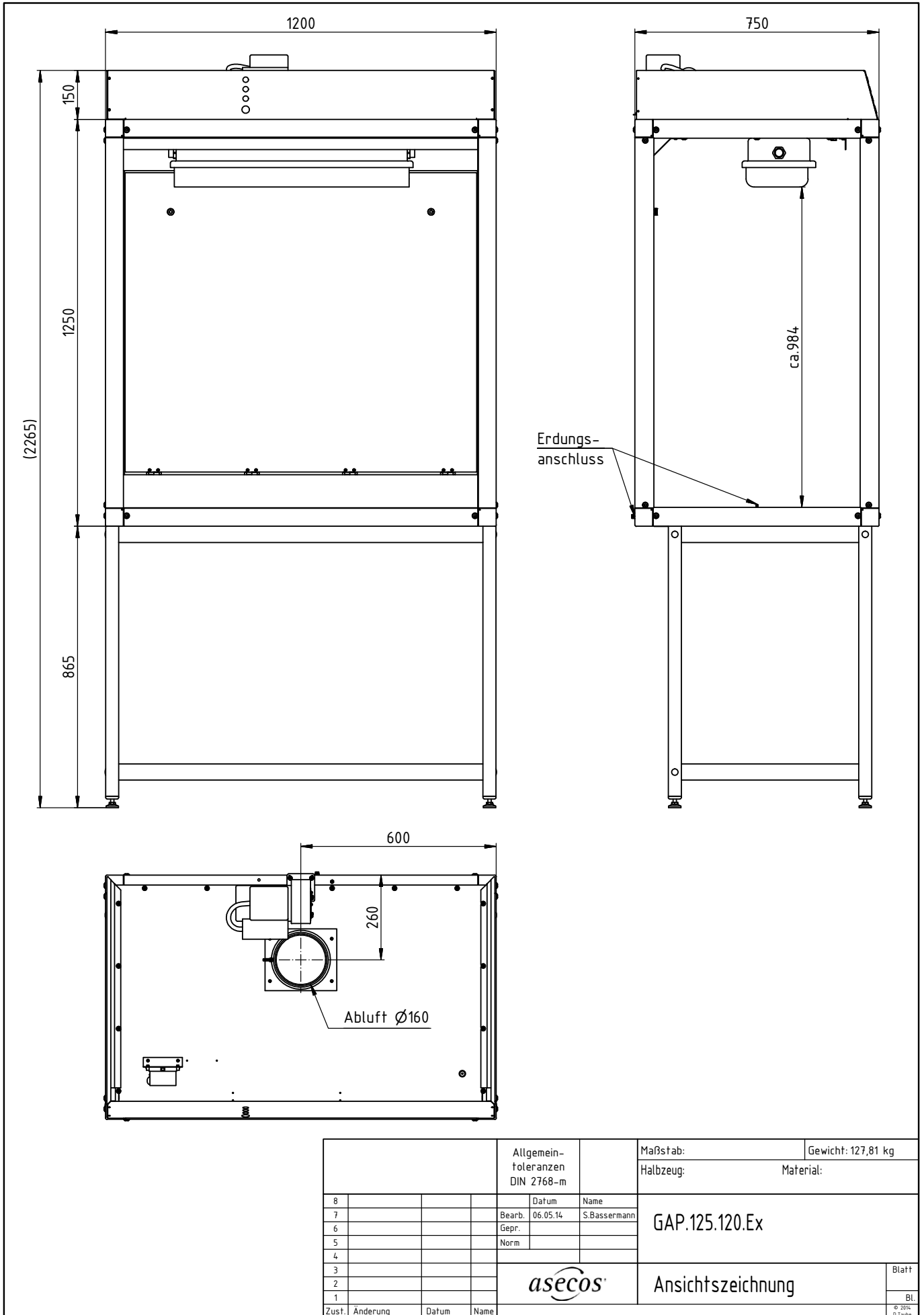


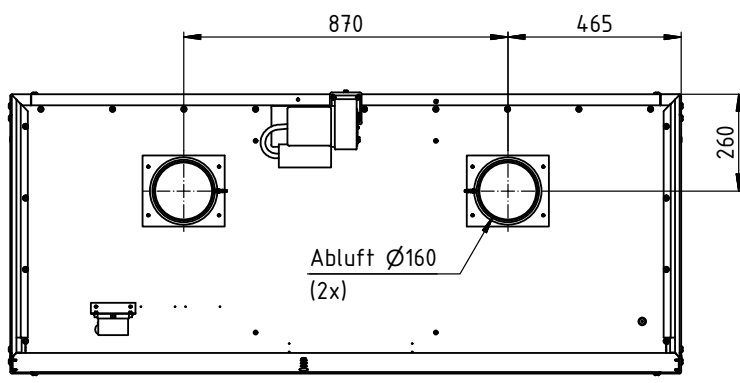
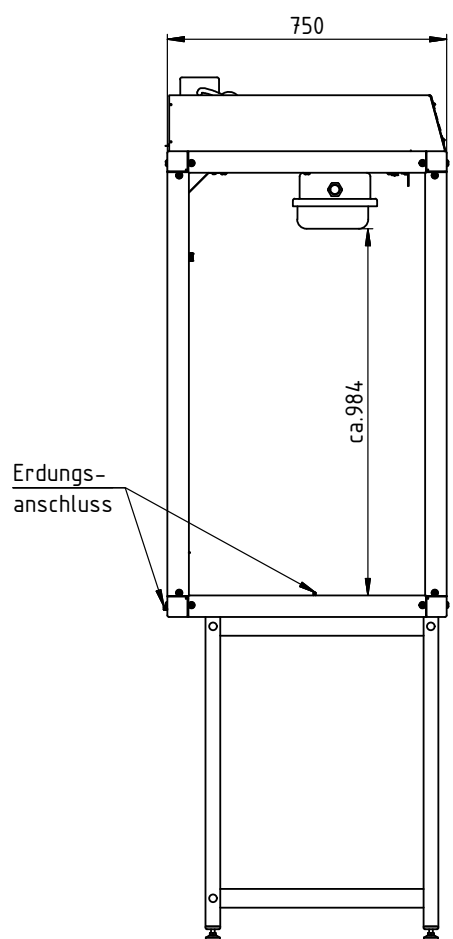
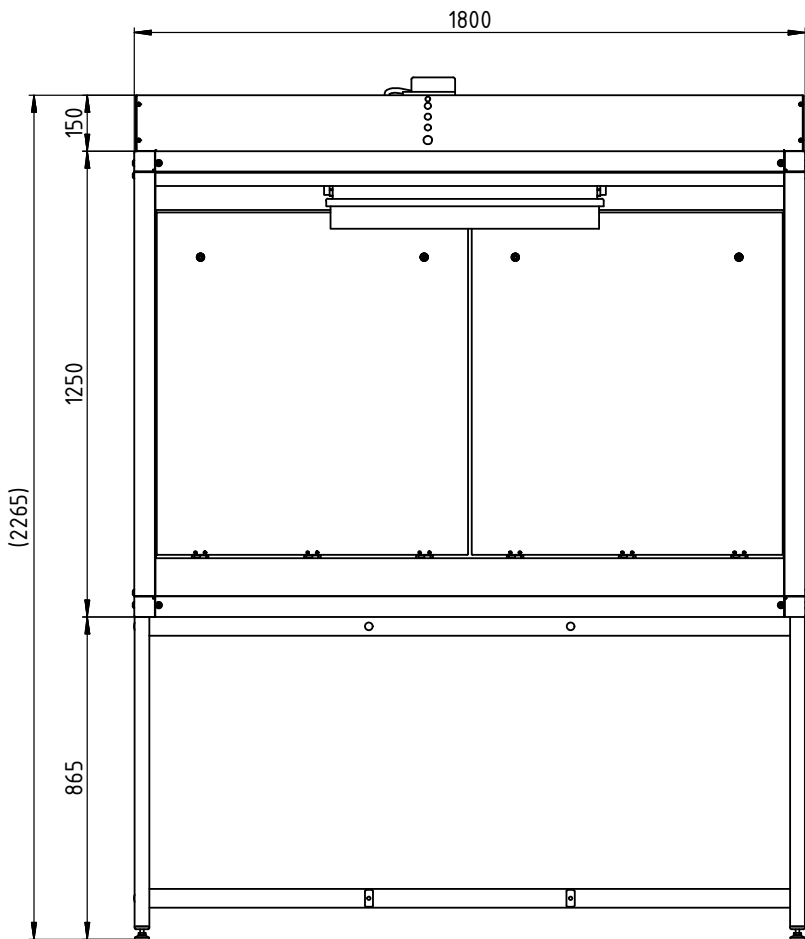


## **DOKUMENTATION der Komponenten**

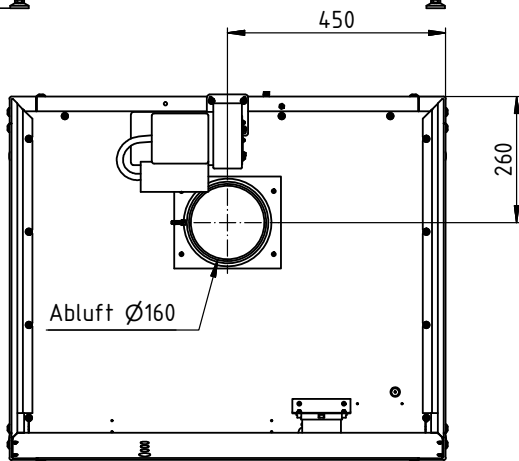
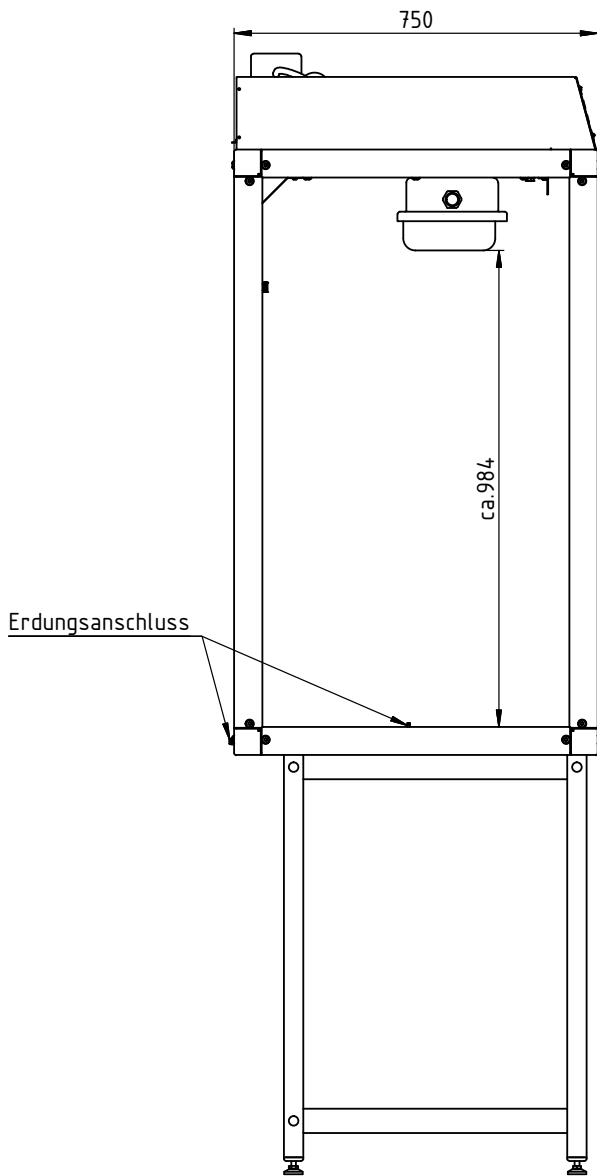
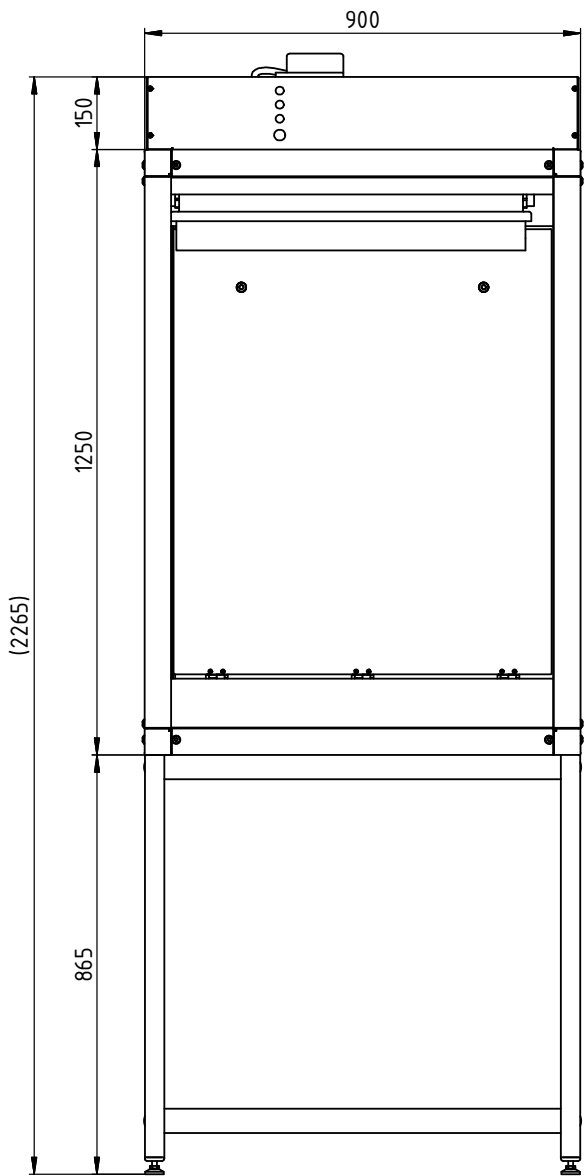
Gefahrstoffarbeitsplätze EX-LINE




		Allgemeintoleranzen DIN 2768-m	Maßstab:	Gewicht: 127,81 kg	
			Halbzeug:	Material:	
8		Datum	GAP.125.120.Ex		
7		Bearb. 06.05.14			Name
6		Gepr.			
5		Norm			
4					
3					
2					
1					
Zust.	Änderung	Datum	Name	Ansichtszeichnung	
				Blatt	
				Bt.	
				© 2014 D. Tacke	



				Allgemein- toleranzen DIN 2768-m		Maßstab: Halbzeug:		Gewicht: Material:		
8				Datum	Name	GAP.125.180.Ex				
7				Bearb.	06.05.14					S.Bassermann
6				Gepr.						
5				Norm						
4							Anichtszeichnung		Blatt	
3										
2										
1										
Zust.	Änderung	Datum	Name			Anichtszeichnung		Blatt		
								© 2014 D. Tacke		



		Allgemein-toleranzen DIN 2768-m		Maßstab:	Gewicht:		
				Halbzeug:	Material:		
8			Datum	GAP.125.090-Ex			
7			Bearb. 06.05.14			Blatt	
6			Gepr. S.Bassermann				
5			Norm				
4							
3							
2				Bl.			
1							
Zust.	Änderung	Datum	Name	 Ansichtzeichnung			
				© 2014 D. Teckle			



# SCHUCH

Adolf Schuch GmbH

Lichttechnische Spezialfabrik

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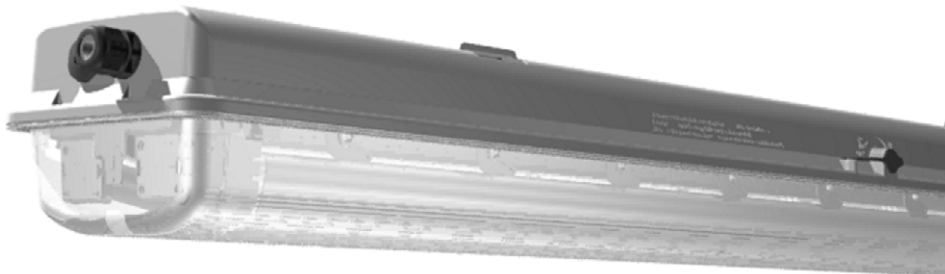
E-Mail: [info@schuch.de](mailto:info@schuch.de)



## - Operating Instructions

Explosion-proof light fitting  
of series

**e 840 ...**



The safety of people and equipment in hazardous areas depends on the observance of all safety standards. Exact knowledge about all applicable regulations and standards is mandatory for installation maintenance and repair of explosion proof equipment, especially

- the determinations of IEC/EN 60079-14 and IEC/EN 60079-17 for maintenance of explosion-proof appliances
- the generally accepted rules of the technical side
- the national rules for prevention of accidents and for safety standards
- the safety instructions of these operating instructions
- the characteristic data on the type plate and the instruction plates

## 1. Safety Instructions

- Mounting and installation must be done in accordance with the respective regulations.
- The light fitting must be protected against overvoltage, overcurrent, short circuits and other electrical failures.
- The light fitting must be operated in an undamaged condition only.
- The non-stationary use of the light fitting as well as any other inappropriate usage is prohibited.
- The operation of the light fitting is allowed within its assessment thresholds only.
- In regard to the minimum and maximum admissible ambient temperature potential sources of cold and heat (e.g. direct heat or solar radiation, cooling units) have to be considered.
- If the light fitting is to be subject to a special application that is influenced chemically, mechanically, thermally or electrically or if the light fitting will be subject to any kind of vibrations, it is highly recommended to consult the Adolf Schuch GmbH before starting the installation.
- Every structural modification will cause dangerous situations and consequently the certification of this light fitting will be null and void.
- Caution - Risk of electrostatic discharge! Fitting to be cleaned with damp cloth only!
- In areas where there is a risk of accidental electrostatic charge (e.g. by passing by) the light fitting must be protected by appropriate measures.
- The light fitting is not allowed to be installed in process areas where strong electrical fields may occur (i.e. HV Sparking Electrodes or Particle Streams). Reason is to avoid any electrostatic charge of the light fitting itself.
- The application of this light fitting in areas with explosive gases combined with combustible dusts is not allowed.
- Replace damaged explosion-proof parts by original spare parts from the Adolf Schuch GmbH only.

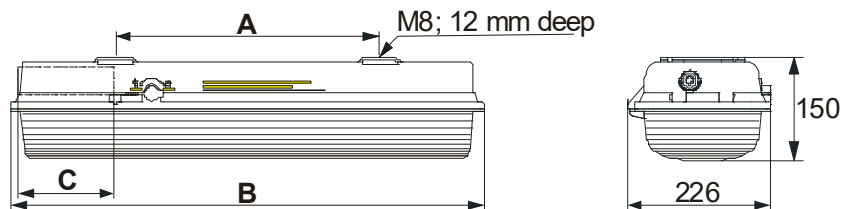
## 2. Operating Advice

- If a lamp is missing or defective or if it has reached the end of its life-time the lamp sockets will be switched off.
- Because of the chemical resistance use only a damp cloth for cleaning the light fitting. If necessary with a mild and solvent-free cleaning agent.
- Against penetration of humidity into the light fitting a special explosion-proof breathing gland is often quite effective. It is allowed to use a breathing gland which is released by the Adolf Schuch GmbH only. Such breathing gland is installed into an opening that is not required for mounting any cable gland. The mentioned IP rate of the light fitting is given by vertical, downwards vectored installation of the breathing gland only. Each other mounting position of the breathing gland will reduce the IP rate of the light fitting to IP64.
- For applications with high ambient humidity, short duty cycles and long idle periods, the special versions of type e 840 ... E1003 must be used.
- In case of DC-operation in version e 840... ZB only one lamp is in operation.
- A through wiring system in explosion-proof light fittings can also be installed at a later stage by using original components of the Adolf Schuch GmbH only.
- Any application of the light fitting that is incorrect or even forbidden will lead to the fact that the manufacturer's warranty is lost.

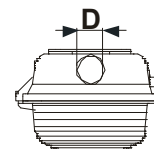
### 3. Technical Data

- Series: e 840 ... (Standard)  
 e 840 2.. ZB (AC-operation: 2 lamps, DC-operation: 1 lamp)  
 e 840 ... oS (without isolating switch)  
 e 840 ... PM (pole mounting)  
 e 840 ... E1003 (special version when having ambience with high humidity)  
 Explosion-proof light fitting for operating in hazardous areas of zones 1, 2, 21 and 22.
- Explosion protection: II 2 G Ex d e q IIC T4 Gb (e840 ...) resp. Ex e q IIC T4 Gb (e840 ... oS)  
 II 2 G Ex d e mb IIC T4 Gb (e840 ... E1003)  
 II 2 G Ex e mb IIC T4 Gb (e840 ... E1003 oS)  
 II 2 D Ex tb IIC T80 °C Db
- Certification: 18/20 W-version: PTB 09 ATEX 2031 and IECEx PTB 09.044  
 36/40 W-version: PTB 07 ATEX 2040 and IECEx PTB 09.061  
 58/65 W-version: PTB 09 ATEX 2039 and IECEx PTB 09.050
- Lamps: Double-capped fluorescent lamps for general lighting with brass pins and lamp base G13 according to IEC 60081, Sheet 2220, 2240, 2420, 2440, 2520, 2540  
 18 W, 36 W and 58 W of a 26 mm Ø  
 20 W, 40 W and 65 W of a 38 mm Ø  
 Lamps which do not meet the specified standard sheets, LED lamps, UV lamps, colored lamps, covered lamps, etc., are not permitted.
- Rated voltage: 220...240 V; 0, 50...60 Hz (e 840 ...)  
 220...250 V AC; 50...60 Hz (e 840 ... E1003)
- Isolation class: I
- Ingress protection: IP66 (When using an Ex-breathing gland see section 2)
- Ambient temperatur: -20 °C ... +50 °C (e 840 258 and e 840 236 E1003 / 258 E1003)  
 -20 °C ... +55 °C (e 840 236 and e 840 218 E1003 / 136 E1003)  
 -20 °C ... +60 °C (e 840 1.. / 218 and e 840 118 E1003 / 158 E1003)

Dimensions:  
 (all measures in mm)



	A	B	only PM-version:	
	C	D		
<b>18/20W</b>	400	745	150	44
<b>36/40W</b>	700	1355	245	44
<b>58/65W</b>	700	1655	-	-



- Locking: central; actuated by a 13 mm Hexagon socket key (ext. Ø: 18 mm max.)
- Cable entry: Cable glands with thread size M25 x 1.5  
 Sealing range: 7 - 17 mm (for 10 - 17 mm remove the small sealing ring)  
 Torques: Connection thread 3 Nm; Pressing screw 2 Nm  
 Cable glands with thread size M20 x 1,5 (PM-version only)  
 Sealing range: 6 - 13 mm;  
 Torques: Connection thread 2.3 Nm; Pressing screw 1.5 Nm  
 See information label on the front page when having special versions!

Connection per terminal: Clamping range: 2 x 1-6 mm<sup>2</sup> max. (U)  
resp. 2 x 1-4 mm<sup>2</sup> max. (R, with conductor sleeve)  
Ampacity: 16 A max.  
Required stripping length: 10 - 11 mm  
Torque of terminal screw: 1,2 Nm  
See information label on the front page when having special versions!

Operation position: in any direction - except upwards light output

## 4. Installation



- ▶ The safety of this light fitting is only guaranteed as long as it is operated within its assessment threshold. Installation and maintenance must be done in accordance with the respective regulations!
- ▶ The installation of explosion-proof light fittings must be done by Ex-skilled electricians only!
- ▶ In regard to the minimum and maximum admissible ambient temperature potential sources of cold and heat (e.g. direct heat or solar radiation, cooling units) have to be considered!
- ▶ The application of this light fitting is depending on the properties of the surrounding dust. Please ensure that there will be an adequate difference between the maximum surface temperature of the fitting and the glowing and the ignition temperature of the respective dust!
- ▶ If there is a risk of accidental electrostatic charge the light fitting must be protected by appropriate measures!
- ▶ The light fitting must be mounted in the instructed operation position (see section 3, Technical Data)!

### 4.1 How to open the light fitting

- Turn the hexagon socket at the locking side of the light fitting in direction of the arrow "Open"
- Open the diffuser

### 4.2 Electrical connection

- Unlock the reflector on the locking side. If necessary push back the reflector retention spring (not in 18/20W-version) and open the reflector
- Screw the explosion-proof cable glands and explosion-proof locking screw supplied with the fitting into the borings of the housing (Torques see section 3, Technical Data).
- Insert the connection cable through the explosion-proof cable gland
- Fasten the pressing screw of the explosion-proof cable gland (Torque see section 3, Technical Data)



- ▶ Appropriate measures (e.g. pull relief clips) must be taken to protect the connection cable which is inserted through the cable entry from tractive forces and twist!
  - ▶ The diameter of the connection cable must correspond to the sealing range of the explosion-proof cable gland (see section 3, Technical Data)!
  - ▶ The conductors must not be damaged when skinning resp. stripping the cable!
  - ▶ When stripping the cable special attention needs to be paid to the correct length of the conductor end sections (see section 3, Technical Data)!
- Remove the protecting cover from the connection terminal block

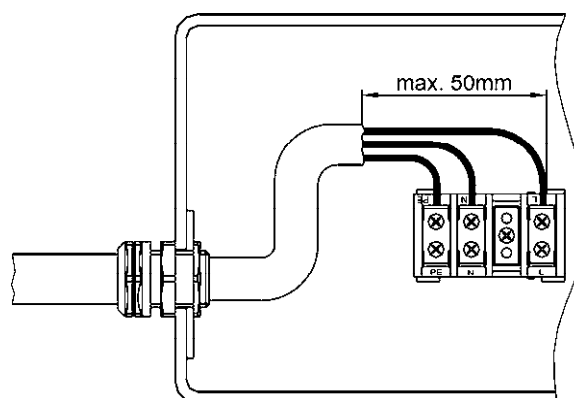
- Connect the conductors to the right terminals as per marking on the terminal block. Tighten the screws. Even tighten the screws which are not required (Torque see section 3, Technical Data)



- ▶ It is important to ensure that the bare conductor is fully inserted into the terminal and that no cable insulation is clamped!

- Put the protecting cover back onto the connection terminal block
- Turn the reflector back in the housing, snap it into the brackets of the lamp socket holder and push it under the reflector retention spring

**Note for connecting armoured cable:**



- ▶ It is necessary to check back with the Adolf Schuch GmbH before installing other explosion-proof cable glands or explosion-proof locking screws than the ones supplied!

#### 4.3 How to insert the lamps / Change of lamps



- ▶ Light fittings without isolation switch (e840 ... oS) must be disconnected from the mains before opening!

- insert the pins of the fluorescent lamp into the vertical slot of the rotary-type lamp holder and move it to the end of the slot by pressing the lamps ends.
- turn the fluorescent lamp by 45° into its locking position. Any further rotation in the same direction is not possible!
- For removing the fluorescent lamp turn it in opposite to inserting direction out of its locking position, take it at its ends and pull it out of the lamp holder.

**Function of the isolating switch:**

With the isolating switch the mains supply will be interrupted when opening the fitting. This allows a safe replacement of the lamps while the fitting remains switched on.



- ▶ The mains on the connection terminal block will not be interrupted when opening the fitting!
- ▶ The reflector may only be opened if the fitting has been disconnected from the mains supply completely!

#### 4.4 How to close the light fitting

- put the diffuser into the hinges and push it into the housing.
- Turn the hexagon socket at the locking side of the light fitting in direction of the arrow "Close".
- After closing the light fitting take care that the whole gasket is effective.

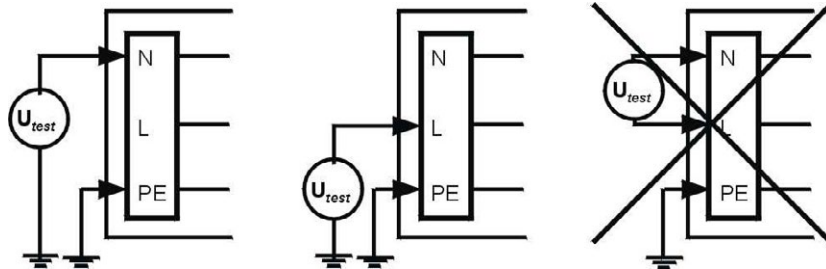
## 5. Commissioning

Before commissioning this explosion-proof lighting fitting please check and ensure that:

- the light fitting has been installed according to the regulations and in the allowed operating position.
- the explosion-proof cable glands resp. explosion-proof locking screws are securely fixed in the housing (Torques see section 3, Technical Data).
- the pressing screw of every explosion-proof cable gland is tightened with the required torque (Torques see section 3, Technical Data).
- the connection cable has been firmly installed and is not subject to any tension whatsoever.
- the bare conductor is fully inserted into the terminal and that no cable insulation is clamped.
- the screws of the connection terminal block are firmly tightened.
- the right type of lamp with the provided wattage is established.
- the lamp is inserted correctly.
- the light fitting is closed correctly.
- all gaskets are effective.
- the light fitting is not damaged whatsoever.

### 5.1 Isolation measurement

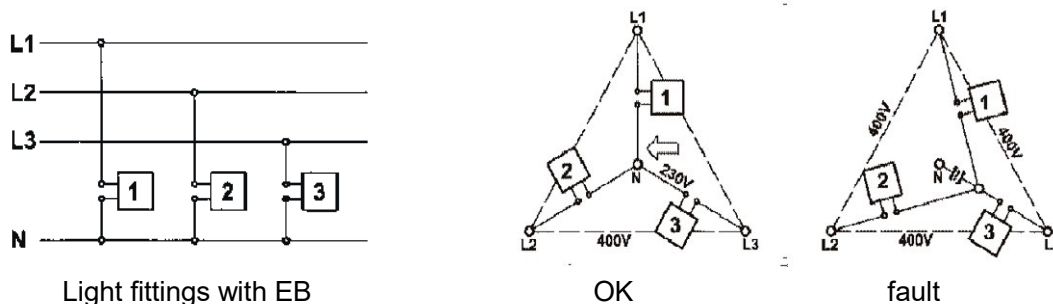
For measuring the isolating resistance the test voltage must be put on between the outer conductor and the earth conductor or between the neutral conductor and the earth conductor only.



After finishing the isolation test the conductor between the mains and the light fitting must be reconnected safely. Before starting operation the connection of the neutral conductor must be safe for avoiding any damage whatsoever of the electronic control gear caused by any inadmissible excess-voltage in case of an unbalanced mains load. (see section 5.2)

### 5.2 Electronic ballast (EB) in 3-phase-operation

The diagram shows the wiring for light fittings or light fitting groups in 3-phase circuits and with a common neutral conductor N.



If the common neutral conductor is interrupted and voltage is present, then light fittings or groups of light fittings may be exposed to unacceptably high voltages and consequently the electronic ballast may be destroyed.

## 6. Maintenance

Explosion-proof light fittings need regular maintenance according to the national rules of the country they are installed. Especially components which are important for the Explosion Category have to be carefully checked. Therefore it must be checked very carefully:

- diffuser, housing and gaskets for any kind of damages
- the correct installation and tightness of explosion-proof cable glands and explosion-proof locking screws (Torques see section 3, Technical Data).
- all parts of plastic to attend to colour change, deformation and damaging especially lamp sockets, terminals and ballast.
- the tight fit of the conductor and the condition of the cable insulation.
- that the light fitting is closed correctly and the gasket is effective.

### 6.1 Cleaning the light fitting



- ▶ At the plastic parts of the light fitting there is a danger of ignition due to electrostatic charging! For cleaning the housing and cover outside and inside and for cleaning internal plastic components use only cold or lukewarm water (if necessary with a mild cleaning agent) together with a viscose sponge or a soft fibrous-free cloth!

#### **Pay attention to the following in case of application of this light fitting in dusty atmospheres:**

Dust deposits have got thermal insulation characteristic features. It is necessary to clean the fitting from dust regularly. In case the dust layer may be higher than 5 mm it must be ensured that the surface temperature of the light fitting does not exceed the maximum permissible surface temperature of the specific dust considering the thickness of the dust layer. The dust layer must not exceed 50 mm at any time.

### 6.2 Repair- and maintenance works



- ▶ For applications in dusty atmospheres the light fitting must be cleaned before opening!
- ▶ Versions without isolating switch (e840 ... oS) must be disconnected from the mains before opening!
- ▶ Versions with isolating switch must be disconnected from the mains before opening the reflector!
- ▶ Ensure that there will be no dust getting into the light fitting while it is open!
- ▶ Replace damaged explosion-proof parts by original spare parts from the Adolf Schuch GmbH only!

- The lamp replacement has to be made according to item 4.3 of these operating instructions.

## 7. Troubleshooting

In case that the light fitting did not get in operation check as follow:

- Is the lamp functional and inserted properly?
- Is the light fitting closed correctly (versions with isolating switch only)?
- Is the ballast functional?

Please consider that the electronic ballast has got a safety-cut-off! It will switch-off the lamp sockets if a lamp is missing or defective or if it has reached the end of its life-time. This error status is reset by switching the lamp off and back on.

Before taking other measures, the functionality of the electronic ballast should be checked by using lamps from a different batch / different manufacturer.

- Is the isolating switch functional?

**EG-Konformitätserklärung**

EC-Declaration Of Conformity  
CE-Déclaration De Conformité



PTB 07 ATEX 2040

PTB 09 ATEX 2031

PTB 09 ATEX 2039

Wir (we; nous)

**Adolf Schuch GmbH, Lichttechnische Spezialfabrik, Mainzer Str. 172, D 67547 Worms**

**erklären in alleiniger Verantwortung, dass  
das Produkt**

hereby declare in our sole responsibility, that the  
product  
déclarons de notre seule responsabilité, que le  
produit

**Explosiongeschützte Leuchte  
Typ e 840... und tD 842...**

Ex-proof light fitting  
Type e 840... and tD 842...  
Luminaire anti-déflagrants  
Type e 840... et tD 842...

**auf das sich diese Erklärung bezieht, mit der/den folgenden Norm(en) oder  
normativen Dokumenten übereinstimmt**

which is the subject of this declaration, is in conformity with the following standard(s) or normative documents  
auquel cette déclaration se rapporte, est conforme aux norme(s) ou aux documents normatifs suivants

**Bestimmungen der Richtlinie**

terms of the directive  
préscription de la directive

**Titel und/oder Nr. sowie Ausgabedatum**

title and/or No. and date of issue of the standard  
titre et/ou No. ainsi que date d'émission des normes

**94/9/EG: Geräte und Schutzsysteme zur  
bestimmungsgemäßen Verwendung in  
explosionsgefährdeten Bereichen**

94/9/EC: Equipment and protective systems intended  
for use in potentially explosive atmospheres  
94/9/CE: Appareils et systèmes de protection  
destinés à être utilisés en atmosphères explosibles

EN 60079-0:2012  
EN 60079-7:2007

EN 60079-31:2009  
EN 60598-1

**2004/108/EG:  
Elektromagnetische Verträglichkeit**

2004/108/EC:  
Electromagnetic compatibility  
2004/108/CE:  
Compatibilité électromagnétique

EN 55015  
EN 61000-3-2  
EN 61000-3-3  
EN 61547

**2011/65/EU: RoHS-Richtlinie**

2011/65/EU: RoHS-Directive  
2011/65/EU: RoHS-directive

EN 50581

Worms, 07. 01. 2014

**Ort und Datum**

place and date  
lieu et date

**Technischer Leiter**

Technical Director  
Directeur de technique

**Leiter Qualitätsmanagement**

Head of quality management dept.  
Chef du dept.assurance de qualité

Adolf Schuch GmbH  
Lichttechnische Spezialfabrik  
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Kto.-Nr. 22101  
BLZ: 550 912 00  
Swift/BIC: GENODE61AZY  
IBAN: DE57 5509 1200 0000 0221 01

Sparkasse Worms-Alzey-Ried  
Kto.-Nr. 171 009  
BLZ: 553 500 10  
Swift/BIC: MALADE51WOR  
IBAN: DE02 5535 0010 0000 1710 09

UST/VA/TVA-ID-Nr.:  
DE 183 995 908  
HRB 11673 Mainz  
WEEE-Reg-Nr.:  
DE 248 68 251

The test certificates are ready to be loaded down from our homepage - [www.schuch.de](http://www.schuch.de) - or we shall send it on request.

Misprints, modifications and errors are excepted

# Uncertified TRANSLATION

## Physikalisch- Technische Bundesanstalt Braunschweig and Berlin

### (1) EC-TYPE-EXAMINATION CERTIFICATE

(2) Equipment and Protective systems intended for use in potentially Explosive Atmospheres – **Directive 94/9/EC**

(3) EC-type-examination Certificate number:

## **PTB 09 ATEX 2031**

(4) Equipment: Explosion protected Light Fitting for fluorescent tubes under type nos. e840.18\*, Explosion protected Emergency Light Fitting type e841.18/.\* and dust protected explosion protected Light Fitting tD842.18\*

(5) Manufacturer: Adolf Schuch GmbH Lichttechnische Spezialfabrik

(6) Address: Mainzer Straße 172, D-67547 Worms, Germany

(7) This equipment and any acceptable variations are specified in the documentation belonging to this certificate.

(8) The Physikalisch-Technische Bundesanstalt, notified Body No. 0102 in accordance with article 9 of the Council Directive 94/9/EG of 23<sup>rd</sup> March, 1994, certifies that this equipment has been found to comply with the essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for application in potentially explosive atmospheres given in Annex II of the Directive.

The test results can be found in the confidential report PTB Ex 09-29046.



(9) The Essential Health and Safety Requirements are fulfilled in compliance with:

**EN 60079-0:2006 EN 60079-7:2007 EN 61241-0:2006 EN 61241-1:2004**

(10) An „X“ placed after the certificate number means that the equipment is subject to special conditions for its safe application acc to the enclosure to this certificate.

(11) This EC-Type-Examination Certificate relates only to the design and test of the specified equipment in accordance with the Directive 94/9/EG. Further requirements of this Directive apply to the manufacture and supply of this equipment. These requirements are not covered by this certificate.

(12) The marking of the equipment must include the following data:

 II 2 G Ex deq IICT4, Ex demb IICT4, Ex deibmaq IICT4, Ex dembq IICT4, Ex deibmb IICT4, Ex eq IICT4,  
Ex emb IICT4, Ex embq IICT4, Ex eibmaq IICT4, Ex eibmb IICT4 und/oder  II 2 D Ex tD A21 IP66/IP64 T..°C

Zertifizierungsstelle Explosionsschutz

Braunschweig, 20 August, 2009

By order:

Dr.-Ing. U. Johannsmeyer

Director and Professor

page1/2

EC type examination certificates without any signature nor seal have no validity.

This EC type examination certificate may be distributed without any modification only.

Any sections or alterations require the approval by the Physikalisch-Technische Bundesanstalt.

Physikalisch-Technische Bundesanstalt \* Bundesallee 100 \* D-38116 Braunschweig

# **Uncertified TRANSLATION**

**Physikalisch- Technische Bundesanstalt  
Braunschweig and Berlin**

(13) **ENCLOSURE**

(14) **EC-TYPE-EXAMINATION CERTIFICATE PTB 09 ATEX 2031**

(15) Description of the equipment

The light fitting for fluorescent tubes of type nos. e840..., explosion protected Emergency Light Fitting e841...and dust protected explosion protected Light Fitting tD842... is an explosion protected electrical equipment with lamp holders for fluorescent tubes with socket G13 of 1x18/20W or 2x18/20W..

This luminaire serves for an illumination of workshops and warehouses in explosive areas.

The housing of this product is made from glass fibre reinforced polyester resin and its transparent portion is made from polycarbonate.

This light fitting can be applied under no. e 840... as a standard one in areas of zone 1 and of zone 21 and under no. e 841... as an emergency fitting in areas of zone 1 and of zone 21. Under no. tD 842... it can be used as a standard fitting in areas of zone 21.

Special versions with control unit, monitoring unit or monitoring module, with and without isolating switch, with special ECG or climatic breather are available.

(16) Test Report No. PTB Ex 09-29046

(17) Special conditions  
not applicable

(18) Essential Health and Safety Requirements  
are fulfilled by corresponding to the aforesaid standards.

Zertifizierungsstelle Explosionsschutz  
By order:

Braunschweig, 20 August, 2009

Dr.-Ing. U. Johannsmeyer  
Director and Professor

page 2/2

EC type examination certificates without any signature nor seal have no validity.  
This EC type examination certificate may be distributed without any modification only.  
Any sections or alterations require the approval by the Physikalisch-Technische Bundesanstalt.


Physikalisch-Technische Bundesanstalt \* Bundesallee 100 \* D-38116 Braunschweig

Uncertified Translation:

Physikalisch-Technische Bundesanstalt  
Braunschweig und Berlin

**1st Amendment**  
according to guide line 94/9/EG attachment III No. 6  
to EG-Baumusterprüfbescheinigung PTB 09 ATEX 2031

Equipment: Explosion-protected Fluorescent Light Fitting: Type e840.18\*,  
Ex-Emergency Light Fitting: Type e841.18\*, and dust-protected Ex-Light Fitting Type tD842.18\*

Identification mark:  II 2 G Ex d e q IIC T4 Gb or Ex d e ib mb q IIC T4 Gb or  
Ex d e mb IIC T4 Gb or Ex d e ib mb IIC T4 Gb or  
Ex d e mb q IIC T4 Gb or Ex e q IIC T4 Gb or Ex e ib mb q IIC  
T4 Gb or Ex e mb IIC T4 Gb or Ex e mb q IIC T4 Gb or  
Ex e ib mb IIC T4 Gb and  
II 2 D Ex tb IIIC T80 °C Db

Manufacturer: Adolf Schuch GmbH Lichttechnische Spezialfabrik

Address: Mainzer Straße 172, 67547 Worms

Description of the completion and amendments

The amended fitting was tested according to the mentioned new test specification.  
The fitting can be used in completion type e840.. as standard fitting in zones 1 and zones 21, in completion type e841...as emergency light fitting in zones 1 and zones 21 and in completion type tD842... as standard light fitting for zones 21. Special Versions with several components are available (e. g. pole-mounted PM, with monitoring module,...)

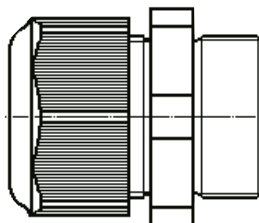
Applied standards: EN 60079-0:2012 EN 60079-7: 2007 EN 60079-31:2009

Assessment- and test report: PTB Ex 12-21228

Explosiongeschützte Kabel- und Leitungseinführungen,  
Verschlussstopfen, Schraubverschlüsse, Trompetenverschraubungen,  
Reduzierungen und Entwässerungsstopfen

Explosion-protected cable entries, blanking plugs, screw plugs,  
trumpet-shaped cable glands, reducing glands and drain plugs

Entrées de câble, bouchons filetés, bouchons de fermeture,  
presses-étoupes à trompette, bagues de réduction et bouchons de  
purgé pour atmosphères explosives



CZ: "Tento návod k použití si můžete vyžádat ve svém mateřském jazyce u příslušného zastoupení společnosti Cooper Crouse-Hinds/CEAG ve vaší zemi."

DK: "Montagevejledningen kan oversættes til andre EU-sprog og rekvireres hos Deres Cooper Crouse-Hinds/CEAG leverandør"

E: "En caso necesario podrá solicitar de su representante Cooper Crouse-Hinds/CEAG estas instrucciones de servicio en otro idioma de la Union Europea"

EST: "Seda kasutusjuhendit oma riigikeeles võite küsida oma riigis asuvasst asjaomasest Cooper Crouse-Hinds/CEAG esindusest."

FIN: "Tarvittaessa tämän käyttöohjeen käännös on saatavissa toisella EU:n kielellä Teidän Cooper Crouse-Hinds/CEAG - edustajaltanne"

GR: "Εάν χρειασθεί, μεταφράση των οδηγιών χρήσεως σε άλλη γλώσσα της ΕΕ, μπορεί να ζητηθεί από τον Αντιπρόσωπο της Cooper Crouse-Hinds/CEAG"

H: "A kezelési útmutatót az adott ország nyelvén a Cooper Crouse-Hinds/CEAG cég helyi képviselőtől igényelheti meg."

I: "Se desiderate la traduzione del manuale operativo in un'altra lingua della Comunità à Europea potete richiederla al vostro rappresentante Cooper Crouse-Hinds/CEAG"

LT: "Šios naudojimo instrukcijos, išverstos į Jūsų gimtąją kalbą, galite pareikalauti atsakingoje "Cooper Crouse-Hinds/CEAG" atstovybėje savo šalyje."

LV: "Šo ekspluatācijas instrukciju valsts valodā varat pieprasīt jūsu valsts atbildīgajā Cooper Crouse-Hinds/CEAG pārstāvniecībā."

M: "Jistghu jitolbu dan il-manwal fil-lingwa nazzjonali taghhom minghand ir-rapprezentant ta' Cooper Crouse Hinds/CEAG f'pajjizhom."

NL: "Indien noodzakelijk kan de vertaling van deze gebruiksinstructie in een andere EU-taal worden opgevraagd bij Uw Cooper Crouse-Hinds/CEAG - vertegenwoordiging"

P: "Se for necessária a tradução destas instruções de operação para outro idioma da União Europeia, pode solicita-la junto do seu representante Cooper Crouse-Hinds/CEAG"

PL: "Niniejszą instrukcję obsługi w odpowiedniej wersji językowej można zamówić w przedstawicielstwie firmy Cooper-Crouse-Hinds/CEAG na dany kraj."

S: "En översättning av denna montage- och skötselinstruktion till annat EU - språk kan vid behov beställas från Er Cooper Crouse-Hinds/CEAG-representant"

SK: "Tento návod na obsluhu Vám vo Vašom rodnom jazyku poskytneme zastúpenie spoločnosti Cooper Crouse-Hinds/CEAG vo Vašej krajine."

SLO: "Navodila za uporabo v Vašem jeziku lahko zahtevate pri pristojnem zastopništvu podjetja Cooper Crouse-Hinds/CEAG v Vaši državi."

RUS: "При необходимости, вы можете запрашивать перевод данного руководства на другом языке ЕС или на русском от вашего Cooper Crouse-Хиндс / CEAG - представителей."

GHG 960 7001 P0001 D/E/F (Q)

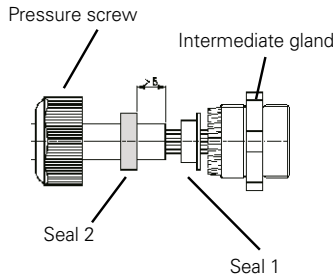
**EAT•N**  
Powering Business Worldwide

Cable entries, blanking plugs, screw plugs, trumpet-shaped cable glands, reducing glands and drain plugs

Dimension drawings and dimensions in mm

**1 Technical data**

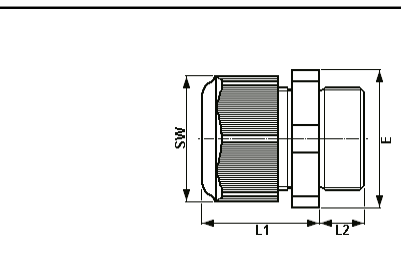
Fig. A Cable entry z.B. M25x1,5



**1.1 Technical details for: Cable entries (KLE) M12x1,5 to M63x1,5**

ATEX type examination certificate:	PTB 14 ATEX 1015 X <sup>(A)</sup>
Marking acc. to 94/9/EG and standard:	EN 60079-0
	II 2 G Ex eb IIC Gb
	II 2 D Ex tb IIIC Db
IECEx type examination certificate:	IECEx PTB 14.0027X <sup>(A)</sup>
Category of application:	IEC60079-0
	Ex eb IIC Gb
	Ex tb IIIC Db
Perm. storage temperature in original packing:	-20° C to +70° C
Degree of protection to IEC/EN 60529:	IP 66 (when fully assembled)

<sup>(A)</sup>The EC-Type Examination Certificate and any future supplements thereto shall, at the same time, be regarded as supplements to the EC-Type Examination Certificates PTB 99 ATEX 3128 X and PTB 99 ATEX 3101 X



Type	SW	L1	L2	E	weight app.
M12x1,5	15 mm	19,3 mm	12 / 8 mm	16,2 mm	3,4 g
M16x1,5	20 mm	23,0 mm	12 / 8 mm	22,0 mm	6,5 g
M20x1,5	24 mm	25,0 mm	13 / 8 mm	26,5 mm	10,1 g
M25x1,5	29 mm	29,5 mm	13 / 8 mm	32,0 mm	16,9 g
M32x1,5	36 mm	35,5 mm	15 / 10 mm	40,0 mm	27,6 g
M40x1,5	46 mm	39,5 mm	15 / 10 mm	50,5 mm	50,3 g
M50x1,5	55 mm	44,0 mm	16 / 12 mm	60,0 mm	75,9 g
M63x1,5	68 mm	47,0 mm	16 / 12 mm	75,0 mm	117,6 g

Type	operating temperature	impact resistance	Cable diameter								Screw-in thread in enclosure	Colour of dust protection cover
			seal 1+2				seal 2					
			min.	max.	min.	max.	min.	max.	min.	max.		
	°C	Joule	Ø	Nm**	Ø <sup>(1)(2)</sup>	Nm**	Ø	Nm**	Ø <sup>(2)</sup>	Nm**	Nm**	
M12x1,5	-20 - 70	4	5,0	0,8	7,0	1,0	without seal 2				1,2	white
M16x1,5	-20 - 70	4	7,0	1,0	10,0	1,4	without seal 2				3,3	white
M20x1,5	-20 - 70	7	7,0	1,5	9,0	1,4	9,5	1,0	13,0	1,7	2,7	white
M20x1,5	-40 - 70	4	7,0	1,5	9,0	1,4	9,5	1,0	11,0	1,7	2,7	green
M25x1,5	-20 - 70	7	10,0	2,3	13,0	2,6	13,5	1,3	17,5	2,3	3,0	white
M25x1,5	-55 - 70	7	10,0	2,3	13,0	2,6	13,5	1,5	15,0	2,3	3,0	green
M32x1,5	-20 - 70	7	14,0	3,0	17,0	4,0	17,5	1,5	21,0	1,3	5,0	white
M32x1,5	-55 - 70	7	14,0	3,0	17,0	4,0	17,5	1,5	21,0	1,3	5,0	green
M40x1,5	-55 - 70	7	19,0	3,3	22,0	5,5	22,0	3,3	28,0	6,7	7,5	green
M50x1,5	-55 - 70	7	24,0	6,0	28,0	7,0	28,0	5,0	35,0	7,0	7,5	green
M63x1,5	-55 - 70	7	29,0	12,0	35,0	12,0	36,0	12,0	41,0	13,0	7,5	green
additional seal			41,0	13,0	48,0	7,8						

\*\* Test torques at 20°C

<sup>(1)</sup> The tests of clamping ranges and torque values were performed with metal mandrel. The clamping range can vary by using cables with different manufacturing tolerances and material properties. Please use the combination of sealing 1 + 2 for the intermediate region.

<sup>(2)</sup> When selecting the seal rubber, ensure that the cap nut can be tightened when carrying out any future maintenance work on the cable entry.

Fig. B Cable diameter 19 mm e.g. for M32x1,5

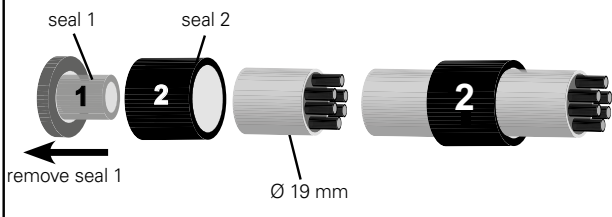
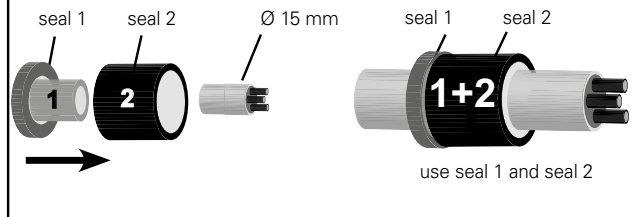


Fig. C Cable diameter 15 mm e.g. for M32x1,5



## Cable entries, blanking plugs, screw plugs, trumpet-shaped cable glands, reducing glands and drain plugs

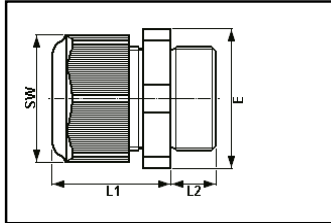
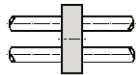
Dimension drawings and dimensions in mm **1.2 Multiple glands**

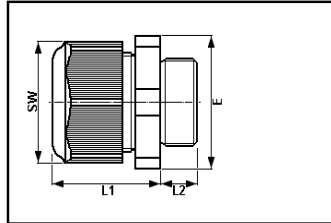
Fig. D/1 Seal insert



for multiple gland

Type	SW	L1	L2	E	weight app.
M25x1,5 2- times	29 mm	29,5 mm	13 / 8 mm	32,0 mm	16,9 g
M32x1,5 4- times	36 mm	35,5 mm	15 / 10 mm	40,0 mm	276 g

Type	Operating temperature	Impact resistant	Cable diameter			
			Seal 1		Seal 2	
	°C	Joule	min. Ø	Nm	max. Ø	Nm
M25x1,5 2- times	-20 - 70	< 7	2x 4,5	2,0	7,0	2,0
M32x1,5 4- times	-20 - 70	< 7	4x 4,5	3,0	7,0	3,5

**1.3 Enlargement glands**

Type	SW	L1	L2	E	weight app.
M16x1,5 / M20x1,5	24 mm	25,0 mm	12 mm	26,5 mm	9,2 g
M20x1,5 / M25x1,5	29 mm	29,5 mm	13 mm	32,0 mm	16,7 g
M25x1,5 / M32x1,5	36 mm	35,5 mm	15 mm	40,0 mm	27,0 g
M32x1,5 / M40x1,5	46 mm	39,5 mm	15 mm	50,5 mm	46,5 g
M40x1,5 / M50x1,5	55 mm	44,0 mm	15 mm	60,0 mm	73,5 g
M50x1,5 / M63x1,5	68 mm	47,0 mm	16 mm	75,0 mm	106,4 g

Type	Operating temperature	Impact resistant	Cable diameter								Screw-in thread in enclosure
			Seal 1+2				Seal 2				
			min.		max.		min.		max.		
°C	Joule	Ø	Nm**	Ø <sup>(1)</sup> (2)	Nm**	Ø	Nm**	Ø <sup>(1)</sup>	Nm**	Nm**	
M16x1,5 / M20x1,5	-20 - 70	< 7	7,0	1,5	9,0	1,4	9,5	1,0	13,0	1,7	3,3
	-40 - 70	< 4	7,0	1,5	9,0	1,4	9,5	1,0	11,0	1,7	3,3
M20x1,5 / M25x1,5	-20 - 70	< 7	10,0	2,3	13,0	2,6	13,5	1,3	17,5	2,3	2,7
	-40 - 70	< 4	10,0	2,3	13,0	2,6	13,5	1,5	15,0	2,3	2,7
M25x1,5 / M32x1,5	-55 - 70	< 7	14,0	3,0	17,0	4,0	17,5	1,5	21,0	1,3	3,0
M32x1,5 / M40x1,5	-55 - 70	< 7	19,0	3,3	22,0	5,5	22,0	3,3	28,0	6,7	5,0
M40x1,5 / M50x1,5	-55 - 70	< 7	24,0	6,0	28,0	7,0	28,0	5,0	35,0	7,0	7,5
M50x1,5 / M63x1,5	-55 - 70	< 7	29,0	12,0	35,0	12	36,0	12,0	41,0	13,0	7,5
additional seal			41,0	13,0	48,0	7,8					

\*\* Test torques at 20°C

(1) The tests of clamping ranges and torque values were performed with metal mandrel. The clamping range can vary by using cables with different manufacturing tolerances and material properties. Please use the combination of sealing 1 + 2 for the intermediate region.

(2) When selecting the seal rubber, ensure that the cap nut can be tightened when carrying out any future maintenance work on the cable entry.

## Cable entries, blanking plugs, screw plugs, trumpet-shaped cable glands, reducing glands and drain plugs

## Dimension drawings and dimensions in mm 1.4 Cable entries in special versions

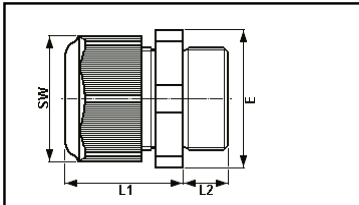
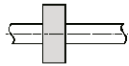


Fig. D/2 Seal insert



for gland for flat cables

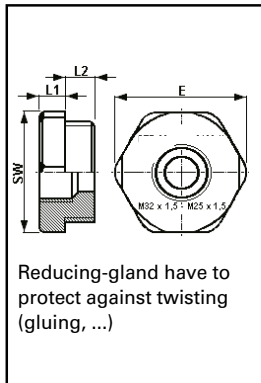
Type	SW	L1	L2	E	weight app.
M20 with seal Ø 2 mm	24 mm	25,0 mm	13 / 8 mm	26,5 mm	10,1 g
M20 with slotted seal Ø 7,0- 13 mm	24 mm	25,0 mm	13 / 8 mm	26,5 mm	10,1 g
M25 flat cable	29 mm	29,5 mm	13 / 8 mm	32,0 mm	16,9 g
M25 with PG 16 thread	36 mm	35,5 mm	15 / 10 mm	40,0 mm	276 g

Type	Operating temperature	Impact resistant	Cable-diameter								Screw-in thread in enclosure
			Seal 1+2				Seal 2				
	°C	Joule	min. Ø	max. Nm**	min. Ø <sup>(1)(2)</sup>	max. Nm**	min. Ø	max. Nm**	min. Ø <sup>(1)(2)</sup>	max. Nm**	
M20 with seal Ø 2 mm	-20 - 60	< 7	2,0	3,5						2,7	
M20x1,5 with slotted seal Ø 7,0- 13 mm	-5 - 45		Breakout-Innenkabel Typ: orange								2,7
	-20 - 60		Ultra-Fox Plus Typ: 903 AG 621 02 709								2,7
	-20 - 60		Ehret / ICS 24 Typ: 84 305 ... ..								2,7
M25x1,5 with PG 16 thread	-20 - 70	< 7	10,0	2,3	13,0	2,6	13,5	1,3	17,5	2,3	3,0
	-55 - 70	< 7	10,0	2,3	13,0	2,6	13,5	1,5	15,0	2,3	3,0
M25x1,5 flat cable	-55 - 70 (110)	< 7	G18 = 5-8x9-12,5 Flachkabel			5,0					3,0
M25x1,5 flat cable	-55 - 70 (110)	< 7	G26 = 6-8x11-14 Flachkabel			3,5					3,0
	Cable type		Seal dimensions				Cable dimensions				
M25 flat cable	Raychem XTV-4XTV 2 ...		8,0	x	11,0	mm	7,5	x	11,0	mm	3,0
M25 flat cable	Raychem VPL-5VPL 2 ...		8,0	x	11,0	mm	7,5	x	11,5	mm	3,0
M25 flat cable	Raychem BTV-3BTV 2 ...		8,0	x	11,0	mm	6,0	x	11,0	mm	3,0
M25 flat cable	Raychem QTV-10QTVR2		8,0	x	11,0	mm	5,0	x	12,5	mm	3,0
M25 flat cable Raychem	Raychem BTV-10BTV 2 ...		8,0	x	14,0	mm	6,0	x	14,0	mm	3,0
M25 flat cable	Raychem KTV-5KTV 2 ...		8,0	x	14,0	mm	7,5	x	13,5	mm	3,0

\*\* Test torques at 20°C

(1) The tests of clamping ranges and torque values were performed with metal mandrel. The clamping range can vary by using cables with different manufacturing tolerances and material properties. Please use the combination of sealing 1 + 2 for the intermediate region.

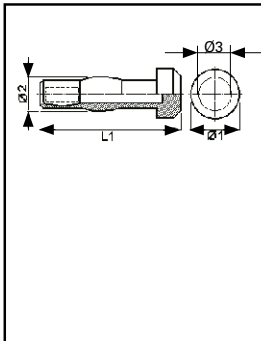
(2) When selecting the seal rubber, ensure that the cap nut can be tightened when carrying out any future maintenance work on the cable entry.

Dimension drawings and dimensions in mm **1.5 Reducing glands**

Type	Operating temperature / °C	SW	L1	L2	E	Screw-in thread in enclosure / Nm	weight app.
M16x1,5 / M12x1,5	-55 - 70					3,3 Nm	
M20x1,5 / M12x1,5	-55 - 70	24 mm	6,0 mm	8 mm	26,5 mm	2,7 Nm	9,0 g
M20x1,5 / M16x1,5	-55 - 70	24 mm	6,0 mm	8 mm	26,5 mm	2,7 Nm	9,0 g
M25x1,5 / M12x1,5	-55 - 70	29 mm	6,0 mm	8 mm	32,0 mm	3,0 Nm	12,5 g
M25x1,5 / M16x1,5	-55 - 70	29 mm	6,0 mm	8 mm	32,0 mm	3,0 Nm	12,5 g
M25x1,5 / M20x1,5	-55 - 70	29 mm	6,0 mm	8 mm	32,0 mm	3,0 Nm	12,5 g
M32x1,5 / M12x1,5	-55 - 70	29 mm	6,0 mm	10 mm	40,0 mm	5,0 Nm	13,5 g
M32x1,5 / M16x1,5	-55 - 70	29 mm	6,0 mm	10 mm	40,0 mm	5,0 Nm	13,5 g
M32x1,5 / M20x1,5	-55 - 70	29 mm	6,0 mm	10 mm	40,0 mm	5,0 Nm	13,5 g
M32x1,5 / M25x1,5	-55 - 70	36 mm	6,0 mm	10 mm	40,0 mm	5,0 Nm	13,0 g
M40x1,5 / M16x1,5	-55 - 70	46 mm	6,0 mm	10 mm	50,5 mm	7,5 Nm	21,0 g
M40x1,5 / M20x1,5	-55 - 70	46 mm	6,0 mm	10 mm	50,5 mm	7,5 Nm	21,0 g
M40x1,5 / M25x1,5	-55 - 70	46 mm	6,0 mm	10 mm	50,5 mm	7,5 Nm	23,0 g
M40x1,5 / M32x1,5	-55 - 70	46 mm	6,0 mm	10 mm	50,5 mm	7,5 Nm	21,0 g
M50x1,5 / M20x1,5	-55 - 70	55 mm	6,0 mm	12 mm	60,0 mm	7,5 Nm	72,0 g
M50x1,5 / M25x1,5	-55 - 70	55 mm	6,0 mm	12 mm	60,0 mm	7,5 Nm	72,0 g
M50x1,5 / M32x1,5	-55 - 70	55 mm	6,0 mm	12 mm	60,0 mm	7,5 Nm	72,0 g
M50x1,5 / M40x1,5	-55 - 70	55 mm	6,0 mm	12 mm	60,0 mm	7,5 Nm	65,0 g
M63x1,5 / M25x1,5	-55 - 70	68 mm	6,0 mm	12 mm	75,0 mm	7,5 Nm	40,0 g
M63x1,5 / M32x1,5	-55 - 70	68 mm	6,0 mm	12 mm	75,0 mm	7,5 Nm	40,0 g
M63x1,5 / M40x1,5	-55 - 70	68 mm	6,0 mm	12 mm	75,0 mm	7,5 Nm	40,0 g
M63x1,5 / M50x1,5	-55 - 70	68 mm	6,0 mm	12 mm	75,0 mm	7,5 Nm	30,0 g

L1 = Screw-in thread in enclosure

L2 = Reducing thread

**1.6 Blanking plug for multiple glands**

Type	Operating temperature / °C	Ø 1	Ø 2	L1	Ø 3	weight app.
M12x1,5*	-55 / +70	7,0 mm	6,0 mm	30,3 mm	5,0 mm	1,0 g
M16x1,5	-55 / +70	8,0 mm	7,0 mm	33,0 mm	6,0 mm	1,3 g
M20x1,5	-55 / +70	12,0 mm	8,5 mm	34,5 mm	7,0 mm	6,6 g
M25x1,5	-55 / +70	16,0 mm	11,0 mm	36,0 mm	10,0 mm	2,8 g
M32x1,5	-55 / +70	20,0 mm	14,0 mm	39,5 mm	13,0 mm	4,6 g
M40x1,5	-55 / +70	24,0 mm	20,0 mm	42,0 mm	19,0 mm	7,0 g
M50x1,5	-55 / +70	32,0 mm	26,0 mm	44,0 mm	25,0 mm	8,0 g
M63x1,5	-55 / +70	39,0 mm	34,0 mm	45,0 mm	32,0 mm	9,0 g

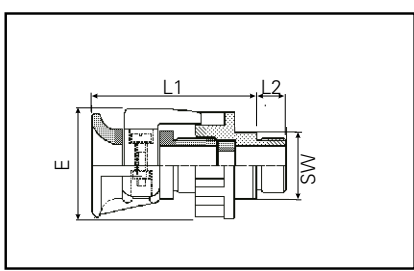
\* for multiple glands M25x1,5 and M32x1,5

Cable entries, blanking plugs, screw plugs, trumpet-shaped cable glands, reducing glands and drain plugs

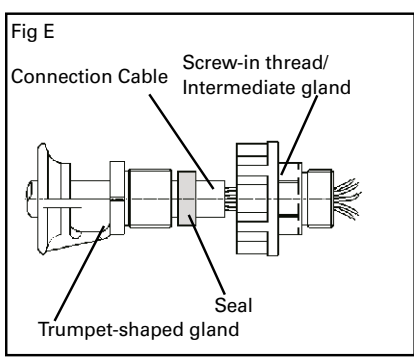
Dimension drawings and dimensions in mm

**1.7 Trumpet-shaped glands M20 to M63**

ATEX type examination certificate:	PTB 00 ATEX 3121
Marking acc. to 94/9/EG and standard:	
EN 60079-0	⊕ II 2 G Ex e II
	⊕ II 2 D Ex tD A21 IP66
IECEx type examination certificate:	IECEx BKI 08.0007
Category of application:	
IEC60079-0	Ex e II
	Ex tD A21 T85°C IP66
Perm. storage temperature in original packing:	-20° C +40° C
Degree of protection to EN/IEC 60529:	IP 66 (fully assembled)



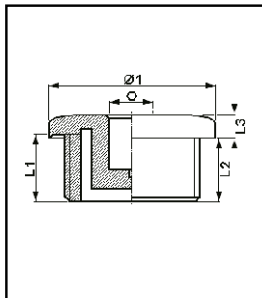
Type	SW	L1	L2	E width across corners	weight app.
M20x1,5	27 mm	64 mm	15 mm	47 mm	100 g
M25x1,5	32 mm	65 mm	15 mm	51 mm	110 g
M32x1,5	41 mm	80 mm	15 mm	68 mm	170 g
M40x1,5	50 mm	86 mm	15 mm	81 mm	230 g
M50x1,5	60 mm	95 mm	16 mm	96 mm	450 g
M63x1,5	75 mm	105 mm	16 mm	107 mm	550 g



Type	Operating temperature	Impact re-sistant	Cable diameter				strain Relief (screws)	Screw-in thread
			Trumpet-shaped gland					
	°C	Joule	min. Ø	max. Nm	min. Ø	max. Nm	Nm	Nm
M20x1,5	-40 - 85	< 7	8,0	3,5	13,0	2,5	1,5	2,7
M25x1,5	-40 - 85	< 7	11,0	5,0	16,0	3,5	2,0	3,0
M32x1,5	-40 - 85	< 7	15,0	8,0	20,0	5,0	4,0	7,5
M40x1,5	-40 - 85	< 7	19,0	6,0	27,0	5,0	6,0	7,5
M50x1,5	-40 - 85	< 7	28,0	16,0	34,0	5,0	10,0	7,5
M63x1,5	-40 - 85	< 7	38,0	22,0	46,0	5,0	15,0	7,5

## Cable entries, blanking plugs, screw plugs, trumpet-shaped cable glands, reducing glands and drain plugs

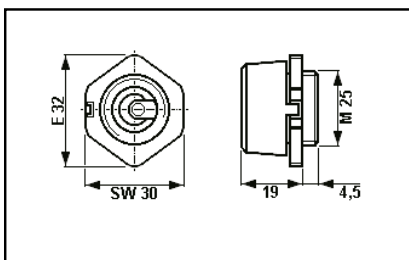
Dimension drawings and dimensions in mm

**1.8 Screw plugs**

ATEX type examination certificate:	PTB 98 ATEX 3130	
Marking acc. to 94/9/EG and standard:	EN 60079-0	
	II 2 G Ex IIC Gb II 2 D Ex tb IIIC Db IP66 (not for M63x1,5)	
IECEx type examination certificate::	IECEx PTB 03.0000	
Category of application:	IEC60079-0	
	Ex IIC Gb	(not for M63x1,5)
	Ex tb IIIC Db IP 66	(not for M63x1,5)
Perm. storage temperature in original packing:	-20° C	+40° C
Degree of protection to EN/IEC 60529:	IP 54 (fully assembled)	

Type	Operating temperature / °C	Ø 1	L1	L2	L3	Screw-in thread in enclosure / Nm	weight app.
M16x1,5	-55 / +95	21 mm	12 mm	11 mm	4,0 mm	3,3	2,4 g
M20x1,5	-55 / +95	25 mm	13 mm	12 mm	4,0 mm	2,7	4,3 g
M25x1,5	-55 / +95	30 mm	13 mm	12 mm	4,0 mm	3,0	6,6 g
M32x1,5	-55 / +95	37 mm	15 mm	14 mm	5,5 mm	5,0	12,0 g
M40x1,5	-55 / +95	45 mm	15 mm	14 mm	5,5 mm	7,5	36,6 g
M50x1,5	-55 / +95	55 mm	16 mm	15 mm	5,5 mm	7,5	56,6 g
M63x1,5	-20 / +80	72 mm	/ mm	12 mm	11,0 mm	7,5	64,5 g

= Socket head spanner or screw driver, size 8 mm

**1.9 Drain plug**

ATEX type examination certificate:	PTB 01 ATEX 1128 X	
Marking acc. to 94/9/EG and standard:	EN 60079-0	
	II 2 G Ex e II	
Einsatztemperaturbereich:	-20° C	+40° C
Perm. storage temperature in original packing:	-20° C	+40° C
Degree of protection to EN/IEC 60529:	IP 66 (fully assembled)	
Einschraubgewinde in Gehäuse:	M25x1,5	
Prüfdrehmoment:	5,0 Nm	

## 2 Legende

### Caution

***This symbol warns of a possible failure. Failure to observe this caution may result in the total failure of the device or the system or plant to which it is connected.***



Special conditions:

This symbol indicates that special conditions apply for a safe operation in accordance with the EC Type Examination Certificate / IECEx Certificate of Conformity.

## 2.1 Safety instructions



***The operations must be carried out by electrical suitably trained in hazardous area with knowledge of increased safety explosion protection IEC/EN 60079-14.***

***All the entries and components listed in these operating and mounting instructions are not suited for use in Zone 0 and Zone 20.***

***In addition, they may not be used as direct cable entries or seals for flameproof enclosures in potentially explosive atmospheres in Zone 1, Zone 2, and Zone 12, Zone 22.***

***They shall be used for their intended purpose and shall be in a perfect and clean state.***

***Prior to mounting, check the entries and components, as well as the screw-in threads of the apparatus into which they are to be mounted to ensure that they are in a perfect state.***

***The requirements of the IEC/EN 60079-0 and EN/IEC 60079-31 regarding excessive dust deposits and temperature to be considered from the user.***

***The national safety rules and regulations for the prevention of accidents, as well as the safety instructions included in these operating instructions, that, like this text, are set in italics, shall be observed!***

## 3 Conformity with standards

The apparatus conforms to the standards specified in the EC-Declaration of conformity, enclosed separately.

The apparatus also fulfils further requirements such as those of the directive on electromagnetic compatibility (2004/108/EC).

## 4 Field of application

The entries and components covered by these instructions (see Technical Data) are suited for mounting in potentially explosive atmospheres in Zone 1, Zone 2 and Zone 21, Zone 22 accordance with EN/IEC 60079-10-1 and EN/IEC 60079-10-2!

The materials used, including the exterior metal parts, are high quality materials that ensure a corrosion resistance and resistance to chemical substances according to the requirements for use in a "normal industrial atmosphere":


- impact resistant polyamide
- stainless steel

In case of use in an extremely aggressive atmosphere, please refer to manufacturer

## 5 Application / Properties

All the cable entries and components covered by these operating and mounting instructions are suited for use in enclosures and apparatus in the type of protection "Increased Safety".

Trumpet-shaped cable glands are used for feeding flexible cables into enclosures and apparatus.


*** The fitting of seal inserts one inside the other or the interchanging of seal inserts of different entries to reduce the cable opening is not permitted.***


Reducing glands can be used to reduce the size of threaded or through holes in enclosures to a smaller thread size.


Blanking plugs are used to seal metric COOPER CROUSE-HINDS cable entries and COOPER CROUSE-HINDS multiple entries.

Screw glands are used to seal unused through and threaded holes.

Any condensation in the apparatus can escape via drain plugs (see 6.1, Mounting).

*** Applications other than those described are not permissible without a written declaration of consent from Messrs. COOPER CROUSE-HINDS.***

*** The instructions according to section 7 of the operating instructions shall be observed during operation.***

*** The sole responsibility with respect to the suitability and proper use of these entry components with regard to the basic conditions of these instructions (see Technical Data) lies with the operator.***


*** The EC-Type Examination Certificate and any future supplements thereto shall, at the same time, be regarded as supplements to the EC-Type Examination Certificates PTB 99 ATEX 3128 X and PTB 99 ATEX 3101 X***

Fig. 1

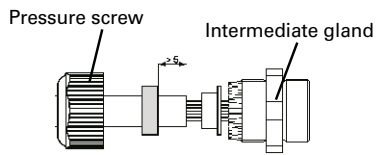


Fig. 2

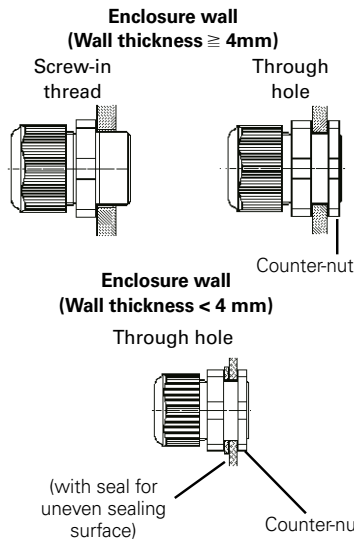


Fig. 3

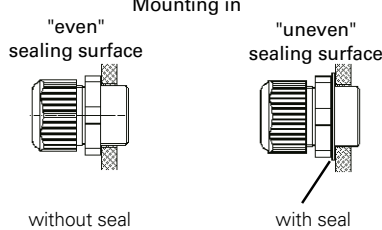


Fig. 4

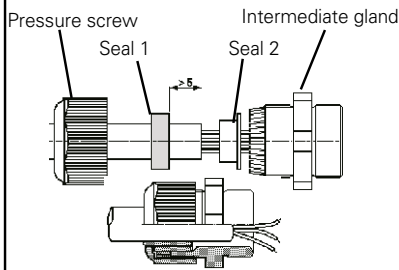


Fig. 5



Special spanner for tightening pressure screws of cable entries

## 6 Installation

The relevant national regulations and the generally recognized rules of engineering apply for the installation and operation. (IEC/EN 60079-14).

**⚠ The improper installation and operation of enclosures can result in the invalidation of the guarantee.**

**⚠ Observe the special operational conditions accordance to IEC/EN 60069-14.**

**⚠ Only fixed cables may be used.** The operator shall ensure that an appropriate strain relief is provided. This is not required for trumpet-shaped glands.

**⚠ The degree of protection IP66 is only attained if the seals and cable entries are installed correctly.**

**⚠ Cable entries that are only suited for a low impact energy shall be built into an enclosure in such a way as to protect them from a mechanical impact energy.**

### 6.1 Mounting

**⚠ Prior to mounting, ensure that the threads of the entry components match the threads of the apparatus or enclosure.**

**⚠ If the entries and components are to be screwed directly into the walls, the wall thickness of the apparatus shall be at least 4 mm.**

**⚠ Counter-nuts shall be used if enclosure walls are less than 4 mm thick. The minimum thickness of the enclosure wall shall be 1.5 mm.**

**⚠ The use of entry elements with damaged or dirty threads can impair the IP degree of protection.**

**⚠ Imported Cables and wiring shall be relieved of tensile forces (eg with a cable clamp).**

### 6.1.1 Cable entries (KLE)

The intermediate gland (see Fig. 1) of the cable entries shall be fitted with a suitable tool, e.g. fork, ring or box spanner.

It is mounted directly in the threaded hole or via the through hole of the enclosure (see Fig. 2).

If the sealing surfaces are uneven, seals shall be used between the enclosure wall and the intermediate gland (see Fig. 3).

Counter-nuts shall be used for walls with a thickness of less than 4 mm (see Fig. 2).

Cables are fed in as shown in Fig. 4.

The seal inserts shall be chosen to suit the respective cable diameter (Figs. A, B and C).

Use COOPER CROUSE-HINDS spanners with a side opening can be used to facilitate the tightening of the pressure screw when the cable entry has been mounted (see Fig. 5).

Order No. GHG 960 1951 R0001 for Set 1 (M12, 16, 20, 25, 32 and 40)

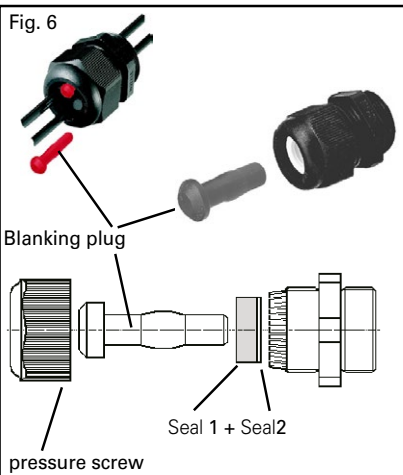
Order No. GHG 960 1951 R0002 for Set 2 (M50 and M63)

To ensure the required minimum degree of protection, the gland body and the pressure cap shall be tightened with the given test torques (see Technical Data).

When tightening the pressure cap, the gland body shall be prevented from turning with a suitable tool, e.g. a spanner.

**⚠ Overtightening can impair the degree of protection.**

Optionally, cable entries with colour-coded (light blue) pressure screws can be used for intrinsically safe circuits (see main COOPER CROUSE-HINDS catalogue for order numbers).



### 6.1.2 Blanking plugs

⚠ Blanking plugs of the types GGH 960 6107 P\*\*\*\* or GGH 960 1944 R\*\*\*\* may only be used in conjunction with cable entries of the types GGH 960 92\*\* P\*\*\*\* or GGH 960 19\*\* R\*\*\*\*.

The following shall be observed when mounting blanking plugs for COOPER CROUSE-HINDS metric cable entries (see Fig. 6):

1. Only the blanking plug associated to the KLE shall be used.
2. The head of the blanking plug shall, as shown in Fig. 5, be on the outside.
3. The head of the blanking plug shall, as shown in Fig. 5, be on the outside.
4. The blanking plug shall be pushed into the KLE until it reaches the stop.
5. The pressure screw of the KLE shall be tightened down as described in 6.1.1.

### 6.1.3 Screw plug

The screw plug shall be screwed tightly into the threaded hole in the enclosure using a suitable tool, e.g. 8 mm socket head spanner or a suitable screw driver.

A counter-nut shall be used for through holes or enclosures that are less than 4 mm thick.

An additional seal shall be used for uneven sealing surfaces.

⚠ **In general, the M50 screw plug shall be mounted together with the seal supplied.**

### 6.1.4 Trumpet-shaped gland

A suitable tool, e.g. a fork spanner, shall be used for mounting the intermediate gland in the trumpet-shaped gland in such a way that it cannot twist.

It is necessary to ensure that the gland cannot twist once the cable has been fed in and the trumpet-shaped gland mounted (e.g. by using a counter-nut, see Figs. 7 + 8). A counter-nut shall be used for through holes or enclosures that are less than 4 mm thick. When mounting, a seal shall always be used between the enclosure wall and intermediate gland (see Fig. 7).

The following describes the mounting of the cable in the trumpet-shaped gland, as shown in Fig. 8:

1. Cut out the individual rings of the "onion ring" seal insert to match the respective cable diameter.
2. After feeding in the cable, that has been cut to length and has the seal mounted, into the intermediate gland, screw the trumpet-shaped gland tightly into the intermediate gland to seal off the cable.
3. Then mount the pull relief on the trumpet-shaped gland.

⚠ **It is necessary to ensure that there is sufficient pull relief, that damage to the cable is not possible and that the trumpet-shaped gland cannot twist.**

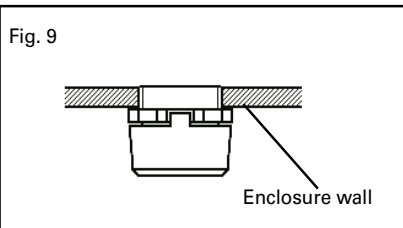
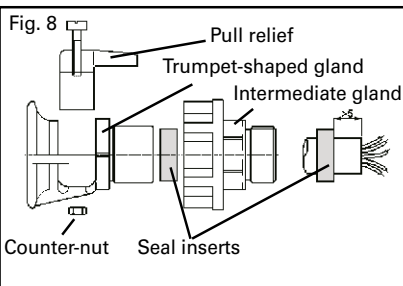
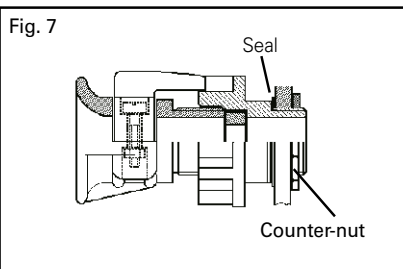
### 6.1.5 Reducing gland

A suitable tool, e.g. a fork, ring or box spanner, shall be used for screwing the reducing gland tightly into the threaded hole in the enclosure.

A counter-nut shall be used for through holes or enclosures that are less than 4 mm thick.

An additional seal shall be used for uneven sealing surfaces.

⚠ **Screwing several reducing glands one inside the other to reduce the size of the entry thread is not permitted.**



### 6.1.6 Drain plug

A suitable tool, e.g. a fork, ring or box spanner, shall be used for screwing the drain plug tightly into the threaded hole in the enclosure.

An additional seal shall be used for uneven sealing surfaces.

The drain plug shall be mounted at the lowest point of the apparatus or enclosure (see Fig. 9).

**⚠ The minimum wall thickness may not be less than 4 mm.**

Entry components shall be screwed in tightly to ensure the specified minimum degree of protection (see Technical Data for test torques).

**⚠ Overtightening can impair the degree of protection.**

## 6.2 Putting into operation

Prior to putting the mounted entry components into operation, the tests specified in the individual national regulations shall be performed.

In addition to this, prior to putting the entries into operation, the correct mounting shall be checked in accordance with these operating and mounting instructions and any other applicable regulations.

**⚠ In locations where they are particularly at risk, the entries shall be safeguarded against being torn out of the apparatus or enclosure walls by external mechanical influences (e.g. by fork lift trucks, by knocking or similar).**

## 7 Maintenance / Servicing

**⚠ The valid national regulations for the servicing / maintenance of electrical apparatus for use in potentially explosive atmospheres shall be observed (e.g. IEC/EN 60079-17).**

The necessary intervals between servicing depend upon the specific application and shall be stipulated by the operator according to the respective operating conditions.

As part of the routine testing, above all, parts on which the explosion protection depends shall be checked (e.g. intactness of entry components and seals).

Pressure screws of cable entries, trumpet-shaped glands of trumpet-shaped cable entries shall be checked at regular intervals to ensure that they are screwed in tightly and, if necessary, they shall be tightened down.

If, in the course of servicing, it is ascertained, that repairs are necessary, section 8 of these operating instructions shall be observed.

## 8 Repairs / Modifications

Only original COOPER CROUSE-HINDS parts shall be used for carrying out repairs that concern the explosion protection.

**⚠ Repairs that affect the explosion protection may only be carried out by COOPER CROUSE-HINDS or by a qualified electrician in compliance with the respective national regulations (e.g. IEC/EN 60 079-19).**

Modifications to the entry components are not permitted.

## 9 Disposal / Recycling

The respective valid national regulations for waste disposal shall be observed when disposing of apparatus.

To facilitate recycling of individual parts, parts made of moulded plastic bear the marking for the type of plastic used.

The product range is subject to changes and additions.





## (1) EC-TYPE-EXAMINATION CERTIFICATE (Translation)

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - **Directive 94/9/EC**

(3) EC-type-examination Certificate Number:

**PTB 99 ATEX 3101 X**



(4) Equipment: Cable and conduit entry, type GHG 960 923. P.... size M12 x 1,5 and M16 x 1,5

(5) Manufacturer: CEAG Sicherheitstechnik GmbH

(6) Address: Neuer Weg Nord 49, D-69412 Eberbach

(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report PTB Ex 99-30113.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:  
EN 50 014:1997                      EN 50 019:1994

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

(11) This EC-type-examination Certificate relates only to the design and construction of the specified equipment in accordance with Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment.

(12) The marking of the equipment shall include the following:

II 2 G EEx e II

Zertifizierungsstelle Explosionschutz

Braunschweig, November 16, 1999

By order:

Dr.-Ing. U. Engel  
Regierungsdirektor



sheet 1/2

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

(13)

## SCHEDULE

(14)

### EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 3101 X

(15)

#### Description of equipment

The cable entry, type GHG 960 923. P... made of polyamide serves to introduce permanently laid cables into electrical equipment of the type of protection Increased Safety "e". The cable entry is composed of intermediate glands, a sealing ring of different materials and a cap nut. Accessoire is a blanking element. They are installed in enclosures with through-holes or threaded holes, with or without lock nut.

#### Technical data

Nominal size	to be used for cable and conduit diameters
M 20 x 1,5 (with long internal thread)	from 5,5 mm to 13,0 mm
M 12 x 1,5	from 4,0 mm to 7,0 mm
M 16 x 1,5	from 5,5 mm to 10,0 mm
Range of temperatures of use, normal:	-20 °C to +70 °C
Expanded range of temperatures of use, depending on material of sealings:	neoprene: -30 °C to +70 °C nitrile rubber NBR: -40 °C to +70 °C silicone: -55 °C to +70 °C evoprene: -50 °C to +70 °C

Suitable for equipment of group II with a degree of mechanical hazard:

low

Installation in equipment with wall thicknesses of:

at least 1,5 mm

Protection against contact, foreign matter and water:

at least IP 54 acc. to EN 60 529:1991

(16)

Report PTB Ex 99-30113

(17)

#### Special conditions for safe use

Only permanently laid cables and conduits may be entered. The user must guarantee suitable clamping.

The maximum thermal load of the cables and conduits entered is to be taken into account.

The cable entries may be used only in places where they are protected against the influence of mechanical danger.

(18)

#### Essential health and safety requirements

The degree of protection - at least IP 54 according to EN 60529:1991 - will be guaranteed only by adequate selection of cable and conduit entries, of the sealings tested and by proper installation of the cable and conduit entries into the electrical apparatus.

Zertifizierungsstelle Explosionsschutz

Braunschweig, November 16, 1999

By order:

Dr.-Ing. U. Engel  
Regierungsdirektor



sheet 2/2

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

## 1st SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 3101 X

(Translation)

Equipment: Cable entry, type GHG 960 923. P....  
sizes M12 x 1.5 and M16 x 1.5

Marking:  II 2 G EEx e II

Manufacturer: CEAG Sicherheitstechnik GmbH

Address: Neuer Weg Nord 49  
69412 Eberbach, Germany

### Description of supplements and modifications

The cable entry, type GHG 960 923. P..., sizes M12 x 1.5 and M16 x 1.5, may optionally also be made from the plastic material Frianyl.

### Technical data

Nominal size	Conductor cross section	Suited for mechanical risk level	Maximum operating temperature range
M 12 x 1.5	4.0 mm to 7.0 mm	low	-20 °C to + 70 °C
M 16 x 1.5	5.5 mm to 10.0 mm	low	-20 °C to + 70 °C

Installed in units of the following wall thickness: 1.5 mm as a minimum

Shock protection, protection against solid bodies, and protection against ingress of water: IP 54 according to EN 60529 as a minimum

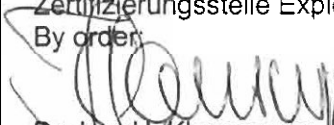
### Special conditions

The special conditions specified shall also apply to this supplement.

Test report: PTB Ex 02-12278

Zertifizierungsstelle Explosionsschutz

By order

  
Dr.-Ing. U. Klausmeyer  
Regierungsdirektor



Braunschweig, September 06, 2002

Sheet 1/1

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

## 2nd SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 3101 X

(Translation)

Equipment: Cable entry, type GHG 960 923. P....  
sizes M12 x 1.5 and M16 x 1.5

Marking: II 2 G EEx e II

Manufacturer: CEAG Sicherheitstechnik GmbH

Address: Neuer Weg Nord 49  
69412 Eberbach, Germany

### Description of supplements and modifications

Standard applied: EN 50281-1-1:1998

The cable entry, type GHG 960 923. P...., sizes M12 x 1.5 and M16 x 1.5, may also be employed in areas in which explosive atmospheres with dust/air mixtures have to be expected to occur. The marking, therefore, changes to read:

II 2 G/D EEx e II IP 66

### Special conditions for safe use

The special conditions shall also apply to this supplement.

Test report: PTB Ex 03-13279

Zertifizierungsstelle Explosionsschutz

By order:

Dr.-Ing. U. Klausmeyer  
Regierungsdirektor

Braunschweig, September 25, 2003

Sheet 1/1

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • D-38116 Braunschweig

**3rd SUPPLEMENT**  
according to Directive 94/9/EC Annex III.6  
**to EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 3101 X**  
**(Translation)**

Equipment: Cable entry fitting, type GHG 960 923. P....., sizes M12 x 1.5 and M16 x 1.5

Marking:  II 2 G EEx e II  
 II 2 D IP66

Manufacturer: Cooper Crouse-Hinds GmbH



Address: Neuer Weg Nord 49, 69412 Eberbach, Germany

Description of supplements and modifications

Cable entry fitting, type GHG 960 923. P....., sizes M12 x 1.5 and M16 x 1.5, is renamed to :  
**Type GHG 960 .....:**

The cable entry fitting has been re-inspected on the basis of standards EN 60079-0, EN 60079-7, EN 61241-0, and EN 61241-1.

The marking thus changes to:

 II 2 G Ex e II  
 II 2 D Ex tD A21 IP 66

Technical data

Nominal size	Conductor size	Degree of mechanical risk	Maximum working temperature range	Tightening torque
M 12 x 1.5	4.0 mm to 7.0 mm	Low	-20 °C to + 70 °C	2.5 Nm
M 16 x 1.5	5.5 mm to 10.0 mm	Low	-20 °C to + 70 °C	3.75 Nm

Installed in devices with wall thickness: Min. 1.5 mm

Shock protection and protection against ingress of solid foreign bodies and water IP 66 in compliance with EN 60529

Sheet 1/2

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • 38116 Braunschweig, Germany

# Physikalisch-Technische Bundesanstalt



Braunschweig und Berlin

3rd SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 99 ATEX 3101 X

## Special conditions

The cable entry fittings may only be installed in locations in which they are protected against the effects of mechanical hazards.

Only permanently wired cables may be entered. The user must provide the required strain relief.

The degree of protection will only be safeguarded when suitable cable entry fittings and tested seals are used, and when the fittings are installed in the electrical equipment in a workmanlike manner.

When selecting the tested sealing elements, the maximum thermal loading capacity of cables entered must be considered.

## Applied standards

EN 60079-0:2006

EN 60079-7:2007

EN 61241-0:2006

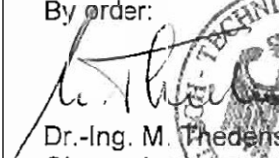
EN 61241-1:2004

Test report: PTB Ex 07-17337

Zertifizierungsstelle Explosionsschutz

By order:

Braunschweig, December 11, 2007

  
Dr.-Ing. M. Thedens  
Oberregierungsrat



Sheet 2/2

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • 38116 Braunschweig, Germany

# EG-Konformitätserklärung EC-Declaration of conformity CE-Déclaration de conformité

PTB 99 ATEX 3128X / PTB 99 ATEX 3101X <sup>(1)</sup>  
GHG 900 1000 P0064 F

## Wir / We / Nous

erklären in alleiniger Verantwortung, dass das Produkt  
*hereby declare in our sole responsibility, that the product*  
déclarons de notre seule responsabilité, que le produit

**Cooper Crouse-Hinds GmbH**  
Neuer Weg-Nord 49  
D-69412 Eberbach

**Kabel und Leitungseinführung**  
*Cable gland*  
*presse-étoupe*

II 2 G / II 2 D

**GHG 960 ....**

den folgenden EU-Richtlinien, den entsprechenden harmonisierten Normen, und weiteren normativen Dokumenten entspricht.  
*complies with the following EU directives, their corresponding harmonised standards, and other normative documents.*  
correspond aux directives européennes suivantes, à leurs normes harmonisées, et aux autres documents normatifs suivants.

Bestimmungen der Richtlinie  
Terms of the directive  
*Prescription de la directive*

Titel und / oder Nr. sowie Ausgabedatum der Norm  
*Title and / or No. and date of issue of the standard*  
*Titre et / ou No. ainsi que date d'émission des normes:*

- 94/9/EG: Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen.
- 94/9/EC: *Equipment and protective systems intended for use in potentially explosive atmospheres.*
- 94/9/CE: *Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles.*
- 2014/34/EU *Equipment and protective systems intended for use in potentially explosive atmospheres.*

- EN 60 079-0: 2012
- EN 60 079-7: 2007
- EN 60 079-31: 2014

- 2011/65 EU: RoHS –Richtlinie
- 2011/65 EU: *RoHS – directive*
- 2011/65 UE: *Directive RoHS*

- EN 50 262: 1998 + A1: 2001 + A2: 2004
- EN 60 529: 1991 + A1: 2000 + A2: 2013
- EN 50 581: 2012

27.03.2015

Datum  
*Date*  
*Date*

Die Original-Konformitätserklärung ist dem Produkt beigelegt !  
The original declaration of conformity is supplied in the packing with the product !  
La déclaration originale de conformité sera fournie avec le produit !

<sup>(1)</sup> Benannte Stelle (EG-Baumusterprüfbescheinigung)  
*Notified body (EC-type examination certificate)*  
*Organisme notifié (Examen CE de type)*

Physikalisch-Technische Bundesanstalt (0102)  
Bundesallee 100  
D-38116 Braunschweig

Benannte Stelle (Qualitätssicherung Produktion)  
*Notified body (Production Quality Assurance)*  
*Organisme notifié (Assurance Qualité de Production)*

DEKRA EXAM GmbH (0158)  
Dinnendahlstraße 9  
D-44809 Bochum

Für den sicheren Betrieb des Betriebsmittels sind die Angaben der zugehörigen Betriebsanleitung zu beachten.  
*For the safe use of this apparatus, the information given in the accompanying operating instructions must be followed.*  
*Afin d'assurer le bon fonctionnement de nos appareils, prière de respecter les directives du mode d'emploi correspondant à ceux-ci.*



**ÖLFLEX® EB****DB 0012420****valid from: 2015-02-11****Application**

ÖLFLEX® EB are PVC control cables with blue outer sheath for occasional flexible use and fixed installation in intrinsically safe circuits. They are among others designed for use in dry, damp and wet rooms. Outdoor use: They may only be installed with UV protection and considering the temperature range. At room temperature they are widely resistant to certain oils and resistant to acids. They are suitable for non-continuously recurring movement without tensile load. Continuous operation movement, compulsory guidance respectively usage on cable drums or pulleys or under a tensile strain of more than 15 N/mm<sup>2</sup> conductor cross section are not allowed.

**Application range:**

Installation of intrinsically safe circuits, where a special cable marking for hazard area type “ i “ – intrinsic safety is specified; The cables meet the requirements of DIN EN 60079-14(VDE 0165-1):2012-2 potentially explosive atmosphere.

**Design**

Design	based on DIN EN 50525-2-51 resp. VDE 0285-525-2-51
Conductor	fine wire strands of bare copper, acc. to IEC 60228 resp. VDE 0295, Class 5
Core insulation	LAPP special PVC compound P8/1 PVC compound TI2 acc. to DIN EN 50363-3 resp. VDE 0207-363-3 with increased Requirements acc. to Lapp specification
Core identification	acc. to VDE 0293-1, with or without GN/YE ground conductor black cores with white numbers acc. to DIN EN 50334 resp. VDE 0293-334
Outer sheath	PVC compound TM2 acc. to DIN EN 50363-4-1 resp. VDE 0207-363-4-1 with increased requirements acc. to Lapp specification colour: blue, similar RAL 5015.

**Electrical properties**

Nominal voltage U <sub>0</sub> /U	300 / 500 V
Operating Voltage	< 50 V AC resp. < 75 V DC in intrinsically safe circuits
Test voltage	3000 V AC

**Mechanical and thermal properties**

Min. bending radius	occasional flexing:	15 x outer diameter
	fixed installation:	4 x outer diameter
Temperature range	occasional flexing:	-5 °C up to +70 °C max. conductor temp.
	fixed installation:	-40 °C up to +80 °C max. conductor temp.
Flammability	flame retardant in acc. with IEC 60332-1-2 resp. VDE 0482-332-1-2	
Tests	acc. to IEC 60811 resp. VDE 0473-811, VDE 0472, EN 50395, EN 50396	
EC-Directives	This cable is conform to the EC-Directives 2006/95/EC (Low Voltage Directive) and 2011/65/EU (RoHS, Restriction of the use of certain hazardous substances).	

Originator: KASC / PDC  
approved: HAPF / PDC

Document: DB0012420\_EN

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PD 0019/2.2\_11.10EN

## EG KONFORMITÄTSERKLÄRUNG

### EC DECLARATION OF CONFORMITY

Dokument-Nr. / Monat / Jahr **E 0012420 - A / 03 / 14**

*Document No. / month / year*

Wir erklären in alleiniger Verantwortung, dass das Erzeugnis:

*We declare under our sole responsibility, that the product:*

Die PVC-Steuerleitung

*The PVC control cable*

**ÖLFLEX® EB**

den Bestimmungen der EG-RICHTLINIE 2006/95/EG (Niederspannungsrichtlinie) entspricht.

*follows the provisions of the EC directive 2006/95/EC (Low Voltage Directive).*

Zur Beurteilung der Erzeugnisse wurden folgende Normen in Anlehnung herangezogen:

*To judge the products following standards have been cited with reference to:*

**DIN EN 50525-2-51 (VDE 0285-525-2-51):2012-01**

Weitere herangezogene Normen:

*Further standards, which are consulted:*

Datum der erstmaligen Anbringung der **CE** Kennzeichnung: 2014

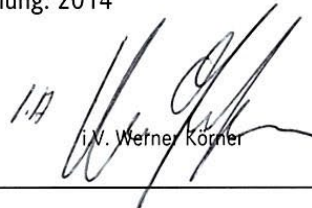
*Date of first fixing of the **CE** label: 2014*

Stuttgart, 10 March 14

U.I.Lapp GmbH

Leiter Technik und Entwicklung

*Head of Technology and Development*

1.0  
  
i.V. Werner Köhler

CAVI PER ENERGIA FLESSIBILI ISOLATI IN GOMMA CON GUAINA SPECIALE ADATTO PER POSA O PER COLLEGAMENTI MOBILI PER SERVIZIO MECCANICO ANCHE GRAVOSO  
 ENERGY TRANSMISSION RUBBER INSULATED CABLES WITH SPECIAL SHEATH SUITED FOR FIXED LAY, MOBILE LINK AND MECHANICAL SERVICE HEAVY TOO

(Conforme alla direttiva BT 2006/95/CE - Direttiva RoHS: 2002/95/CE)

(Accordingly to the standards BT 2006/95/EC- RoHS: 2002/95/EC)

**Norme di riferimento**
**Standards**

CEI 20-19/4 (CENELEC HD 22.4 S4) BS 7919:2001 NF C 32-102-4 VDE 0282-4  
 CEI EN60332-1-2 (CEI 20-35) BS EN 60332-1-2 NF EN 60332-1-2 DIN EN 60332-1-2



Conduttore flessibile di rame rosso ricotto classe 5.  
 Isolante in mescola elastomerica qualità EI4.  
 Guaina in pollicloroprene qualità EM2

Flexible conductor, class 5 copper made.  
 Elastomeric mixture Insulation in EI4 quality.  
 Polychloroprene sheath EM2 quality

<i>Tensione nominale U0</i>	450 V	<i>Nominal voltage U0</i>
<i>Tensione nominale U</i>	750 V	<i>Nominal voltage U</i>
<i>Tensione di prova</i>	2500 V	<i>Test voltage</i>
<i>Tensione massima Um</i>	1000V Installazioni Fisse / for fixed and protected installation	<i>Maximun voltage Um</i>
<i>Temperatura massima di esercizio</i>	+60°C	<i>Maximun operating temperature</i>
<i>Temperatura massima di corto circuito</i>	+200°C	<i>Maximun short circuit temperature</i>
<i>Temperatura minima di esercizio (senza shock meccanico)</i>	-40°C	<i>Min. operating temperature (without mechanical shocks)</i>
<i>Temperatura minima di installazione e maneggio</i>	-25°C	<i>Minimum installation and use temperature</i>

**Condizioni di impiego piu comuni**

Per installazioni in locali secchi, umidi o bagnati (AD6) all'aria libera in officine con atmosfera esplosiva. Per collegamenti soggetti a sollecitazioni meccaniche medie come: apparecchiature in officine industriali e agricole, grossi bollitori, piastre di riscaldamento, lampade portatili, utensili elettrici quali trapani, seghe circolari, motori o generatori trasportabili in cantieri edili o di impianti agricoli. Anche per installazioni fisse come pavimenti e ripiani provvisori di cantieri. Resistente all'ozono RESISTENTE ALL'OLIO SECONDO EN 60811-2-1

**Condizioni di posa**

*Raggio minimo di curvatura per diametro D (in mm):*  
 Installazione fissa D<8=3D D<12=3D D<20=4D D>20=4D  
 Movimento libero D<8=4D D<12=4D D<20=5D D>20=6D  
 All'entrata di un apparecchio portatile o di un'apparecchiatura mobile con sollecitazioni meccaniche D<8=6D D<12=6D D<20=6D D>20=8D  
 Deviato su puleggia D<8=8D D<12=8D D<20=8D D>20=8D  
*Sforzo massimo di tiro:*  
 15 N/mm2 di sezione del rame per posa mobile, 50 N/mm2 per posa fissa

**Imballo**

Matasse da 100 mt. in involucri termoretraibili. Bobine con metrature da definire in fase di ordine

**Colori anime**

Unipolare: nero  
 Bipolare: blu-marrone  
 Tripolare: Marrone, Nero e Grigio (o G/V, Blu e Marrone)  
 Quadripolare: blu-marrone-nero-grigio (o G/V al posto del blu)  
 Pentapolare: G/V-blu-marrone-nero-grigio (senza G/V 2 neri)  
 Multipli per segnalazioni: neri numerati con G/V

**Colori guaina**

Nero

**Marcaturo ad inchiostro**

GENERAL CAVI - IEMMEQU <HAR> - H07RN-F - anno

**Note**

Il cavo è utilizzabile fino a +85°C (in posizione protetta)

**Common features**

This cable is suitable for dry, humid or wet environments (AD6) in open air, in workshops with an explosive atmosphere. When used for connections they're subjected to medium mechanical stress like equipments in industrials and agricultural workshops, great boilers, heating plates, portable lamps, electric tools like drills, circular saws and so on, electric home-tools, motors or transportable generators in construction sites or agricultural plants and so on. It can be used even in fixed laying like floors and temporary construction site set offs. Ozone resistant OIL RESISTANT EN 60811-2-1.

**Employment**

*Minimum bending radius per D cable diameter (in mm):*  
 Fixed installation D <8 D = 3D <3D 12 = D <20 = 4D D > 20 = 4D  
 Free Movement D <8 D = 4D <12 = 4D D <D 5D = 20 > 20 = 6D  
 At the entrance to a portable device or a mobile device mechanical stress with D <8 = 6D D <12 = 6D D <20 = 6D D > 20 = 8D  
 Diverted to pulley D <8 = 8D D <12 = 8D D <20 = 8D D > 20 = 8D  
*Maximum pulling stress:*  
 15 N/mm2 section of copper dynamic applications, for fixed 50 N/mm2

**Packing**

100mt. rings in thermoplastic film or drums to agree.

**Core colours**

Single core: black  
 Two cores: blue-brown  
 Three cores: Brown - Black - Gray (o Y/G, Blue and Brown)  
 Four cores: blue-brown-black-gray (or Y/G instead blue)  
 Five cores: Y/G-blue-brown-black-gray (black no Y/G)  
 Multicores: black with numbers and Y/G

**Sheath colour**

Black

**Ink marking**

GENERAL CAVI - IEMMEQU <HAR> - H07RN-F - year

**Note**

Cables can be used up to +85°C (for fixed protected installations)

ARMONIZZATI / HARMONIZED

Numero conduttori	Sezione nominale	Diametro indicativo conduttore	Spessore medio isolante	Diametro est. indicativo di produzione	Peso indicativo del cavo	Resistenza elettrica a 20°C	Portate di corrente servizio mobile
Cores number	Cross section	Approx conductor diameter	Insulation medium thickness	Approx external production diameter	Approx cable weight	Electric resistance at 20°C	Mobile service Current carrying capacities
(N°)	(mm²)	(mm)	(mm)	(mm)	(kg/km)	(Ohm/km)	(A)
Unipolare / Single core							
1x	1.5	1.6	0.8	5.9	50	13.3	16
1x	2.5	2	0.9	6.50	65	7.98	25
1x	4	2.6	1.0	7.4	89	4.95	30
1x	6	3.4	1.0	8.10	115	3.30	38
1x	10	4.4	1.2	10.4	190	1.91	53
1x	16	5.7	1.2	11.62	259	1.21	71
1x	25	6.9	1.4	13.74	375	0.780	94
1x	35	8.1	1.4	15.35	492	0.554	117
1x	50	9.8	1.6	17.68	675	0.386	148
1x	70	11.6	1.6	20.00	908	0.272	185
1x	95	13.3	1.8	22.12	1171	0.206	222
1x	120	15.1	1.8	24.54	1445	0.161	260
1x	150	16.8	2.0	26.87	1783	0.129	300
1x	185	18.6	2.2	28.89	2125	0.106	341
1x	240	21.4	2.4	32.62	2733	0.0801	407
1x	300	23.9	2.6	36.46	3348	0.0641	468
Bipolare / Two cores							
2X	1	1.3	0.8	8.4	90	19.5	10
2x	1.5	1.6	0.8	9.10	109	13.3	18
2x	2.5	2	0.9	10.80	158	7.98	27
2x	4	2.6	1.0	12.40	217	4.95	34
2x	6	3.4	1.0	13.80	282	3.30	43
2x	10	4.4	1.2	19.37	539	1.91	60
2x	16	5.7	1.2	21.76	722	1.21	79
2x	25	6.9	1.4	25.93	1043	0.780	105
Tripolare / Three cores							
3G	1	1.3	0.8	9.07	110	19.5	10
3G	1.5	1.6	0.8	11.58	134	13.3	16
3G	2.5	2.0	0.9	11.58	196	7.98	25
3G	4	2.6	1.0	13.3	271	4.95	29
3G	6	3.4	1.0	14.78	355	3.30	36
3G	10	4.4	1.2	20.73	674	1.91	51
3G	16	5.7	1.2	23.26	913	1.21	67
3G	25	6.9	1.4	27.69	1324	0.780	89
3G	35	8.1	1.4	30.95	1754	0.554	110
3G	50	9.8	1.6	35.80	2409	0.386	138
3G	70	11.6	1.6	40.45	3211	0.272	172
3G	95	13.3	1.8	45.08	4210	0.206	204
3G	120	15.1	1.8	49.93	5205	0.161	238
3G	150	16.8	2.0	54.78	6389	0.129	273
3G	185	18.6	2.2	58.99	7591	0.106	309
3G	240	21.4	2.4	67.85	9944	0.0801	365
Quadripolare / Four cores							
4G	1	1.3	0.8	10.0	136	19.5	10
4G	1.5	1.6	0.8	10.76	166	13.3	16
4G	2.5	2.0	0.9	12.73	241	7.98	20
4G	4	2.6	1.0	14.63	336	4.95	30
4G	6	3.4	1.0	16.44	449	3.30	37
4G	10	4.4	1.2	22.57	833	1.91	52
4G	16	5.7	1.2	25.36	1138	1.21	69
4G	25	6.9	1.4	30.75	1714	0.780	92
4G	35	8.1	1.4	34.23	2204	0.554	114
4G	50	9.8	1.6	39.56	3029	0.386	143
4G	70	11.6	1.6	44.89	4121	0.272	178
4G	95	13.3	1.8	50.36	5361	0.206	210
4G	120	15.1	1.8	55.33	6546	0.161	246
4G	150	16.8	2.0	60.87	8095	0.129	282

ARMONIZZATI / HARMONIZED

Numero conduttori	Sezione nominale	Diametro indicativo conduttore	Spessore medio isolante	Diametro est. indicativo di produzione	Peso indicativo del cavo	Resistenza elettrica a 20°C	Portate di corrente servizio mobile
Cores number	Cross section	Approx conductor diameter	Insulation medium thickness	Approx external production diameter	Approx cable weight	Electric resistance at 20°C	Mobile service Current carrying capacities
(N°)	(mm²)	(mm)	(mm)	(mm)	(kg/km)	(Ohm/km)	(A)
4G	185	18.6	2.2	65.70	9652	0.106	319
4G	240	21.4	2.4	75.70	12614	0.0801	377
Pentapolare / Five cores							
5G	1	1.3	0.8	11.0	168	19.5	10
5G	1.5	1.6	0.8	11.80	206	13.3	16
5G	2.5	2.0	0.9	13.96	297	7.98	20
5G	4	2.6	1.0	16.25	422	4.95	30
5G	6	3.4	1.0	18.07	567	3.30	38
5G	10	4.4	1.2	24.75	1010	1.91	54
5G	16	5.7	1.2	28.01	1400	1.21	71
5G	25	6.9	1.4	33.57	2096	0.780	94
Multipli / Multicores							
7G	1.5	1.6	0.8	14.75	315	13.3	16
7G	2.5	2.0	0.9	17.11	445	7.98	20
7G	4	2.6	1.0	19.64	618	4.95	25
10G	1.5	1.6	0.8	17.5	420	13.3	16
12G	1.5	1.6	0.8	18.9	493	13.3	16
12G	2.5	2.0	0.9	22.02	702	7.98	20
12G	4	2.6	1.0	25.77	1004	4.95	25
19G	1.5	1.6	0.8	22.07	710	13.3	16
19G	2.5	2.0	0.9	26.0	1030	7.98	20
24G	1.5	1.6	0.8	25.63	898	13.3	16
24G	2.5	2.0	0.9	30.38	1312	7.98	20
36G	1.5	1.6	0.8	29.3	1246	13.3	16
36G	2.5	2.0	0.9	35.0	1851	7.98	20

**Note**

Le portate di corrente per cavi unipolari sono state calcolate considerando 3 cavi distanziati.

Le portate di corrente sono state calcolate nel caso di una conduttura costituita da 3-4 conduttori caricati.

**Note**

Current carrying capacities for unipolar cables are calculated on 3 spanned cables.

Current carrying capacities for cables are calculated on 3-4 spanned cables.

ARMONIZZATI / HARMONIZED

CB TEST CERTIFICATE

CERTIFICAT D'ESSAI OC

<p>Product Produit</p> <p>Name and address of the Applicant Nom et adresse du demandeur</p> <p>Name and address of the manufacturer Nom et adresse du fabricant</p> <p>Name and address of the factory Nom et adresse de l'usine</p> <p>Rating and principal characteristics Valeurs nominales et caractéristiques principales</p> <p>Trademark (if any) Marque de fabrique (si elle existe)</p> <p>Type of manufacturer's Testing Laboratories used Type de programme de laboratoire d'essais constructeur</p> <p>Model / Type Ref. Réf. de type</p> <p>Additional information (if necessary may also be reported on page 2) Les informations complémentaires (si nécessaire, peuvent être indiquées sur la 2ème page)</p> <p>A sample of product was tested and found to be in conformity with IEC Un échantillon de ce produit a été essayé et été considéré conforme à la CEI</p> <p>As shown in the test report Ref. No. which forms part of this certificate Comme indiqué dans le rapport d'essais numéro de référence qui constitue partie de ce certificat</p>	<p>Heavy polychloroprene or other equivalent synthetic elastomer sheathed flexible cable</p> <p>GENERAL CAVI S.p.A. VIA DELL'INDUSTRIA 22 48017 LAVEZZOLA DI CONSELICE RA Italy</p> <p>GENERAL CAVI S.p.A. VIA DELL'INDUSTRIA 22 48017 LAVEZZOLA DI CONSELICE RA Italy</p> <p>GENERAL CAVI S.p.A. VIA L. DA VINCI 6/A 44011 ARGENTA FE Italy</p> <p>450/750V 3G1,5 mm<sup>2</sup> (black colour)</p> <p>GENERAL CAVI</p> <p>60245 IEC 66 (H07RN-F)</p> <p>Additional tests according to EN 50525-2-21:2011</p> <p>60245-1(ed.4);am1 60245-2(ed.2);am1;am2 60245-4(ed.3)</p> <p>CN15A0477854-01</p>
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This CB Test Certificate is issued by the National Certification Body:

Ce Certificat d'essai OC est établi par l'Organisme National de Certification

IMQ S.p.A.  
Via Quintiliano 43 I-20138 Milano, Italy



Date: 2015-07-07

Signature: Mauro Casari

cosign

page 1 of 1

PID:

01011100

CID:

C.1993.36

## Certificato di approvazione

### Approval certificate



**IMQ, ente di certificazione accreditato,  
autorizza la ditta**

*IMQ, accredited certification body, grants to*

SGQ N° 005 A      EMAS N° 003 P  
SGA N° 006 D      PRD N° 005 B  
SGE N° 006 M      PRS N° 080 C  
SCR N° 005 F      ISP N° 063 E  
SSI N° 003 G      LAB N° 0121  
FSM N° 007 I      LAT N° 021  
GHG N° 011 O

Membro degli Accordi di Mutuo Riconoscimento  
EA, IAF e ILAC

Signatory of EA, IAF and ILAC  
Mutual Recognition Agreements

**GENERAL CAVI SPA  
VIA DELL'INDUSTRIA 22  
48017 LAVEZZOLA DI CONSELICE RA**

**all'uso del marchio**

*the licence to use the mark*

**IMQ-HAR**

**Il presente certificato è  
soggetto alle condizioni  
previste nel Regolamento  
"MARCHI IMQ -  
Regolamento per la  
certificazione di prodotti" ed  
è relativo ai prodotti  
descritti nell'Allegato al  
presente certificato.  
Questo certificato è  
rilasciato in base alle regole  
dell'Accordo HAR, secondo le  
quali i certificati emessi da  
uno degli organismi di  
certificazione aderente  
all'Accordo HAR hanno lo  
stesso valore e validità in  
tutti i paesi degli organismi  
di certificazione aderenti  
all'accordo stesso.**

# IEMMEQU ◁ HAR ▷

**per i seguenti prodotti**

**Cavi isolati con gomma  
(H07RN-F)**

*for the following products*

*Rubber insulated cables  
(H07RN-F)*

*This certificate is subjected to  
the conditions foreseen by Rules  
"IMQ MARKS - RULES for  
product certification" and is  
relevant to the products listed in  
the annex to this certificate.*

*This certificate is issued  
according to the rules of the  
HAR Agreement, wherein the  
certificate issued by any  
certification body adhering to  
the HAR agreement as the same  
worth and validity in all other  
certification bodies' countries.*

Emesso il | Issued on **1997-02-07**

Aggiornato il | Updated on **2015-07-07**

Sostituisce | Replaces **2013-09-09**



cosign

**IMQ S.p.A.**

**Allegato - Certificato di approvazione**  
**Annex - Approval certificate**

*Emesso il / Issued on* 1997-02-07  
*Aggiornato il / Updated on* 2015-07-07  
*Sostituisce / Replaces* 2013-09-09

**Prodotto | Product**

***Cavi isolati con gomma***  
***Rubber insulated cables***

**Concessionario | Licence Holder**

**GENERAL CAVI SPA**  
**VIA DELL'INDUSTRIA 22**  
**48017 LAVEZZOLA DI CONSELICE RA**

**Marchio | Mark**

**IEMMEQU ◁ HAR ▷**

IMQ-HAR

**Costruito a | Manufactured at**

PI.G000AF	C02176215	04100	LATINA	LT	Italy
95002942	CLGECA.C01LCGECA+1	44011	ARGENTA	FE	Italy
99001023	CLGECA.C01LCGECA+3	48017	CONSELICE	RA	Italy

*Copia del presente certificato deve essere conservata presso i luoghi di produzione sopra elencati.*

*Copy of this certificate must be available at the manufacturing places listed above*

**Norme**

*EN 50525-2-21:2011*  
*CEI EN 50525-2-21:2012*  
*Prodotti conformi ai requisiti essenziali della Direttiva B.T. 2006/95/CE*

**Standards**

*EN 50525-2-21:2011*  
*CEI EN 50525-2-21:2012*  
*Products meeting the essential requirements of L.V.D. 2006/95/EC*

**Rapporti | Test Reports**

CN15A0477854-01

**Caratteristiche tecniche | Technical characteristics**

<i>Tipo di cavo   Type of cable</i>	<b>Cavo flessibile sotto guaina pesante di PCP o altro equivalente elastomero-sintetico. / Heavy PCP sheathed flexible cable or other equivalent synthetic-elastomer.</b>
<i>Sigla di designazione   Type designation</i>	<b>H07RN-F</b>
<i>Tensione nominale   Rated voltage</i>	<b>450/750V</b>

**Articoli (con dettagli) | Articles (with details)**

DAT96004637.2

*Contrassegni del fabbricante | Manufacturer's identification* **Stabilimento di Argenta / Factory of Argenta**  
*- filo distintivo | - identification thread* **ne-bi-ro (00-90-20)**  
*- stampigliatura | - printing* **GENERAL CAVI o/or GECA**

AR.G000Y2

*Contrassegni del fabbricante | Manufacturer's identification* **Stabilimento di Conselice / Factory of Conselice**  
*- filo distintivo | - identification thread* **-**  
*- stampigliatura | - printing* **GENERAL CAVI II o/or II GECA**

AR.G00CYP

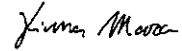
*Contrassegni del fabbricante | Manufacturer's identification* **Stabilimento di Latina / Factory of Latina**  
*- filo distintivo | - identification thread* **-**  
*- stampigliatura | - printing* **GENERAL CAVI I o/or I GECA**

## Diritti di concessione | Annual Fees

DAT96004637 BTP.010100.DA23

*Importo modelli IMQ - forfettario annuo - 0101 - Cavi isolati con gomma | IMQ models - yearly amount - 0101 - Rubber insulated cables*

1



cosign

**IMQ S.p.A.**

Contrassegni del Marchio HAR: - filo distintivo HAR (nero-rosso-giallo)  
- stampigliatura IEMMEQU HAR

NOTE: Il filo distintivo del Marchio HAR, nero-rosso-giallo, e' stato depositato in Italia quale marchio collettivo da parte del Verband Deutscher Elektrotechniker (VDE). Il VDE ha autorizzato l'IMQ ad utilizzare questo filo.

HAR Mark Markings: - HAR identification thread (black-red-yellow)  
- IEMMEQU HAR printing

NOTE: The black-red-yellow thread has been registered in Italy as an identification thread from Verband Deutscher Elektrotechnik (VDE). VDE has authorized IMQ to use this thread.

**EU Declaration of Conformity-Dichiarazione di Conformità UE**  
**EU-Konformitätserklärung-Déclaration UE de Conformité**

**N°160510-13**

**Product:** Rubber insulated cables  
**Prodotto:** Cavi isolati con gomma.  
**Produkt:** Gummi-isolierte Leitungen  
**Produit:** Câbles isolés au caoutchouc

**Issuer's name and address:**  
**Nome e indirizzo Emittente:**  
**Emittenten Name und Anschrift:**  
**Nom et l'adresse de l'émetteur:**

**GENERAL CAVI SPA**  
**VIA DELL'INDUSTRIA 22**  
**48017 LAVEZZOLA (RA)**  
**ITALY**

This declaration of conformity is issued under the unique responsibility of the manufacturer.  
La presente dichiarazione di conformità è rilasciata sotto la responsabilità esclusiva del produttore.  
Diese Konformitätserklärung ist unter der einzigartigen Verantwortung des Herstellers ausgestellt.  
Cette déclaration de conformité est établie sous la responsabilité unique du fabricant.

**Type designation:**  
**Denominazione del tipo:**  
**Typenbezeichnung:**  
**Désignation de type:**

**H07RN-F**

*The designated product is in conformity with the European Directive:*  
*Il prodotto indicato è conforme alla Direttiva Europea:*  
*Das bezeichnete Produkt ist in Übereinstimmung mit der EU-Richtlinie:*  
*Le produit désigné est conforme à la Directive Européenne:*

**2014/35/UE**

*"DIRECTIVE 2014/35/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits"*

*"DIRETTIVA 2014/35/UE DEL PARLAMENTO EUROPEO E DEL CONSIGLIO del 26 febbraio 2014 concernente l'armonizzazione delle legislazioni degli Stati membri relative alla messa a disposizione sul mercato del materiale elettrico destinato a essere adoperato entro taluni limiti di tensione"*

*"RICHTLINIE 2014/35/EU DES EUROPÄISCHEN PARLAMENTS UND DES RATES vom 26. Februar 2014 zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die Bereitstellung elektrischer Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen auf dem Markt"*

*« DIRECTIVE 2014/35/UE DU PARLEMENT EUROPÉEN ET DU CONSEIL du 26 février 2014 relative à l'harmonisation des législations des États membres concernant la mise à disposition sur le marché du matériel électrique destiné à être employé dans certaines limites de tension »*

Full compliance with the standards listed below proves the conformity of the designated product with the provisions of the above-mentioned EU Directive:  
La piena conformità con gli standard elencati di seguito dimostra la conformità del prodotto designato con le disposizioni della direttiva UE suddetta:  
Volle Übereinstimmung mit folgender Normen bestätigt die Konformität des bezeichneten Produkts mit den Bestimmungen der oben genannten Richtlinie EU:  
Le plein respect des normes énumérées ci-dessous démontre la conformité du produit désigné avec les dispositions de la Directive Européenne

EN 50525-2-21:2011  
CEI EN 50525-2-21:2012

**ADDITIONAL INFORMATION - INFORMAZIONI AGGIUNTIVE**  
**ZUSÄTZLICHE INFORMATION - INFORMATION ADDITIONNELLE**

**DAT IMQ A2511**  
**Model Product: 250-251**

**LAVEZZOLA 10.05.2016**

**GENERAL CAVI S.p.A.**  
Salvatore Zangrillo  
Amministratore Delegato

# MS325 manual motor starters

## 0.10 to 25 A – with thermal and electromagnetic protection



MS325-16

### Description

Manual motor starters (MMS) are protection devices for the main circuit. They combine motor control and protection in a single device. MMS are used mainly to switch motors manually ON/OFF and protect them and the installation fuse-less against short-circuit, overload and phase failures. Fuse-less protection with a manual motor starter saves costs, space and ensures a quick reaction under short-circuit condition, by switching off the motor within milliseconds.

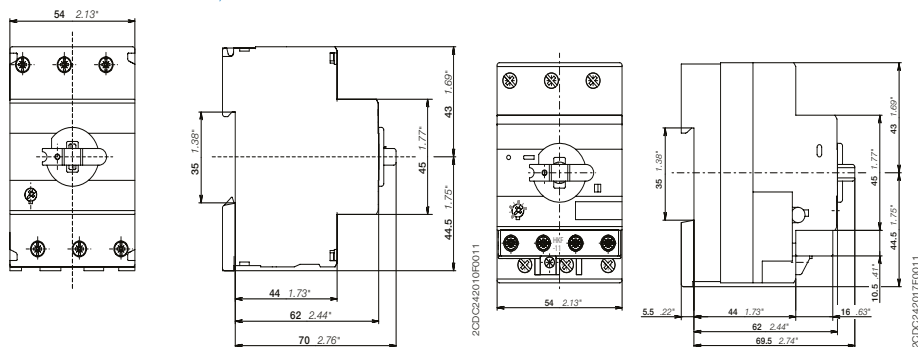
MS325 is a compact and powerful range for motor protection up to 12.5 kW (400 V) / 25 A in width of 54 mm with modular DIN rail design. Further features are the build-in disconnect function, temperature compensation, trip-free mechanism and a rotary handle with a clear switch position indication. The manual motor starters are suitable for three- and single-phase applications. Auxiliary contacts, signalling contacts, undervoltage releases, shunt trips, three-phase busbars, power in-feed blocks are available as accessories.

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### Ordering details

Rated operational power 400 V AC-3	Setting range	Short-circuit breaking capacity $I_{cs}$ at 400 V AC	Rated instantaneous short-circuit current setting $I_i$	Type	Order code	Weight (1 pce)
0.03	0.10 ... 0.16	100	1.56	MS325-0.16	1SAM15000R1001	0.280
0.06	0.16 ... 0.25	100	2.44	MS325-0.25	1SAM15000R1002	0.280
0.09	0.25 ... 0.40	100	3.9	MS325-0.4	1SAM15000R1003	0.280
0.12	0.40 ... 0.63	100	6.14	MS325-0.63	1SAM15000R1004	0.280
0.25	0.63 ... 1.00	100	11.5	MS325-1	1SAM15000R1005	0.310
0.55	1.00 ... 1.60	100	18.4	MS325-1.6	1SAM15000R1006	0.340
0.75	1.60 ... 2.50	100	28.75	MS325-2.5	1SAM15000R1007	0.340
1.5	2.50 ... 4.00	100	50	MS325-4	1SAM15000R1008	0.340
2.2	4.00 ... 6.30	100	78.75	MS325-6.3	1SAM15000R1009	0.340
4.0	6.30 ... 9.00	100	135	MS325-9	1SAM15000R1010	0.340
5.5	9.00 ... 12.5	75	180	MS325-12.5	1SAM15000R1011	0.340
7.5	12.5 ... 16.0	60	240	MS325-16	1SAM15000R1012	0.340
9.0	16.0 ... 20.0	55	300	MS325-20	1SAM15000R1013	0.340
12.5	20.0 ... 25.0	50	375	MS325-25	1SAM15000R1014	0.340
0.03	0.10 ... 0.16	100	1.56	MS325-0.16-HKF11	1SAM150005R0001	0.300
0.06	0.16 ... 0.25	100	2.44	MS325-0.25-HKF11	1SAM150005R0002	0.300
0.09	0.25 ... 0.40	100	3.9	MS325-0.4-HKF11	1SAM150005R0003	0.300
0.12	0.40 ... 0.63	100	6.14	MS325-0.63-HKF11	1SAM150005R0004	0.300
0.25	0.63 ... 1.00	100	11.5	MS325-1-HKF11	1SAM150005R0005	0.330
0.55	1.00 ... 1.60	100	18.4	MS325-1.6-HKF11	1SAM150005R0006	0.360
0.75	1.60 ... 2.50	100	28.75	MS325-2.5-HKF11	1SAM150005R0007	0.360
1.5	2.50 ... 4.00	100	50	MS325-4-HKF11	1SAM150005R0008	0.360
2.2	4.00 ... 6.30	100	78.75	MS325-6.3-HKF11	1SAM150005R0009	0.360
4.0	6.30 ... 10.0	100	135	MS325-9-HKF11	1SAM150005R0010	0.360
5.5	8.00 ... 12.0	75	180	MS325-12.5-HKF11	1SAM150005R0011	0.360
7.5	10.0 ... 16.0	60	240	MS325-16-HKF11	1SAM150005R0012	0.360
9.0	16.0 ... 20.0	55	300	MS325-20-HKF11	1SAM150005R0013	0.360
12.5	20.0 ... 25.0	50	375	MS325-25-HKF11	1SAM150005R0014	0.360

### Main dimensions mm, inches



MS325

MS325 + HKF11



## (1) EC-TYPE-EXAMINATION CERTIFICATE (Translation)

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - **Directive 94/9/EC**

(3) EC-type-examination Certificate Number:

**PTB 01 ATEX 3307**



(4) Equipment: Circuit-breaker for motor protection, type MS325

(5) Manufacturer: ABB Stotz-Kontakt GmbH

(6) Address: Eppelheimer Str. 82, 69123 Heidelberg, Germany

(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report PTB Ex 01-30071.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:  
**EN 60947-1    EN 60947-4-1    EN 60947-5-1    EN 60947-2    EN 60079-14**

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

(11) This EC-type-examination Certificate relates only to the design and construction of the specified equipment in accordance with Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment.

(12) The marking of the equipment shall include the following:

II (2) G

Zertifizierungsstelle Explosionsschutz  
By order:

Braunschweig, March 21, 2002

Dr.-Ing. U. Engel  
Regierungsdirektor



sheet 1/2

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

## SCHEDULE

### (14) EC-TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 3307

#### Description of equipment

The circuit-breaker for motor protection of type MS325 comprise an overload release with current-dependent delay on bimetalic basis and an undelayed electromagnetic overcurrent release against short-circuit. In connection with suitable contactors or without contactors, they will be used to protect non-explosion-protected motors and explosion-protected motors. Type MS325 is available in fourteen designs. It is manufactured for the current ranges between 0,1 A to 25 A and tripping class 10 A.

For installation and use, the instructions for installation and use from the operating instructions "circuit-breaker for motor protection of type M325" for monitoring of EExe motors of December 13, 2001 are to be observed.

### (16) Test report PTB Ex 01-30071

#### Special conditions


none

#### Essential health and safety requirements

The tests carried out and their positive results as well as the proof furnished have confirmed compliance with the standards and thus with Directive 94/9/EC, Annex II (in particular point 1.5) of December 17, 2001. Suitably selected and adjusted safety devices of this type are necessary for the safe operation of motors of the type of protection "Increased Safety". The devices themselves are installed outside potentially explosive atmospheres (article 1, section 2 of the Directive).

Zertifizierungsstelle Explosionsschutz

By order:

  
Dr.-Ing. U. Engel  
Regierungsdirektor



Braunschweig, March 21, 2002

sheet 2/2

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • D-38116 Braunschweig

## 1. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 3307

(Translation)

Equipment: Circuit-breaker for motor protection, type MS325-...

Marking:  II (2) G

Manufacturer: ABB Stotz Kontakt GmbH

Address: Eppelheimer Str. 82  
69123 Heidelberg, Germany

### Description of supplements and modifications

The circuit-breaker for motor protection of type MS325 comprise an overload release with current-dependent delay on bimetalic basis and an undelayed electromagnetic overcurrent release against short-circuit. In connection with suitable contactors or without contactors, they are to be used to protect non-explosion-protected motors and explosion-protected motors. Type MS325 is available in fourteen designs. It is manufactured for the current ranges between 0.1 A to 25 A and tripping class 10 A.

For types MS325 – 4 to 6.3 A (tripping characteristic SA M10 0513 of March 14, 2003), the tripping times of the characteristic were optimized.

Test report: PTB Ex 03-33138


### Essential health and safety requirements

The tests carried out and their positive results as well as the proof furnished have confirmed compliance with the standards and thus with Directive 94/9/EC, Annex II (in particular point 1.5) of December 17, 2001. Suitably selected and adjusted safety devices of this type are necessary for the safe operation of motors of the type of protection "increased safety". The devices themselves are installed outside potentially explosive atmospheres (article 1, section 2 of the Directive).

Zertifizierungsstelle Explosionsschutz

Braunschweig, May 26, 2003

By order:

  
Dr.-Ing. F. Lienesch  
Oberregierungsrat



*Pe/26-5*

Sheet 1/1

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • D-38116 Braunschweig

**2. SUPPLEMENT**

according to Directive 94/9/EC Annex III.6

**to EC-TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 3307**

**(Translation)**

Equipment: Circuit-breaker for motor protection, type MS325-...

Marking: II (2) G

Manufacturer: ABB Stotz Kontakt GmbH

Address: Eppelheimer Str. 82  
69123 Heidelberg, Germany

Description of supplements and modifications

The circuit-breaker for motor protection of type MS325 comprise an overload release with current-dependent delay on bimetallic basis and an undelayed electromagnetic overcurrent release against short-circuit. In connection with suitable contactors or without contactors, they are to be used to protect non-explosion-protected motors and explosion-protected motors. Type MS325 is available in fourteen designs. It is manufactured for the current ranges between 0,1 A to 25 A and tripping class 10 A.

Alternatively, a new material is used for the lower and the central part of the enclosure and for the contact carrier of types M325. The name of the material used is Lonza.

Test report: PTB Ex 03-33315

Additional information can be taken from PTB Report PTB Ex 01-30071 of March 21, 2003 and PTB Ex 03-33178 of May 26, 2003.

Essential health and safety requirements

The tests carried out and their positive results as well as the proof furnished of December 17, 2001 have confirmed compliance with the standards and thus with Directive 94/9/EC, Annex II (in particular point 1.5). Suitably selected and adjusted safety devices of this type are necessary for the safe operation of motors of the type of protection "increased safety". The devices themselves are installed outside potentially explosive atmospheres (article 1, section 2 of the Directive).

Zertifizierungsstelle Explosionsschutz

Braunschweig, September 10, 2003

By order:

Dr.-Ing. F. Lienesc  
Oberregierungsrat



Sheet 1/1

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • D-38116 Braunschweig

## 3. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

### to EC-TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 3307

(Translation)

Equipment: Circuit-breaker for motor protection, type MS325-...

Marking:  II (2) GD

Manufacturer: ABB Stotz Kontakt GmbH

Address: Eppelheimer Str. 82, 69123 Heidelberg, Germany

#### Description of supplements and modifications

The circuit-breakers for motor protection of type MS325 comprise an overload release with current-dependent delay on bimetallic basis and an undelayed electromagnetic short-circuit release against short-circuit. They are to be used in connection with suitable contactors or without contactors to protect non-explosion-protected motors and explosion-protected motors. Type MS325 is available in fourteen device designs and for current ranges between 0.1 A - 25 A in tripping class 10 A.

With the extension to "D: = dust" in the ATEX marking, they may also be used as protection devices for motors in potentially explosive dust atmospheres (EN 50281-1-1).

Additional information can be taken from:

- Test Reports PTB Ex 01-30071 of March 21, 2002 and PTB Ex 03-33138 of May 26, 2003
- Operating instructions "Circuit-breakers for motor protection"
- Internet page "<http://www.abb.com/lowvoltage>" → documentations → control products → manual motor starters

and ABB main catalogue part 1 "Switching and Control Technique" chapter 4 "Circuit-breakers for motor protection".

Test report: PTB Ex 06-36007

#### Special conditions

none

Sheet 1/2

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EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • 38116 Braunschweig, Germany

# Physikalisch-Technische Bundesanstalt



Braunschweig und Berlin

## 3. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 01 ATEX 3307

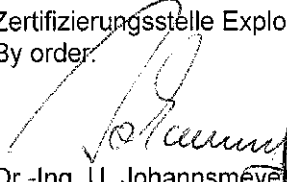
### Essential health and safety requirements

The tests carried out and their positive results as well as the proof furnished of December 17, 2001 have confirmed compliance with the standards and thus with Directive 94/9/EC, Annex II (in particular point 1.5). Suitably selected and adjusted safety devices of this type are necessary for the safe operation of motors of the type of protection "Increased Safety". The devices themselves are installed outside potentially explosive atmospheres (article 1, section 2 of the Directive).

Zertifizierungsstelle Explosionsschutz

Braunschweig, June 29, 2006

By order:

  
Dr.-Ing. U. Johannsmeyer  
Direktor und Professor



Sheet 2/2

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EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • 38116 Braunschweig, Germany



Beck GmbH  
Druckkontrolltechnik  
Ferdinand-Steinbeis-Straße 4  
71144 Steinenbronn

EN

## Operating Instructions



Ident: 060925-BA-930-R8-2015\_englisch\_Druckversion.doc



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**E-Mail** sales@beck-sensors.com  
**Internet** http://www.beck-sensors.com  
**VAT-no.** DE162391354

**Bank Accounts**  
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S.W.I.F.T. ESSLDE66 IBAN: DE33 6115 0020 0057 0119 70  
Commerzbank Stuttgart (BLZ 600 400 71) 876 179 300  
S.W.I.F.T. COBADEFF600 IBAN: DE70 6004 0071 0876 1793 00  
Landesbank Baden-Württemberg (BLZ 600 501 01) 2 214 306  
S.W.I.F.T. SOLADEST IBAN: DE36 6005 0101 0002 2143 06  
UniCredit Bank - HypoVereinsbank Stuttgart (BLZ 600 202 90) 388 773 332  
S.W.I.F.T. HYVEDEMM473 IBAN: DE66 6002 0290 0388 7733 32

Location: Steinenbronn  
Amtsgericht Böblingen HRB 6050  
Managing Directors: Rainer Beck,  
Hans-Peter Funk



# 1 General Instructions

These operating instructions contain all of the information that is required for an efficient start-up and safe operation of **Model 930...EX** pressure switches.

- Please read these operating instructions before carrying out installations, start-ups, maintenance and repairs.
- Please ensure that these operating instructions are available at all times.
- Please follow the applicable instructions and safety regulations.
- All of the work that is described in these operating instructions must be carried out by qualified and authorised experts.
- In order to avoid problems, the prescribed maintenance must be carried out at regular intervals by appropriately trained personnel.

## Symbols used

The meanings of the symbols that are used are as follows:

- Useful, important additional information.



- Dangers and safety instructions. *Important – please read!*  
Failure to comply with these instructions can have a detrimental effect on persons and the operation of the equipment.



- Important instructions for use in potentially explosive areas.  
Danger – *please read!*



## 1.1 Safety Instructions

### 1.1.1 General safety instructions

- Please follow the applicable
  - Instructions and system-specific regulations (e.g. installation standards etc.)
  - Safety regulations and accident prevention regulations
- All work must be carried out by authorised and qualified personnel. These qualifications and authorisations include:
  - Training, experience and knowledge of the regulations, standards
  - Only personnel with appropriate product knowledge must carry out start-ups and maintenance
  - All repairs must be carried out by personnel who have been authorised to do so by the manufacturer
- Only original parts must be used
- Ignoring these operating instructions and making modifications to the equipment are not permitted and can lead to hazardous situations



### 1.1.2 Safety instructions for potentially explosive areas



- The 930..EX pressure switch is suitable for use in areas where there is a *risk of gas or dust explosion*
- Please follow the applicable
  - Instructions and system-specific regulations
- The labelling of the product must point out that important explosion protection characteristics must be adhered to during use.
  - G = Gas; D = Dust
  - Device category 1, 2, 3 or Equipment Protection Level EPL in the 3 zonal areas
  - Gas parameters: temperature class (T1...T6), explosion group (A, B, C)
  - Dust parameters: Explosion group (IIIA, B: non-conductive; IIIC: conductive);
  - Surface temperature, glow and ignition temperature
- When work is being performed such as installation, making electrical connections, making repairs or opening the housing, it must be ensured that
  - *no potentially explosive atmosphere is present*
  - *no electrical voltage is present*
  - *unintentional activation is ruled out*
- Dust deposits must be avoided (installation location, protection, cleaning etc.) in order to prevent dangerous surface temperature increases
- **For the installation procedure it is necessary to take care that no electrostatic charging will be done (no high volume flow, cleaning only with damp cloth,...)**
- It must be ensured that all technical and organisational protective measures are complied with and that the operation and effectiveness thereof is checked
- No modifications must be made to the equipment, since they may lead to a risk of explosion (ignition)
- The specifications of the EC design certificate are binding and must be complied with
- If the number of the EC design certificate is followed by an "X", special conditions or deviations from the standard conditions exist
- Installation, start-ups and repeated testing may only be carried out by appropriately qualified personnel
- The operator must issue a release for work before any activity (installation etc.) is carried out in potentially explosive areas.

### 1.1.3 Notes on environmental protection

Please help to protect the environment. Please pay attention to the environmental notes in these operating instructions:

- Chapter 3.1 "Storage": Handling of packaging materials
- Chapter 8.1 "Disposal": with regard to the product and its components



## 2 Correct Purpose of Use

### 2.1 Application area

#### ➤ Purpose of use

The adjustable differential pressure switches have the following main purpose

- Monitoring air flow in ventilation shafts for adequate
  - ✓ Dilution of gasses that are hazardous to health or potentially explosive
  - ✓ Air supply (fresh air) and/or exhaust air – extraction of “bad” air
- Operational monitoring by monitoring the air flow of
  - ✓ (Air) filters
  - ✓ Air and fire safety flaps
  - ✓ Fans, ventilators
  - ✓ Leak tightness of closed systems
- Liquid level monitoring

The media that are being monitored occur in the following different phases

- *Gaseous* (main application)
  - ✓ Potentially explosive gasses and dust (natural gas, bio-gas, solvents etc.)
- *Liquid*
  - ✓ Flammable liquids (petrol, solvent etc.)

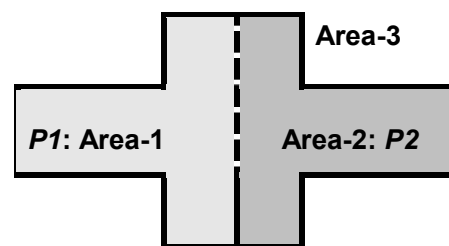
#### ➤ Use in zones in potentially explosive areas

Pressure switches are used to monitor the pressure difference in areas of closed systems where there is a risk of gas explosion.



- The device may be used in areas where there is a risk of gas or dust explosion
- Two separate zonal areas can be connected via pressure connections P1 and P2 (areas 1 and 2)
- Zone 1,2 or zone 21,22 may apply to the pressure connections (areas 1 and 2)
- The surroundings (area 3) can be zone 1,2 or zone 21,22

Area-1	Area-2	Surrounding Area-3	Equipment category Equipment Protection Level EPL
Zone 1,2	Zone 1,2	Zone 1,2	2G Gb
Zone 21,22	Zone 21,22	Zone 21,22	2D Db



### 2.2 CE Conformity

The product complies with the following European directives:

- Explosion protection directive
- RoHS directive



Other information and verification can be found in the

- Conformity declaration (see Chapter 9.3)

### 3 Storage and Transportation

#### 3.1 Packaging

The equipment is protected by packaging. The packaging is environmentally compatible and recyclable. The following main materials are used:

- Cardboard
- PE foam or PE film



Please use appropriate recycling companies to dispose of the packaging

#### 3.2 Storage and Transportation Conditions

The following points must be observed in order to prevent damage:

- Avoid severe mechanical stress caused by throwing, stacking and dropping.
- Keep out of wet and rainy environments
- Do not subject to direct sunlight for long periods
- The storage temperature must not be lower than -40 °C or higher than +85 °C



### 4 Installation

The following checks must be performed prior to installing the equipment:

- The equipment must not show signs of damage or obvious modifications
- The IP protection class of the equipment must correspond with the usage and environmental conditions
- An operator zone definition must be available
- Check whether the equipment category corresponds with the specified zones
- With intrinsically safe systems ("i") the "associated operating materials" (barrier) must always be installed outside the potentially explosive area.
- The labelling of the product must point out that important explosion protection characteristics must be complied with during use.



- G = Gas, D= Dust
- Equipment Protection Level  
EPL / zone area
- Parameters:
  - ✓ Temperature class (T1...T6)
  - ✓ Explosion group (A, B, C)

Equipment category	Equipment Protection Level EPL	Zone		
		0 20	1 21	2 22
1 G,D	Ga, Da	yes	yes	yes
2 G, D	Gb, Db	no	yes	yes
3 G,D	Gc ; Dc	no	no	yes

Additional information for use in areas where there is a risk of dust explosion:

- The details of the maximum surface temperature are valid only for a dust allowance of a maximum of 5 mm. At higher dust deposits must be reduced with the surface temperature.
  - Determining the maximum permissible surface temperature
  - Dust cloud with ignition temperature  $-T_{CL} : T_{max1} = 2/3 T_{CL}$
  - Dust layers with glow temperature  $-T_{5mm} : T_{max2} = T_{5mm} - 75^{\circ}C$

The smaller value of both must be considered for the maximum permitted surface temperature. To prevent from dangerous temperature rises dust deposits should be avoided (appropriate mounting position, use of protection covers, regular cleaning..)

- **For the installation procedure it is necessary to take care that no electrostatic charging will be done (no high volume flow, cleaning only with damp cloth,...)**

The following standards and directives are useful:

- EN 1127-1: Explosion protection – basic concepts and methodology
- Standards for areas with risk of gas or dust explosion (“G”, “D”):
- EN 60079-10: Classification of potentially explosive areas
- EN 60079-14: Electrical installations in potentially explosive areas
- EN 60079-17: Inspection and maintenance
- EN 60079-25: Intrinsically safe systems



## 4.1 Installation

Choose the installation location from the following aspects;

- Ease of access for installation, connection and operation
- Protection from direct effects of the weather, such as rain and sun
- The IP protection class of the equipment must suit the ambient conditions
- In order to prevent dangerous temperature increases on the surface of the equipment, dust deposits must be avoided (installation location, protective cover, cleaning measures etc.)
- Switching pressure specifications apply to vertical installation which is also the recommended position with pressure-pipe connections pointing downwards. If the switches are installed horizontally with AMP connection terminals uppermost, the switching values are approx. 20 Pa higher.



## 4.2 Connection

### 4.2.1 Pressure connections

2 plastic pipe connection pieces (6 mm)

- **P1 +:** for connection to higher pressure
- **P2 -:** for connection to lower pressure




### 4.2.2 Electrical connections

- When work is being performed such as installation, making electrical connection, making repairs or opening the housing, it must be ensured that
  - *No electrical voltage* is present
  - *Unintentional activation* is not possible
- Proceed as follows in potentially explosive areas:
  - Check whether the equipment category corresponds with the specified zones
  - *No potentially explosive atmosphere* is present
  - A release for work must have been issued by the operator
  - Adherence to the applicable regulations and documentation for the equipment
- Special notes for intrinsically safe (“i”) systems:
  - Each intrinsically safe operating material must have an associated operating material inserted before it, outside of the potentially explosive zone.
  - *Separate cable routing* for intrinsically safe and non-intrinsically safe power circuits.
  - For operating voltages of *less than 42V AC or 60V AC*: Intrinsically safe and non-intrinsically safe power circuits can be *routed together* in this case. This *only* applies to safety barrier *with galvanic separation*.
  - Separation of *intrinsically safe/non-intrinsically safe* connecting parts: at least 50mm (tight string length)
  - Distance between *different intrinsically safe power circuits*: at least 6mm
  - Distances between non-insulated *conductive parts* leading to connecting parts: air gap of at least 3mm (housing-terminals-conductor tracks, earth etc.)



### ➤ Power supply

- Each intrinsically safe operating material must have an associated operating material inserted before it, outside of the potentially explosive zone: 
- ✓ Pay attention to maximum characteristics (U, I, P, L, C):  
Compare the information on the specification plate of the appropriate equipment and the pressure switch 930..EX

### ➤ Select connecting cables

The following points must be observed when selecting the cable: 

- Select cable material that complies with the local resistance requirements (mechanical, chemical)
- The outer diameter may be from 5 to 9 mm
- Cable cross-section in accordance with electrical power and data sheet


The following points must be observed when selecting cables for intrinsically safe power circuits:

- *Diameter* of individual conductors: *greater than 0.1mm*
- *Insulation strength* of the individual wires: *greater than 0.2 mm*
- *Test voltage* for intrinsically safe cables:
  - between wires, shield and earth: *500V AC*
- *Shield*: The shield area must be *60%* of the surface coverage or twisting
- *Labelling* of intrinsically safe power circuits: *colour preferably light blue*
- L and C cable characteristics must be available ( $C_i=110\text{nF/km}$ ;  $L_i=1\text{ mH/km}$ )


### ➤ Cable routing

- If there is a risk of mechanical damage, the cable must be provided with additional protection (protective tube etc.)
- The cable diameter must be complied with in order to provide a tight connection in the cable lead-in.
- The screwed cable connection and the screws of the housing cover must be tightened in order to comply with the IP protection class. Over-tightening damages the housing.


### ➤ Connecting the cable

- Please ensure that the cables that are being connected are not live. otherwise there is a risk of igniting a potentially explosive atmosphere 


### ➤ Attach the shield

- Attach shield at one end (in non-potentially explosive area)
- Attach braiding of shield to earth potential over a wide area.
- No potential equalisation current must be flowing between potentially explosive areas and non-potentially explosive areas. Separation using a capacitor is permitted in this case for EMC purposes (total max. 10 nF). 

### ➤ Earthing

- The external earthing terminal on the housing must be connected to the potential equalisation of the potentially explosive area with low resistance   
(removal of electrostatic charge between 0.2-1 MOhms is considered to be earthing)
- No potential equalisation current must be flowing between potentially explosive areas and non-potentially explosive areas
- Minimum cross-section:  $2 \times 1.5\text{ mm}^2$  or  $1 \times 4\text{ mm}^2$
- Intrinsically safe power circuits: Housings made from *metal do not need to be earthed*. (If this is necessary anyway – functional earthing, earthing in one location only...)

### ➤ Documentation

- Operating instructions, conformity declaration, EC design test certificate
- System and zonal plan
- Proof of adherence to explosion protection regulations (see Appendix 9.34) 
  - ✓ Equipment selection: category, Equipment Protection Level EPL, temperature class, explosion group, ...
  - ✓ Proof of adherence to intrinsic safety requirements

## 5 Start-up

Before voltage is applied to the equipment the following checks must be performed:

- Check that screws are firmly seated in
  - Connecting terminals, protective earth conductor terminals and potential equalisation terminals
  - Housing cover
- Check
  - The torque of the cable lead-in
  - The tightness of the seal provided by the cable lead-in
- Check whether the equipment is ready for operation
  - The parameterisation for this application must have been performed
  - All interfaces such as inputs and outputs for control purposes must be connected and ready for operation



### 5.1 Parameterisation

Equipment parameterisation

- Define all application-specific parameters.
- Adjustment of the pressure ranges
  - With this pressure switch the pressure can be adjusted without a pressure gauge using a scaled adjustment knob
  - The switching differential can also be adjusted with a screwdriver by the adjustment screw with the identification “-Δp+”

Type	Adjustment range for trip pressure from to	Switching differential	Tolerance band of
<b>930.80 EX</b>	20 300 Pa	10 Pa	±15 %
<b>930.83 EX</b>	50 500 Pa	20 Pa	±15 %
<b>930.84 EX</b>	30 400 Pa	15 Pa	±15 %
<b>930.85 EX</b>	200 1000 Pa	100 Pa	±15 %
<b>930.86 EX</b>	500 2500 Pa	150 Pa	±15 %
<b>930.87 EX</b>	1000 5000 Pa	250 Pa	±15 %

Note:

Switching pressure specifications apply to vertical installation which is also the recommended position with pressure-pipe connections pointing downwards. If the switches are installed horizontally with AMP connection terminals uppermost, the switching values are approx. 20 Pa higher.

- Once the power supply is applied, the equipment is ready for operation immediately.



## 6 Maintenance / Service

The equipment can only be guaranteed to operate safely and reliably in the long term if regular inspections and servicing are carried out. These include the following:

For cleaning the devices it is necessary to take care that no electrostatic charging will be done (no high volume flow, cleaning only with damp cloth,...)

An **inspection** includes

- Visual inspection
  - Mechanical damage
  - Non-permitted dust deposits
  - Other irregularities or error messages from the equipment
- Checking of components (wearing parts) whose functionality or purpose changes and affects the operation of the equipment
- Documentation of what was done by whom, and when

**Maintenance** includes

- Functionality checking
  - Operating statuses such as alarms etc.
- Checking calibration values (= calibration)
  - Triggering of alarms by known process parameters (test pressure etc.)
- Correction of calibration values (= calibration) must be carried out in the factory
- Documentation of what was done by whom, and when

### 6.1 Time intervals

**Inspection:**

The condition of the equipment must be checked at regular intervals. The time interval is extremely dependent on the local situation and the degree of use, and must therefore be adapted to requirements. Extremely short time intervals can be specified such as once per day, every new shift etc.

- Defined by the operator in accordance with local requirements

**Maintenance**

- The interval from the applicable usage regulations must be taken into consideration
- As a manufacturer we recommend a maximum interval of 1 year



### 6.2 Troubleshooting

A list of possible faults (fault indications) can be found in the table below.

The table contains an explanation of how to detect faults.

A list of possible causes and remedial measures also follows.



Fault indication	Possible cause	Measures
Contact won't switch	Defective diaphragm	Replace pressure switch
	Spring defective	
	Pressure connection blocked	
	Pressure outside working range	

## 7 Repairs

The following points must be noted before carrying out any work whatsoever on the equipment:

- When work is being performed such as installation, making electrical connections or opening the housing, it must be ensured that
  - *No electrical voltage* is present
  - *Unintentional activation* is not possible
- Repairs must only be carried out by the manufacturer
- The following must be observed in potentially explosive areas:
  - *No potentially explosive atmosphere* is present
  - A release for work must have been issued by the operator
  - The applicable regulations and all documentation for this equipment must be adhered to
  - Only original spare parts from the manufacturer must be used
  - The spare parts must comply with the required equipment category
  - Interventions that influence explosion protection must only be carried out by *experts*  
A prerequisite is adequate *qualification* ("capable person") with regard to *explosion protection* and the use of the *equipment*



## 8 Dismantling

The following points must be noted before carrying out any work whatsoever on the equipment:

- Ensure that the equipment may be removed and that appropriate replacement measures have been taken.
- All of the instructions in chapter 7 "





- Repairs" must be followed
- Exposed cable (ends) must be marked, and it must be ensured that
    - *No electrical voltage* is present
    - *Unintentional activation* is not possible

## 8.1 Disposal

The equipment is made from recyclable materials and is designed to make the housing and the electronics easy to separate. Please ensure that all parts are disposed of in accordance with legal regulations.

Please contact us if you cannot dispose of the equipment properly.



## 9 Appendix

### 9.1 Technical data and dimensioned drawing

#### Temperature ranges

Ambient temperature:

- from -20 °C to +85 °C

Medium temperature:

- up to +85 °C

Storage temperature:

- from -40 °C to +85 °C

#### Diaphragm material

Silicone; others upon request.

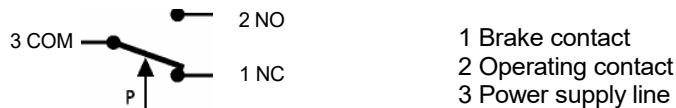
#### Electrical rating

Values indicated for resistive load

- for Gas 2G : 60 mA/30 VDC oder 100 mA/24 VDC
- for Dust 2D: 30V; 60mA ; 0.6W

#### Electrical connection

- Cable conduit M20x1.5 or cap nut conduit M16x1.5 with cable strain relief
- AMP flat plug 6.3 mm x 0.8 mm in accordance with DIN 46244 or push-on screw terminals
- Arrangement of contacts



#### Protection category

- IP 54 (with Cover)

#### Weight

- 150 g

#### Certifications

CE conformity in according with EC explosion protection directive 94/9/EC.

EC design test certification by the specified EXAM body (ID 0158) with the following ATEX labelling:

- 2G Ex ia IIB T4 Gb
- 2D Ex ia IIIB T135°C Db

Characteristics:

- 2G : 60 mA/30 VDC oder 100 mA/24 VDC
- 2D : 30V; 60mA ; 0.6W
- $L_i = 0$  mH;  $C_i = 0$  nF

#### Life

Minimum  $10^6$  cycles.

#### Housing materials

- Switch body made of PA 6.6
- Cover made of PS



**Types / Pressure ranges**

Type	Adjustment range for trip pressure	Switching differential	Tolerance band of
<b>930.80 EX</b>	20 300 Pa	10 Pa	±15 %
<b>930.83 EX</b>	50 500 Pa	20 Pa	±15 %
<b>930.84 EX</b>	30 400 Pa	15 Pa	±15 %
<b>930.85 EX</b>	200 1000 Pa	100 Pa	±15 %
<b>930.86 EX</b>	500 2500 Pa	150 Pa	±15 %
<b>930.87 EX</b>	1000 5000 Pa	250 Pa	±15 %

**Note:**

Switching pressure specifications apply to vertical installation which is also the recommended position with pressure-pipe connections pointing downwards. If the switches are installed horizontally with AMP connection terminals uppermost, the switching values are approx. 20 Pa higher.

**Pressure connections:**

- 2 plastic pipe connection pieces
- external diameter: 6.0 mm

**Maximum operating pressure:**

- 10 kPa for all pressure ranges

**Mounting position**

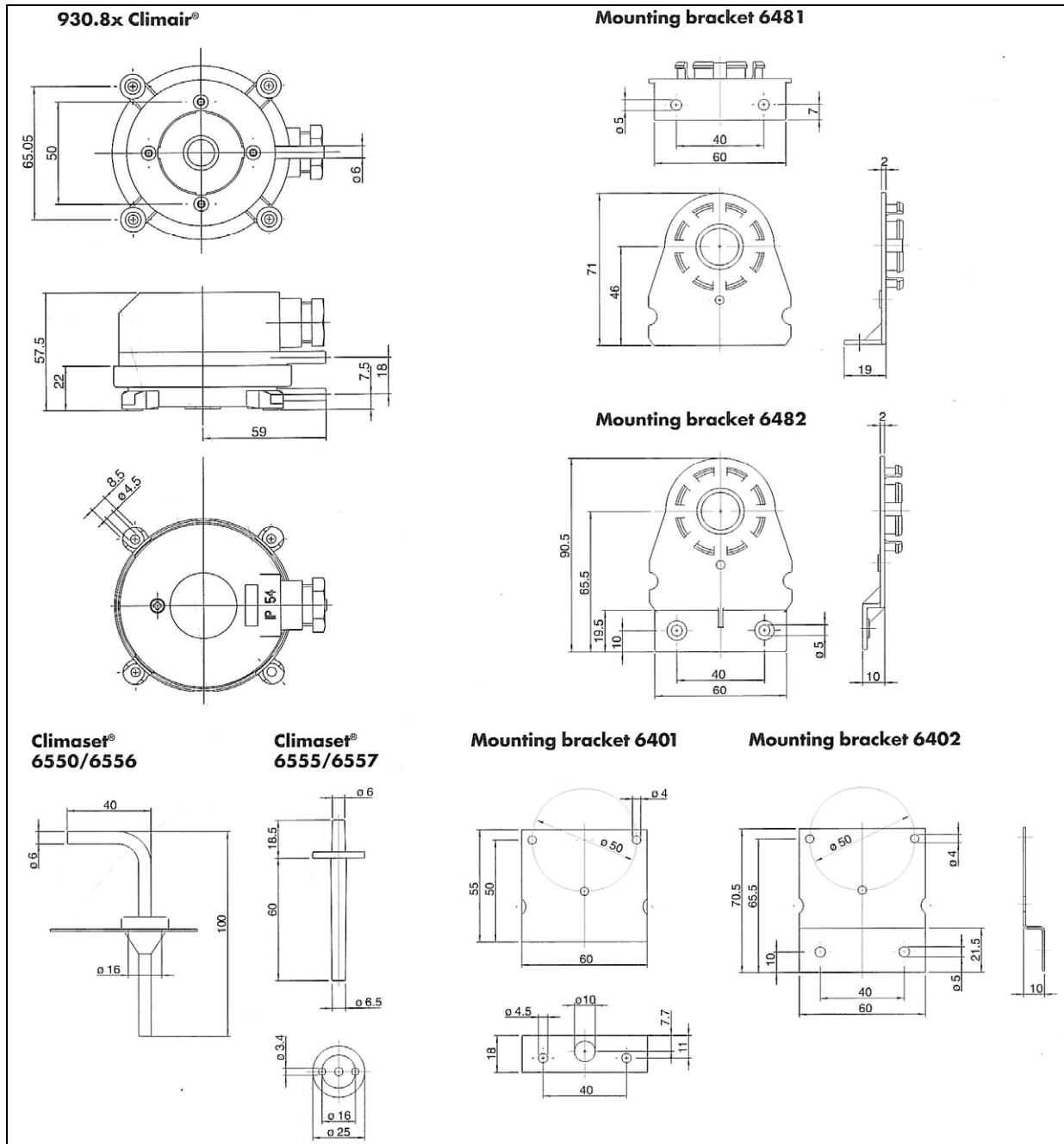
- Switching pressure specifications apply to vertical installation which is also the recommended position with pressure-pipe connections pointing downwards. If the switches are installed horizontally with AMP connection terminals uppermost, the switching values are approx. 20 Pa higher.

**Accessories**

- Various mounting brackets (see Chapter 9.2)
  - ✓ Metal mounting bracket S-shaped
  - ✓ Metal mounting bracket L-shaped
  - ✓ Snap-on plastic bracket S-shaped
  - ✓ Snap-on plastic bracket L-shaped
- Various connection kits (see Chapter 9.2)
  - ✓ Plastic tube for Climaset®
  - ✓ Angled metal pipe for Climaset®
  - ✓ Rubber grommet for Climaset®
  - ✓ Roll with 100 m PVC hose
- Various cable conduits (see Chapter 9.2)
  - ✓ M16x1.5 cable conduit including sealing and counter screw
  - ✓ M20x1.5 cable conduit including sealing and counter screw
  - ✓ NPT1/2" cable conduit without counter parts



## 9.2 Dimensioned drawings and accessories





### 9.3 Declaration of Conformity

<b>EG-Konformitätserklärung</b> <b>EC-Declaration of Conformity</b>		
<b>entsprechend der Explosionsschutzrichtlinie 94/9/EG :</b> Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen <b>in accordance with ATEX- Directive 94/9/EC:</b> <i>Equipment and protective systems intended for use in potentially explosive atmospheres</i>		
<b>Name des Herstellers:</b> <i>Name of manufacturer:</i>	Beck GmbH Druckkontrolltechnik	
<b>Anschrift des Herstellers:</b> <i>Manufacturer's address:</i>	Ferdinand-Steinbeis-Str 4, 71144 Steinenbronn, Germany	
<b>Produktbezeichnung:</b> <i>Product description:</i>	Differenzdruckwächter für Luft und Abgase < 4 bar <i>Differential Pressure switch for air and flue gas &lt; 4 bar</i>	
<b>Modell:</b> <i>Model:</i>	Baureihe 930...EX <i>series 930... EX</i>	
Zur Beurteilung der Erzeugnisse hinsichtlich der Richtlinie wurden benannte Stellen miteinbezogen. Für die Verwendung in explosionsgefährdeten Bereichen wurde folgende EG-Baumusterprüfbescheinigung von der benannten Stelle mit der Kennnummer-0158 ausgestellt: <i>The product has been assessed and tested by a notified body. For the application in explosive atmospheres the notified body with identification number -0158 certified this in the EC type examination certificate</i>		
<b>BVS 06 ATEX E 141 X</b> und Nachträge 1,2,3		
0158: DEKRA EXAM GmbH Dinnendahlstrasse 9 D-44809 Bochum		
Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit: <i>The essential health and safety requirements are met in conformity with:</i>		
	<b>EN 60079-0 :2012</b>	<b>Allgemeine Bestimmungen</b> <i>General requirements</i>
	<b>EN 60079-11:2012</b>	<b>Eigensicherheit „i“</b> <i>Intrinsic safety „i“</i>
Das Produkt wird unter einem Qualitätssicherungssystem -Produktion (Anhang IV der Richtlinie) hergestellt. Dies ist durch die benannte Stelle der Kennnummer -0123 anerkannt worden : <i>The product is manufactured under the modul-product quality assurance (Annex IV of the directive). This was certified by the notified body with the identification number -0123:</i>		
<b>EX2 14 10 29084 005</b>		
0123: TÜV SÜD Product Service GmbH Ridlerstraße 65 D-80339 München		
Kennzeichnung des Geräts <i>Marking of the product</i>		<b>II 2G Ex ia IIB T4 Gb</b> <b>II 2D Ex ia IIIB T135°C Db</b>
Zusätzliche Informationen : <i>Additional information:</i>	Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, beinhaltet jedoch keine Zusicherung von Eigenschaften. Die Bedienungsanleitung und Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten. <i>This declaration confirms only the accordance with the above mentioned directive and do not cover any other characteristics. The manual and security advice of the product has to be kept in mind.</i>	
Steinenbronn, im November 2014		
(Hans-Peter Funk) Geschäftsführer Marketing & Vertrieb Managing director	(Ralph Weigl) Explosionsschutzbeauftragter Authorised ATEX-representative	



## 9.4 EC design test certification

Note: More documentation for EC design test certification you can download from our website.

### (1) 3. Nachtrag zur EG-Baumusterprüfbescheinigung

(2) Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen - Richtlinie 94/9/EG  
Ergänzung gemäß Anhang III Ziffer 6

(3) Nr. der EG-Baumusterprüfbescheinigung: **BVS 06 ATEX E 141 X**

(4) Gerät: **Druckwächter 901\*\*\*EX und 930\*\*\*EX**

(5) Hersteller: **Beck GmbH**

(6) Anschrift: **Ferdinand-Steinbeis-Straße 4, 71144 Steinenbronn**

(7) Die Bauart dieser Geräte sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu diesem Nachtrag festgelegt.

(8) Die Zertifizierungsstelle der DEKRA EXAM GmbH, benannte Stelle Nr. 0158 gemäß Artikel 9 der Richtlinie 94/9/EG des Europäischen Parlaments und des Rates vom 23. März 1994, bescheinigt, dass diese Geräte die grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Geräten und Schutzsystemen zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen gemäß Anhang II der Richtlinie erfüllen. Die Ergebnisse der Prüfung sind in dem Prüfprotokoll BVS PP 06.2129 EG niedergelegt.

(9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit  
**EN 60079-0:2012 Allgemeine Anforderungen**  
**EN 60079-11:2012 Eigensicherheit „I“**

(10) Falls das Zeichen "X" hinter der Bescheinigungsnummer steht, wird in der Anlage zu dieser Bescheinigung auf besondere Bedingungen für die sichere Anwendung des Gerätes hingewiesen.

(11) Dieser Nachtrag zur EG-Baumusterprüfbescheinigung bezieht sich nur auf die Konzeption und die Baumusterprüfung der beschriebenen Geräte in Übereinstimmung mit der Richtlinie 94/9/EG. Für Herstellung und Inverkehrbringen der Geräte sind weitere Anforderungen der Richtlinie zu erfüllen, die nicht durch diese Bescheinigung abgedeckt sind.

(12) Die Kennzeichnung des Gerätes muss die folgenden Angaben enthalten:

für Typ 901 ***EX	für Typ 930 ***EX
<b>II 1/2G Ex ia IIB T4 Ga/Gb</b> <b>II 2G Ex ia IIC T4 Gb</b> <b>II 2D Ex ia IIIB T135°C Db</b>	<b>II 2G Ex ia IIB T4 Gb</b> <b>II 2D Ex ia IIIB T135°C Db</b>

DEKRA EXAM GmbH  
Bochum, den 03.11.2014

\_\_\_\_\_  
 Zertifizierungsstelle

\_\_\_\_\_  
 Fachbereich

Seite 1 von 2 zu: BVS 06 ATEX E 141 X / N3  
Dieses Zertifikat darf nur vollständig und unverändert weiterverbreitet werden.  
DEKRA EXAM GmbH, Dinnendahlstraße 9, 44809 Bochum, Telefon +49 234 3696-105, Telefax +49.234.3696-110, ze-exam@dekra.com

EN



### 9.5 Proof of compliance with explosion protection regulations

<b>Project</b>			
<b>Name</b>		<b>Date</b>	

Requirement		Complies with		Requirement		Complies with	
Anwendungsbereich	II (Gas)	III (Dust)	II Gas	Temperaturklasse	T1	<input type="checkbox"/>	T1
					T2	<input type="checkbox"/>	T1-T2
Explosion group	A	<input type="checkbox"/>	A	T3	<input type="checkbox"/>	T1-T3	
	B	<input type="checkbox"/>	A,B,C	T4	<input type="checkbox"/>	T1-T4	
	C	<input type="checkbox"/>	A,B,C	T5	<input type="checkbox"/>	T1-T5	
				T6	<input type="checkbox"/>	T1-T6	

Requirement	Permitted Equip. Protection Level EPL (G=Gases)	Certified for	Ignition protection class
Zone 2,22 <input type="checkbox"/>	Gc,Dc	Zone 2/22	
Zone 1,21 <input type="checkbox"/>	Gb,Db	Zone 1,2 /21,22	
Zone 0,20 <input type="checkbox"/>	Ga,Da	Zone 0,1,2/ 20,21,22	

CHARACTERISTICS	Intrinsically safe operating materials	Associated operating materials
Bezeichnung	Cable	
Designation		
Model		
Application area		
Ignition protection class		
Explosion group		
Temperature class		
Certification		
Ui,a		
Ii,a		
Pi,a		
Li,a		

Cable characteristics: 1 mH/km ; 110 nF/km

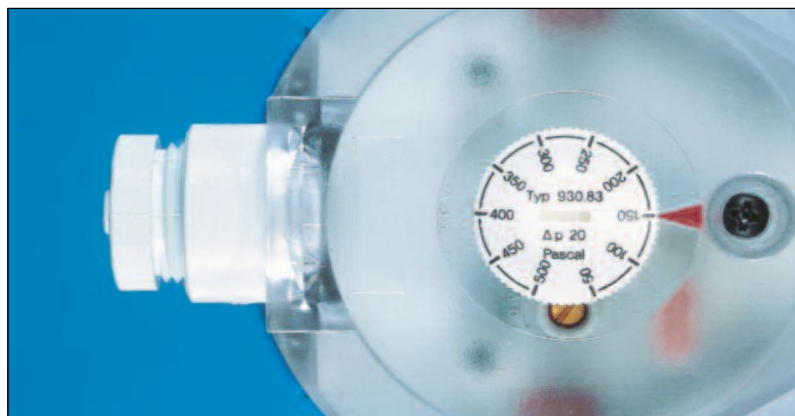
	Forderung erfüllt
Application area	<input type="checkbox"/>
Ignition protection class	<input type="checkbox"/>
Explosion group	<input type="checkbox"/>
Temperature class	<input type="checkbox"/>
Equipment Protection Level EPL / Zone	<input type="checkbox"/>

#### Proof of intrinsic safety

	Associated operating materials (barriers)	Requirement	Intrinsically safe operating materials (including cable)	Compliant
<b>U</b>		≤		<input type="checkbox"/>
<b>I</b>		≤		<input type="checkbox"/>
<b>P</b>		≤		<input type="checkbox"/>
<b>L</b>		≥		<input type="checkbox"/>
<b>C</b>		≥		<input type="checkbox"/>

# Beck.

## The adjustable differential pressure switches in Ex zones.



# Differential pressure switch 930..Ex Climair®

with adjustable switching pressure for  
Ex zones 1, 2 and 21, 22



## Applications

Adjustable differential pressure switch for monitoring overpressure, vacuum and differential pressure of air or other non-aggressive, combustible gases.

Possible fields of application include:

- Monitoring air filters and ventilators
- Monitoring industrial cooling-air circuits
- Overheating protection for fan heaters
- Monitoring flows in ventilation ducts
- Controlling air and fire-protection flaps
- Frost protection for heat exchangers
- Ex zones 1, 2 and 21, 22 with ATEX type examination

## Technical Specifications

Medium	air, (non-)combustible and non-aggressive gases
Temperature ranges:	
Medium and ambient temperature	-20° C to +85° C
Storage temperature	-40° C to +85° C
Switching pressure ranges	20 - 200 Pa (minimum) 1,000 - 4,000 Pa (maximum)
Switching differential	10 Pa minimum 250 Pa maximum depending on pressure range
Switching pressure tolerance	±15% from setpoint
Max. working overpressure	10 kPa
Pressure connections	2 plastic hose ports
Outer diameter	6.0 mm
Materials:	
Diaphragm	silicone, tempered at 200° C, free of gas emissions (other materials on request).
Pressure switch housing	PA 6.6
Cover	PS
Weight	150/110 g (with/without cover)
Electrical rating	24 VDC/100 mA; 30 VDC/45 mA
Electrical connections	AMP flat plug, 6.3 mm x 0.8 mm, in accordance with DIN 46244 or push-on screw terminals
Cable conduit	PG-11 or M20x1.5 with cable strain relief
Protection category	IP 54 (with cover)
Mechanical working life	over 10 <sup>6</sup> switching operations

## ATEX

EC type examination	BVS 06 ATEX E 141X
Device category	II 2G und II 2D
Ignition protection type	Ex ia IIB T4 Gb Ex ia IIB T135C Db
CE conformity	ATEX Directive 94/9/EC RoHS-Directive 2011/65/EC

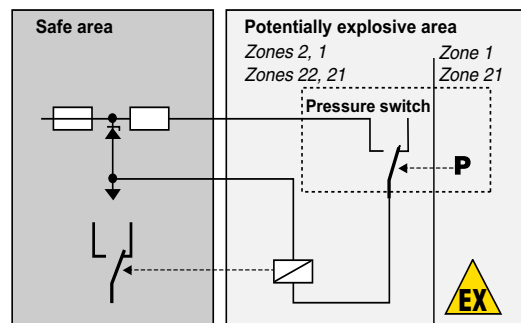
## Ex i-circuits

This pressure switch can be used in potentially explosive zones 1, 2 and 21, 22. In the safe area, an associated isolating means (separating barrier, switching amplifier) must be connected before. The entire isolating circuit must then be proved to keep inherent safety.

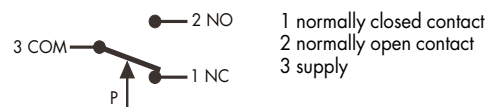
For this purpose, the power specifications (P, I, U) of the barrier must be lower and the characteristics (L, C) higher than those of the pressure switch and of the connection line (blue colour).

## Characteristics:

Gas	for IIB: 30VDC /60mA; 24VDC/100mA
Dust	for IIB: 30VDC /60mA/0,6W
Capacitance - Ci	0 µF
Inductance - Li	0 mH



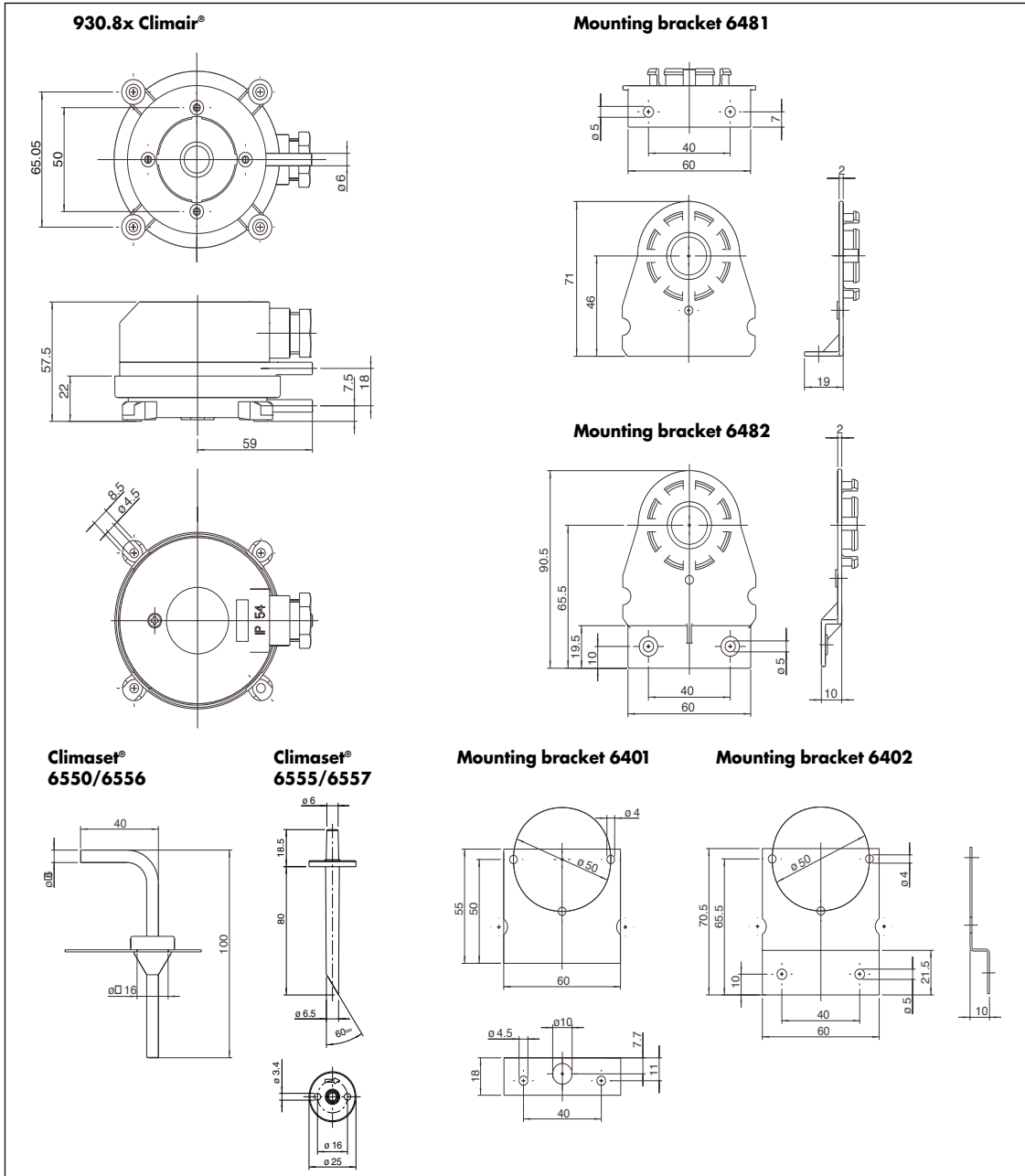
## Arrangement of contacts





# Differential pressure switches 930..Ex Climair®

with adjustable switching pressure  
for Ex zones 1, 2 and 21, 22



Technical data subject to change without prior notice.

930\_ex\_data\_english 1/15



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of Beck GmbH Druckkontrolltechnik.



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e-mail sales@beck-sensors.com  
http://www.beck-sensors.com



## (1) EC-TYPE-EXAMINATION CERTIFICATE (Translation)

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - **Directive 94/9/EC**

(3) EC-type-examination Certificate Number:

**PTB 00 ATEX 2081**



(4) Equipment: Isolation Switching Amplifier type K\*A\*-SR\*-Ex\*.W.\*

(5) Manufacturer: Pepperl + Fuchs GmbH

(6) Address: Königsberger Allee 87, D-68307 Mannheim

(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report PTB Ex 00-20203.

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

**EN 50014:1997**

**EN 50020:1994**

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

(11) This EC-type-examination Certificate relates only to the design and construction of the specified equipment in accordance with Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment.

(12) The marking of the equipment shall include the following:

II (1) G D [EEEx ia] IIC

Zertifizierungsstelle Explosionsschutz

Braunschweig, July 20, 2000

By order:

In the absence of Dr.-Ing. U. Johannsmeyer  
Regierungsdirektor



sheet 1/4

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • D-38116 Braunschweig

(13)

**SCHEDULE**

(14)

**EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2081**

(15) Description of equipment

The isolation switching amplifier type K\*A\*-SR\*-Ex\*.W.\* is used for the transmission of control commands from the hazardous area into the non-hazardous area as well as for the safe electrical isolation of intrinsically safe and nonintrinsically safe circuits.

The maximum permissible ambient temperature is 60°C.

Electrical data

Supply circuit .....230 V AC ±10 %  
 (terminals 14 and 15) maximum voltage:  $U_m = 253 \text{ V AC}$   
 resp.  
 115 V AC ±10 %  
 maximum voltage:  $U_m = 126.5 \text{ V AC}$

Output circuits.....	alternating current	direct current	
(terminals 7, 8, 9 resp.	$U \leq 253 \text{ V}$	$U \leq 40 \text{ V}$	$U \leq 130 \text{ V}$
10, 11, 12)	$I \leq 2 \text{ A}$	$I \leq 2 \text{ A}$	$I \leq 20 \text{ mA}$
	$S \leq 500 \text{ VA}$	$P \leq 80 \text{ W}$	
	$\cos\phi \geq 0.7$		
	maximum voltage:	$U_m = 253 \text{ V AC}$	

Input circuits .....type of protection Intrinsic Safety EEx ia IIA/IIB/IIC  
 (terminals 1, 2, 3 resp. 4, 5, 6) resp. EEx ib IIA/IIB/IIC  
 maximum values per circuit:  
 $U_o = 10.6 \text{ V}$   
 $I_o = 19.1 \text{ mA}$   
 $P_o = 51 \text{ mW}$   
 $R_i = 554.4 \text{ } \Omega$   
 linear characteristic  
 $C_i \approx 0$   
 $L_i \approx 0$

sheet 2/4

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type of protection	EEx ia resp. ib		
	IIA	IIB	IIC
maximum permissible external inductance $L_0$	780 mH	390 mH	97 mH
maximum permissible external capacitance $C_0$	72 $\mu$ F	16.2 $\mu$ F	2.32 $\mu$ F

In the presence of concentrated capacitances and/or inductances in the intrinsically safe input circuit, the maximum permissible external capacitances and inductances for circuits of category „ia“ are to be taken from the following table.

type of protection	EEx ia	
	IIB	IIC
maximum permissible external inductance $L_0$	5 mH	3 mH
maximum permissible external capacitance $C_0$	2.1 $\mu$ F	590 nF

When both intrinsically safe input circuits are interconnected, the following maximum values result:

- $U_0 = 10.6$  V
- $I_0 = 38.2$  mA
- $P_0 = 102$  mW
- $R_i = 277.2$   $\Omega$
- linear characteristic
- $C_i \approx 0$
- $L_i \approx 0$

type of protection	EEx ia resp. ib		
	IIA	IIB	IIC
maximum permissible external inductance $L_0$	195 mH	97 mH	24 mH
maximum permissible external capacitance $C_0$	72 $\mu$ F	16.2 $\mu$ F	2.32 $\mu$ F

In the presence of concentrated capacitances and/or inductances in the interconnected intrinsically safe input circuits, the maximum permissible external capacitances and inductances for circuits of category „ia“ are to be taken from the following table.

type of protection	EEx ia	
	IIB	IIC
maximum permissible external inductance $L_0$	5 mH	3 mH
maximum permissible external capacitance $C_0$	2 $\mu$ F	550 nF

The intrinsically safe input circuits are safely electrically isolated from all other circuits up to a peak value of the nominal voltage of 375 V.

sheet 3/4

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# Physikalisch-Technische Bundesanstalt



Braunschweig und Berlin

SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2081

(16) Test report PTB Ex 00-20203

(17) Special conditions for safe use

None

(18) Essential health and safety requirements

met by standards

Zertifizierungsstelle Explosionsschutz

By order:

Braunschweig, July 20, 2000

In the absence of Dr.-Ing. U. Jahnsmeyer  
Regierungsdirektor



sheet 4/4

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**Physikalisch-Technische Bundesanstalt  
Braunschweig and Berlin**

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

(2) Equipment and Protective Systems Intended for use in  
Potentially Explosive Atmospheres - Directive 94/9/EC

(3) EC-Type Examination Certificate Number

**PTB 00 ATEX 2081**

(4) Equipment: Transformer Isolated Switching Amplifier Type K\*A\*-SR\*-Ex\*.W.\*

(5) Manufacturer: Pepperl + Fuchs GmbH

(6) Address: Königsberger Allee 87, D-68307 Mannheim

(7) The design of this electrical apparatus as well as the different permissible versions are specified in the annex to this type examination certificate.

(8) Physikalisch-Technische Bundesanstalt being notified body number 0102 in accordance with Article 9 of the Council Directive of the European Communities of 23 March 1994 (94/9/EC) confirms the compliance with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The results of the examination are recorded in the confidential test report PTB Ex 00-20203.

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

**EN 50014:1997**

**EN 50020:1994**

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

(11) This EC-type examination certificate relates only to the design and construction of the specified equipment in accordance with the Directive 94/9/EC. Further requirements of this Directive apply to the manufacture and supply of this equipment.

(12) The marking of the equipment shall include the following details:

**Ex II (1) G D [EEEx ia] IIC**

Certification Body Explosion Protection  
on behalf of

Braunschweig, 20 July 2000

(signature)

Dr.-Ing. U. Johannsmeyer, in absence  
Senior Government Official

page 1/4

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certified translation  
Mannheim, 4<sup>th</sup> August 2000  
*J. Plum*  
pp I. Plum

**TUV PRODUCT  
SERVICE GMBH**  
Dudenstraße 28  
68167 Mannheim

**Physikalisch-Technische Bundesanstalt  
Braunschweig and Berlin**

(13) **SCHEDULE**

(14) **EC-Type Examination Certificate PTB 00 ATEX 2081**

(15) Description of the Equipment

The Transformer Isolated Switching Amplifier Type K\*A\*-SR\*-Ex\*.W.\* is designed for the transmission of control commands from the hazardous area to the non-hazardous area and for the galvanic isolation of intrinsically safe and non intrinsically safe circuits.

The max. permissible ambient temperature is 60°C.

Electrical parameters

Supply circuit.....230 V AC  $\pm$  10%  
(terminals 14 and 15) safety relevant maximum voltage:  $V_m = 253V$  AC  
alternatively  
115V AC  $\pm$  10%  
safety relevant max. voltage:  $V_m = 126.5V$  AC

Output circuits.....AC DC  
(terminals 7, 8, 9 alt. 10, 11, 12)  $V \leq 253V$   $V \leq 40V$   $V \leq 130V$   
 $I \leq 2A$   $I \leq 2A$   $I \leq 20mA$   
 $P_a \leq 500VA$   $P \leq 80W$   
 $pf \geq 0.7$   
safety relevant maximum voltage:  $V_m = 253V$  AC

Input circuits.....for ignition protection intrinsic safety EEx ia IIA/IIB/IIC  
(terminals 1, 2, 3 alt. 4, 5, 6) alt. EEx ib IIA/IIB/IIC  
maximum values for each circuit:  
 $V_o = 10.6 V$   
 $I_o = 19.1 mA$   
 $P_o = 51 mW$   
 $R_i = 554.4 \Omega$   
linear characteristic  
 $C_i \approx 0$   
 $L_i \approx 0$

type of protection	EEx ia alt. ib		
	IIA	IIB	IIC
max. permissible ext. inductance $L_0$	780 mH	390 mH	97 mH
max. permissible ext. capacitance $C_0$	72 $\mu F$	16.2 $\mu F$	2.32 $\mu F$

page 2/4

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**Physikalisch-Technische Bundesanstalt  
Braunschweig and Berlin**

**Schedule to EC-Type Examination Certificate PTB 00 ATEX 2081**

In the presence of concentrated capacitance and/or inductance in the intrinsically safe input circuit the maximum permissible external capacitance and inductance for the circuits of category "ia" are to be taken from the following table.

type of protection	EEx ia	
	IIB	IIC
max. permissible ext. inductance $L_0$	5 mH	3 mH
max. permissible ext. capacitance $C_0$	2.1 $\mu$ F	590 nF

When interconnecting both intrinsically safe input circuits the following maximum values apply:

$V_o = 10.6$  V  
 $I_o = 38.2$  mA  
 $P_o = 102$  mW  
 $R_i = 277.2$   $\Omega$   
 linear characteristic  
 $C_i \approx 0$   
 $L_i \approx 0$

type of protection	EEx ia alt ib		
	IIA	IIB	IIC
max. permissible ext. inductance $L_0$	195 mH	97 mH	24 mH
max. permissible ext. capacitance $C_0$	72 $\mu$ F	16.2 $\mu$ F	2.32 $\mu$ F

In the presence of concentrated capacitance and/or inductance in the interconnected intrinsically safe input circuits the maximum permissible external capacitance and inductance for the circuits of category "ia" are to be taken from the following table.

type of protection	EEx ia	
	IIB	IIC
max. permissible ext. inductance $L_0$	5 mH	3 mH
max. permissible ext. capacitance $C_0$	2 $\mu$ F	550 nF

The intrinsically safe input circuits are electrically safely isolated against all other electrical circuits up to the peak value of the nominal voltage of 375V.

(16) Test Report PTB Ex 00-20203

(17) Special Conditions

none

page 3/4

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certified translation  
Mannheim, 4<sup>th</sup> August 2000  
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**Physikalisch-Technische Bundesanstalt  
Braunschweig and Berlin**

**Schedule to EC-Type Examination Certificate PTB 00 ATEX 2081**

**(18) Essential Health and Safety Requirements**

covered by standards

Certification Body Explosion Protection  
on behalf of

Braunschweig, 20 July 2000

(signature)

Dr.-Ing. U. Johannsmeyer, in absence  
Senior Government Official

page 4/4

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**1st SUPPLEMENT**  
according to Directive 94/9/EC Annex III.6  
**to EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2081**  
**(Translation)**

Equipment: Isolation and Switching Amplifier type **K\*A\*-SR\*-Ex\*.W.\***

Marking: **II (1) G D [EEx ia] IIC**

Manufacturer: Pepperl + Fuchs GmbH

Address: Königsberger Allee 87  
D-68307 Mannheim, Germany

Description of supplements and modifications

The isolation and switching amplifier of type **K\*A\*-SR\*-Ex\*.W.\*** has been technically modified and may in future also be manufactured and operated according to the test documents of test report PTB Ex 01-21063. The modifications concern the internal structure, the enclosure, and the “electrical data”.

The “electrical data” are extended to additionally include a supply voltage as well as an additional pair of values for the output circuits when a.c. operated.

The EC type-examination certificate is extended to additionally include the isolation and switching amplifier type **K\*A\*-SR\*-Ex2.W.IR**. This type differs from the previously certified versions only in the firmware. The isolation and switching amplifier with the new supply voltage range of 100 VAC ± 10 % carries the designation: **K\*A4-SR\*-Ex\*.W.\*** .

All other details apply without any changes for this first supplement.

Electrical data

Supply circuit ..... 230 V AC ±10 %  
(terminals 14 & 15) safety voltage, max:  $U_m = 253$  V AC  
or  
115 V AC ±10 %  
safety voltage, max.:  $U_m = 126.5$  V AC  
or  
100 V AC ±10 %

Sheet 1/2

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# Physikalisch-Technische Bundesanstalt



Braunschweig und Berlin

1st SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2081

safety voltage, max.:  $U_m = 110 \text{ V AC}$

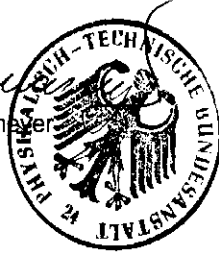
Output circuits.....AC				DC		
(terminals 7, 8, 9 & 10, 11, 12)	$U \leq 253 \text{ V}$	$U \leq 126.5 \text{ V}$	$U \leq 40 \text{ V}$	$U \leq 130 \text{ V}$		
	$I \leq 2 \text{ A}$	$I \leq 4 \text{ A}$	$I \leq 2 \text{ A}$	$I \leq 20 \text{ mA}$		
	$S \leq 500 \text{ VA}$		$P \leq 80 \text{ W}$			
	$\cos\phi \geq 0.7$					
	safety voltage, max.:		$U_m = 253 \text{ V AC}$			

Test report: PTB Ex 01-21063

Zertifizierungsstelle Explosionsschutz  
By order:

Braunschweig, 13 September 2001

Dr.-Ing. U. Johannsmeyer  
Regierungsdirektor



Sheet 2/2

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## 2. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

to EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2081

(Translation)

Equipment: Isolation and Switching Amplifier type K\*A\*-SR\*-Ex\*.W.\*

Marking:  II (1) G D [EEx ia] IIC

Manufacturer: Pepperl + Fuchs GmbH

Address: Königsberger Allee 87, 68307 Mannheim, Germany

### Description of supplements and modifications

The isolation and switching amplifier, type K\*A\*-SR\*-Ex\*.W.\* has been technically revised. In the future it may also be manufactured and operated in accordance with the test documents listed in test report PTB Ex 11-29156.

The modifications concern the address of the manufacturer, the standards applied, the marking, the internal construction as well as the enclosure.

The "Electrical data" as well as all other specifications apply without changes.

The manufacturer's address changes as follows:

Manufacturer: Pepperl + Fuchs GmbH

Address: Lilienthalstrasse 200, 68307 Mannheim, Germany

In the future the marking of the isolation and switching amplifier, type K\*A\*-SR\*-Ex\*.W.\* will read:

 II (1) G [Ex ia] IIC or  II (1) D [Ex ia] IIIC

ZSEx10101e.dofm

Sheet 1/2

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# Physikalisch-Technische Bundesanstalt



Braunschweig und Berlin

## 2. SUPPLEMENT TO EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2081

Applied standards

EN 60079-0:2009, EN 60079-11:2007, EN 61241-11:2006

Assessment and test report: PTB Ex 11-29156

Zertifizierungssektor Explosionsschutz  
On behalf of PTB:

Braunschweig, May 27, 2011

(signature)

Dr.-Ing. U. Johannsmeyer  
Direktor und Professor

**2 pages, correct and complete as regards content.**

By order:

Dr.-Ing. T. Horn



Braunschweig, August 20, 2012

Sheet 2/2

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### 3. SUPPLEMENT

according to Directive 94/9/EC Annex III.6

#### to EC-TYPE-EXAMINATION CERTIFICATE PTB 00 ATEX 2081

(Translation)

Equipment: Isolation and switching amplifier, type KFA\*-SR\*-Ex\*.W.\*

Marking: II (1) G [Ex ia] IIC or II (1) D [Ex ia] IIIC

Manufacturer: Pepperl+Fuchs GmbH

Address: Lilienthalstraße 200, 68307 Mannheim, Germany

The isolation and switching amplifier of type KFA\*-SR\*-Ex\*.W.\* was technically revised. In the future it can also be manufactured and operated according to the test documents listed in test report PTB Ex 14-24081.

The modifications concern the applied standards, the marking, the extension of the "electrical data" by values for explosion groups I and IIIC as well as the internal construction. Isolation and switching amplifiers of type KHA\*-SR\*-Ex\*.W.\* (KH = terminal housing, high) are no longer produced. All other specifications apply without changes.

The new marking reads:

II (1) G [Ex ia Ga] IIC or II (1) D [Ex ia Da] IIIC or I (M1) [Ex ia Ma] I

#### Electrical data

Supply circuit ..... **KFA6-SR\*-Ex\*.W.\***  
(terminals 14 and 15) 230 V AC  $\pm 10\%$   
Safety-related maximum voltage:  $U_m = 253$  V AC  
or  
**KFA5-SR\*-Ex\*.W.\***  
115 V AC  $\pm 10\%$   
Safety-related maximum voltage:  $U_m = 126,5$  V AC  
or  
**KFA4-SR\*-Ex\*.W.\***  
100 V AC  $\pm 10\%$   
Safety-related maximum voltage:  $U_m = 110$  V AC

ZSEx10101e.dotm ZSEx10101e

Sheet 1/3

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • 38116 Braunschweig • GERMANY



Type of protection	Ex ia or ib			
	I	IIA	IIB/IIIC	IIC
$L_o$	320 mH	195 mH	97 mH	24 mH
$C_o$	90 $\mu$ F	72 $\mu$ F	16.2 $\mu$ F	2.32 $\mu$ F

With the existence of concentrated capacitances and/or inductances in the interconnected intrinsically safe input circuits, the maximum permissible external capacitances and inductances for the circuits shall be taken from the following table.

Type of protection	Ex ia or ib			
	I	IIA	IIB/IIIC	IIC
$L_o$	20 mH	10 mH	5 mH	3 mH
$C_o$	4.8 $\mu$ F	4.2 $\mu$ F	2 $\mu$ F	550 nF

The intrinsically safe input circuits are safely electrically isolated from all other circuits up to a peak value of the nominal voltage of 375 V.

Applied standards

**EN 60079-0:2012, EN 60079-11:2012**

Test report: PTB Ex 14-24081

Zertifizierungssektor Explosionsschutz  
On behalf of PTB:

Braunschweig, August 20, 2014

(signature)

Dr.-Ing. U. Johannsmeyer  
Direktor und Professor

**3 pages, correct and complete as regards content.**  
On behalf of PTB:  
  
Dr.-Ing. T. Horn  
Regierungsrat  
Braunschweig, January 22, 2015  


Sheet 3/3

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

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# Instruction Manual

## Marking

K-System, Isolated barriers
Device identification
Model number
ATEX approval
Group, category, type of protection, temperature classification

table 1

The exact designation of the device can be found on the name plate on the device side.

Pepperl+Fuchs GmbH Lilienthalstrasse 200, 68307 Mannheim, Germany
--

table 2

## Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismantling lies with the plant operator.

Mounting, installation, commissioning, operation, maintenance and dismantling of the device may only be carried out by appropriate trained and qualified personnel. The instruction manual must be read and understood.

Prior to using the device you should make yourself familiar with the device and carefully read the instruction manual.

## Reference to Further Documentation

Observe laws, standards, and directives applicable to the intended use and the operating location.

The corresponding datasheets, declarations of conformity, EC-type-examination certificates, certificates and control drawings if applicable supplement this document. You can find this information under [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com).

## Intended Use

The device is only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.

The device is used in control and instrumentation technology (C&I technology) for the galvanic isolation of signals such as 20 mA and 10 V standard signals or alternatively for adapting or standardizing signals. The device has intrinsically safe circuits that are used for operating intrinsically safe field devices in hazardous areas.

Use the device only within the specified ambient conditions.

The device is designed for mounting on a 35 mm DIN mounting rail according to EN 60715.

Only use the device stationary.

The device is an associated apparatus according to IEC/EN 60079-11.

## Improper Use

Protection of the personnel and the plant is not ensured if the device is not being used according to its intended use.

The device is not suitable for isolating signals in power installations unless this is noted separately in the corresponding datasheet.

## Mounting and Installation

Do not mount a damaged or polluted device.

Mount the device in a way that the device is protected against mechanical hazard. Mount the device in a surrounding enclosure for example.

The device must be installed outside of the hazardous area.

The device fulfills a degree of protection IP20 according to IEC/EN 60529.

The device must be installed and operated only in an environment that ensures a pollution degree 2 (or better) according to IEC/EN 60664-1.

If used in areas with higher pollution degree, the device needs to be protected accordingly.

All circuits connected to the device must comply with the overvoltage category II (or better) according to IEC/EN 60664-1.

Only use power supplies that provide protection against electric shock (e. g. SELV or PELV) for the connection to power feed modules.

Observe the installation instructions according to IEC/EN 60079-14.

## Requirements for Cables and Connection Lines

Observe the following points when installing cables and connection lines: Observe the permissible core cross-section of the conductor.

If you use stranded conductors, crimp wire end ferrules on the conductor ends.

Use only one conductor per terminal.

When installing the conductors the insulation must reach up to the terminal.

Observe the tightening torque of the terminal screws.

If the rated voltage is greater than 50 V AC, proceed as follows:

1. Switch off the voltage.
2. Connect the terminal blocks or disconnect the terminal blocks.

## Requirements for Usage as Associated Apparatus

If circuits with type of protection Ex i are operated with non-intrinsically safe circuits, they must no longer be used as circuits with type of protection Ex i.

Intrinsically safe circuits of associated apparatus can be led into hazardous areas. Observe the compliance of the separation distances to all non-intrinsically safe circuits according to IEC/EN 60079-14.

Observe the compliance of the separation distances between two adjacent intrinsically safe circuits according to IEC/EN 60079-14.

Observe the maximum values of the device, when connecting the device to intrinsically safe apparatus.

When connecting intrinsically safe devices with intrinsically safe circuits of associated apparatus, observe the maximum peak values with regard to

explosion protection (verification of intrinsic safety). Observe the standards IEC/EN 60079-14 or IEC/EN 60079-25.

If no  $L_o$  and  $C_o$  values are specified for the simultaneous appearance of lumped inductances and capacitances, the following rule applies:

- The specified value for  $L_o$  and  $C_o$  is used if one of the following conditions applies:
    - The circuit has distributed inductances and capacitances only, e. g., in cables and connection lines.
    - The total value of  $L_i$  (excluding cable) of the circuit is  $< 1\%$  of the specified  $L_o$  value.
    - The total value of  $C_i$  (excluding cable) of the circuit is  $< 1\%$  of the specified  $C_o$  value.
  - A maximum of 50 % of the specified value for  $L_o$  and  $C_o$  is used if the following condition applies:
    - The total value of  $L_i$  (excluding cable) of the circuit is  $\geq 1\%$  of the specified  $L_o$  value.
    - The total value of  $C_i$  (excluding cable) of the circuit is  $\geq 1\%$  of the specified  $C_o$  value.
- The reduced capacitance for gas groups I, IIA and IIB must not exceed the value of 1  $\mu$ F (including cable).  
The reduced capacitance for gas group IIC must not exceed the value of 600 nF (including cable).

If more channels of one device are connected in parallel, ensure the parallel connection is made directly at the terminals of the device. When verifying the intrinsic safety, observe the maximum values for the parallel connection.

## Operation, Maintenance, Repair

The devices must not be repaired, changed or manipulated. If there is a defect, the product must always be replaced with an original device.

If the rated voltage is greater than 50 V AC, proceed as follows:

1. Switch off the voltage.
2. Connect the terminal blocks or disconnect the terminal blocks.

## Delivery, Transport, Disposal

Check the packaging and contents for damage.

Check if you have received every item and if the items received are the ones you ordered.

Always store and transport the device in the original packaging.

Store the device in a clean and dry environment. The permitted ambient conditions (see datasheet) must be considered.

Disposing of device, packaging, and possibly contained batteries must be in compliance with the applicable laws and guidelines of the respective country.

EU-Declaration of conformity  
EU-Konformitätserklärung

en/de

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Date / Datum: 2015-03-30

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**Declaration of conformity / Konformitätserklärung**

We, Pepperl+Fuchs GmbH declare under our sole responsibility that the products listed below are in conformity with the listed European Directives and standards.

Die Pepperl+Fuchs GmbH erklärt hiermit in alleiniger Verantwortung, dass die unten gelisteten Produkte den genannten Europäischen Richtlinien und Normen entsprechen.

**Products / Produkte**

Product / Produkt	Item number	Description / Beschreibung
KFA4-SR2-Ex1.W	112746	Switch Amplifier
KFA4-SR2-Ex1.W.LB	112747	Switch Amplifier
KFA4-SR2-Ex2.W	112748	Switch Amplifier
KFA5-SR2-Ex1.W	103371	Switch Amplifier
KFA5-SR2-Ex1.W.LB	103372 265162	Switch Amplifier
KFA5-SR2-Ex2.W	103370 265163	Switch Amplifier
KFA5-SR2-Ex2.W.IR	107809	Switch Amplifier
KFA6-SR2-Ex1.W	103374	Switch Amplifier
KFA6-SR2-Ex1.W.LB	103375 265167	Switch Amplifier
KFA6-SR2-Ex2.W	103373 265168	Switch Amplifier
KFA6-SR2-Ex2.W.IR	107093	Switch Amplifier

**Directives and Standards / Richtlinien und Normen**

EU-Directive EU-Richtlinie	Standards Normen
2004/108/EC (EMC)	EN 61326-1:2013 (Industrial locations)
94/9/EC (ATEX)	EN 60079-0:2012 EN 60079-11:2012
2006/95/EC (LVD)	EN 61010-1:2010

**Affixed CE Marking / Angebrachte CE-Kennzeichnung**



**Signatures / Unterschriften**

Mannheim, 2015-03-30

ppa. Michael Kessler  
Vice President Business Unit  
Components and Technology

i.V. Werner Bansemir  
Manager  
Interface Technology

**ANNEX 94/9/EC (ATEX)**

**Notified Body QM-System / Notifizierte Stelle des QM-Systems:**

Physikalisch Technische Bundesanstalt (0102)  
Bundesallee 100  
38116 Braunschweig  
Germany

**Marking and Certificates / Kennzeichnung und Zertifikate**

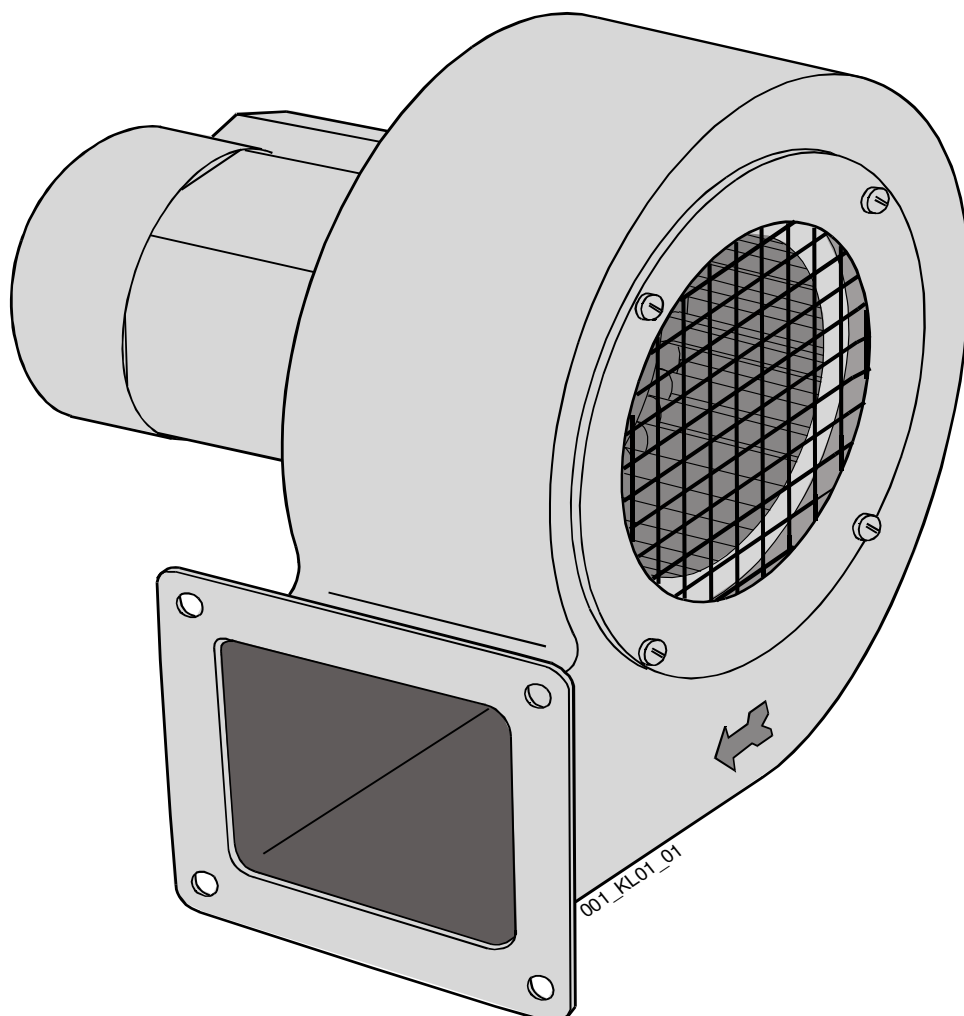
Products / Produkte	All products listed above/ Alle oben aufgelisteten Produkte	
Marking Kennzeichnung	Certificate Zertifikat	Issuer ID Aussteller ID
⊕ II (1) G ⊕ II (1) D ⊕ I (M1)	PTB 00 ATEX 2081	0102

**Key for Issuer ID / Schlüssel zur Aussteller ID**

ID	Issuer / Aussteller
0102	Physikalisch Technische Bundesanstalt Bundesallee 100 38116 Braunschweig Germany

# Operating Instructions

**for all radial blowers for use in category 1  
and 2 explosive atmospheres**





Operating instructions for radial blowers for potentially explosive atmospheres from mixtures of combustible gas, vapors or mist with air.

---

EN

Printed in Germany

We reserve the right to change the information and illustrations shown in this operating manual made as a result of technical advancements. The reprint, translation and reproduction of any kind, including excerpts, require the manufacturer's written approval.

This operating manual is not subject to update services.  
You may inquire with the manufacturer for the most current revision.

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Revision: 04/2014



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### Comply with safety instructions!

Please read all safety instructions contained in this operating manual with care.

Familiarize yourself with the operation of the blower before placing it into service. It will be too late to do so when doing the work!

Never permit someone without the proper technical knowledge to install and operate this blower.

### Applicability

This operating manual applies to all blowers with the following model designations:



ENG ... II 2 G c (IIB or IIC) T4; DNG ... II 2 G c (IIB or IIC) T4;

EMV ... II 2 G c (IIB or IIC) T4; DMV ... II 2 G c (IIB or IIC) T4;

EMVL ... II 2 G c (IIB or IIC) T4; DMVL ... II 2 G c (IIB or IIC) T4;

DSV2 ... II 2 G c (IIB or IIC) T4; DSV 4 ... II 2 G c (IIB or IIC) T4;

DHV ... II 2 G c (IIB or IIC) T4.

### Purpose of the operating manual

This operating manual accompanies the equipment. It also contains the installation instructions.

The operating manual was prepared by the manufacturer on the basis of their knowledge and experience with design, production and operating procedures.

The operating entity may supplement this manual with special instructions (for instance for supervisory and reporting duties, operating specific maintenance and care schedules).

### Symbols used in this operating manual

The graphic representations and drawings are *basic* illustrations of a blower. They are not to scale and do not correspond to the proportions of all blowers in the product range. These illustrations are only intended as a guide.

Detailed dimensions and views are shown in the catalog.

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## 1 Preliminary remarks

### 1.1 Manufacturer's instructions to the operating entity

As the operating entity, you are responsible for:

- the correct technical and designated use of the blower by trained personnel,
- compliance with safety regulations and safety instructions and any occupational safety and accident prevention measures,
- the technical training of the operating personnel on the equipment, and for their awareness of the operating manual.
- preventing hazardous dust deposits and/or the timely cleaning of the motor surfaces.

### 1.2 Operator entity obligations for blowers located in explosive atmospheres

The Operational Safety Directive [BetrSichV or equivalent other national regulations] and the 11th Directive to the Machinery and Product Safety Act [11th GPSGV] require the operating entity to make a variety of provisions for the use of machinery in explosive atmospheres.

Pursuant to § Section 3 of the Operational Safety Directive [BetrSichV or equivalent other national regulations], the operating entity is required to conduct a hazard assessment of the location where the machinery is to be used. This assessment is intended to recognize and to take into consideration hazards that may arise when using the machinery in combination with the production materials and the environment.

Pursuant to §4 of the Operational Safety Directive [BetrSichV or equivalent other national regulations], the operating entity is responsible for taking any required steps and for selecting the equipment that is suited for the conditions at the deployment location and that will ensure safety and health protection if used as designated.

To do so, the operating entity may refer to our KLEIN catalog, which contains detailed technical specifications and notes regarding uses.

When conducting the hazard assessment and selecting a suitable machine, the operating entity must apply directive 2006/42/EC/ of the European Parliament and the Operational Safety Commission and directive 94/9 EC, dated 23 March 1994 (also known as the ATEX directive) and the applicable harmonized standards (EN), for instance EN 14986, Designs for blowers for use in explosive atmospheres or EN 1127-1, Explosive atmospheres.

The operating entity is solely responsible for selecting the equipment (blower) suitable for the intended area and the intended location.

Repairs and/or service work on explosion-protected blowers may only be performed by the manufacturer or by a repair shop authorized to do so. After the work on the blowers is completed, the explosion protection must have been returned to operational status.



Operating instructions for radial blowers for potentially explosive atmospheres from mixtures of combustible gas, vapors or mist with air.

## Product Warranty

KARL KLEIN Ventilatorenbau GmbH provides a product warranty as part of its general terms and conditions of sale and delivery.

The warranty is rendered null and void if the installation and operating procedures described in this operating manual, in particular the designated uses, are not complied with.

Any unauthorized reconfiguration or modification of the blower is prohibited.

Only use replacement parts and accessories approved by KARL KLEIN Ventilatorenbau GmbH. The use of other parts may impair the function. The operating entity is liable for any resulting damages.

KARL KLEIN Ventilatorenbau GmbH does not assume liability or honor warranty claims for damage resulting from repairs performed by the customer or an incorrect blower installation.

EN

### 1.3 Symbols used

This operating manual uses the following symbols. These are complementary to safety and damage prevention instructions.



#### **Attention Electrical Power Shock!**

Designates potentially occurring hazardous situations. Not observing these warning labels can result in death, serious injuries or property damage.



#### **Attention!**

Designates a potentially occurring hazardous situation. Not observing these labels can result in injuries or property damage.



#### **Instruction!**

Application instructions for optimum use of the equipment and other useful information.

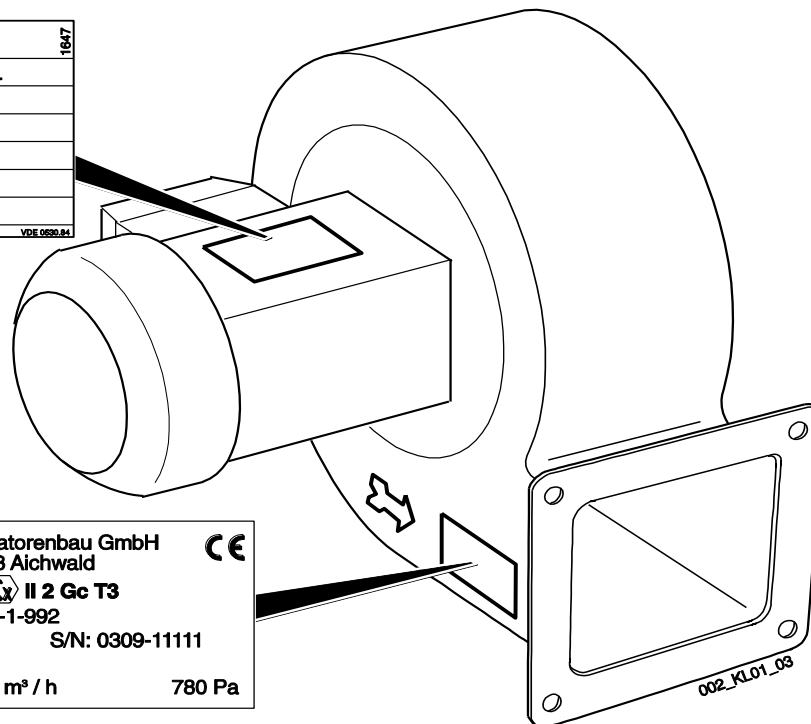
## 1.4 Type plates and instruction labels




### Instruction!

The specifications on the type plate are important for the designated use. All labels and plates must be legible at all times. Illegible or lost type plates and warning labels must be replaced immediately.

Typ		Isol. Kl.
~ Mot.-Nr.		IP
KW	S	
V	A	
n	$\frac{1}{\text{min}}$	$\cos \phi$
Hz		
T.Nr. 009		VDE 0520:04



	Karl Klein Ventilatorenbau GmbH D - 73773 Aichwald	CE
	<b>DNG 6-35</b>  <b>II 2 Gc T3</b>	
	IB-03-1-992	
P/N: 81529-1.040	S/N: 0309-11111	
S/N Motor:		
50 Hz	1760 m <sup>3</sup> / h	780 Pa

The information on the type plates identifies the respectively desired blower type and rating. The information on the type plate corresponds to the performance ratings that were ordered. These may be subject to change.

### Instruction

The values shown on the type plate take precedence. Other performance ratings are found in the order confirmation

## 2 Designated use



### Please note

For instance, the blower may be labeled as II 2 G c IIB T4  
Equipment group II; Category 2; G = Gas (Vapor, Mist); c = design safety  
IIB= explosion sub-group  
T3 = up to 200 °C max. rated surface temperature  
T4 = up to 135 °C max. rated surface temperature

The blower can be used in explosive atmospheres for zones 1 and 2 (in accordance with RL 94/9 EC and Operational Safety Directive [BetrSichV or equivalent other national regulations]).

In reference to EN 1127-1, this means for *Zone 1* that the blower is intended for use in areas in which an atmosphere capable of producing an explosion, in the form of a mixture of combustible gas, vapor or mist with air, may *occasionally* form under normal operating conditions.

In reference to EN 1127-1, this means for *Zone 2* that under normal operating conditions, an atmosphere capable of producing an explosion, in the form a mixture of combustible gas, vapor or mist with air, *normally does not form, or only forms for brief periods*.

The designated use encompasses observing and complying with the specifications and instructions in this operating manual.

### 2.1 Limitations to the use and special considerations for designated uses

The designated operation also includes:

- The conveyed medium may not contain solid, dust forming or liquid contaminants. Use a filter as needed (see KLEIN list of accessories).
- When conveying aggressive media, the blower corrosion protection mechanisms must first be adapted to the material characteristics. (Consult the manufacturer).
- If the blower is to be used in an open blowing configuration, or if it is likely that a hazard exists for the downstream machine or installation if the blower wheel breaks, a protective screen must be mounted to the blower exhaust opening.
- The blower may only be operated in an installed condition, i.e. mounted to or into systems and machines.
- The temperature of the entering conveyed medium may not exceed + 60 °C.
- The ambient temperature may not be below – 20 °C or exceed + 40 °C.
- The blower may only be operated with an installed intake protective screen.

### 2.2 Non-designated uses

Hazardous and non-designated uses specifically include

- conveying explosive or combustible media corresponding to zones 0, 20, 21 and 22. The blower may only be operated in zones 1 and 2 with a corresponding marking on the type plate;
- conveying abrasive media;
- conveying materials without a suitable intake protective screen;
- operation without a suitable motor cut-off switch;
- use in underground mining operations;
- any other use that deviates from the designated uses, and which will result in a hazardous condition.

## 3 Safety

### 3.1 Basic safety instructions

Klein blowers are designed and produced in accordance with generally accepted technology, occupational and accident prevention practices and in accordance with the requirements of directive 94/9/EC for machines and protective systems for the designated use in explosive environments and also the requirements of the Machine and Product Safety Act [GPSG or equivalent other national regulations]. They correspond to the state of the art.

Nevertheless, blowers in operation can represent a hazard, especially if hazardous conditions are created as a result of

- inappropriate use or
- non-designated use

For this reason, all instructions for the use of the blower must be adhered to.



#### Instruction!

- The blower may only be placed into operation when in impeccable overall condition, only with an undamaged housing and impeller wheel, and only with a fully operational, safe electrical hook-up. Operating a defective machine constitutes a danger to life and limb.
- There must be no easily ingested materials such Styrofoam, fabric rags or similar in the vicinity of the intake. Care must be taken that sufficient clearance is provided to the intake.
- Take note of the air exhaust direction and area. The fragments from an impeller wheel failure must be prevented from damaging the downstream equipment to be cooled.
- The electrical installation must correspond to the requirements of the machine into which the blowers are to be installed (i.e. motor cut-off switch).
- Personnel must be familiar with all steps described in this operating manual that relate to the proper operation and use of this equipment.
- Explosion-protected blowers may not be repaired by the customer. To maintain the explosion protection, blowers may only be repaired or maintained for preventive purposes by the manufacturer.
- To avoid combustion hazards from dust deposits, cleaning intervals must be rigorously complied with. The cleaning operation must be performed with diligence. Cleaning agents and cleaning accessories must not cause electrostatic charges.
- Dust deposits must be prevented from forming. These must be cleaned off immediately.



## **3.2 Emissions**

### **3.2.1 Noise**

The noise profile depends on the installation type, on the environmental conditions and the respective operating load on the blower.

The operating noise levels of the blower can reach high levels for certain installation types and uses. The values can range from 60 to 110 dB (A). Detailed acoustic pressure levels can be found in the KLEIN catalog.

If work must be performed in the vicinity, appropriate noise protection steps must be taken by the operating entity as part of their duties in accordance with the Operational Safety Directive [BetrSichV or equivalent other national regulations], for instance hearing protection.

### **3.2.2 Vibrations**

KLEIN blowers are designed to such a high balance quality grade that no dangerous vibrations will occur.

Vibrations resulting from unavoidable residual imbalance can be reduced by installing the equipment with vibration dampers, thus preventing vibrations from being transferred to other components.

External vibrations or impacts must be prevented from being transferred to the blower. The blower must not be exposed to dynamic forces.

## **3.3 Overheating protection**

To avoid potential overheating, the operating entity can request a thermal winding protector when placing the order.

Under all circumstances, the operating entity must avoid excessive dust build-up on the surface by timely cleaning. The dust buildup must not exceed a thickness of 1mm. The dust must not be combustible or ignitable.

## 4 Transportation and storage



### Instruction

A suitable lifting strap should be used and the motor secured in such a way that balance is maintained when transporting and installing weights in excess of 25 kg. Only transport the equipment with suitable rigging and lifting implements. Prevent the blower from tipping.



### Attention!

During transport, body parts are subject to a crushing hazard between the blower and the surroundings.



### Instruction!

Dispose of packaging materials properly. Do not burn them.



### Storage instructions

Before transporting the blower to the installation site, the equipment should only be stored in enclosed, dry areas. Storage in open spaces that are protected by roofing is only permitted for short periods.

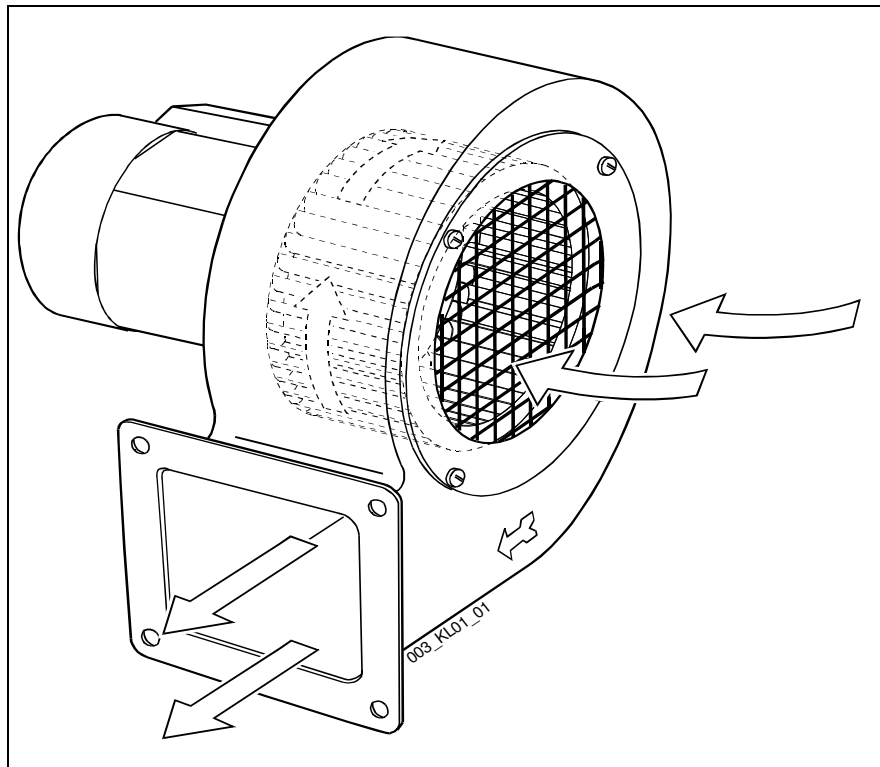
The blower must be protected against damaging environmental influences and mechanical damage.

## 5 Description

### Standard configuration

KLEIN blowers are radial blowers with a ball-bearing mounted electrical drive.

The respective medium is ingested axially and exhausted radially in the desired direction (see illustration).



Flow direction of the medium

## 6 Assembly/installation

### 6.1 General safety instructions for assembly and operation



#### **Warning! Life-threatening electrical shock hazard!**

A life-threatening electrical shock hazard exists if the blower cable ends are connected without first disconnecting the electrical power.

**Always disconnect power prior to working on components that are electrically energized.**

- Correspondingly, the electrical hook up may only be performed by a qualified and trained electrician who is trained in installation procedures in explosive environments.
- Trained electricians are persons who are familiar with the assembly, installation, initial startup and operation of the equipment/machine and possess an appropriate qualification, or who are familiar with safety technology standards in the maintenance and use of appropriate protective gear and accident prevention procedures.
- The installation depends on the requirements placed on the blower and function-specific conditions at the installation location (on the machine or the equipment).
- Only use spark-free tools when performing assembly and installation work in explosive environments.

## 6.2 Hook-up/ installation



### Instruction!

The terminal assignments on the terminal block can be found in the terminal box. The circuit diagram must be observed. A correct hook-up ensures trouble-free operation.



### Instruction

Connecting and control cables must be installed to EMV standards in accordance with operating requirements and the respective local regulations.

## 6.3 Assembly and installation specifications for explosive areas

### Additional mandatory requirements:



### Instruction

The blower may only be attached using one location. Either at the exhaust flange, the blower base and/or motor console or at the intake mounting flange.



### Instruction!

The operating entity must install a suitable motor cut-off switch. The minimum specifications for this (nominal current and  $t_e$  period) is shown on the type plate.



### Attention!

During installation, body parts are subject to a crushing hazard between the blower and the surroundings.

- If the blower is operated with an open intake, the surrounding area must be free of ingestible objects.
- The minimum distance between a wall and the cooling-blower enclosure is 30 mm
- The motor breaker or motor cut-off switch must correspond to the nominal motor rating shown on the motor specification (type plate).

## 6.4 Blower mounting



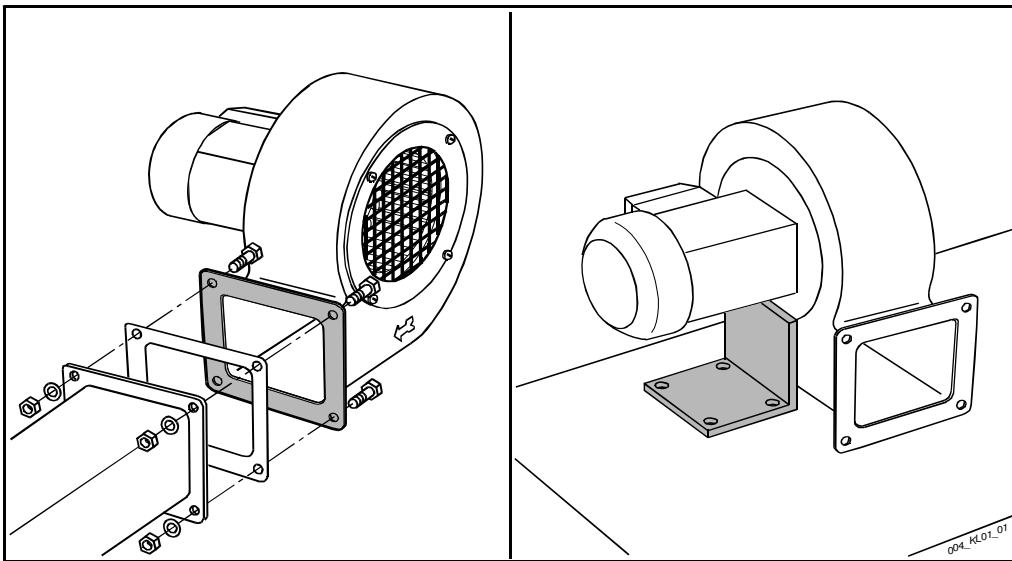
### Attention! Potential for equipment damage!

A double sided mounting must be avoided. This can result in damage and failure of blower components.

Decouple structure-borne sound by installing a conducting pipe expansion joint.

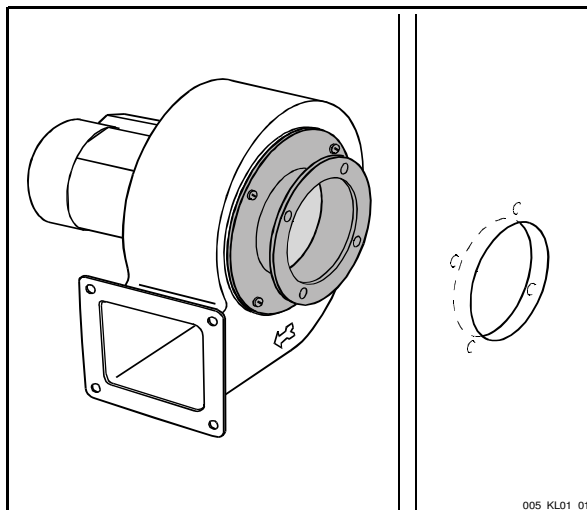
The blower may only be mounted at one location! Either at the exhaust flange, the blower base and/or motor console or at the intake mounting flange.

### Installation examples:



At the exhaust flange

At the motor console



At the intake mounting flange for wall installation

## 7 Maintenance, care and repair instructions



### Instruction!

Depending on the intended use of the blower and the respective system concept, the operating entity may consider additional cleaning and/or maintenance intervals.

Unauthorized repair of damage or exchange of components are hazardous. This renders the explosion protection features ineffective.

### 7.1 Maintenance and care

- When using condensation water drainage holes, or when the equipment is deployed in locations with dew buildup, causing condensation water to collect in the motor's interior, the collected condensation water must be drained at regular intervals via the condensation water drainage opening at the lowest point of the bearing enclosure/housing; the drainage opening must be subsequently resealed.
- Dust deposits on the equipment surface must not exceed a thickness of 1mm. The dust buildup must not be ignitable or combustible.
- The blower wheel must be regularly inspected for contamination and cleaned to identify imbalances of the blower wheel early, and to prevent imbalances.

### 7.2 Inspect and exchange bearings

- Inspect the unimpeded operation of bearings at regular intervals by monitoring the operating noises; replace as needed.
- The ball bearings must be replaced by the manufacturer or an authorized repair shop after no more than 18,000 operating hours or 3 years.

### 7.3 Repair instructions and procedures

Do not perform repairs on defective, damaged or unevenly running blowers yourself, but send the equipment to the manufacturer for repair. The manufacturer will ensure that repairs are performed properly and that the equipment is properly balanced.

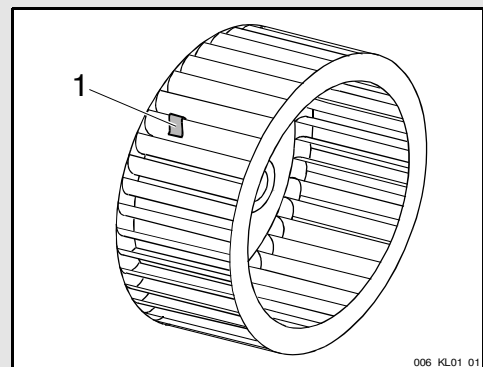
The blower should only be dismantled by qualified and trained personnel.



### Attention! Potential for damage to the equipment!

When balancing weight clips (1) are removed from or relocated on the blower fins, an imbalance results.

Never perform repairs on the blower on your own. If the assembly is not performed properly, any subsequent use may create an explosion hazard.





## 8 Disposal

Reusing defective blowers and/or their components, such as the blower impeller wheels, roller bearings, etc. can result in property damage and personal injury, as well as damage to the environment.

All blower components must be properly disposed of in compliance with national and international laws and regulations.

EN



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## Manufacturer's Declaration about the Installation of an Incomplete Machine

According to EU Directive 2006/42/EG, Appendix II - 1 B and acc. to 9th Edict to the Law Of Products and Devices Safety 4  
(German: Maschinenverordnung- 9.GPSGV.)

We herewith declare that the following products

Radial Fans of Type: EEG ... / DEG ... / ENG ... / DNG ... / EMV ... / DMV ... /  
EMVL  / DMVL ... / DHV   
beginning with year of manufacture 2010,

as far as it is possible within the scope of delivery, comply with the basic requirements of the following directives  
(please read appendix of this document for further information about which requirements are met explicitly):

Directive of the Council 2006/42/EG (Machine Directive)

Directive of the Council 94/9/EG (ATEX Directive)

Directive of the Council 2006/95/EG (Electrical Devices)

The labeling of the devices has to contain the following inscription(s):



II 2 G c T3  T6

The products were manufactured in accordance with the following harmonized standards:

DIN EN 12100-1 und -2	Safety of machines
DIN EN 1127-1	Explosive atmospheres, explosion protection
DIN EN 13463-1 und -5	Non-electrical devices for the use in explosion endangered areas
DIN EN 14986	Construction of fans to be used in explosion endangered areas
DIN IEC 60079/ -1 und -7	Electrical devices for explosion endangered areas
DIN EN 60204-1	Safety of machines, electrical equipment of machines

Requirements of appendix I of the Machine Directive which are met: The chapters of 1.1.2, 1.1.3, 1.3.4, 1.7.4.2 (partially).

Furthermore we declare that the technical documents for these incomplete machines have been manufactured according to Appendix VII B. We enrol ourselves to hand over these documents to market surveillance authorities.

Advice:	Start of operation is forbidden until it is ascertained that the complete machine/plant in which the fan is to be integrated, fully meets the requirements of the European Machine Directive (2006/42).
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City/ Date of issuing

Aichwald, 2011-02-05

Sign and role of the subscriber

Manfred Griesinger, CEO



