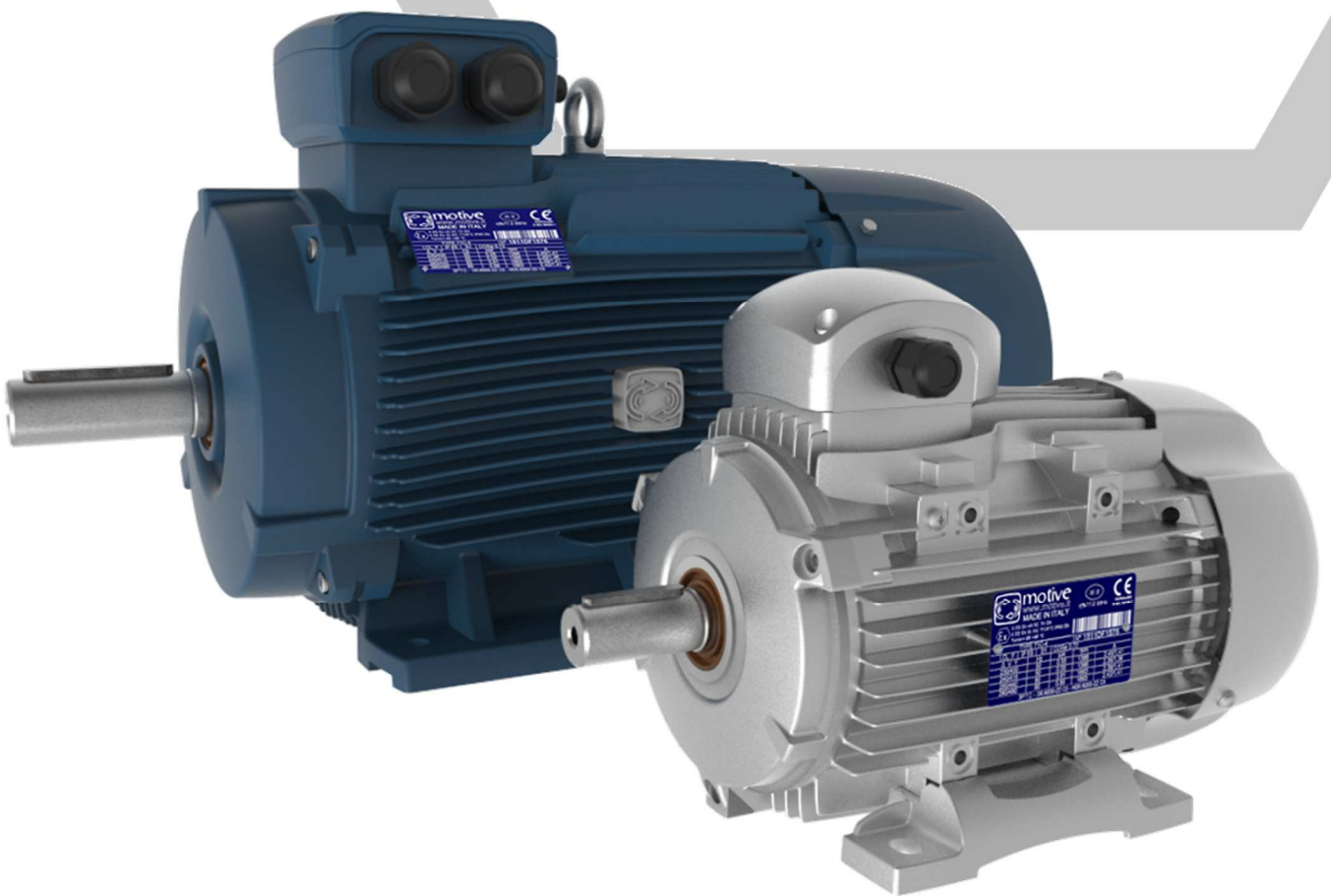


motive

manual addendum

# DELPHI Ex





**II 2G Ex eb IIC TX Gb**  
**II 2D Ex tb IIIC TXXX°C Db**  
**Tamb=-20 +XX °C**

**TX= T6-T5-T4-T3**

**TXXX°C= 85°C(T6)-100°C(T5)-120°(T4-T3)**

**XX°C=(40-45-50-55-60)°C**

#### Reference list:

Norm (last issue)	Title
Dir. 2014/34/EU	Equipment and Protective systems intended for use in Potentially Explosive Atmospheres. Safety requirements
IEC 60034-5:2000/A1:2006	Rotating electrical machines – Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) – Classification Internal methods Tests not related to standards, developed by laboratory or under client's specification
EN IEC 60079-0:2018	Explosive atmospheres – Part 0: Equipment – General requirements
IEC 60079-7:2015+AMD1:2017	Explosive atmospheres – Part 7: Equipment protection by increased safety “e”
IEC 60079-31:2014	Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure “t”
IEC 60204-1:2005	Safety of machinery – Electrical equipment of machines – Part 1: General requirements

#### Field of application

The person authorized to do the work is responsible for the zones sharing. He must follow the norms EN 60079-31, EN60079-14, EN 60079-17 and EN 60079-19 (whenever their application is possible) when choosing the suitable motor. The eventual dust deposits mustn't have a thickness > 5mm.

#### Conformity declaration

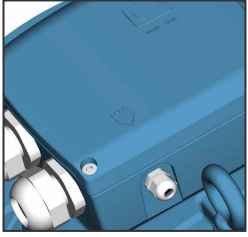
The conformity declaration reported in this addendum, is the document that testifies the product conformity to the Directive 2014/34/EU.

The validity of such certificate is related to the respect of the instructions specified in the use and maintenance manual, together with the following additional instructions.

#### Further instructions for commissioning, use and maintenance.

The persons authorized to do the work in an ambient exposed to explosion risk must be instructed about the right procedure for the use of the motor, respecting all norms related to safety, installation and use.

Motors must be protected against over-heating by suitable control means that must be chosen, considering the working conditions, according to the norm EN60079-7, EN60079-0 and EN60079-31.



All Motive Delphi-Ex motors are equipped as standard with temperature probes (3 PTC thermistors with intervention degree calibrated based on the temperature class and the maximum ambient operating temperature), to be connected to a suitable release device as per EN 50495 regulation.

**It is forbidden to open the motor to connect the electrical cables or to carry out other operations in the presence of an explosive atmosphere. Before each opening, disconnect the motor from the electrical network and secure it against accidental restart.**

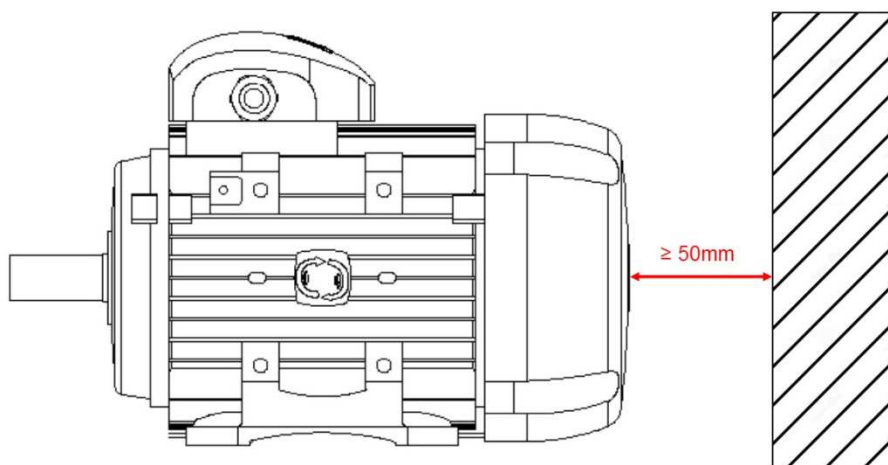
The permitted service of the motors is: S1-S2-S3-S4-S5-S6-S7-S8-S9.

The motors can be powered by any type of frequency converter in compliance with the nameplate parameters.

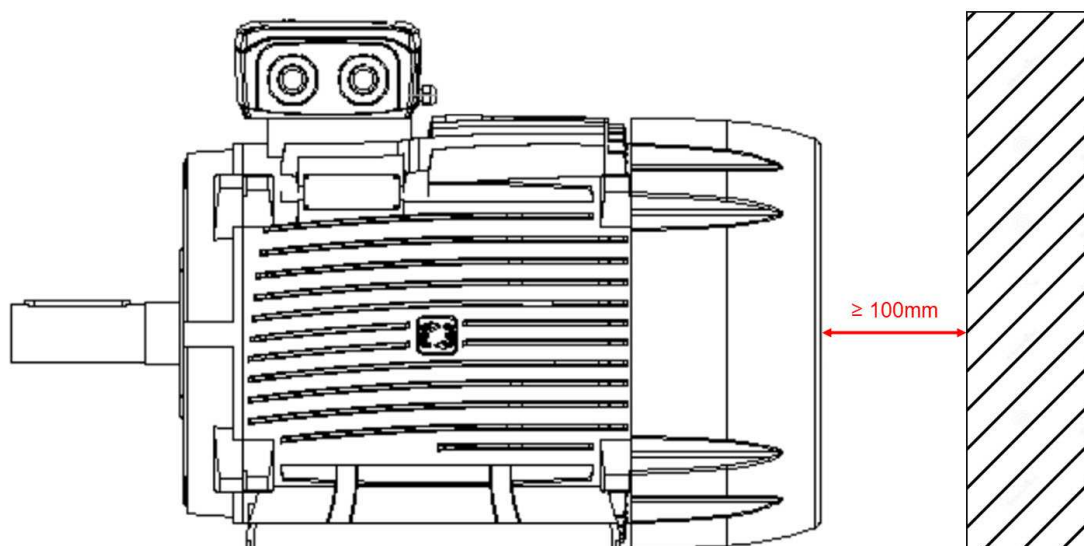
The special condition referring to the mandatory use of PTC is in function of the following:

- In the case of mains power supply (DOL), the internal temperature sensors must be connected to a suitable tripping device in order to create a system compliant with the EN50495 standard with:
  - Hardware fault tolerance EUC = 0;
  - Safety integrity level SIL = 1 (with reference to the EN 61508 standard)
- For VFD power supply, the internal temperature sensor must be connected:
  - directly to the inverter terminals
  - or as per DOL installation.

For correct motor ventilation, it's recommended to maintain a minimum distance from walls or obstructions equal to 50mm for motors from size 56 to 160 and 100mm from size 180 to 355.



Motors size 56÷160



Motors size 180÷355

The earthing must be done (using the supplied galvanized screw and spring washer) both inside the terminal box (fig.1) and at the appropriate fixing on the casing (fig.2).

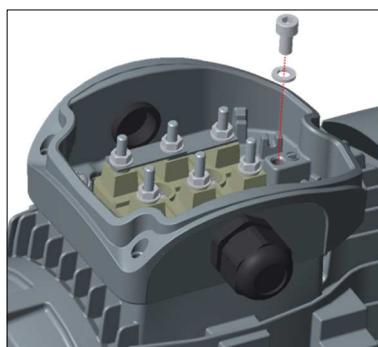


fig.1

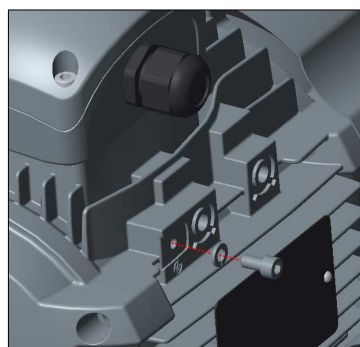


fig.2

The cross-section of the earth wire connected to the motor casing must have a cross-section as per table 12 (EN 60079-0):

**Table 12 – Minimum cross-sectional area of PE conductors**

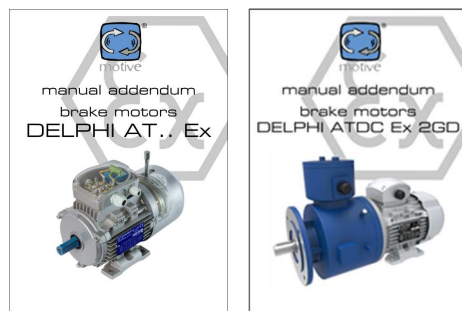
Cross-sectional area of phase conductors, $S$ mm <sup>2</sup>	Minimum cross-sectional area of the corresponding PE conductor, $S_p$ mm <sup>2</sup>
$S \leq 16$	$S$
$16 < S \leq 35$	16
$S > 35$	0,5 $S$

For proper tightening of terminal block nuts and grounding screws, please refer to the table below.

	M4	M5	M6	M8	M10	M12	M16	M20
Nm	2	3,2	5	10	20	35	65	100-110

### Brake motors

See separate ATEX manual addendum for Motive brake motors.



### Use with inverters

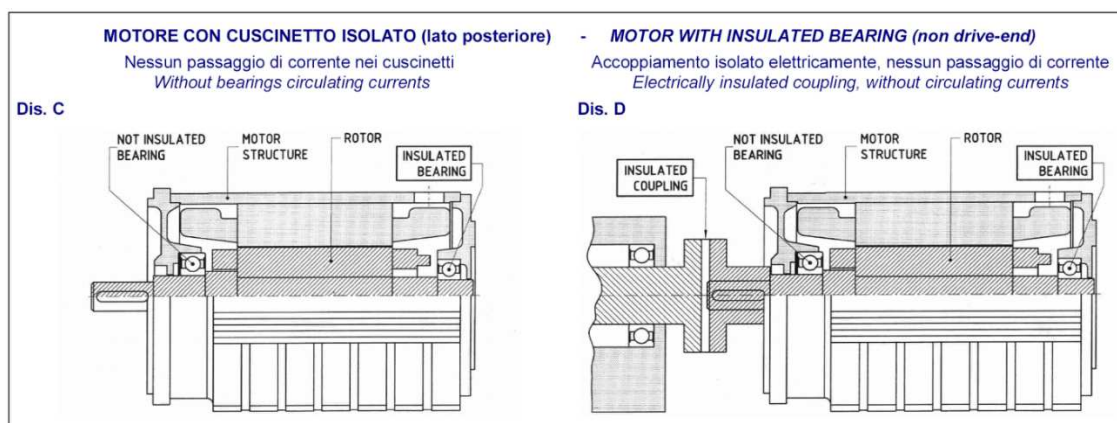
When using Delphi-Ex motors with inverters, in addition to the general selection criteria (limit values: nominal voltage <830V, peak voltage <2.2kV, voltage gradients <2.2kV/1μs), the following elements must be taken into consideration:

- Motors powered by an inverter have a voltage (or current) that is not purely sinusoidal. This causes an increase in losses, vibrations, noise and a different thermal balance of the motor.
- The possibility of peaks is linked to the value of the inverter supply voltage and the length of the motor power cable. To limit the phenomenon, we recommend using special filters connected between the inverter and the motor (mandatory for motor power cables longer than 50 m). All Delphi-Ex motors are equipped as standard with a Nomex reinforcing separator film between the phases to protect against voltage peaks.

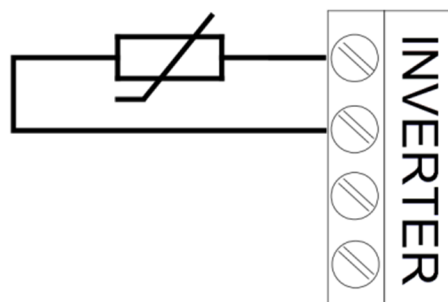
- Proper grounding of the motor and the driven machine is very important to avoid voltages and parasitic currents in the bearings.

To avoid the circulation of current in the bearing if the motor is not equipped with an insulated bearing, use a suitable filter to reduce the high-frequency harmonic voltage above 50kHz.

- Motors with power from 110kW must be equipped with an insulated bearing. The coupling with the machine must be insulated.



- It's mandatory connect thermal probes to the converter to safeguard the motor from the overheating which could be generate by a misuse.

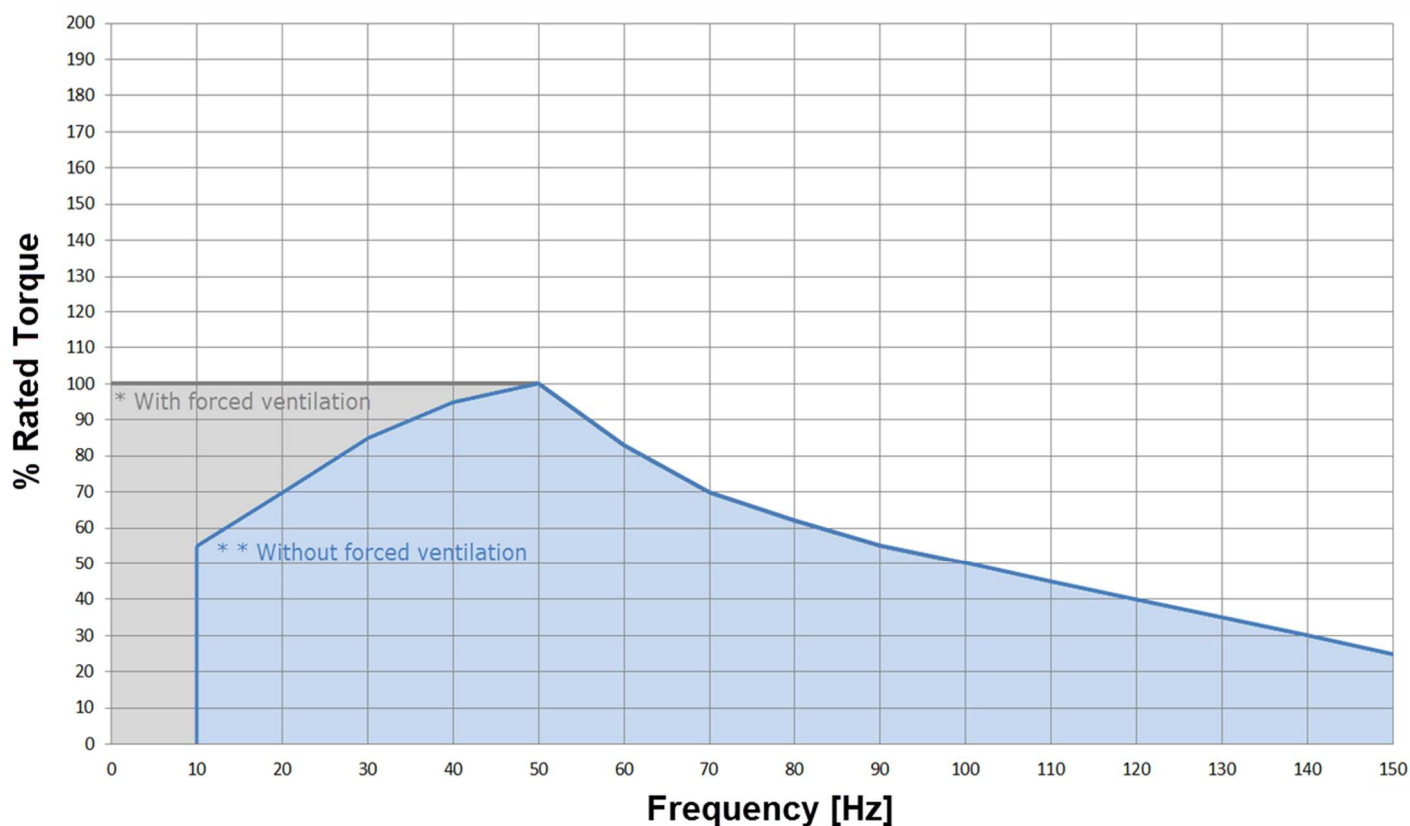


These temperature probes have two terminals for connection identified with a label and located inside the main terminal box.

- For inverter power supply, the switching frequency must be greater than 4kHz (PWM type), output frequency range equal to 0÷120Hz for 2-pole motors / 0÷150Hz for 4-6-8-pole motors
- It is mandatory to install ATEX servo-ventilation if the motor is used at frequencies lower than 50Hz at constant load torque. Motive provides its ATEX certified servo-ventilation.

II 2G Ex IIC T4 Gb  
 II 2D Ex IIIC T135°C Db  
 Tamb=-20 +40 °C

If the motor is operated at frequencies below 50Hz at quadratic load torque, refer to the following graph for the maximum allowable load torque percentage.



For motor Speed/Torque curves, refer to following link: <https://www.motive.it/en/rapporti.php>

### Installation precautions.

When installing the motor, it is advisable to follow the instructions below:

- check that there has been no damage during transport.
- adequately clean the system components from packaging residues and any protective products.
- check that the supply voltage value stamped on the motor nameplate coincides with the mains voltage.
- the paint must not affect the contact surfaces of the equipotential connections and the identification plate.
- install the motor on a flat surface.
- make sure that the feet or flange are well tightened and that, in the case of a direct joint, the motor is perfectly aligned.
- rotate the shaft manually to check that there are no sliding noises.
- check the direction of rotation with the transmission disengaged.
- fit (extract) the driven elements (e.g. pulley for belt transmission, joint, etc.), only using special devices (hot fitting). Avoid unauthorized tension on the pulley.



- do not obstruct ventilation. Exhausted air, including that from other units, must not be immediately re-aspirated.
- check that the motor is properly earthed.

**Maintenance warnings: clean the motor only with a wet or antistatic cloth.**

### Electrical and thermal protections

Protections must be chosen based on the specific running conditions, according to standards EN60079-14 and EN61241-14.

#### External protections\*:

- Protection against overcurrent and short-circuits; this protection can be made with the magnetothermic circuit breaker or with fuses; these must be calibrated on the motor current.
- Protection against overload by thermal relay that controls a power line contactor upstream the motor.
- If the application requires, protection against excessive speed of the electric motor, for example if the mechanical load may drive the electric motor itself and thereby create a hazardous situation.
- If special conditions or synchronised operation with other machines or parts of machines require it, protection against power failures or dips by means of a minimum voltage relay that controls an automatic power knife switch.

\*Note: An EN 50495 compliant motor thermal protector is required\*\*. A thermal relay is not enough.

#### \*\*Internal protections:

The electrical protections present on the motor power line may be insufficient to ensure protection from overloads, and it is therefore necessary to overcome this inconvenience by connecting the thermal protections present on the windings:

- PTC thermistor (device that positively varies its resistance suddenly once the intervention temperature is reached).

All Motive Delphi-Ex motors are equipped with 3 PTC thermistors as standard.

### Power cable entry (DELPHI 3PH EX)

Motor Type	56	63-100	112	132	160-180	200-225	250-355	400
Cable gland / cap as standard	2xM16	2xM20	2xM25	2xM32	2xM40	2xM50	2xM63	3xM63
Cable gland services as standard	/	/	/	/	1xM16	1xM16	1xM16	1xM16
Auxiliary inlet cable gland*	/	1xM16	1xM16	1xM16	/	/	/	/

\* with larger connection box: on request, or as standard with the addition of heaters, PT100 or for ATDC motors.



## Bearings lubrication

Motors with self-lubricated shielded bearings "ZZ" (standard up to size 280 included) do not require periodic lubrication.

The life of the bearings varies from 3 to 5 years depending on the axial and radial loads applied to the shaft and according to the environmental conditions of use of the motor.

Motors provided with the bearing lubrication device must be lubricated with the motor running according to the lubrication intervals and the quantity indicated in table 1.

On special roller bearings "NU-NJ" and non-standard angular contact bearings "7.." the lubrication intervals in table 1 are halved.

The lubrication intervals are also halved for motors powered by inverters, due to vitrification of the grease due to the passage of current between the rotor and stator.

For this reason, insulated bearings (special version) are recommended for these inverter-powered motors, especially on motors with power  $\geq 110\text{kW}$ .

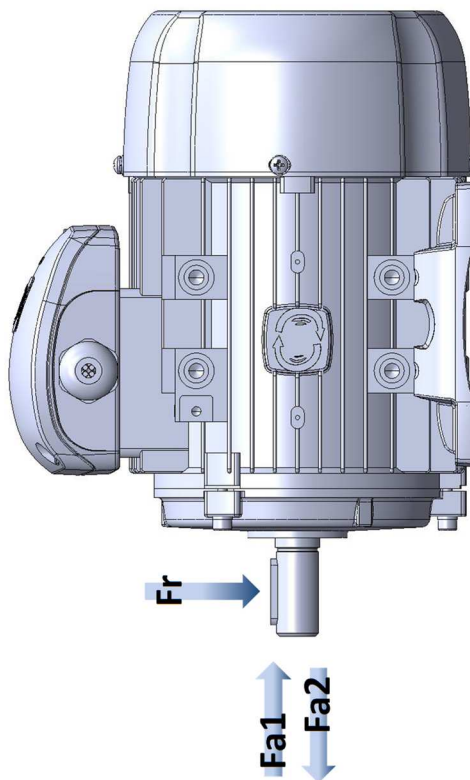
Lithium or polyurea grease with mineral base oil suitable for a maximum operating temperature of at least  $190^{\circ}\text{C}$  can be used

**Tabella 1**

Motor Size	Grease quantity [g]		Lubrication intervals in operation hours			
	2 POLES	4-6-8 POLES	2 POLES	4 POLES	6 POLES	8 POLES
80	10	10	5000	10000	15000	20000
90	12	12	5000	10000	15000	20000
100	14	14	4800	9600	14400	19200
112	14	14	4800	9600	14400	19200
132	15	15	4400	8800	13200	17600
160	20	20	4000	8000	12000	16000
180	25	25	3800	9300	12400	15200
200	25	25	3800	9300	12400	15200
225	25	25	3800	8900	12200	14800
250	30	30	3100	4100	5900	6900
280	32	40	800	3900	5600	6700
315	36	45	800	2300	4100	5100
355	45	60	700	2000	4000	4500

## Maximum radial and axial loads

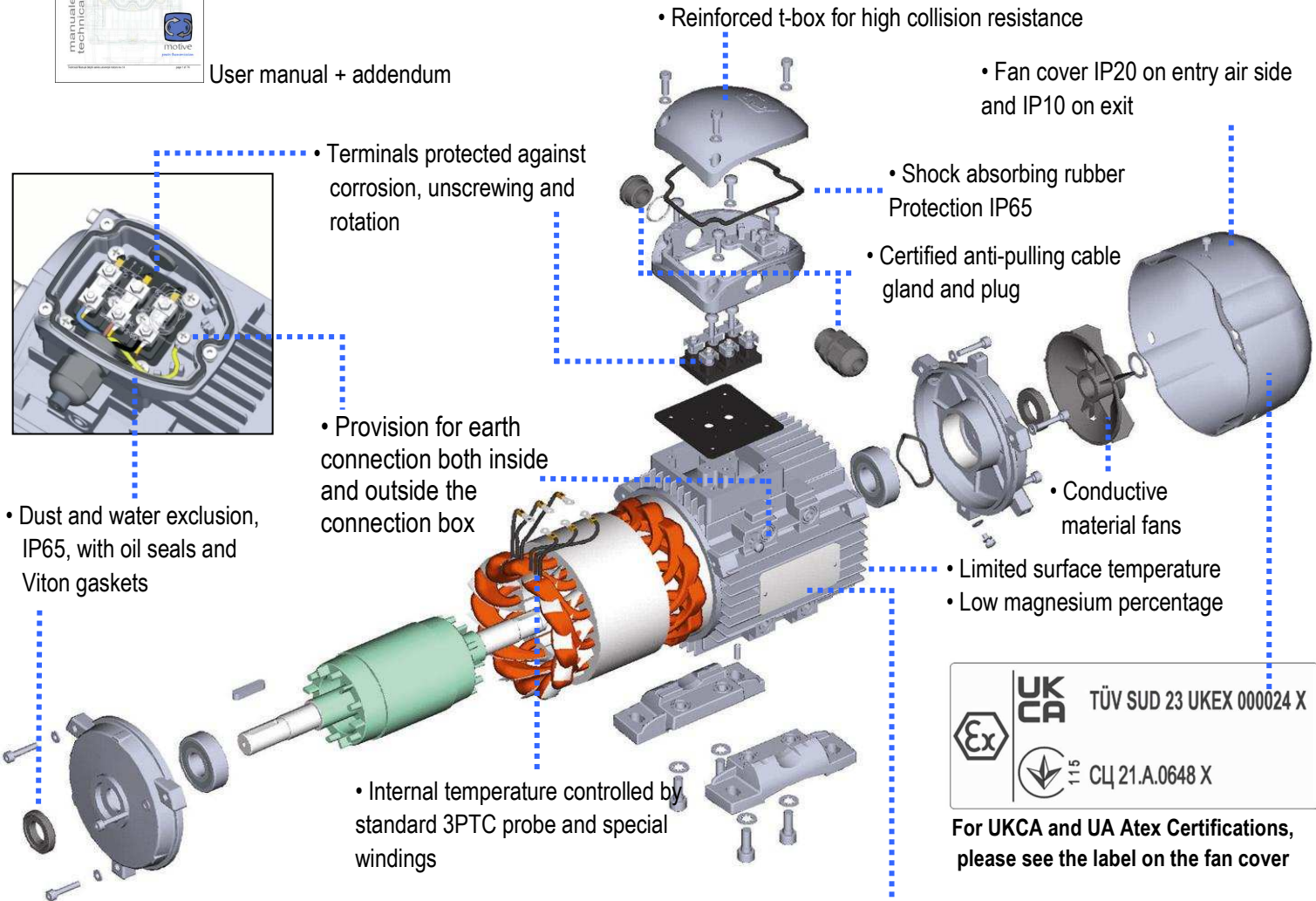
	standard						special for higher axial load						special for higher radial load							
	Fr [N] standard			Fa1 / Fa2 [N] standard			Fa1 / Fa2 [N]			Fa1 / Fa2 [N] special option			dynamic Fr [N]			special option				
	3000rpm	1500rpm	1000rpm	750rpm	3000rpm	1500rpm	1000rpm	750rpm	3000rpm	1500rpm	1000rpm	750rpm	3000rpm	1500rpm	1000rpm	750rpm	3000rpm	1500rpm	1000rpm	750rpm
56	275	360			120	160			380	500										
63	300	375			120	160			380	500										
71	330	410	480	500	200	250	300	320	640	800	960	1000								
80	550	690	800	900	260	340	400	460	880	1160	1370	1440	1110	1390	1560	1810				1810
90	600	770	880	980	340	460	570	650	1480	2000	2480	2080	1260	1620	1810	2060				2060
100	880	1100	1250	1400	480	590	750	850	1960	2410	3070	2900	1760	2200	2470	2800				2800
112	1000	1200	1400	1500	480	590	750	850	1960	2410	3070	2900	2000	2400	2690	3000				3000
132	1350	1700	1950	2200	600	1000	1300	1500	1110	1840	2390	6130	2580	3250	3640	4200				4200
160	2300	2700	3000	3200	1300	1500	1900	2200	1990	2290	2900	8880	4240	4970	5570	5890				5890
180	3000	4000	4600	5300	2400	2700	3000	3300	3560	4000	4450	6070	5750	7670	8590	10160				10160
200	3800	4800	5500	5500	3000	3900	4800	4800	3700	4810	5920	7320	5750	7260	8130	9080				9080
225	4200	5200	6000	6000	3600	4900	5700	5700	5400	7350	8550	8450	6130	7590	8500	9640				9640
250	4800	6000	6000	6000	4100	5500	6500	6500	5930	7950	9390	8010	7300	9120	10210	11550				11550
280	4800	7800	6900	6900	4200	6800	6800	6800	6070	9830	9830	10200	9790	15900	17810	19980				19980
315	5800	15000	15000	17500	4600	7000	7000	7000	6580	10000	10000	10120	11300	14950	16740	18930				18930
355	7700	19000	19000	19000	5800	7200	7200	7200	7740	9600	9600	10400	22650	25970	25970	32890				32890
400	9000	20500	20500		7300	12500	14600		9960	17050	19910		26590	35490	35490					



## PECULIAR FEATURES OF DELPHI Ex MOTORS



User manual + addendum



For UKCA and UA ATEX Certifications, please see the label on the fan cover

Manufacturer's mark

Protection against explosion

Motor type

IP Protection index

3PTC probe

SEE THE MANUAL

CE 0948 TÜV IT 20 ATEX 048 X

Notified body number

ATEX certificate number

YYMM production date


Serial number

TYPE 80L-2		N°		
I.C.L.F	IP 65	S1	COSφ	I <sub>A</sub> /I <sub>N</sub>
Δ.V.V.	Hz	kW	rpm	A
230/400	50			
240/415	50			
260/440	60			
280/480	60			
3PTC		- DE:	- NDE:	- T <sub>cab</sub> 90°C

## DELPHI Ex CLASSIFICATION


 For GAS **G**

(with Tamb=-20 +60°C)

CE		II	2	G	Ex	eb	IIC	T4	Gb
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
① CE marking									
② ATEX code for prevention of explosion									
③ Surface industries									
④ An area where explosive atmospheres may be present during normal operations (Zone 1)									
⑤ Protection against gas combustion									
⑥ Explosion protection: International									
⑦ Increased safety									
⑧ For instance, for Hydrogen. Equipment marked as suitable for Group IIC is also suitable for IIB and IIA									
⑨ For example, T4 for maximum temperature of 135°C. Also certified for Temperature Class: T6 (max85°C), T5 (max100°C), T3 (max200°C).									
⑩ Extended level of protection in hazardous zones with explosive gas mixtures									

 For DUST **D**

(with Tamb=-20 +60°C)

CE		II	2	D	Ex	tb	IIIC	T120°C	Db
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
① CE marking									
② ATEX code for prevention of explosion									
③ Surface industries									
④ An area where explosive atmospheres may be present, in the form of a flammable cloud of dust in the air, during normal operations (Zone 21)									
⑤ Protection against dust combustion									
⑥ Explosion protection: International									
⑦ Enclosure protection									
⑧ For conductive dust. Equipment marked as suitable for Group IIIC is also suitable for IIIB and IIIA									
⑨ For example, Maximum surface temperature of 120°C in class T4-T3; 85°C class T6, 100°C class T5									
⑩ Extended level of protection in flammable dust atmospheres									



Motive s.r.l.  
Via Le Ghiselle, 20  
25014 Castenedolo (BS)  
Tel.: +39 030 2677087  
Fax: +39 030 2677125  
motive@motive.it  
www.motive.it

## Declaration of EU Conformity

Motive srl based in Castenedolo (BS) - Italy

declares as manufacturer, under its own exclusive responsibility, that its range of

**asynchronous electric motors of the series "DELPHI"**

complies with the following directives and standards:

- EC Directive 2014/34/EU: concerning "equipment and Protective systems intended for use in Potentially Explosive Atmospheres"

Marking:



II 2G Ex eb IIC T6..T3 Gb  
II 2D Ex tb IIIC T120°C..T85°C Db

Certificate Number (edit by TÜV Italia, Notified Body Number 0948):  
TÜV IT 20 ATEX 048 X Rev 1

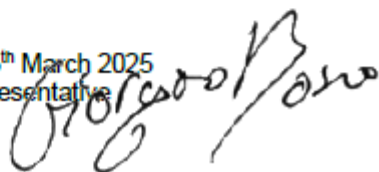
as in accordance to the European Standards:

- IEC 60034-5:2000/A1:2006 Rotating electrical machines – Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code) – Classification Internal methods Tests not related to standards, developed by laboratory or under client's specification
- EN 60079-0:2018 Explosive atmospheres – Part 0: Equipment – General requirements
- EN 60079-7:2015+AMD1:2017 Explosive atmospheres – Part 7: Equipment protection by increased safety "e"
- EN 60079-31:2014 Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure "t"
- IEC 60204-1:2005 Safety of machinery – Electrical equipment of machines – Part 1: General requirements

The machines are supplied without electrical connections to the control panels or any pneumatic and hydraulic supply connections.

It is therefore forbidden to use them until the plant into which they are incorporated has been declared as compliant with the provisions of the Machinery Directive 2006/42/EC and Directive 2014/34/EU and plant's analysis was not done as compliant with Directive 99/92/EC.

Castenedolo, 5<sup>th</sup> March 2025  
The legal Representative



# CERTIFICATE

CERTIFICAT

CERTIFICADO

СЕРТИФИКАТ

認證證書

CERTIFICATE

ZERTIFIKAT

[1] **EU-TYPE EXAMINATION CERTIFICATE**

[2] **Equipment or Protective System intended for use  
in potentially explosive atmospheres  
Directive 2014/34/EU**

[3] EU-Type Examination Certificate number:

**TÜV IT 20 ATEX 048 X Rev 1**

[4] Equipment or Protective System: **Three-phase asynchronous electric motors DELPHI series**

[5] Manufacturer: **MOTIVE S.r.l.**

[6] Address: **Via Le Ghiselle 20  
I-25014 CASTENEDOLO (BS) ITALY**

[7] This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

[8] TÜV Italia, notified body no. 0948 in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 28 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report no. R 20 EX 048 Rev. 1.

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

**EN IEC 60079-0:2018 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 and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

[12] The marking of the product shall include the following:



**II 2G Ex eb IIC T6..T3 Gb  
II 2D Ex tb IIIC T85°C..T120°C Db**

This certificate may only be reproduced in its entirety and without any change, schedule included.

Issue date: 12<sup>th</sup> March 2025

1<sup>st</sup> Issue date: 17<sup>th</sup> February 2021



PRD N° 081B

Membro degli Accordi di Mutuo Riconoscimento  
EA, IAF e ILAC  
Signatory of EA, IAF and ILAC Mutual  
Recognition Agreements



**TÜV Italia S.r.l.  
Notified body N° 0948**

*Alberto Garelli*

**Industry Service - Real Estate & Infrastructure  
Managing Director**

TÜV Italia has been authorized by Italian government to operate as notified body for the certification of equipment or protective system intended for use in potentially explosive atmospheres. This document is not valid without official signature and logo. The internal reference code is 722337347.

page 1 di 14



Italia

# NOTIFICATION

[1] **PRODUCT QUALITY ASSURANCE NOTIFICATION**

[2] **Equipment or Protective System or Component intended for use  
in potentially explosive atmospheres  
Directive 2014/34/EU**

[3] Notification number:

**TÜV IT 21 ATEX 021 Q**

[4] Equipment or Component as listed: Electric Motor, Frequency Converter

Protection concepts: "e" and "t"

[5] Manufacturer: MOTIVE S.r.l.  
Via Le Ghiselle, 20  
I-25014 Castenedolo (BS) - ITALIA

[6] Sites audited: identical

[7] TÜV Italia, notified body no. 0948 in accordance with the Council Directive 2014/34/EU of 26 February 2014, notifies that the manufacturer has a product quality assurance system which complies to Annex VII of the Directive.

[8] This notification is based on audit report no. R 21 EX 015 issued on 02.03.2021

This notification can be withdrawn if the manufacturer no longer satisfies the requirement of Annex VII.

Results of periodical re-assessment of the quality system are a part of this notification.

[9] This notification is valid until <01.03.2024> and can be withdrawn if the Manufacturer does not satisfy the production quality assurance re-assessment.

[10] According to Article 16 paragraph 3 of the Directive 2014/34/EU the CE marking shall be followed by the identification no. 0948 identifying the notified body involved in the production control stage.

This notification may only be reproduced in its entirety and without any change.

First issue date: 26.03.2021

Issue date: 26.03.2021



PRD N° 081B

Membro degli Accordi di Mutuo Riconoscimento  
EA, IAF e ILAC  
Signatory of EA, IAF and ILAC Mutual  
Recognition Agreements



**TÜV Italia S.r.l.**  
**Notified Body N° 0948**



**Alberto Carelli**

**Industry Service - Real Estate & Infrastructure  
Managing Director**

TÜV Italia has been authorized by Italian government to operate as notified body for the certification of equipment or protective system intended for use in potentially explosive atmospheres. This document is not valid without official signature and logo. The internal reference code is 722223318

page 1 of 2

PEX-01-M011\_r10 del 07/08/2018

TÜV Italia • Gruppo TÜV SÜD • Via Carducci 125, Pal. 23 • 20099 Sesto San Giovanni (MI) • Italia • www.tuvsud.com/it



CERTIFICAT

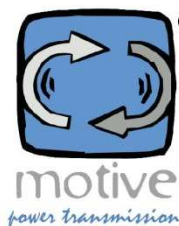
CERTIFICADO

СЕРТИФИКАТ

認證證書

CERTIFICATE

ZERTIFIKAT



Motive s.r.l.  
Via Le Ghiselle, 20  
25014 Castenedolo (BS)  
Tel.: +39 030 2677087  
Fax: +39 030 2677125  
motive@motive.it  
www.motive.it

## Декларация соответствия UA

Motive srl с главным офисом в Castenedolo (BS) – Italy (Италия)

заявляет как производитель под свою исключительную ответственность, что его продукция

### асинхронные электродвигатели серии «DELPHI»

соответствует следующим директивам и стандартам:

- Директива ЕС **2014/34/UE**: относительно «оборудования и защитных систем, предназначенных для использования в потенциально взрывоопасных средах»

Маркировка:



II 2G Ex eb IIC T4 Gb  
II 2D Ex tb IIC T135°C Db  
Tamb=-20 +40 °C

Маркировка\*:



II 2G Ex eb IIC T3 Gb  
II 2D Ex tb IIC T135°C Db  
Tamb=-20 +50 °C

\* Маркировка применима только к двигателям DELPHI Ex IE3

### Номер сертификата

(отредактировал СЕРТИС-ЦЕНТР, номер нотифицированного органа UA.TR.115): **СЦ 21.A.0648 X**

как по украинским стандартам:

- **ДСТУ EN 60079-0:2017 (ЗІ ЗМІНОЮ 11:2017)** Взрывоопасные среды. Часть 0. Оборудование. общие требования
- **ДСТУ EN 60079-7:2017** Взрывоопасные среды. Часть 7. Электрическое оборудование. Вид взрывозащиты: повышенная безопасность «е»
- **ДСТУ EN 60079-31:2017** Взрывоопасные среды. Часть 31. Электрическое оборудование. Вид защиты от воспламенения пыли: оболочка «t»

Машины поставляются без электрических подключений к панелям управления или без каких-либо пневматических и гидравлических подключений.  
Поэтому запрещено использовать их до тех пор, пока завод, в который они включены, не будет объявлен соответствующим положениям Директивы по машинному оборудованию **2006/42/ЕС** и Директивы **2014/34/UE**, а анализ предприятия не был проведен как соответствующий Директиве **99/92/ЕС**.

Castenedolo, 11 мая 2021 г.  
Юридический представитель

