

(1) **EU-Type-Examination Certificate**

(2) Equipment and protective systems intended for use in potentially explosive atmospheres, **Directive 2014/34/EU**



(3) **Certificate Number** TÜV CY 17 ATEX 0205845 X **Issue:** 12

(4) for the equipment: Three-phase Asynchronous Electrical Motors and Brake Motors
 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****;

(5) of the manufacturer: **CEMP S.r.l.**
 (6) Address: Via Piemonte, 16 - 20030 Senago (MI) – ITALY
 Order number: 0205845-12
 Date of issue: 2024-06-13

(7) The design of this equipment or protective system and any acceptable variation thereto are specified in the schedule to this EU-Type-Examination Certificate and the documents therein referred to.

(8) TÜV CYPRUS Ltd, notified body No. 2261 in accordance with Article 17 of the Council Directive of 2014/34/EU of February 26, 2014, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive. The examination and test results are recorded in the confidential report No. 17 0205845-12.



(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018 EN 60079-1:2014 EN IEC 60079-7:2015/A1:2018 EN 60079-31:2014

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EU-Type-Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this equipment which are not covered by this certificate.

(12) The marking of the equipment or protective system must include the following:

 I M2 Ex db I Mb, or  I M2 Ex db eb I Mb, and/or
 II 2G Ex db IIB or IIC T6...T3 Gb, or II 2G Ex db eb IIB or IIC T6...T3 Gb; and/or
 II 2D Ex tb IIIB or IIIC T85°C...T150°C Db

TÜV CYPRUS Ltd (TUV NORD Group),
 The head of the notified body,

Accredited by CYS-CYSAB
 Certificate No. C 004-2



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(13) SCHEDULE

(14) EU-Type-Examination Certificate No. TÜV CY 17 ATEX 0205845 X Issue 12

(15) Description of equipment

The three-phase asynchronous motors **E3A/E4A*******, sizes 80, 90, 100, 112, 132, 160, 180, 200, 225, 250, 280, 315 mm are made of cast iron enclosure material 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 the terminal boxes can be designed in Ex-db or Ex-eb type of protection. The terminal boxes with type of protection Ex-db are available in cast iron material, while the terminal boxes with type of protection Ex-eb are available in cast iron, carbon steel or stainless-steel material.

The motor and terminal box enclosures satisfy also the Ex-tb type of protection with 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 and motor-fan. The anti-condensation heaters installed inside the motor enclosure have a maximum power of 200W 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:

- 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 (see exception inside "Special Condition for Use")

According to EN 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.

The motor with 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, 250 mm 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.

Motors are built with an integrated brake. The brake is enclosed in an enclosure with protection type II 2G Ex db IIB or IIC Gb and II 2D Ex tb IIB or IIC Db, mechanical protection degree IP65.

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

Brake motors terminal box are as the scheme:

- frame size 080-112: Use oversized terminal box on motors
- frame size 132: Use standard terminal box on motors
- frame size 160-180: Use standard terminal box on motors + Brake terminal box on brake enclosure
- frame size 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 and 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.

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

For motors and brake motors in addition to nameplates version with Cemp logo, is possible to create a nameplates with Marathon Logo.

The auxiliary terminal boxes are in execution Ex eb (increased safety) and Ex tb (dust protection by enclosure) are made in sheet metal or stainless steel materials AISI304 or AISI316.

The terminal box lid is fixed to the main enclosure body means metallic screws; a gasket is provided between main enclosure's body and terminal box lid to guarantee the protection degree (IP65).

The three-phase asynchronous motor simplified **E*A*******, size 132mm is 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.

This motor is provided with two shields without bearing caps and bearings without greasing system.

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

New electrical rating for temperature class T6, dual speed brake motor: **E3H******* sizes 80 and 132mm, for II2G application.

New electrical rating for temperature class T5 and T100°C three-phase asynchronous motor size 315mm, new Right-Angled adaptors CMP 787 for cable and cable glands and updated stator core length table.

The three-phase asynchronous motor simplified **E*A*******, size 160mm is 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.

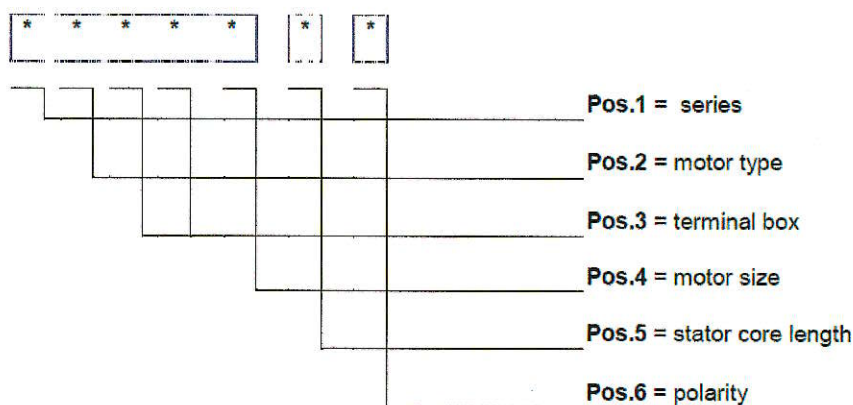
This motor is provided at non drive end side with shield without bearing caps and both bearings are without greasing system.

New frequency range to inverter supply for motors IC411 and IC416 (for special frequency range above 3960 RPM).

New frequency range to inverter supply for motor size 132 without ventilation IC410 (for special frequency range 140Hz).

All the features are describes above for details see test report.

Identification code:



Note:

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

Pos. 1: Motor series

E3AC	Flame proof electric motors for gas group IIC and for dust group IIIC/IIIB
E4AC	E3* Efficiency IE3 Class; E4* Efficiency IE4 Class

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

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

Pos.1bis : Greaser predisposition

Blank	No greaser predisposition (without bearing caps)
i	Greaser predisposition (with bearing caps)

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

1	...	4	Three phase motor double polarity quadratic torque
2	Three phase motor double polarity constant torque	5	Three phase motor for hoist
3	Three phase motor one polarity	7	Three phase motor suitable for frequency converter

Pos. 3: *Terminal box*

0	With standard terminal box	5	Terminal box in Ex eb marking (cast iron)
2	With bigger terminal box (just for frame 80-112)	8	Terminal box enlarged in Ex-eb version (steel)
3	Plate and cable gland 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 attachment A Rev.2		
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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
28	Double polarity : 2/8 poles	81	Double polarity : 8/12 poles
42	Double polarity : 4/24 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.

Code example for motor: **E3AC78 132 MB 4** = Three phase IE3 motor flameproof Ex db eb IIC T4 Gb – Ex tb IIIC T135°C Db, frame size 132, medium iron core, 4 poles (Steel Ex eb terminal box).

Code example no greaser predisposition (without bearing cap) – Frame 132: **E3AC30 132 MB 4** = Three phase motor flameproof Ex db IIC T4 Gb – Ex tb IIIC T135°C Db, frame size 132, medium iron core, 4 pole.

Code example greaser predisposition (with bearing cap) – Frame 132: **E3ACi30 132 MB 4** = Three phase motor flameproof Ex db IIC T4 Gb – Ex tb IIIC T135°C Db, frame size 132, medium iron core, 4 pole.

Code example for Brake motor: **E3HB50 80 MB 28** = Three phase IE3 brake-motor flameproof Ex db IIB T4 Gb – dual speed hoisting motor - frame size 80, long iron core, 2/8 poles.

Code example for Brake motor: **E3HB50 132 MB 21** = Three phase IE3 brake-motor flameproof Ex db IIB T4 Gb – dual speed hoisting motor - frame size 132, long iron core, 2/12 pole

Identification code XD motors series:

The identification code of XD motor series is similar to the identification code of Cemp Motor series, except for Pos.1, in this code position there are the letters "XD" in the middle of the code. (Example "E..XD...").

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
- Duty: S1, S2, S3, S4, S6, S9
- Max rated speed (standard Motors): 3960 r.p.m.
- Special Frequency Range above 3960 rpm according to the table below:

Motor Size (2 poles only)	Frequency Range [Hz]
80 – 132*	5 – 200
132***	140
160 – 250**	5 – 110

* Version IC411 or IC416

** Only version IC416

*** Version IC410 or IC411 or IC416

Allowable ambient temperature range:

-60°C to +60°C;

-60°C to +80°C; (only for IIB)

-60°C to +40°C; (only for E3AB/AC-70/75 280 MB4 motor class T5 IIB/IIC or T100°C IIB/IIC)

-20°C to +40°C; (only for E3HB/HC-50/55 80MB 2/8, E3HB/HC-50/55 132ML 2/12 motor class T6 category II 2G and for E3AB/E3AC-30/35 315S 6 motor class T5 category II 2GD)

-60°C to +80°C; only for motor size 132 IIB without ventilation IC410 (for special frequency range 140Hz) motor class T3

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.

Below the table of temperature class of the motors.

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	T6(**) / T5 100°C Mb	T5 100°C Mb	T5 100°C(*) Mb	T5(**) / 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	T6(**) / T5 100°C Mb	T5 100°C Mb	T5 100°C Mb	T5(**) / T4 125°C(*) Mb	T4 125°C Mb	T4 125°C Mb	T4 125°C Mb	T4 --- Mb	T4 --- Mb
160	T6(**) / T5 100°C Mb	T6(****) / T5 100°C(*) Mb	T6(****) / T5 100°C(*) Mb	T6(****) / T5(**) / T4 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 125°C(*) Mb	T4 --- Mb	T4 --- Mb
180	T6(**) / T5 100°C Mb	T5 100°C(*) Mb	T5(**) / 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	T6(**) / 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 / T5(****) 85°C / 100°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	T6(****) / T5(****) 125°C(*) / 100°C(****) Mb	T6(****) / T4 125°C(*) Mb	T6(****) / T4 125°C(*) Mb	T6(****) / 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.

(**) Providing special construction related to the windings according to manufacturer's documentation at maximum rated power.

(***) 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.

Warning label:

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 T.amb. -20 \ +80°C

"Fasteners A4-80 UNI EN ISO 3506-1" – for T.amb. -60 \ +80°C

"To be energized with cable suitable for temperature - see instructions"

"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".

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Issue 1:

Special conditions for safety use.
Motor electrical ratings.

Issue 2:

New electrical rating for temperature class T6, motor sizes: 160, 250 and 315mm
Motor Identification code for Mining application E3AM****, E4AM*****

Issue 3:

New design of main terminal box with protection type Ex db eb, available in carbon steel or stainless-steel material, for II 2G/D applications and motor sizes 180, 200, 225, 250mm.

Issue 4:

Motor types E3AB/AC-70/75 280 MB4, tested for T5/T100°C for gases/dusts when fed by inverter. See special condition for use.

Issue 5:

New Brake Motors E*D* and E*H* from size 80 to 250, new lamination E1 and E2 for Motors and Brake Motors and new Marathon logo (part of REGAL group) in nameplates.

Issue 6:

New design of main terminal boxes and auxiliary terminal boxes with overall protection type Ex eb and Ex tb, available in carbon steel or stainless-steel material, for II 2G or II 2GD applications for all motors frames.

Issue 7:

The new three-phase asynchronous motor size 132mm simplified, this motor is provided with two shields without bearing caps and bearings without greasing system.

The new series XD is three-phase asynchronous motors and brake motors sizes 80, 90, 100, 112, 132, 160, 180, 200, 225, 250, 280, 315 mm, this motors have shields with strong design and different design of terminal box lid and fan cover.

Issue 8:

New electrical rating for temperature class T6, dual speed brake motor sizes: E3H... 80mm and E3H... 132mm for II2G application.

Issue 9:

New electrical rating for temperature class T5 and T100°C motor size 315mm, new Right-Angled adaptors CMP 787 for cable and cable glands and updated stator core length table.

Issue 10:

The new three-phase asynchronous motor size 160mm simplified, this motor is provided at non drive end side with shield without bearing caps and both bearings are without greasing system. Updated temperature for power cable.

Issue 11:

New frequency range to inverter supply for motors IC411 and IC416 (for special frequency range above 3960 RPM).

Issue 12:

New frequency range to inverter supply for motor size 132 without ventilation IC410 (for special frequency range 140Hz).

(16) Test documents are listed in the test report No. 17 0205845-12

Routine tests:

The manufacturer must perform the required routine tests which includes an overpressure test made according to first method (static) described for the type tests in 15.2.3.2 of EN 60079-1:2014 on each Ex-db motor and/or junction box enclosure (if applicable), applying pressure according to below table:

Item	Material	Ambient temperature T.amb (min.) $\geq -20^{\circ}\text{C}$	Ambient temperature $-60^{\circ}\text{C} \leq \text{T.amb (min.)} < -20^{\circ}\text{C}$	
Motor 80 mm ⁽³⁾	Cast iron EN-GJL-200 (UNI EN 1561)	N / A ⁽¹⁾	N / A ⁽¹⁾	
Motor 90 mm		24.3	24.3	
Motor 100 mm		24.3	24.3	
Motor 112 mm		24.8	24.8	
Motor 132 mm ⁽³⁾		N / A ⁽¹⁾	N / A ⁽¹⁾	
Motor 160 mm ⁽³⁾		N / A ⁽¹⁾	N / A ⁽¹⁾	
Motor 180 mm		22.2	27.0	
Motor 200 mm		22.7	27.8	
Motor 225 mm		23.1	28.5	
Motor 250 mm		24.0	30.0	
Motor 280 mm		28.7	37.8	
Motor 315 mm ⁽³⁾		N / A ⁽²⁾	40.4 bar	
Junction box Motor sizes 80 – 112 Standard			N / A ⁽¹⁾	N / A ⁽¹⁾
Junction box Motor sizes 80 – 112 Oversize			N / A ⁽¹⁾	N / A ⁽¹⁾
Junction box Motor sizes 132 – 160 Standard			N / A ⁽¹⁾	N / A ⁽¹⁾
Junction box Motor sizes 180 – 250 Standard		N / A ⁽¹⁾	N / A ⁽¹⁾	
Junction box Motor sizes 280 – 315 Standard		N / A ⁽¹⁾	N / A ⁽¹⁾	

Junction box Motor sizes 280 – 315 Small		N / A ⁽¹⁾	N / A ⁽¹⁾
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Remarks:

1. Not applicable, due to the positive result of the overpressure test at 4 times the reference pressure.
2. Not applicable, due to the positive result of the overpressure test at 3 times the reference pressure. The routine overpressure testing is replaced by a batch test (according to clause 16.6 of EN 60079-1:2014).
3. Tested samples, see 16TR0111 for motor size 80, see 21TR0010 for motor size 132, see 22TR0021 for motor size 160 and see 16TR0121 for motor size 315 reports.

The manufacturer must perform the required routine tests which includes an overpressure test made according to first method (static) described for the type tests in 15.2.3.2 of EN 60079-1:2014 on each Ex-db motor enclosure (if applicable), for special frequency range above 3960 rpm, to inverter supply (for motor size 80 -132 up to 200 Hz, for motor size 160 – 250 up to 110 Hz), applying pressure according to below table:

Item	Material	Ambient temperature T.amb (min.) ≥ -60°C IIB (H2)	Ambient temperature T.amb (min.) ≥ -60°C IIC
Motor 80 mm ⁽³⁾	Cast iron EN-GJL-200 (UNI EN 1561)	N / A ⁽¹⁾	N / A ⁽²⁾
Motor 90 mm		N / A ⁽²⁾	37.8
Motor 100 mm ⁽³⁾		N / A ⁽²⁾	37.8
Motor 112 mm		N / A ⁽¹⁾	N / A ⁽¹⁾
Motor 132 mm ⁽³⁾		N / A ⁽¹⁾	N / A ⁽¹⁾
Motor 160 mm		22.4	35.1
Motor 180 mm ⁽³⁾		22.4	35.1
Motor 200 mm		27.6	35.1
Motor 225 mm		27.6	35.1
Motor 250 mm ⁽³⁾		27.6	35.1

Remarks:

1. Not applicable, due to the positive result of the overpressure test at 4 times the reference pressure.
2. Not applicable, due to the positive result of the overpressure test at 3 times the reference pressure. The routine overpressure testing is replaced by a batch test (according to clause 16.6 of EN 60079-1:2014).
3. Tested samples, see 24TR0001 for motor size 80, see 24TR0002 for motor size 100, see 23TR0015 for motor size 132, see 23TR0026 for motor size 180 and see 23TR0027 for motor size 250 reports.

Manufacturer shall carry out the routine overpressure test with the static method (clause 16.1.2) on the brake enclosure and his junction box's enclosures at the following pressure values:

Item	Material	Ambient temperature T.amb (min.) ≥ -20°C	Ambient temperature -60°C ≤ T.amb (min.) < -20°C
Motor 80 mm	Cast iron EN-GJL-200 (UNI EN 1561)	N / A ⁽¹⁾	N / A ⁽¹⁾
Motor 90 mm		N / A ⁽¹⁾	N / A ⁽¹⁾

Motor 100 mm		N / A ⁽¹⁾	N / A ⁽¹⁾
Motor 112 mm		N / A ⁽¹⁾	N / A ⁽¹⁾
Motor 132 mm ⁽⁴⁾		N / A ⁽¹⁾	N / A ⁽¹⁾
Motor 160 mm		N / A ⁽¹⁾	N / A ⁽¹⁾
Motor 180 mm ⁽⁴⁾		N / A ⁽¹⁾	N / A ⁽¹⁾
Motor 200 mm		N / A ⁽¹⁾	N / A ⁽²⁾
Motor 225 mm ⁽⁴⁾		N / A ⁽¹⁾	N / A ⁽²⁾
Motor 250 mm		N / A ⁽¹⁾	N / A ⁽²⁾
Junction box ⁽³⁾ For Brake sizes 160 – 180		N / A ⁽¹⁾	N / A ⁽¹⁾
Junction box ⁽³⁾ For Brake sizes 200 – 250		N / A ⁽¹⁾	N / A ⁽¹⁾

Remarks:

1. Not applicable, due to the positive result of the overpressure test at 4 times the reference pressure.
2. Not applicable, due to the positive result of the overpressure test at 3 times the reference pressure. the routine overpressure testing is replaced by a batch test (according to clause 16.6 of IEC 60079-1);
3. Tested samples, see ExTR No. HR/EXA/ExTR17.0001/00 and EXA16TR0111, EXA16TR0112 and EXA16TR0121 reports.
4. Tested samples, see 18TR0084 and 19TR0024, 19TR0026 and 19TR0028 reports

Motor with Ex-eb junction box:

A dielectric strength test shall be carried out on Ex-eb junction box in accordance with 6.1 of EN IEC 60079-7:2015/A1:2018, with voltage $(2U_n+1000)V$ in period of at least 60 s or $1.2x(2U_n+1000)V$ at least 100 ms.

(17) Special conditions for safe use

- The flame-paths are specified in the manufacturer 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 $1500V/\mu s$ 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 installation zone.
- 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 must be used – see safety instructions.
- 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:

- o Max. 120°C for temperature class T4/T125°C/T135°C
- o 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%.
- 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, suitable adaptors CMP 787 and 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 $\geq -50^{\circ}\text{C}$.
- Schedule of limitation and the special conditions for safety use of all equipment/Ex-component used must be observed and fulfilled according to its own certificates.

(18) Essential Health and Safety Requirements

No additional ones. Assured by compliance with the standards set out in the [9].