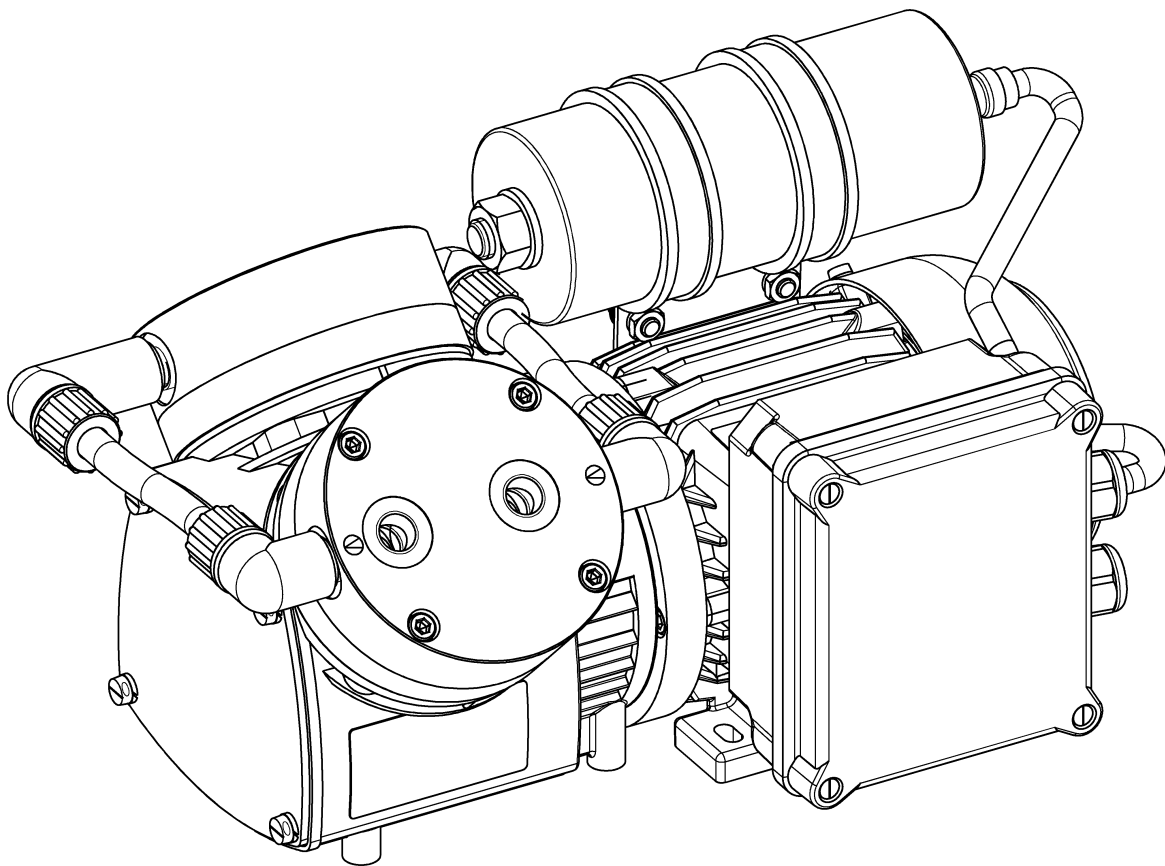


ATEX

**N026 EX
TRANSLATION OF ORIGINAL OPERATION AND
INSTALLATION INSTRUCTION
ENGLISH**

DIAPHRAGM PUMP



Notice!

Before operating the pump and accessories, read and observe the operating and installation instructions as well as the safety information!

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1 About this document

1.1 Using the operating and installation instructions

The operating and installation instructions are part of the pump.

- In the event of uncertainties with regard to the content of the operating and installation instructions, please contact the manufacturer (contact data: see www.knf.com). Please have the type and serial number of the pump ready.
- Read the operating and installation instructions before you commission the pump.
- Give the operating and installation instructions only completely and unchanged to the next owner.
- Keep the operating and installation instructions within reach at all times.

Project pumps For customer-specific project pumps (pump models that begin with "PJ" or "PM"), there may be deviations from the operating and installation instructions.

- For project pumps, also observe the agreed specifications.

Motor The operating and installation instructions apply for the pump part.

- Also observe the operating instructions for the motor in the appendix.

1.2 Exclusion of liability

The manufacturer assumes no liability for damages and malfunctions resulting from failure to observe the operating and installation instructions.

The manufacturer assumes no liability for damages and malfunctions resulting from changes or modifications to the device and improper handling.

The manufacturer assumes no liability for damages and malfunctions resulting from impermissible spare parts and accessories.

1.3 Symbols and markings

Warning notice



A notice that warns you of danger is located here. Possible consequences of a failure to observe the warning notice are specified here. The signal word, e.g. warning, indicates the danger level.

→ Measures for avoiding the danger and its consequences are specified here.

Danger levels

Signal word	Meaning	Consequences if not observed
DANGER	warns of immediate danger	Death or serious injury or serious damage will result.
WARNING	warns of possible danger	Death, serious injury or serious damage is possible.
CAUTION	warns of a possibly dangerous situation	Minor injury or damage is possible.
NOTICE	warns of possible damage	Damage is possible.

Tab.1 Danger levels

Other notices and symbols

→ An activity to be carried out is specified here (a step).

1. The first step of an activity to be carried out is specified here. Follow other sequentially numbered steps.



This symbol indicates important information.

Explanations of pictograms

Pictogram	Meaning
	General warning symbol
	Warning of hot surface
	Warning of electrical voltage
	Warning of explosive materials
	Warning of poisonous substances
	Warning of hand injuries through crushing
	Observe the operating instructions
	General mandatory sign
	Wear hearing protection
	Environmentally conscious disposal

Tab.2 Explanations of pictograms

2 Use

2.1 Proper use

The pumps are intended exclusively for transferring gases and vapors.

Responsibility of the owner

Operating parameters and conditions

Only install and operate the pumps in accordance with the operating parameters and conditions described in Chapter 4 *Technical data* and Chapter 2.3 *Use in potentially explosive areas*.



Pumps with ATEX designation do not always satisfy the regulations for potentially explosive areas in countries outside of the EU.

Only pumps that are fully assembled and in the condition as delivered may be operated.

Make sure that the installation location is dry and that the pump is protected against rain, splash, gushing, and drip water as well as from other contaminants.

The pump is suitable for transferring potentially explosive atmospheres and for operation in potentially explosive atmospheres.

Check the tightness of the connections between the pipes of the application and the pump (or the connection of the pump) at regular intervals. Leaky connections carry the risk of releasing dangerous gases and vapors from the pump system.

Requirements on the transferred medium

Before transferring a medium, check whether the medium can be transferred danger-free in the specific application.

Before using a medium, check the compatibility of the media-contacting components (see 4 *Technical data*) with the medium.

Risk of dangerous gas mixtures during pump operation if diaphragm breaks: Depending on the medium being transferred, breakage of the diaphragm can result in a dangerous mixture if the medium mixes with the air in the compressor housing or the surroundings.

Make certain that no risk of explosion arises even in extreme operating situations (temperature, pressure) and in the event of system breakdowns.

Only transfer gases that remain stable under the pressures and temperatures that arise in the pump.

2.2 Improper use

The pumps are not suitable for use below ground.

The pumps are not suitable for delivering:

- Dusts
- Fluids
- Aerosols
- Biological and microbiological substances
- Explosives
- Fibers
- Foodstuffs.

Pumps that can produce both vacuum as well as overpressure may not be used to simultaneously produce vacuum and overpressure.

This function can be made possible on a project basis following consultation with KNF Customer Service.

No overpressure may be applied to the suction side of the pump.

This function can be made possible on a project basis following consultation with KNF Customer Service.

2.3 Use in potentially explosive areas

In potentially explosive atmospheres (zones), only operate pumps and motors of the appropriate category and temperature class.

The pumps have the following EU explosion protection designation:

Designation	Description
	Symbol for explosion-proof pumps
II	Equipment group (See Chapter 2.4.1 <i>Device groups</i>)
2/2G	Device category (See Chapter 2.4.2 <i>Device categories for gas</i>)
Ex	Symbol indicates that the device complies with one or more ignition protection types
h	Symbol for ignition protection type (See Chapter 2.4.5 <i>Ignition protection type</i>)
II B + H2	Explosion groups (see Chapter 2.4.3 <i>Explosion groups</i>)
T4	Temperature class (see Chapter 2.4.4 <i>Temperature classes</i>)
Gb	Equipment protection level (See Chapter 2.4.6 <i>Equipment protection level for gas</i>)
	Special operating conditions (See Chapter 2.4.7 <i>Special operating conditions</i>)

Tab.3

An ignition hazard assessment in accordance with standards DIN EN ISO 80079-36 and DIN EN ISO 80079-37 was performed for the pumps. The protective goals were reached by applying the ignition protection type of constructional safety "c".

The explosion protection designation can also be found at the following location:

- Type plate of the pump

Motor The pump motor must have at least the same explosion protection as the pump.

2.4 Explanations of the explosion protection designation

2.4.1 Device groups

- Device group I Device group I applies for devices that are used in underground plants of mines as well as their underground systems that could be endangered by methane and/or combustible dusts.
- Device group II Device group II applies for devices that are used in other areas that could be endangered by an explosive atmosphere.

2.4.2 Device categories for gas

The device category describes the frequency and the duration of the occurrence of explosive atmospheres during operation.

Device category	Description
1G	Devices of this category are designed for use in areas in which an explosive atmosphere consisting of a mixture of air and gases, vapors or mists is present constantly or for long periods of time or often.
1D	Devices of this category are designed for use in areas in which an explosive atmosphere consisting of a dust/air mixture is present constantly or for long periods of time or often.
2G	Devices of this category are designed for use in areas in which it is to be expected that an explosive atmosphere consisting of gases, vapors or mists forms occasionally.
2/2G	Devices that extract from zone 1 and are designed for use in areas in which it is to be expected that an explosive atmosphere consisting of gases, vapors or mists forms occasionally.
2/-G	Devices that extract from zone 1 but are not designed for installation in a potentially explosive atmosphere (zone).
2D	Devices of this category are designed for use in areas in which it is to be expected that an explosive atmosphere consisting of a dust/air mixture forms occasionally.
3G	Devices of this category are designed for uses in areas in which it is to be expected that an explosive atmosphere resulting from gases, vapors or mists occurs, though in all likelihood occurs only seldom and for a very short length of time.
3/-G	Devices that extract from zone 2 but are not designed for installation in a potentially explosive atmosphere (zone).
3D	Devices of this category are designed for uses in areas in which it is to be expected that an explosive atmosphere resulting from stirred-up dust occurs, though in all likelihood occurs only seldom and for a very short length of time.

Tab.4

2.4.3 Explosion groups

Combustible gases and vapors are classified according to explosion groups (I, IIA, IIB and IIC) and temperature classes. The following table shows the classification of the most common combustible gases and vapors.

	T1	T2	T3	T4	T5	T6
I	Methane	–	–	–	–	–
IIA	Acetone Ethane Ethyl acetate Ammonia Ethyl chloride Benzene Acetic acid Carbon monoxide Methane Methanol Methyl chloride Naphthalene Phenol Propane Toluene	i-amyl acetate n-butane n-butyl alcohol Cyclohexanone 1,2-dichloroethane Acetic anhydride	Gasoline Diesel fuel Jet fuel Heating oils n-hexane	Acetaldehyde	–	–
IIB	Town gas	Ethylene Ethyl alcohol	Hydrogen sulfide	Ethyl ether	–	–
IIC	Hydrogen	Acetylene	–	–	–	Carbon disulfide

Tab.5

The classification of gases and vapors into groups with respect to explosion group and temperature class applies for the transferred medium as well as for the pump surroundings.

Transferred medium The pump may only be used to transfer gases and vapors that belong to the respective explosion group and corresponding temperature class (or below) (see designation on the type plate) or that are not explosive and combustible.

Environment of the pump The pump may only be operated in an environment that contains an atmosphere that belongs to the respective explosion group and corresponding temperature class (or below) (see designation on the type plate) or that is not explosive and not combustible.

2.4.4 Temperature classes

- Maximum surface temperature The maximum surface temperature is the highest temperature that is reached under the most unfavorable conditions of a surface of the pump.
- Ignition temperature The maximum surface temperature of the pump must always be lower than the lowest ignition temperature of the gas or vapor/air mixture in which it is used.
- Temperature class The maximum surface temperature arises from the design of the pump and is specified as temperature class.

Temperature class	Max. surface temperature [°C]	Ignition temperature [°C]
T1	450	> 450
T2	300	> 300
T3	200	> 200
T4	135	> 135
T5	100	> 100
T6	85	> 85

Tab.6

2.4.5 Ignition protection type

Designation	Description
h	Constructional safety "c"
h	Ignition source monitoring "b"
h	Liquid immersion "k"

Tab.7

An ignition hazard assessment in accordance with standards DIN EN ISO 80079-36 and DIN EN ISO 80079-37 was performed for the pumps. The protective goals were reached by applying ignition protection type constructional safety "c".

2.4.6 Equipment protection level for gas

The equipment protection level describes the frequency and the duration of the occurrence of explosive atmospheres in an area.

Equipment protection level	Description*	Constructional safety
Ga	Devices with very high protection level for use in potentially explosive areas. With these devices, there is no risk of ignition during normal operation or in the event of foreseeable or infrequent faults/malfunctions.	Very high
Gb	Devices with high protection level for use in potentially explosive areas in which there is no risk of ignition during normal operation or in the event of foreseeable or infrequent faults/malfunctions.	High
Gc	Device with increased protection level for use in potentially explosive areas. There is no risk of ignition during normal operation. The devices have a number of additional protection measures which ensure that, in the event of commonly foreseeable faults in the device, no danger of ignition exists.	Increased

Tab.8 *according to DIN EN ISO 80079-36

2.4.7 Special operating conditions

- The pumps may not be set up outdoors. Commissioning may only be performed with suitable weather- and corrosion-protection paneling.
- The pumps are to be set up so that they are not exposed to any UV radiation.

3 Safety



Observe the safety notices in Chapters 7 *Installation and connection* and 8 *Operation*.

The pumps are produced in accordance with the generally recognized rules of engineering, as well as the occupational health, safety and accident prevention regulations. Nevertheless, dangers can arise during their use that lead to injuries to the user or third parties or to damage to the pump or other property.

Only use the pumps in perfect technical condition, for their intended purpose, safely and aware of the dangers and in observation of the operating instructions.

The components that are to be connected to the pumps must be designed according to the pneumatic data of the pumps.

When connecting the pumps to the electrical mains, observe the corresponding safety rules.

Personnel Make sure that only specially trained personnel or trained and instructed personnel work on the pumps. This applies, in particular, for connection and servicing work.

Make sure that the personnel have read and understood the operating instructions, particularly the chapter on safety.

Working in a safety conscious manner Observe the regulations on accident prevention and safety during all work on the pumps and during operation.

Avoid contact with the heads and housing parts, as the pump heats up during operation.

When working on the pump, make certain that the pump is disconnected from mains and without power.

Ensure that no hazards arise from flows when gas connections are open, from the effects of noise or from hot, corrosive, dangerous, and environmentally hazardous gases.

Classification of a pump environment When classifying a pump environment in a potentially explosive area (zone), observe the "Guideline for Preventing Danger from Explosive Atmospheres, with a Collection of Examples – Explosion Protection Guidelines – (EX-RL)".

If the situation relates to special cases or if doubt exists about the definition of the potentially explosive atmospheres, inform the regulatory authorities and have them make the decision.

Use in a potentially explosive environment The following applies for use in a potentially explosive environment consisting of gases, vapors and mists:

The lowest ignition temperature of the potentially explosive atmospheres that comes into question must be higher than the so-called "maximum surface temperature" of the pump.

According to DIN EN ISO 80079-36, the maximum surface temperature is the highest temperature that is achieved during operation under the most unfavorable conditions (but within the accepted tolerances) of a part or on a surface of the pump.

The maximum surface temperature is specified from the design of the pump and noted on the pump type plate as the temperature class.

Explosion protection The introduction of ignition sources such as sparks, open flames and hot surfaces may result in explosions in potentially explosive atmospheres.

Therefore, during transport, during installation and during all work on the device in the potentially explosive atmosphere:

- Only perform work when there is no possibility of a potentially explosive atmosphere.

	Only use tools and lifting gear that are approved for use in potentially explosive atmospheres.
Handling of hazardous media	Upon breakage of the diaphragm and/or leaks, the transferred medium mixes with the air in the surroundings and/or in the pump housing. Make sure that a dangerous situation cannot arise as a result. When pumping hazardous media, observe the safety regulations for the handling of said media.
Handling of combustible media	Make certain that the temperature of the medium is always sufficiently below the ignition temperature of the medium so as to prevent ignition or explosion. This also applies for abnormal operating situations. Note that the temperature of the medium increases when the pump compresses the medium. Therefore, make certain that the temperature of the medium also remains sufficiently below the ignition temperature of the medium even when it is compressed to the maximum permissible operating pressure of the pump. The maximum permissible operating pressure of the pump is stated in Chapter 4 <i>Technical data</i>. Make certain that the permissible ambient temperature (4 <i>Technical data</i>) is not exceeded. Where applicable, also take into account external energy sources (such as radiated heat sources) that could additionally heat the medium. In case of doubt, contact KNF Customer Service.
Environmental protection	Protect all replacement parts in storage according to environmental regulations and dispose of all replacement parts according to regulations. Observe both the respective national and international regulations here. This applies in particular to parts that are contaminated with toxic substances.
EU/EC directives/standards	See EC/EU Declaration of Conformity
	
Customer service and repairs	The pumps are maintenance-free. However, KNF recommends periodic inspection of the pump for obvious changes in noise or vibration. Only have repairs to the pumps performed by qualified KNF personnel. Housings with electrically live components may only be opened by specialized personnel. Use only genuine spare parts from KNF when performing servicing work. Only have repairs to the motors performed by the responsible KNF Customer Service.

4 Technical data

4.1 Technical data

Pump materials

Assembly	Material AT	Material ST
Pump head	Aluminum	Stainless steel
Diaphragm	EPDM/PTFE-coated	EPDM/PTFE-coated
Valve	Stainless steel, PTFE*	Stainless steel, PTFE*

Tab.9 *only for agreed-upon special versions

Assembly	Material AP	Material SP
Pump head	Aluminum	Stainless steel
Diaphragm	EPDM	EPDM
Valve	Stainless steel, EPDM*	Stainless steel, EPDM*

Tab.10 *only for agreed-upon special versions

Pneumatic values

Parameter	Value N026	Value N026.1.2
Max. permissible operating pressure [bar rel*]	2.5	2.0
Ultimate vacuum [mbar abs.]	100	100
Flow rate at atm. pressure [l/min]**	15.0	26.0

Tab.11 **Bar rel related to 1013 hPa*

*Liters in standard state (1013 hPa, 20°C)

Pneumatic connections

Pump type	Value
N026	Thread size G1/8*
N026.1.2	Thread size G1/4*

Tab.12 *Acc. to ISO 228

Other parameters

Parameter	Value
Permissible ambient temperature [°C]	+ 5 to + 40
Permissible media temperature [°C]	+ 5 to + 40
Dimensions -N026 -N026.1.2	See Fig. 3, Kapitel 7.1 <i>Installing the pump</i> See Fig. 4, Chapter 7.1 <i>Installing the pump</i>
Electrical data	See motor type plate
Gas tightness* of the pump head	< 6 x 10 ⁻³ mbar l/s
Relative air humidity	80% for temperatures to 31°C, decreasing linearly to 50% at 40°C (non-condensing).

Tab.13 **The gas tightness of the pump head is no longer ensured after the pump head is opened or after replacing diaphragm and valves. A leak test can be used to determine whether the original gas tightness is achieved again.

Weight

Pump type	Value [kg] Three-phase motor	Value [kg] Capacitor motor
N026ST	7.9	8.9
N026AT	6.6	7.6
N026.1.2ST	10.8	11.4
N026.1.2AT	8.3	9.3

Tab.14

5 Design and function

Design

- 1 Pump outlet
- 2 Pump inlet
- 3 Capacitor
- 4 Type plate of the pump
- 5 Pump head
- 6 Motor

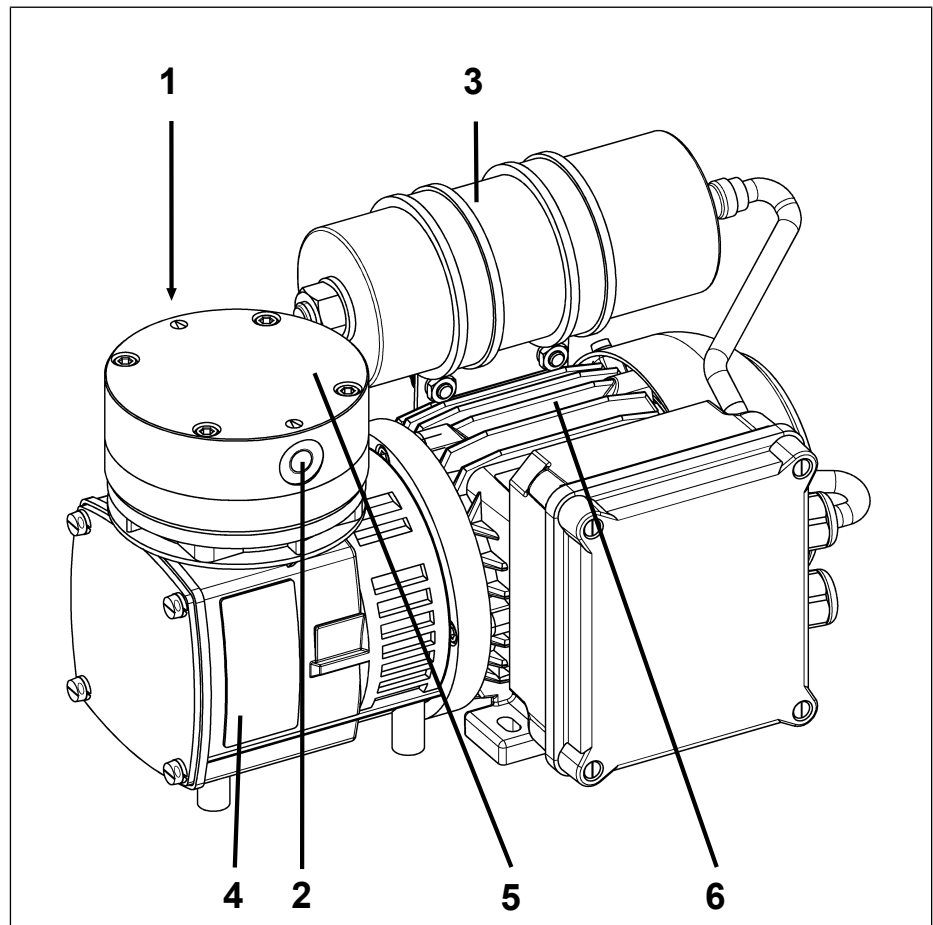


Fig.1 Design N026 EX (with capacitor motor)

Function of a diaphragm pump

- 1 Outlet valve
- 2 Inlet valve
- 3 Transfer chamber
- 4 Diaphragm
- 5 Eccentric
- 6 Connecting rod

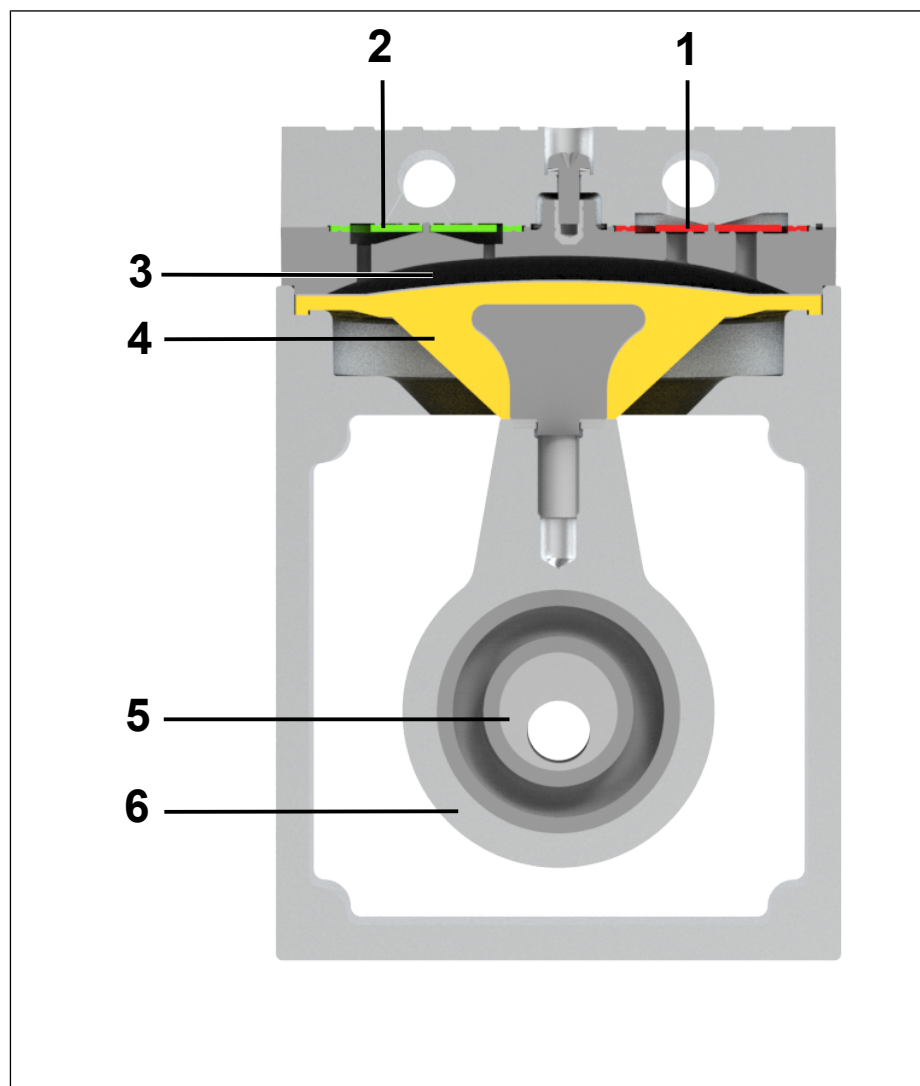


Fig.2 Function of a diaphragm pump

Diaphragm pumps transfer, compress (depending on the version) and evacuate gases and vapors.

The elastic diaphragm (4) is moved up and down by the eccentric (5) and the connecting rod (6). In the downwards stroke, it aspirates the gas to be transferred via the inlet valve (2). In the upwards stroke, the diaphragm presses the medium out of the pump head via the outlet valve (1). The transfer chamber (3) is separated from the pump drive by the diaphragm.

6 Transport

General



Personal injury and/or property damage due to incorrect or improper transport of the pump

In the event of incorrect or improper transport, the pump can fall down, be damaged or injure persons.

- Use suitable auxiliary means if necessary (carrying strap, lifting gear, etc.).
- Where appropriate, wear suitable personal protective equipment (e.g., safety shoes, safety gloves).



Risk of injury from sharp edges on the packaging

There is a risk of injury from cutting on the sharp edges when grabbing corners or when opening the packaging.

- Where appropriate, wear suitable personal protective equipment (e.g., safety shoes, safety gloves).

Only for two-headed pumps:



Personal injury and/or property damage due to incorrect or improper transport of the pump

If the pump is raised and/or carried on the connection during transport, leaks and/or damages to the pump may result.

- Do not carry the pump on the pneumatic connection.

-
- Transport the pump in the original packaging to the installation location.
 - Store the original packaging of the pump (e.g., for later storage).
 - Inspect the pump for transport damage after receiving it.
 - Document any transport damage in writing.
 - Remove any transport safeguards on the pump prior to commissioning.

Parameter

Parameter	Value
Storage temperature [°C]	+ 5 to + 40
Transport temperature [°C]	- 10 to + 60
Permissible humidity (non-condensing) [%]	30 to 85

Tab.15 Transport parameters**NOTICE**

Prior to commissioning, make sure that the pump has reached the ambient temperature (*4 Technical data*).

7 Installation and connection

The pumps are only to be installed in accordance with the operating parameters and conditions described in Chapter 4 *Technical data*.

→ Observe the safety notices (see Chapter Safety).



Risk of dangerous gas mixtures during pump operation

Depending on the medium being transferred, breakage of the media-contacting components can result in a dangerous mixture if the medium mixes with the air in the compressor housing or the surroundings.

→ Before using a medium, check the compatibility of the media-contacting components (see 4 *Technical data*) with the medium.

7.1 Installing the pump

→ Store the pump at the installation site prior to installation to bring it up to the ambient temperature.

Mounting dimensions → For mounting dimensions, see the following illustrations:

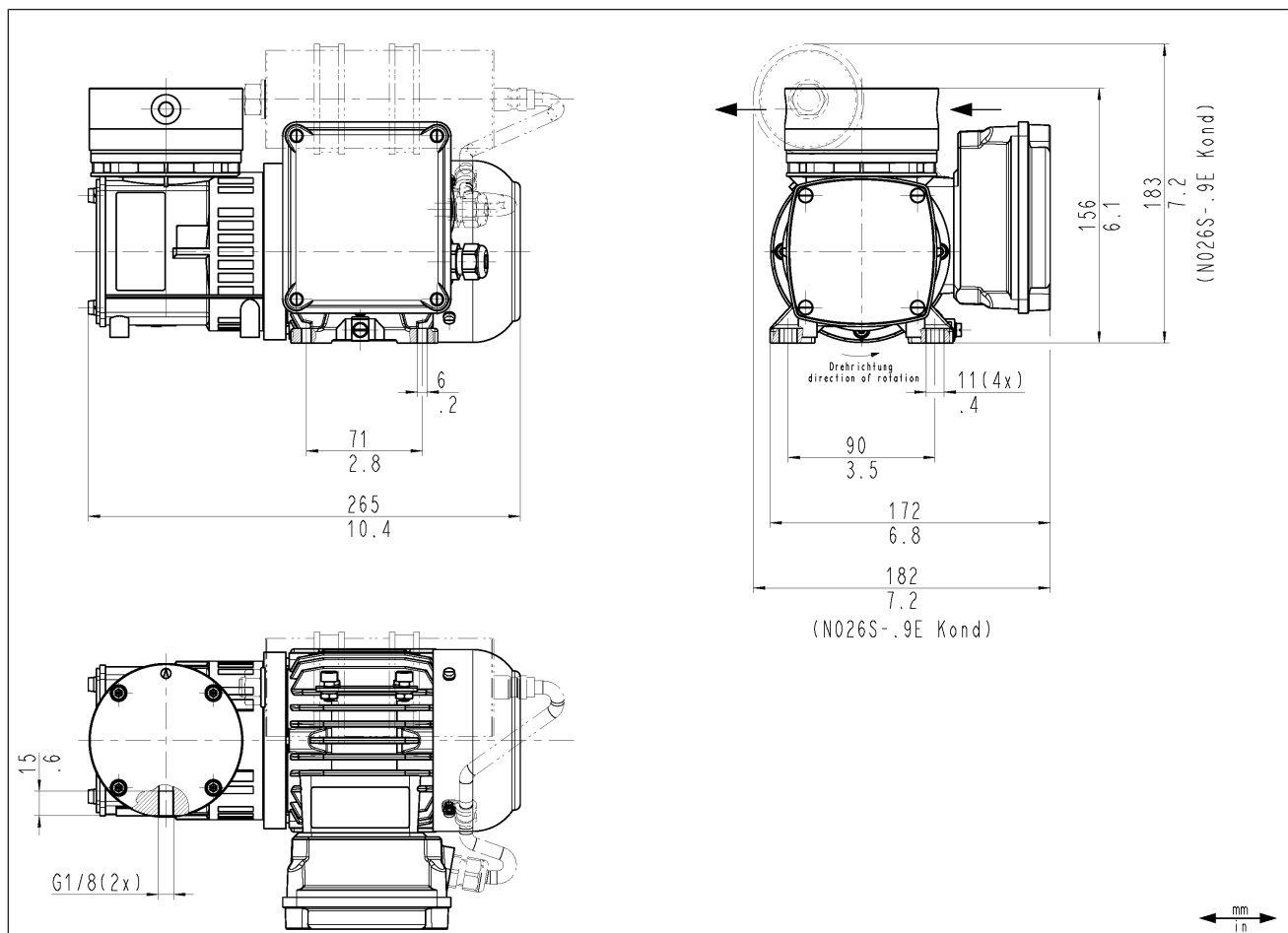


Fig.3 Mounting dimensions N026 EX

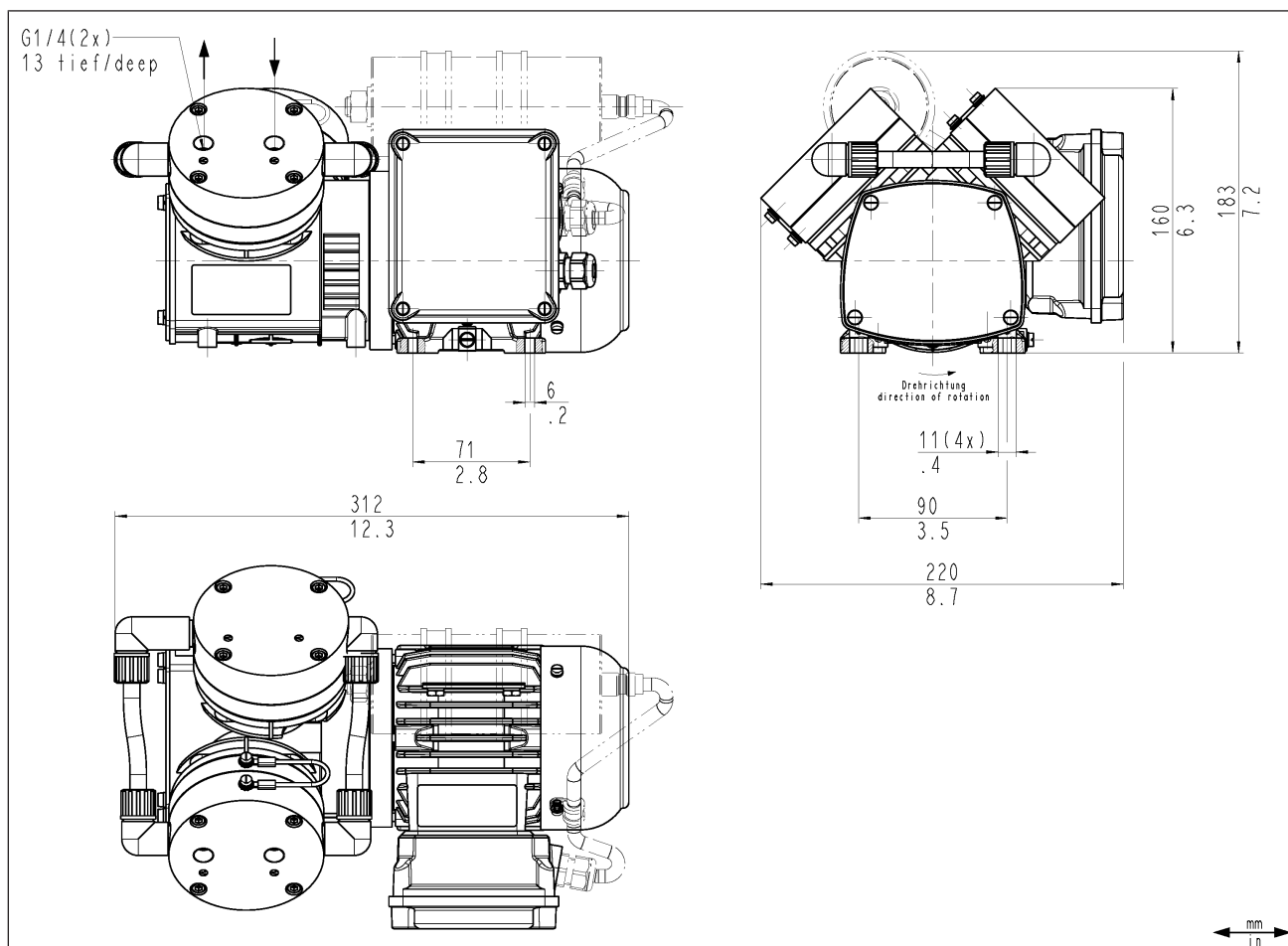


Fig.4 Mounting dimensions N026.1.2 EX

Cooling air supply



Risk of explosion due to lack of cooling air supply

- Mount the pump so that the fan wheel of the pump can draw in sufficient cooling air.
- Ensure sufficient ventilation or heat dissipation in the vicinity of the pump.



Danger of burning on hot surfaces

Hot surfaces could occur if the pump overheats.

- When installing the pump, make sure that sufficient cooling air infeed and discharge is ensured.

Immediate environment of the hot pump parts

- During installation, make sure that no combustible or thermally deformable objects are positioned in the immediate area of the hot pump parts (head, motor).

Installation location

- Make sure that the installation location is dry and that the pump is protected from rain, water spray, splash water, dripping water and other contamination.
- Make sure that the installation location is accessible for service.

→ Make sure that access to moving parts is prevented.

i The IP protection class of the pump motor is specified on the type plate.

→ Mount the pump at the highest point in the system to prevent condensation from collecting in the pump head.

→ Protect the pump from dust.

→ Protect the pump from vibration and impact.



Personal injury and/or property damage from vibrations

Pump vibrations, in combination with adjacent components, can result in crushing and/or damage to these components.

→ Make sure that pump vibrations cannot lead to dangers in combination with adjacent components.

Installation position

→ The pump must be installed in the depicted installation position. Use metal screws to fasten the pump at the attachment points indicated in Chapter 7 *Installation and connection*.

7.2 Electrical connection



Danger to life from electric shock

→ Only have the pump connected by an authorized specialist.

→ Only have the pump connected if the power supply is disconnected.



Risk of explosion from electrostatic charge

→ Connect the pump so that the risk of ignition from electrostatic charge is avoided.

→ Carefully ground the pump.

→ When connecting to a power source, observe the applicable standards, directives, regulations and technical standards.

→ When connecting to a power source, carefully read and observe the operating instructions for the motor.

→ Install a device for separating the pump motor from the electrical mains in the electrical installation.

→ It is recommended that an additional EMERGENCY STOP device be installed.

Potentially explosive atmospheres

→ Only place the electrical equipment in potentially explosive atmospheres that is necessary there for the operation of the pump.

→ Take lightning protection measures.

- Fastening the connection cables → Fasten the connection cables so that
- the cables do not come into contact with movable or hot parts.
 - the cables cannot be worn or damaged on sharp corners or edges
 - no tensile and pressure forces are exerted on the connection point of the cables (strain relief)

7.3 Pneumatic connection



Personal injury or property damage through ejected plugs

If not removed, the plugs on the pressure side of the pump can be ejected during operation by the resulting overpressure.

- Remove the plugs during installation.
- Wear appropriate personal protective equipment.

- Connected components → Only connect components to the pump that are designed for the pneumatic data and thermal requirements of the pump. (see Chapter 4 *Technical data*).
- Pressure relief device → Protect the compressors by means of a pressure relief device between the pressure-side connections of the compressor and the first shut-off valve.



Risk of explosion during pressure limitation resulting from the medium mixing with the environment

- Make certain that there is no risk of explosion posed by the medium mixing with the environment.

- Pump discharge → If the pump is used as a vacuum pump, safely (with respect to medium and noise) drain the hot pump discharge that may, under certain circumstances, occur at the pneumatic outlet of the pump.
- Decoupling → KNF recommends mechanically decoupling the pump from the pipe system, e.g., through the use of flexible hoses or pipes. In this way it is possible to prevent the transfer of possible pump vibrations and noises to the system.

Connecting the pump

**CAUTION**

Risk of injury from mixing up suction side and pressure side

Mixing up the suction side and pressure side can result in breakage of connected components on the suction side and pressure side.

→ Observe the marking of inlet and outlet on the pump head.

-
1. Remove the protective plugs from the gas connection threads.
 2. Connect the suction line and the pressure line (for mounting dimensions, see Chapter 4 *Technical data*).
 3. Lay the suction line and the pressure line at a downward angle to prevent condensate from running into the pump.

8 Operation

8.1 General



Risk of burns from hot pump parts and/or hot medium

Some pump parts may be hot during or after operation of the pump.

- Allow the pump to cool after operation.
- Take protective measures to protect against touching hot parts.



Injury to eyes

Coming too close to the inlet/outlet of the pump may result in injury to the eyes due to the present vacuum/operating pressure.

- Do not look into the pump inlet/outlet during operation.

- Only operate the pumps in accordance with the operating parameters and operating conditions described in Chapter 4 *Technical data* and in Chapter 2.3 *Use in potentially explosive areas*.
- Ensure the proper use of the pumps (See Chapter 2.1 *Proper use*).
- Eliminate the possibility of improper use of the pumps (see Chapter 2.2 *Improper use*).
- Observe safety notices (Chapter 3 *Safety*).



Risk of pump head bursting due to excessive pressure increase

- Do not exceed the maximum permissible operating pressure (see 4 *Technical data*).
- Monitor the pressure during operation.
- If the pressure exceeds the maximum permissible operating pressure of the pump: immediately switch off the pump and remedy the fault (see Chapter Troubleshooting).
- Only throttle or regulate the air or gas quantity on the suction line to prevent the maximum permissible operating pressure from being exceeded.
- If the air quantity or gas quantity on the pressure line is throttled or regulated, make sure that the maximum permissible operating pressure at the pump is not exceeded.
- Ensure that the pump outlet is not closed or restricted.



Risk of explosion from elevated ambient temperature

- Monitor the ambient temperature (compression heat, motor heat).
- Ensure sufficient cooling air supply.



Excessive pressure, with all of the associated hazards, can be prevented by means of a bypass line with a pressure relief valve between the pressure side and suction side of the pump. Further information is available from KNF Customer Service (contact data: see www.knf.com).



Risk of dangerous gas mixtures during pump operation if diaphragm breaks

If the diaphragm should break, the medium will mix with the air in the compressor housing or in the surroundings.

- Stop pump immediately.
- Replace the diaphragm prior to further operation (see Chapter 9 *Servicing*).



Because the diaphragm is a wear part, diaphragm breakage may occur at any time.

Pump standstill

- When the pump is at a standstill, establish normal atmospheric pressure in the lines.

Vapors as medium

- Preventing condensate from forming in the pump will extend the service life of the diaphragm. Therefore, only use a warm pump with saturated or nearly saturated vapors.



Operation with open suction-side gas connection can result in contaminants and objects being drawn in.

8.2 Information on switching the pump on and off

Switching on the pump



The pump must not be started up against pressure or vacuum during switch-on. This also applies during operation after a brief power failure.

- Ensure that normal atmospheric pressure is present in the lines when switching on.

Switching off the pump

- KNF recommends: When pumping corrosive media, flush the pump before switching off (see Chapter 9.2.1 *Flushing the pump*) to extend the service life of the diaphragm.
- Establish normal atmospheric pressure in the lines (relieve pump pneumatically).

Recommissioning

- Before recommissioning, observe the applicable standards, guidelines, regulations and technical standards at the electrical connection.

Inspecting the pump

- Inspect the pump periodically for external damage or leakage.

9 Servicing



NOTICE

Servicing the pump

Damage to the pumps can result from failure to observe the applicable legal regulations and procedures for the location or intervention by untrained or uninstructed personnel.

- Servicing may only be performed according to the legal regulations (e.g. work safety, environmental protection) and provisions.
 - Servicing may only be performed by specialized personnel or trained and instructed personnel.
-

9.1 Servicing schedule



Risk of explosion from wear

- Have the connecting rod bearing replaced by KNF according to servicing schedule.
- Have the motor bearing replaced by KNF according to servicing schedule.



Risk of explosion if genuine spare parts are not used.

If original parts are not used, the pump loses its explosion protection properties. Furthermore, the function of the pump and its safety are lost. The validity of the CE conformity is rendered void if genuine spare parts are not used.

- Use only genuine spare parts from KNF when performing servicing work.

Component	Servicing interval
Pump	→ Inspect the pump periodically for external damage or leakage
Diaphragm and reed valves or valve plate(s)	→ At the latest, replace when the pump flow rate decreases
For N026.0: Connection rod bearing	→ Replace after 24,000 operating hours or after no more than 48 months
For N026: Connection rod bearing	→ Replace after 34,000 operating hours or after no more than 48 months
For N026.0: Motor bearing	→ Replace after 24,000 operating hours or after no more than 48 months
For N026: Motor bearing	→ Replace after 34,000 operating hours or after no more than 48 months
Gas connections	→ Inspect the pump periodically for external damage or leakage

Tab.16

The ball bearings installed in the pump and in the drive motor are lubricated for life. This means that the bearings are coated with a high-quality grease with a high degree of purity and an ideal fill level by the bearing manufacturer at the plant. These bearings cannot be relubricated. The prescribed bearing replacement periods can be found in Chapter 9.1 *Servicing schedule*.

The duration of use of the bearing grease depends on many highly individual factors. The prescribed bearing replacement periods were specified under the assumption of normal ambient conditions. Factors that can make early bearing replacement necessary include dust or dirt that may get into the bearing, aggressive gases or vapors that may change the lubricating properties of the bearing grease, etc. It is the operator's responsibility to assess these factors.

9.2 Cleaning

9.2.1 Flushing the pump



Risk of explosion by flushing the pump with air

- In potentially explosive areas or when using the pump with explosive media, only permit specialist to flush the pump with inert gas.



Risk of burns from hot pump parts and/or hot medium

Some pump parts may be hot during or after operation of the pump.

- Allow the pump to cool after operation.
- Take protective measures to protect against touching hot parts.

- Before switching off the pump under atmospheric conditions, flush for several minutes with inert gas.

i If there is no risk of explosion, flushing can also be performed with air.

- Discharge the media safely.

9.2.2 Cleaning the pump



Risk of explosion from electrostatic charging of the components

- Only clean the pump with a damp cloth.

- Only clean the pump with a damp cloth and non-flammable cleaning agents.
- Only use solvents during cleaning if head materials are not corroded (ensure resistance of the material).
- If compressed air is present, blow out the components.

9.3 Changing diaphragm and reed valves/valve plate(s)

The sequence of work steps varies depending on pump version:

- Pump models with reed valves, see Chapter 9.3.1 *Pump models with reed valves*
- Pump models with valve plates, see Chapter 9.3.2 *Pump models with valve plate*

In case of doubt, please contact KNF Customer Service (have serial number of the pump ready).

9.3.1 Pump models with reed valves

- Requirements → Disconnect the motor from mains and ensure that it is voltage-free.
 → Free the pump of hazardous materials.

Spare parts

Spare part*	Position designation**	Number per pump head
Diaphragm	(F)	1
Reed valve (stainless steel)	(M)	2
O-ring	(B)	2

Tab.17 *According to spare parts list, Chapter 11.1 Spare parts

**Acc. to Fig. 5

Tool and material

Quantity	Tool/material
1	Allen key, 4 mm
1	Screwdriver blade width 4.5 mm
1	Adjustable face spanner wrench for nuts with two holes or KNF wrench for retainer plate (see 11.2 Accessories).
	Thread locker (DELO ML 5249 or comparable product)
1	Pencil

Tab.18

- Information on the procedure → Always replace diaphragm, reed valves and O-rings together to maintain the performance of the pump.
- With multi-headed pumps, parts may be interchanged between the individual pump heads.
- Replace the diaphragm and reed valves of the individual pump heads in sequence.



Risk of explosion from formation of potentially explosive atmosphere

Leaky connections can result in dangerous potentially explosive atmospheres.

- Make certain that all elastomer parts are undamaged, clean and correctly installed.
- Check the pneumatic connections of the pump for leaks.
- Work with care during service work.
- Replace defective parts immediately.



Health hazard due to dangerous substances in the pump

Depending on the medium being transferred, caustic burns or poisoning is possible.

- Wear protective equipment if necessary, e.g., protective gloves, goggles.
- Clean the pump with suitable measures.

Work steps

The following item numbers refer to Fig. 5.

1. Only for two-headed pumps:
Open the pneumatic connection between the two heads; loosen one of the union nuts to do this; take care not to kink the connecting hose.
2. Removing the housing cover (H):

**WARNING**

Risk of explosion from damage

If the housing cover is bent or if the paint is damaged, there is no risk of explosion.

→ Perform the work steps carefully and without the use of force.

Loosen the fastening screws (G) of the housing cover (H) and remove the housing cover.

3. On a pump head, mark housing (A), intermediate plate (D) and head plate (C) with a continuous line made with a pencil. This helps avoid incorrect assembly later.
4. Loosen the four hexagon socket head cap screws (Y) and remove the head plate (C) and the intermediate plate (D) from the housing.
5. Remove the O-rings (B) from the head plate (C).
6. Loosen the valve fastening screws (W) in the head plate and the intermediate plate and remove the reed valves (M).
7. Use wrench for retainer plate to loosen the retainer plate (E) counter-clockwise; remove the retainer plate and the diaphragm (F).
8. Check all parts for soiling and clean the parts if necessary.
9. Mounting the new reed valves (M):
10. Check the pretension of the reed valves; to do this, hold the reed valves lengthwise between two fingers and press the reed valves together very lightly.
11. Place the reed valves (M) on the valve seat of the head plate (C). The slight curvature of the reed valve caused by the pretension must face the head plate (C).
12. Tighten the valve fastening screw (W) with a screwdriver.
13. Place the reed valve (M) on the valve seat of the intermediate plate (D). The slight curvature of the reed valve caused by the pretension must face the intermediate plate (D).
14. Place the washer (X) on the valve fastening screw (W). Then tighten the valve fastening screw (W) with a screwdriver.
15. Check whether the reed valves are properly seated.
16. Insert the new O-rings (B) in the head plate (C).
17. Mount the diaphragm with the retainer plate.
18. Place the retainer plate (E) on the new diaphragm (F). The smooth side of the diaphragm must face upward.
19. Apply a small amount of thread locker to the thread of the retainer plate (DELO ML 5249 or comparable product).
20. Turn the flywheel (I) to move the connecting rod (K) to the middle position.
21. Place the new diaphragm with the retainer plate on the connecting rod (K).

22. Screw in the retainer plate (E) clockwise with the wrench for retainer plate and hand tighten.
23. Place the intermediate plate (D) on the housing according to the pencil marking.
24. Place the head plate (C) on the intermediate plate (D) according to the pencil marking.
25. Uniformly tighten the hexagon socket head cap screws (Y) crosswise.
26. Check the pump for smooth running by turning the flywheel (I).
27. For two-headed pumps:
Perform work steps 3 to 26 on the second head.
28. Remount the housing cover (H).
29. Only for two-headed pumps: Remount the pneumatic connection.
30. Checking the pump head (pump heads) and the pneumatic connections for leaks:

i To ensure the required gas tightness of the pump following servicing, a leak test is to be performed.



Risk of explosion from leaks

- Before recommissioning the pump, check the pump heads and pneumatic connections for leaks. Leaks may lead to a risk of explosion.



Risk of injury and poisoning from leaks

- Before recommissioning the pump, check the pump heads and pneumatic connections for leaks. Leaks may lead to poisoning, chemical burns or similar injuries.

i Before recommissioning, observe the applicable standards, guidelines, regulations and technical standards at the electrical connection.

- A** Housing
- B** O-ring
- C** Head plate
- D** Intermediate plate
- E** Retainer plate
- F** Diaphragm
- G** Fastening screw
- H** Housing cover
- I** Flywheel
- K** Connecting rod
- M** Reed valve (stainless steel)
- W** Valve fastening screw
- X** Washer
- Y** Hexagon socket head cap screws

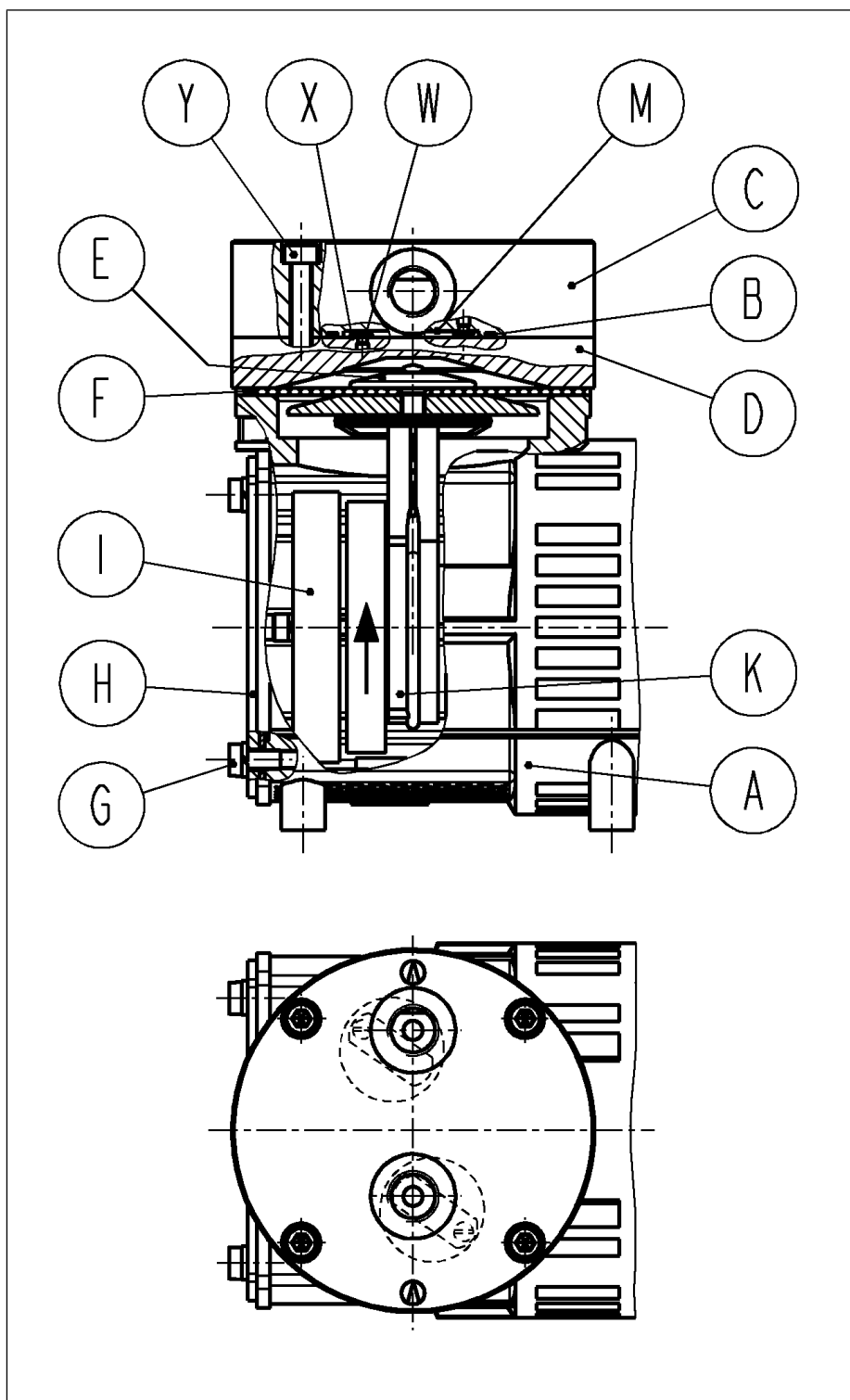


Fig.5 Pump parts for pump models with smooth heads and reed valves (stainless steel, symbolic)

9.3.2 Pump models with valve plate

- Requirements → Disconnect the motor from mains and ensure that it is voltage-free.
→ Free the pump of hazardous materials.

Spare parts

Spare part*	Position designation**	Number per pump head
Diaphragm	(F)	1
Valve plate	(Z)	1
O-ring	(B)	1

Tab.19 *According to spare parts list, Chapter 11.1 Spare parts

**According to Fig. 6

Tool and material

Quantity	Tool/material
1	Allen key, 4 mm
1	Screwdriver blade width 4.5 mm
1	Adjustable face spanner wrench for nuts with two holes or KNF wrench for retainer plate (see 11.2 Accessories).
	Thread locker (DELO ML 5249 or comparable product)
1	Pencil

Tab.20

- Information on the procedure → Always replace diaphragm, valve plates and O-rings together to maintain the performance of the pump.

With multi-headed pumps, parts may be interchanged between the individual pump heads.

- Replace the diaphragm and valve plates of the individual pump heads in sequence.



Risk of explosion from formation of potentially explosive atmosphere

Leaky connections can result in dangerous potentially explosive atmospheres.

- Make certain that all elastomer parts are undamaged, clean and correctly installed.
→ Check the pneumatic connections of the pump for leaks.
→ Work with care during service work.
→ Replace defective parts immediately.



Health hazard due to dangerous substances in the pump

Depending on the medium being transferred, caustic burns or poisoning is possible.

- Wear protective equipment if necessary, e.g., protective gloves, goggles.
→ Clean the pump with suitable measures.

Work steps

The following item numbers refer to Fig. 6.

1. Only for two-headed pumps:
Open the pneumatic connection between the two heads; loosen one of the union nuts to do this; take care not to kink the connecting hose.
2. Removing the housing cover (H):

**WARNING**

Risk of explosion from damage

If the housing cover is bent or if the paint is damaged, there is no risk of explosion.

→ Perform the work steps carefully and without the use of force.

Loosen the fastening screws (G) of the housing cover (H) and remove the housing cover.

3. On a pump head, mark housing (A), intermediate plate (X) and head plate (W) with a continuous line made with a pencil. This helps avoid incorrect assembly later.
4. Loosen the six hexagon socket head cap screws (Y) and remove the head plate (W), valve plate (Z) and intermediate plate (X) from the housing.
5. Only AT and ST versions:
Remove the O-ring (B) from the head plate (W).
6. Use a wrench for retainer plate to loosen the retainer plate (E) counter-clockwise; remove the retainer plate and the diaphragm (F).
7. Check all parts for soiling and clean the parts necessary.
8. Only AT and ST versions:
Insert the new O-ring (B) in the head plate (W).
9. Mounting the diaphragm with the retainer plate:
10. Place the retainer plate (E) on the new diaphragm (F). The smooth side of the diaphragm must face upward.
11. Apply a small amount of thread locker to the thread of the retainer plate (DELO ML 5249 or comparable product).
12. Turn the flywheel (I) to move the connecting rod (K) to the middle position.
13. Place the new diaphragm with the retainer plate on the connecting rod (K).
14. Screw in the retainer plate (E) clockwise with the wrench for retainer plate and hand tighten the screws.
15. Place the intermediate plate (X) on the housing according to the pencil marking.
16. Place the valve plate (Z) on the intermediate plate (X).
17. Place the head plate (W) on the intermediate plate (X) according to the pencil marking.
18. Uniformly tighten the hexagon socket head cap screws (Y) crosswise.
19. Check the pump for smooth running by turning the flywheel (I).
20. For two-headed pumps:
Perform work steps 3 to 14 on the second head.
21. Remount the housing cover (H).
22. Only for two-headed pumps: Remount the pneumatic connection.

23. Checking the pump head (pump heads) and pneumatic connections for leaks:

- i** To ensure the required gas tightness of the pump following servicing, a leak test is to be performed.



Risk of explosion from leaks

- Before recommissioning the pump, check the pump heads and pneumatic connections for leaks. Leaks may lead to a risk of explosion.



Risk of injury and poisoning from leaks

- Before recommissioning the pump, check the pump heads and pneumatic connections for leaks. Leaks may lead to poisoning, chemical burns or similar injuries.

-
- i** Before recommissioning, observe the applicable standards, guidelines, regulations and technical standards at the electrical connection.

- A** Housing
- B** O-ring (only AT/ST versions)
- E** Retainer plate
- F** Diaphragm
- G** Fastening screw
- H** Housing cover
- I** Flywheel
- K** Connecting rod
- W** Head plate
- X** Intermediate plate
- Y** Hexagon socket head cap screws
- Z** Valve plate (elastomer)

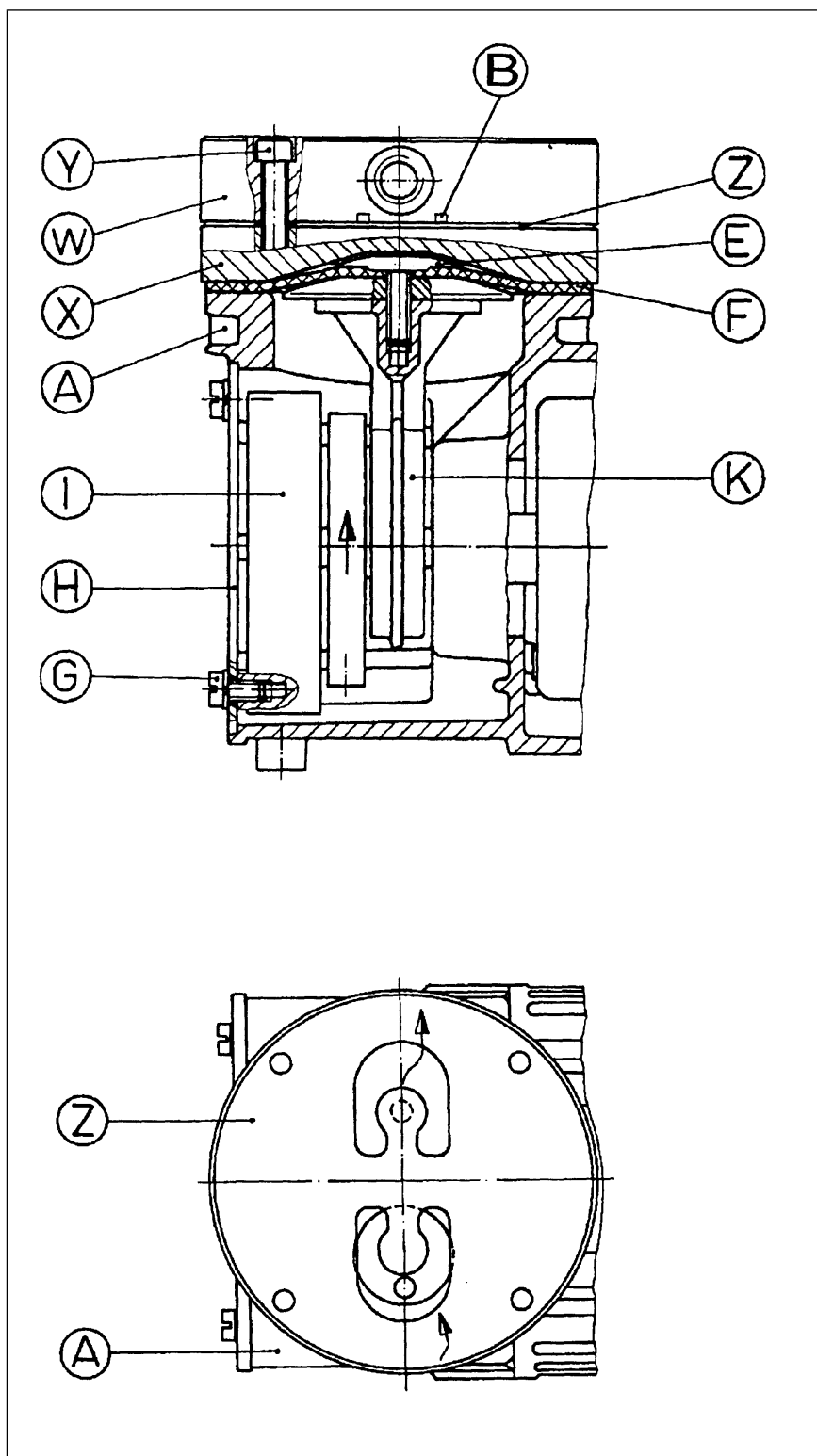


Fig.6 Pump parts for pump models with smooth heads and valve plate (elastomer, symbolic)

10 Troubleshooting



DANGER

Danger: electric shock can be life-threatening.

- All work on the pump may only be performed by an authorized specialist.
- Before working on the pump: Disconnect the pump from the power supply.
- Check and ensure that no voltage is present.

- Allow the pump to cool before troubleshooting.
- Check the pump (see following tables).
- Also observe the operating instructions for the motor when troubleshooting.

Pump not delivering	
Cause	Troubleshooting
Pump is not connected to the electrical mains.	→ Connect the pump to the electrical mains.
No voltage in the electrical mains.	→ Check the circuit breaker for the room and switch it on if necessary.
Pneumatic connections or lines are blocked.	→ Check the pneumatic connections and lines. → Remove the blockage.
External valve is closed or filter is clogged.	→ Check external valves and filters.
Condensation has collected in the pump head.	→ Separate the source of the condensation from the pump. → Flush the pump with air at atmospheric pressure for a few minutes (if necessary for safety reasons: with an inert gas). → Install the pump at the highest location in the system.
Diaphragm or reed valves/valve plate are worn.	→ Change the diaphragm and the reed valves/valve plate (see Chapter 9 <i>Servicing</i>).

Tab.21

Flow rate, pressure or vacuum too low	
The pump does not reach the performance stated in the technical data or data sheet.	
Cause	Troubleshooting
Condensation has collected in the pump head.	→ Separate the source of the condensation from the pump. → Flush the pump with air at atmospheric pressure for a few minutes (if necessary for safety reasons: with an inert gas). → Install the pump at the highest location in the system.
There is overpressure on the pressure side and at the same time vacuum or pressure above atmospheric pressure on the suction side.	→ Change the pneumatic conditions.
Pneumatic lines or connection parts have insufficient cross section or are throttled	→ Disconnect the pump from the system to determine the output values. → Eliminate any throttling (e.g. valve) if necessary. → Use lines or connection parts with a larger cross-section if necessary.
Leaks occur at pneumatic connections, lines or pump head.	→ Eliminate the leaks.
Pneumatic connections or lines are completely or partially clogged.	→ Check the pneumatic connections and lines. → Remove any parts or particles that are causing blockages.
Head parts are soiled.	→ Clean the head components.
Diaphragm or reed valves/valve plate are worn.	→ Change the diaphragm and the reed valves/valve plate (see Chapter 9 <i>Servicing</i>).
Working diaphragm broken	→ Stop the pump immediately.
Pump exhibiting changed running noises and vibrations.	→ Stop the pump immediately. → Contact KNF Customer Service.

Tab.22

Pump exhibiting changed running noises and vibrations	
Cause	Troubleshooting
Pump bearing worn or defective.	→ Determine the cause. → Contact KNF Customer Service.
Motor worn or defective.	→ See operating instructions for the motor.

Tab.23

Fault cannot be rectified

If you are unable to identify any of the specified causes, send the pump to KNF Customer Service (contact data: see www.knf.com).

1. Flush the pump with air for a few minutes (if necessary for safety reasons: with inert gas) at atmospheric pressure to free the pump head of dangerous or aggressive gases (see Chapter 9.2.1 *Flushing the pump*).
2. Clean the pump (see Chapter 9.2.2 *Cleaning the pump*).
3. Send the pump together with completed Health and Safety Clearance and Decontamination Form to KNF, specifying the pumped medium.

11 Spare parts and accessories



To order spare parts and accessories, please contact your KNF sales partner or KNF Customer Service (contact data: see www.knf.com).

11.1 Spare parts

The spare parts necessary for a pump depend on the head version and the type of valves (valve plate or reed valves). In case of doubt, please contact KNF Customer Service (have serial number of the pump ready).

Pump models

Pumps with heads in AT and ST versions with reed valves

Spare part	Position*	Order number
Diaphragm	F	055758
O-ring	B	063789
Reed valve	M	001288

Tab.24 *see Chapter 9.3.1 Pump models with reed valves

Pumps with heads in AP and SP versions with reed valves

Spare part	Position*	Order number
Diaphragm	F	003913
O-ring	B	118963
Reed valve	M	001288

Tab.25 *see Chapter 9.3.1 Pump models with reed valves

Pumps with heads in AT and ST versions with valve plate

Spare part	Position*	Order number
Diaphragm	F	055758
O-ring	B	012143
Valve plate	Z	012440

Tab.26 *see Chapter 9.3.2 Pump models with valve plate

Pumps with heads in AP and SP versions with valve plate

Spare part	Position*	Order number
Diaphragm	F	003913
Valve plate	Z	007759

Tab.27 *see Chapter 9.3.2 Pump models with valve plate

11.2 Accessories

Description	Order number
Wrench for retainer plate	018812

Tab.28

12 Returns

Preparing for return

1. Flush the pump with air for a few minutes (if necessary for safety reasons: with inert gas) at atmospheric pressure to free the pump head of dangerous or aggressive gases (see Chapter 9.2.1 *Flushing the pump*).



Please contact your KNF sales partner if the pump cannot be flushed due to damage.

2. Remove the pump.
3. Clean the pump (see Chapter 9.2.2 *Cleaning the pump*).
4. Send the pump together with the completed Health and Safety Clearance and Decontamination Form to KNF, stating the nature of the transferred medium.
5. Pack the device securely to prevent further damage to the product. If necessary, request original packaging for a fee.

Returns

KNF shall undertake to repair the pump only under the condition that the customer presents a certificate regarding the medium that is pumped and the cleaning of the pump. Please follow the instructions at knf.com/repairs here.

Contact your KNF sales partner directly if you require additional support for your return service.

13 Appendix

13.1 Declaration of Conformity

For further information, see also

- Konformitätserklärung N026EX.pdf

EG / EU – Konformitätserklärung / EC / EU declaration of conformity

Hiermit erklärt der Hersteller:

Herewith the manufacturer:

KNF Neuberger GmbH, Alter Weg 3, D-79112 Freiburg

dass folgende Membranpumpen,

declares that the following diaphragm pumps:

(Seriennummer siehe Typenschild / Serial number see type label)

N026AT.9E EX

N026ST.9E EX

N026.1.2AT.9E EX

N026.1.2ST.9E EX

allen einschlägigen Bestimmungen folgender Richtlinien entspricht:

is in conformity with the following Directives:

Richtlinie 2006/42/EG Maschinen

Directive 2006/42/EC machinery

Richtlinie 2011/65/EU zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten (Anhang II geändert durch die Delegierte Richtlinie (EU) 2015/863 der Kommission) /

Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (Annex II amended by Commission Delegated Directive (EU) 2015/863)

Richtlinie 2014/30/EU über elektromagnetische Verträglichkeit

Directive 2014/30/EU about the electromagnetic compatibility

Folgende harmonisierte Normen wurden zugrunde gelegt:

The following harmonized standards have been applied:

EN 1012-2: 1996 + A1:2009

EN IEC 63000: 2018

Bevollmächtigter für die Zusammenstellung der technischen Unterlagen:

Authorised person to compile the relevant technical documentation:

R. Köpfer, Product Qualification, KNF Neuberger GmbH, Alter Weg 3, D-79112 Freiburg

Die Membranpumpen, fallen ebenso in den Anwendungsbereich der folgenden Richtlinie:

The diaphragm pumps falling in the scope of the following Directive as well:

Richtlinie 2014/34/EU für Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen

Directive 2014/34/EC relating to equipment and protective systems intended for use in potentially explosive atmospheres.

Die zugehörigen Konformitätserklärungen für den:

The corresponding conformity declaration for:

nichtelektrischen Pumpenteil: siehe Seite 2/3 dieser Erklärung

non-electrical part of the pump: see page 2/3 of this declaration

elektrischer Teil - Motor: siehe Seite 3/3 beiliegendes Dokument des Motorenherstellers

electrical part – motor: see page 3/3 enclosed document of motor supplier

Freiburg, 17.06.2021

Ort, Datum (TT.MM.JJJJ)
place, date (dd.mm.yyyy)

CO R&D



ppa. S. Schreiber

EU – Konformitätserklärung / EU declaration of conformity

Hiermit erklärt der Hersteller:

Herewith the manufacturer:

KNF Neuberger GmbH, Alter Weg 3, D-79112 Freiburg
dass folgende Membranpumpen – nichtelektrischer Pumpenteil,
declares that the following diaphragm pumps – non-electrical part:
(Seriennummer siehe Typenschild / Serial number see type label)

N026AT.9E EX
N026ST.9E EX
N026.1.2AT.9E EX
N026.1.2ST.9E EX

Kennzeichnung:

Marking:



II 2/2G Ex h IIB+H2 T4 Gb

allen einschlägigen Bestimmungen folgenden Richtlinie entspricht:

is in conformity with the following Directive:

Richtlinie 2014/34/EU für Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen

Directive 2014/34/EC relating to equipment and protective systems intended for use in potentially explosive atmospheres.

Entsprechend Artikel 13 (1) b) ii) der RL2014/34/EU ist die technische Dokumentation bei der notifizierten Stelle Physikalisch-Technische Bundesanstalt PTB, Nr. 0102 hinterlegt

According to article 13 (1) b) ii) of the directive 2014/34/EU, the technical documentation is deposited at the Physikalisch-Technische Bundesanstalt PTB, notified body no. 0102.

Folgende harmonisierte Normen wurden zugrunde gelegt:

The following harmonized standards have been applied:

EN ISO 80079-36:	2016
EN ISO 80079-37:	2016
EN 1127-1:	2019





M56EX_DOC_121220-0514_07

EG/EU – Konformitätserklärung / EC declaration of conformity
 Richtlinien 2014/34/EU und 2011/65/EU / Directive 2014/34/EU and 2011/65/EU

Hiermit erklärt der Hersteller: / Hereby the manufacturer:

KNF Neuberger GmbH, Alter Weg 3, D-79112 Freiburg

des Elektromotors (Seriennummer siehe Typenschild): / of the electric motor (serial number see type label):

M56EX (Motor / motor)

Dass der Motor den grundlegenden Anforderungen folgender Richtlinien entspricht / declares that the motor corresponds to the basic requirements of the following directives:

EU-Richtlinie 2014/34/EU für Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen / EC directive 2014/34/EU relating to equipment and protective systems intended for use in potentially explosive atmospheres.

Richtlinie 2011/65/EU zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten (Anhang II geändert durch die Delegierte Richtlinie (EU) 2015/863 der Kommission) / Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (Annex II amended by Commission Delegated Directive (EU) 2015/863)

Der Motor erfüllt die Anforderungen der Zündschutzart erhöhte Sicherheit "e" und ist wie folgt gekennzeichnet: / The partly completed machinery fulfils the requirements of the type of protection by increased safety "e" and is marked as follows:

 II 2G Ex eb IIC T4 Gb (Drehstrommotor / Three phase motor)

Bei Anbau eines Kondensators in der Zündschutzart Sandkapselung "q" mit eigener Zulassung und Kennzeichnung ist der Motor wie folgt gekennzeichnet: / With a capacitor with protection class powder filling „q“ with own permission and marking the motor is marked as follows.

 II 2G Ex eb IIC T3 Gb (Kondensatormotor / Capacitor motor)

Entsprechend Artikel 13 (1) b) i) der RL2014/34/EU wurde der Motor geprüft von der TÜV-SÜD Product Service GmbH, Ridlerstr. 65, D-80339 München, notifizierte Stelle Nr. 0123 mit der EG-Baumusterprüfbescheinigungsnummer / According to article 13 (1) b) i) of the directive 2014/34/EU, the motor was tested by the TÜV-SÜD Product Service GmbH, Ridlerstr. 65, D-80339 München, notified body no. 0123 with the EC type examination certificate number:

TPS 12 ATEX 1 612 X

Für die Überwachung des QS-Systems ist verantwortlich die TÜV-SÜD Product Service GmbH, Ridlerstr. 65, D-80339 München. Benannte Stelle Nr. 0123 / For the supervision of the QS-System the TÜV-SÜD Product Service GmbH, Ridlerstr. 65, D-80339 München is responsible. Notified body no. 0123

Folgende harmonisierte Normen bzw. technische Spezifikationen wurden zugrunde gelegt: / The following harmonized standards have been applied:

EN IEC 60079-0:	2018/AC:2020-02	EN 55014-1:	2017
EN 60079-7:	2015	EN 55014-2:	2015
EN 60034-1:	2010 + Cor.:2010	EN IEC 61000-3-2:	2019
EN IEC 63000:	2018	EN 61000-3-3:	2013 + A1:2019

Da diese Motoren Einbaugeräte sind, müssen die Netzanschlüsse und Einrichtungen zum Trennen und Ausschalten des Motors sowie Überstrom- und Überlastschutzeinrichtungen beim entsprechenden Einbau berücksichtigt werden. / As these motors are OEM-models the power supplies and the equipments for disconnecting and switching-off the motor respectively have to be considered when mounting as well as over-current and overload protective gear.

Darüber hinaus muss beim Einbau ein Berührungsschutz gegen bewegte und heiße Teile, soweit vorhanden, vorgesehen werden. / In addition a protection against mechanical parts in motion and hot parts, if existing, has to be provided when mounting.

Freiburg, 17.06.2021

Ort, Datum (TT.MM.JJJJ)
place, date (dd.mm.yyyy)

CO R&D


ppa. S. Schreiber

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13.2 Motor

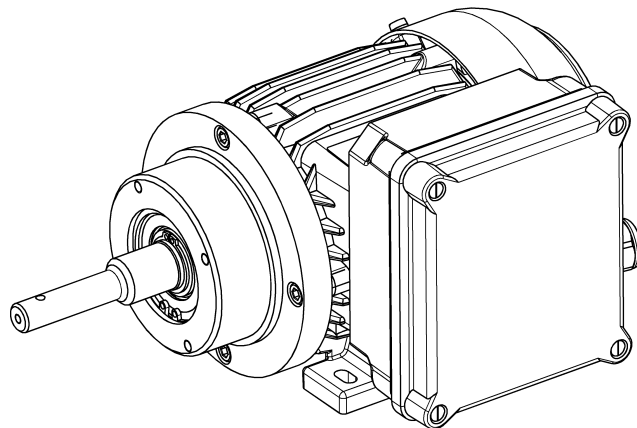
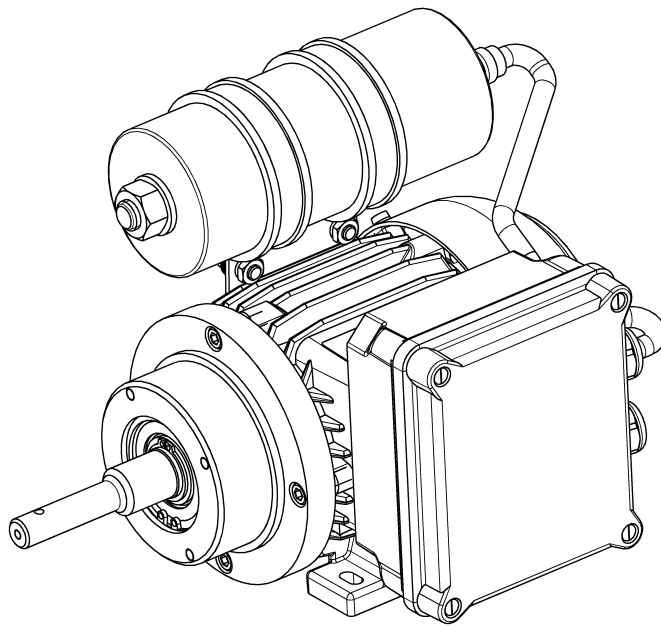
For further information, see also

- BA M56Ex 009.pdf
- Konformitätserklärung Motor M56 EX.pdf
- Kondensator_Süko.pdf
- Betriebsanleitung_Kabel- und Leitungseinführung.pdf
- CE Declaration_Kabel- und Leitungseinführung.pdf

OEM

M 56 EX
TRANSLATION OF ORIGINAL OPERATING AND
INSTALLATION INSTRUCTIONS ENGLISH

KNF-MOTOR





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1. About this document

1.1. Using the operating and installation instructions

- If anything is unclear, please contact the manufacturer (see first page for the address) and reference the model and motor number.

The operating and installation instructions are part of the motor.

- Pass on the operating and installation instructions to the next owner.

1.2. Symbols and markings

Warning



WARNING

A danger warning is located here.

Possible consequences of a failure to observe the warning are specified here. The signal word, e.g.

Warning, indicates the danger level.

- Measures for avoiding the danger and its consequences are specified here.

Danger levels

Signal word	Meaning	Consequences if not observed
DANGER	warns of immediate danger	Death or serious injuries and/or serious damage are the consequence.
WARNING	warns of possible danger	Death or serious injuries and/or serious damage are possible.
CAUTION	warns of a possibly dangerous situation	Minor injuries or damage are possible.

Tab. 1

Other information and symbols

- An activity to be carried out (a step) is specified here.
1. The first step of an activity to be carried out is specified here. Additional, consecutively numbered steps follow.

i This symbol refers to important information.

2. Use

2.1. Proper use

The motor is intended as a drive for diaphragm pumps manufactured by KNF Neuberger.

Owner's responsibility

Operating parameters and conditions

Only install and operate the motor under the operating parameters and conditions described in Chapter 0, Technical data, and Section 2.3, Use in hazardous areas.

Make sure that even when extreme operating conditions occur and in the case of system malfunctions, there is no risk of explosion.

Conformity of the end product

The motor is intended for installation in another machine. Operating is prohibited until the conformity of the end product with the guideline 2006/42/EC has been established.

2.2. Improper use

The motor may not be used in potentially explosive atmospheres that are not covered by the motor's explosion protection marking.

2.3. Use in hazardous areas

In hazardous areas (zones), only operate motors of the corresponding equipment category and temperature class.

If the explosion protection of the device into which the motor is installed differs from that of the motor, the device combination may only be used in accordance with the weaker explosion protection.

The motor has the following explosion protection marking:

Marking	Description
	Symbol for explosion-proof motors
II	Equipment group (see Section 2.4.1)
2 G	Equipment category (see Section 2.4.2)
Ex	manufactured according to EN60079-0 ff.
eb	Type of protection/Protection level (see Section 2.4.5)
IIC	Explosion group (see Section 2.4.4)
T3	Temperature class (see Section 2.4.3) of capacitor motor
T4	Temperature class (see Section 2.4.3) of 3-phase motor
Gb	Equipment protection level (see Section 2.4.6)

Tab. 2

The explosion protection marking is also applied at the following location:

- Motor type plate

2.4. Explanations on explosion-protection marking

2.4.1. Equipment groups

Equipment group I	Equipment group I applies to products for use in underground plants of mines and their above-ground systems which can be endangered by methane and/or flammable dusts.
Equipment group II	Equipment group II applies to products for use in the remaining areas which can be endangered by an explosive atmosphere.

2.4.2. Equipment categories for gas

The equipment category describes the frequency and duration of the occurrence of explosive atmospheres in an area.

Equipment category	Description*	Design safety
1	Equipment for areas in which it is to be expected that a dangerous explosive atmosphere will occur constantly, over longer periods or frequently.	Very high
2	Equipment for areas in which it is to be expected that a dangerous explosive atmosphere will occur occasionally.	High
3	Equipment for areas in which it is not to be expected that a dangerous explosive atmosphere will occur. However, if it does occur, then only seldom and only briefly.	Normal

Tab. 3

*in accordance with 2014/34/EU

2.4.3. Temperature classes

Maximum surface temperature	The maximum surface temperature is the highest temperature reached by a motor surface under the most unfavorable conditions.
Ignition temperature	The maximum motor surface temperature must always be lower than the lowest ignition temperature of the gas or vapor-air mixture in which it is used.
Temperature class	The maximum surface temperature results from the motor design and is specified as the temperature class.

Temperature class	Max. surface temperature [°C]	Ignition temperature [°C]
T1	450	> 450
T2	300	> 300
T3	200	> 200
T4	135	> 135
T5	100	> 100
T6	85	> 85

Tab. 4

2.4.4. Explosion groups

Flammable gases and vapors are classified according to explosion groups (I, IIA, IIB and IIC) and temperature classes. Tab. 5 (capacitor motor) and Tab. 6 (3-phase motor) show the classification of the most common flammable gases and vapors.

Classification of the most common flammable gases and vapors for capacitor motor						
	T1	T2	T3	T4	T5	T6
I	Methane	–	–	–	–	–
IIA	Acetone Ethane Ethyl acetate Ammonia Ethyl chloride Benzole Acetic acid Carbon monoxide Methane Methanol Methyl chloride Naphthalene Phenol Propane Toluene	i-Amyl acetate n-Butane n-Butyl alcohol Cyclohexanon 1.2-Dichloroethane Acetic acid-anhydride	Gasoline Diesel fuel Jet fuel Heating oil n-Hexane	Acetaldehyde	–	–
IIB	City gas	Ethylene Ethyl alcohol	Hydrogen sulfide	Ethyl ether	–	–
IIC	Hydrogen	Acetylene	–	–	–	Carbon disulfide

Tab. 5

Classification of the most common flammable gases and vapors for 3-phase motor						
	T1	T2	T3	T4	T5	T6
I	Methane	–	–	–	–	–
IIA	Acetone Ethane Ethyl acetate Ammonia Ethyl chloride Benzole Acetic acid Carbon monoxide Methane Methanol Methyl chloride Naphthalene Phenol Propane Toluene	i-Amyl acetate n-Butane n-Butyl alcohol Cyclohexanon 1.2-Dichloroethane Acetic acid-anhydride	Gasoline Diesel fuel Jet fuel Heating oil n-Hexane	Acetaldehyde	–	–
IIB	City gas	Ethylene Ethyl alcohol	Hydrogen sulfide	Ethyl ether	–	–
IIC	Hydrogen	Acetylene	–	–	–	Carbon disulfide

Tab. 6

Motor environment

The motor may only be operated in an environment which contains an atmosphere which is not explosive or belongs to the explosion groups II A, II B or II C and the temperature class T3 or below (capacitor motor; marked range in Tab. 5) or T4 or below (3-phase motor; marked range in Tab. 6).

2.4.5. Types of protection

Marking	Description
d	Flameproof enclosure
e	Increased safety
i	Intrinsic safety
p	Pressurization
m	Encapsulation
o	Oil immersion
q	Sand filling

*Tab. 7***2.4.6. Equipment protection level**

Marking	Description
Ga	Device with a “very high” protection level
Gb	Device with a “high” protection level
Gc	Device with “extended” protection level

Tab. 8

3. Safety

i Note the safety precautions in sections 6. *Installation and connection*, and 7. *Operation*.

The motor is built according to the generally recognized rules of technology and in accordance with the occupational safety and accident prevention regulations. Nevertheless, dangers can result during its use which lead to injuries to the user or others, or to damage to the motor or other property.

Only use the motor in proper technical condition and in accordance with its intended use in a safety and danger-conscious manner while observing the operating and installation instructions.

Personnel Make sure that only trained and instructed personnel or specially trained personnel work on the motor. This especially applies to assembly, connection and servicing work.

Make sure that the personnel has read and understood the operating and installation instructions, and in particular the "Safety" chapter.

Work on motor Work on motor which could affect the explosion prevention and protection must be performed only by the motor manufacturer. Such work includes, for example

- Repairs to the stator or rotor winding and on the terminals,
- Repairs to the ventilation system,
- Disassembly of motors and parts

Working in a safety-conscious manner Observe the accident prevention and safety regulations when performing any work on the motor and during operation.

Classifying motor environment When classifying a motor environment in a hazardous area (zone), observe the "Guidelines for the Avoidance of Dangers due to Explosive Atmospheres with Collection of Examples – Explosion Protection Guidelines – (EX-RL)".

In as much as special cases are concerned or there is doubt as to the specification of the hazardous areas, inform the supervisory authorities and have them decide.

Use in hazardous environment For use in hazardous environments containing combustible gases, vapours and aerosols the lowest ignition temperature of a possible hazardous atmosphere must be higher than the so-called "maximum surface temperature" of the motor.

The maximum surface temperature is defined in EN 60079-0 as the highest temperature obtainable in operation under the least favourable conditions (but within recognized tolerances) by any part or surface of the motor.

The maximum surface temperature is determined by the construction of the motor and indicated on the type-plate as the temperature class.

Thermal motor protection switch The motor may be used with a typical thermal motor protection switch (see Chapter 6. *Installation and connection*) only in continuous operation with unloaded and infrequent starts, in which no significant startup heating occurs.

Customer service and repairs	Only have repairs to the motor carried out by the KNF Customer Service responsible. Use only genuine parts from KNF for servicing work; this applies especially to seals. Exception: standard, commercially available and equivalent parts.
Environmental protection	Store all replacement parts in a protected manner and dispose of them properly in accordance with the applicable environmental protection regulations. Observe the respective international regulations.
EC Directives / Standards	See EC-declaration of conformity
	
Customer service and repairs	Only have repairs to the pumps carried out by the KNF Customer Service responsible. Use only genuine parts from KNF for servicing work.

4. Technical data

Electrical data: see motor type plate.

The motor has the following explosion protection marking:

Marking	Description
	Symbol for explosion-proof motors
II	Equipment group
2 G	Equipment category
Ex	manufactured according to EN60079-0 ff.
eb	Type of protection/Protection level
IIC	Explosion group
T3	Temperature class of capacitor motor
T4	Temperature class of 3-phase motor
Gb	Equipment protection level

Tab. 9

i For explanation of explosion protection marking see section 2.4.

The motor has a „e” type of protection („increased safety”).

Permissible ambient temperature: - 20 °C to + 40 °C

Permissible altitude above sea level for operation: 1000 m

The motor may be used only for the type of operation indicated on the output plate. If no type of operation is indicated on the output plate, S1 applies (continuous operation).

Cable gland

Parameter	Value
EX-designation	II 2 G Ex e IIC Gb
Typ-Size	KLE M16x1.5

Tab. 10

5. Design

- 1 Motor shaft
- 2 Terminal box cover
- 3 Cable gland (M 16 x 1.5)
- 4 Cable gland (M 16 x 1.5)
- 5 Capacitor
- 6 Capacitor mounting clamp (collar band)
- 7 Base plate
- 8 Type plate
- 9 Fan cover

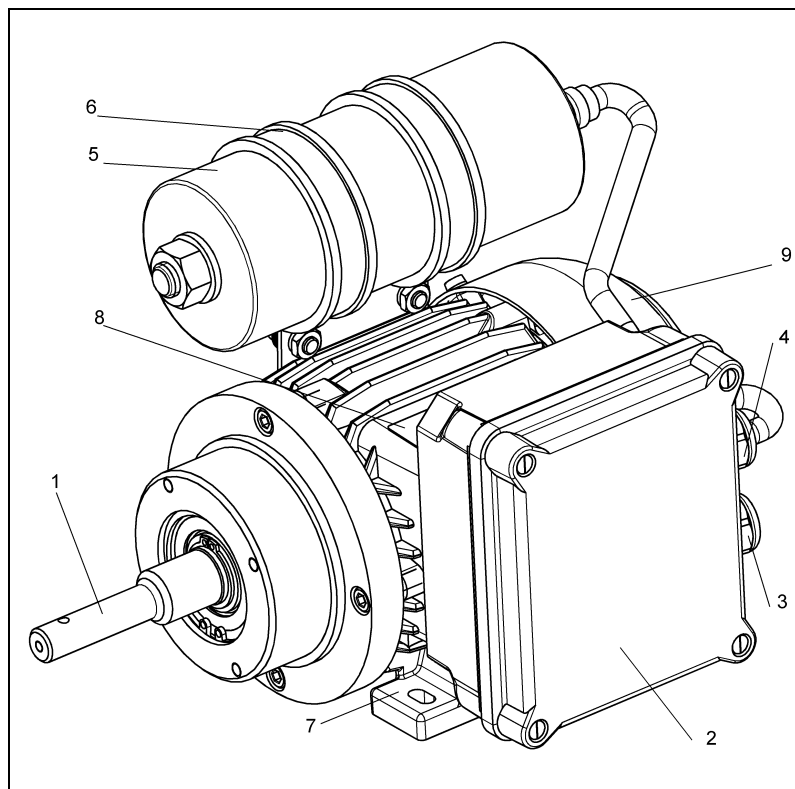


Fig. 1: KNF capacitor motor M 56 Ex

- 1 Motor shaft
- 2 Terminal box cover
- 3 Cable gland (M 16 x 1.5)
- 4 Closing plug (M 16 x 1.5)
- 5 Base plate
- 6 Type plate
- 7 Fan cover

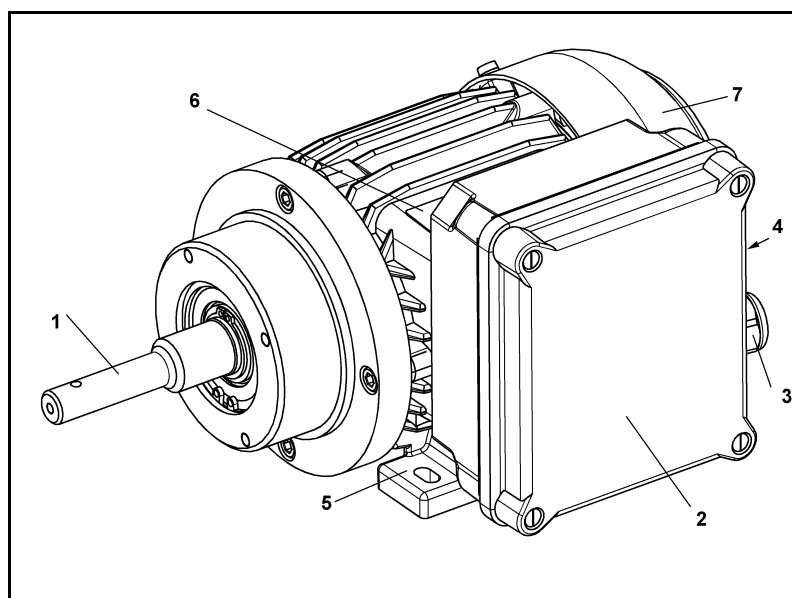


Fig. 2: KNF 3-phase motor M 56 Ex

6. Installation and connection

- Only install and operate the motor under the operating parameters and conditions described in Chapter 4, Technical data, and Section 2.3, Use in hazardous areas.
- Observe the safety precautions (see Chapter 3).

6.1. Installation

- Before installation, store the motor at the installation location for 3 hours to bring it up to room temperature.

Cooling air supply



Danger of explosion from insufficient cooling

- Install the motor so that the motor fan can intake sufficient cooling air.

WARNING → Ensure sufficient ventilation and heat dissipation around the motor.

Installation location

- Make sure that the installation location is dry and the motor is protected against rain, splash, hose and drip water.
- Protect the motor from dust.
- Protect the motor from vibrations and jolts.

6.2. Electrical connection



Extreme danger from electrical shock!

- Only have the motor connected by an authorized specialist.

DANGER → Only have the motor connected when the power supply is disconnected.

General hints

- The customary national and international regulations on the set-up of electrical systems in potentially explosive atmospheres must be observed.
- The motor may only be connected to the electrical supply, if it is certain that it can be safely operated in the potentially explosive atmosphere that is present.
- The general safety and commissioning notes apply to the electrical wiring.
- Connection of the motor to the electrical supply must be carried out by a person qualified to do so, who is authorized to connect electrical equipment in hazardous environments.
- Area A per EN 60034-1 (voltage $\pm 5\%$, frequency $\pm 2\%$) must be maintained so that the temperature is kept within the permissible limits. Exceptions are permitted only if they are indicated on the motor output plate.
- Only electrical equipment that is absolutely necessary for operating the motor should be located in the hazardous area.
- The installation, or additional measures, must protect the motor against water as well as against electrical, chemical, thermal,

or mechanical effects, so that in operation the protection against explosion remains effective.

- When selecting cables and wiring, the general requirements for use in potentially explosive atmosphere must be met (see EN 60079-14). In particular, cables and wiring must be chosen to withstand the expected mechanical, chemical, and thermal conditions.
- When routing cables and wiring, and making connections, the necessary conditions and safety measures must be observed (see EN 60079-14).
- The cable fittings must be tested for potentially explosive atmosphere and approved with an EC-Type Examination Certificate.
- The motor must be installed so that there is no danger of ignition from an electrostatic charging.
- If there is danger from an atmospheric discharge, protection against lightning must be arranged.
- When they are triggered, protection and monitoring devices must disconnect the equipment from all external conductors, and not reconnect automatically.

Requirements for installation and electrical connection of the motors

In addition to the requirements listed above and the instructions for installation (see below) the following points must be observed for installation and electrical connection of the motors:

- The customer must arrange to protect the motor against excessive heating as a result of overload (in compliance with EN 60079-14) by means of a current-dependent delayed protection switch with current-dependent allpole triggering (as per EN 60947). The protection device must be set for the highest rated motor current (see type plate).
- Protective equipment must be included which protects the motor even if an outer conductor fails.
- Current-protected motors may only be used continuously, with unloaded and infrequent starts, which do not produce significant heating.
- Additional overload protection by a direct monitoring device with temperature sensors (PTCs) may be used, if this is certified and specified on the type plate. Connect the temperature sensors by means of foreseen additional terminals in the main terminal box or via an additional terminal box. **If a continuity test of the temperature sensors is required, do not apply voltages greater than 2.5 V!**
- The overload protection by means of a current-dependent delayed triggering must be chosen so that the time delay for triggering the motor protector is less than the safe locked-rotor time t_E . The time delay may be read from the characteristic curve of the protection switch for the I_A/I_N ratio of the protected motor. The ratio I_A/I_N may be read from the motor type-plate.

Connecting motor

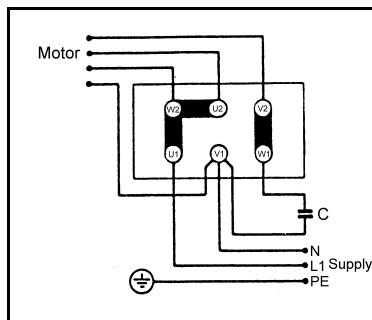


Fig. 3: Circuit diagram single-phase capacitor motor

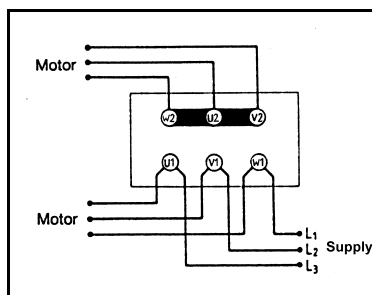


Fig. 4: Circuit diagram 3-phase motor (Y connection)

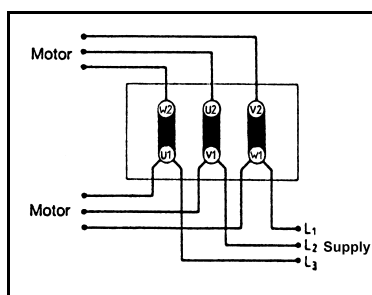


Fig. 5: Circuit diagram 3-phase motor (Δ connection)

Select the excessive current protection equipment such that the motor is protected even when the rotor is blocked.

- ➔ The motors may not be used at variable speed with a frequency converter unless motor, converter, and monitoring device have been tested and approved together, are marked as such, and the permissible operating conditions are listed in the joined EC Type Examination Certificate.

1. Compare the supply data with the data on the motor-plate. For operating current see type plate.

i The voltage must not vary more than + 5 % and - 5 % from that shown on the type-plate.

2. Open terminal box cover (see Fig. 1/2, page 11 and Fig. 2/2, page 11).

3. Connect the mains cables to the connections.

i The terminal-block connections are to be made as shown in fig. 3 (single-phase capacitor motor) and figs. 4 and 5 (3-phase motor).

For connection to the mains supply, the terminal box contains a terminal board and a screwed cable gland with a M 16 x 1.5 thread (Fig. 1/3, page 11, and Fig. 2/3, page 11). The clamping range of this screwed cable gland is between 5 and 10 mm.

The maximum conductor cross-section that can be connected to the connector is 2.5 mm².

At least 7 mm of the insulation must be stripped off each individual cable strand.

Connect the leads to the anti-twist slotted terminals (max. 2.5 mm²) as shown in fig. 6, or with prefabricated cable lugs (max. 2.5 mm²). If you use cable lugs, within the potentially explosive atmosphere only crimping may be used to connect the lead. Soldering is permitted only if the connection is made away from the potentially explosive atmosphere.

Observe creep and air gaps as per EN 60079-0/60079-7.

Tighten the screws of the connectors with a torque of 3 Nm. They must not be able to work loose by themselves.

Take care to make the proper connections in the terminal box.

4. Connect the earth (ground) wire to the motor.

i For connecting the protective ground lead, a screw (4 mm²) with an anti-twist terminal clip is located in the terminal box (fig. 7). The VDE grounding symbol indicates this screw.

Before connecting, the protective ground lead must be stripped off about 20 mm.

An additional grounding screw of the same kind is located at the bottom of the housing.

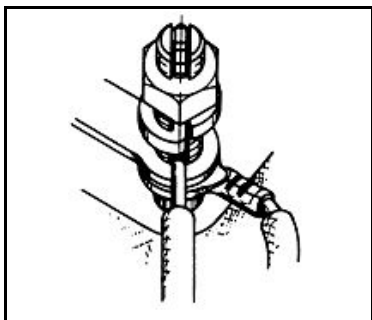


Fig. 6: Connection to the slotted terminals

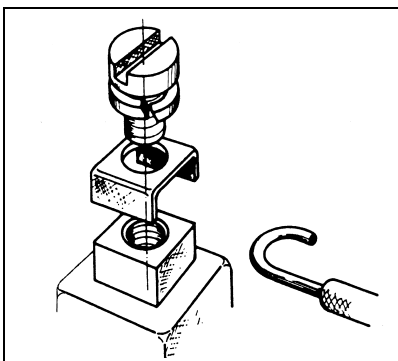


Fig. 7: Protective ground lead connection

5. Close the terminal box cover.

i

→ Keep the inside of the terminal box clean.

→ The seals must be unblemished and correctly seated.

6. Tighten the clamping screw (compression screw) on the cable gland with a torque of 2.5 Nm.

7. Close open bores in the terminal box with certified plugs.

7. Operation

- ➔ Only operate the motor under the operating parameters and conditions described in Chapter 0, Technical data, and in Section 2.3, Use in hazardous areas.
- ➔ Make sure the motor is used properly (see section 2.1).
- ➔ Make sure the motor is not used improperly (see section 2.2).
- ➔ Observe the safety precautions (see Chapter 3).

**WARNING**

Danger of explosion due to increased ambient temperature!

- ➔ Monitor ambient temperature (compression heat, motor heat).
- ➔ Ensure sufficient supply of cooling air.

**WARNING**

Danger of serious damage to persons or property

Changes from normal operation (higher power consumption, temperatures or vibration, unusual noises or odors, triggered monitoring devices) are an indication that function has been affected.

- ➔ In case of any deviations from normal operation, switch off the motor, then determine and remedy the cause.
-

8. Servicing

Servicing schedule



WARNING

Danger of explosion due to wear!

→ Have motor bearings replaced by KNF Neuberger according to servicing schedule (see table 11).

Component	Servicing interval
Motor bearings	- See operating and mounting instructions of the pump (chapter Servicing).
Lead-through, connection or lead-in parts	- Inspect regularly - In case of damage, the damaged parts must be replaced by original spare parts in perfect order.

Tab. 11

- Maintenance on the motor must be performed under observance of the relevant national regulations "Ordinance Concerning Electrical Equipment in Potentially Explosive Areas" as well as the safety advisories and descriptions in these instructions.
- Components such as terminals, cable glands and plugs may be replaced only by equivalent parts having the EC-Type Examination Certificate.

9. Troubleshooting



Extreme danger from electrical shock!

→ Disconnect the motor power supply before working on the motor.

DANGER → Make sure the motor is de-energized and secure.

1. Check the motor (see Tab. 12).
2. Also see the pump operating and installation instructions for troubleshooting.

Fault				Possible Cause	Remedy
Motor does not ramp up	Motor is too warm	Significant drop-off in speed	Protection device trips		
				Load moment too high	Check motor and load moment
				Mains voltage too low	Check mains
				Phase interruption	Check connection network
				Faulty connection	Note wiring diagram and motor type-plate
				Overload	Compare motor type-plate specifications
				Switches too often	Verify rated operation mode
				Insufficient ventilation	Inspect ventilation paths, check turn direction
				Ventilation paths dirty	Clean
				Winding or terminal short circuited	Measure isolation resistance
				Start time has been exceeded	Check start-up conditions

Tab. 12

Fault cannot be rectified

If you are unable to determine any of the specified causes, send the pump to KNF Customer Service (see last page for the address).

If the motor is attached to a pump, observe the operating and installation instructions for the pump.

Send the motor, together with completed Health and Safety Clearance and Decontamination Form to KNF stating the nature of the transferred medium.

10. Spare parts



WARNING

Danger of explosion when using inappropriate parts

→ With the exception of standard, commercially available and equivalent parts (e.g. roller bearings), only original replacement parts may be used; this applies also to seals.

10.1. Spare parts

The replacement parts required for a given motor depend on the motor type (Capacitor motor or three phase motor). In case of doubt, please ask KNF's customer service (have the serial number of your motor handy).

10.1.1. Capacitor motors

Position-No.*	Ident-No.	Description
070	001849	Bearing
170	001850	Bearing
190	049001	Cable gland (M 16 x 1.5)
200	005498	Fan cover
220	008634	Cable lug
260	005493	Collar band
270	052602	Terminal box seal
290	052601	Cover seal
810	When ordering, please indicate voltage and frequency	Capacitor
820	When ordering, please indicate voltage and frequency	Collar band

Tab. 13

* According to figs. 8 and 9

10.1.2. Three-phase motors

Position-No.*	Ident-No.	Description
070	001849	Bearing
120	008634	Cable lug
180	001850	Bearing
200	005498	Fan cover
220	049001	Cable gland (M 16 x 1.5)
240	052602	Terminal box seal
260	052601	Cover seal
270	052605	Screw plug (M 16 x 1.5)

Tab. 14

* According to figs. 10 and 11

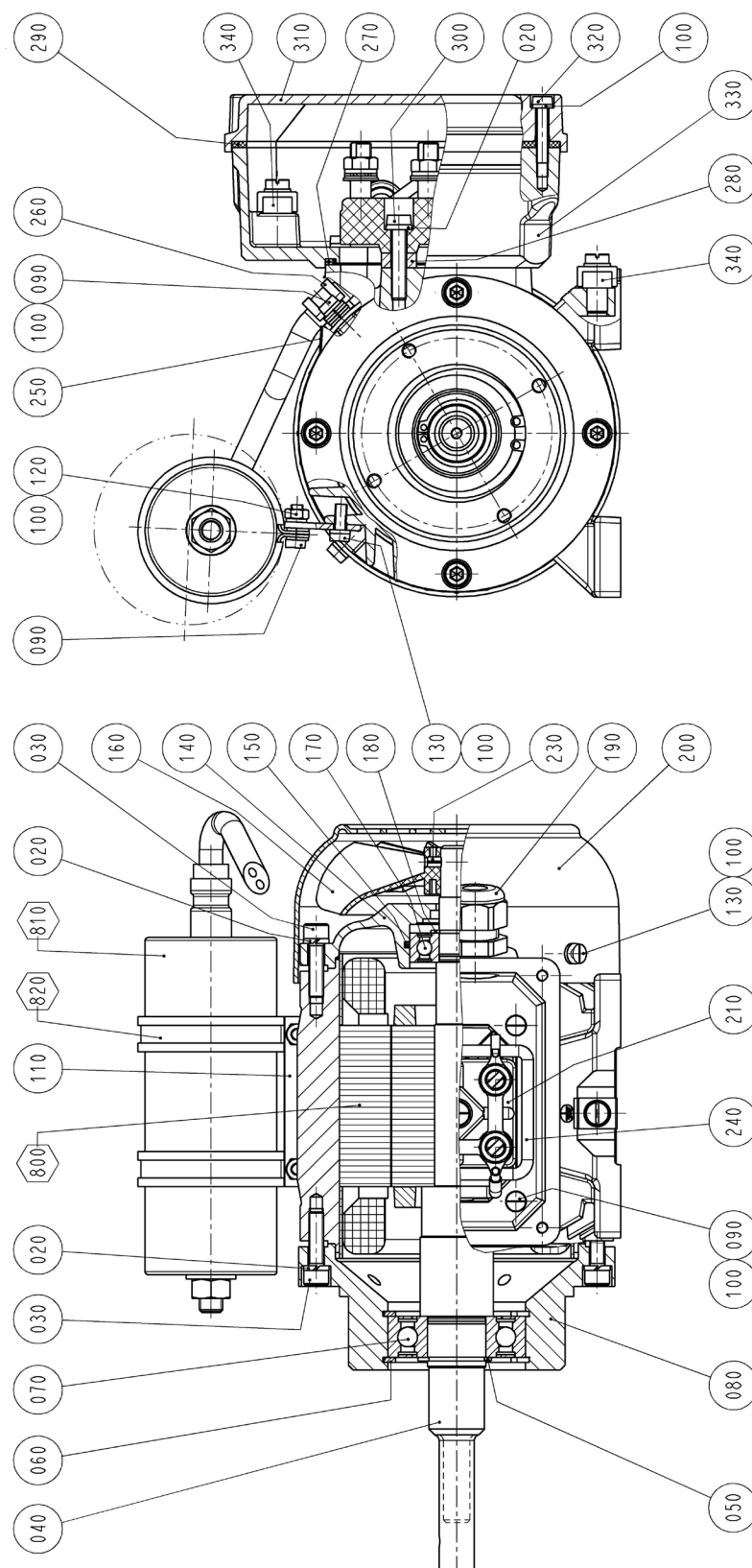
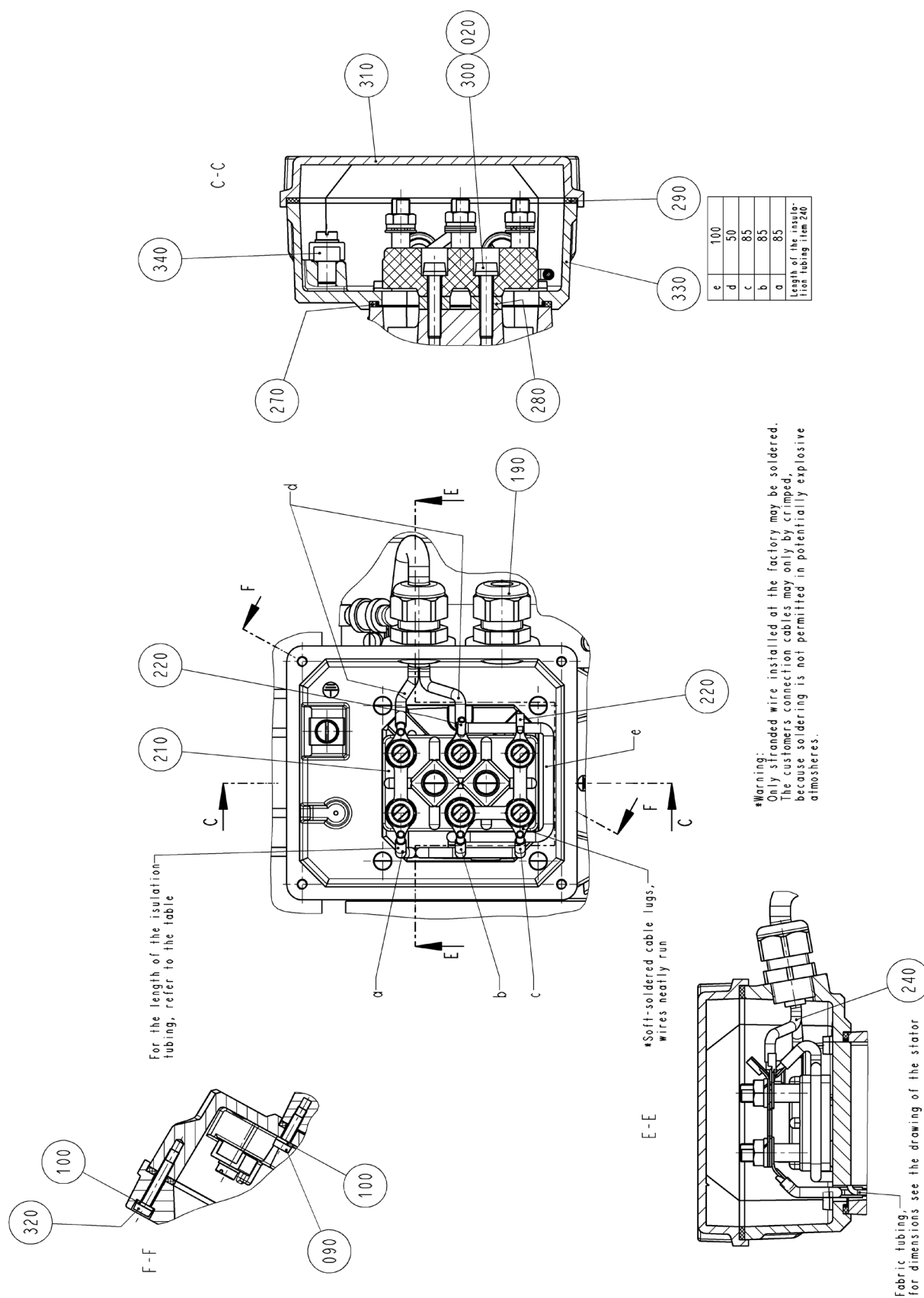


Fig. 8: Explosion-proof capacitor motor



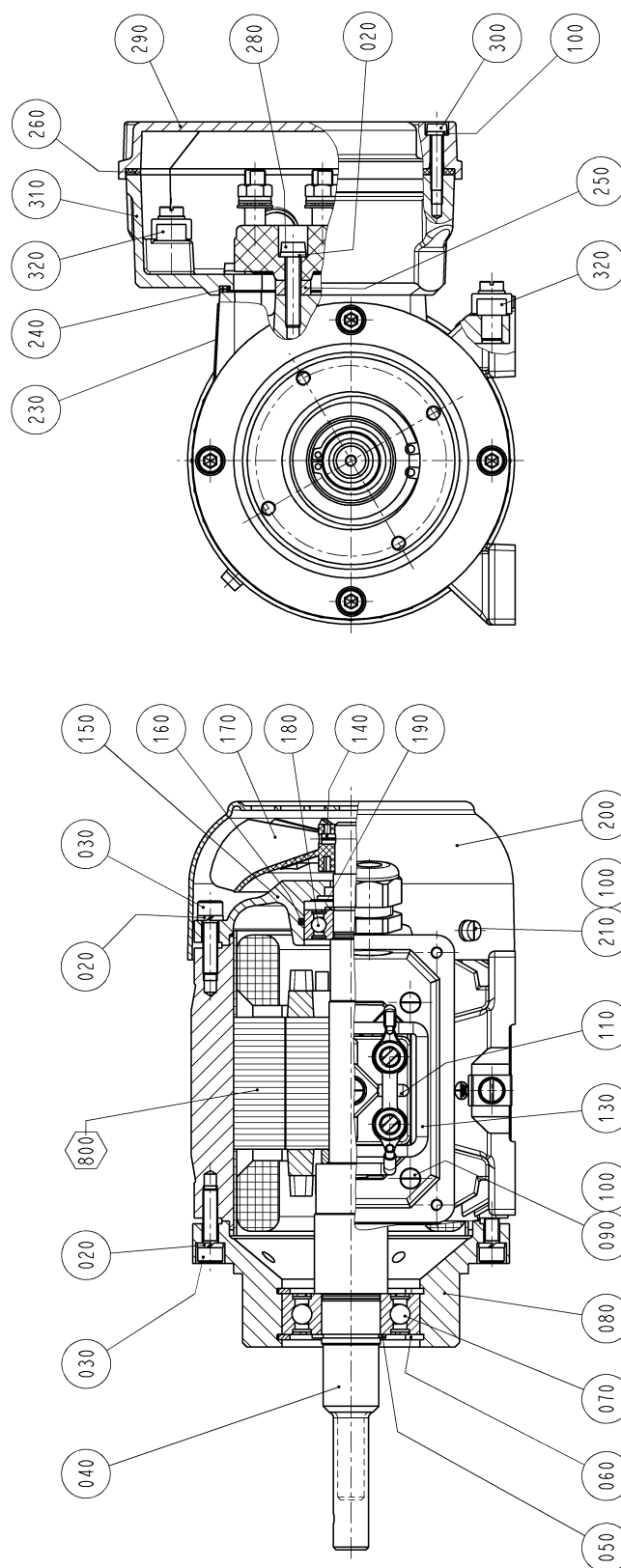


Fig. 10: Explosion-proof 3-phase motor

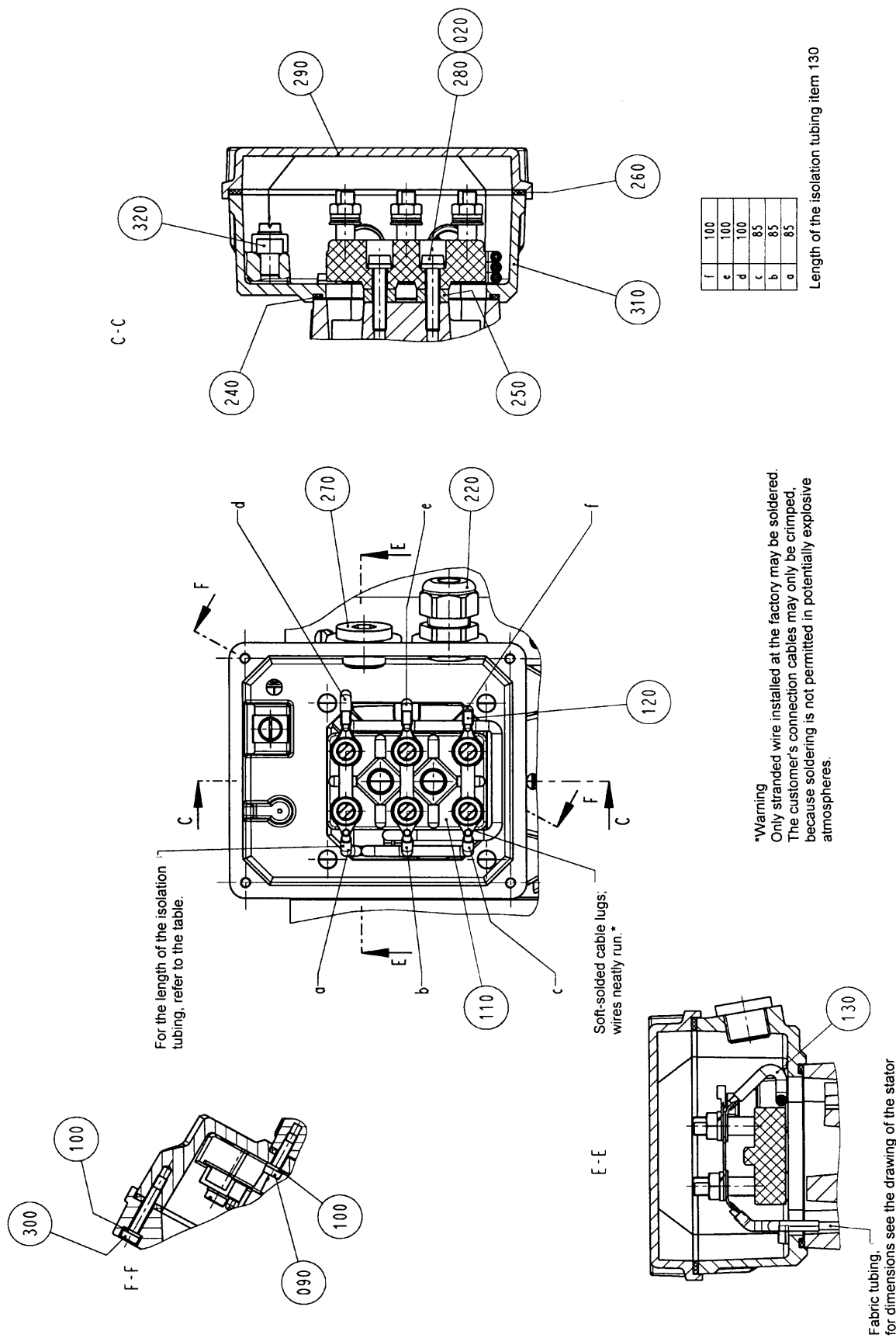


Fig. 11: Terminal box of explosion-proof 3-phase motor

11. Returns

Preparing for return

1. Remove the device.
2. Send the device together with the completed Health and Safety Clearance and Decontamination Form to KNF, stating the nature of the transferred medium.
3. Pack the device securely to prevent further damage to the product. If necessary, request original packaging for a fee.

Returns

KNF shall undertake to repair the device only under the condition that the customer presents a certificate regarding the medium that is pumped and the cleaning of the device. Please follow the instructions at knf.com/repairs here.

Contact your KNF sales partner directly if you require additional support for your return service.

KNF worldwide

Find your local KNF partner on www.knf.com

EG/EU – Konformitätserklärung / EC declaration of conformity
Richtlinien 2014/34/EU und 2011/65/EU / Directive 2014/34/EU and 2011/65/EC

Hiermit erklärt der Hersteller: / Herewith the manufacturer:

KNF Neuberger GmbH, Alter Weg 3, D-79112 Freiburg

des Elektromotors (Seriennummer siehe Typenschild): / of the electric motor (serial number see type label):

M56EX (Motor / motor)

Dass der Motor den grundlegenden Anforderungen folgender Richtlinien entspricht / declares that the motor corresponds to the basic requirements of the following directives:

EU-Richtlinie 2014/34/EU für Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen / EC directive 2014/34/EU relating to equipment and protective systems intended for use in potentially explosive atmospheres.

Richtlinie 2011/65/EU zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten (Anhang II geändert durch die Delegierte Richtlinie (EU) 2015/863 der Kommission) / Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (Annex II amended by Commission Delegated Directive (EU) 2015/863)

Der Motor erfüllt die Anforderungen der Zündschutzart erhöhte Sicherheit "e" und ist wie folgt gekennzeichnet: / The partly completed machinery fulfils the requirements of the type of protection by increased safety "e" and is marked as follows:



II 2G Ex eb IIC T4 Gb

(Drehstrommotor / Three phase motor)

Bei Anbau eines Kondensators in der Zündschutzart Sandkapselung "q" mit eigener Zulassung und Kennzeichnung ist der Motor wie folgt gekennzeichnet. / With a capacitor with protection class powder filling „q“ with own permission and marking the motor is marked as follows.



II 2G Ex eb IIC T3 Gb

(Kondensatormotor / Capacitor motor)

Entsprechend Artikel 13 (1) b) i) der RL2014/34/EU wurde der Motor geprüft von der TÜV-SÜD Product Service GmbH, Ridlerstr. 65, D-80339 München, notifizierte Stelle Nr. 0123 mit der EG-Baumusterprüfbescheinigungsnummer / According to article 13 (1) b) i) of the directive 2014/34/EU, the motor was tested by the TÜV-SÜD Product Service GmbH, Ridlerstr. 65, D-80339 München, notified body no. 0123 with the EC type examination certificate number:

TPS 12 ATEX 1 612 X

Für die Überwachung des QS-Systems ist verantwortlich die TÜV-SÜD Product Service GmbH, Ridlerstr. 65, D-80339 München. Benannte Stelle Nr. 0123 / For the supervision of the QS-System the TÜV-SÜD Product Service GmbH, Ridlerstr. 65, D-80339 München is responsible. Notified body no. 0123

Folgende harmonisierte Normen bzw. technische Spezifikationen wurden zugrunde gelegt: / The following harmonized standards have been applied:

EN IEC 60079-0: 2018/AC:2020-02
EN 60079-7: 2015
EN 60034-1: 2010 + Cor.:2010
EN IEC 63000: 2018

EN 55014-1: 2017
EN 55014-2: 2015
EN IEC 61000-3-2: 2019
EN 61000-3-3: 2013 + A1:2019

Da diese Motoren Einbaugeräte sind, müssen die Netzanschlüsse und Einrichtungen zum Trennen und Ausschalten des Motors sowie Überstrom- und Überlastschutzeinrichtungen beim entsprechenden Einbau berücksichtigt werden. / As these motors are OEM-models the power supplies and the equipments for disconnecting and switching-off the motor respectively have to be considered when mounting as well as over-current and overload protective gear.

Darüber hinaus muss beim Einbau ein Berührungsschutz gegen bewegte und heiße Teile, soweit vorhanden, vorgesehen werden. / In addition a protection against mechanical parts in motion and hot parts, if existing, has to be provided when mounting.

Freiburg, 17.06.2021

Ort, Datum (TT.MM.JJJJ)
place, date (dd.mm.yyyy)

CO R&D



ppa. S. Schreiber

**Explosionsgeschützte
Motorkondensatoren****Explosion protected
motor capacitors****Atmosphères explo-
sibles condensateurs de
moteur****Ausführung
Version
Séries****Typ 24****Zweck dieser Anleitung**

Bei Arbeiten in explosionsgefährdeten Bereichen hängt die Sicherheit von Personen und Anlagen von der Einhaltung aller relevanten Sicherheitsvorschriften ab.

Das Montage- und Wartungspersonal, welches in solchen Anlagen arbeitet, trägt deshalb eine besondere Verantwortung. Die Voraussetzung dafür ist die genaue Kenntnis der geltenden Vorschriften und Bestimmungen.

Diese Anleitung fasst kurz die wichtigsten Sicherheitsmaßnahmen zusammen. Sie ergänzt die entsprechenden Vorschriften, zu deren Studium das verantwortliche Personal verpflichtet ist.

Purpose of these instructions

When working in hazardous areas, the safety of personnel and plant depends on complying with safety regulations.

Assembly and maintenance staff working on such plant therefore have a particular responsibility. The prerequisite for this is precise knowledge of the current rules and regulations.

These instructions summarise the most important safety measures. They supplement the corresponding regulations, which the staff responsible must study.

Objectif du présent mode d'emploi

Au cours des travaux dans les zones à risque d'explosion, la sécurité des hommes et des équipements est liée au respect de toutes les consignes de sécurité.

Le personnel chargé du montage et de la maintenance sur ces équipements possède à cet égard une grande responsabilité et doit connaître parfaitement les prescriptions et dispositions légales en vigueur.

Le présent mode d'emploi résume de façon concise les mesures de sécurité les plus importantes. Il ne peut en aucun cas se substituer aux prescriptions correspondantes, dont l'étude par le personnel responsable demeure obligatoire.

Änderungen vorbehalten

Subject to alterations

Sous réserve de modifications



SÜKO Kondensatorenbau
Robert-Bosch-Straße 2
72411 Bodelshausen
☎07471/71037 / Fax 07471/9595700

Betriebsanleitung	Operating instruction	Mode d'emploi
1 Sicherheitshinweise	1 Safety instructions	1 Consignes de sécurité
Verwenden Sie die Kondensatoren nur für den zugelassenen Einsatzzweck. Fehlerhafter oder unzulässiger Einsatz sowie das Nichtbeachten der Hinweise dieser Betriebsanleitung schließen eine Gewährleistung unsererseits aus.	Only use the capacitors for the approved use. Incorrect or impermissible use as well as the non-observance of the directions in these operating instructions invalidate our warranty.	Utilisez les condensateurs uniquement pour leur utilisation autorisée. Une utilisation erronée ou interdite ainsi qu'un non respect des remarques de cette notice d'utilisation exclut toute garantie de notre part.
Umbauten und Veränderungen an den Kondensatoren, die den Explosionsschutz beeinträchtigen, sind nicht gestattet.	Modifications or changes to the capacitors that impair explosion protection are not permitted.	Les transformations et modifications sur condensateurs influençant sur la protection contre l'explosion ne sont pas autorisées.
Der Kondensator darf nur im unbeschädigten und sauberen Zustand betrieben und eingebaut werden.	The capacitor may only be operated and fitted in an undamaged and clean condition.	Le condensateur ne pourra être utilisé que s'il n'est pas endommagé et qu'il est en parfait état.



Beachten Sie bitte folgendes bei Errichtung und Betrieb des Gerätes:
Observe the following during setting-up and operation:
Lors du montage et du fonctionnement, observer:

- | | | |
|---|--|---|
| <ul style="list-style-type: none"> • die nationalen Sicherheitsvorschriften • die nationalen Unfallverhütungsvorschriften | <ul style="list-style-type: none"> • the national safety regulations • the national accident prevention | <ul style="list-style-type: none"> • les prescriptions de sécurité nationales • les prescriptions nationales en matière de prévention des accidents |
| <ul style="list-style-type: none"> • die nationalen Montage- und Errichtungsvorschriften • die allgemein anerkannten Regeln der Technik • die Sicherheitshinweise dieser Betriebsanleitung • die Kennwerte der Typ- und Datenschilder | <ul style="list-style-type: none"> • national mounting and installation requirements • the generally recognized technical regulations • the safety guidelines in these operating instruction • the characteristic values on the rating and date plates | <ul style="list-style-type: none"> • les prescriptions nationales de montage • les règles généralement reconnues de la technique • les consignes de sécurité du présent mode d'emploi • les valeurs nominales figurant sur les plaques signalétiques de type et de spécifications |
| <ul style="list-style-type: none"> • das Gerätesicherheitsgesetz | <ul style="list-style-type: none"> • the equipment safety legislation | <ul style="list-style-type: none"> • la législation sur la sécurité des appareils en vigueur |
| <ul style="list-style-type: none"> • die Prüfbescheinigungen und die darin enthaltenen besonderen Bedingungen | <ul style="list-style-type: none"> • the test certificates and the special conditions outlined in them | <ul style="list-style-type: none"> • les certificats d'essais et les conditions particulières auxquels ils se rapportent |

Beschädigungen können den Explosionsschutz aufheben.

Damage may eliminate the explosion protection.

Pour d'autres conditions d'utilisation différentes des conditions standard, veuillez prendre contact auprès du fabricant.



Prüfbescheinigungen senden wir Ihnen auf Anfrage gerne zu.
We will be pleased to send you test certificates on request.
Les certificats de contrôle peuvent vous être envoyés sur demande.

Betriebsanleitung	Operating instruction	Mode d'emploi
2 Anwendung Die Kondensatoren sind nach der EU-Richtlinie 2014/34 EU (zugelassen und entsprechen den Europäischen Normen für den Explosionsschutz. Der Einsatz ist in allen explosionsgefährdeten Bereichen der Zonen 1 und 2 zugelassen.	2 Application The capacitors are approved in accordance with EC Directive 2014/34/EC and comply with the European standards for explosion protection. They are approved for use in all hazardous areas of zones 1 and 2.	2 Domaine d'application Les condensateurs sont homologués conformément à la directive 2014/34/UE et répondent aux normes européennes pour la protection contre l'explosion. Ils peuvent être utilisés dans tous les secteurs à risque de déflagration des zones 1 et 2.
3 Technische Daten Explosionsschutz: ⊕ II 2G Ex q IIC T6 Gb Prüfungsschein: SEV 10 ATEX 0154 X Schutzart: IP 54 <u>Umgebungstemperatur:</u> -20°C...+50°C <u>Elektrische Daten:</u> Bemessungsspannung: 280...470V Bemessungsfrequenz: 50/60 Hz Kapazität: 1.....55µF Konformität: nach RL 2014/34/EU CE1258	3 Technical data Ex-protection: ⊕ II 2G Ex q IIC T6 Gb Test certificate: SEV 10 ATEX 0154 X Degree of protection: IP 54 <u>Ambient temperature:</u> -20°C...+50°C <u>Electrical data:</u> Rated voltage: 280...470V Rated frequency : 50/60Hz capacitance: 1.....55µF Conformity: after RL 2014/34/EC CE1258	3 Caractéristiques techniques Ex- protection : ⊕ II 2G Ex q IIC T6 Gb Certificat de test: SEV 10 ATEX 0154 X Indice de protection: IP 54 <u>Température ambiante:</u> -20°C ... +50°C <u>Caractéristiques techniques</u> Tension admissible: 280...470V Fréquence : 50/60Hz Capacité: 1.....55µF Conformité: après RL 2014/34/UE CE1258
4 Normenkonformität Dieser explosionsgeschützte Kondensatoren entspricht dem Stand der Technik. Er wurde gem. EN 29001 (ISO 9001) entwickelt, gefertigt und geprüft Er entspricht unter anderem folgenden Bestimmungen und Normen: EN 1127-1:2011 EN 60079-0:2014 EN 60079-5:2015	4 Conformity with standards This explosion proof capacitor conforms to the latest technical standards. It has been developed, manufactured and tested in accordance with EN 29001 (ISO 9001). The specifications and standards it meets include the following: EN 1127-1:2011 EN 60079-0:2014 EN 60079-5:2015	4 Conformité aux normes Ce condensateur protégé contre les explosions correspond à l'état de la technique. Il a été développé, fabriqué et contrôlé selon la norme EN 29001 (ISO 9001) Il correspond notamment aux dispositions et normes suivantes EN 1127-1:2011 EN 60079-0:2014 EN 60079-5:2015
5 Erdung Eine zusätzliche Erdung des Kondensatorenbeckens kann über den am Gehäuseboden befindlichen Gewindebolzen M12 erfolgen.	5 Grounding An additional earth for the capacitor can be made via the M12 threaded bolt located on the base of the housing.	5 mise à la terre Il est possible de faire une mise à la terre supplémentaire du bocal du condensateur en utilisant la tige filetée M12 située sur le fond du boîtier.
6 Inbetriebnahme	6 Commissioning	6 Mise en service

Betriebsanleitung	Operating instruction	Mode d'emploi
Bevor Sie den Kondensator in Betrieb nehmen, stellen Sie sicher, dass • der Kondensator vorschriftsmäßig installiert wurde • der Anschluss ordnungsgemäß ausgeführt wurde • der Kondensator nicht beschädigt ist	Before operating the capacitor, ensure that • the capacitor has been correctly installed • the connection has been made properly • the capacitor is undamaged	Avant de faire fonctionner le condensateur, assurez-vous que • le condensateur a été correctement installé • le raccordement électrique est conforme • le condensateur n'est pas endommagé
7 Besondere Bedingungen „X“	7 Special conditions 'X'	7 Special conditions 'X'
Die Ex-Motorkondensatoren dürfen nur für feste Installation verwendet werden. Vom Betreiber muss eine zusätzliche Klemmverbindung des Kabels (Leitung) montiert werden um sicherzustellen, dass Zug und Drehung nicht an die Klemmen übertragen werden.	The explosion engine capacitors may only be used for fixed installation. The operating company must fit an additional cable (line) clamping connector in order to ensure that no traction or rotation gets transferred to the clamps.	Les condensateurs des moteurs à explosion ne doivent être utilisés que pour des installations fixes. L'exploitant doit équiper ceux-ci d'un attache-câble supplémentaire (sur le câble) afin d'assurer que les forces de traction et de torsion ne soient pas transmises aux bornes
8 Instandhaltung	8 Maintenance	8 Entretien et maintenance
8.1 Reparatur und Instandhaltung	8.1 Repairs and maintenance	8.1 Réparation et maintenance
Der Zustand der über den Entlüftungsöffnungen vorhandenen Klebeabdeckung ist in geeigneten Zeitabständen zu überprüfen. Bei Beschädigungen ist diese zu erneuern! Wartungs-, Reparatur- und Instandsetzungsarbeiten am Kondensator dürfen nur von dazu befugtem und entsprechend geschultem Personal durchgeführt werden. Vor dem Beginn dieser Arbeiten muss der Kondensator spannungsfrei geschaltet werden.	The condition of the adhesive covering over the venting apertures is to be inspected at suitable intervals. In case of damage, these must be replaced.. Servicing, repair and corrective maintenance work on the capacitor is only to be carried out by specifically authorised and appropriately trained personnel. The capacitor must be disconnected before the work begins.	L'état des protections collées situées au-dessus des ouvertures d'aération doit être contrôlé à intervalles réguliers. Les condensateurs avec des En cas de dommages, ceux-ci doivent être remplacés. Les travaux d'entretien, de réparation et de maintenance sur le condensateur ne pourront être effectués que par du personnel formé à cet effet. Avant le début des travaux, il faut mettre le condensateur hors tension.



Dieses Gehäuse wurde dauerhaft verschlossen und kann nicht repariert werden !
This casing has been permanently sealed and cannot be repaired !
Ce boîtier a été scellé de manière durable et ne peut pas être réparé !



Beachten Sie die geltenden nationalen Bestimmungen im Einsatzland!
Please observe the valid national regulations in the country of use!
Observer les prescriptions nationales en vigueur dans le pays d'installation!

**Explosionssgeschützte
Motorkondensatoren****Explosion protected
motor capacitors****Atmosphères explo-
sibles / condensateurs de
moteur****Ausführung
Version
Séries****Typ 27****Zweck dieser Anleitung**

Bei Arbeiten in explosionsgefährdeten Bereichen hängt die Sicherheit von Personen und Anlagen von der Einhaltung aller relevanten Sicherheitsvorschriften ab.

Das Montage- und Wartungspersonal, welches in solchen Anlagen arbeitet, trägt deshalb eine besondere Verantwortung. Die Voraussetzung dafür ist die genaue Kenntnis der geltenden Vorschriften und Bestimmungen.

Diese Anleitung fasst kurz die wichtigsten Sicherheitsmaßnahmen zusammen. Sie ergänzt die entsprechenden Vorschriften, zu deren Studium das verantwortliche Personal verpflichtet ist.

Purpose of these instructions

When working in hazardous areas, the safety of personnel and plant depends on complying with safety regulations.

Assembly and maintenance staff working on such plant therefore have a particular responsibility. The prerequisite for this is precise knowledge of the current rules and regulations.

These instructions summarise the most important safety measures. They supplement the corresponding regulations, which the staff responsible must study.

Objectif du présent mode d'emploi

Au cours des travaux dans les zones à risque d'explosion, la sécurité des hommes et des équipements est liée au respect de toutes les consignes de sécurité.

Le personnel chargé du montage et de la maintenance sur ces équipements possède à cet égard une grande responsabilité et doit connaître parfaitement les prescriptions et dispositions légales en vigueur.

Le présent mode d'emploi résume de façon concise les mesures de sécurité les plus importantes. Il ne peut en aucun cas se substituer aux prescriptions correspondantes, dont l'étude par le personnel responsable demeure obligatoire.

Änderungen vorbehalten

Subject to alterations

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Betriebsanleitung	Operating instruction	Mode d'emploi
1 Sicherheitshinweise	1 Safety instructions	1 Consignes de sécurité
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Umbauten und Veränderungen an den Kondensatoren, die den Explosionsschutz beeinträchtigen, sind nicht gestattet.	Modifications or changes to the capacitors that impair explosion protection are not permitted.	Les transformations et modifications sur condensateurs influençant sur la protection contre l'explosion ne sont pas autorisées.
Der Kondensator darf nur im unbeschädigten und sauberen Zustand betrieben und eingebaut werden.	The capacitor may only be operated and fitted in an undamaged and clean condition.	Le condensateur ne pourra être utilisé que s'il n'est pas endommagé et qu'il est en parfait état.



Beachten Sie bitte folgendes bei Errichtung und Betrieb des Gerätes:
Observe the following during setting-up and operation:
Lors du montage et du fonctionnement, observer:

- | | | |
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| <ul style="list-style-type: none"> • das Gerätesicherheitsgesetz | <ul style="list-style-type: none"> • the equipment safety legislation | <ul style="list-style-type: none"> • la législation sur la sécurité des appareils en vigueur |
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Beschädigungen können den Explosionsschutz aufheben.

Damage may eliminate the explosion protection.

Pour d'autres conditions d'utilisation différentes des conditions standard, veuillez prendre contact auprès du fabricant.



Prüfbescheinigungen senden wir Ihnen auf Anfrage gerne zu.
We will be pleased to send you test certificates on request.
Les certificats de contrôle peuvent vous être envoyés sur demande.

Betriebsanleitung	Operating instruction	Mode d'emploi
2 Anwendung Die Kondensatoren sind nach der EU-Richtlinie 2014/34 EU (zugelassen und entsprechen den Europäischen Normen für den Explosionsschutz. Der Einsatz ist in allen explosionsgefährdeten Bereichen der Zonen 1 und 2 zugelassen.	2 Application The capacitors are approved in accordance with EC Directive 2014/34/EC and comply with the European standards for explosion protection. They are approved for use in all hazardous areas of zones 1 and 2.	2 Domaine d'application Les condensateurs sont homologués conformément à la directive 2014/34/UE et répondent aux normes européennes pour la protection contre l'explosion. Ils peuvent être utilisés dans tous les secteurs à risque de déflagration des zones 1 et 2.
3 Technische Daten Explosionsschutz: ⊗ II 2 G Ex q IIC T6 Gb ⊗ II 2 D Ex tb IIIC T 65°C Db Prüfungsschein: SEV 17 ATEX 0165 X IECEX SEV 17.0021 X Schutzart: IP 54 <u>Umgebungstemperatur:</u> -20°C...+50°C <u>Elektrische Daten:</u> Bemessungsspannung: 280...470V Bemessungsfrequenz: 50/60 Hz Kapazität: 1.....55µF Konformität: nach RL 2014/34/EU CE1258	3 Technical data Ex-protection: ⊗ II 2 G Ex q IIC T6 Gb ⊗ II 2 D Ex tb IIIC T 65°C Db Test certificate. SEV 17 ATEX 0165 X IECEX SEV 17.0021 X Degree of protection: IP 54 <u>Ambient temperature:</u> -20°C...+50°C <u>Electrical data:</u> Rated voltage: 280...470V Rated frequency : 50/60Hz capacitance: 1.....55µF Conformity: after RL 2014/34/EC CE1258	3 Caractéristiques techniques Ex- protection : ⊗ II 2 G Ex q IIC T6 Gb ⊗ II 2 D Ex tb IIIC T 65°C Db Certificat de test: SEV 17 ATEX 0165 X IECEX SEV 17.0021 X Indice de protection: IP 54 <u>Température ambiante:</u> -20°C ... +50°C <u>Caractéristiques techniques</u> Tension admissible: 280...470V Fréquence : 50/60Hz Capacité: 1.....55µF Conformité: après RL 2014/34/UE CE1258
4 Normenkonformität Dieser explosionsgeschützte Kondensatoren entspricht dem Stand der Technik. Er wurde gem. EN 29001 (ISO 9001) entwickelt, gefertigt und geprüft Er entspricht unter anderem folgenden Bestimmungen und Normen:	4 Conformity with standards This explosion proof capacitor conforms to the latest technical standards. It has been developed, manufactured and tested in accordance with EN 29001 (ISO 9001). The specifications and standards it meets include the following: EN 60079-0 EN 60079-5 EN 60079-31	4 Conformité aux normes Ce condensateur protégé contre les explosions correspond à l'état de la technique. Il a été développé, fabriqué et contrôlé selon la norme EN 29001 (ISO 9001) Il correspond notamment aux dispositions et normes suivantes
5 Erdung Eine zusätzliche Erdung des Kondensatorenbeckens kann über den am Gehäuseboden befindlichen Gewindebolzen M12 erfolgen.	5 Grounding An additional earth for the capacitor can be made via the M12 threaded bolt located on the base of the housing.	5 mise à la terre Il est possible de faire une mise à la terre supplémentaire du bocal du condensateur en utilisant la tige filetée M12 située sur le fond du boîtier.

Betriebsanleitung	Operating instruction	Mode d'emploi
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6 Inbetriebnahme

Bevor Sie den Kondensator in Betrieb nehmen, stellen Sie sicher, dass

- der Kondensator vorschriftsmäßig installiert wurde
- der Anschluss ordnungsgemäß ausgeführt wurde
- der Kondensator nicht beschädigt ist

6 Commissioning

Before operating the capacitor, ensure that

- the capacitor has been correctly installed
- the connection has been made properly
- the capacitor is undamaged

6 Mise en service

Avant de faire fonctionner le condensateur, assurez-vous que

- le condensateur a été correctement installé
- le raccordement électrique est conforme
- le condensateur n'est pas endommagé

7 Besondere Bedingungen „X“

Die Ex-Motorkondensatoren dürfen nur für feste Installation verwendet werden. Vom Betreiber muss eine zusätzliche Klemmverbindung des Kabels (Leitung) montiert werden um sicherzustellen, dass Zug und Drehung nicht an die Klemmen übertragen werden.

7 Special conditions 'X'

The explosion engine capacitors may only be used for fixed installation. The operating company must fit an additional cable (line) clamping connector in order to ensure that no traction or rotation gets transferred to the clamps.

7 Special conditions 'X'

Les condensateurs des moteurs à explosion ne doivent être utilisés que pour des installations fixes. L'exploitant doit équiper ceux-ci d'un attache-câble supplémentaire (sur le câble) afin d'assurer que les forces de traction et de torsion ne soient pas transmises aux bornes

8 Instandhaltung

8.1 Reparatur und Instandhaltung

Wartungs- und Instandhaltungsarbeiten am Kondensator dürfen nur von dazu befugtem und entsprechend geschultem Personal durchgeführt werden. Vor dem Beginn dieser Arbeiten muss der Kondensator spannungsfrei geschaltet werden.

8 Maintenance

8.1 Repairs and maintenance

Servicing, repair and corrective maintenance work on the capacitor is only to be carried out by specifically authorised and appropriately trained personnel. The capacitor must be disconnected before the work begins.

8 Entretien et maintenance

8.1 Réparation et maintenance

Les travaux d'entretien, de réparation et de maintenance sur le condensateur ne pourront être effectués que par du personnel formé à cet effet. Avant le début des travaux, il faut mettre le condensateur hors tension.

	Dieses Gehäuse wurde dauerhaft verschlossen und kann nicht repariert werden ! This casing has been permanently sealed and cannot be repaired ! Ce boîtier a été scellé de manière durable et ne peut pas être réparé !
	Vor UV – Licht (Sonnenlicht) schützen Protect from UV light (sunlight Protéger de la lumière UV (lumière du soleil)
	Beachten Sie die geltenden nationalen Bestimmungen im Einsatzland! Please observe the valid national regulations in the country of use! Observer les prescriptions nationales en vigueur dans le pays d'installation!

EG-Baumusterprüfbescheinigung SEV 10 ATEX 0154 X

Wir (we; nous) SÜKO Kondensatorenbau GmbH, Robert-Bosch-Straße 2, 72411 Bodelshausen erklären in alleiniger Verantwortung, dass das Produkt Motorkondensator Typ 24 hereby declare in our sole responsibility, that the product Motor-capacitor series 24 déclarons de notre seule responsabilité, que le produit Condensateur de moteur type 24 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 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
2014/34EU ; Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen 2014/34EC; Equipment and protective systems intended for use in potentially explosive atmospheres 2014/34CE; Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles	EN 1127-1:2011 EN 60079-0:2014 EN 60079-5:2015
Bodelshausen, 07.06.2016 Ort und Datum Place and date lieu et date  Geschäftsführer Manager Gérant	

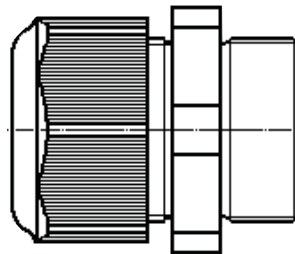
EG-Baumusterprüfbescheinigung IECEx SEV 17.0021X / SEV 17 ATEX 0165 X

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Bodelshausen, 13.03.2018 Ort und Datum Place and date lieu et date  Geschäftsführer Manager Gérant	

Explosionssgeschützte 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
purge 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 asuvas 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, μεταφραση 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-rappreżentant ta' Cooper Crouse Hinds/CEAG f'pajjiżhom."

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 poskytne 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/GB/F (s)



Kabel- und Leitungseinführungen,
Verschlussstopfen,
Schraubverschlüsse, Trompeten-
verschraubungen, Reduzierungen
und Entwässerungsstopfen

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

Entrées de câble, bouchons filetés,
bouchons de fermeture, presses-
étoupes à trompette, bagues de
réduction et bouchons de purge

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Konformitätserklärung
separat beigelegt.

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Declaration of conformity,
enclosed separately.

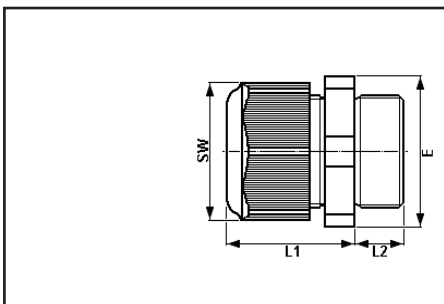
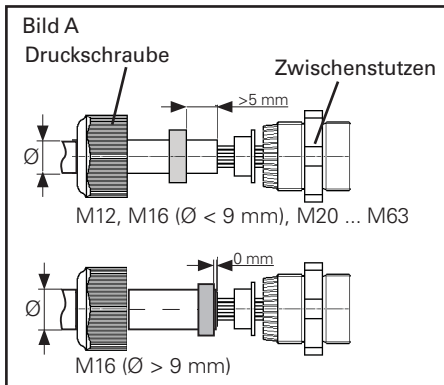
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Déclaration de conformité,
jointe séparément.

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

Maßbilder und Abmessungen in mm



1 Technische Daten

1.1 Technische Angaben für:

Kabel- und Leitungseinführungen (KLE) M12x1,5 bis M63x1,5

ATEX EG-Baumusterprüfbescheinigung: PTB 14 ATEX 1015 X^(A)

GeräteKennzeichnung nach 2014/34/EU und Norm:

EN 60079-0

Ex II 2 G Ex e IIC Gb

Ex II 2 D Ex tb IIIC Db

IECEx Konformitätsbescheinigung:

IECEx PTB 14.0027X^(A)

GeräteKennzeichnung: IEC 60079-0

Ex e IIC Gb

Ex tb IIIC Db

^(A) Die EG-Baumusterprüfbescheinigung/IECEx Konformitätsbescheinigung und künftige Ergänzungen dazu, gelten gleichzeitig als Nachträge zu den EG-Baumusterprüfbescheinigungen PTB 99 ATEX 3128 X und PTB 99 ATEX 3101 X, bzw der IECEx Konformitätsbescheinigung IECEx PTB 05.0004X.

Zul. Lagertemperatur in Originalverpackung: -20° C bis +70° C

Schutzart nach EN/IEC 60529:

IP 66 *) (komplett montierter Zustand)

*) M40, M50 und M63 mit geeigneter Flanschdichtung

Typ	SW	L1	L2	E	Gewicht ca.
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

Typ	Einsatz-temperatur-bereich	Schlag-energie	Klemmbereich für Leitungen														Ein-schraub-gewinde	Farbe Staubschutz-kappe
			Dichtung 1+2+3 						Dichtung 1+2 				Dichtung 1 					
			min.		max.		min.		max.		min.		max.					
	°C	Joule	Ø	Nm**	Ø ⁽¹⁾⁽²⁾	Nm**	Ø	Nm**	Ø ⁽¹⁾⁽²⁾	Nm**	Ø	Nm**	Ø ⁽²⁾	Nm**	Nm**			
M12x1,5	-20 - 70	4										5,0	0,8	7,0	1,0	1,2	weiß	
M16x1,5	-20 - 70	4					5,5	1,0	7,0	1,0		7,0	1,0	10,0	1,4	3,3	weiß	
M20x1,5	-20 - 70	7	5,5	1,5	7,0	1,0	7,0	1,5	9,0	1,4		9,5	1,0	13,0	1,7	2,7	weiß	
M20x1,5	-40 - 70	4	5,5	1,5	7,0	1,0	7,0	1,5	9,0	1,4		9,5	1,0	11,0	1,7	2,7	grün	
M25x1,5	-20 - 70	7	8,0	1,5	10,0	2,0	10,0	2,3	13,0	2,6		13,5	1,3	17,5	2,3	3,0	weiß	
M25x1,5	-55 - 70	7	8,0	1,5	10,0	2,0	10,0	2,3	13,0	2,6		13,5	1,5	15,0	2,3	3,0	grün	
M32x1,5	-20 - 70	7					14,0	3,0	17,0	4,0		17,5	1,5	21,0	1,3	5,0	weiß	
M32x1,5	-55 - 70	7					14,0	3,0	17,0	4,0		17,5	1,5	21,0	1,3	5,0	grün	
M40x1,5	-55 - 70	7					19,0	3,3	22,0	5,5		22,0	3,3	28,0	6,7	7,5	grün	
M50x1,5	-55 - 70	7					24,0	6,0	28,0	7,0		28,0	5,0	35,0	7,0	7,5	grün	
M63x1,5	-55 - 70	7					29,0	12,0	35,0	12,0		36,0	12,0	41,0	13,0	7,5	grün	
zusätzlich mitgelieferter Dichtungseinsatz:							41,0	13,0	48,0	7,8								

** Prüfdrehmomente bei 20°C

⁽¹⁾ Die Prüfungen der Klemmbereiche und Prüfdrehmomente wurden mit Metaldornen durchgeführt. Bei der Verwendung von Leitungen mit unterschiedlichen Fertigungstoleranzen und Materialeigenschaften kann der Klemmbereich variieren. Bitte verwenden Sie im Zwischenbereich die Kombination aus Dichtung 1 + 2 + 3.

⁽²⁾ Bei der Wahl der Dichtungsgummis darauf achten, dass bei zukünftigen Wartungsarbeiten an der KLE, die Hutmutter nachgezogen werden kann.

Bild B Kabeldurchmesser 9 mm
z.B. für M25x1,5

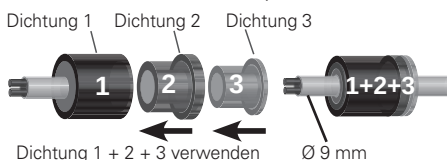


Bild C Kabeldurchmesser 12 mm
z.B. für M25x1,5

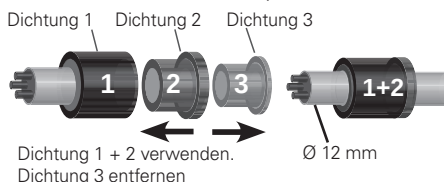
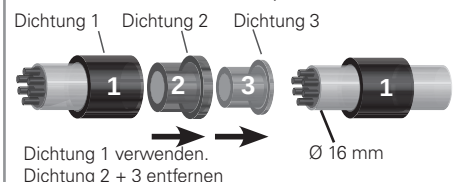


Bild D Kabeldurchmesser 16 mm
z.B. für M25x1,5



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

Maßbilder und Abmessungen in mm

1.2 Mehrfach - Kabel- und Leitungseinführung

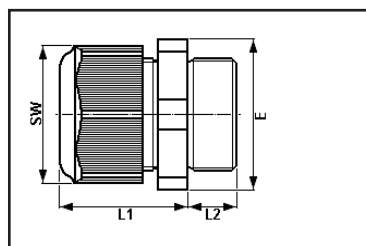
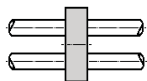


Bild D/1 Dichtungseinsatz

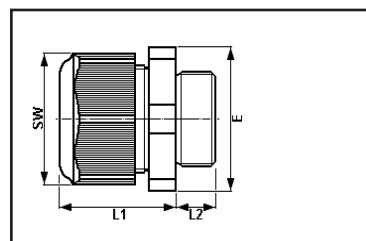


für Mehrfachverschraubung

Typ	SW	L1	L2	E	Gewicht ca.
M25x1,5 2-fach	29 mm	29,5 mm	13 / 8 mm	32,0 mm	16,9 g
M32x1,5 4-fach	36 mm	35,5 mm	15 / 10 mm	40,0 mm	27,6 g

Typ	Einsatztemperaturbereich	Schlagenergie	Klemmbereich				
			Dichtung 1				
				min.		max.	
	°C	Joule		Ø	Nm	Ø	Nm
M25x1,5 2-fach	-20 - 70	< 7	2x	4,5	2,0	7,0	2,0
M32x1,5 4-fach	-20 - 70	< 7	4x	4,5	3,0	7,0	3,5

1.3 Erweiterungs - Kabel- und Leitungseinführung



Typ	SW	L1	L2	E	Gewicht ca.
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

Typ	Einsatztemperaturbereich	Schlagenergie	Klemmbereich												Einschraubgewinde
			Dichtung 1+2+3 ①②③				Dichtung 1+2 ①②				Dichtung 1 ①				
			min.		max.		min.		max.		min.		max.		
	°C	Joule	Ø	Nm**	Ø ⁽¹⁾⁽²⁾	Nm**	Ø	Nm**	Ø ⁽¹⁾⁽²⁾	Nm**		Nm**	Ø ⁽¹⁾	Nm**	Nm**
M16x1,5 / M20x1,5	-20 - 70	< 7	5,5	1,5	7,0	1,0	7,0	1,5	9,0	1,4	9,5	1,0	13,0	1,7	3,3
	-40 - 70	< 4	5,5	1,5	7,0	1,0	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	8,0	1,5	10,0	2,0	10,0	2,3	13,0	2,6	13,5	1,3	17,5	2,3	2,7
	-40 - 70	< 4	8,0	1,5	10,0	2,0	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
zusätzlich mitgelieferte Dichtungseinsatz:							41,0	13,0	48,0	7,8					

** Prüfdrehmomente bei 20°C

⁽¹⁾ Die Prüfungen der Klemmbereiche und Prüfdrehmomente wurden mit Metaldornen durchgeführt. Bei der Verwendung von Leitungen mit unterschiedlichen Fertigungstoleranzen und Materialeigenschaften kann der Klemmbereich variieren. Bitte verwenden Sie im Zwischenbereich die Kombination aus Dichtung 1 + 2 + 3.

⁽²⁾ Bei der Wahl der Dichtungsgummis darauf achten, dass bei zukünftigen Wartungsarbeiten an der KLE, die Hutmutter nachgezogen werden kann.

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

Maßbilder und Abmessungen in mm

1.4 Kabel- und Leitungseinführungen in Sonderausführungen

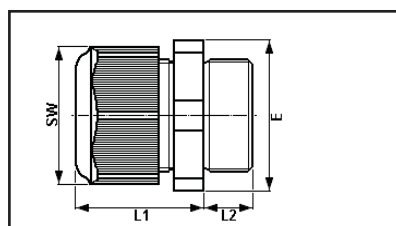
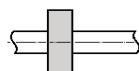


Bild D/2 Dichtungseinsatz



für Flachkabelverschraubung

Typ	SW	L1	L2	E	Gewicht ca.
M20 mit Dichtung Ø 2 mm	24 mm	25,0 mm	13 / 8 mm	26,5 mm	10,1 g
M20 mit geschlitzter Dichtung Ø 7,0- 13 mm	24 mm	25,0 mm	13 / 8 mm	26,5 mm	10,1 g
M25 Flachkabel	29 mm	29,5 mm	13 / 8 mm	32,0 mm	16,9 g
M25 mit PG 16 Gewinde	36 mm	35,5 mm	15 / 10 mm	40,0 mm	27,6 g

Typ	Einsatztemperaturbereich	Schlagenergie	Klemmbereich								Einschraubgewinde
			Dichtung 1				Dichtung 2				
			min.		max.		min.		max.		
	°C	Joule	Ø	Nm**	Ø ⁽¹⁾⁽²⁾	Nm**	Ø	Nm**	Ø ⁽¹⁾⁽²⁾	Nm**	Nm**
M20 mit Dichtung Ø 2 mm	-20 - 60	< 7	2,0	3,5							2,7
M20x1,5 mit geschlitzter Dichtung 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 mit PG 16 Gewinde	-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 Flachkabel	-55 - 70 (110)	< 7	G18 = 5-8x9-12,5 Flachkabel			5,0					3,0
M25x1,5 Flachkabel	-55 - 70 (110)	< 7	G24 / G26 = 6-8x11-14 Flachkabel			3,5					3,0
	Kabeltyp		Dichtungsabmessung				Kabelabmessungen				
M25 Flachkabel	Raychem XTV-4XTV 2 ...		8,0	x	11,0	mm	7,5	x	11,0	mm	3,0
M25 Flachkabel	Raychem VPL-5VPL 2 ...		8,0	x	11,0	mm	7,5	x	11,5	mm	3,0
M25 Flachkabel	Raychem BTV-3BTV 2 ...		8,0	x	11,0	mm	6,0	x	11,0	mm	3,0
M25 Flachkabel	Raychem QTV-10QTVR2		8,0	x	11,0	mm	5,0	x	12,5	mm	3,0
M25 Flachkabel Raychem	Raychem BTV-10BTV 2 ...		8,0	x	14,0	mm	6,0	x	14,0	mm	3,0
M25 Flachkabel	Raychem KTV-5KTV 2 ...		8,0	x	14,0	mm	7,5	x	13,5	mm	3,0

** Prüfdrehmomente bei 20°C

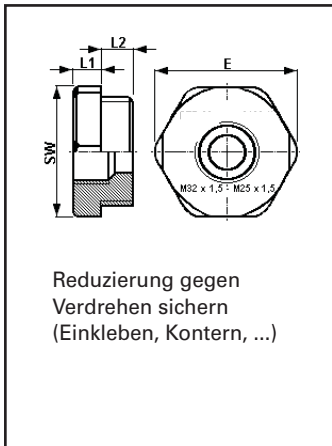
⁽¹⁾ Die Prüfungen der Klemmbereiche und Prüfdrehmomente wurden mit Metaldornen durchgeführt. Bei der Verwendung von Leitungen mit unterschiedlichen Fertigungstoleranzen und Materialeigenschaften kann der Klemmbereich variieren. Bitte verwenden Sie im Zwischenbereich die Kombination aus Dichtung 1 + 2.

⁽²⁾ Bei der Wahl der Dichtungsgummis darauf achten, dass bei zukünftigen Wartungsarbeiten an der KLE, die Muttermutter nachgezogen werden kann.

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

Maßbilder und Abmessungen in mm

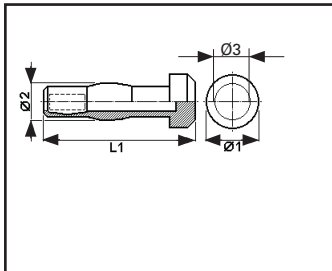
1.5 Reduzierstutzen



Typ	Einsatz-temperaturbereich / °C	SW	L1	L2	E	Einschraubgewinde /	Gewicht ca.
L1	L2						
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	36 mm	6,0 mm	10 mm	40,0 mm	5,0 Nm	13,5 g
M32x1,5 / M16x1,5	-55 - 70	36 mm	6,0 mm	10 mm	40,0 mm	5,0 Nm	13,5 g
M32x1,5 / M20x1,5	-55 - 70	36 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 = Einschraubgewinde
L2 = Reduziergewinde

1.6 Verschlussstopfen für Kabel- und Leitungseinführungen



Typ	Einsatz-temperaturbereich / °C	Ø 1	Ø 2	L1	Ø 3	Gewicht ca.
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

* Für Mehrfacheinführungen M25x1,5 und M32x1,5

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

Maßbilder und Abmessungen in mm

1.7 Trompetenverschraubung M20 bis M63

ATEX EG-Baumusterprüfbescheinigung: PTB 00 ATEX 3121

Gerätekenzeichnung nach 2014/34/EU und Norm:

EN 60079-0  II 2 G Ex e II

 II 2 D Ex tD A21 IP66

IECEx Konformitätsbescheinigung: IECEx BKI 08.0007

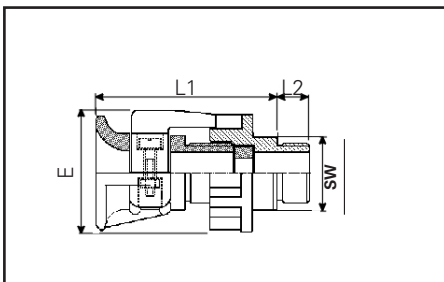
Gerätekenzeichnung:

IEC60079-0 Ex e II

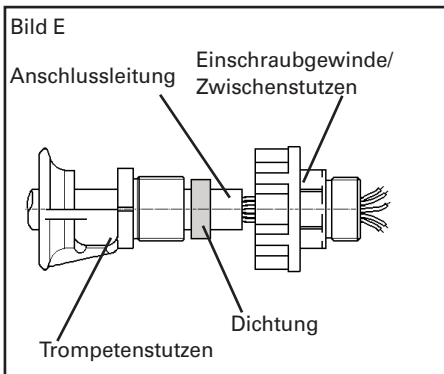
Ex tD A21 T85°C IP66

Zul. Lagertemperatur in Originalverpackung: -20° C bis +40° C

Schutzart nach EN/IEC 60529: IP 66 (komplett montierter Zustand))



Typ	SW	L1	L2	Eckmaß (E)	Gewicht ca.
M20x1,5	27 mm	64 mm	15 mm	47 mm	57 g
M25x1,5	32 mm	65 mm	15 mm	51 mm	68 g
M32x1,5	41 mm	80 mm	15 mm	68 mm	138 g
M40x1,5	50 mm	86 mm	15 mm	81 mm	191 g
M50x1,5	60 mm	95 mm	16 mm	96 mm	325 g
M63x1,5	75 mm	105 mm	16 mm	107 mm	757 g

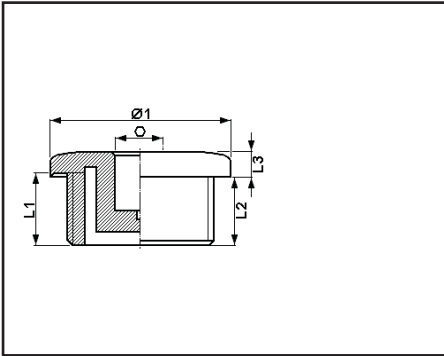


Typ	Einsatztemperaturbereich	Schlagenergie	Klemmbereich			Zugentlastung (Schauben)	Einschraubgewinde
			Trompetenstutzen				
			min.	max.			
	°C	Joule	Ø	Ø	Nm	Nm	Nm
M20x1,5	-40 - 85	< 7	8,0	13,0	3,0	1,5	3,5
M25x1,5	-40 - 85	< 7	11,0	16,0	3,0	2,0	4,0
M32x1,5	-40 - 85	< 7	15,0	20,0	6,0	4,0	7,5
M40x1,5	-40 - 85	< 7	19,0	27,0	10,0	6,0	12,0
M50x1,5	-40 - 85	< 7	26,0	34,0	30,0	10,0	35,0
M63x1,5	-40 - 85	< 7	35,0	46,0	40,0	15,0	45,0

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

Maßbilder und Abmessungen in mm

1.8 Schraubverschluss

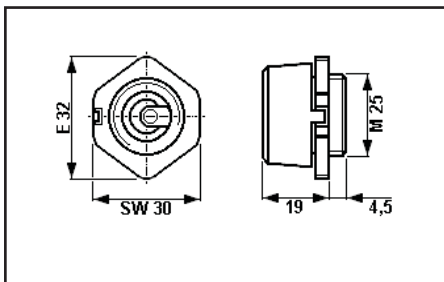


ATEX EG-Baumusterprüfbescheinigung:	PTB 98 ATEX 3130	
Gerätekenzeichnung nach 2014/34/EU und Norm:		
EN 60079-0	Ex II 2 G Ex IIC Gb	
	Ex II 2 D Ex tb IIIC Db IP66 (nicht für M63x1,5)	
IECEx Konformitätsbescheinigung:	IECEx PTB 03.0000	
Gerätekenzeichnung:		
IEC60079-0	Ex IIC Gb	(nicht für M63x1,5)
	Ex tb IIIC Db IP 66	(nicht für M63x1,5)
Zul. Lagertemperatur in Originalverpackung:	-20° C bis +40° C	
Schutzart nach EN/IEC 60529:	(komplett montierter Zustand)	
M12- M50	IP 66	
M63	IP 54	

Typ	Einsatztemperaturbereich / °C	Ø 1	L1	L2	L3	Einschraubgewinde / Nm	Gewicht ca.
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

 = Innensechskantschlüssel oder Schlitzschraubendreher Größe 8 mm

1.9 Entwässerungsstopfen



ATEX EG-Baumusterprüfbescheinigung:	PTB 01 ATEX 1128 X	
Gerätekenzeichnung nach 2014/34/EU und Norm:		
EN 60079-0	Ex II 2 G Ex e II	
Einsatztemperaturbereich:	-20° C bis +40° C	
Zul. Lagertemperatur in Originalverpackung:	-20° C bis +40° C	
Schutzart nach EN/IEC 60529:	IP 66 (komplett montierter Zustand)	
Einschraubgewinde in Gehäuse:	M25x1,5	
Prüfdrehmoment:	5,0 Nm	

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

2 Legende



Achtung

Dieses Symbol warnt von einem möglichen Ausfall. Wird diese Warnung nicht beobachtet kann der Gesamtausfall der Vorrichtung oder des Systems oder des Betriebes erfolgen, an die es angeschlossen wird.



Besondere Bedingungen

Dieses Symbol weist auf Hinweise zum sicheren Betrieb gemäß EG-Baumusterprüfbescheinigung/ IECEx-Konformitätsbescheinigung hin.

2.1 Sicherheitshinweise



Zielgruppe dieser Anleitung sind Elektrofachkräfte und unterwiesene Personen in Anlehnung an die EN/IEC 60079-14.

Alle in dieser Betriebs- und Montageanleitung aufgeführten Einführungen und Elemente sind nicht für den Einsatz in Zone 0 und Zone 20 geeignet.

Sie dürfen auch nicht als direkte Leitungseinführung oder als Verschluss an druckfesten Gehäusen in explosionsgefährdeten Bereichen der Zone 1, Zone 2, Zone 21 und Zone 22 verwendet werden.

Sie sind bestimmungsgemäß in unbeschädigtem und einwandfreiem Zustand zu betreiben.

Überprüfen Sie vor Montagebeginn den einwandfreien Zustand der Einführungen und Elemente sowie der Einschraubgewinde im dafür vorgesehenen Betriebsmittel.

Die Anforderungen der EN/IEC 60079-0 und EN/IEC 60079-31 u.a. in Bezug auf übermäßige Staubablagerungen und Temperatur, sind vom Anwender zu beachten.

Beachten Sie die nationalen Sicherheits- und Unfallverhütungsvorschriften und die nachfolgenden Sicherheitshinweise in dieser Betriebsanleitung, die wie dieser Text in Kursivschrift gefasst sind!

3 Normenkonformität

Das Betriebsmittel ist gemäß DIN EN ISO 9001 und EN ISO/IEC 80079-34 entwickelt, gefertigt und geprüft worden.

Es entspricht den aufgeführten Normen, in der separat beigelegten Konformitätserklärung.

Verweise auf Normen und Richtlinien in dieser Betriebsanleitung beziehen sich immer auf die aktuelle Version. Zusätzliche Ergänzungen (z.B. Jahreszahlangaben) sind zu beachten.

4 Verwendungsbereich

Die Einführungen und Elemente dieser Anleitung (siehe "Technische Daten"), sind zum Einsatz in explosionsgefährdeten Bereichen der Zone 1 und Zone 2 sowie der Zone 21 und Zone 22 gemäß EN/IEC 60079-10-1 und EN/IEC 60079-10-2 geeignet!

Die eingesetzten Gehäusematerialien einschließlich der außenliegenden Metallteile bestehen aus hochwertigen Werkstoffen, die einen anwendungsgerechten Korrosionsschutz und Chemikalienresistenz in "normaler Industriatmosphäre" gewährleisten:

- schlagfestes Polyamid
- Edelstahl

Bei einem Einsatz in extrem aggressiver Atmosphäre, können Sie zusätzliche Informationen über die Chemikalienbeständigkeit der eingesetzten Kunststoffe, bei Ihrer zuständigen Cooper Crouse-Hinds Niederlassung erfragen.

5 Verwendung / Eigenschaften

Alle Elemente und Kabeleinführungen dieser Betriebs- und Montageanleitung sind zum Einsatz in Gehäuse, Geräte und Betriebsmittel der Zündschutzart "Erhöhte Sicherheit" geeignet.

Kabel- und Leitungseinführungen sowie Erweiterungsverschraubungen dienen zum Einführen von fest verlegten Kabeln und Leitungen in Gehäuse und Geräte. Der Betreiber muss für die eingeführten Leitungen eine ausreichende Zugentlastung gewährleisten.

Trompetenverschraubungen dienen zum Einführen von beweglichen Kabeln und Leitungen in Gehäuse und Geräte.



Das Ineinanderstecken und Austauschen von Dichtungseinsätzen unterschiedlicher Einführungen zur Reduzierung des Kabeldurchlasses (Schachteln) ist nicht zulässig.

Mit Reduzierstutzen können Gewinde- oder Durchgangsbohrungen in den Gehäusen und Geräten auf kleinere Gewindegrößen reduziert werden.

Verschlussstopfen dienen zum Verschließen von metrischen COOPER CROUSE-HINDS Kabel- und Leitungseinführungen sowie COOPER CROUSE-HINDS Mehrfachverschraubungen.

Mit Schraubverschlüssen werden nicht benutzte Durchgangs- und Gewindebohrungen verschlossen.

Über Entwässerungsstopfen kann das im Gerät oder Gehäuse entstandene Kondenswasser entweichen (Punkt 6.1 Montage beachten).



Andere als die beschriebenen Anwendungen sind ohne schriftliche Erklärung der Fa. COOPER CROUSE-HINDS nicht zulässig.



Beim Betrieb sind die in der Betriebsanleitung unter Punkt 7 genannten Anweisungen zu beachten.



Die Verantwortung hinsichtlich bestimmungsgemäßer Verwendung dieser Einführungselemente unter Bezugnahme der in dieser Anleitung vorhandenen Rahmenbedingungen (siehe technische Daten) liegt allein beim Betreiber.



Die EG-Baumusterprüfbescheinigung / IECEx Konformitätsbescheinigung und künftige Ergänzungen dazu, gelten gleichzeitig als Nachträge zu den EG-Baumusterprüfbescheinigungen PTB 99 ATEX 3128 X und PTB 99 ATEX 3101 X, bzw der IECEx Konformitätsbescheinigung IECEx PTB 05.0004X.

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

Bild 1

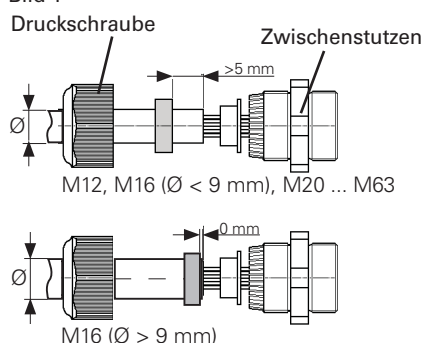


Bild 2

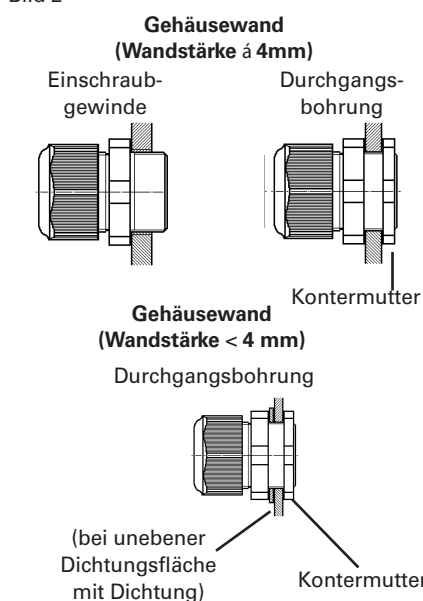


Bild 3

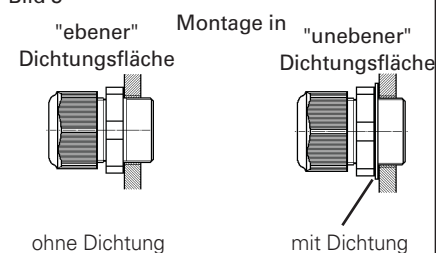


Bild 4

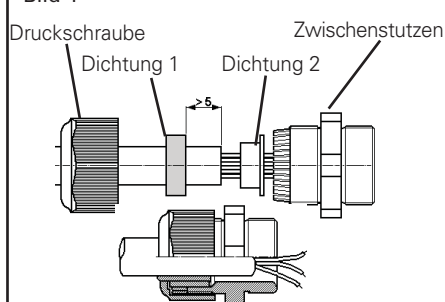


Bild 5



Steckschlüssel für Druckschraube der Kabel- und Leitungseinführung

6 Installation

Für das Errichten / Betreiben sind die relevanten nationalen Vorschriften (z.B. Betr.Si.V, Gerätesicherheitsgesetz in Deutschland) sowie die allgemein anerkannten Regeln der Technik maßgebend (EN/IEC 60079-14).

⚠ Unsachgemäße Installation der Einführungselemente können zum Verlust der Garantie führen.

⚠ Die durch die EN/IEC 60079-14 eventuell eingeschränkten Einsatzbedingungen beachten.

⚠ Es dürfen nur festverlegte Kabel und Leitungen eingeführt werden. Der Betreiber muss eine entsprechende Zugentlastung gewährleisten. Ausnahme hiervon sind Trompetenverschraubungen.

⚠ Die Schutzart IP66 wird nur bei sachgerechtem Einbau der Dichtungen und Kabel- und Leitungseinführungen erreicht.

⚠ Kabel und Leitungseinführungen die nur für niedriger Stoßenergie geeignet sind, müssen geschützt vor mechanischer Stoßenergie in Gehäuse eingebaut werden.

6.1 Montage

⚠ Vor Beginn der Montage ist sicherzustellen, dass die Gewinde der Einführungselemente mit den Gewinden des Gerätes oder Gehäuses übereinstimmen.

⚠ Die Wandstärke der Betriebsmittel muss zum direkten Einschrauben der Einführungen und der Elemente mindestens 4 mm betragen.

⚠ Bei Gehäusewandstärken unter 4 mm sind Kontermuttern zu verwenden. Die Gehäusewandstärke muss mindestens 1,5 mm betragen.

⚠ Die Montage von Einführungselementen mit beschädigten oder verschmutzten Gewinden können die IP Schutzart beeinträchtigen.

⚠ Eingeführte Kabel und Leitungen müssen von Zugkräften entlastet werden (z.B. mit einer Kabelschelle).

6.1.1 Kabel- und Leitungseinführungen (KLE)

Der Zwischenstutzen, (siehe Bild 1), der KLE- Einführungselemente ist mit einem geeigneten Werkzeug z.B. Gabel- Ring- oder Steckschlüssel zu montieren.

Die Montage erfolgt direkt in die Gewindebohrung oder über Durchgangsbohrungen des Gehäuses (siehe Bild 2).

Bei unebenen Dichtungsflächen sind Dichtungen zwischen der Gehäusewand und dem Zwischenstutzen zu verwenden (siehe Bild 3).

Bei der Montage von Einführungen in Gehäusewandstärken unter 4 mm sind Kontermuttern zu verwenden (siehe Bild 2).

Die Einführung der Kabel und Leitungen erfolgt wie in Bild 4 dargestellt.

Die Dichtungseinsätze sind dem jeweiligen Kabeldurchmesser anzupassen (siehe Seite 3, Bild A, B, C und D).

Zur leichteren Montage der Druckschraube bei eingeführtem Kabel können Steckschlüssel von COOPER CROUSE-HINDS mit seitlicher Öffnung als Montagehilfe verwendet werden (siehe Bild 5).

Bestellnummer GHG 960 1951 R0001
für Satz 1 (M12, 16, 20, 25, 32 und M40);

Bestellnummer GHG 960 1951 R0002
für Satz 2 (M50 und M63).

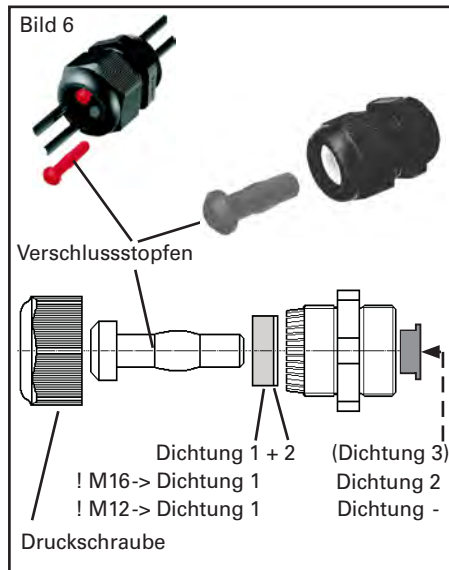
Zur Sicherstellung der erforderlichen Mindestschutzart den Zwischenstutzen und die Druckschraube mit den angegebenen Prüfdrehmomenten (siehe Technische Daten) anziehen.

Wird die Druckschraube angezogen, den Zwischenstutzen mit einem geeigneten Werkzeug, z.B. einem Gabelschlüssel, gegen Verdrehen sichern.

⚠ Übermäßiges Anziehen beeinträchtigt die Schutzart.

Für Eigensichere Stromkreise können optional Kabel- und Leitungseinführungen mit farblich (hellblau) gekennzeichnete Druckschrauben verwendet werden (Bestellnummern siehe COOPER CROUSE-HINDS Hauptkatalog).

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



6.1.2 Verschlussstopfen

⚠ Die Verschlussstopfen Typ GHG 960 6107 P**** bzw. GHG 960 1944 R**** dürfen nur in Verbindung mit den Kabel- und Leitungseinführungen Typ GHG 960 92** P**** bzw. GHG 960 19** R**** verwendet werden.

Bei der Montage von Verschlussstopfen für metrische COOPER CROUSE-HINDS Kabel- und Leitungseinführungen (KLE) ist folgendes zu beachten (siehe Bild 6):

1. Es darf nur der zur KLE gehörende Verschlussstopfen verwendet werden.
2. Beim Verschließen mit einem Verschlussstopfen die Dichtungseinsätze 1 und 2 verwenden!
3. Die Kopfseite des Verschlusses muss, wie in Bild 6 dargestellt, außen liegen.
4. Der Verschlussstopfen ist bis zum Anschlag in die KLE einzuschieben.
5. Die Druckschraube der KLE ist, wie unter Punkt 6.1.1 aufgeführt, fest anzuziehen.

6.1.3 Schraubverschluss

Der Schraubverschluss ist mit einem geeigneten Werkzeug, z.B.: Innensechskantschlüssel 8 mm oder einem geeigneten Schlitzschraubendreher, fest in die Gehäusegewindebohrung einzuschrauben.

Bei Durchgangsbohrungen oder Gehäusewandstärken unter 4 mm ist eine Kontermutter zu verwenden. Die Montage an unebenen Dichtungsflächen darf nur mit einer zusätzlichen Dichtung erfolgen.

⚠ **Der Schraubverschluss M50 ist generell mit der mitgelieferten Dichtung zu montieren.**

6.1.4 Trompetenverschraubung

Der Zwischenstutzen der Trompetenverschraubung ist mit einem geeigneten Werkzeug, z.B. Gabelschlüssel verdrehungssicher in das Gerät oder Gehäuse zu montieren.

Es muss gewährleistet sein, dass kein Verdrehen des Stutzens, bei eingeführtem Kabel und komplett montierter Trompetenverschraubung, möglich ist (z.B. Verwendung einer Kontermutter siehe Bild 7 + Bild 8).

Bei Durchgangsbohrungen oder Gehäusewandstärken unter 4 mm ist generell eine Kontermutter zu verwenden. Die Montage darf nur mit einer Dichtung zwischen Gehäusewand und Zwischenstutzen erfolgen (siehe Bild 7).

Nachfolgend ist die Montage des Kabels in die Trompetenverschraubung, wie in Bild 8 dargestellt, beschrieben:

1. Der "Zwiebelringdichtungseinsatz" ist durch ausschneiden der einzelnen Dichtungsringe auf den jeweiligen Kabeldurchmesser anzupassen.
2. Nach Einführen des abgelängten Kabels mit der montierten Dichtung in den Zwischenstutzen, ist, um das Kabel abzudichten, der Trompetenstutzen fest in den Zwischenstutzen einzuschrauben.
3. Danach wird die Zugentlastung am Trompetenstutzen montiert.

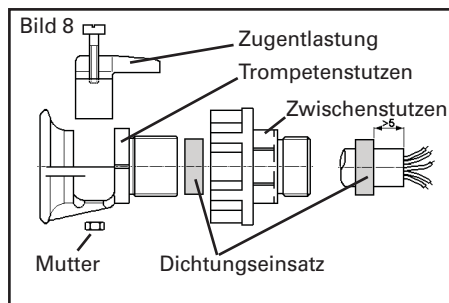
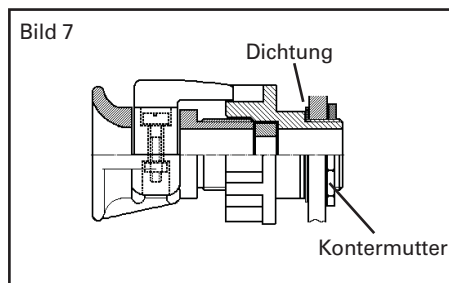
⚠ **Dabei ist darauf zu achten, dass eine ausreichende Zugentlastung gewährleistet, eine Beschädigung der Leitung oder des Kabels ausgeschlossen ist sowie die Verdrehungssicherung des Trompetenstutzens erreicht wird.**

6.1.5 Reduzierstutzen

Der Reduzierstutzen ist mit einem geeigneten Werkzeug, z.B. Gabel-, Ring- oder Steckschlüssel fest in die Gehäusegewindebohrung einzuschrauben.

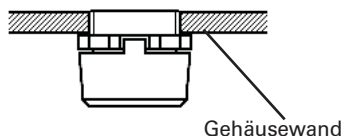
Bei Durchgangsbohrungen oder Gehäusewandstärken unter 4 mm ist eine Kontermutter zu verwenden. Die Montage an unebenen Dichtungsflächen darf nur mit einer zusätzlichen Dichtung erfolgen.

⚠ **Das Ineinanderschrauben (Schachteln) mehrerer Reduzierstutzen zur Verkleinerung des Einführungsgewindes ist nicht zulässig.**



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

Bild 9



6.1.6 Entwässerungsstopfen

Der Entwässerungsstopfen ist mit einem geeigneten Werkzeug, z.B. Gabel-, Ring- oder Steckschlüssel fest in die Gehäusegewindebohrung einzuschrauben.

Die Montage an unebenen Dichtungsflächen darf nur mit einer zusätzlichen Dichtung erfolgen.

Der Entwässerungsstopfen ist an der tiefsten Stelle des Gerätes oder des Gehäuses (siehe Bild 9) anzubringen.

⚠ Die minimale Gehäusewandstärke von 4 mm darf nicht unterschritten werden.

Zur Sicherstellung der erforderlichen Mindestschutzart sind die Einführungselemente fest anzuziehen (Prüfdrehmomente siehe Technische Daten Seite 8).

⚠ Bei übermäßigem Anziehen kann die Schutzart beeinträchtigt werden.

6.2 Inbetriebnahme

Vor Inbetriebnahme der montierten Einführungselemente sind die in den einzelnen nationalen Bestimmungen genannten Prüfungen durchzuführen.

Außerdem ist vor der Inbetriebnahme die korrekte Montage in Übereinstimmung mit dieser Betriebs- und Montageanleitung sowie andere anwendbaren Bestimmungen zu überprüfen.

⚠ An besonders gefährdeten Stellen, sind die Einführungen gegen heraus reisen aus den Geräten- oder Gehäusewänden durch mechanische äußere Einflüsse (z.B. durch Flurförderfahrzeuge, durch Abschlagen oder ähnlichem), zu sichern.

7 Instandhaltung / Wartung

⚠ Die für die Wartung / Instandhaltung von elektrischen Betriebsmitteln in explosionsgefährdeten Bereichen geltenden nationalen Bestimmungen sind einzuhalten (z.B. EN/IEC 60079-17).

Die erforderlichen Wartungsintervalle sind anwendungsspezifisch und daher in Abhängigkeit von den Einsatzbedingungen vom Betreiber festzulegen.

Im Rahmen der Wartung sind vor allem die Teile, von denen die Zündschutzart abhängt, zu prüfen (z.B. Unversehrtheit der Einführungselemente, der Dichtungen).

Druckschrauben der Kabel- und Leitungseinführungen, Trompetenstutzen der Trompetenverschraubungen sind in regelmäßigen Abständen auf deren Dichtigkeit zu überprüfen und gegebenenfalls nachzuziehen.

Sollte bei einer Wartung festgestellt werden, dass Instandsetzungsarbeiten erforderlich sind, ist Abschnitt 8 dieser Betriebsanleitung zu beachten.

8 Reparatur / Instandsetzung / Änderung

Instandsetzungsarbeiten / Reparaturen dürfen nur mit Originalersatzteilen von COOPER CROUSE-HINDS vorgenommen werden.

⚠ Reparaturen, die den Explosionsschutz betreffen, dürfen nur von COOPER CROUSE-HINDS oder einer qualifizierten Elektrofachkraft in Übereinstimmung mit national geltenden Regeln durchgeführt werden (EN/IEC 60079-19).

Umbauten oder Änderungen an den Einführungselementen sind nicht gestattet.

9 Entsorgung / Wiederverwertung

Bei der Entsorgung der Einführungselemente sind die jeweils geltenden nationalen Abfallbeseitigungsvorschriften zu beachten.

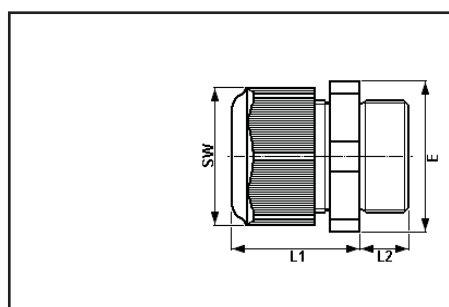
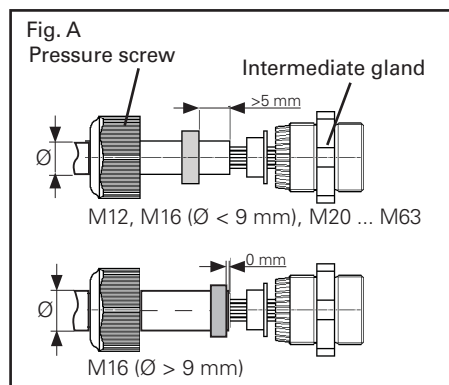
Zur Erleichterung der Wiederverwertbarkeit von Einzelteilen sind Kunststoffteile mit dem Kennzeichen des verwendeten Kunststoffes versehen.

Programmänderungen und-ergänzungen sind vorbehalten.

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

Dimension drawings and dimensions in mm

1 Technical data



1.1 Technical details for:

Cable entries (KLE)

M12x1,5 to M63x1,5

ATEX type examination certificate: PTB 14 ATEX 1015 X^(A)

Marking acc. to 2014/34/EU and standard:

EN 60079-0

Ex II 2 G Ex e IIC Gb

Ex II 2 D Ex tb IIIC Db

IECEx type examination certificate:

IECEx PTB 14.0027X^(A)

Category of application:

IEC60079-0

Ex e IIC Gb

Ex tb IIIC Db

^(A) 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

Perm. storage temperature in original packing: -20° C to +70° C

Degree of protection to IEC/EN 60529: IP 66*⁽¹⁾ (when fully assembled)

*) M40, M50 und M63 with suitable flange seal

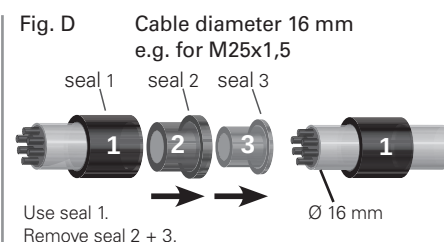
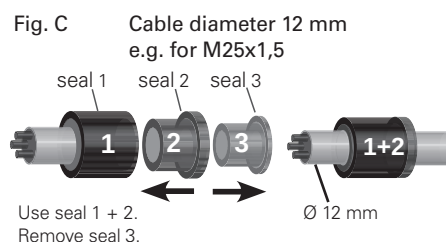
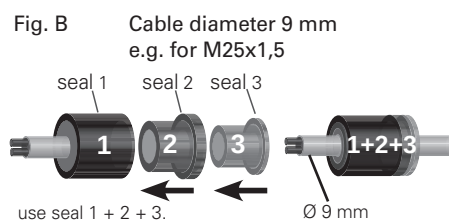
Type	SW	L1	L2	E	weight app.
M12x1,5	15 mm	19,3 mm	12 / 8 mm	16,2 mm	3,4 g
M16x1,5	20 mm	23,0 mm	12 / 8 mm	22,0 mm	6,5 g
M20x1,5	24 mm	25,0 mm	13 / 8 mm	26,5 mm	10,1 g
M25x1,5	29 mm	29,5 mm	13 / 8 mm	32,0 mm	16,9 g
M32x1,5	36 mm	35,5 mm	15 / 10 mm	40,0 mm	27,6 g
M40x1,5	46 mm	39,5 mm	15 / 10 mm	50,5 mm	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
	°C	Joule	Seal 1+2+3 ⁽¹⁾⁽²⁾⁽³⁾				Seal 1+2 ⁽¹⁾⁽²⁾				Seal 1 ⁽¹⁾				Nm**	
			min. Ø	Nm**	max. Ø ⁽¹⁾⁽²⁾	Nm**	min. Ø	Nm**	max. Ø ⁽¹⁾⁽²⁾	Nm**	min. Ø	Nm**	max. Ø ⁽²⁾	Nm**		
M12x1,5	-20 - 70	4									5,0	0,8	7,0	1,0	1,2	white
M16x1,5	-20 - 70	4					5,5	1,0	7,0	1,0	7,0	1,0	10,0	1,4	3,3	white
M20x1,5	-20 - 70	7	5,5	1,5	7,0	1,0	7,0	1,5	9,0	1,4	9,5	1,0	13,0	1,7	2,7	white
M20x1,5	-40 - 70	4	5,5	1,5	7,0	1,0	7,0	1,5	9,0	1,4	9,5	1,0	11,0	1,7	2,7	green
M25x1,5	-20 - 70	7	8,0	1,5	10,0	2,0	10,0	2,3	13,0	2,6	13,5	1,3	17,5	2,3	3,0	white
M25x1,5	-55 - 70	7	8,0	1,5	10,0	2,0	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

⁽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 + 3 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

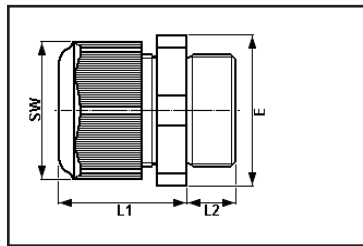
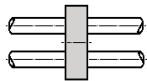


Fig. D/1 Seal insert



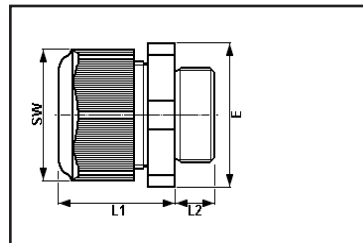
for multiple gland

1.2 Multiple glands

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	27,6 g

Type	Operating temperature	Impact resistant	Cable diameter				
			Seal 1				
				min.		max.	
	°C	Joule		Ø	Nm	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+3 1 2 3				Seal 1+2 1 2				Seal 1 1				
			min.		max.		min.		max.		min.		max.		
	°C	Joule	Ø	Nm**	Ø ⁽¹⁾⁽²⁾	Nm**	Ø	Nm**	Ø ⁽¹⁾⁽²⁾	Nm**		Nm**	Ø ⁽¹⁾	Nm**	Nm**
M16x1,5 / M20x1,5	-20 - 70	< 7	5,5	1,5	7,0	1,0	7,0	1,5	9,0	1,4	9,5	1,0	13,0	1,7	3,3
	-40 - 70	< 4	5,5	1,5	7,0	1,0	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	8,0	1,5	10,0	2,0	10,0	2,3	13,0	2,6	13,5	1,3	17,5	2,3	2,7
	-40 - 70	< 4	8,0	1,5	10,0	2,0	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 + 3 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

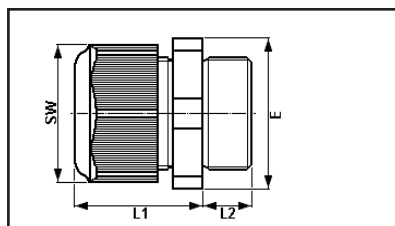
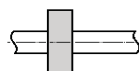


Fig. D/2 Seal insert



for gland for flat cables

1.4 Cable entries in special versions

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	27,6 g

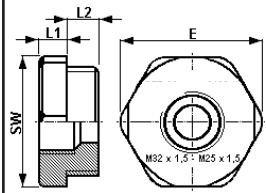
Type	Operating temperature	Impact resistant	Cable-diameter								Screw-in thread in enclosure
			Seal 1+2				Seal 2				
			min.		max.		min.		max.		
	°C	Joule	Ø	Nm**	Ø ⁽¹⁾⁽²⁾	Nm**	Ø	Nm**	Ø ⁽¹⁾⁽²⁾	Nm**	Nm**
M20 with seal Ø 2 mm	-20 - 60	< 7	2,0	3,5							2,7
M20x1,5 with slotted seal Ø 7,0- 13 mm	-5 - 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	G24 / 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



Reducing-gland have to
protect against twisting
(gluing, ...)

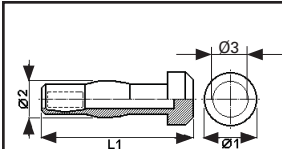
1.5 Reducing glands

Type	Operating temperature / °C	SW	L1	L2	E	Screw-in thread in enclosure / Nm	weight app.
L1 L2							
M16x1,5 / M12x1,5	-55 - 70						
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	36 mm	6,0 mm	10 mm	40,0 mm	5,0 Nm	13,5 g
M32x1,5 / M16x1,5	-55 - 70	36 mm	6,0 mm	10 mm	40,0 mm	5,0 Nm	13,5 g
M32x1,5 / M20x1,5	-55 - 70	36 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

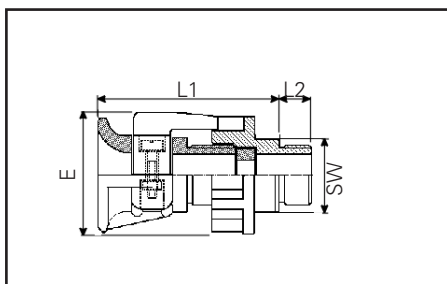
* for multiple glands M25x1,5 and M32x1,5

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

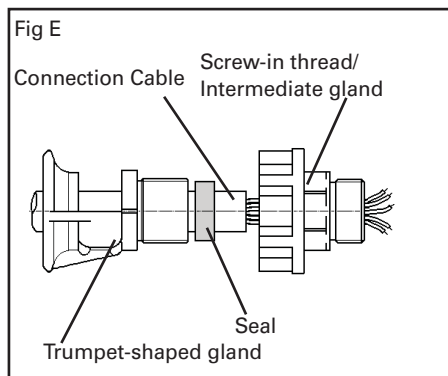
Dimension drawings and dimensions in mm

1.7 Trumpet-shaped glands M20 to M63

ATEX type examination certificate:	PTB 00 ATEX 3121
Marking acc. to 2014/34/EU 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 IEC/EN 60529:	IP 66 (fully assembled)



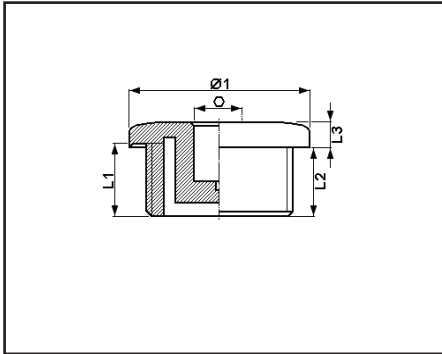
Type	SW	L1	L2	E width across corners	weight app.
M20x1.5	27 mm	64 mm	15 mm	47 mm	57 g
M25x1.5	32 mm	65 mm	15 mm	51 mm	68 g
M32x1.5	41 mm	80 mm	15 mm	68 mm	138 g
M40x1.5	50 mm	86 mm	15 mm	81 mm	191 g
M50x1.5	60 mm	95 mm	16 mm	96 mm	325 g
M63x1.5	75 mm	105 mm	16 mm	107 mm	757 g



Type	Operating tempera- ture	Impact re- sistant	Cable diameter		strain Relief (screws)		Screw- in thread
			Trumpet-shaped gland				
			min.	max.			
	°C	Joule	Ø	Ø	Nm	Nm	Nm
M20x1,5	-40 - 85	< 7	8,0	13,0	3,0	1,5	3,5
M25x1,5	-40 - 85	< 7	11,0	16,0	3,0	2,0	4,0
M32x1,5	-40 - 85	< 7	15,0	20,0	6,0	4,0	7,5
M40x1,5	-40 - 85	< 7	19,0	27,0	10,0	6,0	12,0
M50x1,5	-40 - 85	< 7	26,0	34,0	30,0	10,0	35,0
M63x1,5	-40 - 85	< 7	35,0	46,0	40,0	15,0	45,0

Dimension drawings and dimensions in mm

1.8 Screw plugs

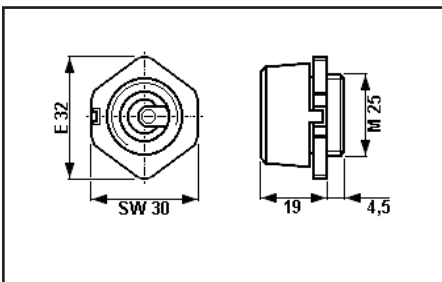


ATEX type examination certificate:	PTB 98 ATEX 3130	
Marking acc. to 2014/34/EU and standard:		
EN 60079-0	Ex II 2 G Ex IIC Gb	
	Ex II 2 D Ex tb IIIC Db IP66	(not for M63x1,5)
IECEx type examination certificate:	IECEx PTB 03.0000	
Category of application:		
IEC60079-0	Ex IIC Gb	(not for M63x1,5)
	Ex tb IIIC Db IP 66	(not for M63x1,5)
Perm. storage temperature in original packing:	-20° C	+40° C
Degree of protection to IEC/EN 60529:	(fully assembled)	
M12- M50	IP 66	
M63	IP 54	

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 2014/34/EU and standard:		
EN 60079-0	Ex II 2 G Ex e II	
Permissible operating temperature range:	-20° C	+40° C
Perm. storage temperature in original packing:	-20° C	+40° C
Degree of protection to IEC/EN 60529:	IP 66 (fully assembled)	
Screw-in thread in enclosure:	M25x1,5	
Test torque:	5,0 Nm	

2 Legend

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 21, 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

They have been designed, manufactured and tested according to the state of the art and to DIN EN ISO 9001 and EN ISO/IEC 80079-34.

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

References to standards and directives in these operating instructions always relate to the latest version. Other additions (e.g. details relating to the year) shall be observed.

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 IEC/EN 60079-10-1 and IEC/EC 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.

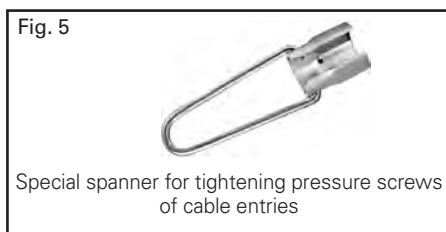
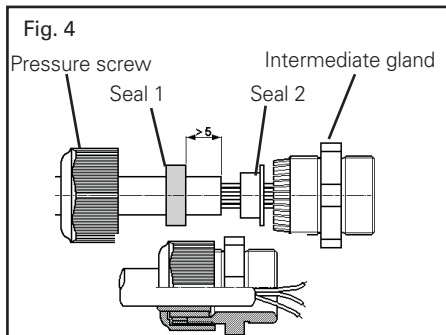
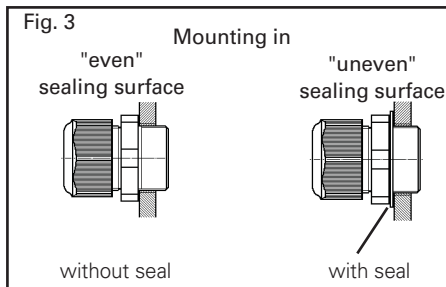
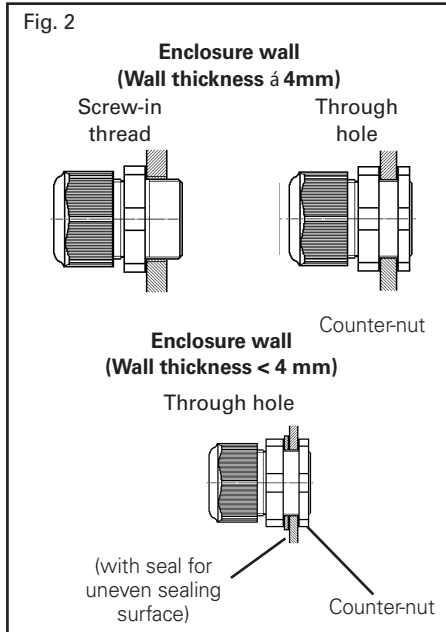
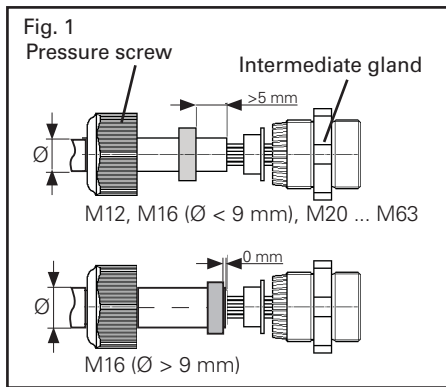
Any condensation in the apparatus can escape via drain plugs (see 6.1, Mounting).

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.



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 (Page 13 Figs. A, B, C and D).

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)

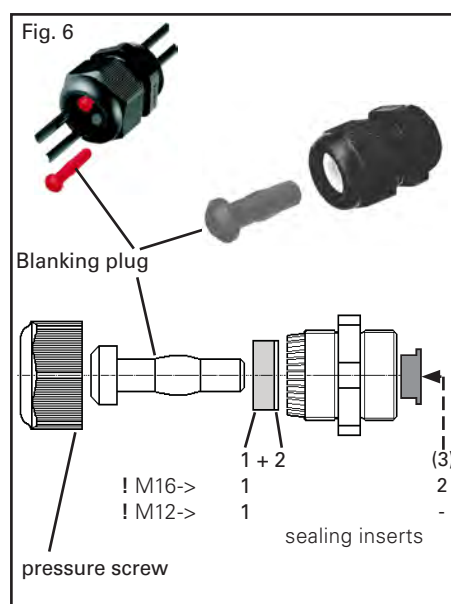
Order No. GHG 960 1951 R0002 for Set 2 (M50 and M63)

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).

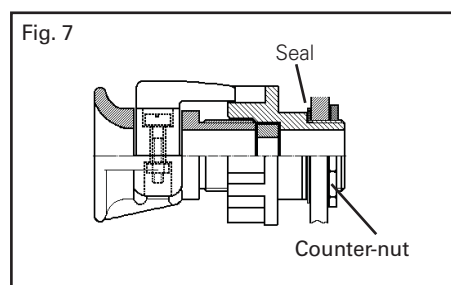


6.1.2 Blanking plugs

⚠ Blanking plugs of the types GGH 960 6107 P**** or GHG 960 1944 R**** may only be used in conjunction with cable entries of the types GHG 960 92** P**** or GHG 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. When closing the gland with a blanking plug, always use sealing inserts 1+2!
3. The head of the blanking plug shall, as shown in Fig. 6, 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.

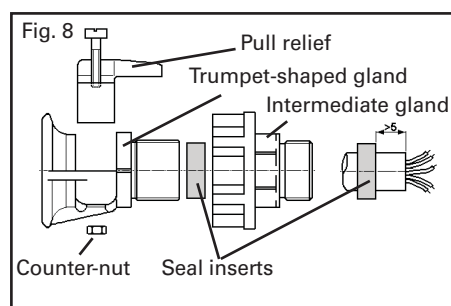
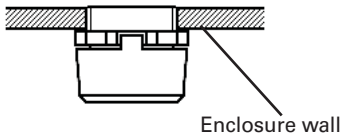


Fig. 9



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 60079-19).

Modifications to the entry components are not permitted.

9 Disposal / Recycling

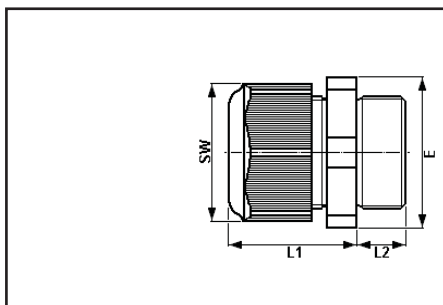
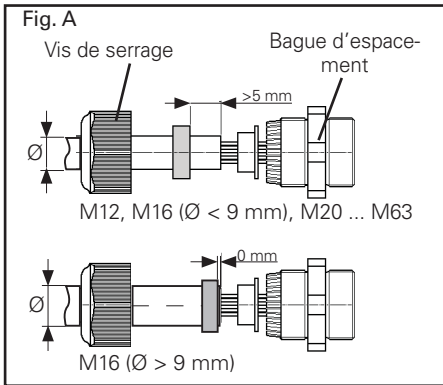
The respective valid national regulations for waste disposal shall be observed when disposing of apparatus.

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.

Entrées de câble, bouchons filetés, bouchons de fermeture, presses-étoupes à trompette, bagues de réduction et bouchons de purge

Plans et dimensions en mm



1 Caractéristiques techniques

1.1 Données techniques pour: Entrées de câble (KLE) M12x1,5 à M63x1,5

ATEX Certificat de Conformité: PTB 14 ATEX 1015 X^(A)

Marquage selon 2014/34/UE et directive:

EN 60079-0 II 2 G Ex e IIC Gb

II 2 D Ex tb IIIC Db

IEC Ex Certificat de Conformité: IECEx PTB 14.0027X^(A)

Marquage selon: Ex e IIC Gb

IEC60079-0 Ex tb IIIC Db

(A) L'attestation d'examen CE de type / le certificat IEC Ex et leurs éventuels suppléments futurs, doivent être considérés comme des compléments aux attestations d'examen CE de type PTB 99 ATEX 3128 X et PTB 99 ATEX 3101 X ainsi qu'au certificat IEC Ex PTB 05.0004X

Température ambiante admissible: -20° C à +70° C

Indice de protection selon CEI/EN 60529: IP 66 *) (après montage complet)

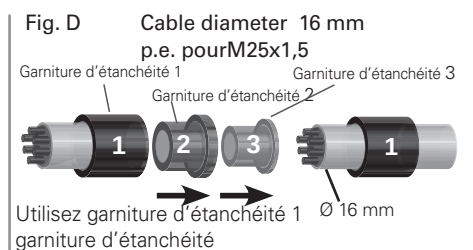
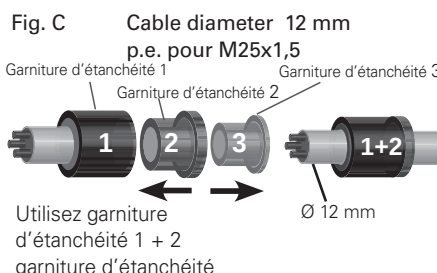
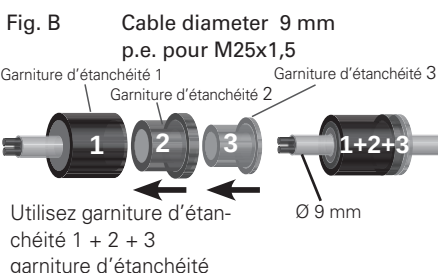
*) M40, M50 et M63 avec brides garnitures adaptable

Type	SW	L1	L2	E	Poids approx
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	d'exploitation température	Pouvoir d'impact	Diamètre par câble 12312								1				Partie filétée dans l'enveloppe	Cache-pous- sière couleur
			Garniture d'étanchéité 1+2+3				Garniture d'étanchéité 1+2				Garniture d'étanchéité 1					
			min.		max.		min.		max.		min.		max.			
	°C	Joule	Ø	Nm**	Ø ⁽¹⁾⁽²⁾	Nm**	Ø	Nm**	Ø ⁽¹⁾⁽²⁾	Nm**	Ø	Nm**	Ø ⁽²⁾	Nm**	Nm**	
M12x1,5	-20 - 70	4									5,0	0,8	7,0	1,0	1,2	blanc
M16x1,5	-20 - 70	4					5,5	1,0	7,0	1,0	7,0	1,0	10,0	1,4	3,3	blanc
M20x1,5	-20 - 70	7	5,5	1,5	7,0	1,0	7,0	1,5	9,0	1,4	9,5	1,0	13,0	1,7	2,7	blanc
M20x1,5	-40 - 70	4	5,5	1,5	7,0	1,0	7,0	1,5	9,0	1,4	9,5	1,0	11,0	1,7	2,7	vert
M25x1,5	-20 - 70	7	8,0	1,5	10,0	2,0	10,0	2,3	13,0	2,6	13,5	1,3	17,5	2,3	3,0	blanc
M25x1,5	-55 - 70	7	8,0	1,5	10,0	2,0	10,0	2,3	13,0	2,6	13,5	1,5	15,0	2,3	3,0	vert
M32x1,5	-20 - 70	7					14,0	3,0	17,0	4,0	17,5	1,5	21,0	1,3	5,0	blanc
M32x1,5	-55 - 70	7					14,0	3,0	17,0	4,0	17,5	1,5	21,0	1,3	5,0	vert
M40x1,5	-55 - 70	7					19,0	3,3	22,0	5,5	22,0	3,3	28,0	6,7	7,5	vert
M50x1,5	-55 - 70	7					24,0	6,0	28,0	7,0	28,0	5,0	35,0	7,0	7,5	vert
M63x1,5	-55 - 70	7					29,0	12,0	35,0	12,0	36,0	12,0	41,0	13,0	7,5	vert
Garniture supplémentaire							41,0	13,0	48,0	7,8						

** Couples de serrage testés à 20°C

- (1) Les tests des plages de serrage et les valeurs de couple de serrage ont été réalisés avec un mandrin métallique. La plage de serrage peut varier légèrement selon le type de câble et les propriétés des matériaux utilisés. Pour la zone intermédiaire, veuillez utiliser la combinaison des bagues d'étanchéité 1 + 2 + 3.
- (2) Lors de la sélection des bagues d'étanchéité au moment de l'installation, il faut s'assurer qu'il reste une marge de serrage suffisante au niveau du chapeau du presse étoupe. Cela permettra de pouvoir resserrer le presse étoupe lors d'une future maintenance.



Entrées de câble, bouchons filetés, bouchons de fermeture, presses-étoupes à trompette, bagues de réduction et bouchons de purge

Plans et dimensions en mm

1.2 Multiple Entrée de câble,

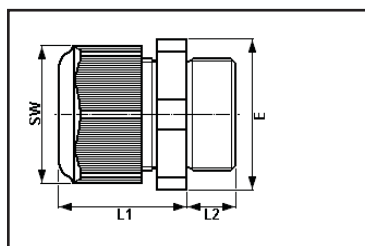
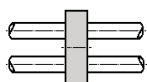


Fig. D/1 Insertion des joints d'étanchéité

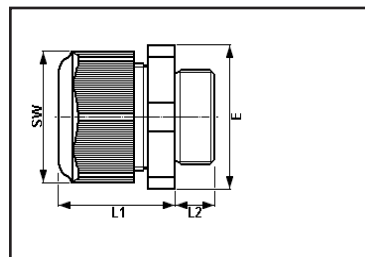


pour presse-étoupe multiple

Type	SW	L1	L2	E	Poids approx
M25x1,5 2- fois	29 mm	29,5 mm	13 / 8 mm	32,0 mm	16,9 g
M32x1,5 4- fois	36 mm	35,5 mm	15 / 10 mm	40,0 mm	27,6 g

Type	d'exploitation température	Pouvoir d'impact	Diamètre par câble			
			joint d'étanchéité 1			
			min.		max.	
	°C	Joule	Ø	Nm	Ø	Nm
M25x1,5 2- fois	-20 - 70	< 7	2x	4,5	2,0	7,0
M32x1,5 4- fois	-20 - 70	< 7	4x	4,5	3,0	7,0

1.3 Presse-étoupe d'élargissement



Type	SW	L1	L2	E	Poids approx
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	d'exploitation température	Pouvoir d'impact	Diamètre par câble												Partie filetéedans l'enveloppe
			①②③				①②				①				
			Garniture d'étanchéité 1+2+3				Garniture d'étanchéité 1+2				Garniture d'étanchéité 1				
			min.		max.		min.		max.		min.		max.		
	°C	Joule	Ø	Nm**	Ø ⁽¹⁾⁽²⁾	Nm**	Ø	Nm**	Ø ⁽¹⁾⁽²⁾	Nm**		Nm**	Ø ⁽¹⁾	Nm**	Nm**
M16x1,5 / M20x1,5	-20 - 70	< 7	5,5	1,5	7,0	1,0	7,0	1,5	9,0	1,4	9,5	1,0	13,0	1,7	3,3
	-40 - 70	< 4	5,5	1,5	7,0	1,0	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	8,0	1,5	10,0	2,0	10,0	2,3	13,0	2,6	13,5	1,3	17,5	2,3	2,7
	-40 - 70	< 4	8,0	1,5	10,0	2,0	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
Garniture supplémentaire							41,0	13,0	48,0	7,8					

** Couples de serrage testés à 20°C

(1) Lorsque les bagues 1+2+3 sont utilisées, la capacité de serrage maximale peut varier légèrement selon le type de câble utilisé.

(2) Lors de la sélection des bagues d'étanchéité au moment de l'installation, il faut s'assurer qu'il reste une marge de serrage suffisante au niveau du chapeau du presse étoupe. Cela permettra de pouvoir resserrer le presse étoupe lors d'une future maintenance.

Entrées de câble, bouchons filetés, bouchons de fermeture, presses-étoupes à trompette, bagues de réduction et bouchons de purge

Plans et dimensions en mm

1.4 Entrée de câble à des modèles spéciaux

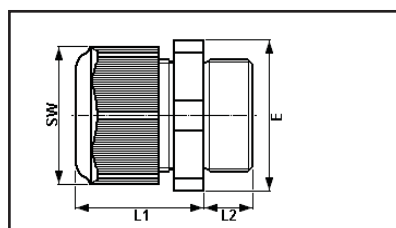
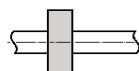


Bild D/2 Dichtungseinsatz



für Flachkabelverschraubung

Type	SW	L1	L2	E	Poids approx.
M20 avec joint Ø 2 mm	24 mm	25,0 mm	13 / 8 mm	26,5 mm	10,1 g
M20 avec fente joint Ø 7,0- 13 mm	24 mm	25,0 mm	13 / 8 mm	26,5 mm	10,1 g
M25 câble plat	29 mm	29,5 mm	13 / 8 mm	32,0 mm	16,9 g
M25 avec PG 16 fil	36 mm	35,5 mm	15 / 10 mm	40,0 mm	27,6 g

Type	d'exploitation température	Pouvoir d'impact	Diamètre par câble								Partie filetée dans l'enveloppe	
			Garniture d'étanchéité 1				Garniture d'étanchéité 2					
			min.		max.		min.		max.			
	°C	Joule	Ø	Nm**	Ø ⁽¹⁾⁽²⁾	Nm**	Ø	Nm**	Ø ⁽¹⁾⁽²⁾	Nm**	Nm**	
M20 avec joint Ø 2 mm	-20 - 60	< 7	2,0	3,5							2,7	
M20x1,5 avec fente joint 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 avec PG 16 fil	-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 câble plat	-55 - 70 (110)	< 7	G18 = 5-8x9-12,5 Flachkabel			5,0					3,0	
M25x1,5 câble plat	-55 - 70 (110)	< 7	G24 / G26 = 6-8x11-14 Flachkabel			3,5					3,0	
	Type de câble		dimensions Garniture				dimensions de câble					
M25 câble plat	Raychem XTV-4XTV 2 ...		8,0	x	11,0	mm	7,5	x	11,0	mm	3,0	
M25 câble plat	Raychem VPL-5VPL 2 ...		8,0	x	11,0	mm	7,5	x	11,5	mm	3,0	
M25 câble plat	Raychem BTV-3BTV 2 ...		8,0	x	11,0	mm	6,0	x	11,0	mm	3,0	
M25 câble plat	Raychem QTV-10QTVR2		8,0	x	11,0	mm	5,0	x	12,5	mm	3,0	
M25 câble plat Raychem	Raychem BTV-10BTV 2 ...		8,0	x	14,0	mm	6,0	x	14,0	mm	3,0	
M25 câble plat	Raychem KTV-5KTV 2 ...		8,0	x	14,0	mm	7,5	x	13,5	mm	3,0	

** Couples de serrage testés à 20°C

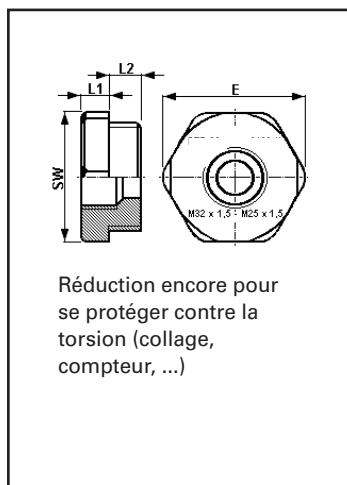
(1) Lorsque les bagues 1+2 sont utilisées, la capacité de serrage maximale peut varier légèrement selon le type de câble utilisé.

(2) Lors de la sélection des bagues d'étanchéité au moment de l'installation, il faut s'assurer qu'il reste une marge de serrage suffisante au niveau du chapeau du presse étoupe. Cela permettra de pouvoir resserrer le presse étoupe lors d'une future maintenance.

Entrées de câble, bouchons filetés, bouchons de fermeture, presses-étoupes à trompette, bagues de réduction et bouchons de purge

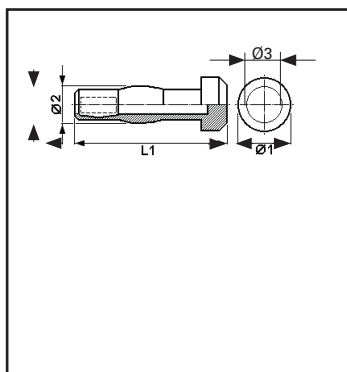
Plans et dimensions en mm

1.5 Bague de réduction



Type	d'exploitation température / °C	SW	L1	L2	E	Partie filetée dans l'enveloppe/ Nm	Poids approx
L1 L2							
M16x1,5 / M12x1,5	-55 - 70						
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	36 mm	6,0 mm	10 mm	40,0 mm	5,0 Nm	13,5 g
M32x1,5 / M16x1,5	-55 - 70	36 mm	6,0 mm	10 mm	40,0 mm	5,0 Nm	13,5 g
M32x1,5 / M20x1,5	-55 - 70	36 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 = visser fil							
L2 = Réduire fil							

1.6 Bouchon obturateur pour entrée de câble



Type	d'exploitation température / °C	Ø 1	Ø 2	L1	Ø 3	Poids approx
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

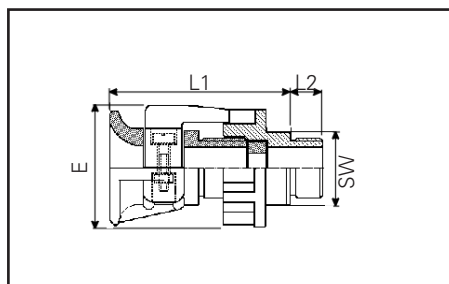
* pour presse-étoupe multiple M25x1,5 et M32x1,5

Entrées de câble, bouchons filetés, bouchons de fermeture, presses-étoupes à trompette, bagues de réduction et bouchons de purge

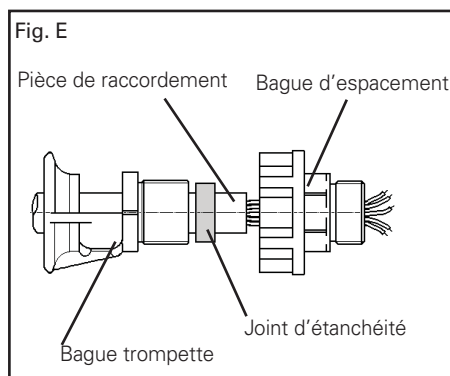
Plans et dimensions en mm

1.7 Presse-étoupe trompette M20 à M63

ATEX Certificat de Conformité:	PTB 00 ATEX 3121
Marquage selon 2014/34/UE et directive	
EN 60079-0	Ex II 2 G Ex e II
	Ex II 2 D Ex tD A21 IP66
IECEx Certificat de Conformité	IECEx BKI 08.0007
Marquage selon::	
IEC60079-0	Ex e II
	Ex tD A21 T85°C IP66
Temp. de stockage dans l'emballage original:	-20° C à +40° C
Indice de protection selon CEI/EN 60529:	IP 66 (après montage complet)



Type	SW	L1	L2	E	Poids approx.
M20x1,5	27 mm	64 mm	15 mm	47 mm	57 g
M25x1,5	32 mm	65 mm	15 mm	51 mm	68 g
M32x1,5	41 mm	80 mm	15 mm	68 mm	138 g
M40x1,5	50 mm	86 mm	15 mm	81 mm	191 g
M50x1,5	60 mm	95 mm	16 mm	96 mm	325 g
M63x1,5	75 mm	105 mm	16 mm	107 mm	757 g

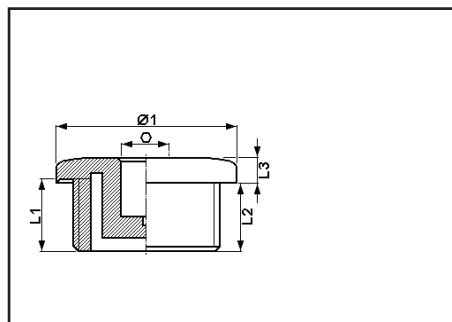


Type	d'exploitati- on température / °C	Pouvoir d' impact	Diamètre par câble		strain Relief (screws)		Partie filetée dans l'enveloppe
			Presse-étoupe rompette				
			min.	max.			
	°C	Joule	Ø	Ø	Nm	Nm	Nm
M20x1,5	-40 - 85	< 7	8,0	13,0	3,0	1,5	3,5
M25x1,5	-40 - 85	< 7	11,0	16,0	3,0	2,0	4,0
M32x1,5	-40 - 85	< 7	15,0	20,0	6,0	4,0	7,5
M40x1,5	-40 - 85	< 7	19,0	27,0	10,0	6,0	12,0
M50x1,5	-40 - 85	< 7	26,0	34,0	30,0	10,0	35,0
M63x1,5	-40 - 85	< 7	35,0	46,0	40,0	15,0	45,0

Entrées de câble, bouchons filetés, bouchons de fermeture, presses-étoupes à trompette, bagues de réduction et bouchons de purge

Plans et dimensions en mm

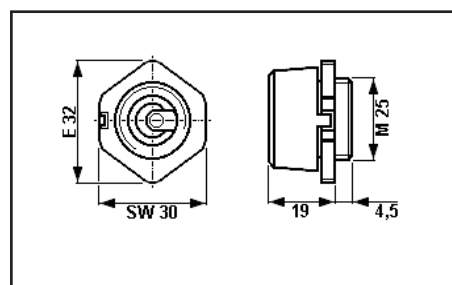
1.8 Bouchon fileté



ATEX Certificat de Conformité:		PTB 98 ATEX 3130
Marquage selon 2014/34/UE et directive		
EN 60079-0	Ex II 2 G Ex IIC Gb Ex II 2 D Ex tb IIIC Db IP66	
IECEx Certificat de Conformité		IECEx PTB 03.0000
Marquage selon:		
IEC60079-0	Ex IIC Gb	(pas pour M63x1,5)
	Ex tb IIIC Db IP 66	(pas pour M63x1,5)
Temp. de stockage dans l'emballage original:		-20° C à +40° C
Indice de protection selon CEI/EN 60529:		(après montage complet)
M12- M50	IP 66	
M63	IP 54	

Type	d'exploitation température / °C	Ø 1	L1	L2	L3	Partie filetée dans l'enveloppe/ Nm	Poids approx
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 Bouchon de drainage

ATEX Certificat de Conformité:		PTB 01 ATEX 1128 X
Marquage selon 2014/34/UE et directive:		
EN 60079-0	Ex II 2 G Ex e II	
Température de fonctionnement:		-20° C à +40° C
Temp. de stockage dans l'emballage original:		-20° C à +40° C
Indice de protection selon CEI/EN 60529:		IP 66 (après montage complet)
Type:		M25x1,5
Couple d'essai:		5,0 Nm

Entrées de câble, bouchons filetés, bouchons de fermeture, presses-étoupes à trompette, bagues de réduction et bouchons de purge

2 Légende

Caution

Attention : Ce symbole met en garde contre un éventuel défaut. Le non-respect de cette consigne peut entraîner une panne totale de l'appareil ou du système ou de l'installation à laquelle il est connecté.



Conditions particulières:

Ce symbole indique certaines conditions particulières à respecter pour une utilisation sûre, en accord avec l'attestation d'examen CE de type ou le certificat IEC Ex.

2.1 Consignes de sécurité



Pour le personnel électricien qualifié et le personnel instruit suivant la réglementation légale, y compris les normes respectives ainsi

que, le cas échéant, CEI/EN 60079-14 pour appareils électriques utilisables en atmosphère explosive.

Toutes les entrées de câble et autres éléments exposés dans cette notice d'utilisation ne conviennent pas à un emploi en zone 0 et zone 20.

Ceux-ci ne doivent pas être utilisés en tant qu'entrées de câble directes ou bouchons sur des enveloppes antidéflagrantes dans les atmosphères explosibles des zone 1, zone 2 et zone 21, zone 22.

Avant de commencer le montage, on vérifiera l'état des entrées de câble et des autres éléments ainsi que la partie filetée.

Les exigences des CEI/EN 60079-0 et CEI/EN 60079-31 en ce qui concerne des dépôts de poussière démesurés et une température doivent être considérées par l'utilisateur.

Tenez compte des prescriptions nationales en matière de sécurité et de prévention contre les accidents ainsi que des consignes de sécurité développées en italique dans ce mode d'emploi.

3 Conformité aux normes

Les Appareils ont été conçus, fabriqués et contrôlés suivant DIN EN ISO 9001 et EN ISO/IEC 80079-34.

Les Appareils sont conformes aux normes reprises dans la déclaration de conformité, jointe séparément.

Les références aux normes et directives de ce manuel se réfèrent toujours à la dernière version. Des frais supplémentaires (par exemple, des informations à jour) doivent être respectées.

4 Domaine d'utilisation

Les entrées de câble et autre éléments de ce mode d'emploi (voir Caractéristiques techniques) sont, selon la norme CEI/IEC 60079-10-1 et CEI/IEC 60079-10-2, conformes à une utilisation en zone 1, zone 2 et zone 21, zone 22.

Les éléments de l'enveloppe (dont notamment les éléments métalliques extérieurs) sont issus de matériaux de qualité supérieure qui garantissent une protection contre la corrosion et une résistance aux produits chimiques appropriées en atmosphère non-explosive.

- polyamide anti choc
- acier inoxydable

En cas d'utilisation en atmosphère extrêmement corrosive, vous pouvez obtenir des informations complémentaires sur la résistance chimique des plastiques utilisés chez la succursale Cooper Crouse-Hinds de votre région.

5 Utilisation / Propriétés

Tous les éléments et entrées de câble de ce mode d'emploi sont certifiés pour une montage et utilisation dans des enveloppes et appareils à sécurité augmentée.

Les presse-étoupes trompette servent à l'introduction de câbles et conducteurs flexibles dans les enveloppes et appareils.

 Il n'est pas permis de juxtaposer plusieurs bagues de réduction afin de réduire les parties filetées ou les perçages directs dans les enveloppes et appareils.

Avec des bagues de réduction, les parties filetées ou les perçages directs dans les enveloppes et appareils peuvent être réduits.

Les bouchons obturateurs servent à la fermeture des entrées de câble métriques COOPER CROUSE-HINDS et aux presse-étoupes multiples COOPER CROUSE-HINDS.

On fermera les parties filetées ou les perçages directs inutilisés avec des bouchons filetés.

Grâce aux bouchons de drainage, la condensation peut être évacuée de l'appareil ou enveloppe (point 6.1. Montage).

 Toute application autre que celles décrites sont interdites sans approbation écrite de la société COOPER CROUSE-HINDS.

 Lors de la mise en marche, on prendra en compte les instructions du point 7 de ce mode d'emploi.

 La responsabilité relative à l'utilisation conforme de ces éléments et selon ce mode d'emploi (voir caractéristiques techniques) est celle de l'utilisateur seul.

 L'attestation d'examen CE de type / le certificat IEC Ex et leurs éventuels suppléments futurs, doivent être considérés comme des compléments aux attestations d'examen CE de type PTB 99 ATEX 3128 X et PTB 99 ATEX 3101 X ainsi qu'au certificat IEC Ex PTB 05.0004X

Entrées de câble, bouchons filetés, bouchons de fermeture, presses-étoupes à trompette, bagues de réduction et bouchons de purge

Fig. 1

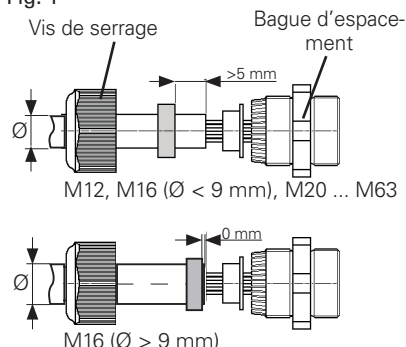
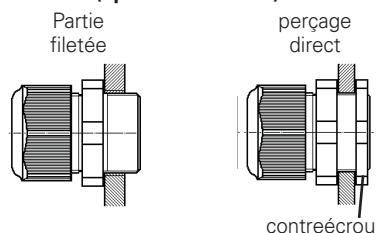


Fig. 2

Paroi de l'enveloppe (épaisseur à 4 mm)



Paroi de l'enveloppe (épaisseur < 4 mm)

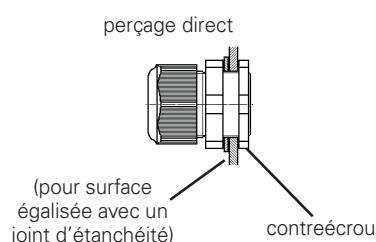


Fig. 3

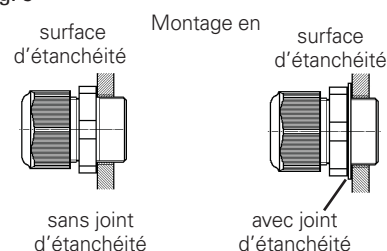


Fig. 4

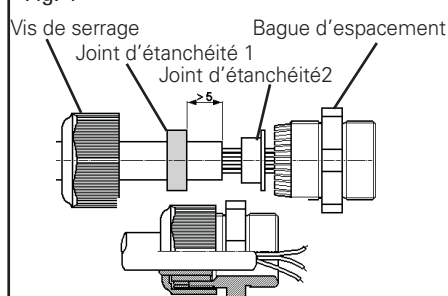


Fig. 5



Clé à douille pour la vis de serrage des presse-étoupes

6 Installation

Pour l'érection / la mise en marche, les prescriptions nationales ainsi que les règles de la technique généralement reconnues. (CEI/EN 60079-14).

⚠ Un installation non conforme des éléments d'insertion de câble peut entraîner la perte de la garantie

⚠ Observez les conditions particulières d'exploitation, conformément à la norme CEI/EN 60069-14.

⚠ Utiliser seulement avec des câbles fixes. L'utilisateur devra s'assurer qu'un dispositif de maintien du câble est prévu. Cela n'est pas nécessaire pour les presse étoupe trompette.

⚠ L'indice de protection IP66 est obtenu uniquement si les joints et les presse étoupe sont installés correctement.

⚠ Les presse étoupe qui ont une faible résistance aux chocs (4J) devront être installés à l'intérieur d'un coffret de telle sorte qu'ils soient protégés contre un éventuel choc mécanique.

6.1 Montage

⚠ Avant de commencer le montage, on s'assurera que le filetage des éléments correspond à celui de l'enveloppe ou appareil.

⚠ Pour le vissage direct des presse-étoupes et autres éléments, l'épaisseur de la paroi de l'appareil doit être d'au moins 4 mm.

⚠ Des écrous devront être utilisés si l'épaisseur du boîtier est inférieure à 4mm. L'épaisseur minimale du boîtier doit être de 1,5mm.

⚠ L'utilisation d'entrées de câbles ayant des filetages endommagés ou sales pourra impacter l'indice de protection (IP).

⚠ Les câbles devront être équipés d'un dispositif de maintien (par exemple un module d'amarrage).

6.1.1 Entrées de câble (KLE)

Les bagues d'espacement (voir Fig. 1) des entrées de câble doivent être montées avec un outil approprié (clé à fourche, à anneau ou à douille).

Le montage se fait directement dans le perçage fileté ou dans le perçage direct de l'enveloppe (voir Fig. 2).

Pour des surfaces d'étanchéité non planes, on devra employer des joints entre l'enveloppe et la bague d'espacement (voir Fig. 3).

Lors du montage d'entrées de câble dans les parois d'enveloppes dont l'épaisseur est de 4 mm, on aura recours à des contre-écrous (voir Fig. 2).

L'introduction du câble se fait comme représenté par la Fig. 4.

Les garnitures doivent être adaptées au diamètre du câble (voir page 23; Fig. A, B, C et D).

Afin de maintenir l'indice de protection minimum, la bague d'espacement et la vis de serrage doivent être serrées à fond (couple de serrage testés – voir Caractéristiques techniques).

Afin de retirer aisément la vis de serrage lors qu'un câble est engagé, on peut utiliser un clé à douille COOPER CROUSE-HINDS avec ouvertures latérales (voir Fig. 5).

No de référence
GHG 960 1951 R0001
(pour M12, 16, 20, 25, 32 et 40)

No de référence
GHG 960 1951 R0002
(pour M50 et 63)

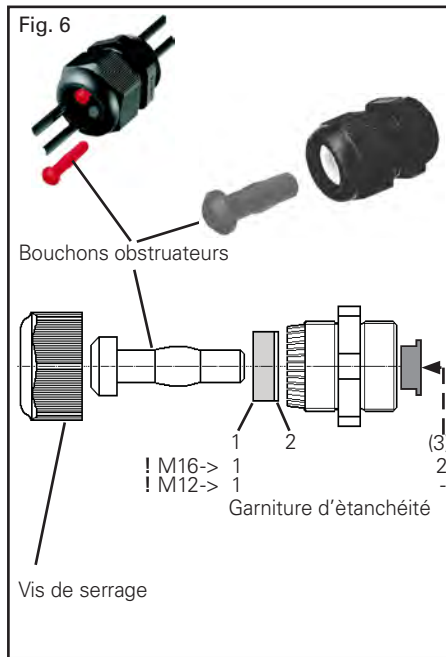
Pour garantir l'indice de protection minimum, le corps du presse étoupe ainsi que le chapeau devront être serrés aux couples indiqués (voir caractéristiques techniques).

Lors du serrage du chapeau, il faudra empêcher le corps du presse étoupe de tourner à l'aide d'une clé appropriée.

⚠ Un serrage excessif peut porter préjudice à l'indice de protection.

Pour les circuits à sécurité intrinsèque, on pourra employer des presse-étoupes dont les vis de serrage portent la couleur distinctive (bleu clair) Ex-i (No de référence: voir catalogue COOPER CROUSE-HINDS).

Entrées de câble, bouchons filetés, bouchons de fermeture, presses-étoupes à trompette, bagues de réduction et bouchons de purge

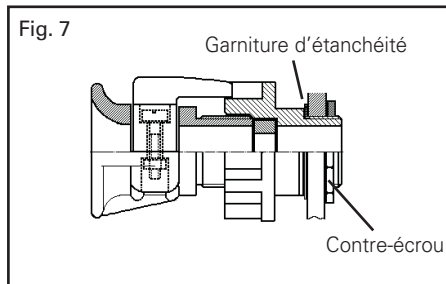


6.1.2 Bouchons obturateurs

⚠ Les obturateurs GHG 960 6107 P**** ou GHG 960 1944 R**** sont utilisables uniquement avec les presse étoupe GHG 960 92** P**** ou GHG 960 19** R****.

Lors du montage de bouchons obturateurs métriques pour entrées de câble COOPER CROUSE-HINDS, les points suivants sont à respecter (voir fig. 6):

1. Seuls les bouchons obturateurs correspondant aux entrées de câble pourront être utilisés.
2. L'entrée de câble doit être montée avec toutes les garnitures requises (garniture d'étanchéité 1 et 2).
3. La tête du bouchon obturateur doit être placée à l'extérieur (voir Fig. 6)
4. Le bouchon obturateur doit être introduit jusqu'à la butée.
5. La vis de serrage de l'entrée de câble doit être montée selon les indications du point 6.1.1.

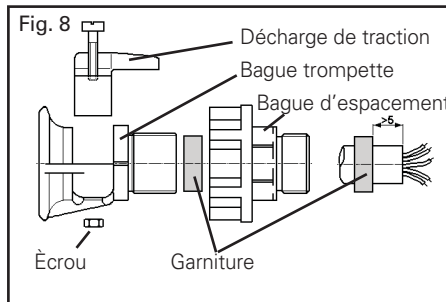


6.1.3 Bouchon fileté

Le bouchon fileté doit être vissé à fond dans l'entrée filetée de l'enveloppe avec un outil approprié (par ex. clé hexagonale de 8 mm ou clé à écrous spéciale).

Pour des perçages directs ou des perçages dans des parois dont l'épaisseur est inférieure à 4 mm, on utilisera un contre-écrou. Le montage sur des surfaces non planes ne peut se faire qu'avec un joint d'étanchéité supplémentaire.

⚠ **Le bouchon fileté M50 doit être généralement monté avec le joint d'étanchéité livré avec celui-ci.**

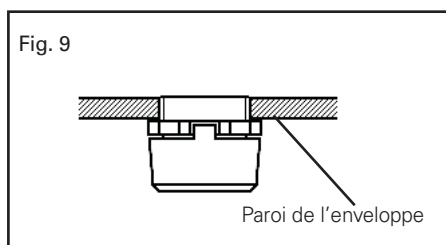


6.1.4 Presse-étoupe trompette

La bague d'espacement du presse-étoupe trompette doit être montée dans l'enveloppe ou l'appareil avec une clé à fourche de telle sorte qu'une rotation soit impossible.

On devra s'assurer qu'aucune rotation de la bague ne s'opère quand le câble est inséré et le presse-étoupe trompette complètement monté (pour cela, on peut utiliser un contre-écrou – voir Fig. 7 et 8.)

Pour les perçages directs ou des perçages dans des parois dont l'épaisseur est inférieure à 4 mm, on utilisera un contre-écrou. Le montage sur des surfaces non planes ne peut se faire qu'avec un joint d'étanchéité placé entre la paroi de l'enveloppe et la bague d'espacement (voir Fig. 7).



Ensuite, le montage du câble dans le presse-étoupe trompette s'effectue comme représenté par la Fig. 8 et comme suit :

1. La garniture en rondelles doit être adaptée par découpage au diamètre du câble.
2. Après introduction du câble dénudé avec le joint dans la bague d'espacement, la bague trompette doit être serrée à fond dans la bague d'espacement.
3. La décharge de traction sera ensuite connectée à la bague trompette.

⚠ **Ce faisant, on veillera à ce qu'une décharge de traction suffisante est employée de manière à prévenir un endommagement du câble ou conducteur. De même, on s'assurera qu'aucune rotation de la bague trompette n'est possible.**

6.1.5 Bagues de réduction

Le réducteur est un outil approprié, par exemple Fourche, clé polygonale ou clé à douille pour visser dans le trou fileté du logement.

Pour trous ou paroi du boîtier des épaisseurs inférieures à 4 mm contre-écrou doit être utilisé. Le montage sur des surfaces inégales d'étanchéité doit être fourni avec un joint supplémentaire.

⚠ **Les vis de verrouillage (boîtes) de plusieurs Réducteur pour réduire le fil d'introduction n'est pas autorisé.**

Entrées de câble, bouchons filetés, bouchons de fermeture, presses-étoupes à trompette, bagues de réduction et bouchons de purge

6.1.6 Bouchon de drainage

Le bouchon de vidange est équipée d'un outil approprié, par exemple Fourche, clé polygonale ou clé à douille pour visser dans le trou fileté du logement.

Le montage sur des surfaces inégales d'étanchéité doit être fourni avec un joint supplémentaire.

Le bouchon de vidange (voir figure 9) pour être fixée au point de l'appareil ou de l'enveloppe la plus basse.

⚠ L'épaisseur minimale de la paroi du boîtier de 4 mm ne doit pas être dépassée.

Pour assurer la protection minimum requis l'introduction d'éléments doit être serré (couple d'essai voir caractéristiques techniques).

⚠ Un serrage excessif de la protection peut être altérée.

6.2 Mise en service

Avant la mise en service des éléments montés, les tests requis par les réglementations nationales devront être effectués.

Par ailleurs, avant la mise en service, on s'assurera que le montage a été effectué correctement en conformité avec le présent mode d'emploi et les autres réglementations applicables.

⚠ Si l'appareil est installé à un emplacement particulièrement dangereux, on s'assurera que les éléments d'entrée ne puissent être arrachés du fait d'influences mécaniques extérieures (par ex. marteau-piqueur, coups, etc.).

7 Maintien/Entretien

⚠ Pour le maintien / l'entretien d'appareils électriques installés en atmosphères explosibles, les réglementations nationales en vigueur doivent être respectées (par ex. CEI/EN 60079-17).

La régularité des travaux obligatoires de maintenance est à déterminer en fonction de chaque cas particulier et des conditions d'utilisation.

Dans le cadre des travaux d'entretien, on vérifiera tout particulièrement les pièces desquelles dépend directement l'indice de protection (par ex. intégrité des éléments d'introduction de câble et des joints d'étanchéité).

L'étanchéité des vis de serrage des entrées de câble et les bagues trompette des presses-étoupes trompette doit être contrôlée à intervalles réguliers et adaptée le cas échéant.

Si à l'occasion de travaux d'entretien, une remise en état était jugée nécessaire, les directives du chapitre 8 de cette notice devraient être respectées.

8 Réparations / Remise en état

Les travaux de remise en état / réparation qui concernent la protection contre le risque d'explosion ne doivent être effectués qu'en utilisant des pièces originales de COOPER CROUSE-HINDS.

⚠ Des réparations portant sur la protection contre l'explosion ne peuvent être effectuées que par COOPER CROUSE-HINDS ou un électricien qualifié et ce, en respect des réglementations nationales (CEI/EN 60079-19).

Toute transformation ou modification de ces éléments est interdite.

9 Évacuation des déchets / Recyclage

Lors de l'évacuation de ces éléments, la réglementation nationale en vigueur devra être respectée.

Afin de faciliter le recyclage de ces éléments, les parties en plastique sont marquées du signe distinctif de la matière plastique employée.

Sous réserve de modification ou d'informations complémentaires.

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

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Neuer Weg-Nord 49
D-69412 Eberbach****Kabel und Leitungseinführung
Cable gland
presse-étoupe****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.
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Terms of the directive
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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:

2014/34/EU: Geräte und Schutzsysteme zur bestimmungsgemäßen
Verwendung in explosionsgefährdeten Bereichen.
2014/34/EU: *Equipment and protective systems intended for*
use in potentially explosive atmospheres.
2014/34/UE: *Appareils et systèmes de protection destinés à*
être utilisés en atmosphères explosibles.
(OJ L 96, 29.3.2014, p. 309–356)

EN IEC 60 079-0: 2018
EN IEC 60 079-7: 2015+A1:2018
EN 60 079-31: 2014

2011/65/EU: RoHS –Richtlinie, RoHS – directive
2011/65/UE: *Directive RoHS*
(OJ L 174, 01.7.2011, p. 88–110 as well as their
subsequent amendments in place at the date of
this declaration)

EN 62 444: 2013
EN 60 529: 1991 + A1: 2000 + A2: 2013

EN 50 581: 2012

Eberbach, den 31.07.2020

Ort und Datum
Place and date
Lieu et date

Dr. Matthias Stelzer
Geschäftsführer
Managing Director
Président-directeur général

ppa. Völker Daul
Leitender Controller
Senior Controller
Contrôleur principal

⁽¹⁾ Benannte Stelle (EU-Baumusterprüfbescheinigung)
Notified body (EU-type examination certificate)
Organisme notifié (Examen UE de type)

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

BVS 20 ATEX ZQS/E332 ⁽²⁾

⁽²⁾ Benannte Stelle (Qualitätssicherung Produktion)
Notified body (Production Quality Assurance)
Organisme notifié (Assurance Qualité de Production)

DEKRA Testing and Certification GmbH (0158)
Dinnendahlstraße 9
D-44809 Bochum

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Sitz der Gesellschaft: Soest
Amtsgericht Arnsberg, HRB B 5766

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WEEE-Reg. Nr. DE 69860126

**EU-Konformitätserklärung
EU-Declaration of conformity
UE-Déclaration de conformité****PTB 14 ATEX 1015X⁽¹⁾**

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EN 50 581: 2012

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La déclaration originale de conformité sera fournie avec le produit !

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