Spark detectors

FM 1/8, FM 1/8 Ex

Instruction Manual

GreCon

Imprint:

Department: Technical Information Service (TIW)

Edition: 10.2019

Translation [gb] of the original instruction manual [de]

Contents

1 Safety

1.1 Symbols used in the manual

DANGER

DANGER refers to a hazard with a high degree of risk, which, if not avoided, results in fatal or serious injuries.

WARNING

WARNING refers to a hazard with a medium degree of risk, which, if not avoided, may result in fatal or serious injuries.

CAUTION

CAUTION refers to a hazard with a low degree of risk, which, if not avoided, may result in minor or moderate injuries.

NOTICE

Notices are used to indicate material damage.

It may relate to possible errors when installing, servicing and repairing equipment, devices and machines.

Personal injuries as a result of material damage cannot be ruled out.

1.2 Scope and target group

This instruction manual is valid for the spark detectors FM 1/8 and FM 1/8 Ex.

Please also pay attention to the product documentation describing other systems installed in your complete system.

This manual is to be used by those persons who operate the system and carry out maintenance and repairs on it.

The operating personnel must be trained by a GreCon technician.

1.3 Intended use

The FM 1/8 spark detector is used in conveying paths in order to detect sparks in the conveyed material. The conveying paths must be free of ambient light.

Spark detectors may only be operated in GreCon control consoles in accordance with the technical specifications of this instruction manual. Using the spark detector for any purpose other than that described in the chapter "Technical data" is considered contrary to the intended purpose.

No unauthorised changes or conversions can be made. The manufacturer accepts no liability for any damage or impaired function of the system resulting from this.

The manufacturer does not accept any liability for damage caused by improper use.

Intended use includes observing the instructions given in the manual.

1.4 Consequences of non-compliance with this instruction manual

Non-compliance with the safety notices may result not only in danger to individuals but also to the environment and machinery.

Non-compliance may lead to the following hazards, for example:

- Failure of important functions of the machine.
- Failure of specified methods for maintenance and servicing.
- Hazards to individuals due to electrical, mechanical and chemical effects.

1.5 Notices

Compliance is required not only with the instructions and notices in this chapter on safety but also with all the specific safety notices in all the other chapters.

Compliance is also required with the safety notices given in this instruction manual as well as with the existing national regulations on accident prevention and any internal regulations of the owner/operator that relate to working, operation and safety.

Signs, labels or type plates directly attached to the system must be legible at all times.

1.6 Documentation

The documentation must be ready to hand.

1.7 Operation

Ensure that the spark extinguishing system is exclusively operated by personnel who received specific training to do so by GreCon service engineers during commissioning.

1.8 Specifications

During all work the local regulations (e.g. of supply companies) have to be observed.

With VdS-approved systems, attention must be paid to the following extract from VdS Directive 2106 Issue 2012-12:

The owner/operator must maintain a logbook and enter in this logbook all the events that occur, as are listed below:

- Commissioning
- Responsible persons appointed by the owner/operator
- Alarms
- Faults
- Maintenance and repair work
- Technical changes and enhancements
- Regular inspections by the owner/operator in keeping with the manufacturer's specifications

1.9 Production stop

Mounting, maintenance and replacement of components may only be done with the production line switched off.

1.10 Working at heights

If you have to carry out the required work on ladders or working platforms, please protect yourself from falling.

1.11 Selection of the installation sites

The installation sites must be chosen so that they comply with the technical requirements and are easily accessible for subsequent maintenance work. Compliance is required with the conditions specified in the technical data.

Also see the VdS Directive 2106 Issue 2012-12, Paragraphs 3.2 and 4.8.

1.12 Technical personnel

All work described in this documentation may only be carried out by trained and qualified personnel of the corresponding discipline. The qualified personnel must be able to assess the work they have been assigned, recognise possible risks and dangers and avoid them and be authorised by the person responsible for the safety of the system.

1.13 Commissioning

The spark extinguishing system may only be started up by a GreCon service technician or by personnel authorised by GreCon.

1.14 Taking care of the system

GreCon fire detection and fire alarm systems and spark extinguishing systems are a part of safety engineering. These systems may only be operated in a technically perfect condition. Faults must be eliminated immediately after they occur.

Duties of the operator:

- Appointment of responsible and competent individuals.
- Regular routine check of the system (at least a monthly visual inspection for damage).
- Quarterly inspection by the qualified person.
- Commissioning for servicing.
- Immediate troubleshooting in the event of a fault.
- Acceptance, storage and update of system documentation.
- Create, introduce and document organisational fire protection and provide relevant training.
- Adaptation of fire detector and spark extinguishing systems to changes in use.
- Tracking of fire brigade deployment plans.

Maintenance at least once a year by certified professional company:

- Care and cleaning of system parts.
- Adjustment and readjustment of components, equipment and devices.
- Check all relevant documentation for completeness and up-to-dateness.

After inspection and maintenance work, the complete plant must be put back into a state of operational readiness.

Testing of the electrical system must be carried out in accordance with DIN VDE 0833-1.

1.15 Explosion safety

DANGER

Danger of explosion

Fatal or serious injury possible.

- Never open the devices in the dust-explosion endangered zone and do not set up any kind of electrical connections in the explosion-endangered environment.
- Stickers provide warnings, during installation and maintenance work, of the consequences of zone dragging in dust explosion-endangered areas. It is imperative to comply with these warnings.
- If Ex components are operated in Ex-free zones with extended temperature ranges or stored at a higher temperature, a subsequent deployment in Ex conditions is no longer allowed.

The Directive 2014/34/EU and the EC type examination certificates generally only apply to the use of electrical operating equipment in atmospheric conditions between 0.8 bar and 1.1 bar and -20 °C and +60 °C with residual air which corresponds to the normal oxygen content. Safety parameters may change significantly if the operating equipment is used outside these atmospheric conditions. Examples of this are:

- Reduction in the minimum ignition energy with increased oxygen content or higher temperatures.
- Change in the explosion limits at increased temperatures and pressures.

Accordingly, the use of the operating equipment under non-atmospheric conditions in the meaning of the Directive cannot be certified. In these cases, the EC type examination certificate serves only as a guideline for the operating agency, whose attention is drawn to compliance with the remaining labour protection specifications. The operating agency is recommended to carry out additional tests for special usage conditions.

The testing of all the devices described in this manual for use in dust-explosive atmosphere was carried out without a dust layer and safety distance, unless specified otherwise.

The following stickers are intended to draw the attention of the owner/operator to the fact that pulling out equipment and devices of the spark extinguishing system from the piping can result in the neutralisation of its zone separation.

Attention!
Removing the detector or the extinguishing nozzle causes the Ex Zone to be opened.
Please check with your Safety Officer first.

1.16 Unpacking

- Using the delivery note, check whether all the listed items have been supplied.
- Unpack the machines carefully and in a clean environment.
- Completely remove the packaging and any transport securing devices that are present.
- Dispose of the packaging properly.
- Remove and preserve the documentation.
- Check the devices carefully for signs of damage.
- Some components have a serial number.
  If the serial numbers of the components differ from the serial numbers in the delivery documents, immediately notify GreCon or the responsible GreCon representative.
- If equipment has to be stored until it is installed, suitable storage conditions must be ensured (see the chapter "Technical data").

1.17 Disposal

The applicable local regulations must be obeyed for disposal of the device.

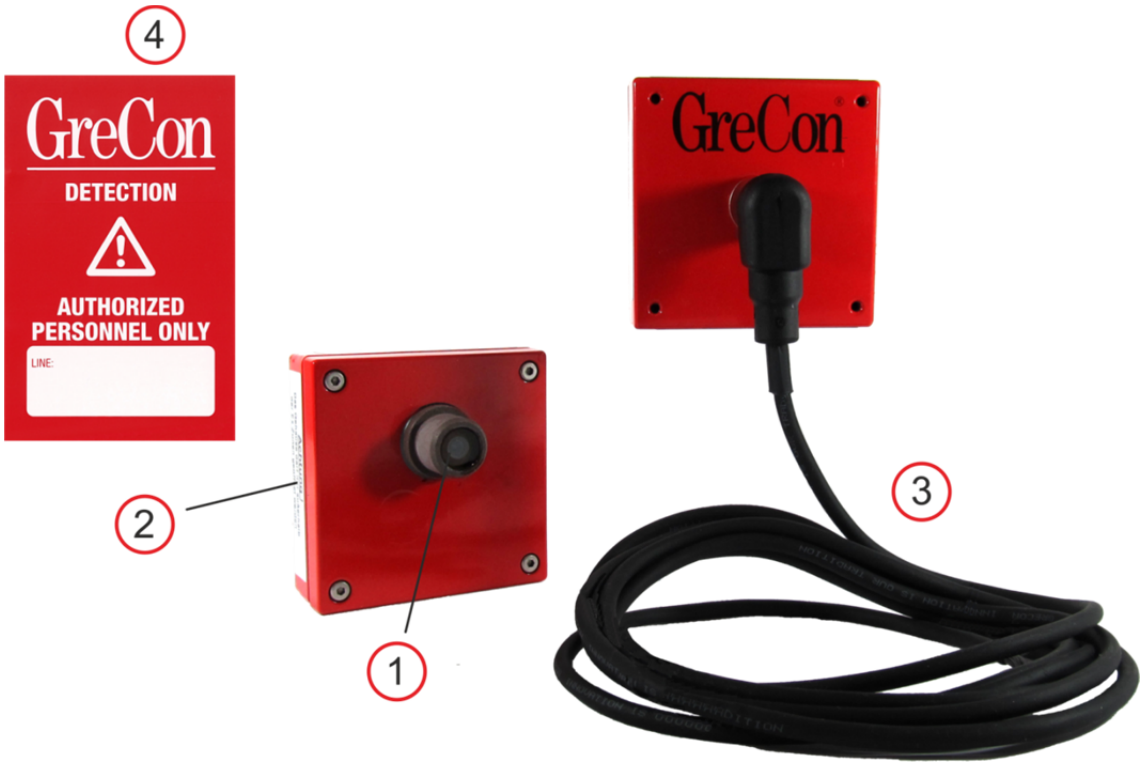
Attention must be paid to the following points:

- The device may not be disposed of with domestic waste. Compliance with regional, national and international regulations is required when disposing of the device or its individual components.
- The device may contain harmful materials. Electrical parts (PCBs, mains units, transformers, coils, cables, connectors) must be given for recycling after dismantling.
- After dismantling, all the metal parts must be separated by type and handed over for recycling.
- The device or individual parts must be handed over for disposal to a recognised disposal agency.

The data in this description are based on our current knowledge and experiences. It does not release the entity disposing of the waste from the responsibility of compliance with the regulations and laws that apply at the time of disposal.

2 Description

2.1 Component overview



1. *Detector lens*
2. *Type plate*
3. *Connection cable with angle socket*
4. *"Detection" identification plate*

2.2 Description of the function

The spark detectors are sensors for detecting sparks and react to the infrared radiation range of light radiated by a spark. This also means that the spark detectors are sensitive to ambient light and may only be operated at installation sites without ambient light.

The spark detectors are connected through a three-core cable via a terminal box with the control console. This cable is monitored by the control console for broken wire and short circuit. The functioning of the spark detectors is automatically checked by the control console at programmed intervals.

To be able to use the spark detectors at different locations, they are available in different variants. The individual variants of the spark detector FM 1/8 with their specific properties and the relevant components are described on the following pages.

2.3 Scope of delivery

Scope of delivery

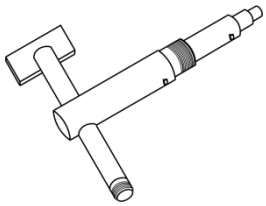
Spark detector FM 1/8 or FM 1/8 Ex incl. ID plate and connection cable with angle socket

Quantity:	1	
Part number:	FM 1/8	581540
	FM 1/8 Ex	58154015EX

Accessories

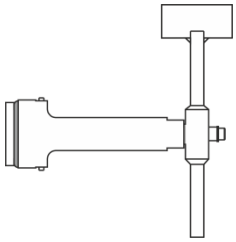
Installation tool for installation of angle socket of spark detector

Part number: 500531



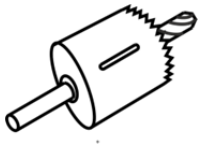
Special wrench for the installation of detector holder.

Part number: 501564



Special wrench for air purge adapter

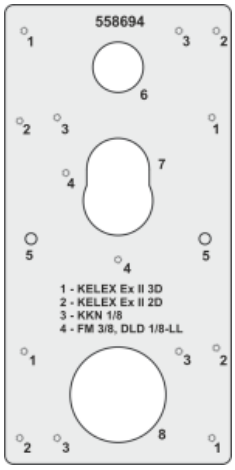
Part number: 581499.90



Carbide saw

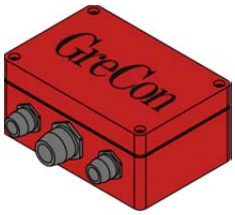
Part number:	5589198
Ø 32 mm	for screw-in adapter
Part number:	558920
Ø 40 mm	for weld-on mounting adapter
Part number:	5589202
Ø 50 mm	for air purge adapter, screw-in or weld-on.

Accessories (continued)



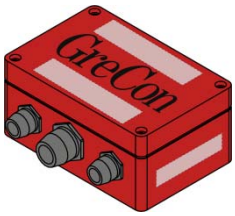
Universal mounting plate

Quantity: 1 per detector
Part number: 558694



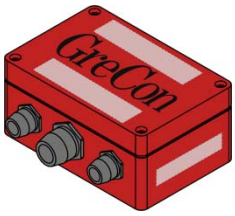
Terminal box KELEX 1/8

Quantity: 1 per detector channel
Part number: 5815802



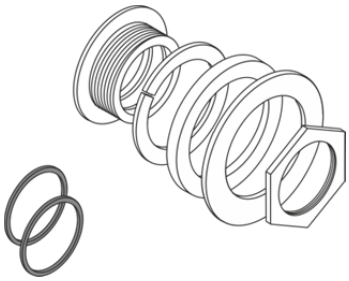
Terminal box KELEX 1/8 Ex II 3D

Quantity: 1 per detector channel
Part number: 5815885EX



Terminal box KELEX 1/8 Ex II 2D

Quantity: 1 per detector channel
Part number: 5815886EX

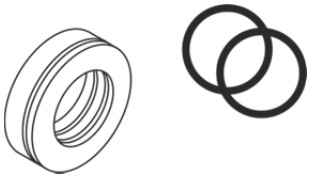


Optional version for detector adapter

Screw-in adapter

Ex-free area and Ex area

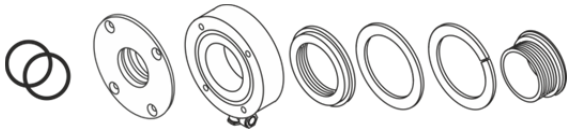
Quantity: 1 per spark detector
Part number: 581565EX



Weld-on mounting adapter

Ex-free area and Ex area

Quantity: 1 per spark detector
Part number: 5815661EX

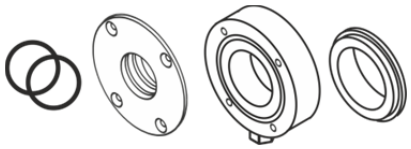


Screw-in air purge adapter

Quantity: 1 per spark detector

Part number:

Ex-free 581499.40
Ex zone 581499.41EX

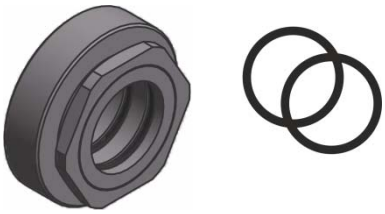


Weld-on air purge adapter

Quantity: 1 per spark detector

Part number:

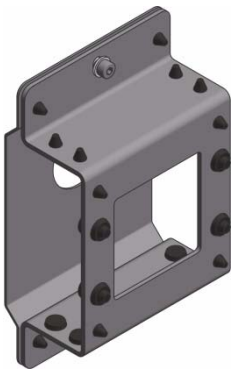
Ex-free 581499.00
Ex zone 581499.001EX



Weld-on mounting adapter, fixing set

Quantity: 1 per detector

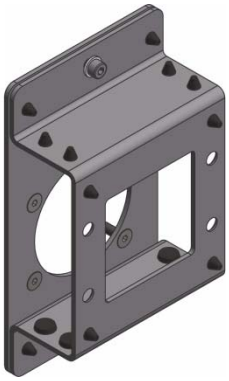
Part number: 507343



Fixing set, spark detector

Quantity: 1 per detector

Part number: 505007



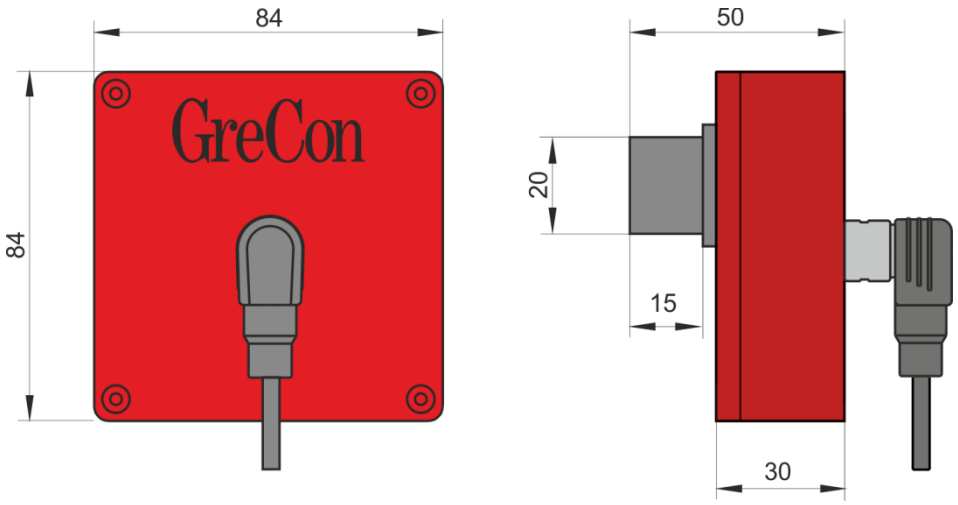
Fixing set, air purge adapter

Quantity: 1 per detector

Part number: 581499.80

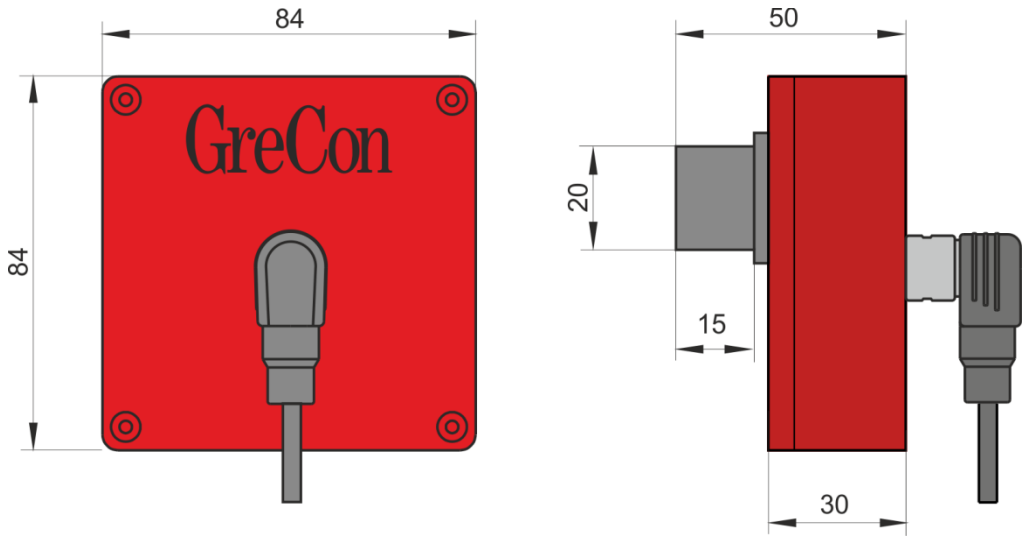
3 Technical data

3.1 Spark detector FM 1/8



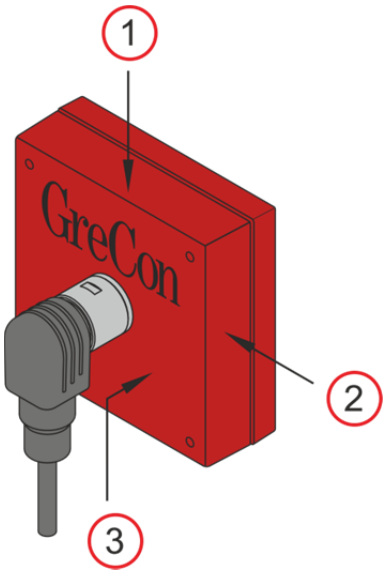
Current consumption:	min. 9 mA to max. 30 mA
Viewing angle:	120°
Temperature range, ambient:	-40 °C to +70 °C
Temperature range, process:	-40 °C to +80 °C
Temperature range, storage:	-40 °C to +70 °C
Relative humidity:	0 to 95 %, non-condensing
Transportation speed:	2 to 50 m/s (other speeds available upon request)
Operation site:	in non-explosive zones in zones without ambient light
Protection class:	IP 65
Connection:	preassembled connection cable, pluggable, with angle socket and threaded connection, cable length 2.5 m (3 x 0.5 mm²) optional 25 m (3 x 0.5 mm²)
Material of housing:	aluminium pressure casting (GD-AlSi12)
Housing colour:	red (RAL 3000), painted
Weight:	270 g (without connection cable)
Part number:	581540
Adapter systems that can be used:	screw-in adapter FM 1/8 Ex, weld-on mounting adapter FM 1/8 Ex, air purge adapter SPA and SPA Ex

3.2 Spark detector FM 1/8 Ex



Current consumption:	min. 9 mA to max. 30 mA
Viewing angle:	120°
Ambient temperature range:	Ex-free zone -40 °C to +70 °C Ex zone -20 °C to +60 °C
Temperature range, process:	Ex-free zone -40 °C to +80 °C Ex zone -20 °C to +60 °C
Temperature range, storage:	-20 °C to +60 °C
Relative humidity:	0 to 95 %, non-condensing
Transportation speed:	2 to 50 m/s (other speeds available upon request)
Operation site:	in non-explosive zones in explosive zones in zones without ambient light
Protection class:	IP 65
Connection:	preassembled connection cable, pluggable, with angle socket and threaded connection, cable length 2.5 m (3 x 0.5 mm²) optional 25 m (3 x 0.5 mm²)
Material of housing:	aluminium pressure casting (GD-AlSi12)
Housing colour:	red (RAL 3000), painted
Weight:	270 g (without connection cable)
Part number:	58154015EX
Adapter systems that can be used:	screw-in adapter FM 1/8 Ex, weld-on mounting adapter FM 1/8 Ex, air purge adapter SPA Ex
Location of marking:	outer wall of the housing

3.2.1 Factory identification



1 Warning notice

Attention!
Only pull the plug when the machine has been switched off for min. 3 seconds.

2 Type plate

GreCon Alfeld Leine Typ: FM 1/8 Ex
CE 0044 II1D Ex ta IIIC T80°C T_{500} 115°C IP65 Da
TÜV 10 ATEX 556165X
ID-Nr.: 58154015EX SN:...../...

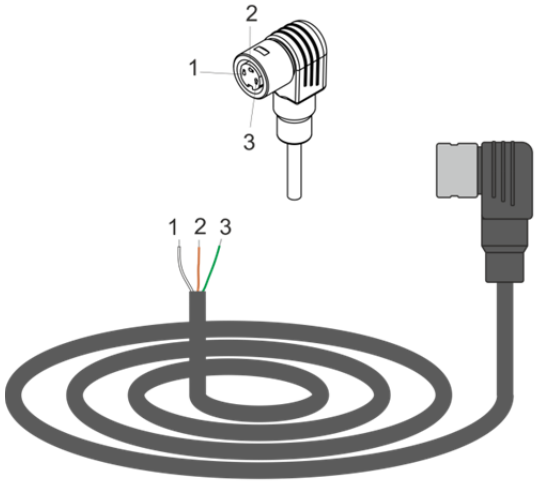
T80 °C means surface temperature in case of error without dust layer.

T_{500} 115 °C means, surface temperature in case of error with 500 mm dust layer.

3 Warning notice

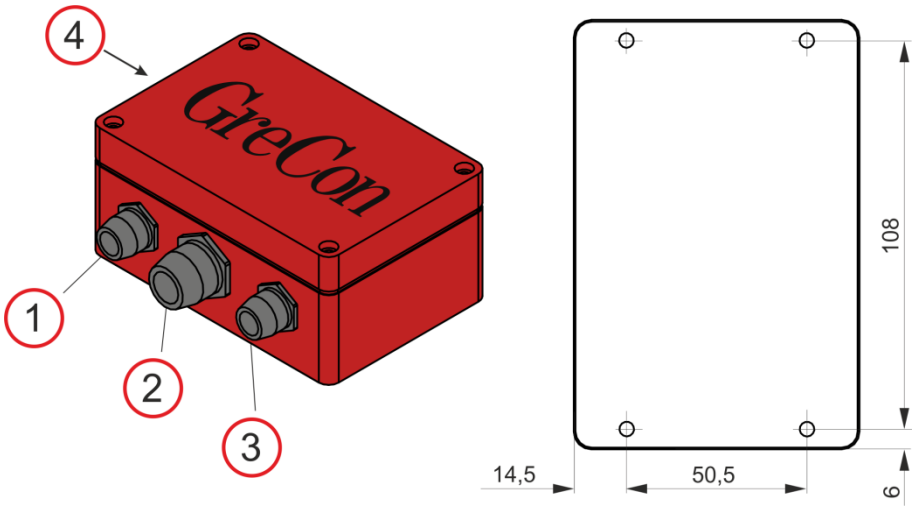
Attention!
The housing of the detector may only be opened when it is in a voltage-free condition.

3.3 Connection cable



Number of poles:	3	
Number of wires:	3	
Wire cross-section:	0.75 mm^2	
Cable outer diameter:	approx. 5.5 mm	
Wire end:	ferrule DIN 46228	
Min. bend radius:	7.5 X outer diameter of cable	
Temperature range, ambient:	-30 °C to +90 °C	
Temperature range, storage:	-40 °C to +100 °C	
Insulation resistance:	min. 20 MOhm x km	
Operation site:	in explosive zones	
Part number:	500101	2.5 m (VdS-compliant)
	504646	5 m (optional)
	504837	10 m (optional)
	500102	25 m (optional)

3.4 Terminal box KELEX 1/8

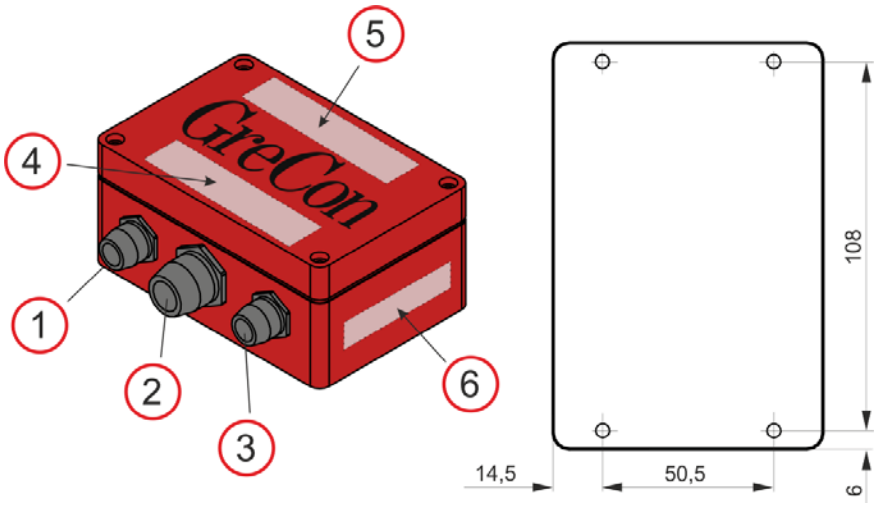


1	*Connection of detector 1*	3	*Connection of detector 2 (optional)*
2	*Connection of control console*	4	*Type plate*

Dimensions (L x W x D):	80 mm x 120 mm x 57 mm	
Temperature range, ambient:	-40 °C to +85 °C	
Temperature range, storage:	-40 °C to +85 °C	
Relative humidity:	0 to 95 %, non-condensing	
Operation site:	in non-explosive zones	
Protection class:	IP 65	
Terminal clamps:	max. 2.5 mm²	
Cable length:	3 x 0.75 mm²	max. 1000 m
	3 x 1.50 mm²	max. 2000 m
	3 x 2.50 mm²	max. 3000 m
Outer diameter of cable:	min. 6.5 mm, max. 12 mm (Connection 2)	
Housing colour:	RAL 3000	
Housing material:	Makrolon	
Weight:	0.3 kg	
Part number:	5815802	
Number of independent detectors:	max. 2	
Location of marking:	outer wall of the housing	
Type plate:		

GreCon	Typ: Klemmenkasten KELEX 1/8	
ID-Nr.: 5815802		
SN: XXXXXXX	IP 65	CE VdS

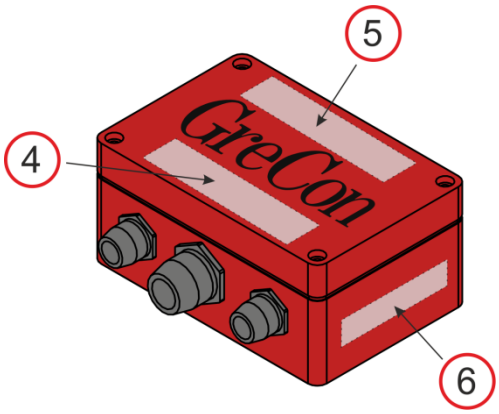
3.5 Terminal box KELEX 1/8 Ex II 3D



1	*Connection of detector 1*	4	*Warning notice 1*
2	*Connection of control console*	5	*Warning notice 2*
3	*Connection of detector 2 (optional)*	6	*Type plate*

Dimensions (L x W x D):	80 mm x 120 mm x 57 mm
Temperature range, ambient:	Ex zone -20 °C to +60 °C Ex-free zone -40 °C to +85 °C
Temperature range, storage:	-20 °C to +60 °C
Relative humidity:	0 to 95 %, non-condensing
Operation site:	in explosion-endangered areas Zone 22 in non-explosion endangered areas
Protection class:	IP 65
Terminal clamps:	max. 2.5 mm²
Cable length:	3 x 0.75 mm² max. 1000 m 3 x 1.50 mm² max. 2000 m 3 x 2.50 mm² max. 3000 m
Outer diameter of cable:	min. 6.5 mm, max. 12 mm (Connection 2)
Housing colour:	RAL 3000
Housing material:	Makrolon
Weight:	0.3 kg
Part number:	5815885EX
Number of independent detectors:	max. 2
Location of marking:	outer wall of the housing
Approvals:	The terminal box contains the separately approved energy limitation KELEX 1/8 IP20. Identification: II (1) D, TÜV 13 ATEX 112998 X

3.5.1 Factory identification



4 Warning notice 1

Attention!
Cable inlets (KLEs) ensure IP protection.
The terminal area must be observed.
Unused cable glands must be sealed against dust and splash-proof.

5 Warning notice 2

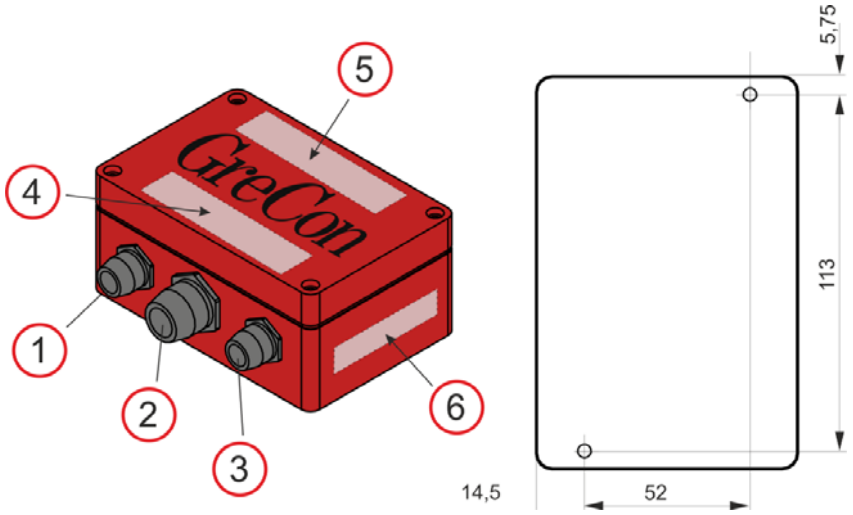
Attention!
Open the housing only when
the machine has been switched off for
min. 3 seconds.

6 Type plate

GreCon Alfeld Leine Typ: KELEX 1/8
CE Ex II 3 D Ex tc IIIC T80°C IP66 Dc
ID-Nr.: 5815885EX SN:...../...

The maximum surface temperature was determined without dust layer and safety distance.
The screwed cable connection for strain relief has been certified i.a.w. directive 2014/34/EU.

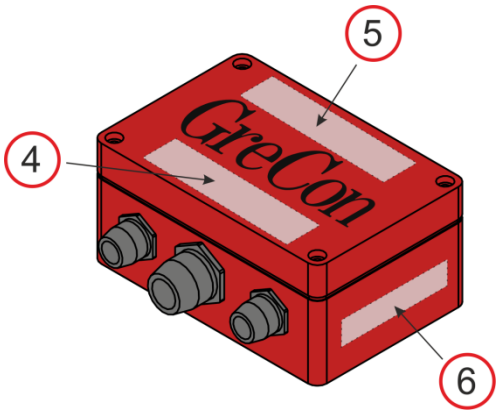
3.6 Terminal box KELEX 1/8 Ex II 2D



1	*Connection of detector 1*	4	*Warning notice 1*
2	*Connection of control console*	5	*Warning notice 2*
3	*Connection of detector 2 (optional)*	6	*Type plate*

Outer dimensions (L x W x D):	81 mm x 125 mm x 57 mm
Temperature range, ambient:	Ex zone -20 °C to +60 °C Ex-free zone -40 °C to +85 °C
Temperature range, storage:	-20 °C to +60 °C
Relative humidity:	0 to 95 %, non-condensing
Operation site:	in explosion-endangered areas Zone 21 in non-explosion endangered areas
Protection class:	IP 66
Terminal clamps:	max. 2.5 mm²
Cable length:	3 x 0.75 mm² max. 1000 m 3 x 1.50 mm² max. 2000 m 3 x 2.50 mm² max. 3000 m
Outer diameter of cable:	min. 6.5 mm, max. 12 mm (Connection 2)
Housing colour:	RAL 3000
Housing material:	aluminium
Weight:	0.6 kg
Part number:	5815886EX
Number of independent detectors:	max. 2
Location of marking:	outer wall of the housing
Approvals:	The terminal box contains the separately approved energy limitation KELEX 1/8 IP20. Identification: II (1) D, TÜV 13 ATEX 112998 X

3.6.1 Factory identification



4 Warning notice

Attention!
Cable inlets (KLEs) ensure IP protection.
The terminal area must be observed.
Unused cable glands must be sealed against dust and splash-proof.

5 Warning notice

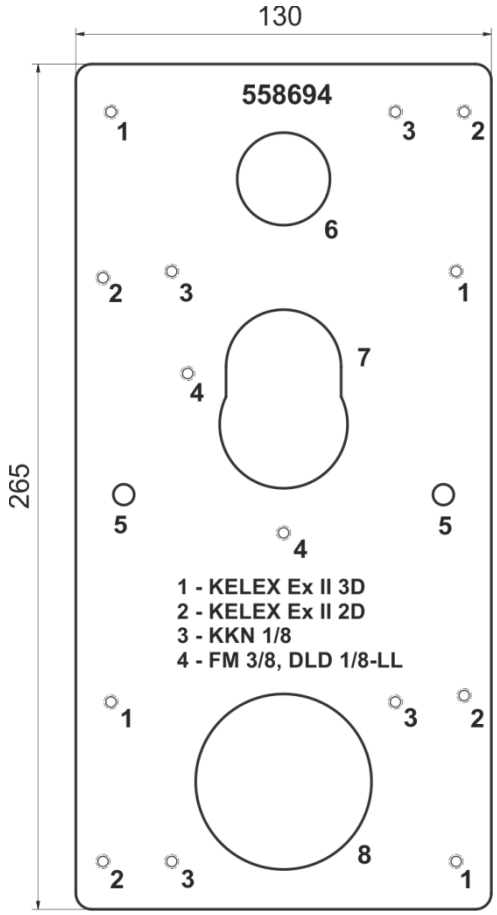
Attention!
Open the housing only when
the machine has been switched off for
min. 3 seconds.

6 Type plate

GreCon Alfeld Leine Typ: KELEX 1/8 Ex II 2D
CE 0044 Ex II 2 D Ex tb IIIC T80°C Db IP66
TÜV 14 ATEX 7583X -20°C < Ta < +60°C
ID-Nr.: 5815886EX SN:...../...

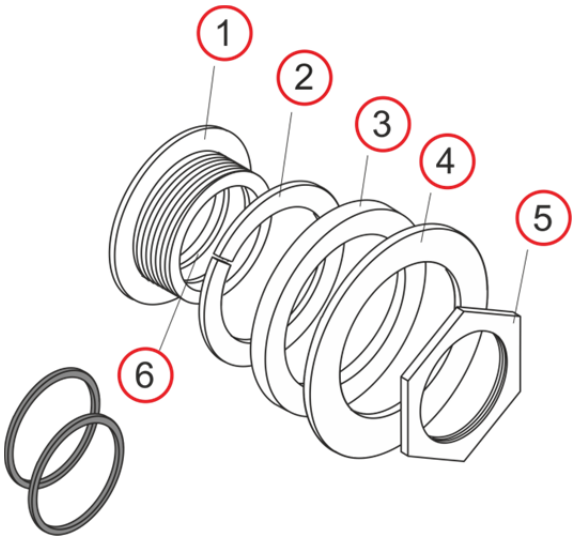
The maximum surface temperature was determined without dust layer and safety distance.
The screwed cable connection for strain relief has been certified i.a.w. directive 2014/34/EU.

3.7 Universal mounting plate



Bolting positions:	5 hole for wall mounting 6 hole for screw-in adapter 7 hole for weld-on mounting adapter 8 hole for air purge adapter
Material (material number):	chrome-nickel steel (1.4305)
Weight:	225 g
Part number:.....	558694
Marking location:	on the component

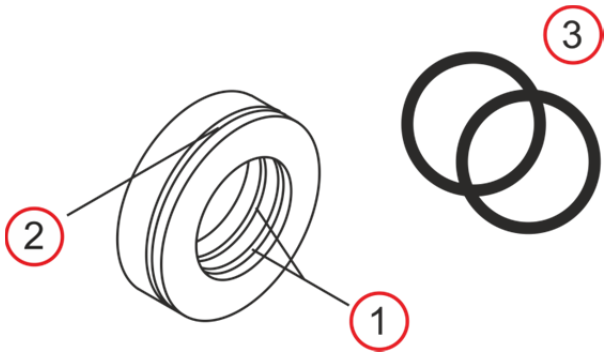
3.8 Screw-in adapter FM 1/8 Ex



1 *Base body with grooves for 2 O-rings*
2 *Locking ring, with slot*
3 *Silicone foam gasket for compliance with IP 6x*
4 *Washer*
5 *Nut*
6 *2 O-rings*

Hole diameter for installation:	32 mm
Material (material number):	chrome-nickel steel (1.4305)
Material of O-rings:	NBR 60
Permissible process temperature:	max. 200 °C
Temperature range, storage:	-20 °C to +70 °C
Diameter of the conveying pipe:	min. 250 mm
Wall thickness at installation site:	max. 3 mm
Ex zone material flow:	20, 21, 22
Ex zone surroundings:	21, 22, Ex-free
Weight:	approx. 0.1 kg
Part number:	581565EX
Marking location:	on the component

3.9 Weld-on mounting adapter FM 1/8 Ex



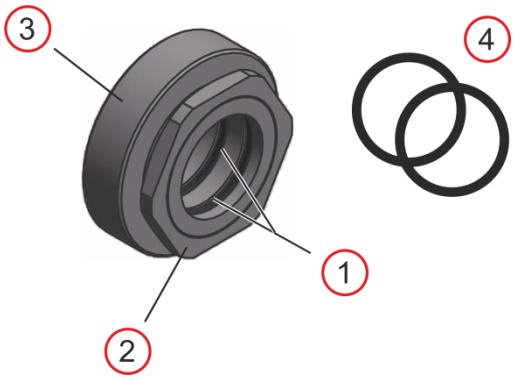
1 *2 grooves for O-rings*

2 *Groove for universal mounting plate*

3 *2 O-rings*

Hole diameter for installation:	40 mm
Material of base body (material number):	chromium nickel steel (1.4301)
Material of O-rings:	NBR 60
Permissible process temperature:	max. 200 °C
Temperature range, storage:	-20 °C to +70 °C
Relative humidity:	0 to 95 %, non-condensing
Diameter of the conveying pipe:	min. 140 mm
Wall thickness at installation site:	min. 3 mm
Ex zone material flow:	20, 21, 22
Ex zone surroundings:	21, 22, Ex-free
Weight:	approx. 0.1 kg
Part number:	5815661EX
Marking location:	on the component

3.10 Weld-on mounting adapter, fixing set



1 *2 grooves for O-rings*

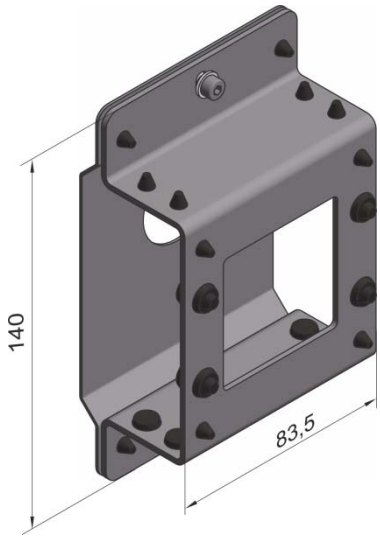
2 *SKT nut (for clamp connection with the fixing set)*

3 *Base body*

4 *2 O-rings*

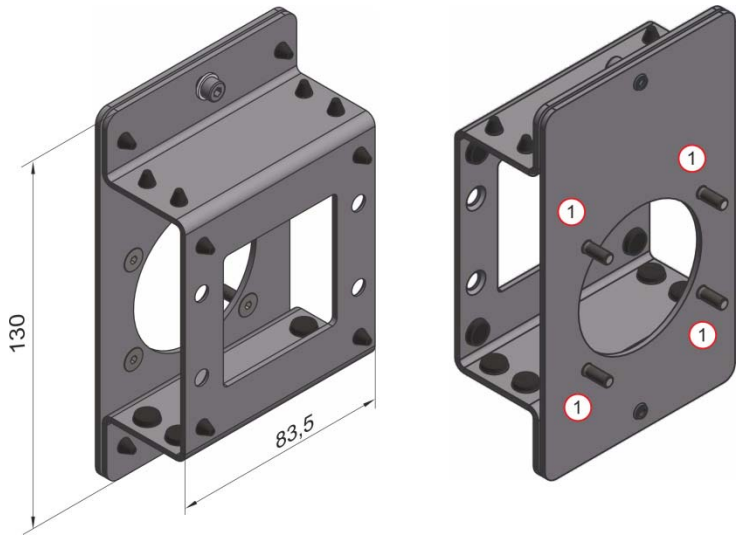
Hole diameter for installation:	40 mm
Material of base body (material number):	chromium nickel steel (1.4301)
Material of SKT nut:	MS58
Material of O-rings:	NBR 60
Permissible process temperature:	max. +200 °C
Temperature range, storage:	-40 °C to +70 °C
Pipe diameter:	min. 140 mm
Wall thickness at installation site:	min. 3 mm
Ex zone material flow:	20, 21, 22
Ex zone surroundings:	21, 22, Ex-free
Weight:	approx. 0.1 kg
Part number:	507343
Marking location:	on the component
Used for:	detector installation with fixing set

3.11 Fixing set



Material (material number):	chromium nickel steel (1.4301)	
Material of buffer elements:	EPDM 62°SH	
Temperature range, ambient:	Ex-free zone Ex zone	-40 °C to +85 °C -20 °C to +60 °C
Temperature range, storage:	-20 °C to +60 °C	
Weight:	320 g	
Ex zone surroundings:	21, 22, Ex-free	
Use:	for detector installation site with vibrations for detector installation site with overpressure	
Part number:	505007	
Used for:	screw-in adapter FM 1/8 Ex weld-on mounting adapter for fixing set	

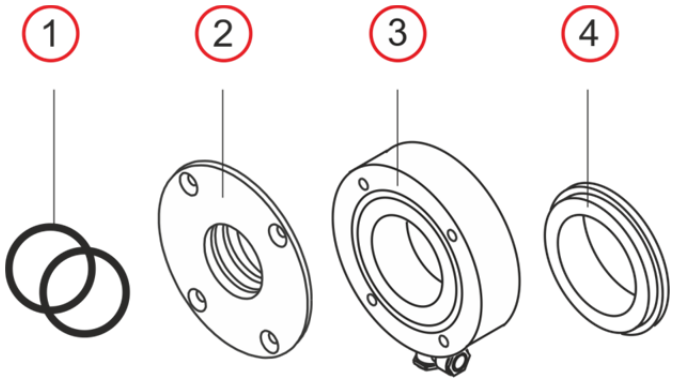
3.12 Fixing set, air purge adapter



1 *4 screws for fastening the fixing set for air purge adapter on an air purge adapter*

Material (material number):	chromium nickel steel (1.4301)
Material of buffer elements:	EPDM 62°SH
Temperature range, ambient:	Ex-free zone -40 °C to +85 °C Ex zone -20 °C to +60 °C
Temperature range, storage:	-20 °C to +60 °C
Weight:	320 g
Ex zone surroundings:	21, 22, Ex-free
Use:	for detector installation site with vibrations for detector installation site with overpressure
Part number:	581499.80
Used for:	air purge adapter with screw-in adapter air purge adapter with weld-on mounting adapter

3.13 Air purge adapter FM 1/8 with weld-on mounting adapter



1 *2 O-rings*

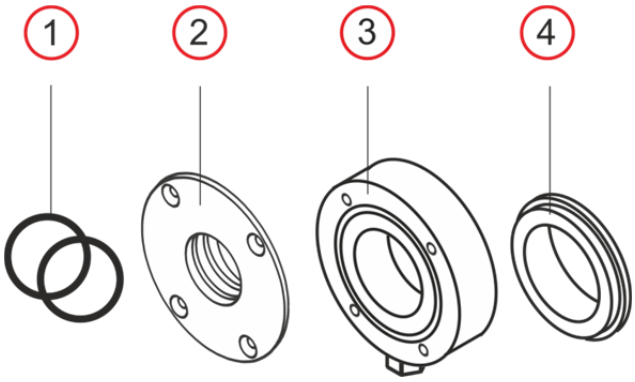
2 *Flange for FM 1/8*

3 *Base body with hose connection and throttle valve*

4 *Weld-on mounting adapter SPA*

Hole diameter for installation:	50 mm
Material (material number):	chrome-nickel steel (1.4305)
Material of O-rings:	FPM 80
Permissible process temperature:	max. +200 °C
Diameter of the conveying pipe:	min. 250 mm
Wall thickness of the conveying pipe:	min. 3 mm
Ex zone, material stream:	Ex-free
Ex zone surroundings:	Ex-free
Compressed air consumption (reference value):	0-35 l/min
Minimum operating pressure:	1.5 bar measured at the compressed air connection of the air purge adapter
Connecting pipe:	compressed air hose da = 6 mm, di = 5 mm
Weight:	0.8 kg
Labelling:	none
Part number:	581499.00

3.14 Air purge adapter FM 1/8 Ex with weld-on mounting adapter



1 *2 O-rings*

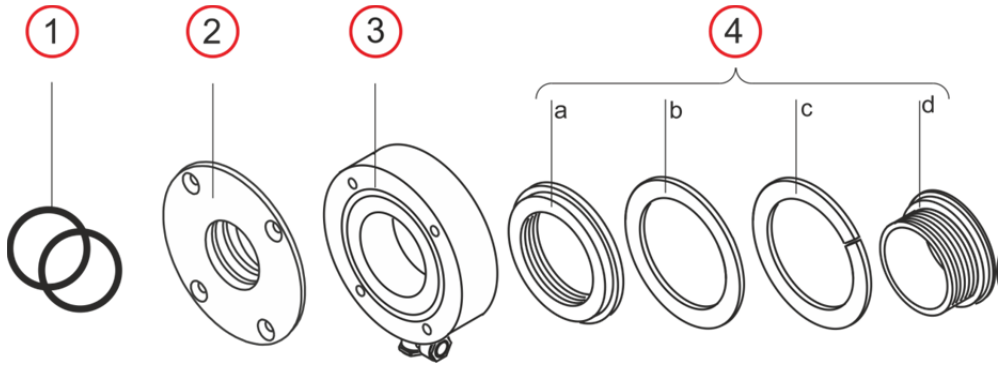
2 *Flange for FM 1/8*

3 *Base body with pipe connection with cutting ring fitting*

4 *Weld-on mounting adapter SPA*

Hole diameter for installation:	50 mm
Material (material number):	chrome-nickel steel (1.4305)
Material of O-rings:	FPM 80
Permissible process temperature:	max. +200 °C
Diameter of the conveying pipe:	min. 250 mm
Wall thickness of the conveying pipe:	min. 3 mm
Ex zone material flow:	20, 21
Ex zone surroundings:	21, 22, Ex-free
Compressed air consumption (reference value):	0 to 35 l/min
Minimum operating pressure:	1.5 bar measured at the compressed air connection of the air purge adapter
Connecting pipe:	copper pipe Ø 8 mm
Weight:	0.8 kg
Labelling:	none
Part number:	581499.001EX

3.15 Air purge adapter FM 1/8 with screw-in adapter



1 *2 O-rings*

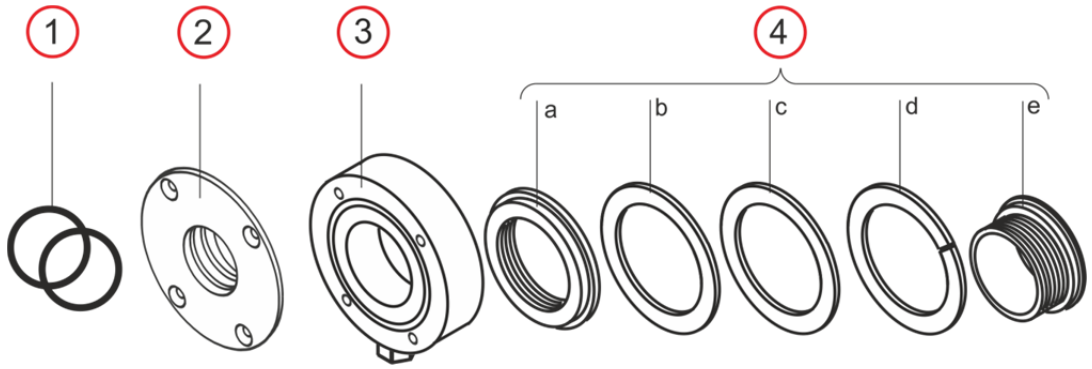
2 *Flange for FM 1/8*

3 *Base body with hose connection and throttle valve*

4 *Screw-in adapter SPA*
- *4a Threaded ring*
- *4b Metal disk*
- *4c Clamping plate*
- *4d Holder*

Hole diameter for installation:	50 mm
Material (material number):	chrome-nickel steel (1.4305)
Material of O-rings:	FPM 80
Permissible process temperature:	max. +200 °C
Diameter of the conveying pipe:	min. 400 mm
Wall thickness of the conveying pipe:	max. 3 mm
Ex zone, material stream:	Ex-free
Ex zone surroundings:	Ex-free
Compressed air consumption (reference value):	0 to 35 l/min
Minimum operating pressure:	1.5 bar measured at the compressed air connection of the air purge adapter
Connecting pipe:	compressed air hose da = 6 mm, di = 5 mm
Weight:	0.8 kg
Labelling:	none
Part number:	581499.40

3.16 Air purge adapter FM 1/8 Ex with screw-in adapter



1 *2 O-rings*

2 *Flange for FM 1/8*

3 *Base body with pipe connection with cutting ring fitting*

4 *Screw-in adapter SPA*
- *4a Threaded ring*
- *4b Metal disk*
- *4c Silicon foam gasket*
- *4d Clamping plate*
- *4e Holder*

Hole diameter for installation:	50 mm
Material (material number):	chrome-nickel steel (1.4305)
Material of O-rings:	FPM 80
Permissible process temperature:	max. +200 °C
Diameter of the conveying pipe:	min. 400 mm
Wall thickness of the conveying pipe:	max. 3 mm
Ex zone material flow:	20, 21
Ex zone surroundings:	21, 22, Ex-free
Compressed air consumption (reference value):	0 to 35 l/min
Minimum operating pressure:	1.5 bar measured at the compressed air connection of the air purge adapter
Connecting cable:	copper cable 8 mm
Weight:	0.8 kg
Labelling:	none
Part number:	581499.41EX

4 Installation

4.1 Warning notices for installation

DANGER

Danger of explosion

Fatal or serious injury possible.

- If Ex components are operated in Ex-free zones with extended temperature ranges, a subsequent deployment in Ex zones is no longer allowed.
- Drilling and welding work is only permitted after the explosive atmosphere has been neutralised.
- Cable glands not required must be closed off. The plugs must be approved for explosive zones.

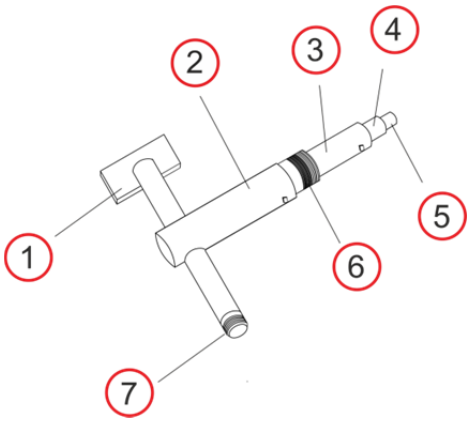
CAUTION

Working at heights

Risk of cutting injuries, burns and falls

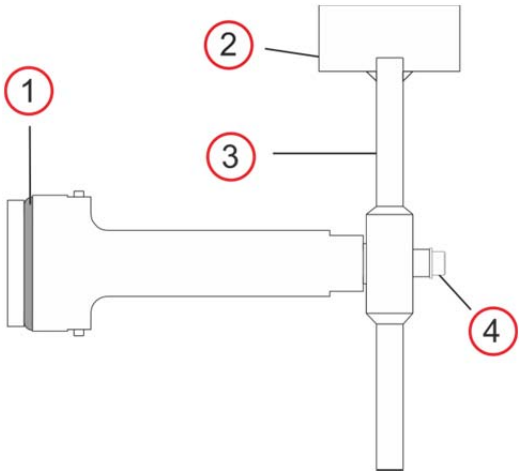
- Protective clothing appropriate to the work being carried out is required.
- Safely erect ladders and/or platforms.
- Secure cable of hand-guided machines.

4.2 Mounting tools



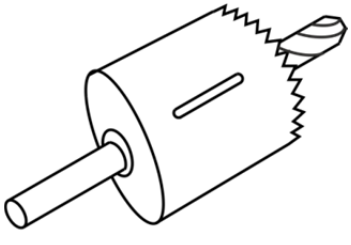
Special wrench (TN 501564)

1. *Lock with installation of screw-in adapter*
2. *Installation of screw-in or weld-on mounting adapter DLD 1/8*
3. *Installation of screw-in or weld-on mounting adapter FM 1/8*
4. *Optic cable installation*
5. *Installation of screw-in or weld-on mounting adapter FM 1/8*
6. *Installation of adapter for 3/4" extinguishing nozzles*
7. *Installation of adapter for extinguishing nozzles M24x1.5*



Special wrench for air purge adapter (TN 581499.90)

1. *Lock with installation of screw-in adapter*
2. *Rotary handle*
3. *Threaded rod*
4. *O-ring*



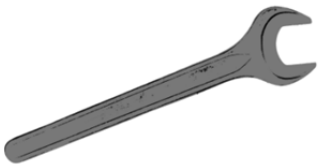
Carbide saw

Ø 32 mm	for screw-in adapter
Ø 40 mm	for weld-on mounting adapter
Ø 50 mm	for air purge adapter, screw-in or weld-on.

Continuation of installation tools

Allen key

AF 2 mm



Wrench AF 40 mm

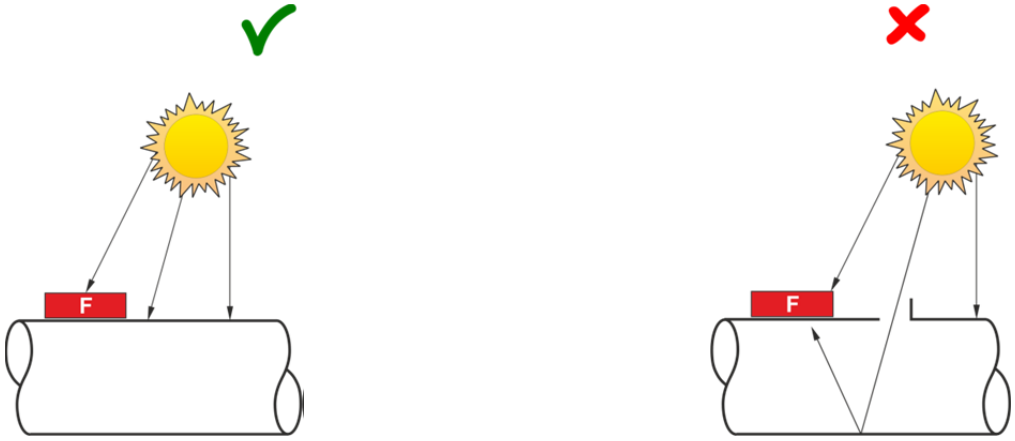
Wrench AF 50 (only with use of air purge adapter with screw-in adapter)

Installation tool for angle socket of spark detector
(Part no. 500531)

4.3 Positioning

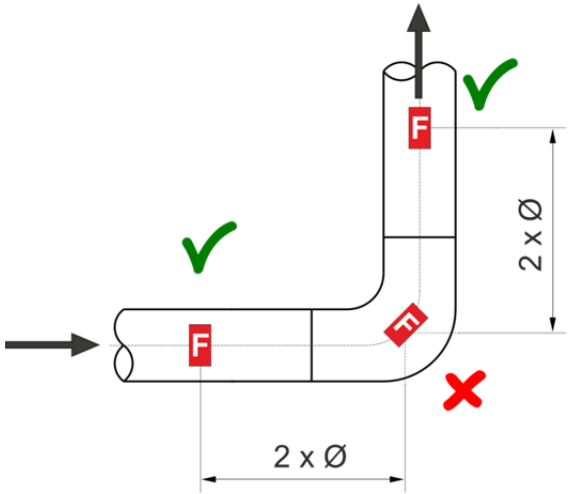
NOTICE

These instructions only apply to use in pneumatic delivery pipes.



Avoid false alarms from the incidence of light

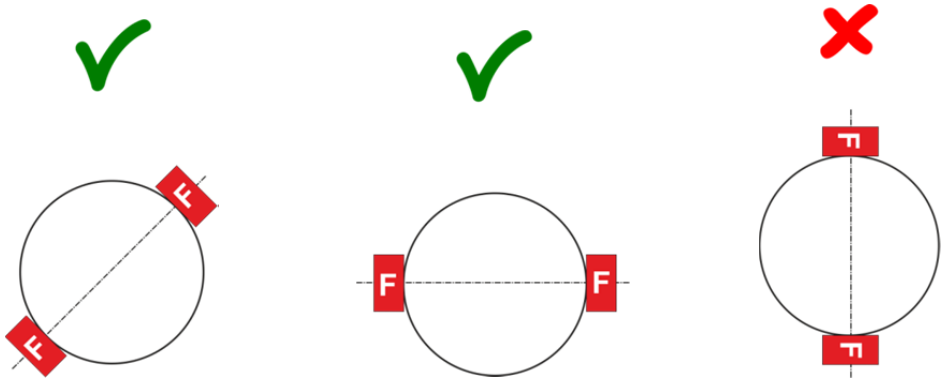
Incident light, e.g. via defective or open pipes, inspection flaps or windows, can cause false alarms.



Avoid wear of the lens

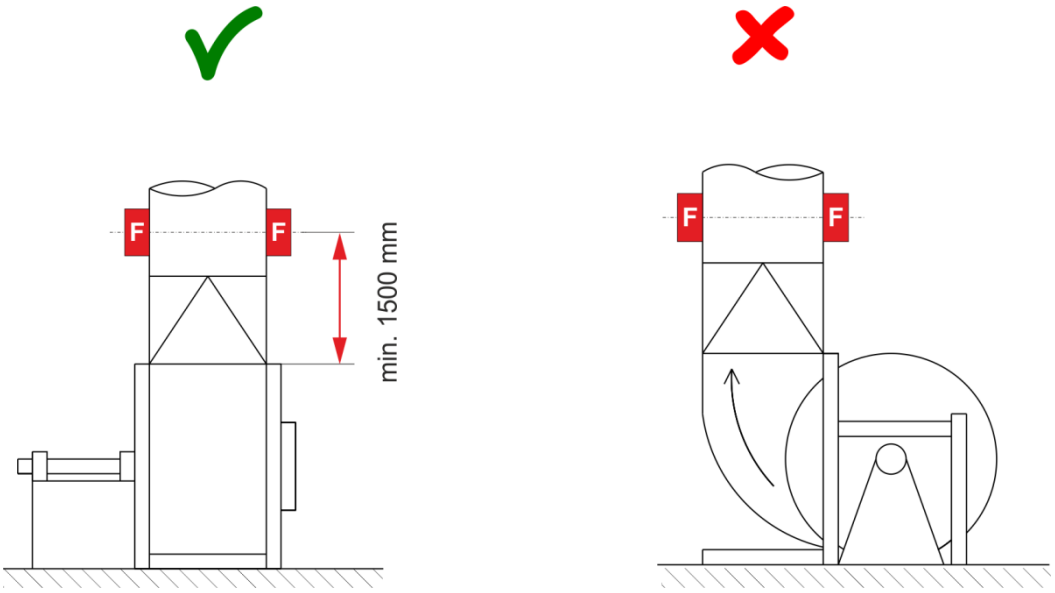
Install detectors in front of or behind pipe bends at a minimum distance of "2 x Ø".

Continuation of "Information on positioning"



Avoid dirtying of the detector lens

Do not install detectors at the lowest point of a horizontal conveyor pipe.



Fitting behind a fan

Do not install the detector directly in the discharge direction of the fan.

Install the detector at a minimum distance of 1500 mm after the fan outlet.

4.4 Combinations of components

4.4.1 FM 1/8

Use in dust explosive atmosphere:	impossible
Required components:	spark detector FM 1/8, terminal box KELEX 1/8 optional terminal box KELEX 1/8 Ex II 3D
Optional components:	air purge adapter FM 1/8 fixing set
Fastening materials that can be used:	screw-in adapter FM 1/8 Ex weld-on mounting adapter FM 1/8 Ex air purge adapter SPA FM 1/8 universal mounting plate

4.4.2 FM 1/8 Ex

Use in dust-explosive atmosphere:	in accordance with Ex-approval, see type plate
Required components:	spark detector FM 1/8 Ex, terminal box KELEX 1/8 Ex II 3D, terminal box KELEX 1/8 Ex II 2D
Optional components:	air purge adapter FM 1/8 Ex fixing set
Fastening materials that can be used:	weld-on mounting adapter FM 1/8 Ex screw-in adapter FM 1/8 Ex air purge adapter SPA FM 1/8 universal mounting plate

4.5 Overview of steps

1. Choose the installation site of the spark detector.

2. Choose the type of detector holder.

- Weld-on mounting adapter
- Screw-in adapter
- Air purge adapter

3. Select the installation site of the assembly plate.

- With the mounting plate on the conveyor pipe
- With the mounting plate on a wall
- With the fixing set at the delivery pipe

4. Prepare mounting plate.

5. Prepare fixing set.

6. Install the weld-on mounting adapter or the screw-in adapter or the retaining system for the air purge adapter.

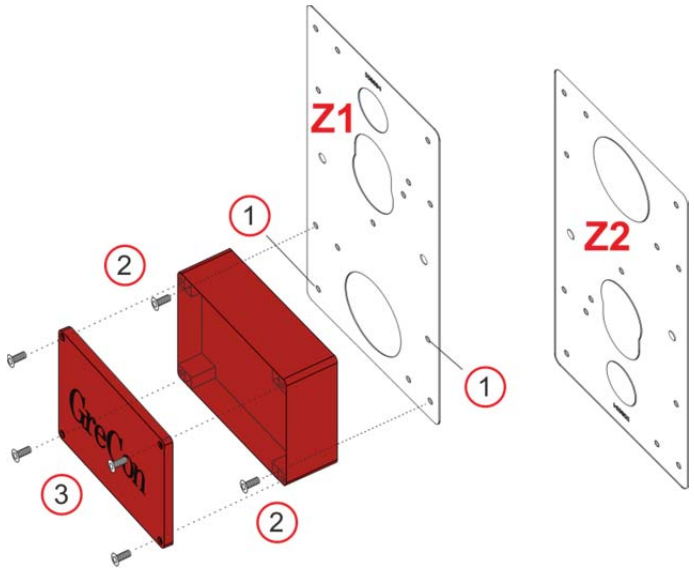
7. Install the prepared mounting plates.

8. Install the detector.

9. Install the purging air supply.

10. Connect the electrical elements of the detector.

4.6 Prepare mounting plate



1	*Diagonal screw-on position for KELEX 1/8*
2	*Fastening screws*
3	*Cover screws*
Z1	*Plate alignment for installation for later use with a screw-in adapter, weld-on mounting adapter and for wall mounting.*
Z2	*Plate alignment for installation for later use with an air purge adapter.*

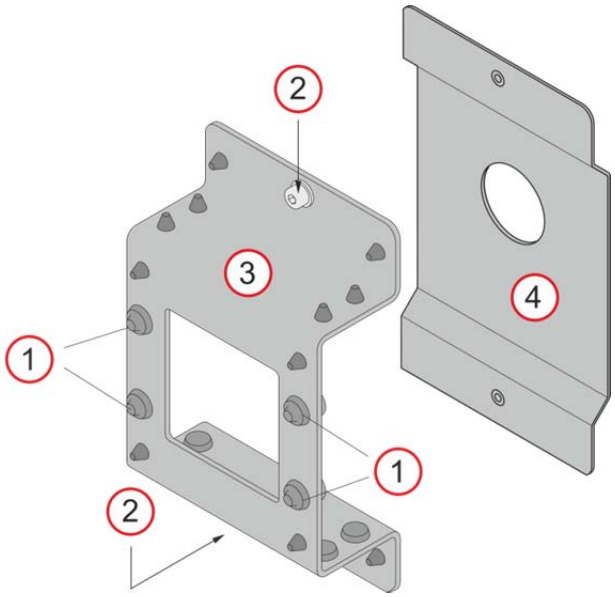
1. Loosen the 4 cover screws of the terminal box.

2. Remove the cover of the terminal box.

3. Secure the terminal box to the mounting plate using the two fastening screws.

4. Secure the cover to the terminal box using the cover screws.

4.7 Prepare fixing set



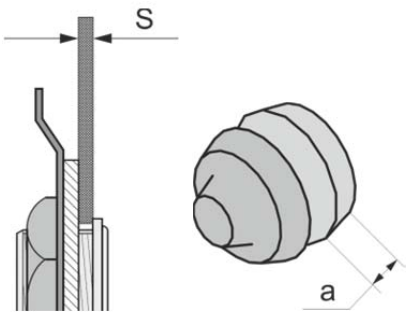
(1) *Rubber buffer*

(2) *Fastening screws of individual parts of fixing set*

(3) *Upper part of fixing set*

(4) *Lower part of fixing set*

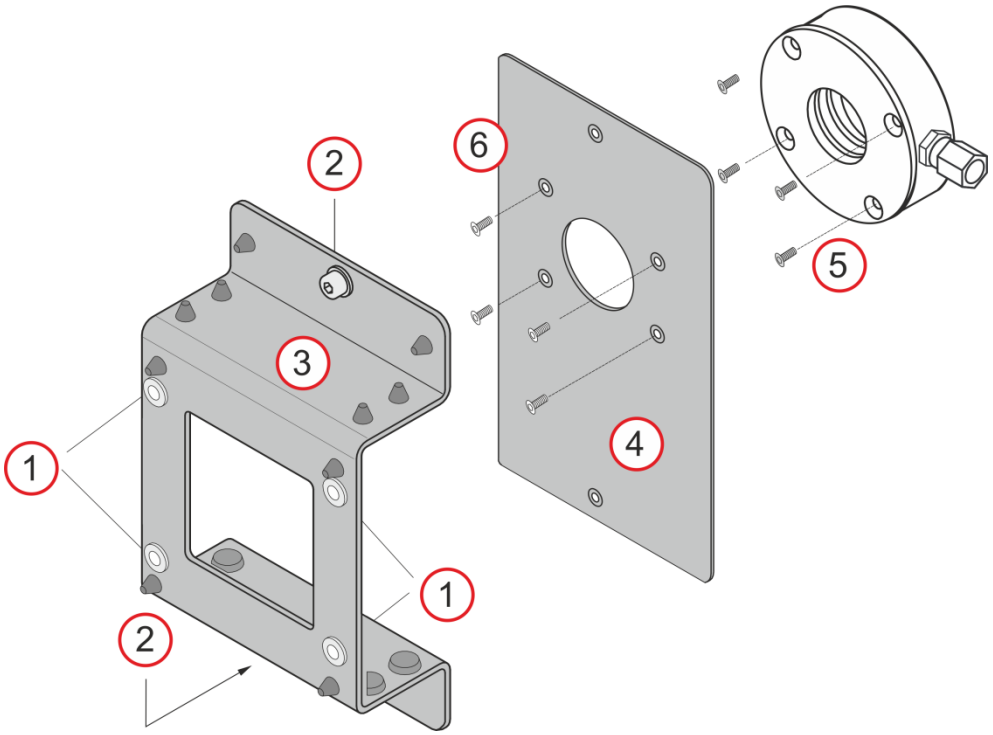
1. Separate the upper part and lower part of the fixing set. For this, loosen the fastening screws **(2)** using an Allen key AF 3 mm.
2. Based on the wall thickness S at the installation site, insert the appropriate rubber buffers **(1)** in the upper part of the fixing set.

	S ≤ 1 mm	without rubber buffer **(1)**
	1 mm < S ≤ 2 mm	Rubber buffer **(1)** with a = 3 mm
	2 mm < S ≤ 3 mm	Rubber buffer **(1)** with a = 4.2 mm

Note

- The fixing set can remain separated.
- The individual parts must be stored carefully until the final assembly.

4.8 Prepare air purge adapter



1	*Screws for fastening the detector at the fixing set for air purge adapter*	4	*Lower part of fixing set*
2	*Fastening screws of individual parts of fixing set*	5	*Fastening screws for the flange of the air purge adapter*
3	*Upper part of fixing set*	6	*Fastening screws for the lower part of the fixing set*

1. Separate the upper part **(3)** and the lower part **(4)** of the fixing set. For this, loosen the fastening screws **(2)** using an Allen key AF 3.

2. Loosen the fastening screws **(5)** for the flange of the air purge adapter with an Allen key AF 2.5 and remove.

3. Using the fastening screws **(6)** (scope of delivery of fixing set), secure the lower part of the fixing set for the air purge adapter together with the flange of the air purge adapter on the base body of the air purge adapter.

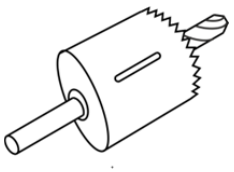
Note

- The fixing set can remain separated.
- The individual parts must be stored carefully until the final assembly.

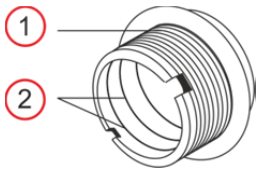
4.9 Installation of the screw-in adapter

4.9.1 Either with or without mounting plate

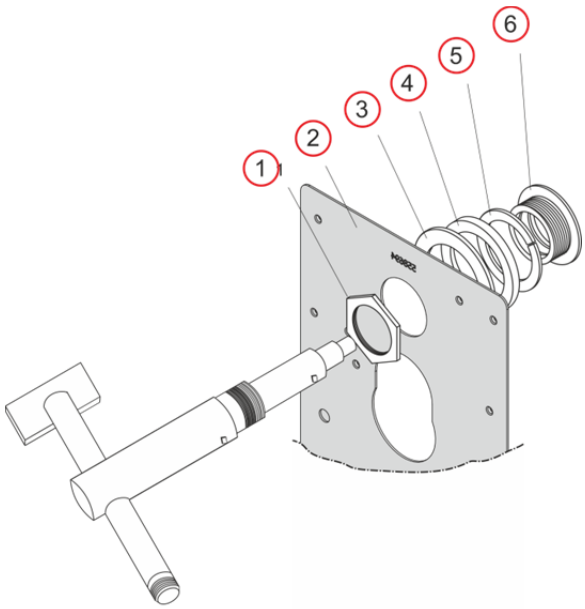
1. Create the mounting hole using the carbide saw (Ø 32).
   Remove the carbide saw carefully so that the arising circular cut-out does not fall into the inner space.



2. For a secure hold of the base body **(1)** on the special wrench, insert at least one of the O-rings into the grooves **(2)** of the base body.



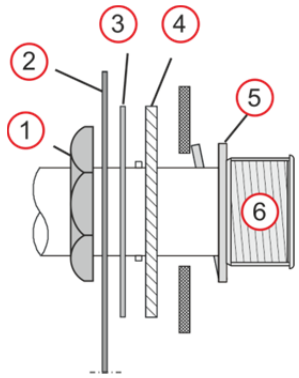
3. Slide the individual parts of the screw-in adapter onto the special wrench in the sequence shown.



1. *Nut*
2. *Mounting plate (only if required)*
3. *Washer*
   *If the thread length of the base body is too small with the installation type with mounting plate, the washer **(3)** can be omitted. If the available thread length is sufficient for the secure fastening of the detector holder, then this installation type is also allowed for the zone subject to explosion hazard.*
4. *Silicone foam gasket*
   The silicone foam gasket cannot be used in non-explosive zones.
5. *Locking ring, with slot*
6. *Base body with 2 O-rings*

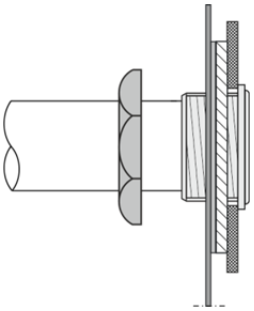
4. Guide the base body and the slotted locking ring through the mounting hole.

Explanation of item numbers, see Step 3

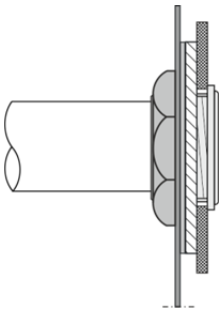


5. Pull back the special wrench until the thread of the base body projects out of the hole and the slotted locking ring is in contact with the inner wall.

6. Push the silicon foam gasket and the washer onto the outer wall.

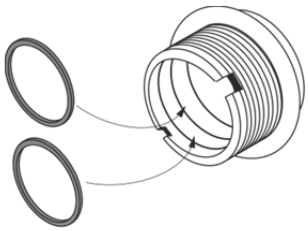


7. Screw on the washer and the nut and tighten them with a wrench.
After the final tightening of the nuts, at least one complete thread of the base body must project out of the nut. Only then is a secure fastening of the detector adapter achieved.



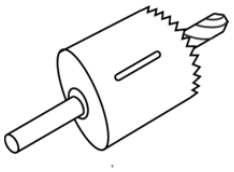
8. Remove the special wrench from the screw-in adapter.

9. Insert the O-rings into the grooves of the base body.

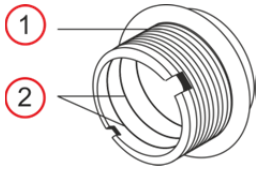


4.9.2 With fixing set

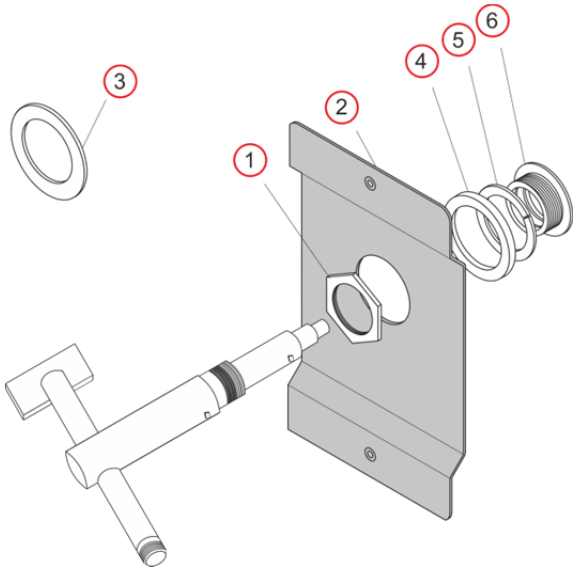
1. Create the mounting hole using the carbide saw (Ø 32).
Remove the carbide saw carefully so that the arising circular cut-out does not fall into the inner space.



2. For a secure hold of the base body **(1)** on the special wrench, insert at least one of the O-rings into the grooves **(2)** of the base body.



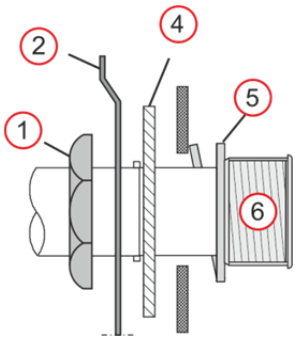
3. Slide the individual parts of the screw-in adapter onto the special wrench in the sequence shown.



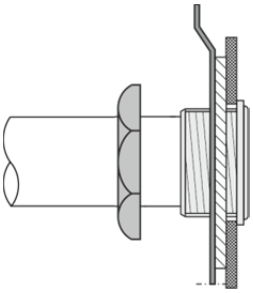
1. *Nut*
2. *Lower part of fixing set*
3. *Washer*
   This washer is not required for the installation of the screw-in adapter with the fixing set.
4. *Silicone foam gasket*
   The silicone foam gasket cannot be used in non-explosive zones.
5. *Locking ring, with slot*
6. *Base body with 2 O-rings*

4. Guide the base body and the slotted locking ring through the mounting hole.

Explanation of item numbers, see Step 3

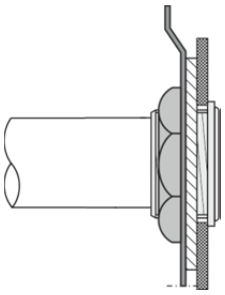


5. Pull back the special wrench until the thread of the base body projects out of the hole and the slotted locking ring is in contact with the inner wall.



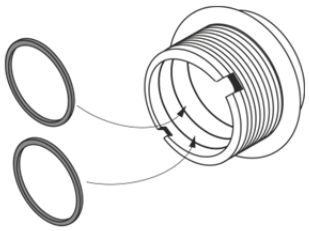
6. Push the silicon foam gasket and the washer onto the outer wall.

7. Screw on the washer and the nut and tighten them with a wrench.
After the final tightening of the nuts, at least one complete thread of the base body must project out of the nut. Only then is a secure fastening of the detector adapter achieved.



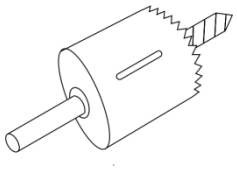
8. Remove the special wrench from the screw-in adapter.

9. Insert the O-rings into the grooves of the base body.

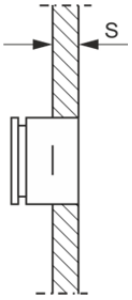


4.10 Installing the weld-on mounting adapter

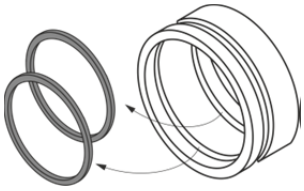
1. Create the mounting hole using the carbide saw (Ø 40).
   Remove the carbide saw carefully so that the arising circular cut-out does not fall into the inner space.



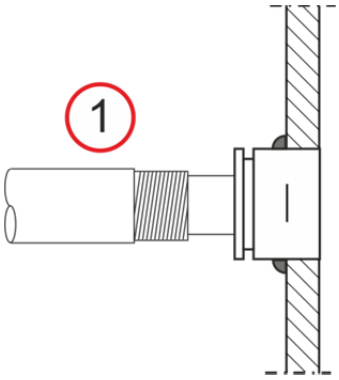
2. Mark the wall thickness S of the installation site at the weld-on mounting adapter. The wall thickness corresponds to the weld depth. This ensures that the weld-on mounting adapter is flush with the inner wall.



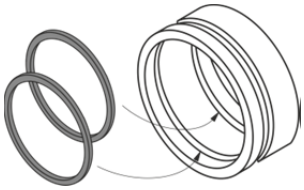
3. Remove the O-rings from the grooves of the weld-on mounting adapter.



4. Place the weld-on mounting adapter on the special wrench **(1)**. The weld-on mounting adapter must be installed so that the guiding groove for the mounting plate is pointed outwards.
5. Insert the weld-on mounting adapter into the hole in such a way that its marking is flush with the outer side of the wall.
6. Fix the weld-on mounting adapter with two spot welds.
7. Remove the special wrench from the weld-on mounting adapter.
8. Weld on the weld-on mounting adapter with a circumferential weld.

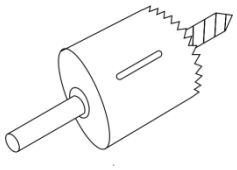


9. Allow the weld-on mounting adapter to cool down to room temperature.
10. Insert the O-rings into the grooves of the weld-on mounting adapter.

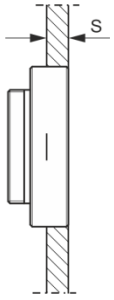


4.11 Installing the weld-on mounting adapter fixing set

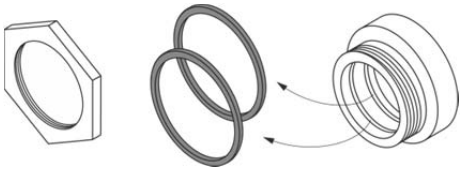
1. Create the mounting hole using the carbide saw (Ø 40).
   Remove the carbide saw carefully so that the arising circular cut-out does not fall into the inner space.



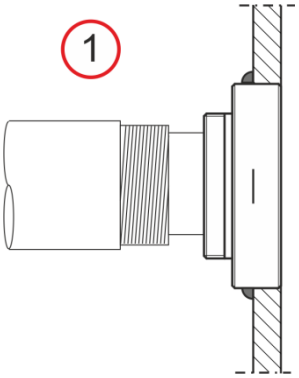
2. Mark the wall thickness S of the installation site at the weld-on mounting adapter. The wall thickness corresponds to the weld depth. This ensures that the weld-on mounting adapter is flush with the inner wall.



3. Unscrew the SKT nuts and remove the O-rings from the grooves of the weld-on mounting adapter.



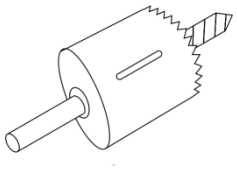
4. Place the weld-on mounting adapter on the special wrench (1). The weld-on mounting adapter must be installed so that the thread for the SKT nut is pointed outwards.
5. Insert the weld-on mounting adapter into the hole in such a way that its marking is flush with the outer side of the wall.
6. Fix the weld-on mounting adapter with two spot welds.
7. Remove the special wrench from the weld-on mounting adapter.
8. Weld on the weld-on mounting adapter with a circumferential weld.



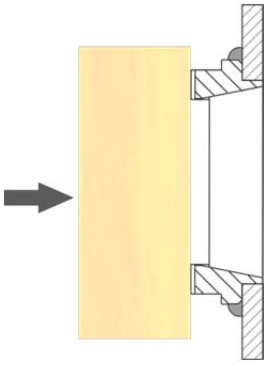
9. Allow the weld-on mounting adapter to cool down to room temperature.
10. Screw on the SKT nuts and insert the O-rings into the grooves of the weld-on mounting adapter.

4.12 Installation of the weld-on mounting adapter SPA FM 1/8

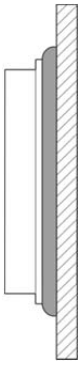
1. Create the mounting hole using the carbide saw (Ø 50).
   Remove the carbide saw carefully so that the arising circular cut-out does not fall into the inner space.



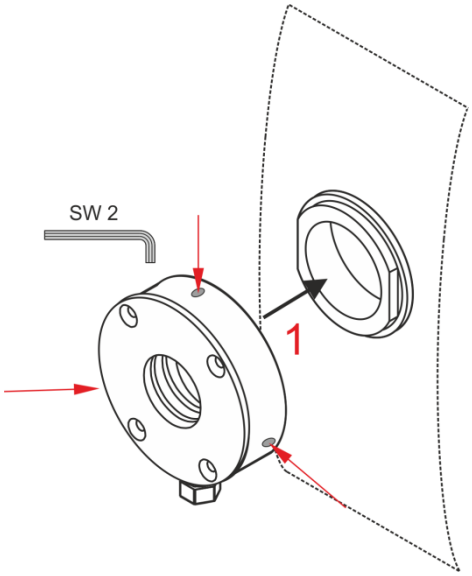
2. Insert the weld-on mounting adapter into the mounting hole as far as the limit stop and press down firmly using a suitable tool.
3. Fix the weld-on mounting adapter with two spot welds.



4. Weld on the weld-on mounting adapter with a circumferential weld.

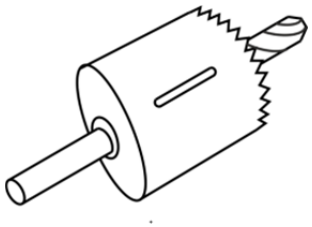


5. Allow the weld-on mounting adapter to cool down to room temperature.
6. Slide the air purge adapter onto the holder **(1)** and secure the 3 threaded pins using an Allen key.

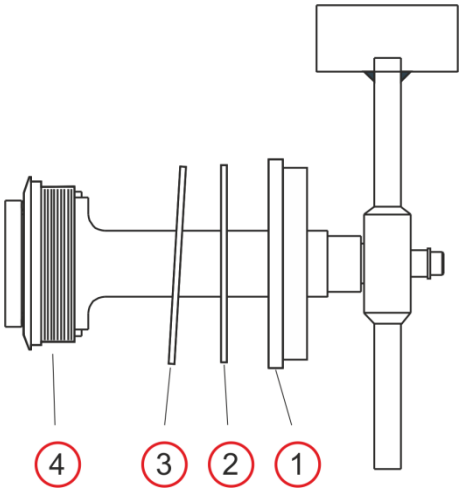


4.13 Installing the screw-in adapter SPA FM 1/8 and SPA FM 1/8 EX

1. Create the mounting hole using the carbide saw (Ø 50).
Remove the carbide saw carefully so that the arising circular cut-out does not fall into the inner space.

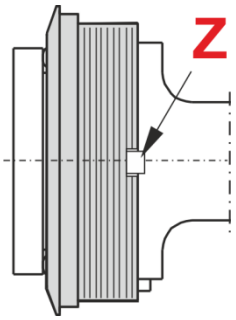


2. Slide the individual parts of the screw-in adapter onto the special wrench in the sequence shown.

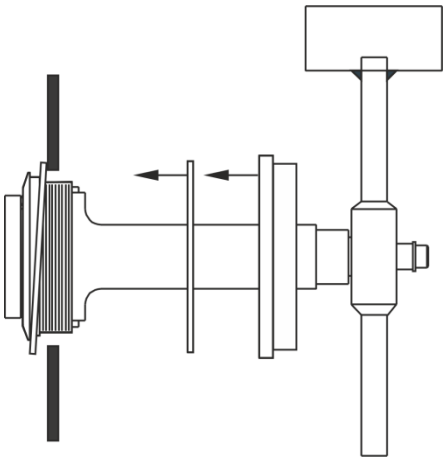


1. *Threaded ring*
2. *Press-in sealing ring (or metal washer and silicone foam gasket in Ex zone)*
3. *Slotted metal ring*
4. *Locking ring, with slot*

3. Secure the base body on the special wrench.
For this, insert the counterholder pins of the special wrench into the grooves of the base body (**Z**). Hold the base body and turn the rotary handle. Turning the rotary handle clockwise crushes the O-ring, causing it to expand sideways and hold the base body firmly in place.

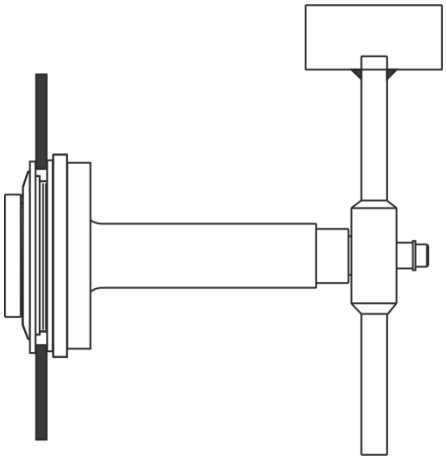


4. Insert the base body and the slotted metal ring into the mounting hole using the special wrench. Pull the components together towards the outer pipe wall until the slotted metal ring is at the pipe inner wall.

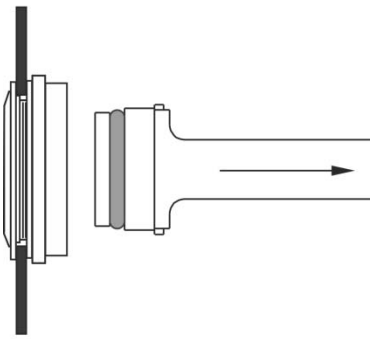


5. Slide the press-in sealing ring or (in the Ex zone, the silicon foam gasket and the washer) onto the base body of the screw-in adapter.

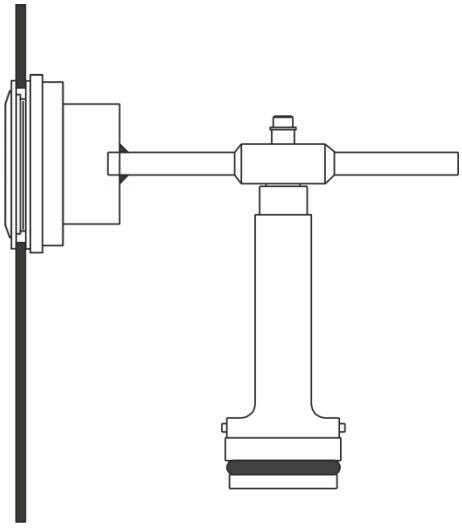
6. Screw the threaded ring onto the base body and tighten using a wrench AF50.



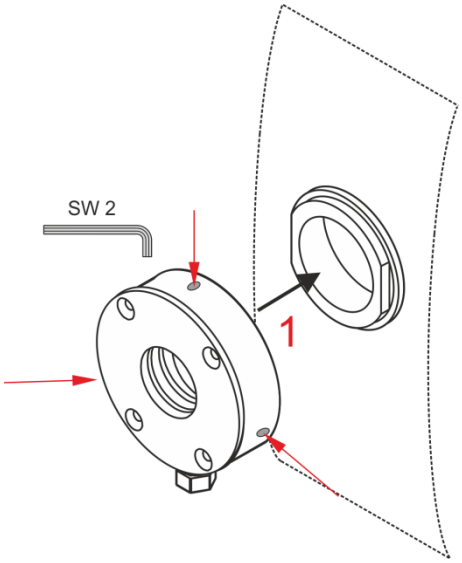
7. Turn the rotary handle of the special wrench counterclockwise. The O-ring contracts and the special wrench can be removed from the screw-in adapter.



8. Insert the wing of the special wrench into the grooves of the screw-in adapter and tighten the threaded ring again with the wrench.



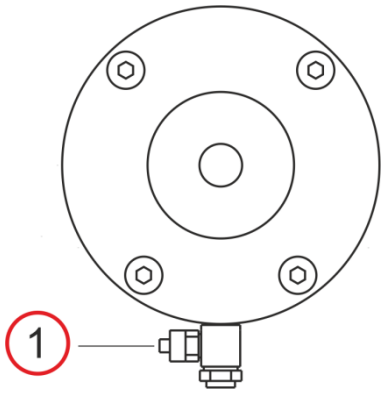
9. Slide the air purge adapter onto the holder **(1)** and secure the 3 threaded pins using an Allen key.



4.14 Installation of the purging air supply

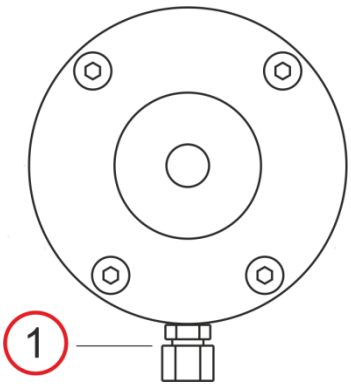
4.14.1 Air purge adapter SPA

- Connect the compressed air hose to the compressed air connection at the throttle valve **(1)** of the base body and tighten the union nut.



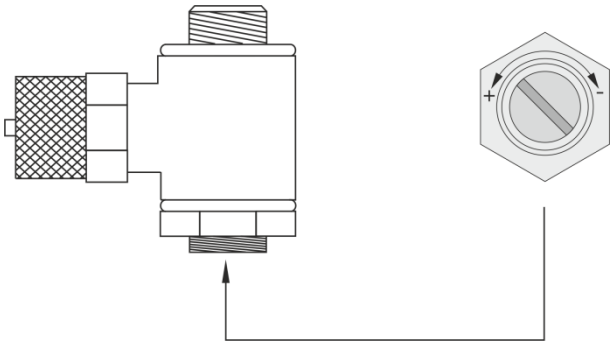
4.14.2 Air purge adapter SPA Ex

- For the compressed air supply connect a 8 mm copper cable to the cutting ring fitting **(1)**.



4.15 Set flow rate of purging air

4.15.1 Throttle valve



1. To start with, set an air flow rate that is as small as possible. There should be a slight air flow tangible before the air purge adapter.

2. Install the spark detector and operate for a while.

3. Observe the degree of fouling on the detector lens.

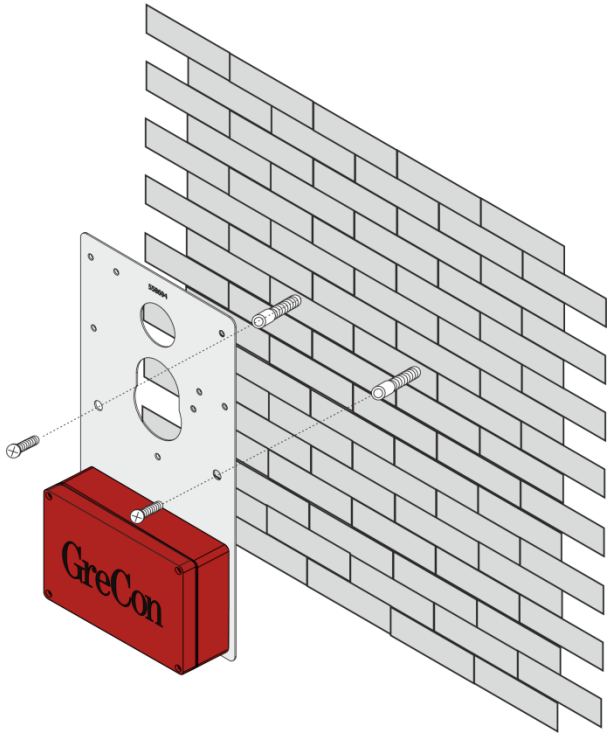
4. If the fouling is significant, open the throttle valve a bit to allow a greater air flow. Repeat the test until the optimal ratio of fouling and compressed air consumption is achieved.

4.15.2 Cutting ring fitting SPA Ex

The cutting ring fitting of the air purge adapter for the EX zone does not have an adjusting screw. Here the purging air is controlled indirectly by the pressure of the incoming compressed air.

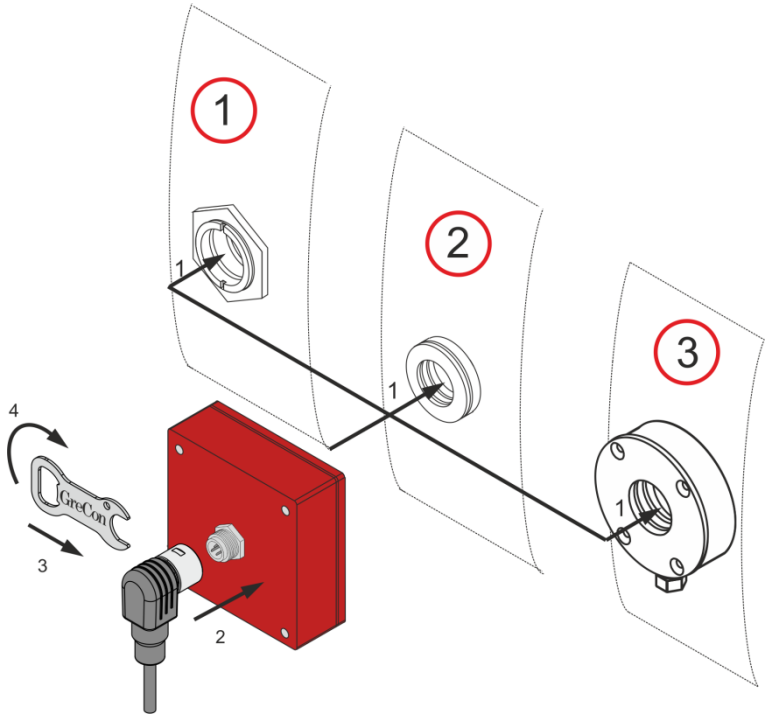
Low air pressure = low purging air flow rate
High air pressure = high purging air flow rate

4.16 Wall mounting of the assembled mounting plate



1. Use the mounting plate as a template for marking the holes.
2. Drill the corresponding number of dowel holes.
3. Provide a suitable dowel pin for every hole.
4. Fasten the component using suitable screws.

4.17 Detector installation



1 *Installation with screw-in adapter*

2 *Installation with weld-on mounting adapter*

3 *Installation with air purge adapter*

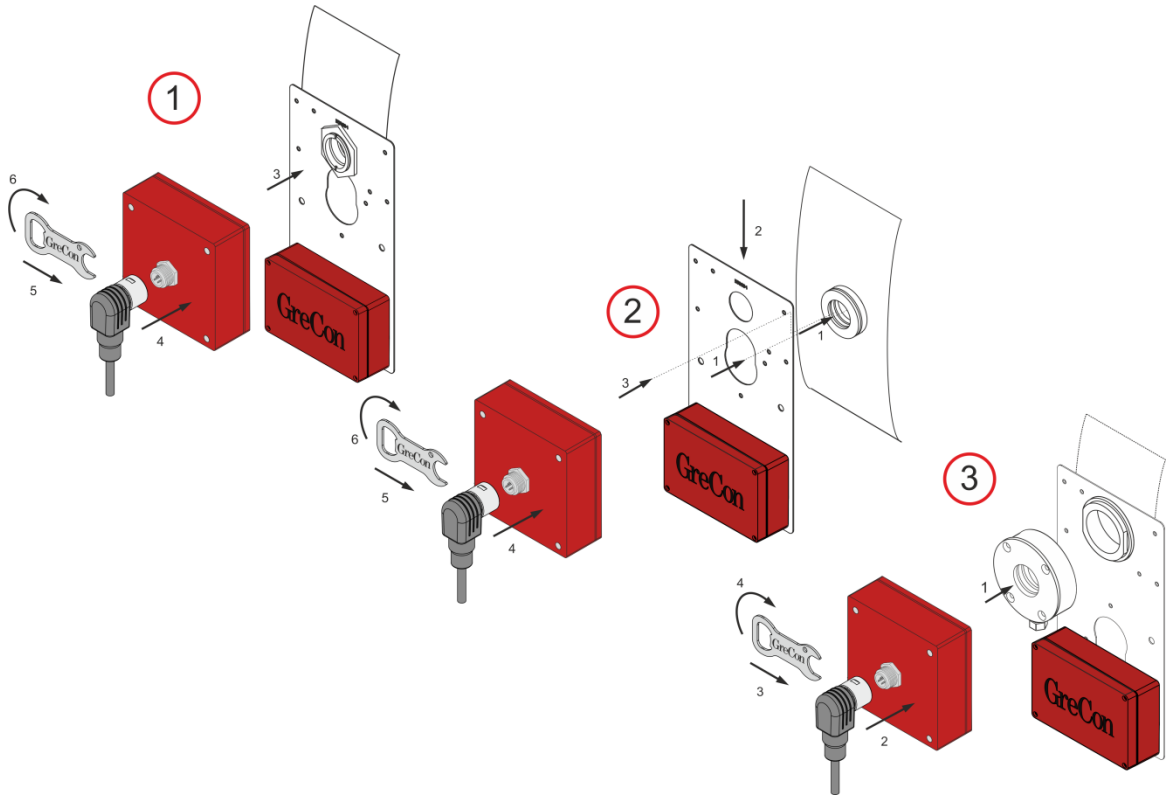
1. Ensure that the O-rings are inserted in both grooves of the detector adapter.

2. Fully insert the detector lens of the spark detector into the detector adapter by pressing and twisting at the same time.

3. Screw the angle socket to the connector of the spark detector by hand as far as the limit stop.

4. Using the installation tool, tighten the angle socket a further 45° to 90°.

4.18 Detector installation with mounting plate



1 *Installation with screw-in adapter*

2 *Installation with weld-on mounting adapter*

3 *Installation with air purge adapter with screw-in adapter or weld-on mounting adapter*

1. Ensure that the O-rings are inserted in both grooves of the detector adapter.

2. Only weld-on mounting adapter:

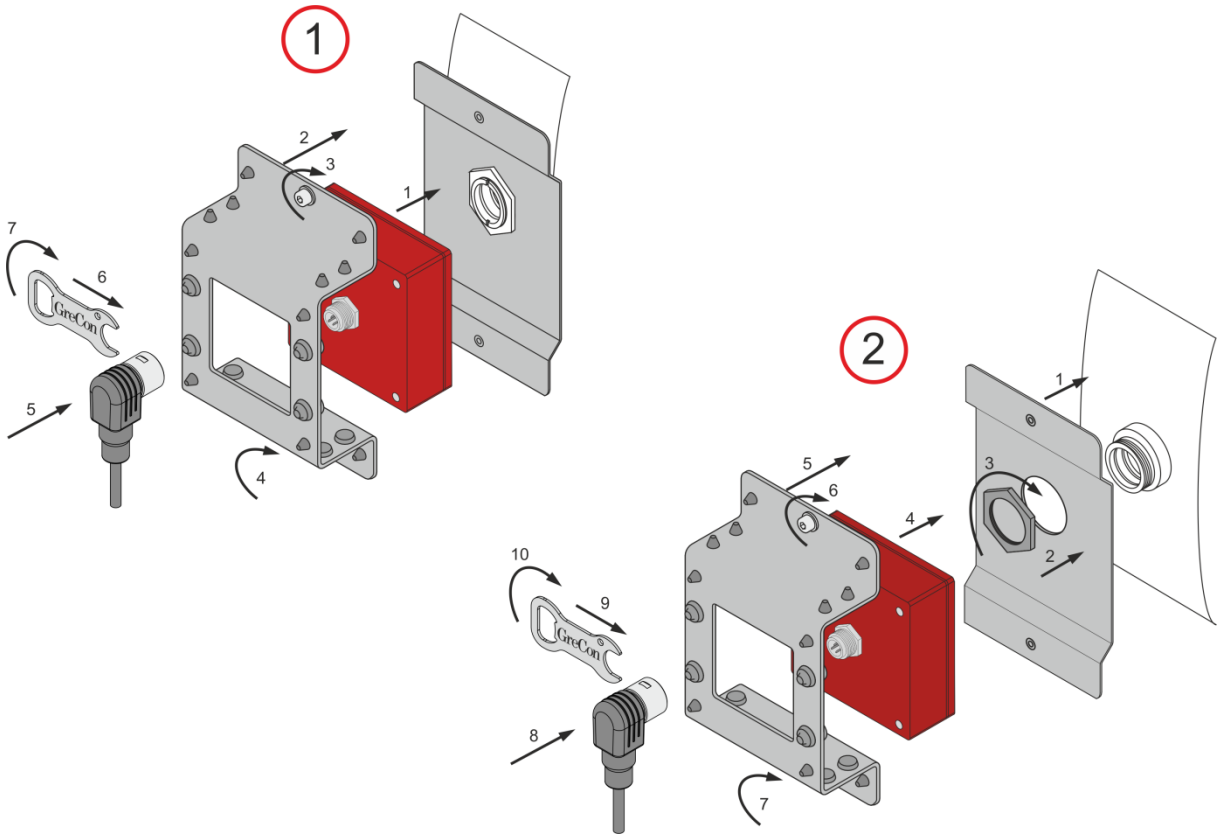
- Slide the mounting plate from the front onto the weld-on mounting adapter so that it protrudes through the larger centre hole of the mounting plate.
- Thread the mounting plate with a downward movement into the groove of the weld-on mounting adapter.

3. Fully insert the detector lens of the spark detector into the detector adapter by pressing and twisting at the same time.

4. Screw the angle socket to the connector of the spark detector by hand as far as the limit stop.

5. Using the installation tool, tighten the angle socket a further 45° to 90°.

4.19 Detector installation with fixing set



(1) *Installation with screw-in adapter*

(2) *Installation with weld-on mounting adapter fixing set*

1. Ensure that the O-rings are inserted in both grooves of the detector adapter.

2. Only weld-on mounting adapter:

- Slide the lower part of the fixing set onto the weld-on mounting adapter.
- Screw on the SKT nut of the weld-on mounting adapter and secure the lower part of the fixing set at the weld-on mounting adapter.

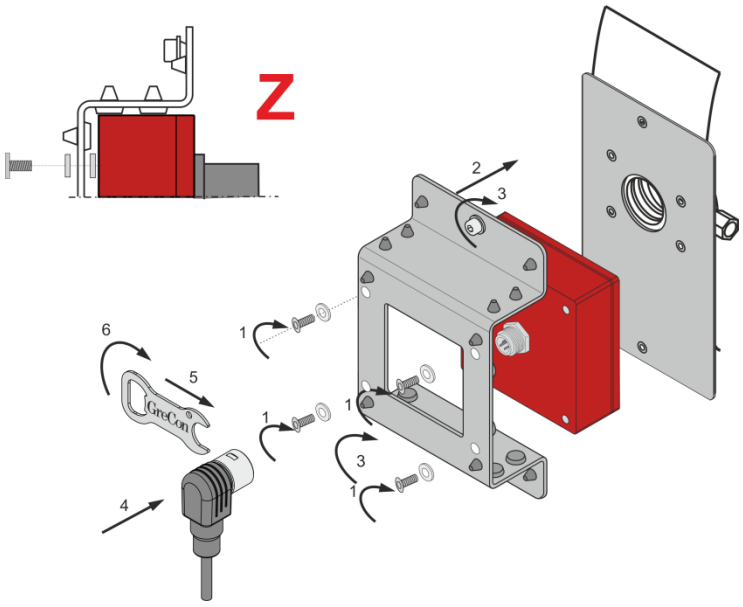
3. Fully insert the detector lens of the spark detector into the detector adapter by pressing and twisting at the same time.

4. Place the upper part of the fixing set on the lower part and secure using the two socket screws.

5. Screw the angle socket to the connector of the spark detector by hand as far as the limit stop.

6. Using the installation tool, tighten the angle socket a further 45° to 90°.

4.20 Detector installation with fixing set and air purge adapter

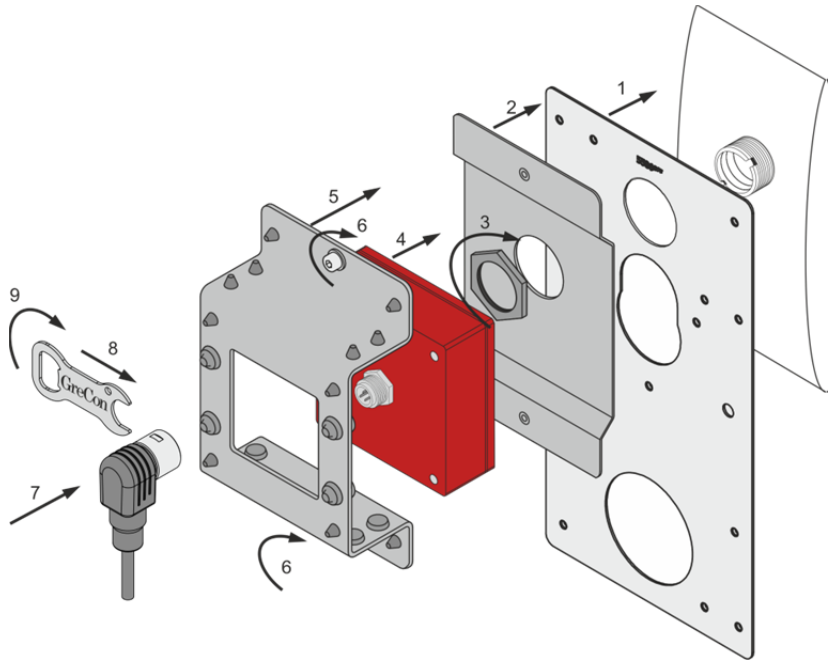


1. Ensure that the O-rings are inserted in both grooves of the detector adapter.
2. Secure the spark detector at the upper part of the fixing set.

   Note item Z:
   The plastic shims between the upper part of the fixing set and the spark detector must be installed.
3. Fully insert the detector lens of the spark detector into the detector adapter by pressing and twisting at the same time.
4. Align the upper part of the fixing set and secure at the lower part of the fixing set using the two socket screws.
5. Screw the angle socket to the connector of the spark detector by hand as far as the limit stop.
6. Using the installation tool, tighten the angle socket a further 45° to 90°.

4.21 Detector installation with mounting plate and fixing set

4.21.1 Screw-in adapter



1. Ensure that the O-rings are inserted in both grooves of the detector adapter.

2. Slide the necessary individual parts onto the special wrench as described in the assembly steps 4.9.1 page 52 and 4.9.2 page 54.

3. Carry out the installation as described in chapter 4.9 Installation of the screw-in adapter.

4. Now secure the screw-in adapter with the fastening nut.

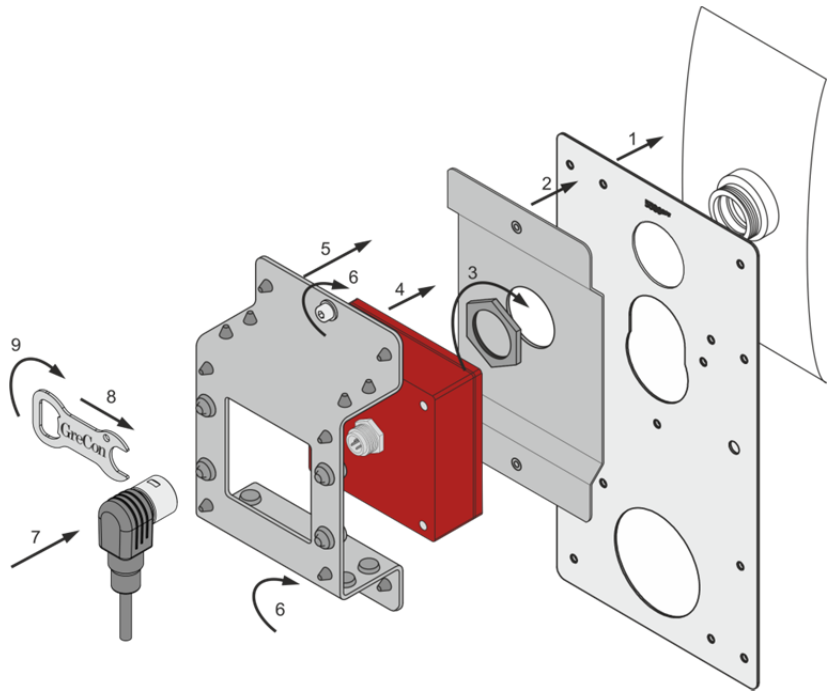
5. Fully insert the detector lens of the spark detector into the detector adapter by pressing and twisting at the same time.

6. Place the upper part of the fixing set on the lower part and secure using the two socket screws.

7. Screw the angle socket to the connector of the spark detector by hand as far as the limit stop.

8. Using the installation tool, tighten the angle socket a further 45° to 90°.

4.21.2 Weld-on mounting adapter, fixing set



1. Ensure that the O-rings are inserted in both grooves of the detector adapter.

2. Slide the mounting plate onto the weld-on mounting adapter.

3. Slide the lower part of the fixing set onto the weld-on mounting adapter.

4. Screw on the SKT nut of the weld-on mounting adapter and secure the lower part of the fixing set and the mounting plate at the weld-on mounting adapter.

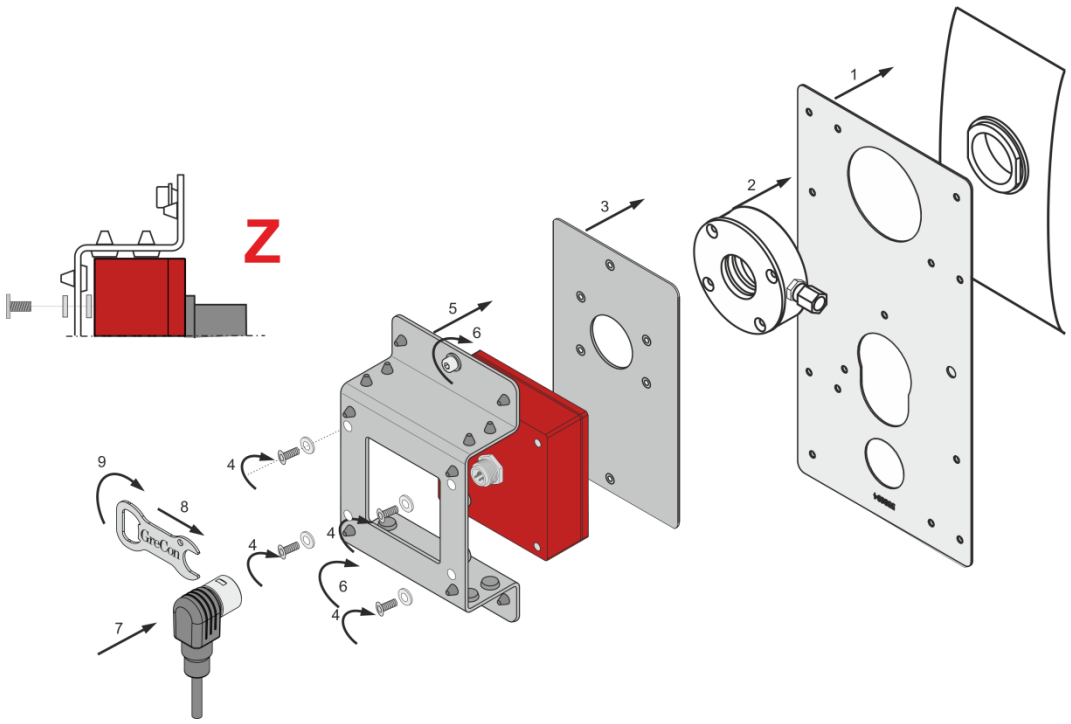
5. Fully insert the detector lens of the spark detector into the detector adapter by pressing and twisting at the same time.

6. Place the upper part of the fixing set on the lower part and secure using the two socket screws.

7. Screw the angle socket to the connector of the spark detector by hand as far as the limit stop.

8. Using the installation tool, tighten the angle socket a further 45° to 90°.

4.21.3 Air purge adapter (weld-on mounting adapter and screw-in adapter)



1. Ensure that the O-rings are inserted in both grooves of the detector adapter.
2. Slide the mounting plate onto the holder of the air purge adapter.
3. Secure the air purge adapter using the three threaded pins.
4. Secure the lower part of the fixing set at the air purge adapter.
5. Secure the spark detector at the upper part of the fixing set.

   Note item Z:
   The plastic shims between the upper part of the fixing set and the spark detector must be installed.
6. Fully insert the detector lens of the spark detector into the detector adapter by pressing and twisting at the same time.
7. Align the upper part of the fixing set and secure at the lower part of the fixing set using the two socket screws.
8. Screw the angle socket to the connector of the spark detector by hand as far as the limit stop.
9. Using the installation tool, tighten the angle socket a further 45° to 90°.

5 Electrical installation

5.1 Warning notices for electrical installation

CAUTION

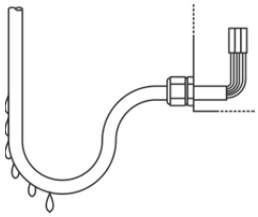
Malfunctions possible

Monitoring function not guaranteed.

- There must be no protective earthing of the detector housing. The potential separation is realised via the control console.

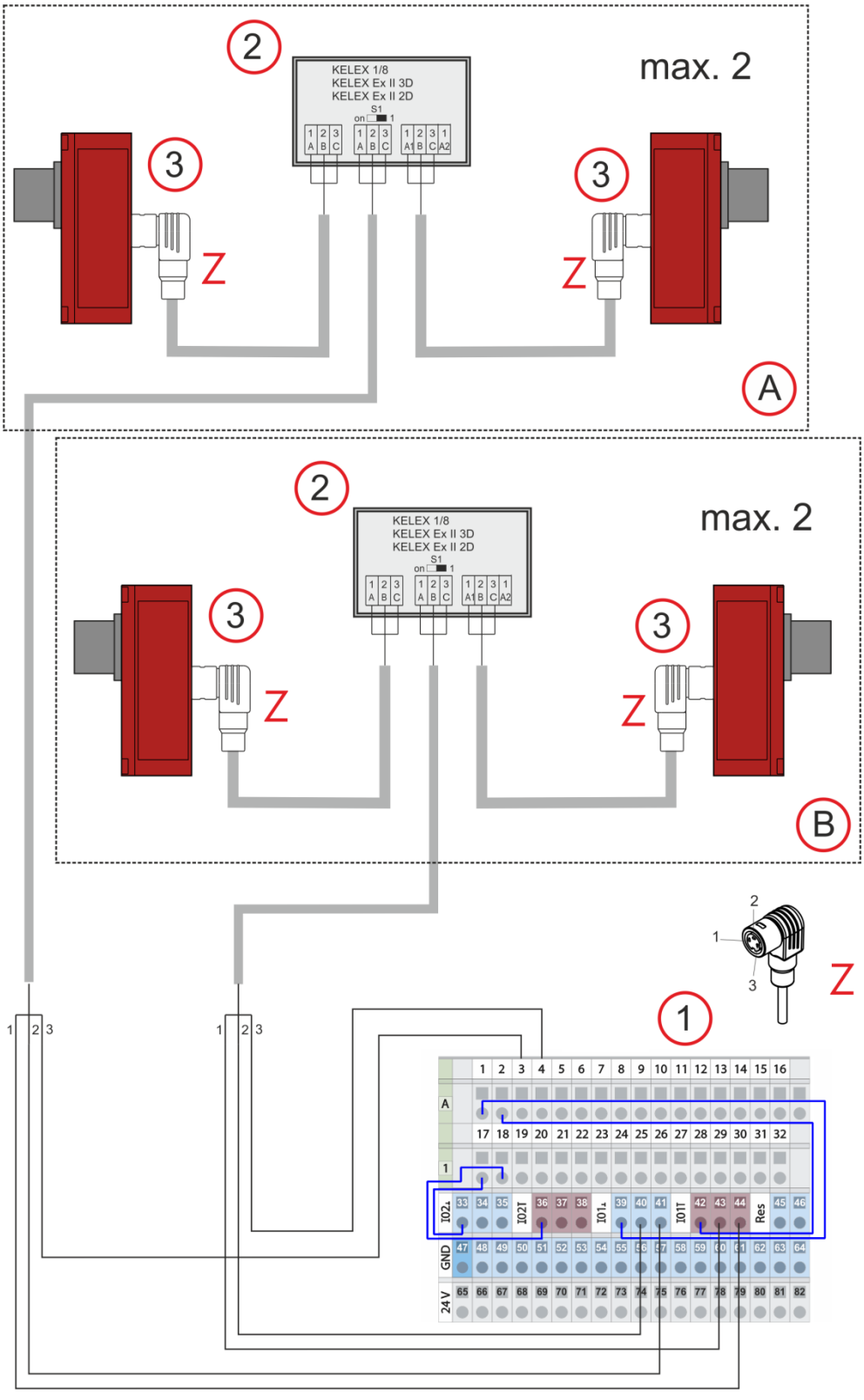
NOTICE

- Avoid tensile forces on the cable ends.
  Long cables must be rolled up and stored at suitable locations.
- Cables cannot be bent.
  A radius of 10 times the outer diameter of the connection cable is recommended as a guide value for bends.
- Moisture damage can be avoided by a cable with a drip loop.



5.2 Connection of spark detector FM 1/8 or FM 1/8 Ex

(example for detector channels 1 and 2 on IO level 1 with line module version 1)



CAUTION

Malfunctions possible

Monitoring function not guaranteed.

- Switch the slide switch S1 in the terminal box to position 1.

(1) *Line module base (within the housing of the control console)*

(2) *Terminal box KELEX 1/8, KELEX Ex II 3D or KELEX Ex II 2D*

(3) *Spark detector FM 1/8 or FM 1/8 Ex*

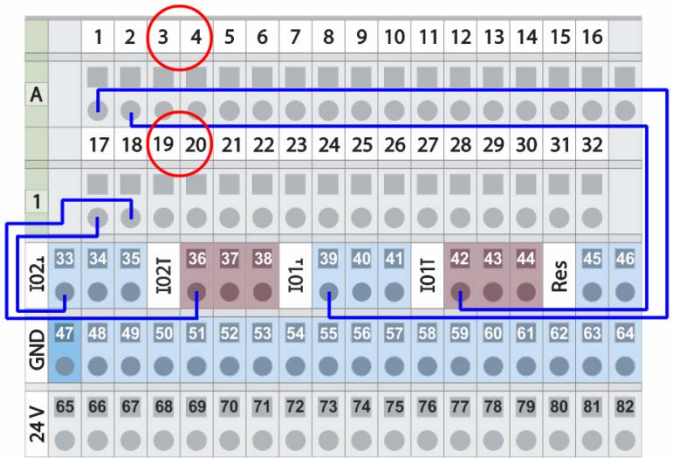
Z

Cable colours and function

1 White (Test)
2 Brown (GND)
3 Green (+20 V)

(A) *Detector channel 1; IO level 1*

(B) *Detector channel 2; IO level 1*



Connection points 3:

Detector channel 1 on IO level 1

Connection points 4:

Detector channel 2 on IO level 1

Connection points 19:
Not available for line module version 2 and combination module.

Detector channel 3 on IO level 2

Connection points 20:
Not available for line module version 2 and combination module.

Detector channel 4 on IO level 2

Bridges installed at the factory for IO level 1 and IO level 2

6 Maintenance

6.1 Warning notices for maintenance

DANGER

Fire hazard, explosion hazard

Fatal or serious injury possible

- The Ex zone must be neutralised during maintenance work.
- Maintenance work may only be carried out when production is at a standstill.
- All maintenance measures and function tests are to be carried out by specially trained personnel only.
- Spark detectors with damaged sealing must be replaced.
- Spark detectors with mechanical damage, e.g. scratched detector lens, must be replaced.
- If electroconductive connections are disconnected during maintenance or devices are opened, the corresponding device must be disconnected from the power supply.

6.2 Maintenance interval, monthly

1. Switch off the detector channel of the spark detector to be serviced (see instruction manual for the control console).

2. Check installation site for subsequent fixtures and fittings and existing suitability.

3. Check ambient temperature for compliance with permissible temperature.

4. Remove the spark detector from the detector adapter.

5. Check the detector adapter for secure seat, damage / wear.

6. Clean the detector adapter.

7. Check the detector lens for secure seat and damage / wear.

8. Clean the detector lens according to the degree of fouling.

9. Check angle socket, connector and supply line for tightness and damage.

10. Insert the spark detector back into the detector adapter.
Ensure that the spark detector sits securely in the detector adapter. If this is not the case, the O-rings must be exchanged.

11. Switch on the detector channel of the spark detector to be serviced (see instruction manual for the control console).

12. Enter maintenance work carried out in the logbook and sign.

6.3 Maintenance interval: every 6 months

1. Switch off the detector channel of the spark detector to be serviced (see instruction manual for the control console).

2. Check installation site for subsequent fixtures and fittings and existing suitability.

3. Check ambient temperature for compliance with permissible temperature.

4. Remove the spark detector from the detector adapter.

5. Check the detector adapter for secure seat, damage / wear.

6. Clean the detector adapter.

7. Check the detector lens for secure seat and damage / wear.

8. Clean the detector lens according to the degree of fouling.

9. Check angle socket, connector and supply line for tightness and damage.

10. Insert the spark detector back into the detector adapter.
Ensure that the spark detector sits securely in the detector adapter. If this is not the case, the O-rings must be exchanged.

11. Turn on the detector channel that is switched off (see instruction manual for control console).

12. Perform manual detector test (see 6.4.2 "Manual detector test" function check) for the detector group due to be serviced.

6.4 Function tests

6.4.1 Function test "Automatic detector test"

The "Automatic detector test" function is automatically started by the control consoles of series CC 7000 and CC 5000. In doing so, an alarm is simulated in the spark detectors and the reaction to it is evaluated. If a fault in the monitoring function of the spark detector is determined in the test, this fault is displayed.

6.4.2 "Manual detector test" function check

The manual detector test can be triggered separately for each detector channel in the control menu of the control console. The manually triggered test routine progresses identically to the automatic detector test and shows the test result in the display.

Note

- The detector's monitoring functions remain active during the "Manual detector test" function check.
- The "Manual detector test" function check can also be performed in an Ex zone.
- The "Manual detector test" function check is automatically interrupted in the event of an alarm.
- Brief descriptions of the operations for the "Manual detector test" function check are listed below. For further details, please consult the instruction manual of the corresponding control console.

Brief description for control consoles with TOUCH display

- At the control console, select "Settings ➔ Shutdown / Function check ➔ Test detector group".
- Select the detector group to be tested.
  - ➔ The test cycle starts.
  - ➔ Depending on the test result, a corresponding symbol appears on the tile of the detector group.

Brief description for control consoles with R/B display

- At the control console, select "System ➔ Function check / Components ➔ Test detector group".
  - Select the "Test detector group" function and press the "Right" cursor key.
- Select the detector group to be tested and press the "Confirm" push-button.
  - ➔ The test cycle starts.
  - ➔ Depending on the test result, a corresponding symbol appears behind the tested detector group.

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