IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx FIDI 20.0001X**

Certificate history:

Status: **Current**

Issue No: 0

Date of Issue: 2020-05-26

Applicant: **CEMP S.r.l**
Via Piemonte, 16
20030 Senago (MI)
Italy

Equipment: **Three-phase asynchronous motors, brake motors and terminal boxes, Types: E3AC*****; E3AB*****; E3AM*****; E4AC*****; E4AB*****; E4AM***** E1AC*****; E1AB*****; E1AM*****; E2AC*****; E2AB*****; E2AM*****; E1DC*****; E1DB*****; E1HC*****; E1HB*****; E2DC*****; E2DB*****; E2HC*****; E2HB*****; E3DC*****; E3DB*****; E3HC*****; E3HB*****; E4DC*****; E4DB*****; E4HC*****; E4HB*****;**

Optional accessory: Motor sizes 80, 90, 100, 112 132, 160, 180, 200, 225, 250, 280 and 315; Brakes sizes 80, 90, 100, 112, 132, 160, 180, 200, 225 and 250

Type of Protection: **Flameproof enclosure 'd'; Increased safety 'e'; Protection by enclosure 't'**

Marking: **Ex db I Mb** or **Ex db eb I Mb** (only motors); and/or

Ex db IIB/IIC T6...T3 Gb or **Ex db eb IIB/IIC T6...T3 Gb** ; and/or

Ex tb/tc IIIB/IIIC T85°C ...T150°C Db/Dc ;

Approved for issue on behalf of the IECEx Certification Body: **Marino Kelava**

Position: **Certification Signatory**

Signature:
(for printed version)

Date:

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:

Fiditas Ltd
Karlovačka cesta 197
Zagreb-Lučko HR-10250
Croatia

Fiditas
explosion safety solutions

IECEx Certificate of Conformity

Certificate No.: **IECEx FIDI 20.0001X**

Date of issue: 2020-05-26 Issue No: 0

Manufacturer: **CEMP S.r.l**
Via Piemonte, 16
20030 Senago (MI)
Italy

Additional manufacturing locations:

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements.This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :
The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2011 Explosive atmospheres - Part 0: General requirements
Edition:6.0

IEC 60079-1:2014-06 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition:7.0

IEC 60079-31:2013 Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"
Edition:2

IEC 60079-7:2015 Explosive atmospheres – Part 7: Equipment protection by increased safety "e"
Edition:5.0

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Reports:

GB/CML/ExTR17.0032/00 GB/CML/ExTR18.0235/00 HR/FIDI/ExTR20.0001/00

Quality Assessment Report:

IT/CES/QAR07.0002/13

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EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

The three-phase asynchronous motors E*A******, sizes 80, 90, 100, 112, 132, 160, 180, 200, 225, 250, 280 and 315 are made of cast iron with separate compartments: motor enclosure and terminal box for supply and auxiliary circuits connection. Motor enclosure is designed in Ex-db type of protection, while terminal box can be Ex-db or Ex-eb type of protection. The motor and terminal box enclosures satisfies also the Ex-tb type of protection, mechanical protection degree IP65.

The three-phase asynchronous brake motors E*D/H******, sizes 80, 90, 100, 112, 132, 160, 180, 200, 225 and 250 have a separate compartments: brake enclosure and terminal box for brake from size 160 to size 250. The components of the brake enclosure are made of cast iron (quality EN-GJL-200 UNI EN 1561) and they consist in Brake holder back shield, Brake cover enclosure and Brake Shields - Brake Manual Release. The assembly of these components with its terminals box realizes a flame proof enclosure with type of protection Ex db, Ex db eb.

For other details see Annex of this certificate.

SPECIFIC CONDITIONS OF USE: YES as shown below:

- The flame-paths are specified in the manufacturer's documentation. For information regarding the dimension of the flameproof joints the manufacturer shall be contacted.
- For installation in places with presence of gas group IIC, when motors are painted with a maximum thickness of paint exceeding 0.2mm, shall be taken into account the risk of electrostatic charges, see manufacturer instructions.
- To limit the bearing current, parasitic capacitances and resonant frequencies, the end user shall limit the dV/dt maximum to 1500V/µs by using sinus-filter and taking in account the cable length and voltage between inverter and motor. In case of use of special insulated bearing, higher dV/dt is allowed.
- The motor can be equipped with auxiliary devices: thermal detectors, encoders, anti-condensation heaters, motor-fan, etc. Auxiliary devices shall be separately certified and be suitable for the EPL, gas/dust group and temperature class/maximum surface temperature of the motor.
- The CEMP anti-condensation heaters installed inside the Ex-db motor enclosure have a maximum power of 200W and are allowed to be in operation only when motor is not powered, they shall be interlocked with the motor drive circuitry.
- The motor in type of protection Ex-db or Ex-tb can be equipped with separately certified draining devices.
- The accessories used for cable entry and for the unused holes shall be separately certified according to the applicable type of protection and shall guarantee the minimum degree of protection as indicated on motor nameplate.
- Temperature at the cable gland or branching point could exceed 70°C or 80°C respectively, suitable cable for temperature 90°C must be used.
- The motor supplied by inverter is equipped inside of stator winding with PTC or PT100 thermal detectors for temperature control. Rating data are specified on supplementary nameplate. The presence of the thermal detectors inside the motor is shown by appropriated warning label.
- The thermal detectors are calibrated for cut off the supply at:
    - Max. 120°C for temperature class T4/T125°C/T135°C
    - Max. 130°C for temperature class T3/T150°C and for Group I

The intervention of the thermal detector shall guarantee the disconnection of the supply; the resetting of the supply shall not be automatic.

- The motor marked for temperature class T5 and T6 are not intended for supply by inverter.

For motor types E3AB/AC-70/75 280 MB4, which are rated T5/T100°C for gases/dusts, when fed by inverter, the customer shall provide a minimum voltage of 44Vac at 5 Hz, despite the voltage drop in frequency converter input up to 10%.

Other conditions are given in Annex 1 of this certificate.

Annex:

IECEx FIDI 20.0001 X CEMP motor+brakes Annex1 draft3_1.pdf

ANNEX

Annex 1 to: IECEx FIDI 20.0001X Issue: 0 Date: 2020-05-25

1. Product description

The three-phase asynchronous motors **E*A******,** sizes 80, 90, 100, 112, 132, 160, 180, 200, 225, 250, 280 and 315 are made of cast iron with separate compartments: motor enclosure and terminal box for supply and auxiliary circuits connection. Motor enclosure is designed in Ex-db type of protection, while terminal box can be Ex-db or Ex-eb type of protection. The motor and terminal box enclosures satisfy also the Ex-tb type of protection, mechanical protection degree IP65.
Special solution provides the motor without terminal box, the motor enclosure is closed by metallic plate and suitable cable glands for the stator winding cables.

The motors can be equipped with auxiliary devices: thermal detectors, encoders, anti-condensation heaters, motor-fan, etc. The anti-condensation heaters installed inside the motor enclosure have a maximum power of 200 W and are allowed to be in operation only when motor is not powered.
The motor supplied by inverter is equipped inside of stator winding with PTC or PT100 thermal detectors for temperature control. Rating data are specified on supplementary nameplate. The presence of the thermal detectors inside the motor is shown by appropriated warning label.
The thermal detectors are calibrated for cut off the supply at:

- 120°C for temperature class T4/T125°C/T135°C
- 130°C for temperature class T3/T150°C and for Group I.

The intervention of the thermal detector shall guarantee the disconnection of the supply; the resetting of the supply shall not be automatic.
The motor marked for temperature class T5 and T6 are not intended for supply by inverter.

According to IEC 60034-6 standard, the cooling is achieved by one of the following methods:

- Self-cooled motor by fan fitted on shaft, IC411;
- Fan directly coupled; IC418;
- Totally enclosed not ventilated, IC410;
- Forced ventilation by means of auxiliary motor, IC416.

The operation of the primary motor shall be interlocked to the correct operation of the forced ventilation. External fan can be made of plastic material (Polyethylene), aluminium, brass or steel. Plastic and aluminium fan are not allowed on mining applications.
The motor in type of protection Ex-db or Ex-tb can be equipped with separately certified draining devices, see equipment list below.
The accessories used for cable entry and for the unused holes shall be separately certified according to the applicable type of protection and shall guarantee the minimum degree of protection as indicated on motor nameplate.

The three-phase asynchronous brake motors E*D/H******, sizes 80, 90, 100, 112, 132, 160, 180, 200, 225 and 250 have a separate compartments: brake enclosure and terminal box for brake from size 160 to size 250. The components of the brake enclosure are made of cast iron (quality EN-GJL-200 UNI EN 1561) and they consist in Brake holder back shield, Brake cover enclosure and Brake Shields - Brake Manual Release. The assembly of these components with its terminals box realizes a flameproof enclosure with type of protection Ex db, Ex db eb.

Motors are built with an integrated brake. The brake is enclosed in an enclosure with protection type Ex db IIB or IIC Gb and Ex tb IIIB or IIIC Db, mechanical protection degree IP65.
The Brake motors sizes 80 - 132 have a brake terminal into the main terminal box of the motor because they pass through the resin passage in the brake flange.
The Brake motors sizes 160-180 and 200-250 have a brake terminal box coupling to brake cover enclosure, is dedicated of brake connections and brake auxiliaries:

- Brake enclosure sizes 160-180 mounted the terminal box 063-100 motors for brake connections,
- Brake enclosure sizes 200-250 mounted the terminal box 132-160 motors for brake connections.

Brake motors terminal box as per scheme:

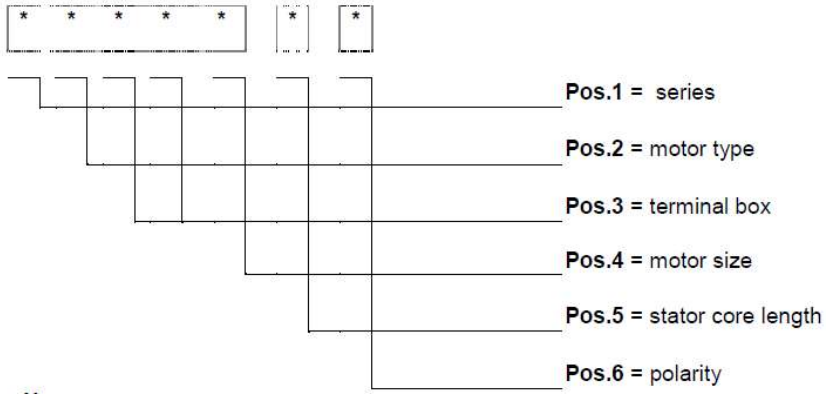
- frame sizes 80-112: Use oversized terminal box on motors,
- frame size 132: Use standard terminal box on motors,
- frame sizes 160-180: Use standard terminal box on motors + Brake terminal box on brake enclosure,
- frame sizes 200-250: Use standard terminal box on motors + Brake terminal box on brake enclosure.

The temperature class of the brake enclosure is T4 based on 40°C ambient for both ventilated or not ventilated motor, by limiting the stating hours or the load inertia.
DC brake supplied with a rectified with a single-phase a.c. input.

The three-phase asynchronous motors E1A/E2A******, sizes 80, 90, 100, 112, 132, 160, 180, 200, 225, 250 and 280, 315 the manufacturer has the possibility to declare lower efficiency level than IE3 without any technical changes. In this case all electrical values, product E1 or E2 is identical to E3 product, but only with nameplate data different.

For motors and brake motors in addition to name plates version with CEMP logo, is possible to create a name plates with Marathon Logo, but the manufacturer on the nameplates is always CEMP.

2. Identification code



Note: *Nameplate data always includes "**IC**" code to clarify type of cooling (IC410 - IC411 - IC416 - IC418)*

Pos. 1: *Motor series*

E3AC **E4AC**	Flameproof electric motors for gas group IIC and for dust group IIIC/IIIB E3* Efficiency IE3 Class; E4* Efficiency IE4 Class
E3AB **E4AB**	Flameproof electric motors for gas group IIB and for dust group IIIC/IIIB E3* Efficiency IE3 Class; E4* Efficiency IE4 Class
E3AM **E4AM**	Flameproof electric motors for Mining – M2 E3* Efficiency IE3 Class; E4* Efficiency IE4 Class
E1AC **E2AC**	Flameproof electric motors for gas group IIC and for dust group IIIC/IIIB E1* Efficiency IE1 Class; E2* Efficiency IE2 Class
E1AB **E2AB**	Flameproof electric motors for gas group IIC and for dust group IIIC/IIIB E1* Efficiency IE1 Class; E2* Efficiency IE2 Class
E1AM **E2AM**	Flameproof electric motors for Mining – M2 E1* Efficiency IE1 Class; E2* Efficiency IE2 Class

E1DC **E2DC**	Flameproof brake motors IC410 for gas group IIC and for dust group IIIC/IIIB E1* Efficiency IE1 Class; E2* Efficiency IE2 Class
E1HC **E2HC**	Flameproof brake motors IC411 for gas group IIC and for dust group IIIC/IIIB E1* Efficiency IE1 Class; E2* Efficiency IE2 Class
E1DB **E2DB**	Flameproof brake motors IC410 for gas group IIB and for dust group IIIC/IIIB E1* Efficiency IE1 Class; E2* Efficiency IE2 Class
E1HB **E2HB**	Flameproof brake motors IC411 for gas group IIB and for dust group IIIC/IIIB E1* Efficiency IE1 Class; E2* Efficiency IE2 Class
E3DC **E4DC**	Flameproof brake motors IC410 for gas group IIC and for dust group IIIC/IIIB E3* Efficiency IE3 Class; E4* Efficiency IE4 Class
E3HC **E4HC**	Flameproof brake motors IC411 for gas group IIC and for dust group IIIC/IIIB E3* Efficiency IE3 Class; E4* Efficiency IE4 Class
E3DB **E4DB**	Flameproof brake motors IC410 for gas group IIB and for dust group IIIC/IIIB E3* Efficiency IE3 Class; E4* Efficiency IE4 Class
E3HB **E4HB**	Flameproof brake motors IC411 for gas group IIB and for dust group IIIC/IIIB E3* Efficiency IE3 Class; E4* Efficiency IE4 Class

Pos. 2: *Motor type (electrical features)*

1	…	**5**	Three phase motor for hoist
2	Three phase motor double polarity constant torque	**6**	…
3	Three phase motor one polarity	**7**	Three phase motor suitable for frequency converter
4	Three phase motor double polarity quadratic torque	**8**	Three phase motor with enlarged Ex-eb terminal box

Pos. 3: *Terminal box*

0	With standard terminal box	**3**	Plate and cable gland version
2	With bigger terminal box (just for frames 80-112)	**5**	Terminal box in Ex-eb version

Pos. 4: *Size*

80	Motor size 80	**180**	Motor size 180
90	Motor size 90	**200**	Motor size 200
100	Motor size 100	**225**	Motor size 225

112	Motor size 112	**250**	Motor size 250
132	Motor size 132	**280**	Motor size 280 (only motor)
160	Motor size 160	**315**	Motor size 315 (only motor)
Pos. 5:	*Stator core length*		
	As per manufacturer's documentation		
Pos. 6:	*Polarity number*		
2	2 poles	**48**	Double polarity: 4/8 poles
4	4 poles	**46**	Double polarity: 4/6 poles
6	6 poles	**68**	Double polarity: 6/8 poles
8	8 poles	**21**	Double polarity: 2/12 poles
10	10 poles	**26**	Double polarity: 2/6 poles
12	12 poles	**61**	Double polarity: 6/12 poles
16	16 poles	**83**	Double polarity: 8/16 poles
24	Double polarity: 2/4 poles	**60**	Double polarity: 6/10 poles
42	Double polarity: 4/24 poles	**81**	Double polarity: 8/12 poles

*Code example for motor: **E3AC30 132 MB 4** = Three phase IE3 motor flameproof Ex db IIC T4 Gb – Ex tb IIIC T135°C Db, frame size 132, medium iron core, 4 poles.*
*Code example for motor: **E1AC30 132 MB 4** = Three phase IE1 motor flameproof Ex db IIC T4 Gb – Ex tb IIIC T135°C Db, frame size 132, medium iron core, 4 poles*
*Code example for Brake motor: **E3HC30 132 MB 4** = Three phase IE3 brake-motor flameproof Ex db IIC T4 Gb – Ex tb IIIC T135°C Db, frame size 132, medium iron core, 4 poles.*

3. Ratings

Main supply:

- Maximum rated voltage: 1000 V
- Maximum rated power: 240 kW
- Maximum current: 380 A
- Rated frequency: 50 / 60 Hz
- Insulation class: F (with ΔT class B)
- Duty: S1, S2, S3, S4, S6, S9
- Max. rated speed: 3600 r.p.m

Inverter supply:

- Maximum rated voltage: 1000 V
- Maximum peak voltage: 2300 V
- Maximum current: 380 A
- Max. rated speed: 3960 r.p.m
- Duty: S9

Temperature ambient range: -60°C to +60°C
-60°C to +80°C (Only for Group IIB)

The minimum ambient temperature is in function of the motor constructional characteristics as indicated in the manufacturer's documentation.
The motors with the ambient temperature above +40°C up to +80°C are made in compliance with the power de-rating according to the following table as indicated in the manufacturer documentation.
The temperature class tests were performed on brake-motors and as per thermal test, brake enclosure surface temperature class is always lower than motor enclosure temperature class.

Ambient temperature [C°] max.	40	45	50	55	60	65	70	75	80
ΔT limit [K] - Stator Winding Class B (max. 120°C)	80	75	70	65	60	55	50	45	40
Shaft power reduction	0%	5%	10%	15%	20%	30%	35%	52%	50%
Motor size [mm]	Temperature Class (Gb) Max. Temperature (Db) (Mb)								
80	T6 85°C Mb	T6 85°C Mb	T6 85°C Mb	T5 100°C Mb	T5 100°C Mb	T5 100°C(*) Mb	T4 125°C(*) Mb	T4 --- Mb	T4 --- Mb
90	T5(**) 100°C Mb	T5 100°C Mb	T5 100°C(*) Mb	T4(**) 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 --- Mb	T4 --- Mb
100	T6 85°C Mb	T6 85°C Mb	T5 100°C Mb	T5 100°C(*) Mb	T5 100°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 --- Mb	T4 --- Mb
112	T6 85°C Mb	T6 85°C Mb	T5 100°C Mb	T5 100°C(*) Mb	T5 100°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 --- Mb	T4 --- Mb
132	T5(**) 100°C Mb	T5 100°C Mb	T5 100°C Mb	T4(**) 125°C Mb	T4 125°C Mb	T4 125°C Mb	T4 125°C Mb	T4 --- Mb	T4 --- Mb
160	T5(**) 100°C Mb	T5 100°C(*) Mb	T5 100°C(*) Mb	T4(**) 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 --- Mb	T4 --- Mb
180	T5(**) 100°C Mb	T5 100°C(*) Mb	T4 125°C(*) Mb	T4(**) 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 --- Mb	T4 --- Mb
200	T6 85°C Mb	T5 100°C Mb	T5 100°C Mb	T5 100°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 --- Mb	T4 --- Mb
225	T5 100°C Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 --- Mb	T3 --- Mb
250	T5 100°C Mb	T5 100°C Mb	T5 100°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 --- Mb	T4 --- Mb
280	T6 85°C Mb	T5 100°C(*) Mb	T5 100°C(*) Mb	T5 100°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 --- Mb	T4 --- Mb
315	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 135°C(*) Mb	T3 --- Mb	T3 --- Mb

(*) *Additional de-rating of ΔT -10K is required.*
(**) *Temperature class T6 at Tamb= 40°C and T5 at Tamb= 55°C is respected providing special construction related to the windings according to manufacturer's documentation.*
(***) *With limited rated power.*
(****) *Only types E3AB/AC-70/75 280 MB4 motors, which are rated T5/T100°C for gases/dusts, when fed by inverter within the rating data reported on the nameplates*

4. Warning labels

The following warnings are applied to the motor:
"Restore the greasing on the joints at every opening".
"Fasteners 8.8 ISO 898-1, or better…" – for Tamb= -20°C \ +80°C
"Fasteners A4-80 UNI EN ISO 3506-1" – for Tamb= -60°C \ +80°C
"To be energized with cable suitable for temperature 90°C"
"Warning – potential electrostatic charging hazard – see instructions"

On the cover of the junction box:
A warning sticker is applied, which means do not open when energized
When motor anti-condensate heaters are used:
"Warning: energized heaters"

For motor supplied by inverter:
"Warning – Windings fitted with PTC thermistors".
"Warning – Winding protected by PT100 – Set operating temperature at x °C".
"Warning – Windings fitted with bimetallic detector"

5. Certified component/equipment

The followings Ex equipment and Ex components have been assessed into the enclosure certificate:

Component	Material or Type	Applicable IECEx certificate
Auxiliary terminal board	BARTEC, Type 07-9702 / 03	IECEx PTB 07.0007U
Auxiliary terminal board	CABUR, Type BPL… series	IECEx CES 11.0008U
Rubber bushing	CEMP Srl. Type:552…	IECEx LCI 09.0003U
Line bushing	BARTEC Type 07-91..-..../G	IECEx EPS 13.0045U
Motor for IC146	CEMP motor 63 – 71 – 80	IECEx EXA 16.0006X
Drain valve	ELFIT, Type ECD-2*	IECEx CES 14.0016U
Drain valve	CMP, Type 781 D	IECEx SIR 10.0149U
Encoder	SCANCON Incremental, type 2REX	IECEx ITS 10.0015X
Encoder	SCANCON Absolute, type EX…	IECEx ITS 10.0016X
Cable Gland	RCN Type: RAD / BAD / RN	IECEx INE 10.0010X
Barrier cable gland	KOPEX, Type EX…	IECEx CES 14.0013X

6. Specific conditions of use (continued from main body text):

- According to IEC 60034-6 standard, the cooling is achieved by one of the following methods:
  - Self-cooled motor by fan fitted on shaft, IC411;
  - Fan directly coupled; IC418;
  - Totally enclosed not ventilated, IC410;
  - Forced ventilation by means of auxiliary motor, IC416.

  The operation of the primary motor shall be interlocked to the correct operation of the forced ventilation.
- Plastic and aluminium fan are not allowed on mining applications.
- Special solution provides the motor without terminal box, the motor enclosure is closed by metallic plate and suitable cable glands for the stator winding cables.
- When IP65 is required, a proper selection of bearing features is required in order to limit the bearing temperature max. at 90°C.
- All terminal boxes non-metallic material components are suitable for ambient temperature ≥ -50°C.
- Schedule of limitation and the special conditions for safety use of all Ex-equipment/Ex-component used must be observed and fulfilled according to its own certificates.