

## 6 Maintenance

- Damaged parts must be replaced immediately.
- Regularly check the function of the electrical protection.

During maintenance, remember:

- The equipment must be maintained by a professional familiar with the safety requirements and risks.
- Only perform maintenance work described in these operating and installation instructions.
- Observe the respective safety regulations and operating specifications when performing any type of maintenance.
- Always use genuine spare parts.

### DANGER



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

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

### DANGER



#### Electrical voltage

Electrocution hazard.

- Disconnect the device from power supply.
- Make sure that the equipment cannot be reconnected to mains unintentionally.
- The device must be opened by trained staff only.
- Regard correct mains voltage.



### DANGER



#### Toxic, corrosive gases

The measuring gas led through the equipment can be hazardous when breathing or touching it.

- Check tightness of the measuring system before putting it into operation.
- Take care that harmful gases are exhausted to a safe place.
- Before maintenance turn off the gas supply and make sure that it cannot be turned on unintentionally.
- Protect yourself during maintenance against toxic / corrosive gases. Use suitable protective equipment.



### DANGER



#### Dangerous electrostatic charge (explosion hazard)

Incendive electrostatic charges may occur when cleaning plastic housing parts and decals (e.g. with a dry cloth or compressed air). The sparks this produces could ignite flammable, explosive atmospheres.

Always clean plastic housing parts and decals **with a damp cloth!**

### WARNING



#### Housing or component damage

Never exceed the maximum working pressure and temperature range of the drive.

### CAUTION



#### Hot surface

Risk of burns

Depending on the operating parameters, the housing temperature may reach over 100 °C during operation.

Allow the unit to cool down before performing maintenance.

**CAUTION****Excess pressure**

The unit mustn't be pressurised or energised when opened.  
If necessary, close the gas supply and ensure a safe pressure on the process end before opening.

**CAUTION****Drive pressurised**

Never loosen or remove the cover or any accessories with the drive pressurised.

**CAUTION****Never open the drive with the function "single-acting"!**

This may only be done at the manufacturer's plant.

**CAUTION****Do not attach levers or tools to the drive's spindle!**

Levers and tools on the spindle can flap around when switching the compressed air or control voltage back on and cause serious injury or damage!

## 6.1 Maintaining the filter element

The probes feature a particle filter which needs to be changed as it becomes dirty.

To do so, disconnect the voltage supply and if applicable close the shut-off valve to the process or switch off the process.

**CAUTION! Do not damage the rear filter seat.**

**NOTICE**

**Ceramic filter elements** are very brittle by nature. Handle them with care, don't let them fall.

**Filter elements made out of sintered stainless steel** can be cleaned in an ultrasonic bath and be used several times as long as both seals are still in proper conditions.

### 6.1.1 Replacing the downstream filter

- Unlock and lift up the weather hood.
- Turn the handle at the back end of the probe by 90° (handle must then be horizontal), pushing in slightly, and remove.
- Remove the dirty filter element and check the sealing surfaces.
- Before installing the new filter element, replace the seal on the handle plug (seal included with the filter element). When changing the seals in low temperatures the temperature limits must particularly be observed (see "Spare Parts and Accessories")
- Then carefully insert the handle with new filter, push in slightly and turn 90° (handle must then be vertical). Pull on the handle to verify the filter element is firmly seated.
- With the filter removed, if necessary also need clean the inside of the sampling tube by blowing it out or using a cleaning wand.

**NOTICE**

The weather hood can only be closed again when the handle is completely vertical. In order to do so, loosen the hood from the locking supports by lifting slightly and then fold down. Ensure that the hood lock clicks into place correctly.

## 6.1.2 Replacing the upstream filter

The probe can be equipped with both an upstream filter as well as an downstream filter. When sampling flammable gases, nitrogen (inert gas) must be used for blowback. Blowback of explosive gases is prohibited.

The effectiveness of cleaning a filter within a process is directly influenced by the available airflow (amount of gas). We therefore recommend using a pressure vessel directly on the probe.

With sufficient upstream filter blowback (within the process stream) the probes are maintenance-free. However, due to process conditions the filter may clog over time. In this case the filter element will need to be replaced.

To do so, the probe must be completely removed and reinstalled after changing the element. If the probe is equipped with an downstream filter, it must be replaced.

### NOTICE



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**Filter elements made out of sintered stainless steel** can be cleaned in an ultrasonic bath and be used several times as long as both seals are still in proper conditions.

### NOTICE



The weather hood can only be closed again when the handle is completely vertical. In order to do so, loosen the hood from the locking supports by lifting slightly and then fold down. Ensure that the hood lock clicks into place correctly.

## Condensate inside the pressure vessel

Depending on the installation site and application conditions a small amount of condensate may form inside the blowback air pressure vessel. Open the drain screw at the bottom of the vessel and drain the condensate at least once a year.

If the probe needs to be serviced more frequently due to operating conditions, we recommend also draining the condensate at these intervals.

### CAUTION



#### High pressure

Pressure vessel under pressure.

Before opening the condensate drain, close the air supply to the blowback control and drain the vessel by manual blowback.

Pressing the main switch for the blowback control to interrupt the voltage supply.

## 6.2 Backwashing the Intake Filter (within the process stream)

### 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.

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

Be sure to use filtered air with a minimum rating of PNEUROP / ISO Class 4 for blowback:

| Class | Particles / m <sup>3</sup><br>Particle size:<br>(1 to 5) µm | Pressure dew point<br>[°C] | Residual oil content<br>[mg / m <sup>3</sup> ] |
|-------|-------------------------------------------------------------|----------------------------|------------------------------------------------|
| 4     | to 1000<br>(no particles ≥ 15 µm)                           | ≤ 3                        | ≤ 5                                            |

## 6.2.1 Manual Blowback (Without Blowback Control)

The shut-off valve in the air supply (inert gas supply) to the pressure vessel must be open. The optional pressure gauge on the pressure vessel shows the current operating pressure.

- To blowback, first close the shut-off valve in the gas probe (handle below the probe/weather hood).
- Then **abruptly** open the ball valve inside the connecting line from the pressure vessel to the probe until the display on the pressure gauge has dropped to the lowest reading.
- After blowback, close the ball valve and open the shut-off valve in the probe.

## 6.2.2 Automatic Blowback (External Blowback Control)

For automatic blowback, the shut-off valve in the probe must have a pneumatic control (optional). The control unit for the system is designed for sequential valve control, i.e.:

1. Close the shut-off valve in the probe using the pneumatic control.
2. Open the solenoid valve between the pressure vessel and probe for approx. 10 seconds.
3. Open the shut-off valve in the probe.

Blowback can also be set as a closed process at intervals ranging from several minutes to hours or even days based on requirements.

## 6.3 Maintenance Schedule

### NOTICE



When using the probe in explosive areas the maintenance schedule must be observed!

### Maintenance schedule for normal ambient conditions:

| Component                                                                 | Interval in operating hours | Work to be performed                                                                                                                                                                                                                                                                            | To be performed by          |
|---------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| Entire probe                                                              | every 8000 h                | <ul style="list-style-type: none"> <li>– Check gas connections</li> <li>– Check safety devices and controllers</li> <li>– Check electrical protective measures</li> <li>– Working properly, dirt, visual inspection for dirt/damage.</li> </ul> If damaged, replace or have repaired by Bühler. | Operator                    |
| Ball valves                                                               | every 8000 h                | <ul style="list-style-type: none"> <li>– Check ball valve function and check for leaks.</li> </ul>                                                                                                                                                                                              | Operator                    |
| Filter                                                                    | every 8,000 h               | <ul style="list-style-type: none"> <li>– Check dirt level of filter.</li> </ul>                                                                                                                                                                                                                 | Operator                    |
| Seals                                                                     | every 8,000 h               | <ul style="list-style-type: none"> <li>– Replace O-rings.</li> <li>– Replace seals after every filter change.</li> </ul>                                                                                                                                                                        | Operator                    |
| Pressure vessel                                                           | every 8,000 h               | <ul style="list-style-type: none"> <li>– Drain condensate</li> </ul>                                                                                                                                                                                                                            | Operator                    |
| Drive                                                                     | 1 x per year                | <ul style="list-style-type: none"> <li>– Replace seals, guides and lubricants.</li> </ul>                                                                                                                                                                                                       | Manufacturer                |
| Entire probe<br>With respect to ball valve, pneumatic and solenoid valves | after 20,000 h or 3 years   | <ul style="list-style-type: none"> <li>– Inspection by Bühler</li> </ul>                                                                                                                                                                                                                        | Service technician / Bühler |
| Limit switch                                                              | after 5 years               | <ul style="list-style-type: none"> <li>– Replace seals on the shaft and the housing cover.</li> </ul>                                                                                                                                                                                           | Operator                    |