

## 4 Installation and connection

### NOTICE



#### Accessories may limit critical operating parameters of the base unit

Adding accessories may limit critical operating parameters. Ambient temperatures, zone classifications, explosion groups, temperature classes or chemical resistances of accessories may vary from the base unit.

Always include all technical data in the operating instructions and data sheets of all components in the safety assessment.

### 4.1 Installation site requirements

Sample gas probes are intended for flange mounting.

- Installation site and installation position are determined based on requirements specific to the application.
- If necessary, the connection piece should be slightly tilted toward the centre of the channel.
- The installation site should be protected from the weather. Protect the device from dust, falling objects, and external blows.
- In addition, adequate and safe access for installation and future maintenance work should be provided. In particular, note the length required to uninstall the probe tube!

If the probe is transported to the installation site in pieces, it will first need to be assembled.

### 4.2 Installation

#### DANGER



#### Danger to life and explosion during installation and maintenance

The unit must not be worked on (assembly, installation, maintenance) in explosive atmospheres.

#### DANGER



#### Explosion hazard

##### When used in explosive areas

Flammable gasses and dust could ignite or explode.

Never operate the gas probe outside the specifications. Extracting gases or gas mixtures which are also explosive in the absence of air is prohibited.

#### DANGER



#### Explosion hazard due to flame propagation

Severe injuries and damage to the system

If the process holds a risk of flame propagation, install a flame arrestor.

### 4.3 Installing the sampling tube (optional)

The sampling tube, if necessary with the fitting extension, must be screwed in. The probe is then attached to the mating flange using the included seal and nuts.

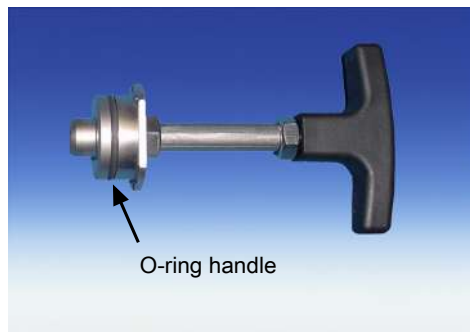
## 4.4 Installing the downstream filter

### NOTICE



The downstream filter and the O-ring for the handle must be inserted prior to first start-up.

**Operating without downstream filter prohibited!**



Attach an O-ring suitable for the expected ambient temperature (see "Spare Parts and Accessories").

Attach the downstream filter to the handle. Then carefully insert the handle with filter in the gas probe and turn 90° to secure.

Verify the handle is seated correctly. When seated correctly it locks onto the filter housing.

## 4.5 Installing the upstream filter (Optional)

The upstream filter, if necessary with matching extension, must be screwed in. The probe is then attached to the mating flange using the included seals and screws.

## 4.6 Insulation

On heated probes completely insulate any exposed flange areas and, if applicable, the connection piece to absolutely prevent thermal bridges. The insulating material must meet the application requirements and be weatherproof.

## 4.7 Connecting the Gas Line

The sample gas line must be carefully and properly connected using a suitable fitting.

This table provides an overview of the sample gas probe connections:

|                                   | Probe<br>GAS 222        | Reservoir<br>PAV01 | Ball valve<br>pneumatic drive | Control valve<br>3/2-way solenoid<br>valve |
|-----------------------------------|-------------------------|--------------------|-------------------------------|--------------------------------------------|
| Connecting flange <sup>1)</sup>   | DN65/PN6/<br>DN3"-150   |                    |                               |                                            |
| Sample gas inlet                  | G3/4                    |                    |                               |                                            |
| Sample gas outlet                 | NPT 1/4                 |                    |                               |                                            |
| Blowback connection               | G3/8                    |                    |                               |                                            |
| Test gas connection <sup>1)</sup> | Tube Ø6 mm<br>Tube Ø1/4 |                    |                               |                                            |
| Filling port                      |                         | NPT 1/4            |                               |                                            |
| Condensate                        |                         | G1/2               |                               |                                            |
| Bypass                            |                         | NPT 1/4            |                               |                                            |
| Control air                       |                         |                    | G1/8                          | G1/4<br>NPT 1/4                            |

Tab. 1: Gas Probe Connections (Varies by Model)

<sup>1)</sup> Varies by version.

Please note the following items when connecting the sample gas line (NPT 1/4") on heated probes to prevent thermal bridges:

- Choose the shortest possible screw connection.
- Shorten the connection pipe for the sample gas line as much as possible. To do so, remove the insulation around the sample gas line. This is done by loosening the fixing bolts.

**CAUTION****Fragile**

The insulation is fragile. Handle with care, do not drop.

After connecting the sample gas line it must be braced and secured with the clamp.

Long sample gas lines may require additional support clamps along the way to the analysis system! Once all lines have been connected and checked for leaks, carefully reinstall and secure the insulation.

**WARNING****Gas emanation****Sample gas can be harmful to the health!**

Check the lines for leaks.

### 4.7.1 Blowback Connection

Without accessories installed for the blowback device, the blowback connection comes with a sealed G3/8 screw-in connection. If you require blowback, you will need to undo this screw-in connection and ensure the blowback line is connected properly and tight.

**DANGER****Toxic, corrosive gasses**

Explosive or toxic gases can develop due to a leaking or open blowback connection.

### 4.7.2 Connecting the calibrating gas line (optional)

Connecting the calibrating gas line requires a Ø6 mm or Ø1/4" pipe fitting.

If the calibrating gas connection was ordered with check valve, a Ø6 mm or Ø1/4" pipe can be connected directly to the check valve.

## 4.8 Connecting the Backwashing System and the Compressed Air Cylinder (Optional)

The air lines must be connected carefully and properly, using suitable fittings.

If the probe is equipped with pressure vessel for efficient blowback (optional), a manual shut-off valve (ball valve) must be installed in the air supply, immediately upstream from the pressure vessel.

On probes used to sample flammable gas, nitrogen (inert gas) must be used for blowback. Blowback of explosive gases is prohibited.

**NOTICE**

The operating pressure of the compressed air (inert gas) required for blowback must always be higher than the process pressure.  
Required pressure differential min. 3 bar (44 psi).

**DANGER****Broken pressure vessel****Gas leak, danger due to flying parts.**

Maximum operating pressure of the pressure vessel 10 bar (145 psi)!

The operating pressure reduces based on the operating voltage (see solenoid valve type plate).

**DANGER****Adiabatic compression during gas blowback (explosion hazard)!**

Adiabatic compression may cause high gas temperatures and must be checked by the user.

Gas blowback may result in high gas temperatures due to adiabatic compression. This can cause flammable gases to ignite spontaneously.

- a) Blowback of explosive atmosphere / gases is prohibited.
- b) Flammable atmosphere / gases (non-explosive) may only be blown back with nitrogen (inert gas).

## 4.9 Electrical Connections

**WARNING****Hazardous electrical voltage**

The device must be installed by trained staff only.

**CAUTION****Wrong mains voltage**

Wrong mains voltage may damage the device.

Regard the correct mains voltage as given on the type plate.

**CAUTION****Equipment damage**

Cables damaged

Do not damage the cable during installation. Install a strain relief for the cable connection. Secure the cable against twisting and loosening. Please note the temperature resistance of the cables (> 100 °C/212 °F).

Only use cables with a temperature resistance of > 100 °C (212 °F) to connect to power. Make sure the connecting cable has sufficient strain relief (match cable diameter to the seal on the cubic plug/cable fitting).

Please note, the heating system briefly has high starting currents (max. 6 A). Use a suitable fuse (8 A). When connecting, also observe the applicable explosion protection regulations (e.g. IEC/EN 60079-14).

### 4.9.1 Version Without Terminal Box

The probe includes two cubic plugs per EN 175301-803. The plug is configured so it cannot be connected reversed. For safety reasons this configuration must not be modified.

One plug is used to power the two heating cartridges (power supply (115/230) VAC, 50/60 Hz, see type plate), the other plug is for the temperature switch (alarm output).

The supply line cross-sections must be suitable for the rated current. Use a maximum line cross-section of 1.5 mm<sup>2</sup> and a cable diameter of 8-10 mm.

Connect the power supply and the intrinsically-safe temperature switch per the connection diagram.

Connect optional probe accessories directly to the respective power supply.

### 4.9.2 Version With Terminal Box

This probe version includes a terminal box. All electrical connections are factory connected to the terminals in the terminal box.

Connect the respective power supply for the two heating cartridges, the intrinsically-safe temperature switch and the optional accessories to the terminals per the connection diagram.

The probe may only be operated using the Ex e cable fittings and the terminal box closed. The cable glands have a clamping range of Ø6-10 mm. Never change the terminal assignment.

### 4.9.3 Connecting the Temperature Switch

According to IEC/EN 60079-11 the temperature switch in this probe is a simple electrical equipment and to be considered a purely ohmic circuit. It may only be operated with a type-tested controller with an intrinsically-safe circuit.

Temperature switch connection data:

$U_i = 30 \text{ V}$ ;  $I_i = 100 \text{ mA}$ ;  $C_i = 0$ ;  $L_i = 0$

Never exceed the connection data!

### 4.9.4 Connecting the Earth Conductor/Grounding

Always connect all of the designated connections on your unit to your protective bonding system. Connect the grounding to the additional equipotential bonding system terminal on the housing.

### 4.9.5 Solenoid Valves (Optional)

#### DANGER



#### Explosion hazard when opening the solenoid valve housing

The solenoid valve is a closed system. It must not be removed!

A fuse suitable for the rated current (max. 3 x Ib per IEC 60127-2-1) or a protective motor switch with short circuit and fast thermal response (set for rated current) must be connected upstream from each magnet to prevent short-circuits.

- For magnets with a very low rated current, a fuse of the lowest current value under the IEC standard will suffice. This fuse must be connected separately, upstream.
- The rated fuse voltage must be equal to or greater than the specified nominal voltage ( $U_N + 10 \%$ ) of the magnet. The fuse rating is specified in the type plate of the solenoid valve.
- The limiting breaking capacity of the fuse element must be equivalent to or greater than the maximum short-circuit current expected at the installation site (typically 1500 A).

#### DANGER



#### Potential equalization/static charge

##### Static charges can result in incendive sparking.

Avoid static charges. All conductive probe parts must be earthed!

The housing has a connection for an earth/equipotential bonding conductor. Ensure the housing is adequately earthed (minimum conductor cross-section 4 mm<sup>2</sup>).

Particularly also observe the requirements of IEC/EN 60079-14!

### 4.9.6 Limit Switch (Optional)

The optimal limit switch has a separate terminal box with terminals (terminal diagram see "Appendix").