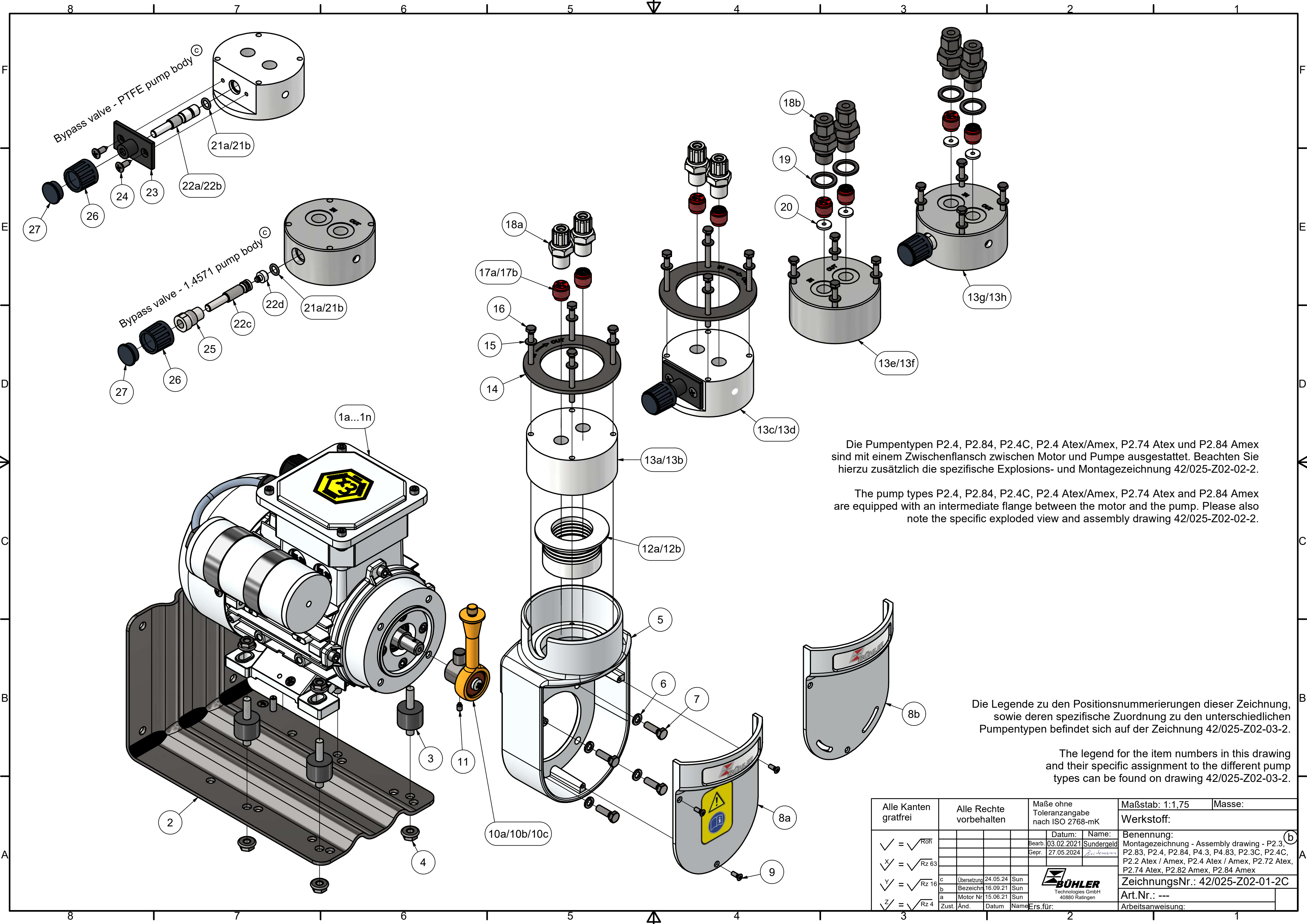


10 Beigefügte Dokumente

- Zeichnungen: 42/025-Z02-01-2, 42/025-Z02-02-2; 42/025-Z02-03-2
- EU-Konformitätserklärung: KX420010
- IECEx Zertifikat: IECExIBE24.0022X
- O₂-Erklärung: B#420025
- Betriebsanleitung: Elektromotor
- Bescheinigungen: Konformitätserklärung Motorhersteller
EPT 17 ATEX 2588 X
IECEx EUT 14.0001X
- Beständigkeitsliste
- RMA - Dekontaminierungserklärung



Die Pumpentypen P2.4, P2.84, P2.4C, P2.4 Atex/Amex, P2.74 Atex und P2.84 Amex sind mit einem Zwischenflansch zwischen Motor und Pumpe ausgestattet. Beachten Sie hierzu zusätzlich die spezifische Explosions- und Montagezeichnung 42/025-Z02-02-2.

The pump types P2.4, P2.84, P2.4C, P2.4 Atex/Amex, P2.74 Atex and P2.84 Amex are equipped with an intermediate flange between the motor and the pump. Please also note the specific exploded view and assembly drawing 42/025-Z02-02-2.

Die Legende zu den Positionsnummerierungen dieser Zeichnung, sowie deren spezifische Zuordnung zu den unterschiedlichen Pumpentypen befindet sich auf der Zeichnung 42/025-Z02-03-2.

The legend for the item numbers in this drawing and their specific assignment to the different pump types can be found on drawing 42/025-Z02-03-2.

Alle Kanten gratfrei		Alle Rechte vorbehalten		Maße ohne Toleranzangabe nach ISO 2768-mK		Maßstab: 1:1,75		Masse:			
						Werkstoff:					
✓ = √R0f					Datum:	Name:	Benennung: Montagezeichnung - Assembly drawing - P2.3, P2.83, P2.4, P2.84, P4.3, P4.83, P2.3C, P2.4C, P2.2 Atex / Amex, P2.4 Atex / Amex, P2.72 Atex, P2.74 Atex, P2.82 Amex, P2.84 Amex ZeichnungsNr.: 42/025-Z02-01-2C Art.Nr.: ---				
					Bearb.	03.02.2021				Sundergeld	
✓x = √Rz 63					Gepr.	27.05.2024					
✓y = √Rz 16	c	Übersetzung	24.05.24	Sun	 BÜHLER Technologies GmbH 40880 Ratingen						
	b	Bezeichn	16.09.21	Sun							
✓z = √Rz 4	a	Motor Nr	15.06.21	Sun							
	Zust.	Änd.	Datum	Name	Ers.für:		Arbeitsanweisung:				

Zeichnungsnummer/Drawing no. 42/025-Z02-03-2 Rev.D Date: 10.01.2025 Autor: Sundergeld			Legende und spezifische Zuordnung der Positionsnummern aus den Montagezeichnungen 42/025-Z02-01-2 & 42/025-Z02-02-2															
Änderung: D = Übersetzung vertauscht => Beschreibung/Description Geprüft am:13.01.2025 Prüfer: <i>B. W. G. G.</i>			Legend and specific assignment for the item numbers of the assembly drawings															
Pos. No.	Beschreibung	Description	P2.3	P2.83	P2.4	P2.84	P4.3	P4.83	P2.3C	P2.4C	P2.2 Atex	P2.2 Amex	P2.4 Atex	P2.4 Amex	P2.72 Atex	P2.74 Atex	P2.82 Amex	P2.84 Amex
1a	Motor 230V 50/60Hz	Motor 230V 50/60Hz	X	X	X	X	---	---	X	X	---	---	---	---	---	---	---	---
1b	Motor 115V 50/60Hz	Motor 115V 50/60Hz	X	X	X	X	---	---	X	X	---	---	---	---	---	---	---	---
1c	Motor 230/400V 50/60Hz	Motor 230/400V 50/60Hz	X	X	X		---	---	X	X	---	---	---	---	---	---	---	---
1d	Motor 230V 50/60Hz with two shaft ends	Motor 230V 50/60Hz mit 2 Wellenenden	---	---	---	---	X	X	---	---	---	---	---	---	---	---	---	---
1e	Motor 115V 50/60Hz with two shaft ends	Motor 115V 50/60Hz mit 2 Wellenenden	---	---	---	---	X	X	---	---	---	---	---	---	---	---	---	---
1f	Motor 230V 50/60Hz Atex, IECEX	Motor 230V 50/60Hz Atex, IECEX	---	---	---	---	---	---	---	---	X	---	X	---	X	X	---	---
1g	Motor 115V 50/60Hz Atex, IECEX	Motor 115V 50/60Hz Atex, IECEX	---	---	---	---	---	---	---	---	X	---	X	---	X	X	---	---
1h	Motor 380-420V 50Hz Atex, IECEX	Motor 380-420V 50Hz Atex, IECEX	---	---	---	---	---	---	---	---	X	---	X	---	X	X	---	---
1i	Motor 500V 50Hz Atex, IECEX	Motor 500V 50Hz Atex, IECEX	---	---	---	---	---	---	---	---	X	---	X	---	X	X	---	---
1j	Motor 230V 50/60Hz Cl.I, Div.2	Motor 230V 50/60Hz Cl.I, Div.2	---	---	---	---	---	---	---	---	---	X	---	X	---	---	X	X
1k	Motor 115V 50/60Hz Cl.I, Div.2	Motor 115V 50/60Hz Cl.I, Div.2	---	---	---	---	---	---	---	---	---	X	---	X	---	---	X	X
2	Montagekonsole	Mounting bracket	X	X	---	---	X	X	X	---	X	X	---	---	X	---	X	---
3	Gummi-Metall-Puffer	Shock absorber	X	X	---	---	X	X	X	---	X	X	---	---	X	---	X	---
4	Mutter DIN 6923 - M6	Nut DIN 6923 - M6	X	X	---	---	X	X	X	---	X	X	---	---	X	---	X	---
5	Pumpenkonsole	Pump housing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	Federring DIN 127 B5,1	Spring washer DIN 127 B5,1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7	Schraube DIN 933 M5x16	Screw DIN 933 M5x16	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8a	Konsolendeckel - standard	Cover - standard	X	X	X	X	X	X	---	---	X	X	X	X	X	X	X	X
8b	Konsolendeckel mit Schlitzen	Cover with slots	---	---	---	---	---	---	X	X	---	---	---	---	---	---	---	---
9	Schraube DIN 966 M3x8	Screw DIN 966 M3x8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10a	Kurbeltrieb für 400l/h Pumpen (Stößel gold)	Crank drive for 400l/h pumps (plunger gold)	X	---	X	---	X	---	X	X	X	X	X	X	---	---	---	---
10b	Kurbeltrieb für 700l/h Pumpen (Stößel grün)	Crank drive for 700l/h pumps (plunger green)	---	---	---	---	---	---	---	---	---	---	---	---	X	X	---	---
10c	Kurbeltrieb für 800l/h Pumpen (Stößel schwarz)	Crank drive for 800l/h pumps (plunger black)	---	X	---	X	---	X	---	---	---	---	---	---	---	---	X	X
11	Schraube DIN 915 M4x6 oder ISO 4028 M4X6 TX 8	Screw DIN 915 M4x6 or ISO 4028 M4X6 TX 8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12a	Faltenbalg für 400l/h Pumpen (4 Falten)	Below for 400l/h pumps (4 folds)	X	---	X	---	X	---	X	X	X	X	X	X	---	---	---	---
12b	Faltenbalg für 700l/h und 800l/h Pumpen (8 Falten)	Below for 700l/h and 800l/h pumps (8 folds)	---	X	---	X	---	X	---	---	---	---	---	---	X	X	X	X
13a	Pumpenkörper - PTFE für 400l/h Pumpen	Pump body - PTFE for 400l/h pumps	X	---	X	---	X	---	X	X	X	X	X	X	---	---	---	---
13b	Pumpenkörper - PTFE für 800l/h Pumpen	Pump body - PTFE for 800l/h pumps	---	X	---	X	---	X	---	---	---	---	---	---	---	---	X	X
13c	Pumpenkörper - PTFE mit Bypassventil für 400l/h Pumpen	Pump body - PTFE with bypass valve for 400l/h pumps	X	---	X	---	X	---	X	X	X	X	X	X	---	---	---	---
13d	Pumpenkörper - PTFE mit Bypassventil 800l/h Pumpen	Pump body - PTFE with bypass valve for 800l/h pumps	---	X	---	X	---	X	---	---	---	---	---	---	---	---	X	X
13e	Pumpenkörper - 1.4571 für 400l/h und 700l/h Pumpen	Pump body - 1.4571 for 400l/h and 700l/h pumps	X	---	X	---	X	---	X	X	X	X	X	X	X	X	---	---
13f	Pumpenkörper - 1.4571 für 800l/h Pumpen	Pump body - 1.4571 for 800l/h pumps	---	X	---	X	---	X	---	---	---	---	---	---	---	---	X	X
13g	Pumpenkörper - 1.4571 mit Bypassventil für 400l/h und 700l/h Pumpen	Pump body - 1.4571 with bypass valve for 400l/h and 700l/h pumps	X	---	X	---	X	---	X	X	X	X	X	X	X	X	---	---
13h	Pumpenkörper - 1.4571 mit Bypassventil für 800l/h Pumpen	Pump body - 1.4571 with bypass valve for 800l/h pumps	---	X	---	X	---	X	---	---	---	---	---	---	---	---	X	X
14	Montagering - nur für PTFE Pumpenkörper	Mounting ring - only for pump bodys made of PTFE	X	X	X	X	X	X	X	X	X	X	X	X	---	---	X	X
15	Spannscheibe DIN 6796 d=4	Clamping washer DIN 6796 d=4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16	Schraube DIN 933 M4x45	Screw DIN 933 M4x45	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17a	Ventil - geeignet bis zu 100°C Gaseingangstemperatur	Valve - suitable up to 100°C gas inlet temperature	X	---	---	---	X	---	X	---	X	X	---	---	---	---	---	---
17b	Ventil - geeignet bis zu 160°C Gaseingangstemperatur	Valve - suitable up to 160°C gas inlet temperature	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18a	Kunststoff Einschraubverschraubung - diverse Typen - siehe Pumpendatenblätter	Plastic fitting - various types - see pump data sheets	X	X	X	X	X	X	X	X	X	X	X	X	---	---	X	X
18b	Edelstahl Rohrverschraubung - diverse Typen - siehe Pumpendatenblätter	Stainless steel fitting - various types - see pump data sheets	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
19	Dichtring - nur für Edelstahl Pumpenkörper	Sealing ring - only for pump bodys made of 1.4571	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20	Verdränger - nur für Edelstahl Pumpenkörper	Displacer - only for pump bodys made of 1.4571	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21a	O-Ring - FKM	O-Ring made of FKM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21b	O-Ring - FFKM	O-Ring made of FFKM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22a	Spindel für Bypassventil - geeignet bis zu 100°C Gaseingangstemperatur	Spindle for PTFE bypass valve - suitable up to 100°C gas inlet temperature	X	---	---	---	X	---	X	---	X	X	---	---	---	---	---	---
22b	Spindel für Bypassventil - geeignet bis zu 160°C Gaseingangstemperatur	Spindle for PTFE bypass valve - suitable up to 160°C gas inlet temperature	---	X	X	X	---	X	---	X	---	---	X	X	X	X	X	X
22c	Spindel für Edelstahl Bypassventil	Spindle for 1.4571 bypass valve	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22d	Spindelspitze	Spindle tip	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
23	Montageplatte Bypassventil	Mounting plate bypass valve	X	X	X	X	X	X	X	X	X	X	X	X	---	---	X	X
24	Schraube DIN 7982 4,2x13	Screw DIN 7982 4,2x13	X	X	X	X	X	X	X	X	X	X	X	X	---	---	X	X
25	Spindelaufnahme	Spindle holder	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26	Drehknopf	Knob	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
27	Deckel	Cover	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
28	Zwischenflansch	Intermediate flange	---	---	X	X	---	---	---	X	---	---	X	X	---	X	---	X
28a/28b	Kupplungsnahe	Coupling hub	---	---	X	X	---	---	---	X	---	---	X	X	---	X	---	X
28c	Kupplungsstern	Spider	---	---	X	X	---	---	---	X	---	---	X	X	---	X	---	X
29	Kupplungsflansch	Coupling flange	---	---	X	X	---	---	---	X	---	---	X	X	---	X	---	X
30	Montagering	Mounting ring	---	---	X	X	---	---	---	X	---	---	X	X	---	X	---	X
31	Schraube DIN 933 M6x20	Screw DIN 933 M6x20	---	---	X	X	---	---	---	X	---	---	X	X	---	X	---	X
32	Unterlegscheibe DIN 125 A6,4	Washer DIN 125 A6,4	---	---	X	X	---	---	---	X	---	---	X	X	---	X	---	X
33	Unterlegscheibe DIN 125 A5,3	Washer DIN 125 A5,3	---	---	X	X	---	---	---	X	---	---	X	X	---	X	---	X
34	Schraube DIN 933 M5x20	Screw DIN 933 M5x20	---	---	X	X			---	X	---	---	X	X	---	X	---	X
X	Kompletter Pumpenkopf - diverse Kombinationsmöglichkeiten	Complete pump head - various combinations	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

EG-/EU-Konformitätserklärung EC/EU Declaration of Conformity



Hiermit erklärt Bühler Technologies GmbH, dass die nachfolgenden Produkte „Geräte“ im Sinne der Richtlinie **2014/34/EU (ATEX)** in ihrer aktuellen Fassung sind.
Bühler Technologies GmbH hereby declares that the following products are "equipment" according to Directive 2014/34/EU (ATEX) in its current version.

Die technischen Unterlagen dieses Produkts sind gemäß Anhang VIII der Richtlinie 2014/34/EU bei der notifizierten Stelle IBExU Institut für Sicherheitstechnik GmbH, Kennnummer 0637, hinterlegt.
The technical documentation for this product is filed with the notified body IBExU Institut für Sicherheitstechnik GmbH, identification number 0637, in accordance with Annex VIII of Directive 2014/34/EU.

Die Produkte sind Maschinen im Sinne der Richtlinie **2006/42/EG (MRL)** Artikel 2 a) und erfüllen alle einschlägigen Anforderungen.
The products are machines according to Directive 2006/42/EC (MD) Article 2 (a) and fulfill all relevant requirements.

Folgende Richtlinien wurden berücksichtigt:
The following directives were taken into account:

2011/65/EU (RoHS)

Produkt/product: Messgaspumpen / *Sample gas pumps*
Typen/types: **P2.2 ATEX, P2.4 ATEX, P2.72 ATEX, P2.74 ATEX (-H2/-O2)**

Die Produkte werden entsprechend der derzeit gültigen ATEX-Richtlinie innerhalb der internen Fertigungskontrolle folgendermaßen gekennzeichnet:
The products are marked according to the currently valid ATEX directive during internal control of production:

P2.2 ATEX, P2.4 ATEX (-H2/-O2)
II 2 G Ex h IIB+H2 T3...T4 Gb X
P2.72 ATEX, P2.74 ATEX (-H2/-O2)
II 2 G Ex h IIB+H2 T3 Gb X

Zur Beurteilung der Konformität gemäß ATEX-Richtlinie wurden folgende harmonisierte Normen herangezogen:
For the assessment of conformity according to the ATEX directive, the following harmonised standards were applied:

EN ISO 80079-36:2016 **EN 809:1998+A1:2009 + AC:2010**
EN ISO 80079-37:2016

Zusätzlich wurden berücksichtigt:
The following standards were also applied:

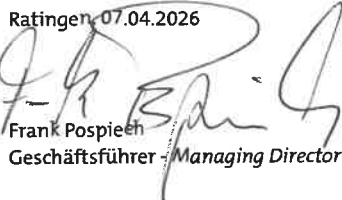
EN ISO 12100:2010

CE-Erklärung Zulieferer: Orange1 Electric Motors S.P.A.
CE-Declaration supplier: Via Mantova 93
43122 Parma Italy
Eingeschaltete Benannte Stelle: Eurofins Produkt Testing Italy S.r.l.
Engaged Notified Body: Nummer 0477
Nr. der Konformitätsbescheinigung: EPT 17 ATEX 2588 X
No. of Certificate:

Die Vorschriften zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten und die Änderung 2015/863 wurden berücksichtigt.
The product is in conformity with the restriction of the use of certain hazardous substances in electrical and electronic equipment and the amending through the directive 2015/863 was regarded.

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.
The manufacturer bears sole responsibility for this Declaration of Conformity.

Ratingen, 07.04.2026


Frank Pospiech
Geschäftsführer - Managing Director



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 IBE 24.0022X**

Page 1 of 6

Certificate history:

Status: **Current**

Issue No: 1

Issue 0 (2025-04-04)

Date of Issue: 2026-01-05

Applicant: **Bühler Technologies GmbH**
Harkortstrasse 29
40880 Ratingen
Germany

Equipment: **sample gas pump**

Optional accessory:

Type of Protection: **Non-electrical "h"**

Marking: used abbreviation: T_m ...medium temperature, T_a ...ambient (motor) temperature, T_h ...pump head temperature,
w ...with, w/o ... without

P2.2 ATEX / P2.2 ATEX-H2 with bypass:

Ex h IIB+H₂ T3...T4 Gb X

(T3) $-20^{\circ}\text{C} \leq T_m \leq +135^{\circ}\text{C}$, $-20^{\circ}\text{C} \leq T_{a,h} \leq +50^{\circ}\text{C}$

(T4) $-20^{\circ}\text{C} \leq T_m \leq +85^{\circ}\text{C}$, $-20^{\circ}\text{C} \leq T_{a,h} \leq +50^{\circ}\text{C}$,

P2.2 ATEX / P2.2 ATEX-H2 / P2.4 ATEX / P2.4 ATEX-H2 without bypass:

Ex h IIB+H₂ T3...T4 Gb X

(T3) $-20^{\circ}\text{C} \leq T_m \leq +140^{\circ}\text{C}$, w/o coupling: $-20^{\circ}\text{C} \leq T_{a,h} \leq +50^{\circ}\text{C}$, w. coupling: $-20^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$, $-20^{\circ}\text{C} \leq T_h \leq +100^{\circ}\text{C}$

(T4) $-20^{\circ}\text{C} \leq T_m \leq +90^{\circ}\text{C}$, w/o coupling: $-20^{\circ}\text{C} \leq T_{a,h} \leq +50^{\circ}\text{C}$, w. coupling: $-20^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$, $-20^{\circ}\text{C} \leq T_h \leq +90^{\circ}\text{C}$

P2.2 ATEX-O2 with/without bypass, P2.4 ATEX-O2 without bypass:

Ex h IIB+H₂ T3...T4 Gb X

(T3,T4) $-20^{\circ}\text{C} \leq T_m \leq +75^{\circ}\text{C}$, w/o coupling: $-20^{\circ}\text{C} \leq T_{a,h} \leq +50^{\circ}\text{C}$, w. coupling: $-20^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$, $-20^{\circ}\text{C} \leq T_h \leq +75^{\circ}\text{C}$

P2.72 ATEX / P2.72 ATEX-H2 with bypass:

Ex h IIB+H₂ T3 Gb X

(T3) $-20^{\circ}\text{C} \leq T_m \leq +105^{\circ}\text{C}$, $-20^{\circ}\text{C} \leq T_{a,h} \leq +50^{\circ}\text{C}$

P2.72 ATEX / P2.72 ATEX-H2 / P2.74 ATEX / P2.74 ATEX-H2 without bypass: Ex h IIB+H₂ T3 Gb X

(T3) $-20^{\circ}\text{C} \leq T_m \leq +115^{\circ}\text{C}$, w/o coupling: $-20^{\circ}\text{C} \leq T_{a,h} \leq +50^{\circ}\text{C}$, w. coupling: $-20^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$, $-20^{\circ}\text{C} \leq T_h \leq +100^{\circ}\text{C}$

P2.72 ATEX-O2 with/without bypass, P2.74 ATEX-O2 without bypass:

Ex h IIB+H₂ T3 Gb X

(T3) $-20^{\circ}\text{C} \leq T_{m,a,h} \leq +45^{\circ}\text{C}$

Approved for issue on behalf of the IECEx
Certification Body:

Kai Willamowski

Position:

Head of department Certification Body

Signature:
(for printed version)

Date:
(for printed version)

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:

IBExU Institut für Sicherheitstechnik GmbH
Fuchsmühlenweg 7
09599 Freiberg
Germany





IECEx Certificate of Conformity

Certificate No.: **IECEx IBE 24.0022X**

Page 2 of 6

Date of issue: 2026-01-05

Issue No: 1

Manufacturer: **Bühler Technologies GmbH**
Harkortstrasse 29
40880 Ratingen
Germany

Manufacturing
locations: **Bühler Technologies GmbH**
Harkortstrasse 29
40880 Ratingen
Germany

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 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition: 7.0

ISO 80079-36:2016 Explosive atmospheres - Part 36: Non-electrical equipment for explosive atmospheres - Basic methods and requirements
Edition: 1.0

ISO 80079-37:2016 Explosive atmospheres - Part 37: Non-electrical equipment for explosive atmospheres - Non electrical type of protection constructional safety "c", control of ignition source "b", liquid immersion "k"
Edition: 1.0

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 Report:

DE/IBE/ExTR24.0028/01

Quality Assessment Report:

DE/BVS/QAR16.0002/08



IECEx Certificate of Conformity

Certificate No.: **IECEx IBE 24.0022X**

Page 3 of 6

Date of issue: 2026-01-05

Issue No: 1

EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

with/without bypass:

P2.2 ATEX, P2.2 ATEX-H2, P2.2 ATEX-O2, P2.72 ATEX, P2.72 ATEX-H2, P2.72 ATEX-O2

without bypass:

P2.4 ATEX, P2.4 ATEX-H2, P2.4 ATEX-O2, P2.74 ATEX, P2.74 ATEX-H2, P2.74 ATEX-O2

SPECIFIC CONDITIONS OF USE: YES as shown below:

- 1.) *The pumps may only be used under observance of the installation conditions with integration into the equipotential bonding and by ensuring the maintenance work according to the operating instructions. Explicit attention must be paid to deposits. After an ignition inside the equipment, all parts exposed to flames must be checked.*
- 2.) *The pumps may only be used if their materials are resistant to mechanical and/or chemical effects and corrosion under the respective operating conditions so that the explosion protection is always maintained.*
- 3.) *At a medium temperature of > 85 °C, operation with a bypass valve is only permitted in the stainless steel version.*
- 4.) *The plastic screw-in fittings (PVDF) installed by Bühler factory have a maximum continuous operating temperature of 140 °C. The compression processes inside the pump cause additional temperature increases. The pump types P2.2 ATEX (with/without bypass) and P2.4 ATEX (without bypass) are therefore restricted in the maximum permissible ambient / pump head / medium temperatures using PVDF screw-in-fittings, see Table 5 in section "Equipment continued" under the point technical data..*
- 5.) *The following boundary values have to be complied. The temperature of the entering sample gas (medium temperature) inside the gas pump and the ambient and pump head temperature outside the gas pump must not exceed the given temperatures in Table 1 to Table 4 in section "Equipment continued" under the point technical data.*
- 6.) *The attachments and accessories used on pumps must fulfil the requirements in accordance with IECEx with respect to equipment group and category. They must be suitable for use in potentially explosive atmospheres of the respective explosion group and temperature class.*
- 7.) *The equipment is designed exclusively for pumping gas. If the gases and vapours flowing through the pump contain particles or condensate the pump head has to be mounted with pump head pointing downward (pump head rotatable, see manual). It must be ensured that no foreign bodies can get through the pump inlet.*
- 8.) *The gases and vapours flowing through the pump must not cause exothermic reactions.*
- 9.) *A maximum drive shaft speed of 1700 rpm for pump types P2.x/2.7x must not be exceeded. The correct voltage and frequency for the motor must be observed.*
- 10.) *Safety of screwed connections against unscrewing and loosening must be ensured by appropriate measures such as maintenance of tightening torques as specified in the operating instructions of the sample gas pumps, use of protection elements or sticking in with appropriate adhesives.*
- 11.) *Opening of the pumps is only allowed at standstill and after clearance measurement so that no explosive atmosphere is present.*
- 12.) *To avoid electrostatic charging on non-dissipative materials (e. g. externally attached labels made of non-dissipative plastics, insulating paint on outer surfaces of the pumps), cleaning work must not be carried out with dry cloths. In addition, processes that generate intensive electrostatic charging must not be operated in the vicinity of the sample gas pumps.*
- 13.) *The additional requirements from the respective operating instructions for the devices and operating equipment attached to the pump must be observed and applied. In addition to the speed or frequency range of the motor, the minimum and maximum speed of the pumps according to the operating instructions must be observed.*



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Issue No: 1

Equipment (continued):

The sample gas pump is a combination of a non-electrical bellows pump with an electrical drive (covered by its own certificate). The sample gas pump is intended for installation in gas analysis systems for industrial applications to transport gaseous media only. It is not suitable for liquids.

If the specifications of the pump is observed, in particular the temperature parameters in the technical data, the sample gas pump can convey non-flammable and also flammable gaseous media, which can occasionally be explosive in normal operation.

The pump head and the drive motor on the P2.4 ATEX/P2.74 ATEX sample gas pump are isolated for use in hot applications. The sample gas pump has a split adapter which can be mounted with one half inside a heated cabinet while the other half mounted on the outside supports the drive motor. In doing so, wall thicknesses of up to 30 mm can be bridged without additional modifications.

There are two types of special pumps: P2.x/P2.7x ATEX-O2 and P2.x/P2.7x ATEX-H2. The pumps are optimised with regard to parts in contact with O₂/H₂ by special tested material and cleaning of the components.

The applied materials are:

- pump console/console cover cast aluminium 226-D (P2.x/P2.7x (Atex O2/H2))
- plunger AlMgSi0.5 or AlMgSi1 with anodic coating
- bellows PTFE
- pump body stainless steel 1.4571 or PTFE
- screw-in connectors (connector, sealing) PVDF or stainless steel 1.4401 with FKM (viton)
- valve material (diaphragm, housing, inlet) PTFE, PVDF or PEEK
- bypass spindle material (spindle, sealing) PVDF & FKM or PCTFE & FKM or PTFE & 1.4571 & FKM or PVDF & FFKM or PCTFE & FFKM or PTFE & 1.4571 & FFKM

Technical data:

Table 1: P2.x ATEX, P2.x ATEX-H2

	with bypass	without bypass	
	P2.2	P2.2	P2.4 (with coupling)
Maximum drive shaft speed	1700 rpm		
Ambient temperature	-20 °C to 50 °C		
Pump head temperature	T3: Max. 50 °C T4: Max. 50 °C	T3: Max. 50 °C T4: Max. 50 °C	T3: Max. 100 °C T4: Max. 90 °C
Medium temperature	T3: Max. 135 °C T4: Max. 85 °C	T3: Max. 140 °C T4: Max. 90 °C	T3: Max. 140 °C T4: Max. 90 °C
Nominal output	400 l/h		
Weight	Approx. 7.5 kg	Approx. 7.5 kg	Approx. 8.5 kg

Table 2: P2.x ATEX-O2

	with bypass	without bypass	
	P2.2	P2.2	P2.4 (with coupling)
Maximum drive shaft speed	1700 rpm		
Ambient temperature	-20 °C to 50 °C		
Pump head temperature	T3: Max. 50 °C T4: Max. 50 °C	T3: Max. 50 °C T4: Max. 50 °C	T3: Max. 75 °C T4: Max. 75 °C
Medium temperature	T3: Max. 75 °C T4: Max. 75 °C	T3: Max. 75 °C T4: Max. 75 °C	T3: Max. 75 °C T4: Max. 75 °C
Nominal output	400 l/h		
Weight	Approx. 7.5 kg	Approx. 7.5 kg	Approx. 8.5 kg



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Date of issue: 2026-01-05

Issue No: 1

Table 3: P2.7x ATEX, P2.7x ATEX-H2

	with bypass	without bypass	
	P2.72	P2.72	P2.74 (with coupling)
Maximum drive shaft speed	1700 rpm		
Ambient temperature	-20 °C to 50 °C		
Pump head temperature	T3: Max. 50 °C	T3: Max. 50 °C	T3: Max. 100 °C
Medium temperature	T3: Max. 105 °C	T3: Max. 115 °C	T3: Max. 115 °C
Nominal output	700 l/h		
Weight	Approx. 7.5 kg	Approx. 7.5 kg	Approx. 8.5 kg

Table 4: P2.7x ATEX-O2

	with bypass	without bypass	
	P2.72	P2.72	P2.74 (with coupling)
Maximum drive shaft speed	1700 rpm		
Ambient temperature	-20 °C to 45 °C		
Pump head temperature	T3: Max. 45 °C	T3: Max. 45 °C	T3: Max. 45 °C
Medium temperature	T3: Max. 45 °C	T3: Max. 45 °C	T3: Max. 45 °C
Nominal output	700 l/h		
Weight	Approx. 7.5 kg	Approx. 7.5 kg	Approx. 8.5 kg

The pump types P2.2 ATEX (with/without bypass) and P2.4 ATEX (without bypass) with plastic screw-in fittings (PVDF) are further restricted in the maximum permissible ambient / pump head / medium temperatures using PVDF screw-in-fittings.

Table 5: restrictions due to plastic screw fittings (PVDF)

pump				permissible temperatures (°C)		
No.	bypass	coupling	PVDF screw-in-fittings	ambient	pump head	medium
P2.2 ATEX	no	no	limited	-20 ... 50	max. 50	max. 80
P2.2 ATEX	yes	no	limited	-20 ... 50	max. 50	max. 75
P2.4 ATEX	no	yes	limited	-20 ... 50	max. 80	max. 80

The product is a non-electrical equipment with attached separately certified electrical and non-electrical equipment. In accordance with the options provided by OD 280, this certification covers just the non-electrical equipment. Correct selection of the attached equipment is assessed in the IHA.

Following potential ignition hazards were identified on the product:

1. hot surfaces
2. mechanically generated sparks
3. electrical sources
4. static electricity
5. adiabatic compression / shock waves (only inside the gas pump)
6. exothermic reactions

Following protective measures were applied to minimize the ignition hazards:

1. limitation of medium and ambient temperature
2. measurements to determine maximum temperature from adiabatic compression with different types of pumps (P2.x, P2.7x) and pump configurations (with/without bypass)
3. correct selection of materials
4. correct selection of electric products for intended use in explosive atmospheres
5. operating instructions for the user



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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

Compared to version 1, the pump designation has been adjusted and additional pump details have been added. Specification and correction of marking, supplement in IHA



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 IBE 24.0022X** Page 1 of 5 [Certificate history:](#)

Status: **Current** Issue No: 0

Date of Issue: 2025-04-04

Applicant: **Bühler Technologies GmbH**
Harkortstrasse 29
40880 Ratingen
Germany

Equipment: **sample gas pump**

Optional accessory:

Type of Protection: **Non-electrical "h"**

Marking: used abbreviation: T_a ...ambient (motor) temperature, T_m ...medium temperature, T_h ...pump head temperature

P2.2 ATEX / P2.2 ATEX-H2 with bypass: Ex h IIB+H₂ T3...T4 Gb/Gb X
(T3) $-20^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$, $-20^{\circ}\text{C} \leq T_m \leq +135^{\circ}\text{C}$
(T4) $-20^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$, $-20^{\circ}\text{C} \leq T_m \leq +85^{\circ}\text{C}$

P2.2 ATEX / P2.2 ATEX-H2 / P2.4 ATEX / P2.4 ATEX-H2 without bypass: Ex h IIB+H₂ T3...T4 Gb/Gb X
(T3) $-20^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$, $-20^{\circ}\text{C} \leq T_m \leq +140^{\circ}\text{C}$, additional with coupling: $-20^{\circ}\text{C} \leq T_h \leq +100^{\circ}\text{C}$
(T4) $-20^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$, $-20^{\circ}\text{C} \leq T_m \leq +90^{\circ}\text{C}$, additional with coupling: $-20^{\circ}\text{C} \leq T_h \leq +90^{\circ}\text{C}$

P2.2 ATEX-O2 with/without bypass, P2.4 ATEX-O2 without bypass: Ex h IIB+H₂ T3...T4 Gb/Gb X
(T3) $-20^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$, $-20^{\circ}\text{C} \leq T_m \leq +75^{\circ}\text{C}$, additional with coupling: $-20^{\circ}\text{C} \leq T_h \leq +75^{\circ}\text{C}$
(T4) $-20^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$, $-20^{\circ}\text{C} \leq T_m \leq +75^{\circ}\text{C}$, additional with coupling: $-20^{\circ}\text{C} \leq T_h \leq +75^{\circ}\text{C}$

P2.72 ATEX / P2.72 ATEX-H2 with bypass: Ex h IIB+H₂ T3 Gb/Gb X
(T3) $-20^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$, $-20^{\circ}\text{C} \leq T_m \leq +105^{\circ}\text{C}$

P2.72 ATEX / P2.72 ATEX-H2 / P2.74 ATEX / P2.74 ATEX-H2 without bypass: Ex h IIB+H₂ T3 Gb/Gb X
(T3) $-20^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$, $-20^{\circ}\text{C} \leq T_m \leq +115^{\circ}\text{C}$, additional with coupling: $-20^{\circ}\text{C} \leq T_h \leq +100^{\circ}\text{C}$

P2.72 ATEX-O2 with/without bypass, P2.74 ATEX-O2 without bypass: Ex h IIB+H₂ T3 Gb/Gb X
(T3) $-20^{\circ}\text{C} \leq T_a \leq +45^{\circ}\text{C}$, $-20^{\circ}\text{C} \leq T_m \leq +45^{\circ}\text{C}$, additional with coupling: $-20^{\circ}\text{C} \leq T_h \leq +45^{\circ}\text{C}$

Approved for issue on behalf of the IECEx
Certification Body: **Kai Willamowski**

Position: **Head of department Certification Body**

Signature:
(for printed version)

Date:
(for printed version)

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:

IBExU Institut für Sicherheitstechnik GmbH
Fuchsmühlenweg 7
09599 Freiberg
Germany





IECEx Certificate of Conformity

Certificate No.: **IECEx IBE 24.0022X**

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Date of issue: 2025-04-04

Issue No: 0

Manufacturer: **Bühler Technologies GmbH**
Harkortstrasse 29
40880 Ratingen
Germany

Manufacturing
locations: **Bühler Technologies GmbH**
Harkortstrasse 29
40880 Ratingen
Germany

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 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition: 7.0

ISO 80079-36:2016 Explosive atmospheres - Part 36: Non-electrical equipment for explosive atmospheres - Basic methods and requirements
Edition: 1.0

ISO 80079-37:2016 Explosive atmospheres - Part 37: Non-electrical equipment for explosive atmospheres - Non electrical type of protection constructional safety "c", control of ignition source "b", liquid immersion "k"
Edition: 1.0

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 Report:

DE/IBE/ExTR24.0028/00

Quality Assessment Report:

DE/BVS/QAR16.0002/08



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Certificate No.: **IECEx IBE 24.0022X**

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Date of issue: 2025-04-04

Issue No: 0

EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

with/without bypass:

P2.2 ATEX, P2.2 ATEX-H2, P2.2 ATEX-O2, P2.72 ATEX, P2.72 ATEX-H2, P2.72 ATEX-O2

without bypass:

P2.4ATEX, P2.4ATEX-H2, P2.4 ATEX-O2, P2.74 ATEX, P2.74 ATEX-H2, P2.74 ATEX-O2

SPECIFIC CONDITIONS OF USE: YES as shown below:

- 1.) *The pumps may only be used under observance of the installation conditions with integration into the equipotential bonding and by ensuring the maintenance work according to the operating instructions. Explicit attention must be paid to deposits. After an ignition inside the equipment, all parts exposed to flames must be checked.*
- 2.) *The pumps may only be used if their materials are resistant to mechanical and/or chemical effects and corrosion under the respective operating conditions so that the explosion protection is always maintained.*
- 3.) *At a medium temperature of > 85 °C, operation with a bypass valve is only permitted in the stainless steel version.*
- 4.) *The plastic screw-in fittings (PVDF) installed by Bühler factory have a maximum continuous operating temperature of 140 °C. The compression processes inside the pump cause additional temperature increases. The pump types P2.2 ATEX (with/without bypass) and P2.4 ATEX (without bypass) are therefore restricted in the maximum permissible ambient / pump head / medium temperatures using PVDF screw-in-fittings, see Table 5 in section "Equipment continued" under the point technical data.*
- 5.) *The following boundary values have to be complied. The temperature of the entering sample gas (medium temperature) inside the gas pump and the ambient and pump head temperature outside the gas pump must not exceed the given temperatures in Table 1 to Table 4 in section "Equipment continued" under the point technical data.*
- 6.) *The attachments and accessories used on pumps must fulfil the requirements in accordance with Directive 2014/34/EU with respect to equipment group and category. They must be suitable for use in potentially explosive atmospheres of the respective explosion group and temperature class.*
- 7.) *The equipment is designed exclusively for pumping gas. If the gases and vapours flowing through the pump contain particles or condensate the pump head has to be mounted with pump head pointing downward (pump head rotatable, see manual). It must be ensured that no foreign bodies can get through the pump inlet.*
- 8.) *The gases and vapours flowing through the pump must not cause exothermic reactions.*
- 9.) *A maximum drive shaft speed of 1700 rpm for pump types P2.xATEX/2.7xATEX must not be exceeded. The correct voltage and frequency for the motor must be observed.*
- 10.) *Safety of screwed connections against unscrewing and loosening must be ensured by appropriate measures such as maintenance of tightening torques as specified in the operating instructions of the sample gas pumps, use of protection elements or sticking in with appropriate adhesives.*
- 11.) *Opening of the pumps is only allowed at standstill and after clearance measurement so that no explosive atmosphere is present.*
- 12.) *To avoid electrostatic charging on non-dissipative materials and painted outer surfaces of the pumps and externally attached labels made of non-dissipative plastics, cleaning work must not be carried out with dry cloths. In addition, processes that generate intensive electrostatic charging must not be operated in the vicinity of the sample gas pumps.*
- 13.) *In case the motors are supplied by inverter, they shall be provided with protectors inside the windings (normally PTC thermistors), capable of assuring the respect of temperature class limits. Such devices shall be connected to a control device able to cut off power to the motor in case of reaching of the limit temperature. In addition to the speed or frequency range of the motor, the minimum and maximum speed of the pumps according to the operating instructions must be observed.*



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Certificate No.: **IECEx IBE 24.0022X**

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Date of issue: 2025-04-04

Issue No: 0

Equipment (continued):

The sample gas pump is a combination of a non-electrical bellows pump with an electrical drive (covered by its own certificate). The sample gas pump is intended for installation in gas analysis systems for industrial applications to transport gaseous media only. It is not suitable for liquids.

If the specifications of the pump is observed, in particular the temperature parameters in the technical data, the sample gas pump can convey non-flammable and also flammable gaseous media, which can occasionally be explosive in normal operation.

The pump head and the drive motor on the P2.4 ATEX/P2.74 ATEX sample gas pump are isolated for use in hot applications. The sample gas pump has a split adapter which can be mounted with one half inside a heated cabinet while the other half mounted on the outside supports the drive motor. In doing so, wall thicknesses of up to 30 mm can be bridged without additional modifications.

There are two types of special pumps: (P2.x/P2.7x) ATEX-O2 and (P2.x/P2.7x) ATEX-H2. The pumps are optimised with regard to parts in contact with O₂/H₂ by special tested material and cleaning of the components.

The applied materials are:

- pump console/console cover cast aluminium 226-D (P2.x/2.7x ATEX(-O₂/H₂))
- plunger AlMgSi0.5 or AlMgSi1 with anodic coating
- bellows PTFE
- pump body stainless steel 1.4571 or PTFE
- screw-in connectors (connector, sealing) PVDF or stainless steel 1.4401 with FKM (viton)
- valve material (diaphragm, housing, inlet) PTFE, PVDF or PEEK
- bypass spindle material (spindle, sealing) PVDF & FKM or PCTFE & FKM or PTFE & 1.4571 & FKM or PVDF & FFKM or PCTFE & FFKM or PTFE & 1.4571 & FFKM

Technical data:

Table 1: P2.x ATEX, P2.x ATEX-H2

	with bypass	without bypass	
	P2.2	P2.2	P2.4 (with coupling)
Maximum drive shaft speed	1700 rpm		
Ambient temperature	-20 °C to 50 °C		
Pump head temperature	T3: Max. 50 °C T4: Max. 50 °C	T3: Max. 50 °C T4: Max. 50 °C	T3: Max. 100 °C T4: Max. 90 °C
Medium temperature	T3: Max. 135 °C T4: Max. 85 °C	T3: Max. 140 °C T4: Max. 90 °C	T3: Max. 140 °C T4: Max. 90 °C
Nominal output	400 l/h		
Weight	Approx. 7.5 kg	Approx. 7.5 kg	Approx. 8.5 kg

Table 2: P2.x ATEX-O2

	with bypass	without bypass	
	P2.2	P2.2	P2.4 (with coupling)
Maximum drive shaft speed	1700 rpm		
Ambient temperature	-20 °C to 50 °C		
Pump head temperature	T3: Max. 50 °C T4: Max. 50 °C	T3: Max. 50 °C T4: Max. 50 °C	T3: Max. 75 °C T4: Max. 75 °C
Medium temperature	T3: Max. 75 °C T4: Max. 75 °C	T3: Max. 75 °C T4: Max. 75 °C	T3: Max. 75 °C T4: Max. 75 °C
Nominal output	400 l/h		
Weight	Approx. 7.5 kg	Approx. 7.5 kg	Approx. 8.5 kg



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Date of issue: 2025-04-04

Issue No: 0

Table 3: P2.7x ATEX, P2.7x ATEX-H2

	with bypass	without bypass	
	P2.72	P2.72	P2.74 (with coupling)
Maximum drive shaft speed	1700 rpm		
Ambient temperature	-20 °C to 50 °C		
Pump head temperature	T3: Max. 50 °C	T3: Max. 50 °C	T3: Max. 100 °C
Medium temperature	T3: Max. 105 °C	T3: Max. 115 °C	T3: Max. 115 °C
Nominal output	700 l/h		
Weight	Approx. 7.5 kg	Approx. 7.5 kg	Approx. 8.5 kg

Table 4: P2.7x ATEX-O2

	with bypass	without bypass	
	P2.72	P2.72	P2.74 (with coupling)
Maximum drive shaft speed	1700 rpm		
Ambient temperature	-20 °C to 45 °C		
Pump head temperature	T3: Max. 45 °C	T3: Max. 45 °C	T3: Max. 45 °C
Medium temperature	T3: Max. 45 °C	T3: Max. 45 °C	T3: Max. 45 °C
Nominal output	700 l/h		
Weight	Approx. 7.5 kg	Approx. 7.5 kg	Approx. 8.5 kg

The pump types P2.2 ATEX (with/without bypass) and P2.4 ATEX (without bypass) with plastic screw-in fittings (PVDF) are further restricted in the maximum permissible ambient / pump head / medium temperatures using PVDF screw-in-fittings.

Table 5: restrictions due to plastic screw fittings (PVDF)

pump				permissible temperatures (°C)		
No.	bypass	coupling	PVDF screw-in-fittings	ambient	pump head	medium
P2.2 ATEX	no	no	limited	-20 ... 50	max. 50	max. 80
P2.2 ATEX	yes	no	limited	-20 ... 50	max. 50	max. 75
P2.4 ATEX	no	yes	limited	-20 ... 50	max. 80	max. 80

The product is a non-electrical equipment with attached separately certified electrical and non-electrical equipment. In accordance with the options provided by OD 280, this certification covers just the non-electrical equipment. Correct selection of the attached equipment is assessed in the IHA.

Following potential ignition hazards were identified on the product:

1. hot surfaces
2. mechanically generated sparks
3. electrical sources
4. static electricity
5. adiabatic compression / shock waves (only inside the gas pump)
6. exothermic reactions

Following protective measures were applied to minimize the ignition hazards:

1. limitation of medium and ambient temperature
2. measurements to determine maximum temperature from adiabatic compression with different types of pumps (P2.x, P2.7x) and pump configurations (with/without bypass)
3. correct selection of materials
4. correct selection of electric products for intended use in explosive atmospheres
5. operating instructions for the user

O2-Erklärung *O2 Declaration*

**Messgaspumpen für den Einsatz mit
hochreinem Sauerstoff optimiert**

*Sample Gas Pumps optimised for use with
high-purity oxygen*

Applikationen mit Sauerstoff: Partikel-, Öl- und Fettfreiheit

Mit dieser Erklärung bestätigen wir, dass alle medienberührenden Flächen der nachfolgenden Produkte in Anlehnung an die Vorgaben der EIGA Doc 33/18 und des VDA-Band 19 gereinigt und gefertigt sind.

Applications with oxygen: free of particles, oil and grease

With this declaration, we confirm that all surfaces of the following products that come into contact with media have been cleaned and manufactured in accordance with the specifications of EIGA Doc 33/18 and VDA Volume 19.

Produkt / Products	Messgaspumpen / Sample Gas Pumps
Typen / Types:	P2.x ATEX-O2 P2.x AMEX-O2 P1.3-O2
Art-Nr. / Item no.:	42-O2

Ratingen, den 25.04.2024

Bühler Technologies GmbH



Messgaspumpen für den Einsatz mit hochreinem Sauerstoff optimiert

Applikationen mit Sauerstoff: Partikel-, Öl- und Fettfreiheit



Für den Einsatz mit hochreinem Sauerstoff muss das Produkt speziell gereinigt (öl- und fettfrei) sein, da Sauerstoff ein starkes Oxidationsmittel ist. Sauerstoff kann unter ungünstigen Bedingungen bei organischen Substanzen wie Partikeln, Ölen und Fetten eine Selbstentzündung bewirken und fördert im Allgemeinen die Verbrennung von Stoffen. Öle und Fette können bei Kontakt mit Sauerstoff sogar explosionsartig reagieren. Für den sicheren Einsatz unserer Produkte mit hochreinem Sauerstoff und Vermeidung der o. g. unerwünschten Reaktionen, wenden wir spezielle Reinigungs- und Fertigungsverfahren an.

Mit dieser Erklärung bestätigen wir, dass alle medienberührenden Flächen der nachfolgenden Produkte in Anlehnung an die Vorgaben der EIGA Doc 33/18 und des VDA-Band 19 gereinigt und gefertigt sind.

Produkt:	Messgaspumpen
Typen:	P2.x ATEX-O2 P2.x AMEX-O2 P1.3-O2
Art-Nr.:	42-O2

Für die „O2“-Messgaspumpen werden für die medienberührenden Bauteile ausschließlich Werkstoffe verwendet, die unter der Berücksichtigung der entsprechenden Einsatzparameter von der Bundesanstalt für Materialforschung und -prüfung (BAM) für Sauerstoffanwendungen geprüft sind.

Alle medienberührenden Bauteile durchlaufen den speziellen Reinigungsprozess, um zuverlässig Verunreinigungen (wie Öle, Fette und Partikel) zu entfernen. Dieser Prozess wird durch eine umfassende Liefervorschrift an den Dienstleister dokumentiert und die Einhaltung der Grenzwerte mit turnusmäßigen Analysen durch ein unabhängiges, akkreditiertes Labor verifiziert.

Die Verschmutzungsgrenzwerte der medienberührenden Flächen sind analog zu „EIGA Doc 33/18 Cleaning of Equipment for oxygen service“ wie folgt definiert:

	Verschmutzungsgrenzwerte
Nichtflüchtige organische oder anorganische Verunreinigungen:	$\leq 220 \text{ mg/m}^2$ für nichtflüchtige Verunreinigungen
Partikel:	$\leq 22 \text{ Partikel/m}^2$ zwischen $500 \mu\text{m}$ und $1000 \mu\text{m}$

Die Fertigung der „O2“-Messgaspumpen, erfolgt in einem baulich abgegrenzten Sauberraum, in Anlehnung an VDA-Band 19.

Die Einhaltung der Produktions- und Montagevorgaben wird durch den speziell geschulten Facharbeiter anhand eines Prüfberichtes dokumentiert. Nach der Reinigung werden die Messgaspumpen luft- und staubdicht verpackt und eindeutig mit dem Hinweis „Cleaned for oxygen service. Do not open until ready for use“ gekennzeichnet.

Alle beschriebenen Reinigungseigenschaften gehen verloren, wenn das Produkt mit öl- oder fett-haltigen Medien in Berührung kommt oder anderweitig von außen kontaminiert wird.





1. INFORMAZIONI GENERALI DI SICUREZZA

EX Queste istruzioni di sicurezza si riferiscono all'installazione, utilizzo e manutenzione dei motori serie O-M utilizzabili in aree potenzialmente esplosive per la presenza di GAS e POLVERI combustibili. Le informazioni riportate sono ad uso di personale qualificato. Fatta eccezione per l'apertura della scatola morsettiera, l'apertura di ogni altra parte cancella le condizioni di garanzia dei motori.

Riportiamo qui sotto le differenti marcature e le zone (ATEX) di utilizzo dei differenti motori:

GAS	II 2G Ex db IIC T3 Gb T.amb -40°C , +60°C	Zone 1, 2
	II 2G Ex db IIC T4 Gb T.amb -40°C , +60°C	
	II 2G Ex db IIC T5 Gb T.amb -40°C , +40°C	
	II 2G Ex db eb IIC T3 Gb T.amb -40°C , +60°C	
	II 2G Ex db eb IIC T4 Gb T.amb -40°C , +60°C	
POLVERI	II 2G Ex db eb IIC T5 Gb T.amb -40°C , 40°C	Zone 21, 22
	II 2D Ex tb IIIC T125°C T.amb -40°C , +60°C (spessore max layer 5mm)	

I motori sono conformi con I Requisiti Essenziali di Salute e Sicurezza per le zone potenzialmente esplosive riportati nelle normative Europee:

IEC/EN 60079-0, IEC/EN 60079-1, IEC/EN 60079-7, IEC/EN60079-31

! Le macchine elettriche rotanti presentano parti sotto tensione o in movimento e parti molto calde. Il trasporto, il collegamento per la messa in funzione e la manutenzione devono essere eseguiti da personale qualificato e responsabile (vedere IEC 364). Interventi inadeguati possono causare danni a persone e cose.

! Controllare attentamente i dati indicati sulla targa prima della messa in funzione del motore. I motori in bassa tensione sono considerati come componenti da installare in altre macchine ai sensi della Direttiva Comunitaria sulle macchine 2006/42/EC. La messa in funzione è proibita fino ad avvenuto accertamento della conformità finale a tale direttiva. Le macchine elettriche rotanti alimentate da rete sono conformi alle norme EN 61000-6-1,2,3,4 riguardanti fenomeni di compatibilità elettromagnetica - Direttiva 2004/108/CE e non sono necessari particolari accorgimenti di schermatura. Nel caso di funzionamento intermittente, gli eventuali disturbi generati dai dispositivi di inserzione devono essere limitati mediante adeguati cablaggi.

! I lavori sulla macchina elettrica devono avvenire a macchina ferma e scollegata dalla rete (compresi gli equipaggiamenti ausiliari). Se sono presenti protezioni elettriche, eliminare ogni possibilità di avviamento improvviso attenendosi alle specifiche raccomandazioni sull'impiego delle varie apparecchiature.

2. TRASPORTO, IMMAGAZZINAMENTO

! Al ricevimento della fornitura accertarsi che non sussistano danni imputabili al trasporto e nell'eventualità darne comunicazione immediata, contestandoli allo spedizioniere ed astenendosi dalla messa in funzione.

Quando sono forniti con il motore, serrare saldamente i golfari a vite; poiché essi servono per il sollevamento del solo motore, non si devono sollevare macchine o accessori aggiuntivi ad esso accoppiati.

Se necessario, fare ricorso a mezzi di trasporto adeguati e sufficientemente dimensionati. Se sul motore sono presenti due golfari utilizzare sempre entrambi per il sollevamento. Se i motori vengono immagazzinati accertarsi che l'ambiente sia asciutto, senza polvere ed esente da vibrazioni (v eff. <0,2 mm/s) al fine di evitare danneggiamenti ai cuscinetti. Prima della messa in funzione misurare la resistenza di isolamento. Se si misurano valori di resistenza <1,5MΩ□□essicare l'avvolgimento. Per la procedura di essiccazione rivolgersi direttamente al nostro ufficio tecnico.

3. INSTALLAZIONE

! L'installazione deve essere conforme alle regole riportate nella norma IEC/EN 60079-14 o con le normative nazionali (edizione in vigore).

Prima di iniziare l'installazione in atmosfera esplosiva, l'installatore deve assicurarsi che il motore sia idoneo all'utilizzo nella rea classificata tenendo in considerazione le differenti sostanze infiammabili presenti (verificare la marcatura riportata sul motore prima di installarlo).

Il motore verrà installato solo da personale qualificato con conoscenza riguardante l'installazione di apparecchiature elettriche per atmosfere esplosive e ciò si può procedere solo nel caso in cui sia il motore sia la macchina applicata sia perfettamente fermi, non alimentati elettricamente ed assicurati contro partenze improvvise.

La targa motore riporta tutti i dati quali tensione, potenza e tutti gli altri dati elettrici e meccanici, inoltre sulla targa sono riportate tutte le informazioni di sicurezza (tipo di protezione, classe di temperatura, temperatura ambiente etc.).

ATTENZIONE: NON APRIRE IN PRESENZA DI ATMOSFERA ESPLOSIVA

Gli organi di accoppiamento devono essere equilibrati con mezza chavetta su mandrino liscio. Giunti e pulegge devono essere montati mediante apparecchiature apposite al fine di non danneggiare i cuscinetti del motore. Dopo il montaggio controllare che gli organi di accoppiamento siano ben fissi sull'estremità albero e spinti contro l'arresto. Se il mozzo dell'organo di accoppiamento fosse più corto dell'estremità d'albero la differenza dovrà essere compensata mediante bussola distanziatrice. Pulegge troppo piccole o troppo larghe compromettono il buon funzionamento dei cuscinetti.

I motori devono essere installati in posizione tale che l'aria di raffreddamento possa entrare ed uscire facilmente. La ventilazione non deve essere impedita e l'aria di scarico, anche di gruppi adiacenti, non deve essere aspirata dalla ventola. Evitare di avere fonti di calore tali da influenzare la temperatura sia dell'aria sia del motore.

In caso di installazione all'aperto proteggere il motore con opportuni accorgimenti dall'irraggiamento solare e dalle intemperie. In caso di posizione verticale con albero in basso usare copriventola con tettuccio parapigioggia. Si consiglia di proteggere il motore con dispositivi salvamotore, limitatori elettronici di coppia qualora il motore non sia dotato di termistori.

Nel caso di ambienti con forti escursioni termiche ed ove si preveda la formazione di condensa, Orange1 EM potrà dotare il motore di apposite scaldiglie anticondensa.

Invece di utilizzare riscaldatori anticondensa, è possibile alimentare il motore sui pin U1-V1 con una tensione del 4-10% della tensione di fase nominale del motore; il 20-30% della corrente nominale è sufficiente per riscaldare il motore.

! Controllare il senso di rotazione a motore non accoppiato facendo attenzione di assicurare la linguetta al fine di evitarne un distacco violento durante la rotazione. Se il senso di rotazione non è quello voluto, togliere tensione e quando il motore si sarà fermato:

- nel caso di motore trifase scambiare tra loro due delle tre fasi
- nel caso di motore monofase scambiare tra loro i cavetti dell'avvolgimento ausiliario

Entrate cavo

! A seconda del tipo di protezione del motore gli ingressi cavo dovranno essere certificate in conformità con le normative riportate in tabella ed avere l'intervallo di temperatura ambiente del motore medesimo:

Tipo di protezione della scatola morsetti	Tipo di protezione del passacavo	Temperatura operativa
Ex eb tb	Ex eb tb	-40°C , +100°C
Ex db tb	Ex db tb	-40°C , +100°C

Le sezioni dei cavi ammissibili a seconda del tipo di filettatura sono i seguenti:

Filetto pressacavo	Grandezza Motore	Diametro cavi (mm)
M16x1.5	56-63-71-80-90-100-112	6-12
M20X1.5	56-63-71-80-90-100-112	6-12 / 9-16
M25X1.5	132	12,5-20,5
M32X1.5	160-180	17-26

I pressacavi e/o tappi di chiusura, se non forniti con il motore dovranno essere con filetto come da tabella sopra.

I passacavi montati sulla scatola morsetti devono essere coperti da un certificato ATEX e IECEx in accordo con il tipo di protezione della scatola morsetti (Ex db e/o Ex db eb e/o Ex tb).

Devono avere un grado di protezione minimo di IP66 in accordo con EN/IEC 60529 e EN/IEC 60079-0; la temperatura di esercizio del passacavo deve essere inclusa nel campo di temperatura ambiente definito sulla targa, dalla minima temperatura fino alla massima temperatura riportata +25°C.

I passacavi devono essere completamente avvitati al corpo della custodia con una coppia di serraggio di 5Nm.

La connessione elettrica deve essere realizzata utilizzando cavi che hanno una temperatura di esercizio della guaina almeno uguale alla massima temperatura ambiente indicata sulla targa +25°C e una temperatura dell'isolante del conduttore almeno uguale alla massima temperatura ambiente indicata sulla targa +35°C.

I pressacavi dell'alloggiamento del condensatore e i pressacavi dei cavi del motore all'interno delle custodie Ex sono installati in fabbrica. Non è consentito svitare o modificare l'installazione di fabbrica.

Essendo piedi applicabili al corpo motore è possibile montarli in 3 diverse posizioni in modo da avere la scatola sulla parte superiore del motore oppure sui lati destro o sinistro.

Allo stesso tempo la scatola morsettiera può essere montata con l'uscita cavo posizionata dove necessario (ripristinare in tal caso le guarnizioni).

Questa operazione deve essere effettuata prima della connessione rimuovendo il coperchio, svitando le viti che fissano la scatola al motore e riavvitandole nel rispetto della coppia di serraggio (vedi la tabella con le coppie di serraggio). Avvitare completamente rispettando le coppie di serraggio consultando la tabella COPPIE DI SERRAGGIO

4. COLLEGAMENTO ALLA RETE ELETTRICA

EX Solo personale qualificato è autorizzato al collegamento del motore alla rete elettrica.

Il collegamento alla rete di alimentazione deve essere effettuato tramite ingressi cavo forniti con il motore o tramite altri ingressi cavo purché certificate in accordo con le normative europee come riportato sopra, in conformità alla Direttiva ATEX 2014/34/UE e approvati IECEx.

Nel caso di motore completo di cavo, la parte libera del cavo dovrà essere collegata in zona sicura oppure all'interno di una custodia Ex avente modo di protezione idoneo all'atmosfera esplosiva circostante.

! Fare sempre riferimento ai dati stampati sulla targa di tensione e frequenza per assicurarsi un corretto accoppiamento alla rete di alimentazione. Tolleranze di ±5% sulla tensione e ±1% sulla frequenza (la X sul numero del certificato). Per motori con classe di temperatura T3 e T4 è possibile avere ±10% sulla tensione I diagrammi di collegamento vengono normalmente forniti con il motore o sono stampati nella scatola morsettiera. Qualora mancassero, fare riferimento a quelli forniti nel presente manuale.

Assicurarsi che, nel caso di avviamento stella/triangolo, il passaggio da stella a triangolo sia eseguito solo quando la corrente di avviamento sia diminuita al valore corrispondente a quello di stella: ciò è importante per evitare il rischio di sovraccarichi non ammessi.

La scelta del cavo deve essere adeguata alla potenza del motore ed al tipo di impianto in cui è installato.

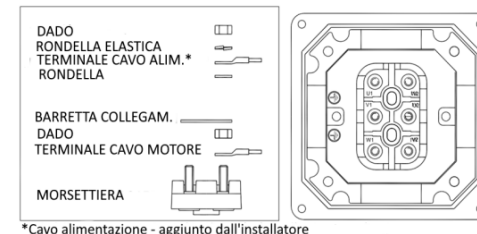
Il motore deve essere protetto da un dispositivo di protezione, che nel caso di guasto tolga alimentazione prima che la temperatura superficiale superi il valore di innesco dell'atmosfera circostante.

EX I motori con scatola Ex d sono dotati di una morsettiera standard.

TABELLA COPPIE DI SERRAGGIO

Filettatura	M4	M5	M6	M8
Copie di serraggio (Nm)	1,5	2	3	6

Le connessioni di potenza devono essere realizzate come in figura. I collegamenti devono essere sufficientemente stretti in modo da evitare ogni tipo di allentamento in accordo con la tabella COPPIE DI SERRAGGIO .



IMPORTANTE: Motori con scatola morsetti Ex eb: RIPOSIZIONARE LA GUARNIZIONE NELLA CORRETTA POSIZIONE PRIMA DI RICHIEDERE LA SCATOLA E RIAVVITARE COMPLETAMENTE LE VITI

Collegamento di terra

⚠ In aggiunta al collegamento di terra effettuato all'interno della scatola morsettiera, un altro collegamento esterno deve essere effettuato sul corpo motore. Se i conduttori di linea hanno sezione S il conduttore di terra sarà:

Conduttore di terra	Conduttori di linea
= S	$S \leq 16 \text{ mm}^2$
16	$16 \text{ mm}^2 < S \leq 35 \text{ mm}^2$
$\geq 0,5 S$	$S > 35 \text{ mm}^2$

Protezione termica

⚠ Il motore deve essere protetto tramite un dispositivo di sgancio che, in caso di guasto, tolga tensione al motore in modo da evitare che la temperatura superficiale delle parti a contatto con l'atmosfera esplosiva non raggiunga il valore di innesco.

Motori Alimentati tramite inverter

⚠ Nel caso in cui i motori vengano alimentati tramite inverter (VFD) , essi devono essere provvisti di protettori termici (normalmente PTC), all'interno degli avvolgimenti, in grado di garantire i limiti della classe di temperatura.

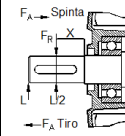
Tali dispositivi di controllo della temperatura devono essere a loro volta collegati a dispositivi di sgancio dell'alimentazione del motore nel caso di raggiungimento della temperatura. Le caratteristiche operative consentite in questa modalità sono riportate sulla targa dati o su un'etichetta aggiuntiva. I filtri di uscita devono essere installati in base alla lunghezza del cavo sul lato motore del VFD. La scelta del filtro e la lunghezza massima del cavo dipendono dalle istruzioni e dai dati forniti dal produttore del VFD. Per prevenire le correnti vaganti circolanti, si raccomanda di adottare opportuni accorgimenti sull'alimentazione che permettano di ridurne sensibilmente la causa. A tal fine, contattare il fornitore VFD locale.

Scaldiglie

⚠ Le scaldiglie non devono essere alimentate in alcun caso quando il motore è sotto tensione. I cavi di collegamento dovranno essere adeguati ad una potenza di 25W con tensione di alimentazione con range 110V-240V (±10%).

Carichi ammissibili

Supponendo una durata di 20.000h per motori 2P e 40.000h per motori 4/6/8P:

	Taglia Motore	Cuscinetti	Max carico radiale in L/2	Max carico assiale Spinta	Max carico assiale Tiro
	63	6202	365	230	120
	71	6202	450	280	160
	80	6204	590	370	220
	90	6205	645	400	230
	100	6206	920	560	350
	112	6306	1280	700	480
	132	6308	1345	770	590
	160	6309	2465	1401	714
	180	6310	3000	1498	615

Servizi ammissibili

S1: servizio continuo, il motore raggiunge la temperatura di equilibrio termico.

S2: servizio intermittente: periodo funzionamento carico costante di durata tale da non raggiungere l'equilibrio termico seguito da periodo di riposo fino al raggiungimento della temperatura ambiente (del fluido scambiatore).

S3: servizio intermittente: sequenza di cicli di funzionamento identici comprendenti un periodo di funzionamento a carico seguito da un periodo di riposo; il ciclo è tale che la corrente di avviamento non influenza la sovratemperatura in maniera significativa.

S9: servizio in cui carico e velocità variano in modo non periodico. Tipico del motore funzionante tramite inverter in cui all'interno degli avvolgimenti devono essere montate protezioni termiche adeguate (vedi sopra).

Motori Servoventilati (IC416)

Nel caso di motori aventi ventilazione forzata (IC416) il motore principale dovrà essere alimentato solo quando la ventilazione ausiliaria è funzionante.

5. MARCATURA

CE (*)		Marchatura di conformità alle direttive Europee
Ex (*)		Marchatura per le protezioni contro le esplosioni
II (*)		Motori per impianti di superficie (diversi dalle miniere)
2 (*)		Categoria 2: livello di protezione elevato
GAS	G (*)	Atmosfera esplosiva per la presenza di gas vapori o nebbie infiammabili
	Ex db	Motore e scatola antideflagranti
	Ex dbeb	Motore antideflagrante, scatola a sicurezza aumentata
	IIC	Gruppo del Gas, idoneo anche per IIB e IIA
POLVERE	T3, T4, T5	Classe di temperatura
	D (*)	Atmosfera esplosiva per la presenza di polveri combustibili
	Ex tb IIC	Custodie tb idonee per zona 21 (cat. 2D)
	T125°C	Max temperatura superficiale
T.amb		Temperatura ambiente
AB xx yyy		AB : laboratorio che rilascia il certificato CE di tipo xx : anno di rilascio del certificato yyy : numero del certificate CE di tipo
ZZZZ (*)		Numero dell'O.N. che rilascia la Notifica della Garanzia di Qualità dei Prodotti
(*) Solo per marcatura ATEX		

6. MANUTENZIONE E RIPARAZIONI

⚠ ⚠ La MANUTENZIONE sarà effettuata solo da personale qualificato in accordo con la normative EN 60079-17 o norme nazionali (ultima edizione in vigore).

Il personale qualificato deve avere conoscenza riguardante l'installazione di apparecchiature elettriche per atmosfere potenzialmente esplosive.

Ogni 3000 h di servizio verificare e ripristinare, se necessario il grasso sulle tenute radiali (ad esempio i V-ring) Periodicamente (in funzione dell'ambiente e del tipo di impiego) verificare:

- pulizia del motore (olio, POLVERE, sporco e residui di lavorazioni) e che non sia ostruito il passaggio dell'aria di raffreddamento.
- corretto fissaggio e connessione dei collegamenti elettrici
- il livello di vibrazione del motore (v_{eff}<3,5 mm/s per P_n<15KW v_{eff}<4,5 mm/s per P_n>15KW) il livello di rumore e nel caso questo si presenti anormale verificare il fissaggio motore, l'equilibratura della macchina accoppiata o l'esigenza di sostituzione dei cuscinetti.

⚠ Le RIPARAZIONI devono essere fatte in accordo con la normative IEC/EN 60079-19.

Tali riparazioni possono essere effettuate solo sotto il controllo e l'autorizzazione di Orange1 EM oppure da parte di un'officina certificata.

Nel caso in cui la riparazione venga realizzata da parte di un'officina autorizzata, questa deve rispettare le caratteristiche originali del motore ed utilizzare solo parti di ricambio originali.

Inoltre sarà loro dovere mettere sul motore una targa aggiuntiva con un simbolo che identifichi la riparazione, il nome dell'azienda, la certificazione, numero e data della riparazione effettuata.

Nulla riguardante il modo di protezione può essere modificato. Nel caso in cui tali regole non vengano rispettate il motore perderà tutte le sue caratteristiche di certificato.

I GIUNTI NON POSSONO ESSERE RIPARATI

7. COMPONENTI MODULARI

I motori sono completamente modulari. Piedi e flange possono essere montati senza alterare la certificazione ATEX, essendo esterni e non facendo parte del tipo di protezione Ex. Nella tabella sottostante mostriamo le viti da utilizzare per il montaggio dei diversi componenti modulari.

Taglia Motore	Flange	Piedi	Coperchio scatola morsetti
63-71	M5x16	M6x16	M5x14
80-90	M6x20	M6x20	M5x14
100	M8x20	M8x30 DADO M8	M5x14
112	M8x20	M8x35 DADO M8	M5x14
132	M10x20	M10X50 DADO M10	M6x16
160	n.3 M10x95 n.1 M10x70	M10x70 + DADO M10	M6X20
180	n.3 M10x95 n.1 M10x70	M10x70 + DADO M10	M6X20
Viti classe 8.8			

8.DATA DI PRODUZIONE

La data di produzione viene riportata sulla targa del motore indicando Mese ed Anno di fabbricazione : MM-AA



1. GENERAL SAFETY INFORMATION

⚠ These safety instructions refer to the installation, utilization and maintenance of motors O-M series to be used in potentially explosive areas with presence of combustible GAS and/or DUST. The information of these instructions are only for qualified personnel. Except for the opening of terminal cover, any other opening cancels the warranty conditions of the motors.

Here below you can see the different markings of the motors and the different zones where they can be used:

GAS	II 2G Ex db IIC T3 Gb T.amb -40°C , +60°C II 2G Ex db IIC T4 Gb T.amb -40°C , +60°C II 2G Ex db IIC T5 Gb T.amb -40°C , +40°C II 2G Ex db eb IIC T3 Gb T.amb -40°C , +60°C II 2G Ex db eb IIC T4 Gb T.amb -40°C , +60°C II 2G Ex db eb IIC T5 Gb T.amb -40°C , +40°C	Zones 1, 2
DUST	II 2D Ex tb IIC T125°C T.amb -40°C , +60°C (maximum thickness of dust layer 5mm)	Zones 21, 22

The motors comply with the Essential Health and Safety Requirements for potentially explosive atmospheres provided by European Standards:

IEC/EN 60079-0, IEC/EN 60079-1, IEC/EN 60079-7,
IEC/EN 60079-31

⚠ Electric rotating machines present dangers from live and rotating parts, and probably very hot surfaces. All work on them including transportation, connection, commissioning and maintenance must be by qualified and responsible specialists (IEC 364 must be observed). Inadequate work can lead to severe damage to persons and property.

⚠ It is imperative to observe the data printed on the nameplate before operating the motor. Low voltage motors are components to be installed into machines in accordance with Directive 2006/42/EC. Commissioning is not allowed until the conformity of the end product with this directive has been established. These asynchronous motors comply the EMC (2014/30/EU) Directive and no particular shielding is necessary when connected to a pure sinewave voltage supply.

⚠ Before working on the motor, ensure it has stopped and is disconnected from the power supply (including auxiliary equipment). If there is any form of automatic starting, automatic resetting, relays or remote starting, avoid any possibility of unexpected re-starting, paying attention to specific recommendations on equipment application.

2. TRANSPORT, STORAGE

⚠ On receipt verify that the motor has not been damaged during transport and in this case avoid any installation and communicate immediately to the transport service.

Eyebolts, when provided with the motor, must be tightened properly as they are suitable only for lifting the motor, no additional loads are allowed to be attached. If necessary use sufficiently dimensioned devices as a means of transport. Do not use any projection of the motor body to hang the motor for transport purposes.

If two eyebolts are present on the motor use both for lifting. Store low voltage motors in a dry, dust free and low vibration (v eff <0.2 mm/s) area to prevent bearing damage. Before commissioning, the insulation resistance must be measured. In case of values < 1,5 MΩ the winding must be dried. Contact our technical department directly for information on the drying procedure.

3. INSTALLATION

⚠ Installation must comply with the rules of the standard IEC/EN 60079-14 or with the national standards (edition into effect).

Before the installation in an explosive atmosphere, the installer must ensure that the motor is suitable for the classified area in consideration of the different inflammable substances present in the installation area (**please verify the marking on the motor plate before installation**).

The motor must be installed only by qualified people with knowledge about electrical apparatus for explosive gas atmospheres and electrical installations in hazardous areas and has to be done with the motor and driven machine at standstill, electrically dead and locked against restart.

The rating on the nameplate corresponds to voltage and frequency of the power supply and all other electrical and mechanical data, as well as the safety data regarding the motor (protection type, temperature class, ambient temperature etc.).

WARNING: DO NOT OPEN IN PRESENCE OF EXPLOSIVE ATMOSPHERE

. The coupling components must also be balanced with a half key on a smooth mandrel. Coupling belts and pulleys must be assembled by suitable tools to protect the bearings.

After assembly check that the coupling components are well fixed on the shaft end; they must be properly pushed against the shaft shoulder. Where the hub of the coupling gear is shorter than the shaft end, compensate the difference by use of a bush spacer.

Too large or too small pulleys can impair the shaft bearing life; similarly excessive belt tension can cause low bearing life or shaft breakage.

The motors must be installed in a proper position so that cooling air can go in and out easily. The ventilation must not be hindered and the outgoing air - also from adjacent units - must not be directly sucked in again. To keep a good cooling of the motor, there must be a minimum distance of 40mm between the fan cover and another element capable to reduce the air aspiration of the ventilation. Avoid heat sources near the motor that might affect the temperatures both of cooling air and of the motor.

In case of outdoor installation protect the motor from solar radiation and extremes of weather. In case of vertical mounting with shaft down use fan cover with rain roof. It is advisable to protect the motor with such as overcurrent devices and torque limiters where it is not protected by winding temperature transducers connected to appropriate switchgear.

In case of environments with wide thermal excursions and when can be preview the presence of moisture, Orange1 EM will equip the motor with heaters.

Instead of use anti-condensation heaters, is possible to supply the motor on pins U1-V1 with a voltage 4-10% of the rated motor phase-voltage; 20-30% of the rated current is enough to heat the motor.

⚠ Check the direction of rotation with the motor not coupled fastening the shaft key to avoid its violent ejection during rotation.

If the direction of rotation is not as desired, disconnect the motor and wait until the motor is completely stopped:

- in case of three phase motors interchange two phases at the terminals.
- in case of single phase motors refer to the diagram supplied with the motor

Cable entries

⚠ Depending on the type of protection of the motor the cable entries shall comply with the standards written in the table and having the range of temperature of the motor itself:

Type of protection of the terminal box	Type of protection of the cable gland	Operative Temp.
Ex eb tb	Ex eb tb	-40°C , +100°C
Ex db tb	Ex db tb	-40°C , +100°C

The cable diameter for each size of cable gland are like below:

Cable gland thread	Motor size	Range of cable diameter (mm)
M16x1.5	56-63-71-80-90-100-112	6-12
M20x1.5	56-63-71-80-90-100-112	6-12 / 9-16
M25x1.5	132	12,5-20,5
M32x1.5	160-180	17-26

Cable glands and plugs if not supplied with the motor shall be like above.

The cable gland mounted on the terminal box shall be covered by a valid ATEX and IECEx certificate according to the type of protection of the terminal compartment (Ex db and or Ex eb and or Ex tb). It shall have a minimum protection degree IP66 according to EN/IEC 60529 and EN/IEC 60079-0; the operating temperature of the cable gland shall be included in the temperature range defined by the minimum ambient temperature reported on the Ex Label of the motor and the maximum ambient temperature + 25°C.

The cable glands shall be completely screwed to the motor with a tightening torque of 5Nm

- The field wiring shall be carried out using cables having an overall sheath operating temperature at least equal to the maximum ambient temperature of the motor +25°C and conductor insulation temperature at least equal to the maximum ambient temperature of the motor +35°C.

Capacitor housing cable glands and motor wires cable glands inside Ex enclosures are factory installed. It is not allowed to unscrew or modify the factory installation.

As the feet can be mounted on the frame it is possible to fix them in 3 different positions so to have the possibility to have the terminal box on the top or on the right and left sides of the motor.

At the same time the terminal box can be mounted on the motor so to have the cable entries where it is necessary. So the cable entries can be in the four different positions. This operation has to be done before connection, removing the box cover, unscrewing the 4 screws that fix the box to the motor. Screw completely in respect of the tightening torque of TIGHTENING TORQUE TABLE

4. CONNECTION TO THE POWER SUPPLY

⚠ Only qualified people are allowed to connect the motor to the power supply. The connection to the electric supply must be done by through the cable entry supplied with the motor or through another type of cable entry certified in accordance with the European Standards showed above in compliance with Directive 2014/34/EU and IECEx approved.

In case of motor complete with cable, the free end of the cable should be connected in a safe zone or inside an Ex enclosure with a type of protection suitable for the explosive atmosphere.

⚠ Always refer to the data printed on the nameplate for voltage and frequency to ensure the motor is appropriate for the mains supply.

If not specified it is possible to assume tolerances of ±5% on voltage and ±1% on frequency indicated on the nameplate (X on the certificate number).

For motor with temperature class T3 and T4 is possible to have ±10% on voltage. The connection diagrams are normally supplied together with the motor or are printed in the terminal box. If they are missing please refer to this manual or contact directly to our technical office.

Check and make sure that, in the case of star /delta start, the switching from star to delta can only be executed after the starting current of the star step has fallen; this is important because of the risk of not allowed operational loads.

The cable size choice must be suitable to the motor ratings and the plant type.

The motors shall be protected by a tripping device, which in case of breakdown could cut off the power supply before the surface temperature exceeds the ignition temperature of the explosive atmosphere.

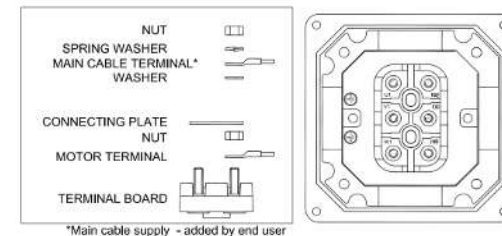
⚠ The motors with increased safety terminal box ("eb") are built with a special terminal board with improved insulation and distances.

⚠ The Ex d motors have a normal terminal board.

TIGHTENING TORQUE TABLE

Thread	M4	M5	M6	M8
Tightening Torque (Nm)	1,5	2	3	6

The power connection shall be made as in the picture. The nuts shall have to be tightened according to TIGHTENING TORQUE TABLE to avoid any loosening.



IMPORTANT: Motors with Ex eb terminal box REPLACE THE GASKET (SEAL) IN THE RIGHT POSITION BEFORE CLOSING THE TERMINAL BOX AND SCREW COMPLETELY ALL THE SCREWS.

Earth connection

⚠ In addition to the earth screw terminal fitted inside the terminal box, another external one must be on the motor frame. If the line conductors have a section S the earth connections have to be:

Earth conductor	Line conductors
= S	S ≤ 16 mm ²
16	16 mm ² < S ≤ 35 mm ²
≥ 0,5 S	S > 35 mm ²

Connection of auxiliary cables ("e" terminal box)

⚠ If the motor is provided with terminal board with auxiliary pins the connection of thermal protection and/or heaters can be made in such pins.

If the motor is provided with just a terminal board having just the 6 mains pins the connection of thermal protection and heaters have to be made by welding the wires of auxiliary devices with the wires of the cable and insulate using a heat-shrink sheath.

Protection

⚠ The motor must be protected by a tripping device that in case of breakdown, cut off the supply of the motor so that the surface temperature of the parts in contact with the explosive atmosphere doesn't reach the ignition temperature.

Motors for inverter duty

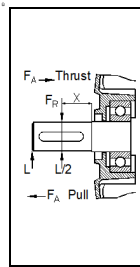
⚠ In case the motors are supplied by inverter, they shall be provided with protectors inside the windings (normally PTC thermistors), capable of assuring the respect of temperature class limits. Such devices shall be connected to a control device able to cut off power to the motor in case of reaching of the limit temperature. The permissible operating characteristics in this mode are stated on the nameplate or an additional label. Output filters must be installed based upon the length of the cable on the motor side of the VFD. Filter selection and the maximum cable length depend on the instructions and data provided by the VFD manufacturer. To prevent stray circulating currents, it is recommended to use appropriate measures on the power supply that allow to significantly reduce the triggering cause. For this purpose contact your local VFD supplier.

Heaters

⚠ The heaters shall be supplied only when the motor is not under power. The cables have to be adequate for a power of 25W with supply that can be from 110V up to 240V (±10%).

Permissible load

Assuming a life-span of 20.000h for 2P motors and 40.000h for 4,6,8P motors:

	Motor size	Bearing	*Max radial load in L/2	*Max axial load Thrust	*Max axial load Pull
	63	6202	365	230	120
	71	6202	450	280	160
	80	6204	590	370	220
	90	6205	645	400	230
	100	6206	920	560	350
	112	6306	1280	700	480
	132	6308	1345	770	590
	160	6309	2465	1401	714
	180	6310	3000	1498	615

* Values in [N]

Allowed duty services

S1: Continuous duty the motor works at a constant load until thermal equilibrium is reached.

S2: Intermittent duty: Once started, the motor works at a constant load for a limited period and thermal equilibrium is not reached. Motor will be started a second time then when its temperature has decreased to room temperature.

S3: Intermittent duty: A sequence of identical duty cycles, made up with a time of operation at constant load and a time at rest. When at rest, the motor is not fed. Starting current does not significantly influence temperature rise.

S9: Load and speed vary periodically within the permissible operating range. Frequent overloading may occur. Typical of motors supplied by inverter.

Motors with forced ventilation (IC416)

In case of motors with forced ventilation, the main motor can be supplied only when the auxiliary ventilation is already working.

5. MARKING

CE (*)		Marking of conformity to the European Directives
Ex (*)		Specific marking of explosion protection
II (*)		Motor for surface plants (different from mines)
2 (*)		Category 2: high level of protection
GAS	G (*)	explosive atmosphere due to presence of combustible gas vapour or mist
	Ex db	Flameproof motor and terminal box
	Ex dbeb	Flameproof motor, increased safety terminal box
	IIC	Gas group, suitable for IIB and IIA
	T3, T4, T5	Temperature class
DUST	D (*)	explosive atmosphere due to presence of combustible dust
	Ex tb IIC	tb enclosures suitable for zone 21 (cat. 2D)
	T125 °C	Max surface temperature
T.amb		Ambient temperature
AB xx yyy		AB : laboratory which issues the CE type certificate xx : year of issue of certificate yyy : number of CE type certificate
ZZZZ (*)		Notified Body that gives the Product Quality Assurance Notification
(*) Only for ATEX marking		

6. MAINTENANCE AND REPAIR

⚠ **⚠** **Ex** **MAINTENANCE** shall be performed only by qualified people in accordance with the standard IEC/EN 60079-17 or national standards (last edition). Qualified people must have knowledge about electrical apparatus for explosive atmospheres and electrical installations in hazardous areas.

- Every 3000 hours of service verify and restore, if necessary, the grease on the radial seals (for example V-rings).

Periodically (depending on the environment and duty) verify:

- motor cleanliness (oil, DUST, dirt and machining residuals absence) and free passage of cooling air
- correct tightening of electrical connections, of fastening screws
- free motor running with low vibration ($v_{eff} < 3,5 \text{ mm/s}$ for $P_n < 15 \text{ KW}$ $v_{eff} < 4,5 \text{ mm/s}$ for $P_n > 15 \text{ KW}$) and absence of anomalous noises; where there is high vibration and/or noise verify the motor fastenings, machine balancing and that the bearings are in good condition.
- The bearings must be inspected once per 3000h operation.

⚠ **Ex** **REPAIRS** shall be made in accordance with the rules as defined in EN 60079-19 standard. These repairs can only be done under the control and authorization of Orange1 EM or by certified repair workshop. When the repair is made by a certified repair workshop, they must respect all the original characteristic of the motor and use only original spare parts. Furthermore they have to place an additional nameplate on the motor with written a symbol to identify the **Repair**, company name and certification, repair operation number and date. Nothing regarding the type of protection can be modified. In case all these rules are not respected, the motor loses all its characteristic of certification.

FLAMEPROOF JOINTS CANNOT BE REPAIRED

7. MODULAR COMPONENTS

The motors are completely modular. Feet and flanges can be mounted without affecting the ATEX certificate, as they are external and are not part of the type of protection. In the table here below we show you the screws to be used to mount the different modular components.

Motor Size	Flange	Feet	Terminal box Cover
63-71	M5x16	M6x16	M5x14
80-90	M6x20	M6x20	M5x14
100	M8x20	M8x30 DADO M8	M5x14
112	M8x20	M8x35 NUT M8	M5x14
132	M10x20	M10x50 NUT M10	M6x16
160	n.3 M10x95 n.1 M10x70	M10x70 + NUT M10	M6X20
180	n.3 M10x95 n.1 M10x70	M10x70 + NUT M10	M6X20
Screws class 8.8			

8. MANUFACTURING DATE

The manufacturing date is shown on the motor nameplate indicating Month and year of manufacture: MM-YY



1. ALLGEMEINE SICHERHEITSHINWEISE

⚠ Diese Anleitung betrifft die Installation, den Betrieb und die Wartung der Motoren der O-M Serie zum Einsatz in explosionsgefährdeten Bereichen durch GAS und/oder STÄUBE.

Die Informationen zu dieser Anleitung sind nur für entsprechend qualifiziertes Personal bestimmt. Alle Eingriffe die über das Öffnen des Klemmkastens hinaus gehen, haben ein Erlöschen der Motorgarantie zur Folge! Nachfolgend die Motorkennzeichnungen, welche für die entsprechenden Zonen maßgeblich sind.

GAS	II 2G Ex db IIC T3 Gb T.amb –40°C , +60°C II 2G Ex db IIC T4 Gb T.amb –40°C , +60°C II 2G Ex db IIC T5 Gb T.amb –40°C , +40°C II 2G Ex db eb IIC T3 Gb T.amb –40°C , +60°C II 2G Ex db eb IIC T4 Gb T.amb –40°C , +60°C II 2G Ex db eb IIC T5 Gb T.amb –40°C , +40°C	Zones 1, 2
	II 2D Ex tb IIC T125°C T.amb –40°C , +60°C (maximale Dicke der Staubschicht 5mm)	Zones 21, 22
STAUB		

Für diese Motoren gelten die Gesundheit- und Sicherheitsbestimmungen für explosionsfähige Atmosphäre nach Europeanorm:

IEC/EN 60079-0, IEC/EN 60079-1, IEC/EN 60079-7, IEC/EN60079-31

⚠ Elektrisch drehende Maschinen stellen durch Spannung, drehende Teile und evt. erhitzte Oberflächen eine Gefahr dar. Alle Arbeiten daran, einschließlich Transport, Anschluss, Inbetriebnahme und Wartung hat durch qualifiziertes Fachpersonal zu erfolgen (unter Beachtung der IEC 364). Unsachgemäße Arbeiten können zu ernststen Personen- und Sachschäden führen.

⚠ Die auf dem Leistungsschild vermerkten Daten müssen unbedingt beachtet werden. Niederspannungsmotoren sind Komponenten zum Einbau in Maschinen gemäß Bestimmung 2006/42/EC. Die Inbetriebnahme darf erst dann erfolgen, wenn die Konformität des Endprodukts mit diesen Bestimmungen sicher gestellt wurde. Diese Asynchronmotoren entsprechen der EMC Bestimmung(2014/30/UE) und bedürfen keiner besonderen Abschirmung beim Anschluss an eine reine Sinuswellen-Spannungsversorgung. Die gesamte Inbetriebnahme darf erst erfolgen, nachdem diese Bestimmungen für das komplette Endprodukt umgesetzt worden sind.

⚠ Vor Arbeiten an dem Motor vergewissern Sie sich, dass sich dieser nicht mehr dreht und auch die Stromversorgung abgestellt ist. (dies gilt auch für Zusatzeinrichtungen!). Jegliche Art von automatischem Start sowie automatischem Relais- oder ferngesteuertem Start der Anlage ist vorher zu überprüfen

und auszuschalten um einen versehentlichen Anlauf zu verhindern

2. TRANSPORT UND LAGERUNG

⚠ Nach Erhalt ist der Motor auf eventuelle Transportschäden zu untersuchen und gegebenenfalls der Spediteur davon zu unterrichten - der Motor darf dann auf keinen Fall eingebaut werden.

Wenn vorgesehen, müssen die Hebeösen sorgfältig am Motor befestigt werden und dürfen nur die Last des Motors tragen. Eine zusätzliche Belastung ist nicht gestattet und muss gegebenenfalls gesondert gesichert werden. Verwenden Sie zu Transportzwecken nie irgendwelche Vorsprünge des Motorgehäuses. Wurden zwei Hebeösen mitgeliefert sind diese auch zu benutzen.

Lagern Sie Niederspannungsmotoren in trockener, staub- und vibrationsfreier Umgebung (v eff<0,2mm/s) um Lagerschäden zu vermeiden. Vor Inbetriebnahme messen Sie den Isolationswiderstand. Bei Werten < 1,5 MΩ muss die Wicklung getrocknet werden. Setzen Sie sich direkt mit unserer Technikabteilung in Verbindung um Informationen über die Vorgehensweise zu erhalten.

3. INSTALLATION

⚠ Die Installation erfolgt gemäß den Bestimmungen nach EN 60079-14 oder nach nationalen Standards (neuester Stand). Vor dem Einbau in einen explosionsgefährdeten Bereich ist sicher zu stellen, dass der Motor auch für diesen Einsatz entsprechend der Klassifizierung der auftretenden Stoffe denen er ausgesetzt sein wird, ausgelegt ist (**prüfen Sie vor der Installation die Kennzeichnung auf dem Leistungsschild!**)

Der Einbau darf nur durch Fachpersonal mit fundierten Kenntnissen zu elektrischen Geräten in explosionsgefährdeten Bereichen und deren elektrischen Installation in diesem Bereich erfolgen. Hierbei ist der Motor / die Anlage außer Betrieb, die Stromversorgung abgeschaltet und ein versehentlicher Neustart ausgeschlossen. Alle Angaben auf dem Leistungsschild entsprechen der Spannung und Frequenz des Netzanschlusses und allen anderen darauf vermerkten elektrischen und mechanischen Daten, sowie den Sicherheitsangaben zum Motor (Schutzart, Temperaturklasse, Umgebungstemperatur etc.).

WARNUNG: NICHT ÖFFNEN BEI EXPLOSIONGEFÄHRDETEN

Die Anschlussteile sind ebenso mit einer halben Passfeder auf einem glatten Dorn auszuwuchten. Antriebsriemen und Riemenscheiben werden mit einem geeigneten Werkzeug montiert um die Lager zu schützen. Nach dem Zusammenbau überprüfen Sie den festen Sitz der Bauteile. Sie müssen sorgfältig gegen die Wellenschulter geschoben werden. Ist die Kupplungsnahe kürzer als das Wellenende wird der Unterschied mit einem Zwischenstück ausgeglichen. Zu große oder zu kleine Riemenscheiben können die Lebensdauer der Wellenlager beeinträchtigen; desgleichen reduziert eine zu hohe Riemenspannung die Lebensdauer des Lagers oder verursacht einen Bruch der Welle. Der Motor wird so eingebaut, dass eine ungehinderte Luftzirkulation gewährleistet ist und die abgeführte Wärme, auch die benachbarter Geräte, nicht wieder als Kühlluft angesaugt wird. Zur Kühlung des Motors ist ein Mindestabstand von 40 mm von der Lüfterhaube zu anderen Teilen, welche den Luftstrom zum Lüfter beeinträchtigen könnten, einzuhalten. Vermeiden Sie Wärmequellen in der Nähe des Motors, welche sowohl den Motor als auch die zur Kühlung benötigte Luft erhitzen könnten.

Bei der Aufstellung im Freien ist der Motor vor direkter Sonneneinstrahlung und Wetterextremen zu schützen. Ist die Wicklung des Motors nicht mit einem an einer entsprechenden Schaltanlage angeschlossenen Temperaturmesswandler ausgestattet, ist es ratsam den

Motor gegen Überstrom und mit einen Drehmomentbegrenzer zu schützen.

Bei einer Umgebung mit starken Temperaturschwankungen oder hoher Luft-feuchtigkeit, kann Orange1 EM den Motor mit einer Stillstandheizung ausstatten. Dichtungen und Schrauben sind so ausgelegt, dass die IP Klassifizierung gewährleistet ist. Anstelle der Verwendung von Antikondensationsheizungen ist es möglich, den Motor an den Stiften U1-V1 mit einer Spannung von 4-10% der Nenn-Motorphasenspannung zu versorgen; 20-30% des Nennstroms reichen aus, um den Motor zu erwärmen.

⚠ Überprüfen Sie die Drehrichtung des Motors ohne montierte Wellenpassfeder um eine spätere Beschädigung zu vermeiden.

Sollte der Motor nicht die gewünschte Drehrichtung haben schalten Sie den Motor aus und warten bis zu dessen vollständigem Stillstand.

- Bei einem 3-ph Motor tauschen Sie 2 Phasen an der Klemme.
- bei einem 1-ph Motor folgen Sie dem mitgelieferten Diagramm

⚠ Kabeleingänge

Je nach Schutzart des Motors sollen die Kabeleingänge den in nachfolgender Tabelle festgelegten Normen und dem Temperaturbereich des Motors entsprechen.

Schutzart des Klemmkasten	Schutzart der Kabelverschraubung	Betriebstemp.
Ex eb tb	Ex eb tb	–40 °C , +100 °C
Ex db tb	Ex db tb	–40 °C , +100 °C

Der Kabeldurchmesser für jede Größe der Kabelverschraubung ist wie folgt:

Kabelverschraubung Gewinde	Motor Größe	Kabeldurchmesser (mm)
M16x1.5	56-63-71-80-90-100-112	6-12
M20X1.5	56-63-71-80-90-100-112	6-12 / 9-16
M25X1.5	132	12.5-20.5
M32X1.5	160-180	17-26

Kabelverschraubungen und Stecker, wenn sie nicht mit dem Motor geliefert werden, müssen wie oben ausgeführt sein. Die am Anschlusskasten montierte Kabelverschraubung muss gemäß der Schutzart des Anschlusses (Ex db und/oder Ex eb und/oder Ex tb) durch ein gültiges ATEX- und IECEx-Zertifikat abgedeckt sein. Sie muss mindestens die Schutzart IP66 aufweisen nach EN/IEC 60529 und EN/IEC 60079-0 zertifiziert sein. Die Betriebstemperatur der Kabelverschraubung muss innerhalb des Temperaturbereiches liegen, der durch die auf dem Ex-Etikett des Motors angegebene minimale Umgebungstemperatur und die maximale Umgebungstemperatur + 25 °C definiert ist. **Die Kabelverschraubungen sind gut an den Motor festzuschrauben mit einem Anzugsdrehmoment von 5 Nm.**

- Die Feldverdrahtung muss mit Kabeln durchgeführt werden, deren Gesamtmantel-Betriebstemperatur mindestens gleich der maximalen Umgebungstemperatur des Motors +25 °C und die Leiterisolationstemperatur mindestens gleich der maximalen Umgebungstemperatur des Motors +35 °C sein. Kondensatorgehäuse-Kabelverschraubungen und Motorkabelverschraubungen in Ex-Gehäusen werden werkseitig installiert. Die werkseitige Installation darf nicht abgeschraubt oder verändert werden! Da die Füße am Motor Gehäuse montiert werden, ist es möglich, sie in 3 verschiedenen Positionen zu befestigen, um die Möglichkeit zu haben, den Klemmenkasten auf der Oberseite oder auf der rechten bzw. linken Seite des Motors anzubringen. Gleichzeitig kann der Klemmenkasten am Motor unterschiedlich ausgerichtet werden, um die Kabeleinführungen dort zu haben, wo es notwendig ist. So

können die Kabeleinführungen in den vier verschiedenen Richtungen positioniert werden. Dieser Vorgang muss vor dem Anschluss durchgeführt werden, indem der Klemmkastendeckel entfernt wird und die 4 Schrauben gelöst werden, mit denen der Kasten am Motor befestigt ist. Schrauben Sie vollständig unter Beachtung des Anzugsdrehmoments der ANZUGSMOMENT-TABELLE diese wieder fest.

4. ANSCHLUSS AN DIE STROMVERSORGUNG

Der Motor darf nur von Fachpersonal an die Stromversorgung angeschlossen werden.

Der Anschluss an die Stromversorgung erfolgt über den mitgelieferten Kabeleingang oder einen entsprechenden Eingang nach o.g. Liste, gemäß den Richtlinien zu 2014/34/EU.

Wird der Motor mit Kabel geliefert, erfolgt der Anschluss in einem sichern Bereich oder in einem extra dafür ausgelegtem explosionsgeschützten Gehäuse.

⚠ Prüfen Sie immer die Daten zur Spannung und Frequenz um sicher zu stellen, dass der Motor auch wirklich für diese Stromversorgung ausgelegt ist. Wenn nicht anders angegeben, ist eine Toleranz von ±5% bei der Spannung und ± 1 % bei der Frequenz zu den gestempelten Daten zulässig (das X auf der Zertifikatsnummer). Bei Motoren der Temperaturklassen T3 und T4 ist eine Spannungsabweichung von ±10 % möglich. Die Anschlussdiagramme werden entweder zusammen mit dem Motor geliefert oder sind im Klemmkasten aufgedruckt. Sollten diese doch einmal fehlen, folgen Sie dem Diagramm in diesem Handbuch oder wenden sich an unsere Technikabteilung.

Überprüfen und stellen Sie sicher, dass bei einer Stern/Dreieckschaltung der Wechsel von Stern zu Dreieck nur dann stattfinden kann, nachdem der Anlaufstrom der Sternschaltung gefallen ist. Dies ist notwendig um eine nicht zulässige Betriebslast zu vermeiden.

Die Auswahl der Kabelstärke erfolgt nach den Vorgaben von Motor und Anlage.

Die Motoren müssen mit einem Auslöser geschützt werden, damit im Falle einer Störung die Stromzufuhr unterbrochen wird, bevor die Oberflächentemperatur die zulässige Entzündungstemperatur innerhalb der explosionsgeschützten Umgebung überschreitet

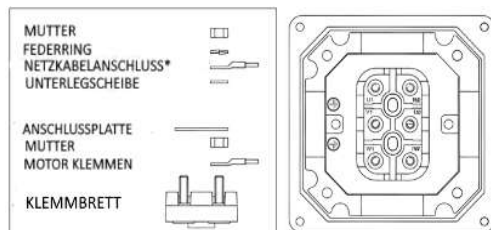
⚠ Die Ex e Motoren – erhöhte Sicherheit verfügen über spezielle Klemmkästen mit besserer Isolation und Zwischenräumen.

⚠ Die Ex d Motoren haben ein normales Klemmenbrett. Der Stromanschluss erfolgt nach Anschlussplan. Die Muttern sind entsprechend fest anzuziehen um ein Lockern auszuschließen.

ANZUGSMOMENTTABELLE

Gewinde	M4	M5	M6	M8
Anzugsmoment (Nm)	1,5	2	3	6

Der Stromanschluss erfolgt wie auf dem Bild. Die Muttern müssen gemäß der ANZUGSMOMENTTABELLE angezogen werden, um ein Lockern zu verhindern.



*Vom Benutzer hinzugefügtes Netzkabel

WICHTIG: Motoren mit Klemmkasten Ex eb: Achten Sie auf den korrekten Sitz der Dichtung am Klemmkasten und ziehen Sie sorgfältig sämtliche Schrauben an.

Erdung

⚠ Zusätzlich zum Schutzleiteranschluss innerhalb des Klemmkastens muss ein entsprechender weiterer Erdungsanschluss außen am Motorgehäuse angebracht werden.

Bei einem Schnitt S bei der Schleifleitung ist das Erdungskabel wie folgt auszuführen:

Schutzleitung	Schleifleitung
$\approx S$	$S \leq 16 \text{ mm}^2$
16	$16 \text{ mm}^2 < S \leq 35 \text{ mm}^2$
$\geq 0,5 S$	$S > 35 \text{ mm}^2$

Anschluss zusätzlicher Kabel (Exe Klemmkasten):

⚠ Besitzt der Motor zusätzliche Kontakte auf dem Klemmbrett, kann dort ein Thermoschutz und/oder eine Stillstandheizung angeschlossen werden.

Sollte das Klemmbrett nur über 6 Kontakte verfügen, erfolgt der Anschluss des Thermoschutzes und der Stillstandheizung indem man deren Drähte mit den Kabeldrähten verlötet und einer geschrumpften Schlauchhülle isoliert.

Thermoschutz

⚠ Die Motoren müssen mit einem Auslöser geschützt werden, damit im Falle einer Störung die Stromzufuhr unterbrochen wird. Dadurch wird verhindert, dass die Flächen innerhalb der explosionsgefährdeten Umgebung die zulässige Oberflächentemperatur nicht erreicht.

Motoren für Umrichterbetrieb.

⚠ Wird der Motor mit einem Umrichter (VFD) betrieben ist die Wicklung mit PTCs auszustatten um die angegebene Temperaturklasse zu gewährleisten. Diese Wärmeschalter sind an eine entsprechende Kontrollschaltung anzuschließen um den Motor bei Erreichung des Temperaturlimits abzuschalten.

Die zulässigen Betriebseigenschaften in diesem Modus sind auf dem Typenschild oder einem zusätzlichen Aufkleber angegeben. Ausgangsfilter müssen basierend auf der Länge des Kabels auf der Motorseite des VFD installiert werden. Die Filterauswahl und die maximale Kabellänge hängen von den Anweisungen und Daten des VFD-Herstellers ab. Um umlaufende Ströme / Peaks zu vermeiden, wird empfohlen, geeignete Maßnahmen an der Stromversorgung zu treffen, die es ermöglichen, die Auslöseursache deutlich zu reduzieren. Wenden Sie sich zu diesem Zweck an Ihren VFD-Händler vor Ort.

Stillstandheizung

⚠ Diese Heizung ist nur bei ausgeschaltetem Motor in Betrieb.

Zulässige Belastung:

Bei einer angenommenen Lebenszeit von 20.000 h bei 2-Pol Motoren und 40.000 für 4,6,8-Pol Motoren.

	BG	Lager	*Max radial Last in L/2	*Max axial Last Schub	*Max axial Last Druck
$F_A \rightarrow \text{Druck}$	63	6202	365	230	120
$F_B \rightarrow X$	71	6202	450	280	160
$L/2$	80	6204	590	370	220
$\leftarrow F_A \text{ Zug}$	90	6205	645	400	230
	100	6206	920	560	350
	112	6306	1280	700	480
	132	6308	1345	770	590
	160	6309	2465	1401	714
	180	6310	3000	1498	615

*Maßeinheit IN [N]

Erlaubte Zolldienste

S1: Dauerbetrieb Der Motor arbeitet mit konstanter Last, bis das thermische Gleichgewicht erreicht ist.

S2: Aussetzbetrieb: Nach dem Start arbeitet der Motor für eine begrenzte Zeit mit konstanter Last und das thermische Gleichgewicht wird nicht erreicht. Der Motor wird dann ein zweites Mal gestartet, wenn seine Temperatur auf Raumtemperatur abgesunken ist.

S3: Aussetzbetrieb: Eine Abfolge identischer Lastspiele, die sich aus einer Betriebszeit bei konstanter Belastung und einer Ruhezeit zusammensetzt. Im Ruhezustand wird der Motor nicht gespeist. Der Anlaufstrom hat keinen wesentlichen Einfluss auf den Temperaturanstieg.

S9: Last und Drehzahl ändern sich periodisch innerhalb des zulässigen Betriebsbereichs. Es kann zu häufigen Überlastungen kommen. Typisch für Motoren, die vom Umrichter versorgt werden.

Servolüftete Motoren (IC416)

Bei Motoren mit Fremdbelüftung (IC416) muss der Hauptmotor nur bei Betrieb der Zusatzlüftung eingeschaltet sein.

5. KENNZEICHNUNGEN

CE (*)		Konformität zu Europäischen Direktiven
Ex (*)		Kennzeichen für Explosionsschutz
II (*)		Motor für oberirdische Anlagen (kein Bergbau)
2 (*)		Kategorie 2: hoher Schutzgrad
Gas	G (*)	Explosionsfähige Atmosphäre durch Dampf oder Nebel
	Ex db	Explosionsgesuch. Motor und Klemmkasten
	Ex dbeb	Explosionsgesuch. Motor und Klemmkasten, erhöhte Sicherheit
	IIC	Gasgruppe, auch geeignet für IIB und IIA
	T3, T4, T5	Temperaturklasse
Staub	D (*)	Explosionsfähige Atmosphäre durch brennbare Stäube
	Ex tb IIC	Gehäuse tD Verfahren A für Zone 21 (Kat. 2D)
	T125°C	maximale Oberflächentemperatur
T.amb		Umgebungstemperaturbereich
AB xx ATEX yyy		AB : Zertifizierungsstelle für CE Type xx : Jahr der Zertifizierung yyy : Zertifizierungsnummer
ZZZZ (*)		Prüfstelle für Baumusterprüfbescheinigung
		(*) Nur für ATEX-Kennzeichnung

6. WARTUNG UND REPARATUR

⚠ **WARTUNG:** Darf nur von entsprechend qualifiziertem Personal unter Beachtung der aktuellen europäischen Standards und IEC/EN 60079-17 Bestimmungen ausgeführt werden. Dieses Personal muss über spezielles Wissen für die Installation elektrischer Betriebsmittel in explosionsgefährdeter Umgebung verfügen.

- Alle 3000 Betriebsstunden ist das Fett an den radialen Dichtungen (V-Ringe) zu überprüfen und gegebenenfalls nachzuschmieren.

Je nach Einsatz und Umgebung sind regelmäßig folgende Wartungen auszuführen:

- Motor säubern (von STAUB, ÖL und Maschinenablagerungen) und die Durchgänge zur Kühlung freihalten

- korrekten Sitz der elektrischen Anschlüsse und aller Befestigungen prüfen.

- auf einen freien, vibrationsarmen Motorlauf

(v eff < 3,5 mm/s für Pn < 15 kW)

(v eff < 4,5 mm/s für Pn > 15 kW)

überprüfen und auf außergewöhnliche Laufgeräusche achten.

Sollten o.g. Probleme auftreten, sind die Motorbefestigungen, die Maschinenwucht oder der Zustand der Lager zu kontrollieren.

⚠ **REPARATUREN:** sind gemäß den Bestimmungen nach IEC/EN 60079-19 Standards durchzuführen.

Diese Reparaturen können nur unter der Kontrolle und mit der Genehmigung von Orange1 EM oder einer entsprechend zertifizierten Werkstatt ausgeführt werden.

Wird die Reparatur von einer solchen Werkstatt ausgeführt, hat diese alle ursprünglichen Eigenschaften des Motors zu beachten. Es dürfen nur originale Ersatzteile verwendet werden. Darüber hinaus ist ein zusätzliches Schild am Motor anzubringen, welches das Reparatursymbol **R** aufweist, sowie den Firmennamen, und deren Zertifizierung, die Reparatur-Vorgangsnummer und das Datum.

An der Schutzart dürfen keine Veränderungen vorgenommen werden!

Sollten diese Vorschriften nicht eingehalten werden, verliert der Motor sämtliche Zertifizierungskriterien.

VERBINDUNGEN KÖNNEN NICHT REPARIERT WERDEN 7. MODULARE KOMponenten

Diese Motoren sind komplett modular, das heißt Füße und Flansche können vom Kunden selbst montiert werden ohne dabei gegen das ATEX Zertifikat zu verstoßen, da es sich hier um außen liegende Teile handelt, welche nicht die Schutzart betreffen. Nachfolgende Tabelle zeigt die zu verwendenden Schraubengrößen um die verschiedenen Teile zu befestigen.

BG	Flansche	Füße	Klemmkasten-deckel
63	M5x16	M6x16	M5x14
71	M5x16	M6x16	M5x14
80	M6x20	M6x20	M5x14
90	M6x20	M8x20	M5x14
100	M8x20	M8x30 NUSS M8	M5x14
112	M8x20	M8x35 NUSS M8	M5x14
132	M10x20	M10x50 NUSS M10	M6x16
160	n.3 M10x95 n.1 M10x70	M10x70 + NUSS M10	M6x20
180	n.3 M10x95 n.1 M10x70	M10x70 + NUSS M10	M6x20
Schraubengüte 8.8			

8. HERSTELLUNGSDATUM

Das Herstellungsdatum ist auf dem Typenschild des Motors angegeben

Angabe von Herstellungsmonat und -jahr: MM-JJ



1. INFORMACIÓN DE SEGURIDAD GENERAL

⚠ Estas instrucciones de seguridad se refieren a la instalación, utilización y mantenimiento de los motores de la serie OM para ser utilizado en zonas con peligro de explosión con presencia de gas y / o polvo combustible. La información de estas instrucciones son sólo para personal cualificado. A excepción de la apertura de la tapa del terminal, cualquier otra apertura anula las condiciones de garantía de los motores.

A continuación se pueden ver los diferentes marcados de los motores y las diferentes zonas en las que se pueden utilizar:

GAS	II 2G Ex db IIC T3 Gb	T.amb -40°C , +60°C	Zones 1, 2
	II 2G Ex db IIC T4 Gb	T.amb -40°C , +60°C	
	II 2G Ex db IIC T5 Gb	T.amb -40°C , +40°C	
	II 2G Ex db eb IIC T3 Gb	T.amb -40°C , +60°C	
	II 2G Ex db eb IIC T4 Gb	T.amb -40°C , +60°C	
	II 2G Ex db eb IIC T5 Gb	T.amb -40°C , +40°C	
POLVO	II 2D Ex tb IIIC T125°C	T.amb -40°C , +60°C	Zones 21, 22
	(espesor máximo de la capa de polvo de 5 mm)		

Los motores cumplen con los requisitos de seguridad para atmósferas potencialmente explosivas proporcionadas por las normas europeas:

IEC/EN 60079-0, EN 60079-1, EN 60079-7, EN60079-31

⚠ Las máquinas rotativas eléctricas pueden presentar un peligro por abrasión debido a las altas temperaturas de su superficie así como un peligro físico debido a las partes móviles. Todos los trabajos en las mismas, incluyendo el transporte, conexión, puesta en servicio y mantenimiento, deben realizarse por personal cualificado (Acorde con el IEC 364). Una manipulación inadecuada puede conducir a graves daños a personas y/o equipos.

⚠ Es imprescindible revisar y comprobar los datos impresos en la placa de identificación antes de hacer funcionar el motor. Los motores de baja tensión cumplen con la Directiva 2006/42/EC. La puesta en marcha no está permitida hasta conformidad del producto final con dicha directiva. Los motores asíncronos cumplen la Directiva EMC(2014/30/UE) por lo que no es necesaria ninguna protección especial en caso de conectarse a una fuente de tensión sinusoidal pura.

⚠ Antes de trabajar en el motor, asegúrese de que se ha detenido y está desconectado de la fuente de alimentación (incluyendo equipos auxiliares). Si hay instalado cualquier forma de arranque automático, relés o arranque remoto, evite toda posibilidad de arranque inesperado, prestando atención a las recomendaciones específicas sobre la aplicación del equipo.

2. TRANSPORTE, ALMACENAMIENTO

⚠ A la recepción ,verifique que el motor no ha sido dañado durante el transporte. En caso de daños en el motor debe evitarse la instalación y debe comunicarse la incidencia de inmediato al servicio de transporte. Los cáncamos, deben estar bien apretados al suministrarse del motor, ya que sirven para elevar el mismo, y no debe haber cargas adicionales en el momento de la fijación. Utilice si es necesario dispositivos que ayuden a su transporte. No utilice otras partes del motor que no sean los cáncamos para colgarlo con la finalidad de transportarlo. En caso de que hayan 2 cáncamos, use ambos para un transporte óptimo. Almacene los motores en un lugar seco, libre de polvo y sin vibraciones (v eff <0.2 mm / s) para evitar daños en los rodamientos. Antes de la puesta en marcha, se debe comprobar la resistencia de aislamiento. En caso de que la resistencia dé valores de <1,5 MΩ el bobinado debe secarse. Póngase en contacto con nuestro departamento técnico directamente para obtener información sobre el procedimiento de secado.

3. INSTALACIÓN

⚠ La instalación del motor debe cumplir con la norma EN 60079-14 o bien las normas nacionales en vigor donde vaya a ser instalado. Antes de la instalación en un entorno explosivo, el instalador debe asegurarse de que el motor es el adecuado para el área clasificada teniendo en consideración las diferentes sustancias inflamables presentes en el área de la instalación (**por favor, compruebe la placa de características antes de la instalación**). El motor debe ser instalado exclusivamente por personal cualificado con conocimientos sobre aparatos eléctricos para atmósferas de gas explosivas e instalaciones eléctricas en áreas peligrosas y tiene que hacerse con el motor y la máquina accionada parada, desconectada y protegida contra re-arranque.

El marcado de la placa de características se corresponde al voltaje y frecuencia de la fuente de alimentación y todos los demás datos eléctricos y mecánicos, así como los datos de seguridad en relación con el motor (tipo de protección, clase de temperatura, temperatura ambiente, etc).

ADVERTENCIA: NO ABRIR EN PRESENCIA DE ATMÓSFERA EXPLOSIVA

Los componentes de acoplamiento deben ser también equilibrados con una media chaveta en una superficie completamente plana. Las correas y poleas de acoplamiento deben ser montadas con las herramientas adecuadas para proteger los cojinetes. Después del montaje compruebe que los enganches están bien fijados en el extremo del eje; deben estar debidamente sujetos al mismo. Cuando el engranaje de la rueda dentada de acoplamiento es más corto que el extremo del eje, se debe compensar la diferencia mediante el uso de un casquillo distanciador. Poleas demasiado grandes o demasiado pequeñas pueden perjudicar la vida de los rodamientos y del eje; Tener una tensión excesiva en la correa puede acortar la vida del rodamiento e incluso puede provocar la rotura del eje. Los motores deben instalarse en una posición adecuada para que el aire de refrigeración pueda entrar y salir fácilmente. La ventilación no debe obstaculizarse y el aire de salida - también de agregados - no puede ser insertarse directamente de nuevo. Para mantener una buena refrigeración del motor, debe haber una distancia mínima de 40 mm entre la tapa del ventilador y cualquier elemento capaz de reducir la aspiración de aire de la ventilación. Evitar fuentes de calor cerca del motor que podrían afectar a las temperaturas del aire de enfriamiento y del motor. En caso de instalación al aire libre proteger el motor de la radiación solar y las inclemencias del tiempo. En caso de montaje vertical con el eje hacia abajo, utilice la tapa del

ventilador con protector de lluvia (sombbrero). Es aconsejable proteger el motor con dispositivos contra sobretensión como limitadores de par allá donde no hayan protecciones térmicas o interruptores de protección. En caso de ambientes con constantes cambios ambientales o con previsión de presencia de humedad, Orange1 EM equipará el motor con resistencias de caldeo. En lugar de usar resistencias de caldeo, es posible suministrar el motor a los pines U1-V1 con un voltaje del 4-10% del voltaje nominal de fase del motor; 20-30% de la corriente nominal es suficiente para calentar el motor.

⚠ Compruebe el sentido de giro con el motor no acoplado, sujetando el eje para evitar una expulsión violenta durante la rotación. Si el sentido de giro no es el deseado, desconecte el motor y espere hasta que el motor se detenga por completo: - en caso de motores trifásicos debe intercambiar dos fases en los terminales. - en caso de motores monofásicos consulte el diagrama suministrado con el motor.

Entrada de cable

⚠ Dependiendo del tipo de protección del motor, las entradas de los cables deberán cumplir con las normas escritas en la siguiente tabla y con el mismo rango de temperatura del motor:

Tipo de protección de la tapa del terminal	Tipo de protección de Prensaestopas	Temperatura de funcionamiento
Ex eb tb	Ex eb tb	-40°C , +100°C
Ex db tb	Ex db tb	-40°C , +100°C

El diámetro del cable para cada tamaño de prensaestopas es el siguiente:

Prensaestopas hilo	Tamaño del Motor	Diámetro del cable (mm)
M16x1.5	56-63-71-80-90-100-112	6-12
M20X1.5	56-63-71-80-90-100-112	6-12 / 9-16
M25X1.5	132	12.5-20.5
M32X1.5	160-180	17-26

Los prensaestopas y los tapones, si no se suministran con el motor, deben ser como se indica arriba. El prensaestopas montado en la caja de bornes deberá estar cubierto por un certificado ATEX e IECEx válido según el tipo de protección de la caja de bornes (Ex db y/o Ex eb y/o Ex tb), deberá tener un grado de protección mínimo IP66 según normativa EN/IEC 60529 y EN/IEC 60079-0; la temperatura de funcionamiento del prensaestopas debe estar incluida en el rango de temperatura definido por la temperatura ambiente mínima indicada en la etiqueta Ex del motor y la temperatura ambiente máxima + 25 °C.

Los prensaestopas se atornillarán completamente al motor con un par de apriete de 5Nm

El cableado debe realizarse con cables que tengan una temperatura de funcionamiento de la cubierta al menos igual a la temperatura ambiente máxima del motor +25 °C y una temperatura de aislamiento del conductor al menos igual a la temperatura ambiente máxima del motor +35 °C . Los prensaestopas del cable de la carcasa del condensador y los prensaestopas de los cables del motor dentro de la carcasa Ex se instalan en fábrica. No está permitido desatornillar ni modificar la instalación de fábrica. Como las patas son desmontables es posible fijarlas en 3 posiciones diferentes para tener la posibilidad de tener la caja de bornes en la parte superior o en los lados derecho e izquierdo del motor. Al mismo tiempo la caja de bornes se puede montar directamente en el motor para tener las entradas de cables que sea necesario. Así que las entradas de los cables pueden estar en las cuatro posiciones diferentes. Esta operación se tiene que hacer antes de la conexión. Para quitar la cubierta de la caja de bornes, debe desatornillarse

los 4 tornillos que fijan la caja al motor y para colocarla de nuevo se debe enroscar por completo teniendo en cuenta el par de apriete (ver la tabla de los pares de apriete). Atornillar completamente respetando el par de apriete de la TABLA DE PARES DE APRIETE

4.CONEXIÓN A LA RED ELÉCTRICA

⚠ La conexión a la red eléctrica debe hacerse sólo por personal debidamente cualificado por medio de la entrada del cable suministrado con el motor o bien por medio de otro tipo de entrada de cables certificada, de conformidad con las normas europeas mostradas anteriormente en cumplimiento con la Directiva 2014/34/EU. En caso de motor con cable ya instalado, el extremo libre del cable debe estar conectado en una zona de seguridad o en el interior de un recinto, con un tipo de protección adecuado para el ambiente explosivo. Consulte siempre los datos de tensión y frecuencia impresos en la placa para asegurar que el motor esta adecuado a la alimentación de red. Si no se especifica, se puede suponer una tolerancia de $\pm 5\%$ de la tensión y de $\pm 1\%$ en la frecuencia indicada en la placa de características (X en el número de certificado). Para motores con clase de temperatura T3 y T4 es posible tener $\pm 10\%$ en el voltaje. Los diagramas de conexión se suministran normalmente junto con el motor o se imprimen en la caja de bornes. Si faltan, por favor consulte este manual o póngase en contacto directamente con nuestra oficina técnica. Compruebe y asegúrese de que, en el caso de arranque estrella / triángulo, el paso de estrella a triángulo solo puede ser ejecutado después de que el paso del arranque estrella haya finalizado; este punto importante ya que puede haber un riesgo de cargas no permitidas.

El tamaño de cable debe ser adecuado a las características del motor y del tipo de planta. Los motores deberán estar protegidos por un dispositivo de disparo, que en caso de avería debe cortar el suministro de energía antes de que la temperatura de la superficie sea superior a la temperatura de ignición de la atmósfera explosiva.

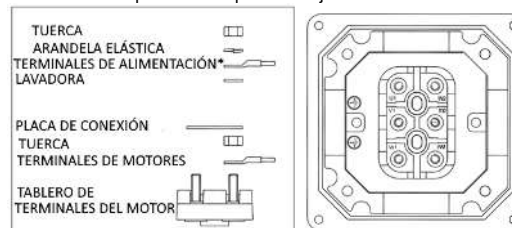
⚠ Los motores con caja de bornes de seguridad aumentada ("eb") se fabrican con una tarjeta de terminales especial y con un mejor aislamiento y mayor distancia.

⚠ Los motores Ex d tienen una tarjeta de terminales estándar. La conexión de alimentación se hará como en la imagen. Las tuercas tendrán que apretarse lo suficiente para evitar un afloje futuro.

TABLA DE PARES DE APRIETE

Rosca	M4	M5	M6	M8
Par de apriete (Nm)	1,5	2	3	6

La conexión de alimentación se realizará como en la imagen. Las tuercas deberán apretarse según la TABLA DE PARES DE APRIETE para evitar que se aflojen.



*Cable de motor - agregado por el instalador

IMPORTANTE: Motores con caja de bornes Ex eb, SÍTUE LA JUNTA (SEAL) EN LA POSICIÓN CORRECTA ANTES

DE CERRAR LA CAJA DE BORNES Y DESTORNILLAR TOTALMENTE TODOS LOS TORNILLOS. CONEXIÓN A TIERRA

Además del tornillo de la terminal de tierra instalado en el interior de la caja de bornes, debe haber otro terminal externo en la carcasa del motor. Si los conductores de la línea tienen una sección S las conexiones a tierra tiene que ser::

Conductor de tierra	Conductores de línea
= S	$S \leq 16 \text{ mm}^2$
16	$16 \text{ mm}^2 < S \leq 35 \text{ mm}^2$
$\geq 0,5 \text{ S}$	$S > 35 \text{ mm}^2$

Conexión de cables auxiliares (Caja de terminales “e”)

Si el motor está provisto de caja de bornes auxiliares, la conexión de protecciones térmicas y / o resistencias de caldeo se puede hacer en las mismas borneras. Si el motor está provisto de una caja de bornes que tiene sólo las 6 principales borneras, la conexión de la protección térmica y calentadores, tiene que ser realizada mediante soldadura de los alambres de los dispositivos auxiliares con los hilos del cable, y aislar usando una funda termorretráctil.

Protección

El motor debe estar protegido por un dispositivo de disparo que, en caso de avería, corte la alimentación del motor de manera que la temperatura de la superficie de las partes en contacto con la atmósfera explosiva no alcance la temperatura de ignición.

Acondicionamiento para convertidor

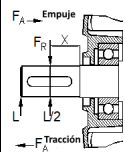
En caso de que los motores vayan a trabajar con convertidor de frecuencia (VFD) , deberán estar provistos de protectores en los bobinados (normalmente termistores PTC), capaces de asegurar su funcionamiento dentro de los límites de las clases de temperatura. Dichos dispositivos deberán estar conectados a un dispositivo de control capaz de cortar el suministro de energía al motor en caso de llegar de la temperatura límite. Las características de funcionamiento admisibles en este modo se indican en la placa de características o en una etiqueta adicional. Los filtros de salida deben instalarse según la longitud del cable en el lado del motor del VFD. La selección del filtro y la longitud máxima del cable dependen de las instrucciones y los datos proporcionados por el fabricante del VFD. Para evitar corrientes de circulación parásitas, se recomienda utilizar medidas adecuadas en la fuente de alimentación que permitan reducir significativamente la causa de activación. Para ello, póngase en contacto con su proveedor local de VFD.

Resistencias de caldeo

Las resistencias de caldeo funcionan únicamente cuando el motor está en marcha o conectado a la red.

Carga permitida

Suponiendo una vida útil de 20.000h para motores 2P y 40.000h para motores 4,6,8 P:

	Tamaño del Motor	Rodamientos	*Max radial carga in L/2	*Max axial carga (Empuje)	*Max axial Carga (tracción)
	63	6202	365	230	120
	71	6202	450	280	160
	80	6204	590	370	220
	90	6205	645	400	230
	100	6206	920	560	350
	112	6306	1280	700	480
	132	6308	1345	770	590
	160	6309	2465	1401	714
	180	6310	3000	1498	615

*unidad de medida in [N]

Servicios permitidos

S1: trabajo continuo, el motor funciona a una carga constante hasta que se alcanza el equilibrio térmico.
S2: Servicio intermitente: una vez encendido, el motor trabaja a una carga constante durante un período limitado y no se alcanza el equilibrio térmico. El motor se iniciará una segunda vez, luego cuando su temperatura haya disminuido a temperatura ambiente.
S3: servicio intermitente: secuencia de ciclos de trabajo idénticos, compuesta por un tiempo de funcionamiento a carga constante y un tiempo de reposo. Cuando está en reposo, el motor no se alimenta. La corriente de arranque no influye significativamente en el aumento de la temperatura.
S9: la carga y la velocidad varían periódicamente dentro del rango de funcionamiento permitido. Sobrecarga frecuente puede ocurrir. Típico de los motores suministrados por el inversor (ver arriba).

Motores con ventilación forzada (IC416)

En el caso de motores con ventilación forzada, el motor principal solo se puede suministrar cuando la ventilación auxiliar ya está funcionando.

5. MARCADO

CE (*)		Marcado de conformidad con las directivas Europeas
Ex (*)		Marcado específico de protección contra explosiones
II (*)		Motor para plantas en superficie (no para minas)
2 (*)		Categoría 2: Alto nivel de protección
GAS	G (+)	Atmosfera explosiva, por la presencia de vapor de gas combustible o vaho
	Ex db	Motor y caja de bornes antideflagrante
	Ex dbeb	Motor y caja de bornes antideflagrante de seguridad aumentada.
	IIIC	Grupo gas, incluye las zonas IIB and IIA
	T3, T4, T5	Clase de temperatura
DUST	D (*)	Atmosfera explosiva, debido a la presencia de polvo combustible
	Ex tb IIIC	Aptos para zona 21 (cat. 2D)
	T125°C	Max temperatura superficial
T.amb		Temperatura ambiente
AB xx ATEX yyy		AB : laboratorio que emite certificado de tipo CE xx : año de expedición del certificado yyy : numero de tipo de certificado CE
ZZZZ (*)		Organismo certificador, que notifica la garantía de calidad producto.
(*) Solo para marcado ATEX		

6. MANTENIMIENTO Y REPARACIÓN

EL MANTENIMIENTO debe ser realizado únicamente por personal cualificado de acuerdo con la norma EN 60079-17 o bien las normas nacionales donde esté instalado el motor. El personal cualificado deben tener conocimiento sobre aparatos eléctricos en atmósferas explosivas e instalaciones eléctricas en áreas peligrosas.
- Cada 3000 horas de servicio verificar y restablecer, si es necesario, la grasa en las juntas radiales (por ejemplo, los anillos en V). Periódicamente (en función del entorno y el deber) verificar:
- Limpieza del motor (aceite, polvo, suciedad y residuos) y el libre paso de aire de refrigeración
- El correcto ajuste de los tornillos de fijación de las conexiones eléctricas.
- Niveles de vibración admitidos (v ef <3,5 mm / s para Pn <15KW v ef <4,5 mm / s para Pn> 15KW) y ausencia de ruidos anómalos; en caso un alto nivel de vibraciones y / o ruido

verificar la fijaciones de motor y que el equilibrio de la máquina y los rodamientos estén en buenas condiciones.

EX LAS REPARACIONES se harán de acuerdo con las normas definidas en el estándar EN 60079-19..

Estas reparaciones sólo pueden realizarse bajo el control y autorización de Orange1 EM o bien en un taller de reparaciones certificado. Cuando la reparación se realice en un taller de reparaciones certificado, deben respetarse todas las características originales del motor y utilizar sólo recambios originales. Además se debe colocar una placa de identificación adicional en el motor con el símbolo escrito para identificar la reparación. Debe mostrarse en dicha placa el nombre de la empresa, certificación, número de operación de reparación y fecha. No puede modificarse nada en relación con el tipo de protección. En caso de que no se respeten estas normas, el motor pierde toda su característica de certificación.

LAS JUNTAS NO SE PUEDEN REPARAR

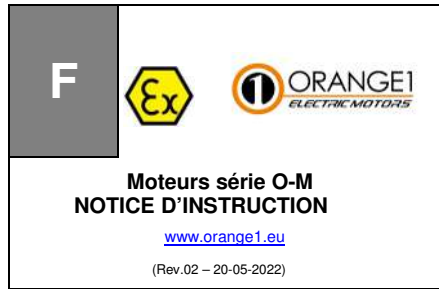
7. COMPONENTES MODULARES

Los motores son completamente modulares. Las patas y las bridas pueden montarse sin afectar el certificado ATEX, ya que son externos y no son parte del tipo de protección. En la tabla de a continuación te mostramos los tornillos que deben utilizarse para montar los diferentes componentes modulares.

Tamaño del Motor	Bridas	Pies/Patas	Cubierta caja de terminales
63	M5x16	M6x16	M5x14
71	M5x16	M6x16	M5x14
80	M6x20	M6x20	M5x14
90	M6x20	M8x20	M5x14
100	M8x20	M8x30 TUERCA M8	M5x14
112	M8x20	M8x35 TUERCA M8	M5x14
132	M10x20	M10X50 TUERCA M10	M6x16
160	n.3 M10x95 n.1 M10x70	M10x70 + DADO M10	M6X20
180	n.3 M10x95 n.1 M10x70	M10x70 + DADO M10	M6X20
Calidad de tornillo 8.8			

8. FECHA DE PRODUCCIÓN

La fecha de producción se muestra en la placa del motor indicando Mes y Año de fabricación: MM-AA



1. GENERALITES

⚠ Ces instructions de sécurité se réfèrent à l'installation, l'utilisation, le transport et à la maintenance des moteurs série O-M pour une utilisation dans les atmosphères potentiellement explosives en présence de gaz et / ou de poussières. Les informations de ces instructions sont uniquement destinées à du personnel qualifié. Les instructions sont généralement délivrées à un personnel qualifié, en responsabilité d'utiliser des machines dans les atmosphères potentiellement explosives. A l'exception de l'ouverture du couvercle de la boîte à bornes, toute ouverture d'un autre élément, annule les conditions de garantie concernant ces moteurs. Ci-dessous sont listés les différents marquages des moteurs ainsi que les zones dans lesquelles ils peuvent être utilisés.

GAZ	II 2G Ex db IIC T3 Gb T.amb -40°C , +60°C II 2G Ex db IIC T4 Gb T.amb -40°C , +60°C II 2G Ex db IIC T5 Gb T.amb -40°C , +40°C II 2G Ex db eb IIC T3 Gb T.amb -40°C , +60°C II 2G Ex db eb IIC T4 Gb T.amb -40°C , +60°C II 2G Ex db eb IIC T5 Gb T.amb -40°C , +40°C	Zones 1, 2
	II 2D Ex tb IIIC T125°C T.amb -40°C , +60°C (épaisseur maximale de la couche de poussière 5mm)	Zones 21, 22

Ces moteurs sont conformes aux Exigences Essentielles de sécurité et de santé pour les atmosphères potentiellement explosives selon les normes européennes :

IEC/EN 60079-0, EC/EN 60079-1, IEC/EN 60079-7, IEC/EN 60079-31

⚠ Les machines tournantes représentent un danger lorsqu'elles sont en rotation et peuvent provoquer également des brûlures en raison de la température très élevée de la surface extérieure. Toute intervention sur ces moteurs tels que branchement, connexion, maintenance, mise en service, ne peuvent être effectués que par des personnes qualifiées (IEC 364 doit être appliquée). Un travail mal réalisé peut provoquer des dommages aux personnes et aux biens environnants.

⚠ Il est impératif avant de branchement de lire avec précaution la plaque signalétique fixée sur le moteur. Les moteurs basse tension sont des composants devant être incorporés à des machines selon la directive 2006/42/EC. La mise en service n'est pas autorisée jusqu'à ce que la conformité de la machine avec cette directive ne soit établie.

Ces moteurs asynchrones sont en conformité avec la directive EMC 2014/30/UE et aucune protection particulière n'est requise lorsqu'ils sont connectés à un signal sinusoïdale pur.

⚠ Avant toute intervention sur le moteur, soyez certain qu'il soit arrêté et débranché du secteur d'alimentation (ainsi que les équipements auxiliaires éventuels). En cas de démarreurs, de re-démarreurs automatiques, relais ou télécommande, faire attention aux recommandations spécifiques de ces équipements.

2. TRANSPORT ET STOCKAGE

⚠ Lors de la réception de ces moteurs, vérifier si aucune avarie n'est survenue lors du transport. Si tel est le fait, ne pas mettre en service et contacter immédiatement votre transporteur.

Les anneaux de levage, lorsqu'ils sont fournis avec le moteur, doivent être correctement fixés, ou en vérifier la fixation, car ils ne sont prévus et calculés que pour lever le moteur seul, et aucune charge additionnelle n'est autorisée. Si nécessaire utiliser des éléments plus appropriés au transport ou déplacements. Ne jamais utiliser d'autres éléments du moteur pour le lever ou le transporter. Si deux anneaux de levage sont montés ou fournis avec le moteur, utiliser les deux anneaux en même temps pour le lever. Stocker les moteurs dans un local sec, propre, sans poussières, abrité des intempéries dans une température ambiante comprise entre 5°C et 40°C, avec un taux d'humidité relative < à 50%. Afin de ne pas endommager les roulements, durant leur stockage, les moteurs ne devront pas être exposés à des vibrations (v < 0,2mm/s). Avant la mise en service, la résistance d'isolement devra être mesurée. Dans le cas où la valeur de la résistance serait < 1,5 MΩ, les bobinages devront être séchés. Contactez immédiatement notre service technique afin de connaître la procédure à suivre.

3. INSTALLATION

⚠ L'installation doit être effectuée conformément aux normes EN 60079-14 ou aux normes nationales en vigueur (dernière édition). Avant l'installation dans une atmosphère explosive, l'installateur devra vérifier que le moteur est adapté à la classification de la zone et aux caractéristiques des différentes substances inflammables, gaz ou poussières, présentent dans la zone où le moteur sera installé. Il est impératif de vérifier le marquage sur la plaque signalétique avant l'installation.

Le moteur doit être installé uniquement par du personnel qualifié qui a la connaissance des risques dus aux courants électriques et aux caractéristiques chimiques et physiques des gaz et poussières combustibles dans les environnements dangereux. Il devra également savoir quoi faire en cas d'arrêt du moteur, de la machine, afin d'éviter un redémarrage intempestif.

Les indications portées sur la plaque signalétique correspondent aux voltages et fréquences de l'alimentation et autres données électriques et mécaniques, ainsi que les indications de sécurité concernant le moteur (type de protection, classe de température, température ambiante etc...).

ATTENTION : NE PAS OUVRIR EN PRESENCE D'ATMOSPHERE EXPLOSIVE

Les accouplements ou autres éléments montés sur les arbres moteurs devront être équilibrés. Tous montages sur l'arbre moteur, accouplements, poulies, moyeux etc... devront être effectués avec des outillages appropriés pour ne pas endommager les roulements du moteur.

Après montage de ces éléments, vérifier qu'ils soient bien fixés sur le bout d'arbre et notamment qu'ils soient en appui contre l'épaulement. Dans le cas contraire compenser l'espace par des rondelles ou par une entretoise.

Les poulies trop grandes ou trop petites peuvent nuire à la durée de vie des roulements à billes. De même une tension trop importante des courroies provoquent les mêmes problèmes et également provoquer une déformation ou une rupture de l'arbre.

Les moteurs doivent être installés dans de bonnes conditions mécaniques et aérodynamiques nécessaires à un bon échange thermique. La ventilation doit être libre de toute gêne pour faciliter l'entrée et la sortie d'air de toute part, et ne doit pas être perturbée par des éléments voisins contradictoires. Afin de ne pas perturber la ventilation, une distance de 40mm minimum doit être respectée entre l'arrière du capot de ventilation et un élément susceptible de nuire à l'aspiration de l'air, nécessaire au refroidissement du moteur. Eviter également des éléments chauds à proximité du moteur qui pourraient affecter les températures du refroidissement ainsi que celle du moteur lui-même.

En cas d'installation à l'extérieur, il est impératif de protéger le moteur des rayons solaires ainsi que des intempéries pluie et neige (la neige neutralisant la ventilation). Il est obligatoire d'utiliser en cas de montage vertical arbre en bas, un toit ou un parapluie pour protéger l'entrée d'air du ventilateur contre des éléments étrangers extérieurs.

Il est préférable de protéger le moteur par un disjoncteur ou un limiteur de couple lorsqu'il n'est pas protégé par une sonde thermométrique dans les bobinages connectée à un relais approprié.

Dans le cas d'un environnement très humide et / ou de moisissure, Orange1 EM peut équiper les moteurs de réchauffeurs.

Ces réchauffeurs ne doivent pas être connectés lorsque le moteur fonctionne.

Au lieu d'utiliser des réchauffeurs anti-condensation, il est possible d'alimenter le moteur sur les broches U1-V1 avec une tension de 4 à 10% de la tension de phase nominale du moteur; 20-30% du courant nominal est suffisant pour chauffer le moteur.

⚠ Vérifier le sens de rotation avant de coupler le moteur. Pour cela, avant de brancher le moteur, retirer ou maintenir par un adhésif la clavette afin d'éviter son éjection lors de la rotation.

Si le sens de rotation n'est pas celui requis, débrancher le moteur du secteur et modifier le sens selon:

- Moteur triphasé, intervertir 2 phases sur la plaquette à bornes
- Moteur monophasé, suivre le schéma de branchement fourni avec le moteur.

Les schémas de branchement sont fournis avec le moteur ou imprimés dans la boîte à borne. En cas d'oubli ou de perte, se référer à ce manuel ou nous contacter

Entrées de câbles

⚠ En fonction du type de protection du moteur, les entrées de câbles, presse-étoupe ou autres raccordements, devront être impérativement conformes aux normes en vigueur selon le tableau ci-dessous et devront aussi correspondre à la gamme de température du moteur.

Type de protection de la boîte à bornes	Type de protection du presse-étoupe	Température operativa
Ex eb tb	Ex eb tb	-40°C , +100°C
Ex db tb	Ex db tb	-40°C , +100°C

Filetage de presse-étoupe	Taille du moteur	Diamètre du câble (mm)
M16x1.5	56-63-71-80-90-100-112	6-12
M20X1.5	56-63-71-80-90-100-112	6-12 / 9-16
M25X1.5	132	12,5-20,5
M32X1.5	160-180	17-26

Les presse-étoupes et les fiches, s'ils ne sont pas fournis avec le moteur, doivent être comme ci-dessus.

Le presse-étoupe monté sur la boîte à bornes doit être couvert par un certificat ATEX et IECEx valide selon le type de protection du compartiment de raccordement (Ex db et ou Ex eb et ou Ex tb), Il doit avoir un degré de protection minimum IP66 selon EN/CEI 60529 et EN/CEI 60079-0 ; la température de fonctionnement du presse-étoupe doit être comprise dans la plage de température définie par la température ambiante minimale indiquée sur l'étiquette Ex du moteur et la température ambiante maximale + 25 °C.

Les presse étoupe ou tout autre raccordements, devront être vissés à fond sur les entrées de câbles de la boîte à bornes du moteur : 5Nm couple de serrage

- Le câblage de terrain doit être effectué en utilisant des câbles ayant une température globale de fonctionnement de la gaine au moins égale à la température ambiante maximale du moteur +25°C et une température d'isolation du conducteur au moins égale à la température ambiante maximale du moteur +35°C.

Les presse-étoupes du boîtier du condensateur et les presse-étoupes des câbles du moteur à l'intérieur des boîtiers Ex sont installés en usine. Il est interdit de dévisser ou de modifier l'installation d'usine.

Les moteurs sont conçus avec des pattes rapportées pouvant être montées dans différentes positions sur la carcasse du moteur afin de positionner la boîte à bornes sur le dessus ou à droite ou à gauche.

De même les entrées de câbles de la boîte à bornes peuvent être orientées dans 4 positions différentes. Pour cela, avant câblage, et après avoir enlevé le couvercle de la boîte à bornes, desserrer les 4 vis à l'intérieur de la boîte à bornes et tourner la boîte dans la position requise. Resserrer les 4 vis à fond en appliquant le couple de serrage selon le tableau « couple de serrage » ci-après, et refermer le couvercle de la boîte à bornes après connexion : 5Nm couple de serrage.

4. RACCORDEMENT AUX CIRCUITS ELECTRIQUES

⚠ ⚠ Seulement les personnes qualifiées peuvent effectuer cette opération. Vérifier la mesure de résistance d'isolement.

Ce raccordement, doit être réalisé soit par l'intermédiaire du ou des presse étoupe fournis avec le moteur , soit par un presse étoupe ou autre dispositif possédant obligatoirement une certification en accord avec la directive ATEX 2014/34/EU.

Dans le cas où le moteur serait fourni avec une sortie de fils ou câbles, les fils volants devront être connectés directement dans une zone non dangereuse, si la longueur du câble d'origine le permet, ou à l'intérieur d'une boîte EX correspondant à la protection requise de la zone ou elle sera installée.

⚠ Toujours se rapporter à la plaque signalétique du moteur pour vérifier les tensions et fréquences, afin qu'elles correspondent avec l'alimentation à réaliser. Si rien n'est spécifié, la tolérance de voltage admise est +/- 5% et de 1% pour la fréquence par rapport aux indications écrites sur la plaque (le X sur le numéro du certificat). Pour les moteurs des classes de température T3 et T4 il est possible d'avoir ±10% sur la tension. Il est important afin d'éviter les risques de surcharge ampère-métriques non autorisée dans le cas d'un démarrage Y / D, de vérifier et d'être certain que la connexion se réalise après que la période de démarrage soit terminée.

Le calibrage des câbles d'alimentation doit correspondre dimensionnellement aux intensités indiquées sur la plaque signalétique.

Les moteurs doivent être protégés par un disjoncteur pouvant en cas de surcharge couper l'alimentation afin que la température de surface du moteur ne dépasse pas la température maximale d'inflammabilité des gaz ou poussières dans l'atmosphère environnante.

⚠ Les moteurs construits avec des boîte à bornes « eb » (Exdb eb) sont équipés de plaquettes à bornes à isolation renforcée et possèdent des distances augmentées entre les contacts.

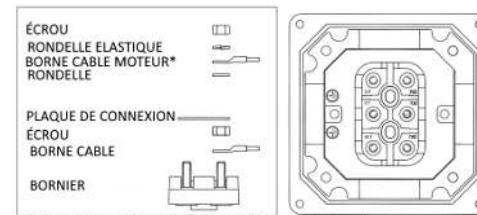
⚠ Les moteurs Exd sont équipés d' une plaquette à bornes standard.

TABLEAU DES COUPLES DE SERRAGE

Visserie	M4	M5	M6	M8
Couple de serrage (Nm)	1,5	2	3	6

La visserie de connexion de la plaquette à bornes doit être montée selon le schéma ci-dessous:

Les écrous doivent être serrés conformément au TABLEAU DES COUPLES DE SERRAGE pour éviter tout desserrage.



IMPORTANT : Pour les moteurs équipés de boîte à bornes Ex eb, et pour le respect d'une bonne étanchéité, bien replacer le joint avant de refermer le couvercle de boîte à bornes et bien resserrer toutes les vis.

Mise à la terre:

⚠ En plus du dispositif de mise à la terre à l'intérieur de la boîte à bornes, le moteur est équipé d'une borne de terre extérieure. Ces bornes doivent être connectées selon:

Câble de terre	Câble d'alimentation
= S	S ≤ 16 mm ²
16	16 mm ² < S ≤ 35 mm ²
≥ 0,5 S	S > 35 mm ²

Connexions des auxiliaires dans une boîte à bornes « eb », pour moteurs Exdb eb.

⚠ Si le moteur est équipé d'une plaquette à bornes incluant des bornes pour brancher des sondes thermiques ou réchauffeurs, les utiliser à ces fins. Dans le cas contraire, ces auxiliaires devront être soudés aux câbles, et isolés en utilisant un fourreau ou gaine rétractable en le chauffant.

Protection

⚠ Le moteur doit être protégé par un disjoncteur thermique ou ampère-métrique permettant en cas de surcharge ou blocage de couper l'alimentation afin d'éviter une surchauffe pouvant dépasser la température d'inflammabilité permise dans la zone où il est installé.

Moteurs alimentés par l'intermédiaire d'un variateur de fréquence.

⚠ Il est obligatoire dans ce cas que les bobinages des moteurs soient équipés de sondes thermiques (les sondes PTC étant les plus utilisées).Celles-ci ont pour fonction de contrôler la classe de température à respecter de la zone. Ces sondes doivent être connectées à un relais qui coupera l'alimentation du moteur dans le cas de températures excessives.

Les caractéristiques de fonctionnement autorisées dans ce mode sont indiquées sur la plaque signalétique ou sur une étiquette supplémentaire. Les filtres de sortie doivent être installés en fonction de la longueur du câble côté moteur du variateur de fréquence (VFD). La sélection du filtre et la longueur maximale du câble dépendent des instructions et des données fournies par le fabricant du VFD. Pour éviter les courants de circulation vagabonds, il est recommandé d'utiliser des mesures appropriées sur l'alimentation électrique qui permettent de réduire considérablement la cause de déclenchement. Pour cela, contactez votre fournisseur VFD local.

Résistance de chauffage

⚠ Les résistances ne doivent en aucun cas être alimentées lorsque le moteur est sous tension. Les câbles de raccordement doivent être adaptés à une puissance de 25W avec une tension d'alimentation d'une intervalle de 110V-240V (± 10%).

Charges axiales et radiales maximum admises

Dans l'esprit d'assurer une durée de vie de 20 000 heures pour les moteurs 2 pôles et de 40 000 heures pour les moteurs 4,6,8 pôles, il est recommandé de ne pas dépasser les valeurs suivantes:

	Ht D'axe	Roulements	*Charges radiales maxi à L/2	*Charges axiales maxi (poussée)	*Charges radiales maxi (tirée)
Poussée F_R $L/2$ Tirée $-F_R$	63	6202	365	230	120
	71	6202	450	280	160
	80	6204	590	370	220
	90	6205	645	400	230
	100	6206	920	560	350
	112	6306	1280	700	480
	132	6308	1345	770	590
	160	6309	2465	1401	714
	180	6310	3000	1498	615

Services autorisés

S1 : Service continu le moteur fonctionne à charge constante jusqu'à ce que l'équilibre thermique soit atteint.
S2 : Service intermittent : Une fois démarré, le moteur fonctionne à charge constante pendant une durée limitée et l'équilibre thermique n'est pas atteint. Le moteur sera redémarré une deuxième fois lorsque sa température sera descendue à la température ambiante.

S3 : Service intermittent : Suite de cycles de service identiques, constitués d'un temps de fonctionnement à charge constante et d'un temps de repos. Au repos, le moteur n'est pas alimenté. Le courant de démarrage n'influence pas significativement l'échauffement.

S9 : La charge et la vitesse varient périodiquement dans la plage de fonctionnement autorisée. Une surcharge fréquente peut se produire. Typique des moteurs alimentés par variateur de fréquence.

Moteurs servo-ventilés (IC416)

Dans le cas de moteurs à ventilation forcée (IC416), le moteur principal ne doit être alimenté que lorsque la ventilation auxiliaire fonctionne.

5. MARQUAGE

CE (*)	Marquage de conformité des Normes Européennes
Ex (*)	Marquage spécifique des matériels de protection contre l'explosion
II (*)	Zone de surface (différents des mines zone I)
2 (*)	Category 2: high level of protection
G (*)	Atmosphère explosive due à la présence de gaz et/ou vapeur
Ex db	Moteur antidéflagrant ainsi que la boîte à bornes
Ex dbeb	Moteur antidéflagrant avec la boîte à bornes à sécurité augmentée «e»
IIC	Groupe de gaz , valable également pour IIB et IIA
T3, T4, T5	Classes de températures
D (*)	Atmosphère explosive due à la présence de poussières explosives
Ex tb IIC	tD Enceinte, méthode A pour zone 21(catégorie2D)
T125°C	température de surface maximale
T.amb	la température ambiante
AB xx ATEX yyy	AB: Nom du laboratoire ayant délivré le certificat CE de type xx: Année du certificat yyy: Numéro du certificat
ZZZZ (*)	Numéro de référence déterminant la notification de l'Assurance Qualité du produit.
(*) Uniquement pour le marquage ATEX	

6. MAINTENANCE ET REPARATION

⚠ ⚠ ⚠ La maintenance doit être effectuée uniquement par du personnel qualifié en accord avec les normes EN60079-17 ou avec les normes nationales, dernière édition en vigueur.Le personnel qualifié doit avoir la parfaite connaissance de l' installation des appareils électriques dans les atmosphères explosives. Périodiquement, en relation avec l'environnement et le service , vérifiez:

-Toutes les 3000 heures, compléter si nécessaire la graisse sur les joints d'arbres.

-La présence de poussières ou huiles sur la surface du moteur et la nettoyer régulièrement pour éviter les dépôts.

-S'assurer que le passage d'air du ventilateur et capot ne soit pas gênés ou obstrués.

-Que les vis principales, les connexions et presse étoupe ne soient pas desserrés.

-Que le moteur tourne librement, sans vibrations anormales (v eff < 3,5mm/s pour Pn < 15kw) et sans bruits excessifs. Dans le cas de vibrations et / ou bruits, vérifier les fixations du moteur, équilibrage (des équipements montés) et que les roulements soient en bon état.

⚠ Les réparations doivent être effectuées en relation avec les règles et Normes définies selon EN60079-19. Les réparations ne peuvent être réalisées que sous le contrôle et l'autorisation de Orange1 EM, ou par un établissement agréé et certifié. Lorsqu'un établissement certifié effectue la réparation, celle-ci doit être réalisée en respectant strictement les caractéristiques du moteur et en utilisant uniquement des pièces d'origine . Après cette intervention, une plaque signalétique supplémentaire doit être fixée sur le moteur avec le symbole d'identification de l'établissement étant intervenu , son numéro de certification, le numéro et la date d'intervention.

Aucun élément d'origine concernant la protection du moteur ne peut être modifié.

Dans le cas d'une modification par rapport à l'origine ou du non respect évoqué ci-dessus, le moteur perdra sa certification d'origine.

LES JOINTS NE PEUVENT PAS ÊTRE RÉPARÉS 7. COMPOSANTS MODULAIRES

Ces moteurs sont construits dans un esprit de modularité. Pattes et brides peuvent être montées ou démontées sans pour autant affecter la certification ATEX du moteur lui-même. Ces opérations étant hors de l'enceinte antidéflagrante.

Dans le tableau ci-dessous, sont répertoriées les vis nécessaires aux montages de ces différents éléments.

Ht D'axe	Brides	Pattes	Couvercle BâB
63	M5x16	M6x16	M5x14
71	M5x16	M6x16	M5x14
80	M6x20	M6x20	M5x14
90	M6x20	M8x20	M5x14
100	M8x20	M8x30 / ECROU M8	M5x14
112	M8x20	M8x35 / ECROU M8	M5x14
132	M10x20	M10X50 MUT M10	M6x16
160	n.3 M10x95 n.1 M10x70	M10x70 + DADO M10	M6X20
180	n.3 M10x95 n.1 M10x70	M10x70 + DADO M10	M6X20
Vis qualité 8.8			

8. DATE DE FABRICATION

La date de fabrication est indiquée sur la plaque signalétique du moteur indiquant le mois et l'année de fabrication : MM-AA

Dichiarazione UE di Conformità / UE Declaration of Conformity / Déclaration UE de Conformité UE Konformitätserklärung / Declaration UE de Conformidad

*I motori elettrici asincroni / Electric asynchronous motors / Les moteurs électriques asynchrones
Elektrische asynchron motoren typ / Los motores electricos asincronos del tipo*

Serie O-M

Che riportano una delle marcature

Bearing one of the marks / Marques / Kennzeichnung / Que llevan una de los marcados

EU Type Examination certificate (according to Annex III of the ATEX Directive 2014/34/EU)				EPT 17 ATEX 2588 X
CE	0477	Ex	II 2G Ex db IIC T5... T3 Gb	
CE	0477	Ex	II 2GD Ex db IIC T5... T3 Gb Ex tb IIIC T125°C Db	
CE	0477	Ex	II 2G Ex db eb IIC T5... T3 Gb	
CE	0477	Ex	II 2GD Ex db eb IIC T5... T3 Gb Ex tb IIIC T125°C Db	

Sono dichiarati conformi sotto l'esclusiva responsabilità del costruttore / They are declared compliant under the sole responsibility of the manufacturer / Ils sont déclarés conformes sous la seule responsabilité du fabricant / Sie werden unter der alleinigen Verantwortung des Herstellers als konform erklärt. / Se declaran conformes bajo la exclusiva responsabilidad del fabricante.

ORANGE 1 ELECTRIC MOTORS S.P.A.

*in accordo alle seguenti Direttive CE / in compliance with the EC Directives / selon les Directives CE suivantes
in Übereinstimmung mit den folgenden EG-Richtlinien / de acuerdo con las siguientes Directivas EC*

2014/34/UE
2014/30/UE
2006/42/EC
2015/863 / EU
(EU) 2019/1781

(ATEX)
(EMC)
(Machinery)
(RoHS III)
(Ecodesign Requirements)

*e in conformità alle seguenti Norme / and comply with the following Standards / et en conformité avec les Normes
und entsprechen den folgenden Standard / y conform a las siguientes Normas*

EN IEC 60079-0:2018, EN 60079-1:2014, EN 60079-31:2014, EN 60079-7:2015+A1:2018
EN 60034-1,2,5,6,7,9,12,14, IEC60072-1,

NOTA/ NOTE/ BEMERKUNG/ NOTAS

(Directive 2006/42/EC Direttiva Macchine, Machinery Directive, Directive Machine, Maschinen-Richtlinie, Directiva Maquinaria)

*I motori in oggetto sono considerati componenti, in accordo con la direttiva macchine. Il motore non deve essere messo in servizio
finché la macchina stessa su cui è montato non venga dichiarata conforme alla direttiva macchine.*

*Above motors considered as components, comply with the directive machine. The motor must not be incorporated in service until the machine
itself has not been declared in conformity with the machinery directive.*

*Les moteurs ci-dessus considérés comme composants sont conformes à la directive machine. Le moteur ne peut être incorporé
et mis en service avant que la machine dans laquelle il est incorporé ne soit déclarée conforme à la directive machine.*

*Für die korrekte installation der oben genannten Motore sowie der entsprechenden komponenten, die in ihrer Bauart mit den zu dieser
Bescheinigung aufgeführten Vorschriften übereinstimmen, ist der Maschinenhersteller/Maschinenbetreiber verantwortlich. Die Motoren
entsprechen den Vorschriften nur, solange die Anlage, in der sie eingebaut wurden, in Übereinstimmung mit den geltenden Maschinen-
richtlinien und Vorschriften errichtet wurde.*

*Los motores en objeto, por tratarse de componentes, cumplen las normas de la directiva si la instalacion está correctamente controlada por el
constructor de la máquina. El motor no debe entrar en servicio hasta que la máquina en que ha sido incorporado disponga de la declaration de
la directive maquinaria*

Product Quality Assurance Notification Number (according to Annex IV of the ATEX Directive 2014/34/EU): EPT 21 ATEX 4234 Q
Notified by Eurofins Product Testing Italy S.r.l. – Notified Body n.0477 - Via Courgné 21 - 10156 Torino Italy

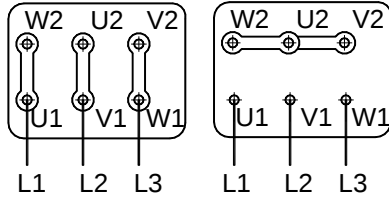


28/06/2021

Armando Donazzan
Legale Rappresentante

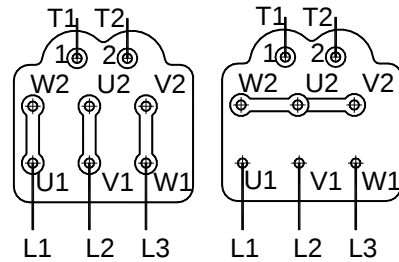
Schemi di collegamento / Wiring diagrams

Trifase 1 Velocità 2-4-6-8 poli (6 fili) – Three-phase 1 speed 2-4-6-8 poles (6 wires)



(D) Collegamento delta
Tensione inferiore
Delta connection
lower voltage

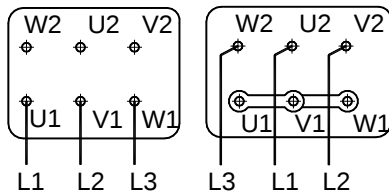
(Y) Collegamento stella
Tensione superiore
Star connection
higher voltage



(D) Collegamento delta
Tensione inferiore
Delta connection
lower voltage

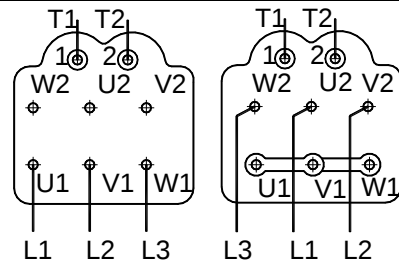
(Y) Collegamento stella
Tensione superiore
Star connection
higher voltage

Trifase doppia velocità 1 avvolgimento – Three-phase double speed 1 winding



Bassa velocità – Low speed

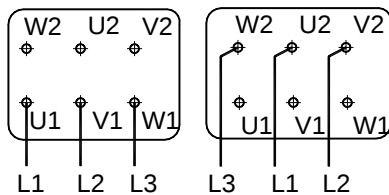
Alta velocità – high speed



Bassa velocità – Low speed

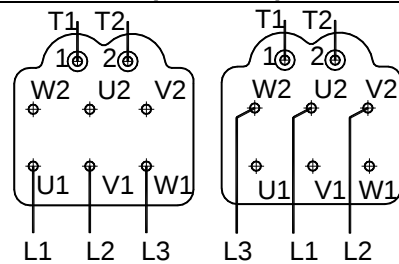
Alta velocità – high speed

Trifase doppia velocità 2 avvolgimenti separati – Three-phase double speed 2 separate windings



Bassa velocità – Low speed

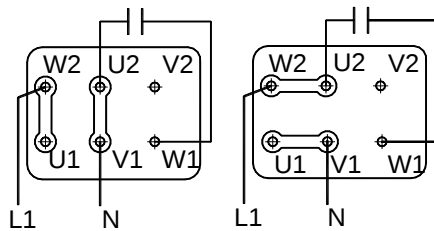
Alta velocità – high speed



Bassa velocità – Low speed

Alta velocità – high speed

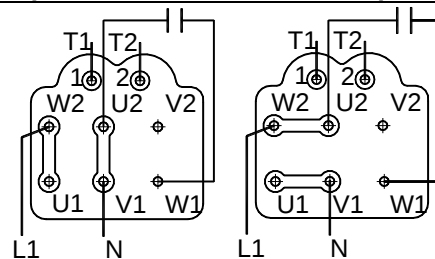
Monofase 4 fili – Single-phase 4 wires



Rotazione oraria
Clockwise rotation

Rotazione antioraria
Counter clockwise rotation

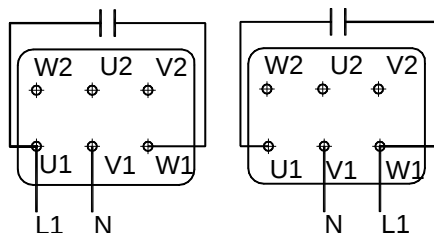
Monofase 4 fili con protezione termica Single-phase 4 wires with thermal protection



Rotazione oraria
Clockwise rotation

Rotazione antioraria
Counter clockwise rotation

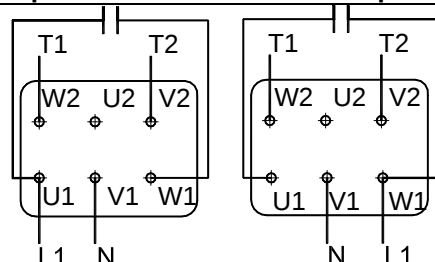
Monofase 3 fili – Single-phase 3 wires



Rotazione oraria
Clockwise rotation

Rotazione antioraria
Counter clockwise rotation

Monofase 3 fili con protezione termica Single-phase 3 wires with thermal protection



Rotazione oraria
Clockwise rotation

Rotazione antioraria
Counter clockwise rotation



[1]

EU-TYPE EXAMINATION CERTIFICATE

[2] **Equipment intended for use in potentially explosive atmospheres Directive 2014/34/EU – Annex III**

[3] Certificate Number: **EPT 17 ATEX 2588 X** **issue 5**

[4] Equipment: **Electric motor
O-M**

[5] Manufacturer: **ORANGE1 ELECTRIC MOTORS S.p.A**

[6] Address: **Via Mantova, 93 – 43122 Parma - Italy**

[7] This equipment and its accepted variations are specified in the annex to this Certificate.

[8] Eurofins Product Testing Italy S.r.l., Notified Body n. 0477 in accordance with Article 21 of the Directive 2014/34/EU of the European Parliament and of the Council of 26th February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II of the Directive. The examination and test results are recorded in the confidential Report N°EPT.24.REL.01/2313114

[9] Compliance with the essential health and safety requirements is assured through the verification of them and by compliance with the following harmonized standards:

EN IEC 60079-0:2018, EN 60079-1:2014, EN 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 is subject to the special conditions for safe use specified in the annex to this Certificate.

[11] This EU-TYPE EXAMINATION CERTIFICATE relates only to the design, the exam and the tests of the specified equipment.

Further requirements of the Directive 2014/34/EU apply to the manufacture and supply of this equipment. These requirements are not object of this Certificate.

[12] The equipment shall include the sign  and the following strings:

II 2G
Ex db IIC T5 ... T3 Gb or
II 2G
Ex db eb IIC T5 ... T3 Gb or
-40°C ≤ Tamb ≤ +60°C
II 2GD
Ex db IIC T5 ... T3 Gb
Ex tb IIIC T125°C Db
II 2GD
Ex db eb IIC T5 ... T3 Gb
Ex tb IIIC T125°C Db

Relationships between ambient temperature range and temperature limits are reported in the equipment description

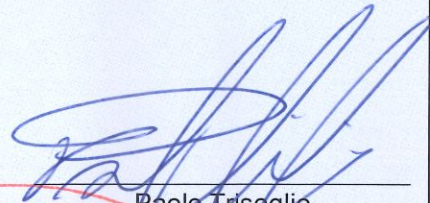
Applicable when flameproof terminal compartment is used

Applicable when increased safety terminal compartment is used

Place and date of issue:

(DD-MM-YYYY)

Torino, 19-03-2024

Dionisio Bucchieri
Directive Responsible

Paolo Trisoglio
Managing Director


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 CP-ATEX-MOD-26-00



This Certificate has 8 pages and it is reproducible only in its entirety. Conditions of validity are reported below.



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[14]

ANNEX
EU-TYPE EXAMINATION CERTIFICATE
N. EPT 17 ATEX 2588 X issue 5

[15] Equipment description

The motors are made of aluminium and have separate parts: motor enclosure, terminal box for supply and capacitor enclosure (optional). The motors are suitable for group IIC and group IIIC. The motor enclosure has types of protection "Ex d" and "Ex t";

The terminal box can have types of protection "Ex d" and "Ex t" or "Ex e" and "Ex t"; in addition, the connection between the motor wires and supply cable can be made in a box without terminals by the use of splicing or head to head connectors

The capacitor enclosure has types of protection "Ex d" and "Ex t";

All the parts of the flameproof enclosures have flameproof joints independent from each other.

The motors can be equipped with auxiliary devices (heaters, thermal protectors).

The anti-condensation heater can be activated only when the motor is not powered.

In case of single phase motors the capacitors have to be placed in the appropriate enclosure or in safe area.

Electrical characteristics

The equipment can be supplied by mains or inverter:

Mains Supply

Maximum rated voltage: 850 V

Maximum rated power: 30 kW

Rated frequency: 50/60 Hz

Insulation class: F or H

Duty: S1, S2, S3, S9

Poles: 2, 4, 6, 8, 2/4, 4/8, 4/6, 6/8

Degree of protection: IP65 (For version with Ex db eb flat box execution)
IP66 (Other versions)

Inverter supply

Frequency range: 5-100 Hz

Possibility of supply through inverter exclusively with the use of thermal protectors applied on the windings.

Such protectors may be either PTO and PTC and they shall be connected to an appropriate and reliable control device.

Activation temperature related to the temperature class:

- 90°C for temperature class T5;
- 130°C for temperature class T4;
- 150°C for temperature class T3.

Ambient temperature: $-40 \div +40$ °C (or $+60$ °C for T3, T4 class of temperature)

Temperature classes and Maximum surface temperature:

T5, T4, T3, T125°C as a function of the ambient temperature and of the electrical characteristics (as indicated in the technical note).



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ANNEX **EU-TYPE EXAMINATION CERTIFICATE** **N. EPT 17 ATEX 2588 X issue 5**

Ventilation

The motors can be ventilated and not ventilated (with half power in respect to the ventilated corresponding motors so to maintain a T3 temperature class with ambient temperature of 60°C or T4 temperature class with ambient temperature of 40°C).

Ventilation can be made by fan, who is fitted directly on the shaft, or by using an auxiliary motor. The auxiliary motor belongs to O-M series. It will be a two poles 63 motor (for shaft height from 80 to 132) or a two poles 71 motor (for shaft height from 160 to 180).

Impellers for Ex db motors, which have a peripheral speed below 50 m/s, are made of plastic material.

Impellers for Ex tb or Ex db tb or Ex db motors (which have a peripheral speed above 50 m/s) are made of plastic dissipative material or metallic material.

The degree of protection (IP) of ventilation openings are:

- IP 20 on the air inlet side
- IP 10 on the air outlet side

Summary of possible marking strings and allowed ambient temperature range

Ordinary terminal box

Ex db IIC T4 Gb	Ex tb IIIC T125°C	Tamb -40°C + 60°C
Ex db eb IIC T4 Gb	Ex tb IIIC T125°C	Tamb -40°C + 60°C
Ex db IIC T5 Gb	Ex tb IIIC T125°C	Tamb -40°C + 40°C
Ex db eb IIC T5 Gb	Ex tb IIIC T125°C	Tamb -40°C + 40°C

Cable connection by means of flat box

Three phases motors

Ex db eb IIC T3 Gb	Ex tb IIIC T125°C	Tamb -40°C + 60°C
Ex db eb IIC T4 Gb	Ex tb IIIC T125°C	Tamb -40°C + 50°C

Single phase motors from frame size 56 up to frame 100:

Ex db eb IIC T3 Gb	Ex tb IIIC T125°C	Tamb -40°C + 50°C
--------------------	-------------------	-------------------

Cable entries

The cable entries integrated in motor body, terminal box (motor side), capacitor box are part of this certification.

All the other cable entries devices used on the enclosures are already properly ATEX certified.

The accessories used for cable entries and for unused holes must be covered by a separate ATEX certification according to the applicable standards EN 60079-0, EN 60079-1, EN 60079-7 and EN 60079-31.

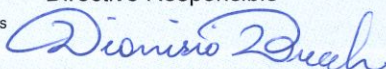


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ANNEX

EU-TYPE EXAMINATION CERTIFICATE

N. EPT 17 ATEX 2588 X issue 5

Identification

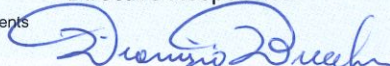
The three-phase and single-phase asynchronous motors, Series O-M (IE1 Range), are identified by a code as follows

Motor Type Identification				OD	063	A	4
Motor Type							
Single phase motors Efficiency IE1							
MD	1ph Ex db or Ex tb (ATEX Marking)	ME	1ph Ex db eb or Ex db eb tb (ATEX Marking)				
MX	P<0.12Kw 1ph Ex db or Ex db tb (ATEX + IECEX Marking)	MY	P<0.12Kw 1ph Ex db eb or Ex db eb tb (ATEX + IECEX Marking)				
	P>= 0.12Kw 1ph Ex db or Ex db tb (IECEX Marking only)		P>= 0.12Kw 1ph Ex db eb or Ex db eb tb (IECEX Marking only)				
Three phase motors Efficiency IE1							
OD	3ph Ex db or Ex tb (ATEX Marking)	OE	3ph Ex db eb or Ex db eb tb (ATEX Marking)				
OX	P<0.12 kW all speeds P>= 0.12 kW double speed 3ph Ex db or Ex db tb (ATEX + IECEX Marking)	OY	P<0.12 kW all speeds P>= 0.12 kW double speed 3ph Ex db eb or Ex db eb tb (ATEX + IECEX Marking)				
	P>= 0.12 kW single speed 3ph Ex db or Ex db tb (IECEX Marking only)		P>= 0.12 kW single speed 3ph Ex db eb or Ex db eb tb (IECEX Marking only)				
Shaft Height							
56, 63, 71, 80, 90, 100, 112, 132, 160, 180							
Main stator dimensions (depending on motor power)							
A,B		56, 63, 71, 80					
S,L		90, 132, 160, 180					
K,M		100, 132, 160, 180					
Poles number							
2, 4, 6	Single phase motors 1 speed						
2, 4, 6, 8	Three phase motors 1 speed						
3, 5, 7, 9	3ph double speed 2/4, 4/8, 4/6, 6/8 poles Constant Torque						
C, D, E, F	3ph double speed 2/4, 4/8, 4/6, 6/8 poles Quadratic Torque						



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ANNEX **EU-TYPE EXAMINATION CERTIFICATE** **N. EPT 17 ATEX 2588 X issue 5**

The three-phase and single phase asynchronous motors, Series O (IE2-IE3 Range), are identified by a code as follows:

Motor Type Identification				OH	063	A	4
Motor Type							
Three phase and single phase motors Efficiency IE2 – IE3							
MH	1-Phase Ex db or Ex db tb (Atex marking)	MK	1-Phase Ex db eb or Ex db eb tb (Atex marking)				
OH	3 –Phase Ex db or Ex db Ex tb (ATEX Marking)	OK	Ex db Ex eb or Ex db Ex eb Ex tb (ATEX Marking)				
MZ	1-Phase Ex db or Ex db tb (Atex + IECEX marking)	MJ	1-Phase Ex db eb or Ex db tb (ATEX + IECEX marking)				
OZ	Ex db or Ex db Ex tb (ATEX + IECEX Marking)	OJ	Ex db Ex eb or Ex db Ex eb Ex tb (ATEX + IECEX Marking)				
Shaft Height							
56, 63, 71, 80, 90, 100, 112, 132, 160, 180							
Main housing Frame S M L Main stator dimensions (depending on motor power) A B C D E S Z							
Poles number							
2, 4, 6, 8	Three phase motors 1 speed						
2, 4	Single phase motors 1 speed						

Warning label

“Flameproof joints cannot be repaired”

“Use screws quality ≥ 8.8 ”

“Potential electrostatic charging hazard – Do not rub the surface – Clean only with a damp cloth”

Note: this warning is included only in case of painting with thickness greater than 0.2mm

“Do not open in presence of explosive atmosphere”

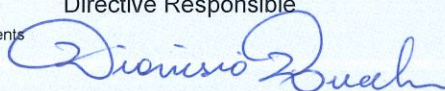
“Refer to instruction for cable and cable gland selection”

“Do not open when energized”



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ANNEX **EU-TYPE EXAMINATION CERTIFICATE** **N. EPT 17 ATEX 2588 X issue 5**

Routine tests

According to clause 7.1 of EN 60079-7 standard, each motor having increased safety "Ex eb" terminal box shall be submitted to the dielectric strength test (carried out in accordance with clause 6.1). The test shall be deemed to have passed if no breakdown or arcing occurs applying a test voltage equals to $(1000 + 2U)$ V.r.m.s. for at least 1 minute, where U is the rated voltage of the motor.

The test can be alternatively carried out at 1.2 times the test voltage for a period of at least 100 ms.

The test voltage shall be applied between each galvanically isolated connection included in the terminal box.

[16] **Assessment Report n° EPT.24.REL.01/2313114**

This EU-Type Examination Certificate is released after the positive result of the conformity assessment of the Council Directive 2014/34/EU and to harmonized technical standards listed in this certificate performed by the Notified Body Eurofins Product Testing Italy S.r.l., and reported in the Assessment Report above cited.

[17] **Special condition for a safe use**

Supply voltage must be within:

- $\pm 5\%$ of the nominal value for temperature class T5;
- $\pm 10\%$ of the nominal value for temperature class T3 or T4.
- Flameproof joints are not intended to be repaired.
- The anti-condensation heater can be activated only when the motor is not powered.

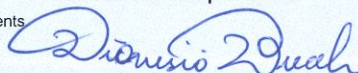
Essential Health and Safety Requirements

[18] **Assured by compliance with harmonized standards.**



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[19] Descriptive documents

The equipment object of this Certificate are described by the following documents that are scheduled documents and therefore they cannot be modified without the explicit authorization of the Notified Body.

Type of document	Document identification	Rev.	Date
*Technical note (four attachments included)	Technical note asynchronous motors series O - M sizes 56-180	4	21-11-2023
Sealing rings drawings	Schema gommini	-	19-02-2021
Gland nuts drawings	Schema premistoppa	-	23-02-2021
Washer drawings	Schema rondelle	-	23-02-2021
Safety, installing maintenance instructions (non- flat box motor)	Motors series O-M - Safety, installing maintenance instructions	01	28-06-2021
Safety, installing maintenance instructions (flat box and not flat box motors)	Motors series O-M - Safety, installing maintenance instructions	02	20-05-2022

* New or revised document

[20] Terms and conditions

The product liability rests with the Manufacturer, his representative or, in the absence of a representative, with the importer, in accordance with the General Product Safety Directive 2001/95/EC.

The following conditions may render this certificate invalid:

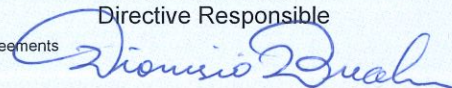
- changes in the design or construction of the product;
- changes or amendments to the Directive;
- changes or amendments in the standards which form the basis for documenting compliance with the essential requirements of the 2014/34/EU Directive.



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ANNEX
EU-TYPE EXAMINATION CERTIFICATE
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[21] History

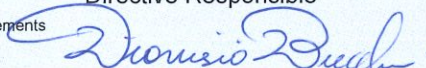
Issue	Description	Date
0	First emission, replacement of the EC-TYPE EXAMINATION CERTIFICATE n. EUM1 10 ATEX 0350 and its supplements n. 1 and 2.	06-02-2017
1	Constructive change and changing of manufacturer's references	08-02-2019
2	- Inclusion of the high efficiency IE2-IE3 versions (with and without extension ring) - Verification of compliance according to the latest standard editions EN IEC 60079-0:2018 and EN 60079-7:2015+A1:2018	29-06-2021
3	Inclusion of "flat box" version for single phase motors sizes from 56 to 100 and for three phase motors sizes from 56 to 132 (models 132M D2, 71M Z6, 132M E6 are excluded)	15-07-2022
4	The high efficiency version (IE2) for single phase motors has been included in the scope of the certificate	21-12-2022
5	The marking plate of IE1 motors version has been updated. The protection degree has been increased from IP 65 to IP 66, excluding Ex db eb flat box execution that remain IP 65.	19-03-2024



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End of Certificate



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 EUT 14.0001X	Page 1 of 6	<u>Certificate history:</u>
Status:	Current	Issue No: 8	Issue 7 (2024-05-08)
Date of Issue:	2026-02-17		Issue 6 (2023-12-04)
Applicant:	ORANGE1 ELECTRIC MOTORS S.p.A. Via Mantova, 93 43122 Parma Italy		Issue 5 (2022-12-21)
Equipment:	Series O-M three-phase and single-phase asynchronous squirrel cage rotor motors, supplied by mains or inverter		
Optional accessory:	Terminal box and Capacitor box		
Type of Protection:	Flameproof enclosures "d"; Dust ignition protection by enclosure "t"; Increased safety "e"		
Marking:	Ex db IIC T5 or T4 or T3 Gb <i>or</i> Ex db IIC T5 or T4 or T3 Gb, and Ex tb IIIC T125°C Db <i>or</i> Ex db eb IIC T5 or T4 or T3 Gb <i>or</i> Ex db eb IIC T5 or T4 or T3 Gb, and Ex tb IIIC T125°C Db -40 °C ≤ Ta ≤ +60 °C Relationships between ambient temperature range and temperature classes are reported in the attachment of this certificate.		

Approved for issue on behalf of the IECEx
Certification Body:

Dionisio Bucchieri

Position:

Head of IECEx Certification Body

Signature:
(for printed version)

Date:
(for printed version)

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:

Eurofins Product Testing Italy S.r.l.
Via Cuorgnè
n.21 - 10156 Torino
Italy





IECEx Certificate of Conformity

Certificate No.: **IECEx EUT 14.0001X**

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Date of issue: 2026-02-17

Issue No: 8

Manufacturer: **ORANGE1 ELECTRIC MOTORS S.p.A.**
Via Mantova, 93
43122 Parma
Italy

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 60079-0:2017](#) Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

[IEC 60079-1:2014](#) 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 60079-7:2017](#) Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
Edition:5.1

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 Report:

[IT/EUT/ExTR14.0001/08](#)

Quality Assessment Report:

[IT/EUT/QAR14.0001/12](#)



IECEx Certificate of Conformity

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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The motors are made of aluminium alloy and have separate parts: motor enclosure always Ex db protected, terminal box that can be protected by Ex db or Ex eb methods as specified in identification section and a capacitor enclosure Ex db protected, only for single-phase versions. These motors are suitable for gas group IIC.

In addition, when the marking for dust group IIIC is present, all parts of motors are also compliant with Ex tb type of protection.

As alternative to the Ex eb standard terminal box the connection between the motor wires and supply cable can be made in a box without terminals by the use of splicing or head to head connectors and a permanently connected cable.

All the parts of the flameproof enclosures have flameproof joints independent from each other.

The motors can be equipped with auxiliary devices (heaters, thermal protectors).

The anti-condensation heater can be activated only when the motor is not powered.

Electrical characteristics

The equipment can be supplied by mains or inverter:

Mains Supply

Maximum rated voltage: 850 V

Maximum rated power: 30 kW

Rated frequency: 50/60 Hz

Insulation class: F or H

Duty: S1, S2, S3, S9

Poles: 2, 4, 6, 8, 2/4, 4/8, 4/6, 6/8

Degree of protection: IP65 (For version with Ex db eb flat box execution)

IP66 (Other versions)

SPECIFIC CONDITIONS OF USE: YES as shown below:

- Supply voltage must be within:
 - $\pm 5\%$ of the nominal value for temperature class T5;
 - $\pm 10\%$ of the nominal value for temperature class T3 or T4.

- Flameproof joints are not intended to be repaired.

The anti-condensation heater can be energized only when the motor is not powered.

- Motors supplied with converters, with forced ventilation types TEFV and air-over ventilated types TEAO shall be installed only with a safety device able to disconnect the supply system when the embedded thermal sensors inside the windings detect the temperature value specified in the safety instruction, related to the temperature class indicated in the marking plate.
- The motor version MB, MC, MS, MP, MA, ML, OB, OC, OS and OP (identified as TEAO) shall be installed only with an auxiliary air ventilation source that is able to assure a minimum air speed value close to the motor fins equal or higher than the value specified in the ventilation section of this certificate and in the safety instruction.



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Certificate No.: **IECEx EUT 14.0001X**

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Equipment (continued):

Inverter supply

Frequency range: 5-100 Hz

Possibility of supply through inverter exclusively with the use of thermal protectors applied on the windings.

Such protectors may be either PTO and PTC and they shall be connected to an appropriate and reliable control device.

Activation temperature related to the temperature class:

- 90 °C for temperature class T5;
- 130 °C for temperature class T4;
- 150 °C for temperature class T3.

Ambient temperature. $-40 \div +40$ °C (or +60°C for T3, T4 class of temperature)

Temperature classes and Maximum surface temperature:

T5, T4, T3, T125°C as a function of the ambient temperature and of the electrical characteristics.

Ventilation

The motors can be totally enclosed fan cooled (TEFC, IC 411), totally enclosed air over/airtight (TEAO, IC 418) or totally enclosed forced ventilated (TEFV, IC 416).

Ventilation can be made by fan, that is fitted directly on the shaft (TEFC), by auxiliary air cooling system (TEAO), or by using an auxiliary motor (TEFV).

The only auxiliary motors permitted for TEFV version are O-M series flat-box types with Ex db eb type of protection, two poles size 63 motors (for shaft height from 80 to 132) or a two poles size 71 motors (for shaft height from 160 to 180).

For TEAO application the permitted motor sizes and the minimum air speeds that shall be assured on the motor surface is indicated the safety instruction and detailed below:

Minimum value of air speed [m/s]

Frame size	2 poles	4 poles
56	18	9
63	18	9
71	21	11
80	27	14
90S	32	16
90L	32	16



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Summary of possible marking strings and allowed ambient temperature range

Ordinary terminal box

Ex db IIC T4 Gb	or	Ex db IIC T4 Gb Ex tb IIIC T125 °C Db	Tamb -40 °C + 60 °C
Ex db eb IIC T4 Gb	or	Ex db eb IIC T4 Gb Ex tb IIIC T125 °C Db	Tamb -40 °C + 60 °C
Ex db IIC T5 Gb	or	Ex db IIC T5 Gb Ex tb IIIC T125 °C Db	Tamb -40 °C + 40 °C
Ex db eb IIC T5 Gb	or	Ex db eb IIC T5 Gb Ex tb IIIC T125 °C Db	Tamb -40 °C + 40 °C

Cable connection by means of flat box

Three phases motors:

Ex db eb IIC T3 Gb	or	Ex db eb IIC T3 Gb Ex tb IIIC T125 °C Db	Tamb -40 °C + 60 °C
Ex db eb IIC T4 Gb	or	Ex db eb IIC T4 Gb Ex tb IIIC T125 °C Db	Tamb -40 °C + 50 °C

Single phase motors from frame size 56 up to frame 100:

Ex db eb IIC T3 Gb	or	Ex db eb IIC T4 Gb Ex tb IIIC T125 °C Db	Tamb -40 °C + 50 °C
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Cable entries

The cable entry integrated in the capacitor box is part of this certification.

All the other cable entries devices used on the enclosures are already properly IECEx certified.

The accessories used for cable entries and for unused holes must be covered by a separate IECEx certification according to the applicable standards IEC 60079-0, IEC 60079-1, IEC 60079-7 and IEC 60079-31.

Warning label

“FLAMEPROOF JOINTS CANNOT BE REPAIRED”

“USE SCREWS QUALITY ≥ 8.8 ”

“POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS”

Note: this warning is included only in case of painting with thickness greater than 0.2 mm

“DO NOT OPEN IN PRESENCE OF EXPLOSIVE ATMOSPHERE”

“REFER TO INSTRUCTION FOR CABLE AND CABLE GLAND SELECTION”

“DO NOT OPEN WHEN ENERGIZED”

Routine tests

According to clause 7.1 of IEC 60079-7 standard, each motor having increased safety “Ex eb” terminal box shall be submitted to the dielectric strength test (carried out in accordance with clause 6.1). The test shall be deemed to have passed if no breakdown or arcing occurs applying a test voltage equals to $(1000 + 2U)$ V.r.m.s. for at least 1 minute, where U is the rated voltage of the motor.

The test can be alternatively carried out at 1.2 times the test voltage for a period of at least 100 ms.

The test voltage shall be applied between each galvanically isolated connection included in the terminal box.



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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

The range of cable glands installed at the factory on the various types of motors has been expanded, and some typing errors have been corrected.

Annex:

[EPT.26.REL.02-2513113_1.pdf](#)

Beständigkeitstabelle

Formel	Medium	Konzentration	Teflon® PTFE	PCTFE	PEEK	PVDF	FEP	FFKM	Viton® FPM	V4A	Glas
CH ₃ COCH ₃	Aceton		1/1	1/3	1/1	3/4	(1)	1/1	4/4	1/1	1/1
C ₆ H ₆	Benzol		1/1	1/3	1/1	1/3	1/1	1/1	3/3	1/1	1/1
Cl ₂	Chlor	10 % nass	1/1	0/0	4/4	2/2	1/1	1/1	3/0	4/4	1/1
Cl ₂	Chlor	97 %	1/0	1/3	4/4	1/1	1/1	1/0	1/1	1/1	1/0
C ₂ H ₆	Ethan		1/0	0/0	1/0	2/0	-	1/0	1/0	2/0	1/0
C ₂ H ₅ OH	Ethanol	50 %	1/1	1/3	1/1	1/1	1/1	1/1	2/2	1/0	1/1
C ₂ H ₄	Ethen		1/0	0/0	0/0	1/0	1/1	1/0	1/0	1/0	1/0
C ₂ H ₂	Ethin		1/0	0/0	0/0	1/0	1/1	1/0	2/0	1/0	1/0
C ₆ H ₅ C ₂ H ₅	Ethylbenzol		1/0	0/0	0/0	1/1	1/1	1/0	2/0	1/0	1/0
HF	Fluorwasserstoff		1/0	0/0	0/0	2/2	(1)	2/0	4/0	3/4	1/0
CO ₂	Kohlendioxid		1/1	0/0	1/0	1/1	(1)	1/0	1/1	1/1	1/1
CO	Kohlenmonoxid		1/0	0/0	1/1	1/1	-	1/0	1/0	1/1	1/0
CH ₄	Methan	technisch rein	1/1	0/0	1/1	1/0	1/1	1/0	1/1	1/1	1/1
CH ₃ OH	Methanol		1/1	1/1	1/1	1/1	1/1	1/1	3/4	1/1	1/1
CH ₃ Cl ₂	Methylchlorid		1/0	2/0	1/0	1/0	1/1	1/0	3/0	1/1	1/0
H ₃ PO ₄	Phosphorsäure	1-5 %	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
H ₃ PO ₄	Phosphorsäure	30 %	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
C ₃ H ₈	Propan	gasförmig	1/1	0/0	1/0	1/1	1/1	1/0	1/0	1/0	1/1
C ₃ H ₆ O	Propylenoxid		1/0	0/0	0/0	2/4	1/1	2/0	4/0	1/0	1/0
HNO ₃	Salpetersäure	1-10 %	1/1	1/0	1/1	1/1	1/1	1/0	1/1	1/1	1/1
HNO ₃	Salpetersäure	50 %	1/1	1/0	3/3	1/1	1/1	1/0	1/0	1/2	1/1
HCl	Salzsäure	1-5 %	1/1	1/1	1/0	1/1	1/1	1/1	1/1	2/4	1/1
HCl	Salzsäure	35 %	1/1	1/1	1/0	1/1	1/1	1/1	1/2	2/4	1/1
O ₂	Sauerstoff		1/1	0/0	1/0	1/1	1/1	1/1	1/2	1/1	1/1
SF ₆	Schwefelhexafluorid		1/0	0/0	1/0	0/0	0/0	1/0	2/0	0/0	1/0
H ₂ SO ₄	Schwefelsäure	1-6 %	1/1	1/1	2/2	1/1	1/1	1/1	1/1	1/2	1/1
H ₂ S	Schwefelwasserstoff		1/1	1/1	0/0	1/1	1/0	1/1	4/4	1/1	1/1
N ₂	Stickstoff		1/1	0/0	1/0	1/1	1/1	1/0	1/1	1/0	1/1
C ₆ H ₅ C ₂ H ₃	Styrol		1/1	0/0	1/0	1/0	1/0	1/0	3/0	1/0	1/1
C ₆ H ₅ CH ₃	Toluol (Methylbenzol)		1/1	0/0	1/0	1/1	1/1	1/1	3/3	1/1	1/1
H ₂ O	Wasser		1/1	0/0	1/1	1/1	1/1	1/1	1/1	1/1	1/1
H ₂	Wasserstoff		1/0	1/0	1/0	1/0	(1)	1/0	1/0	1/0	1/0

0 - keine Angabe vorhanden/keine Aussage möglich

1 - sehr gut beständig/geeignet

2 - gut beständig/geeignet

3 - eingeschränkt geeignet

4 - nicht geeignet

() - Schätzwert

Je Medium sind zwei Werte angegeben. Linke Zahl = Wert bei 20 °C, rechte Zahl = Wert bei 50 °C.

Quelle: Bürkle GmbH: Liste chemische Beständigkeiten, <https://www.buerkle.de> [Zugriff am 12.02.2026].



RMA-Formular und Erklärung über Dekontaminierung

RMA-Form and explanation for decontamination



RMA-Nr./ RMA-No.

Die RMA-Nr. bekommen Sie von Ihrem Ansprechpartner im Vertrieb oder Service. Bei Rücksendung eines Altgeräts zur Entsorgung tragen Sie bitte in das Feld der RMA-Nr. "WEEE" ein./ You may obtain the RMA number from your sales or service representative. When returning an old appliance for disposal, please enter "WEEE" in the RMA number box.

Zu diesem Rücksendeschein gehört eine Dekontaminierungserklärung. Die gesetzlichen Vorschriften schreiben vor, dass Sie uns diese Dekontaminierungserklärung ausgefüllt und unterschrieben zurücksenden müssen. Bitte füllen Sie auch diese im Sinne der Gesundheit unserer Mitarbeiter vollständig aus./ This return form includes a decontamination statement. The law requires you to submit this completed and signed decontamination statement to us. Please complete the entire form, also in the interest of our employee health.

Firma/ Company

Firma/ Company

Straße/ Street

PLZ, Ort/ Zip, City

Land/ Country

Gerät/ Device

Anzahl/ Quantity

Auftragsnr./ Order No.

Ansprechpartner/ Person in charge

Name/ Name

Abt./ Dept.

Tel./ Phone

E-Mail

Serien-Nr./ Serial No.

Artikel-Nr./ Item No.

Grund der Rücksendung/ Reason for return

- ☐ Kalibrierung/ Calibration ☐ Modifikation/ Modification
☐ Reklamation/ Claim ☐ Reparatur/ Repair
☐ Elektroaltgerät/ Waste Electrical & Electronic Equipment (WEEE)
☐ andere/ other

bitte spezifizieren/ please specify

Handelt es sich bei dem Gerät um ein sogenanntes Bühler O2-Ready Produkt (Artikelnummer endet mit „-O2“)?/ Is the device a Bühler O2-Ready product (item number ending with "-O2")?

- ☐ Nein/ No ☐ Ja/ Yes

Ist das Gerät möglicherweise kontaminiert?/ Could the equipment be contaminated?

- ☐ Nein, da das Gerät nicht mit gesundheitsgefährdenden Stoffen betrieben wurde./ No, because the device was not operated with hazardous substances.
☐ Nein, da das Gerät ordnungsgemäß gereinigt und dekontaminiert wurde./ No, because the device has been properly cleaned and decontaminated.

☐ Ja, kontaminiert mit:/ Yes, contaminated with:



☐
explosiv/
explosive



☐
entzündlich/
flammable



☐
brandfördernd/
oxidizing



☐
komprimierte
Gase/
compressed
gases



☐
ätzend/
caustic



☐
giftig, Lebensge-
fahr/
poisonous, risk of
death



☐
gesundheitsge-
fährdend/
harmful to health



☐
gesund-
heitsschädlich/
health hazard



☐
umweltge-
fährdend/
environmental
hazard

Bitte Sicherheitsdatenblatt beilegen!/ Please enclose safety data sheet!

Das Gerät wurde gespült mit:/ The equipment was purged with:

Diese Erklärung wurde korrekt und vollständig ausgefüllt und von einer dazu befugten Person unterschrieben. Der Versand der (dekontaminierten) Geräte und Komponenten erfolgt gemäß den gesetzlichen Bestimmungen.

Falls die Ware nicht gereinigt, also kontaminiert bei uns eintrifft, muss die Firma Bühler sich vorbehalten, diese durch einen externen Dienstleister reinigen zu lassen und Ihnen dies in Rechnung zu stellen.

Firmenstempel/ Company Sign

This declaration has been filled out correctly and completely, and signed by an authorized person. The dispatch of the (decontaminated) devices and components takes place according to the legal regulations.

Should the goods not arrive clean, but contaminated, Bühler reserves the right, to commission an external service provider to clean the goods and invoice it to your account.

Datum/ Date

rechtsverbindliche Unterschrift/ Legally binding signature



Vermeiden von Veränderung und Beschädigung der einzusendenden Baugruppe

Die Analyse defekter Baugruppen ist ein wesentlicher Bestandteil der Qualitätssicherung der Firma Bühler Technologies GmbH. Um eine aussagekräftige Analyse zu gewährleisten muss die Ware möglichst unverändert untersucht werden. Es dürfen keine Veränderungen oder weitere Beschädigungen auftreten, die Ursachen verdecken oder eine Analyse unmöglich machen.

Vermeidung von Kontaminationen bei Produkten für hochreine Sauerstoffapplikationen (O2-Ready)

Handelt es sich bei dem Gerät um ein sogenanntes Bühler O2-Ready Produkt (Artikelnummer endet mit „-O2“), so ist dafür zu sorgen, dass es vom Ausbau des Artikels bis zur Anlieferung bei Firma Bühler zu keiner Kontamination medienberührender Teile kommt. Verschießen Sie Öffnungen und verpacken Sie das Gerät in ein luftdichtes Behältnis. Kennzeichnen Sie die Ware deutlich, insbesondere durch Angabe der vollständigen Artikelnummer (.....-O2) auf der ersten Seite dieses Formulars. Hierdurch wird sichergestellt, dass es auch unsererseits zu keiner unnötigen Kontamination kommt.

Umgang mit elektrostatisch sensiblen Baugruppen

Bei elektronischen Baugruppen kann es sich um elektrostatisch sensible Baugruppen handeln. Es ist darauf zu achten, diese Baugruppen ESD-gerecht zu behandeln. Nach Möglichkeit sollten die Baugruppen an einem ESD-gerechten Arbeitsplatz getauscht werden. Ist dies nicht möglich sollten ESD-gerechte Maßnahmen beim Austausch getroffen werden. Der Transport darf nur in ESD-gerechten Behältnissen durchgeführt werden. Die Verpackung der Baugruppen muss ESD-konform sein. Verwenden Sie nach Möglichkeit die Verpackung des Ersatzteils oder wählen Sie selber eine ESD-gerechte Verpackung.

Einbau von Ersatzteilen

Beachten Sie beim Einbau des Ersatzteils die gleichen Vorgaben wie oben beschrieben. Achten Sie auf die ordnungsgemäße Montage des Bauteils und aller Komponenten. Versetzen Sie vor der Inbetriebnahme die Verkabelung wieder in den ursprünglichen Zustand. Fragen Sie im Zweifel beim Hersteller nach weiteren Informationen.

Einsenden von Elektroaltgeräten zur Entsorgung

Wollen Sie ein von Bühler Technologies GmbH stammendes Elektroprodukt zur fachgerechten Entsorgung einsenden, dann tragen Sie bitte in das Feld der RMA-Nr. „WEEE“ ein. Legen Sie dem Altgerät die vollständig ausgefüllte Dekontaminierungserklärung für den Transport von außen sichtbar bei. Weitere Informationen zur Entsorgung von Elektroaltgeräten finden Sie auf der Webseite unseres Unternehmens.

Avoiding alterations and damage to the components to be returned

Analysing defective assemblies is an essential part of quality assurance at Bühler Technologies GmbH. To ensure conclusive analysis the goods must be inspected unaltered, if possible. Modifications or other damages which may hide the cause or render it impossible to analyse are prohibited.

Avoidance of contamination in products for high-purity oxygen applications (O2-Ready)

If the device is a Bühler O2-Ready product (item number ending with “-O2”), it must be ensured that there is no contamination of parts in contact with the medium from the time the item is removed until it is delivered to Bühler. Seal openings and pack the device in an airtight container. Mark the goods clearly, in particular by stating the full item number (.....-O2) on the first page of this form. This ensures that there is no unnecessary contamination on our part either.

Handling electrostatically conductive components

Electronic assemblies may be sensitive to static electricity. Be sure to handle these assemblies in an ESD-safe manner. Where possible, the assemblies should be replaced in an ESD-safe location. If unable to do so, take ESD-safe precautions when replacing these. Must be transported in ESD-safe containers. The packaging of the assemblies must be ESD-safe. If possible, use the packaging of the spare part or use ESD-safe packaging.

Fitting of spare parts

Observe the above specifications when installing the spare part. Ensure the part and all components are properly installed. Return the cables to the original state before putting into service. When in doubt, contact the manufacturer for additional information.

Returning old electrical appliances for disposal

If you wish to return an electrical product from Bühler Technologies GmbH for proper disposal, please enter "WEEE" in the RMA number box. Please attach the fully completed decontamination declaration form for transport to the old appliance so that it is visible from the outside. You can find more information on the disposal of old electrical appliances on our company's website.

