50	(E)cSTe200L4-IE3	30	40	1477	194	93,8	0,89	52	42	2,1	6,4	2,6	0,38	460
51	(E)cSTe200L4C-IE3	37	50	1475	240	93,9	0,86	66	53	2,3	6,7	2,7	0,38	465
52	(E)cSTe225S4-IE3	37	50	1485	238	94,0	0,87	65	52	2,0	6,9	2,8	0,51	470
53	(E)cSTe225M4-IE3	45	60	1483	290	94,3	0,88	78	63	2,1	7,1	2,7	0,59	520
54	(E)cSTe225M4C-IE3	55	75	1484	354	94,6	0,86	98	78	2,1	7,1	2,9	0,66	545
55	(E)cSTe250M4-IE3	55	75	1487	353	94,7	0,90	93	75	2,5	7,6	2,9	1,0	670
56	(E)cSTe250M4C-IE3	75	100	1483	483	95,0	0,90	127	101	2,3	6,8	3,0	1,15	710
57	(E)cSTe280S4-IE3	75	100	1488	481	95,0	0,89	128	102	2,0	6,8	2,5	1,37	865
58	(E)cSTe280M4-IE3	90	125	1491	576	95,4	0,89	153	122	2,6	8,4	3,0	1,8	970
59	(E)cSTe315S4-IE3	110	150	1488	706	95,4	0,90	185	148	2,0	6,6	2,4	2,25	1100
60	(E)cSTe315M4A-IE3	132	175	1489	847	95,6	0,91	219	175	2,3	7,9	2,8	2,59	1160
61	(E)cSTe315M4B-IE3	160	220	1490	1026	95,8	0,90	268	214	2,4	8,5	3,1	2,8	1245
62	(E)cSTe315M4C-IE3	200	270	1488	1284	96,2	0,90	333	267	2,4	8,1	2,9	3,46	1385

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

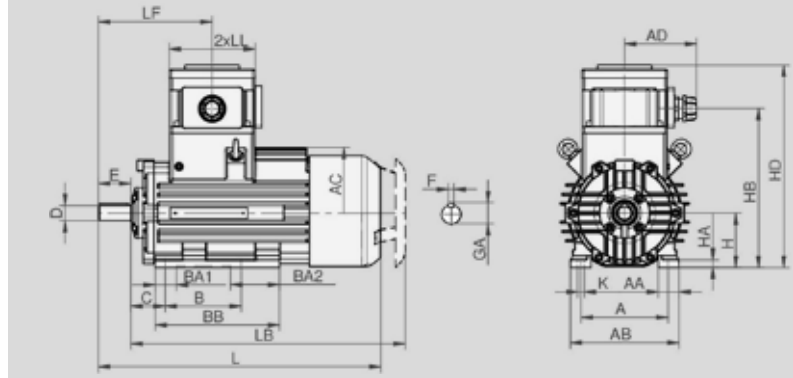
# Totally Enclosed Motors IP 55 $f=50\text{Hz}$ $\text{RPM}=1000 \text{ min}^{-1}$

Item	Type	Rated output		Rated speed	Rated torque	Efficiency	Power factor	Full load current		Locked rotor torque ratio	Locked rotor current ratio	Breakdown torque ratio	Moment of Inertia	Weight (MIB3)
		$P_N$ [kW]	[HP]	$n_N$ [min <sup>-1</sup> ]	$T_N$ [Nm]	$\eta_N$ [%]	$\cos \varphi$ [-]	$I_N$ at rated voltage [A]		$T_L/T_N$ [-]	$I_L/I_N$ [-]	$T_B/T_N$ [-]	J [kgm <sup>2</sup> ]	[kg]
					2p=6		$n_s=1000 \text{ rpm}$							
63	(E)cSte90S6-IE3	0,75	1	940	7,6	78,9	0,70	2,0	1,6	1,7	4,3	2,4	0,0032	49
64	(E)cSte90L6-IE3	1,1	1,5	940	11,1	81,0	0,70	2,8	2,2	2,1	4,5	2,6	0,009	52
65	(E)cSte90L6A-IE3	1,5	2	940	15,2	82,5	0,70	3,7	3,0	2,5	4,7	3,0	0,009	57
66	(E)cSte100L6-IE3	1,5	2	960	14,9	82,5	0,74	3,5	2,8	2,6	6,2	3,3	0,01	67
67	(E)cSte100L6A-IE3	2,2	3	960	21,9	84,3	0,73	5,2	4,1	2,9	6,5	3,6	0,01	70
68	(E)cSte112M6-IE3	2,2	3	965	21,8	84,3	0,76	5,0	4,0	2,1	5,9	2,6	0,0177	95
69	(E)cSte112M6A-IE3	3	4	960	29,7	85,6	0,75	6,7	5,4	1,5	5,5	2,3	0,0177	98
70	(E)cSte132S6-IE3	3	4	965	29,7	85,6	0,81	6,2	4,9	2,2	6,6	2,9	0,044	119
71	(E)cSte132M6A-IE3	4	5,5	965	39,8	88,0	0,81	8,1	6,5	2,3	6,6	3,0	0,0579	126
72	(E)cSte132M6B-IE3	5,5	7,5	965	54,7	88,0	0,81	11,1	8,9	2,2	7,0	3,1	0,0637	131
73	(E)cSte132M6C-IE3	7,5	10	965	74,2	89,1	0,76	16,0	12,8	3,1	7,7	3,8	0,0637	134
74	(E)cSte160M6-IE3	7,5	10	970	74	89,5	0,82	14,8	11,8	2,3	6,6	2,8	0,102	254
75	(E)cSte160L6-IE3	11	15	970	108	90,3	0,82	21,4	17,2	2,2	7,0	3,0	0,123	270
76	(E)cSte180L6-IE3	15	20	975	147	91,2	0,81	29,3	23,5	3,3	7,3	2,8	0,276	310
77	(E)cSte200L6A-IE3	18,5	25	988	179	91,7	0,81	36	29	2,0	5,8	2,4	0,50	450
78	(E)cSte200L6B-IE3	22	30	987	213	92,2	0,82	42	33,5	2,0	5,7	2,1	0,64	470
79	(E)cSte225M6-IE3	30	40	989	290	92,9	0,83	56	45	1,9	6,4	2,3	0,89	490
80	(E)cSte225M6C-IE3	37	50	991	357	93,9	0,77	74	59	2,4	8,6	2,6	1,09	530
81	(E)cSte250M6-IE3	37	50	991	357	93,3	0,82	70	56	2,0	6,7	2,6	1,23	550
82	(E)cSte250M6C-IE3	45	60	992	433	93,7	0,82	85	68	2,0	6,9	2,6	1,55	600
83	(E)cSte280S6-IE3	45	60	993	433	93,7	0,81	86	69	2,3	7,3	2,6	1,7	770
84	(E)cSte280M6-IE3	55	75	992	529	94,1	0,82	103	82	2,3	6,8	2,6	1,9	840
85	(E)cSte280M6C-IE3	75	100	992	722	94,7	0,82	139	112	2,4	7,1	2,6	2,4	950
86	(E)cSte315S6-IE3	75	100	992	722	94,7	0,82	139	112	2,4	7,1	2,6	2,4	1035
87	(E)cSte315M6A-IE3	90	125	993	866	95,1	0,82	167	133	2,6	7,6	2,7	2,93	1100
88	(E)cSte315M6B-IE3	110	150	992	1059	95,2	0,82	203	163	2,8	7,5	2,8	3,46	1270
89	(E)cSte315M6C-IE3	132	175	992	1271	95,4	0,83	241	193	2,5	7,0	2,5	4,21	1400
90	(E)cSte315M6D-IE3	160	220	992	1540	95,6	0,78	310	248	3,3	8,0	2,7	4,36	1420

# Totally Enclosed Motors IP 55 $f=50\text{Hz}$ RPM=750 min<sup>-1</sup>

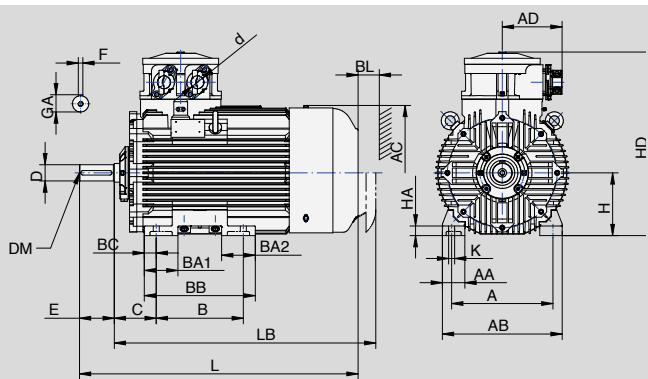
Item	Type	Rated output		Rated speed	Rated torque	Efficiency	Power factor	Full load current		Locked rotor torque ratio	Locked rotor current ratio	Breakdown torque ratio	Moment of inertia	Weight (MIB3)
		$P_N$	$P_N$	$n_N$	$T_N$	$\eta_N$	$\cos \varphi$	$I_N$ at rated voltage [A]		$T_L/T_N$	$I_L/I_N$	$T_B/T_N$	J	
		[kW]	[HP]	[min <sup>-1</sup> ]	[Nm]	[%]	[-]	400V	500V	[-]	[-]	[-]	[kgm <sup>2</sup> ]	[kg]
				<b>2p=8</b>		<b><math>n_s=750</math> rpm</b>								
91	(E)cSte90S8-IE3	0,37	0,5	709	5,0	69,3	0,57	1,4	1,1	1,4	3,6	2,2	0,0026	49
92	(E)cSte90L8-IE3	0,55	0,75	700	7,5	73,0	0,64	1,7	1,4	1,4	3,6	2,2	0,0035	52
93	(E)cSte100L8A-IE3	0,75	1	720	10,0	75,0	0,63	2,3	1,8	1,4	4,0	2,4	0,0076	69
94	(E)cSte100L8B-IE3	1,1	1,5	710	14,8	77,7	0,64	3,2	2,6	1,4	3,7	2,0	0,0122	75
95	(E)cSte112M8-IE3	1,5	2	700	20,5	79,7	0,70	3,9	3,1	1,7	4,6	2,7	0,0168	95
96	(E)cSte132S8-IE3	2,2	3	714	29,4	81,9	0,71	5,5	4,3	2,2	5,5	2,9	0,0361	130
97	(E)cSte132M8-IE3	3	4	710	40,4	83,5	0,75	6,9	5,5	2,3	5,7	2,9	0,0489	138
98	(E)cSte160M8A-IE3	4	5,5	710	54	84,8	0,74	9,2	7,4	1,7	4,9	2,4	0,057	220
99	(E)cSte160M8B-IE3	5,5	7,5	710	74	86,2	0,73	12,6	10,1	1,8	5,0	2,6	0,078	230
100	(E)cSte160L8-IE3	7,5	10	710	101	87,3	0,77	16,1	12,9	2,0	5,4	2,6	0,102	240
101	(E)cSte180L8-IE3	11	15	730	144	88,6	0,76	24,6	18,9	2,0	6,0	2,3	0,219	280
102	(E)cSte200L8-IE3	15	20	736	195	89,6	0,78	31	25	2,0	6,4	2,9	0,45	320
103	(E)cSte225S8-IE3	18,5	25	737	240	90,1	0,77	38,5	31	2,4	6,0	2,3	0,58	390
104	(E)cSte225M8-IE3	22	30	737	285	90,6	0,80	44	35	2,1	5,8	2,4	0,68	430
105	(E)cSte250M8-IE3	30	40	739	388	91,3	0,80	59	47	2,8	6,6	2,5	1,27	580
106	(E)cSte280S8-IE3	37	50	738	479	92,8	0,83	69	55	2,0	5,3	1,8	1,47	720
107	(E)cSte280M8-IE3	45	60	738	582	92,2	0,82	86	69	2,3	6,0	2,1	1,8	770
108	(E)cSte315S8-IE3	55	75	740	710	92,5	0,80	107	86	1,9	6,3	2,6	2,16	1110
109	(E)cSte315M8A-IE3	75	100	739	969	93,1	0,80	145	116	2,1	6,6	2,8	2,29	1160
110	(E)cSte315M8B-IE3	90	125	739	1163	93,4	0,80	174	139	2,2	7,1	3,1	2,86	1280
111	(E)cSte315M8C-IE3	110	150	740	1420	93,7	0,78	217	174	2,4	7,3	2,8	4,1	1410
112	(E)cSte315M8D-IE3	132	175	739	1706	94,0	0,79	257	205	2,2	7,2	3,0	4,36	1430

## Dimensions of Foot Mounted Motors – IM B3



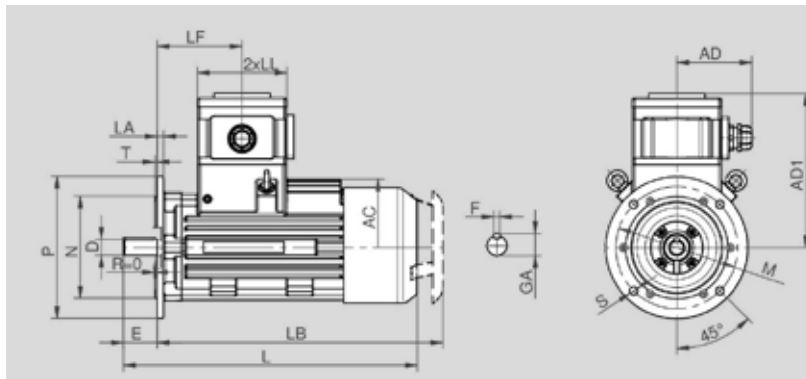
Size	A	B	C	D <sub>16</sub>	E	F <sub>10</sub>	GA	H <sub>0.5</sub>	HA	K	AA	AB	AC	AD	BA1	BA2	BB	HB	HD	L	LB	LF	LL
80-2A, 4A	125	100	50	19	40	6	21,5	80	12	10	40	165	190	145	38	38	130	217	275	315	300	138	66
80-2B, 4B	125	100	50	19	40	6	21,5	80	12	10	33	165	190	145	38	38	130	217	275	355	340	138	66
90S	140	100	56	24	50	8	27	90	12	10	35	180	220	135	-	-	201	265	346	475	450	183	91
90L	140	125	56	24	50	8	27	90	12	10	35	180	220	135	-	-	201	265	346	475	450	183	91
100	160	140	63	28	60	8	31	100	14	9	38	200	240	150	-	-	230	292	375	525	510	209	80
112	190	140	70	28	60	8	31	112	14	12	54	230	260	150	-	-	230	330	415	535	515	213	96
132S	216	140	89	38k6	80	10	41	132	16	12	60	272	290	150	-	-	280	377	460	620	595	238	96
132M	216	178	89	38k6	80	10	41	132	16	12	60	272	290	150	-	-	280	377	460	620	595	238	96

# Dimensions of Foot Mounted Motors – IM B3



Size	A	B	C	DM	Dk6 (160; 180) Dm6	E	F <sub>h9</sub>	GA	H <sub>0,5</sub>	HA	K	AA	AB	AC	AD	BA1	BA2	BB	BC <sub>+0,3</sub>	HD	BL	L	LB
160M	254	210	108	16	42	110	12	45	160	24	15	63	320	350	225	75	115	310	23	575	60	825	780
160L	254	254	108	16	42	110	12	45	160	24	15	63	320	350	225	75	115	310	23	575	60	825	780
180M	297	241	121	16	48	110	14	51,5	180	28	15	68	345	370	225	110	110	340	28	600	65	860	810
180L	297	279	121	16	48	110	14	51,5	180	28	15	68	345	370	225	110	110	340	28	600	65	860	810
200L	318	305	133	20	55	110	16	59	200	32	19	80	402	450	245	115	115	380	30	670	75	960	930
225S4÷8	356	286	149	20	60	140	18	64	225	34	19	85	444	500	230	115	115	380	36	700	75	1015	950
225M2	356	311	149	20	55	110	16	59	225	34	19	85	444	500	230	115	115	380	36	700	75	1015	950
225M4÷8	356	311	149	20	60	140	18	64	225	34	19	85	444	500	230	115	115	380	36	700	75	1015	950
250M2	406	349	168	20	60	140	18	64	250	37	24	90	480	545	245	135	135	445	48	740	75	1120	1050
250M4÷8	406	349	168	20	65	140	18	69	250	37	24	90	480	545	245	135	135	445	48	740	75	1120	1050
280S2	457	368	190	20	65	140	18	69	280	40	24	94	560	625	265	117	170	550	42	860	80	1100	1040
280S4÷8	457	368	190	20	75	140	20	79,5	280	40	24	94	560	625	265	117	170	550	42	860	80	1100	1040
280M2	457	419	190	20	65	140	18	69	280	40	24	94	560	625	265	117	170	550	42	860	80	1100	1040
280M4÷8	457	419	190	20	75	140	20	79,59	280	40	24	94	560	625	265	117	170	550	42	860	80	1100	1040
315(S2, M2A)	508	457	216	M20	65	140	18	69	315	46	28	120	610	625	265	117	168	550	47	895	130	1245	1225
315M2(B,C)	508	457	216	M20	65	140	18	69	315	46	28	120	610	625	265	117	168	550	47	895	130	1345	1325
315S4	508	457	216	M20	80	170	22	85	315	46	28	120	610	625	265	117	168	550	47	895	130	1275	1225
315M4(A,B)	508	457	216	M20	80	170	22	85	315	46	28	120	610	625	265	117	168	550	47	895	130	1375	1325
315M4C	508	457	216	M20	80	170	22	85	315	46	28	120	610	625	265	135	265	685	55	895	130	1475	1425
315(S6, M6A)	508	457	216	M20	80	170	22	85	315	46	28	120	610	625	265	117	168	550	47	895	130	1275	1225
315M6B	508	457	216	M20	80	170	22	85	315	46	28	120	610	625	265	117	168	550	47	895	130	1375	1325
315M6C	508	457	216	M20	80	170	22	85	315	46	28	120	610	625	265	135	265	685	55	895	130	1475	1425
315M6D	508	457	216	M24	90	170	25	95	315	46	28	120	610	625	265	135	265	685	55	895	130	1475	1425
315(S8, M8A)	508	457	216	M20	80	170	22	85	315	46	28	120	610	625	265	117	168	550	47	895	130	1275	1225
315M8B	508	457	216	M20	80	170	22	85	315	46	28	120	610	625	265	117	168	550	47	895	130	1375	1325
315M8(C,D)	508	457	216	M24	90	170	25	95	315	46	28	120	610	625	265	135	265	685	55	895	130	1475	1425

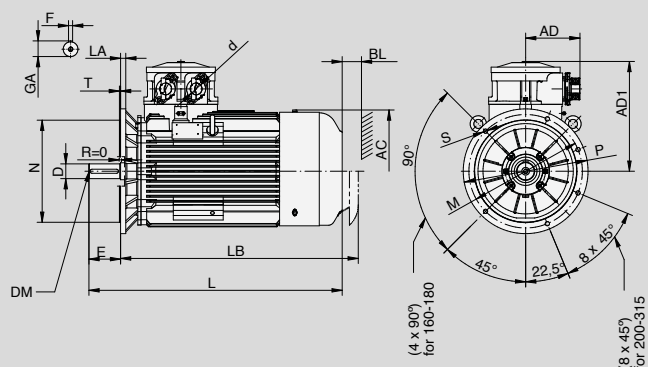
## Dimensions of Flange Mounted Motors – IM B5, IM B14, IM V1



Size	D <sub>fl</sub>	E	F <sub>fl</sub>	GA	AC	AD	AD1	L	LB	LF	LL	LA	IMB5						IMB14					
													M <sub>±0,3</sub>	N <sub>fl</sub>	P	S		T	M <sub>±0,3</sub>	N <sub>fl</sub>	P	S		T
																∅	Qty					-	Qty	
80-2A, 4A	19	40	6	21,5	190	145	195	315	300	138	66	15	165	130	200	12	4	3,5	100	80	120	M6	4	3
80-2B, 4B	19	40	6	21,5	190	145	195	355	340	138	66	15	165	130	200	12	4	3,5	100	80	120	M6	4	3
90	24	50	8	27	220	135	256	475	450	183	91	11	165	130	200	12	4	3,5	115	95	140	M8	4	3
100	28	60	8	31	240	150	275	525	510	209	80	11	215	180	250	15	4	4	130	110	160	M8	4	3,5
112	28	60	8	31	260	150	303	535	515	213	96	12	215	180	250	15	4	5	130	110	160	M8	4	3,5
132	38k6	80	10	41	290	150	328	620	595	238	96	16	265	230	300	15	4	4	165	130	200	M10	4	3,5

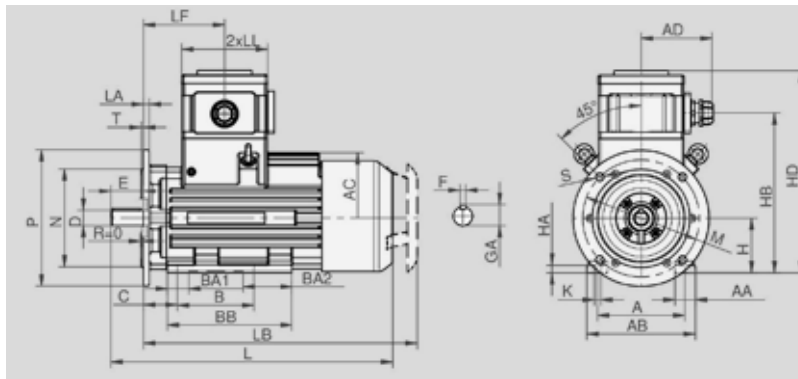


# Dimensions of Flange Mounted Motors – IM B5, IM V1



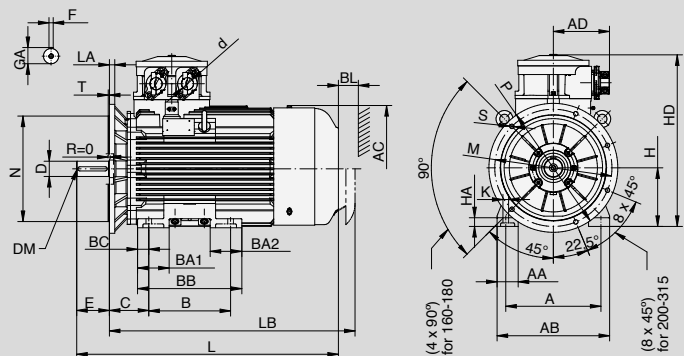
Size	Dk6 (160:180) Dm6	DM	E	F <sub>ns</sub>	GA	AC	AD	AD1	LA	M <sub>±0,4</sub>	N j6	P	S		T	BL	L	LB
													∅	Qty				
160M	42	16	110	12	45	350	225	415	18	300	250	350	19	4	5	60	825	780
160L	42	16	110	12	45	350	225	415	18	300	250	350	19	4	5	60	825	780
180M	48	16	110	14	51,5	370	225	420	18	300	250	350	19	4	5	65	860	810
180L	48	16	110	14	51,5	370	225	420	18	300	250	350	19	4	5	65	860	810
200L	55	20	110	16	59	450	245	470	19	350	300	400	19	4	5	75	960	930
225S4÷8	60	20	140	18	64	500	230	475	21	400	350	450	19	8	5	75	1015	950
225M2	55	20	110	16	59	500	230	475	21	400	350	450	19	8	5	75	1015	950
225M4÷8	60	20	140	18	64	500	230	475	21	400	350	450	19	8	5	75	1015	950
250M2	60	20	140	18	64	545	245	490	23	500	450	550	19	8	5	75	1120	1050
250M4÷8	65	20	140	18	69	545	245	490	23	500	450	550	19	8	5	75	1120	1050
280S2	65	20	140	18	69	625	265	580	20	500	450	550	19	8	5	80	1100	1040
280S4÷8	75	20	140	20	79,5	625	265	580	20	500	450	550	19	8	5	80	1100	1040
280M2	65	20	140	18	69	625	265	580	20	500	450	550	19	8	5	80	1100	1040
280M4÷8	75	20	140	20	79,59	625	265	580	20	500	450	550	19	8	5	80	1100	1040
315(S2, M2A)	65	M20	140	18	69	625	265	580	23	600	550	660	24	8	6	130	1245	1225
315M2(B,C)	65	M20	140	18	69	625	265	580	23	600	550	660	24	8	6	130	1345	1325
315S4	80	M20	170	22	85	625	265	580	23	600	550	660	24	8	6	130	1275	1225
315M4(A,B)	80	M20	170	22	85	625	265	580	23	600	550	660	24	8	6	130	1375	1325
315M4C	80	M20	170	22	85	625	265	580	23	600	550	660	24	8	6	130	1475	1425
315(S6, M6A)	80	M20	170	22	85	625	265	580	23	600	550	660	24	8	6	130	1275	1225
315M6B	80	M20	170	22	85	625	265	580	23	600	550	660	24	8	6	130	1375	1325
315M6C	80	M20	170	22	85	625	265	580	23	600	550	660	24	8	6	130	1475	1425
315M6D	90	M24	170	25	95	625	265	580	23	600	550	660	24	8	6	130	1475	1425
315(S8, M8A)	80	M20	170	22	85	625	265	580	23	600	550	660	24	8	6	130	1275	1225
315M8B	80	M20	170	22	85	625	265	580	23	600	550	660	24	8	6	130	1375	1325
315M8(C,D)	90	M24	170	25	95	625	265	580	23	600	550	660	24	8	6	130	1475	1425

# Dimensions of Foot / Flange Mounted Motors – IM B35, IM B34



Size	A	B	C	D <sub>j6</sub>	E	F <sub>h9</sub>	GA	H <sub>-0,5</sub>	HA	K	AA	AB	AC	AD	BA1	BA2	BB	HB	HD	L	LB	LF	LL	LA	IM B35					IM B34						
																									M <sub>±0,3</sub>	N <sub>j6</sub>	P	S		M <sub>±0,3</sub>	N <sub>j6</sub>	P	S			
																												ø	Qty				ø	Qty		
80-2A, 4A	125	100	50	19	40	6	21,5	80	12	10	40	165	190	145	38	38	130	217	275	315	300	138	66	15	165	130	200	12	4	3,5	100	80	120	M6	4	3
80-2B, 4B	125	100	50	19	40	6	21,5	80	12	10	33	165	190	145	-	-	183	217	275	355	340	138	66	15	165	130	200	12	4	3,5	100	80	120	M6	4	3
90S	140	100	56	24	50	8	27	90	12	10	35	180	220	135	-	-	201	265	346	475	450	183	91	11	165	130	200	12	4	3,5	115	95	140	M8	4	3
90L	140	125	56	24	50	8	27	90	12	10	35	180	220	135	-	-	201	265	346	475	450	183	91	11	215	180	250	15	4	4	130	110	160	M8	4	3,5
100	160	140	63	28	60	8	31	100	14	9	38	200	240	150	-	-	230	292	375	525	510	209	80	12	215	180	250	15	4	5	130	110	160	M8	4	3,5
112	190	140	70	28	60	8	31	112	14	12	54	230	260	150	-	-	230	330	415	535	515	213	96	16	265	230	300	15	4	4	165	130	200	M10	4	3,5
132S	216	140	89	38k6	80	10	41	132	16	12	60	272	290	150	-	-	280	377	460	620	595	238	96	15	165	130	200	12	4	3,5	100	80	120	M6	4	3
132M	216	178	89	38k6	80	10	41	132	16	12	60	272	290	150	-	-	280	377	460	620	595	238	96	15	165	130	200	12	4	3,5	100	80	120	M6	4	3

# Dimensions of Foot / Flange Mounted Motors – IM B35



Size	A	B	C	Dk6 (160-180) Dm6	DM	E	F <sub>h9</sub>	GA	H <sub>-0.5</sub>	HA	K	AA	AB	BB	B ±3	BA1	BA2	AC	AD	HD	LA	M ±0.4	N j6	P	S ø Qty	T	BL	L	LB	
160M2÷8	254	210	108	42	16	110	12	45	160	24	15	63	320	310	23	75	115	350	225	575	18	300	250	350	19	4	5	60	825	780
160L2÷8	254	254	108	42	16	110	12	45	160	24	15	63	320	310	23	75	115	350	225	575	18	300	250	350	19	4	5	60	825	780
180M2÷8	297	241	121	48	16	110	14	51,5	180	28	15	68	345	340	28	110	110	370	225	600	18	300	250	350	19	4	5	65	860	810
180L4÷8	297	279	121	48	16	110	14	51,5	180	28	15	68	345	340	28	110	110	370	225	600	18	300	250	350	19	4	5	65	860	810
200L2÷8	318	305	133	55	20	110	16	59	200	32	19	80	402	380	30	115	115	450	245	670	19	350	300	400	19	4	5	75	960	930
225S4÷8	356	286	149	60	20	140	18	64	225	34	19	85	444	380	36	115	115	500	230	700	21	400	350	450	19	8	5	75	1015	950
225M2	356	311	149	55	20	110	16	59	225	34	19	85	444	380	36	115	115	500	230	700	21	400	350	450	19	8	5	75	1015	950
225M4÷8	356	311	149	60	20	140	18	64	225	34	19	85	444	380	36	115	115	500	230	700	21	400	350	450	19	8	5	75	1015	950
250M2	406	349	168	60	20	140	18	64	250	37	24	90	480	445	48	135	135	545	245	740	23	500	450	550	19	8	5	75	1120	1050
250M4÷8	406	349	168	65	20	140	18	69	250	37	24	90	480	445	48	135	135	545	245	740	23	500	450	550	19	8	5	75	1120	1050
280S2	457	368	190	65	20	140	18	69	280	40	24	94	560	550	42	117	170	625	265	860	20	500	450	550	19	8	5	80	1100	1040
280S4÷8	457	368	190	75	20	140	20	79,5	280	40	24	94	560	550	42	117	170	625	265	860	20	500	450	550	19	8	5	80	1100	1040
280M2	457	419	190	65	20	140	18	69	280	40	24	94	560	550	42	117	170	625	265	860	20	500	450	550	19	8	5	80	1100	1040
280M4÷6	457	419	190	75	20	140	20	79,5	280	40	24	94	560	550	42	117	170	625	265	860	20	500	450	550	19	8	5	80	1100	1040
315(S2, M2A)	508	457	216	65	M20	140	18	69	315	46	28	120	610	550	457	117	168	625	265	895	23	600	550	660	24	8	6	130	1245	1225
315M2(B,C)	508	457	216	65	M20	140	18	69	315	46	28	120	610	550	457	117	168	625	265	895	23	600	550	660	24	8	6	130	1345	1325
315S4	508	457	216	80	M20	170	22	85	315	46	28	120	610	550	457	117	168	625	265	895	23	600	550	660	24	8	6	130	1275	1225
315M4(A,B)	508	457	216	80	M20	170	22	85	315	46	28	120	610	550	457	117	168	625	265	895	23	600	550	660	24	8	6	130	1375	1325
315M4C	508	457	216	80	M20	170	22	85	315	46	28	120	610	685	457	135	265	625	265	895	23	600	550	660	24	8	6	130	1475	1425
315(S6, M6A)	508	457	216	80	M20	170	22	85	315	46	28	120	610	550	457	117	168	625	265	895	23	600	550	660	24	8	6	130	1275	1225
315M6B	508	457	216	80	M20	170	22	85	315	46	28	120	610	550	457	117	168	625	265	895	23	600	550	660	24	8	6	130	1375	1325
315M6C	508	457	216	80	M20	170	22	85	315	46	28	120	610	685	457	135	265	625	265	895	23	600	550	660	24	8	6	130	1475	1425
315M6D	508	457	216	90	M24	170	25	95	315	46	28	120	610	685	457	135	265	625	265	895	23	600	550	660	24	8	6	130	1475	1425
315(S8, M8A)	508	457	216	80	M20	170	22	85	315	46	28	120	610	550	457	117	168	625	265	895	23	600	550	660	24	8	6	130	1275	1225
315M8B	508	457	216	80	M20	170	22	85	315	46	28	120	610	550	457	117	168	625	265	895	23	600	550	660	24	8	6	130	1375	1325
315M8(C,D)	508	457	216	90	M24	170	25	95	315	46	28	120	610	685	457	135	265	625	265	895	23	600	550	660	24	8	6	130	1475	1425

# Flameproof motors with electromagnetic brake

Cantoni Group has a vast experience in the production of explosion proof motors. In 1950s, it was one of Cantoni Group's manufacturing companies which produced the first explosion proof and flameproof motors in Poland. Such long experience resulted in Cantoni's outstanding knowledge in this field.

**Cantoni motors are recognized globally as safe, reliable and durable, operating in the harshest conditions.**



Premium efficiency IE3 flameproof motor (Ex db eb) with built in electromagnetic brake HEX160 (1600Nm) type EcSte315M4B-IE3-H

Apart from the wide range of standard flameproof motors, our offer includes also many different special executions of motors.

One of them are motors equipped with **flameproof electromagnetic (DC) brakes** which are installed on the ND side of motor. This compact execution enables to reduce complexity of the drive system.

The whole variety of electromagnetic brakes (including flameproof brakes) is produced within Cantoni Group, therefore, we can guarantee the highest quality of the whole set.

**HEX DC electromagnetic brakes** are switchable spring loaded and electromagnetically released brakes which can be used also separately (as stand alone components) in different drive systems to brake the rotating parts of machines (safety) and their exact positioning.

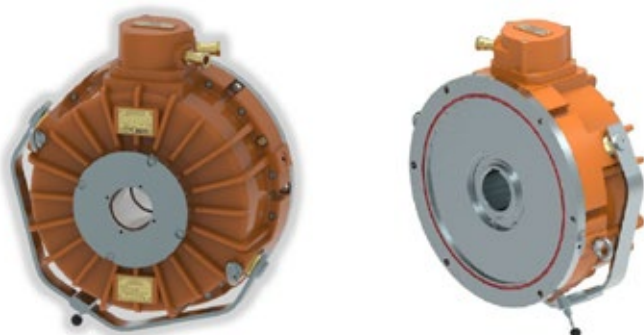
They feature high repeatability, also at high operating rates and can be powered from alternating current sources through a built-in rectifier. Brakes are optionally equipped with manual release levers to allow their emergency releasing.

An additional feature is their stable operation, which is particularly important if a machine is powered by several drives, working at high on-off rates. Brake design guarantees simple and trouble-free installation.

Various versions are available with different equipment, brake power supply types, allowing users to select the right option for their needs.

**HEX brakes** provide protection:

- against methane and coal dust explosion for the I group of devices, category M2 (I M2 Ex db [ia] I Mb)
- against explosion of gases for the II group of devices, category 2G (I 2G Ex db [ia] IIB T4 Gb)
- against dust explosion for the II group of devices, category 2D (II 2D Ex tb [ia] IIIC T125°C Db)



Application areas:

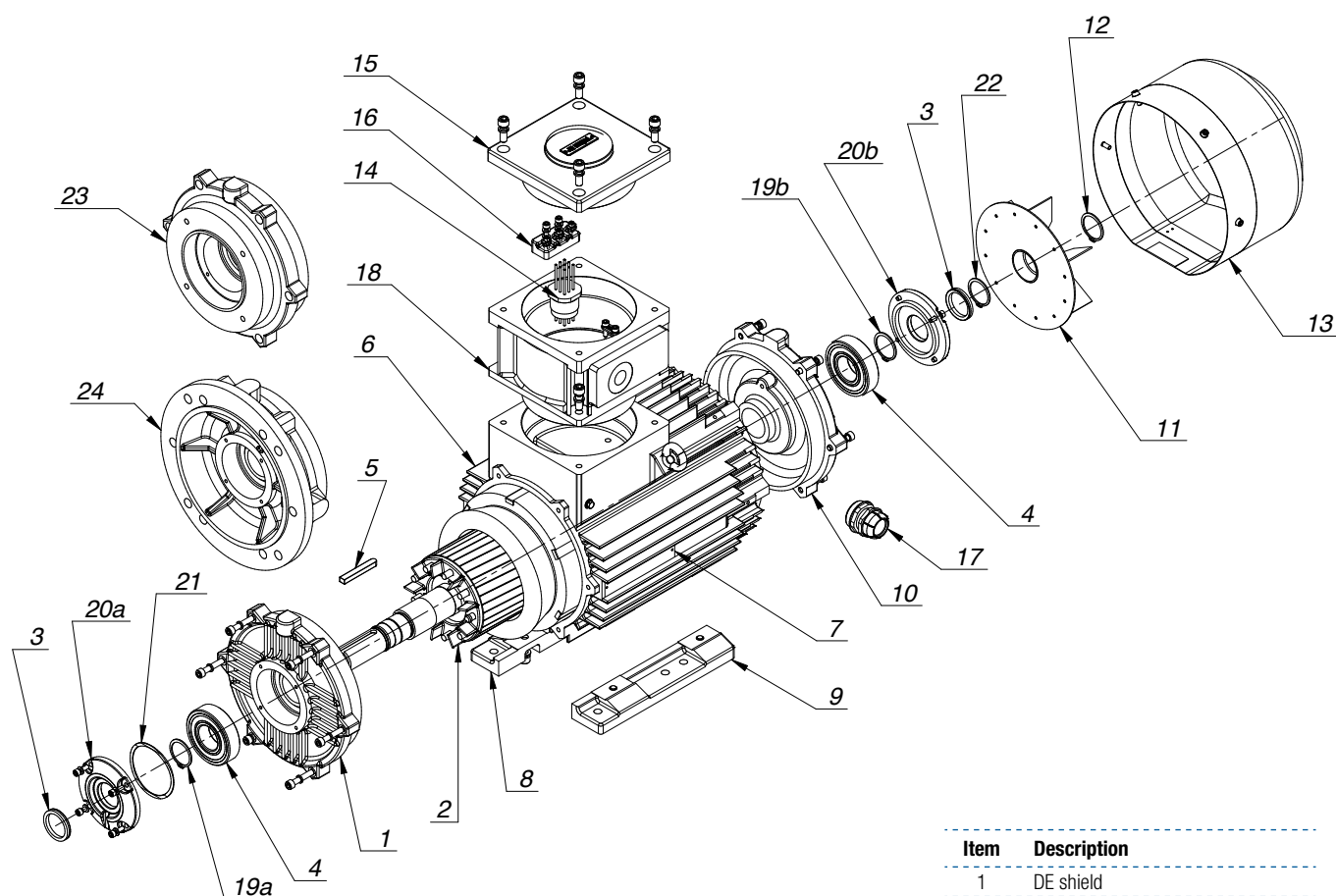
- Underground mining and open-cast mining
- Chemical industry
- Petrochemical and refinery industry
- Motor with brake – explosion proof self-braking motor
- Brake reducer - explosion proof kit
- Lifts, cranes and winches working in explosive areas...



For other types of brakes or for more information on brake motors please contact us directly or visit [www.cantonigroup.com](http://www.cantonigroup.com).

# List of Motor parts

Frame Size: 80÷132



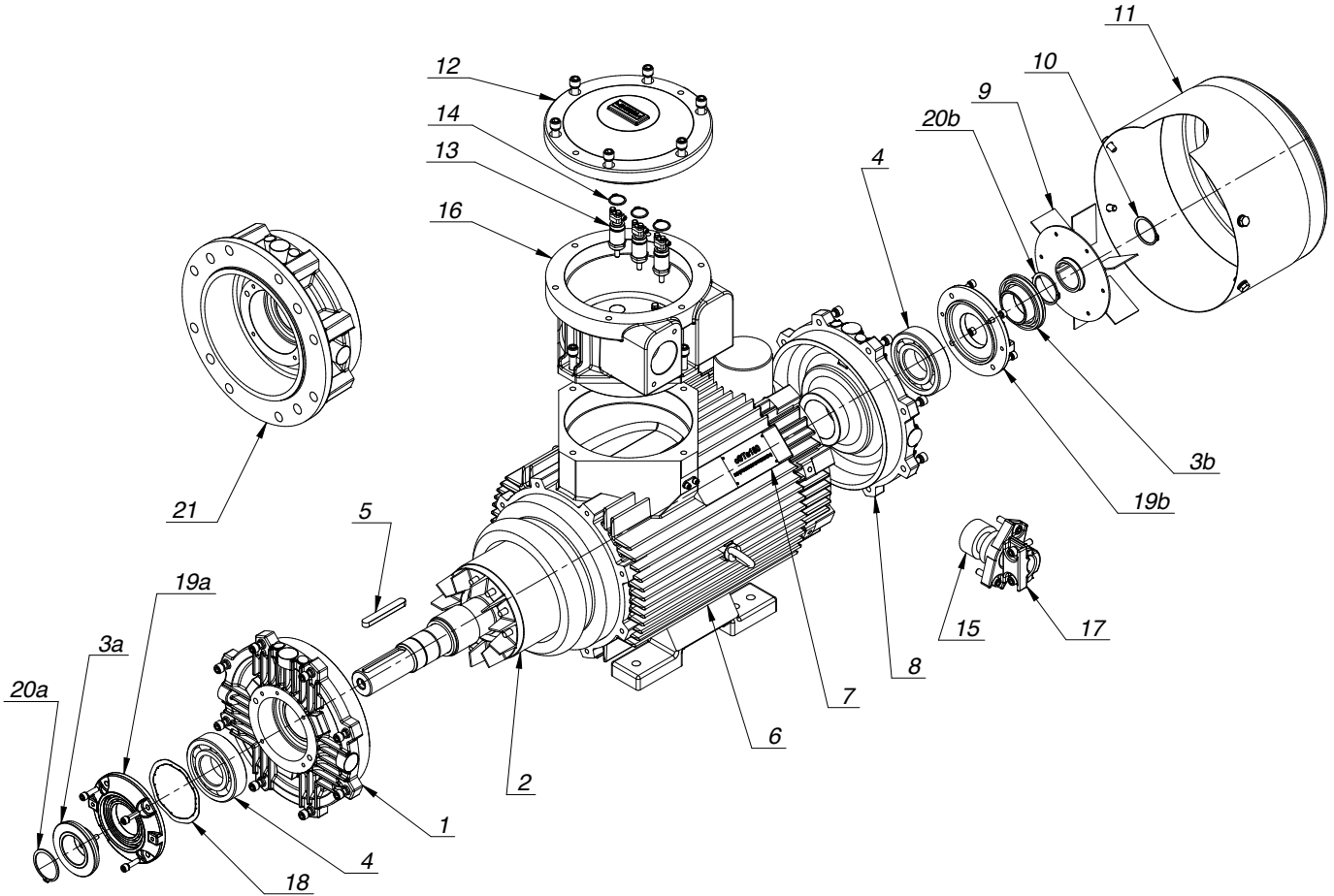
Item	Description
1	DE shield
2	rotor
3	shaft seal
4	bearing
5	key
6	stator without feet
7	nameplate
8	left feet
9	right feet
10	NDE shield
11	fan
12	seeger ring
13	fan cover
14	cable bushing
15	terminal box cover
16	terminal board
17	cable gland
18	terminal box housing
19ab	seeger ring – except (E)cST(K,L,1)80
20ab	external bearing cover – except (E)cST(K,L,1)80
21	spring washer
22	seeger ring – except (E)cST(K,L,1)80
23	B14 shield
24	B5 shield

DE – drive end

NDE – non drive end

# List of Motor parts

Frame Size: 160÷180

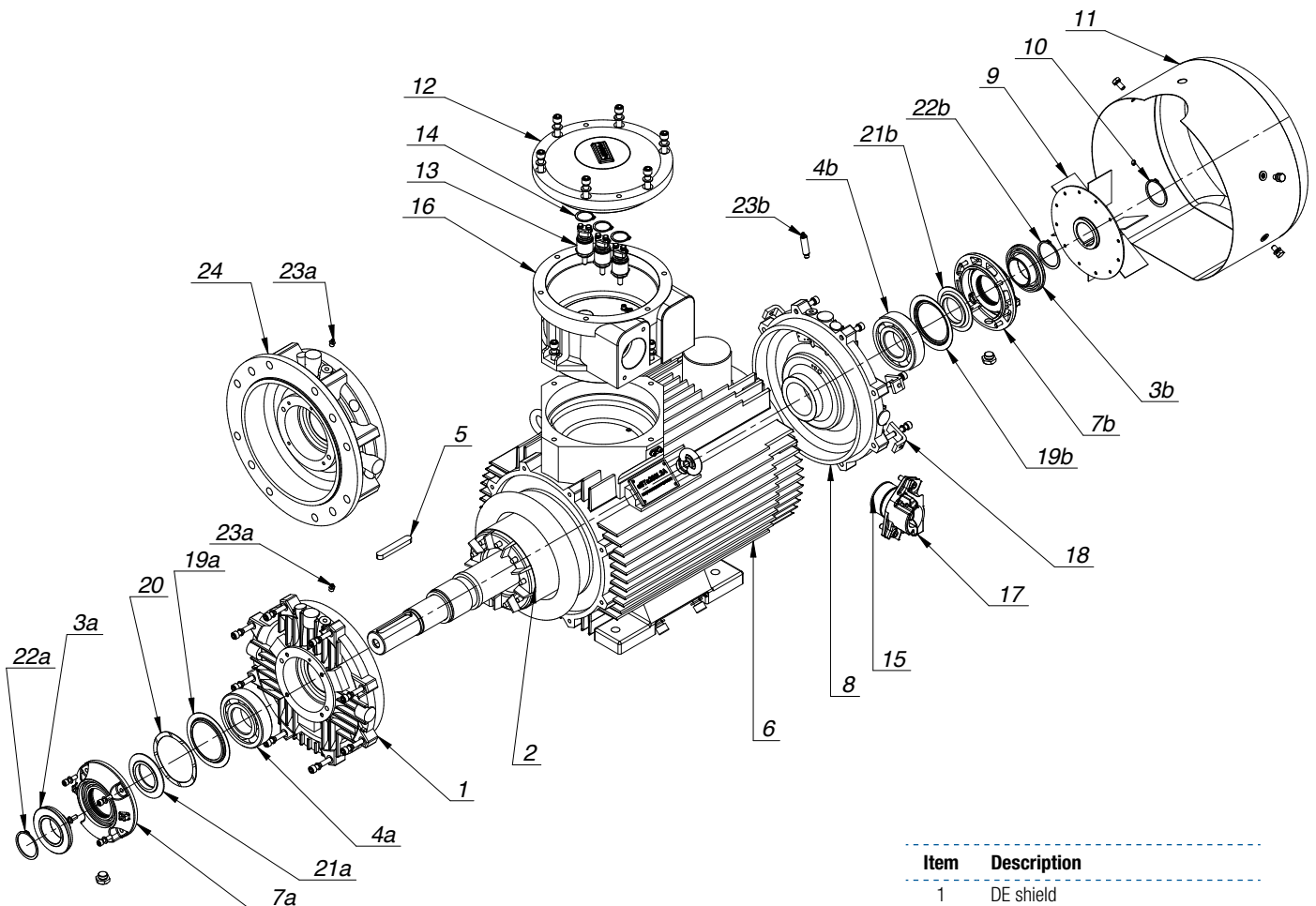


Item	Description
1	DE shield
2	rotor
3ab	shaft seal
4	bearing
5	key
6	stator
7	nameplate
8	NDE shield
9	fan
10	seeger ring
11	fan cover
12	terminal box cover
13	current insulators (terminals)
14	seeger rings
15	cable inlet seal
16	terminal box housing
17	cable inlet
18	spring washer
19ab	external bearing cover
20ab	seeger ring
21	B5 shield

DE – drive end  
NDE – non drive end

# List of Motor parts

Frame Size: 200÷315



Item	Description
1	DE shield
2	rotor
3ab	shaft seal
4ab	bearing
5	key
6	stator
7ab	external bearing cover
8	NDE shield
9	fan
10	seeger ring
11	fan cover
12	terminal box cover
13	current insulators (terminals)
14	seeger rings
15	cable inlet seal
16	terminal box housing
17	cable inlet
18	fan cover support
19ab	bearing internal ring
20	spring washer
21ab	grease shield
22ab	seeger ring
23ab	grease nipple
24	B5 shield

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**

- » motor type designation, including terminal box design (Ex db or Ex eb)
- » 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.**

- » auxiliary terminal box,
- » 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

Duty  Mounting  IP  Insulation class

Number of terminals

Efficiency  RAL  Zone  Ambient temperature

PTC  Yes  No  Group  Terminal box design (Ex db or Ex eb)

PT100  Yes  No  Temperature class  Starting and supply method (DOL, Y/Δ, VSD, Soft-Start)

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.



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## 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.



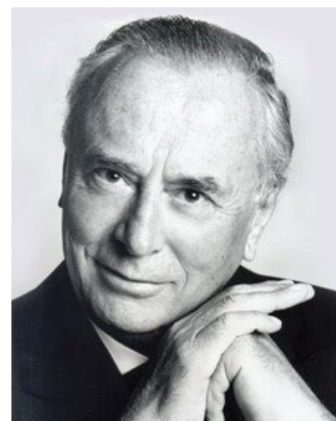
## Cantoni Group



### 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

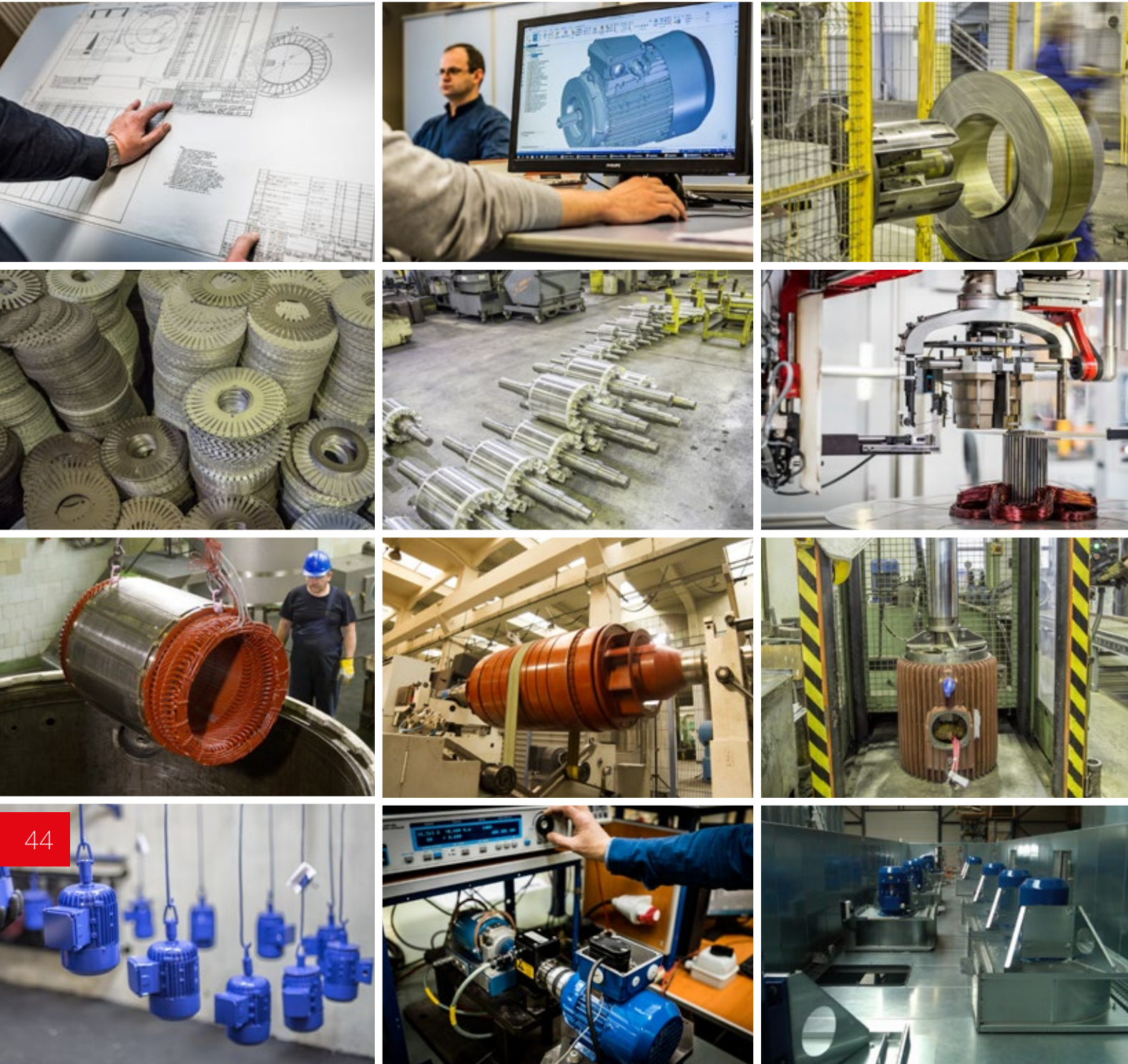
is able to face all requirements of modern market and realize the most challenging projects.

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 6000 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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