

2 Safety instructions

2.1 Important advice

This unit may only be used if:

- the product is being used under the conditions described in the operating- and system instructions, used according to the nameplate and for applications for which it is intended. Any unauthorized modifications of the device will void the warranty provided by Bühler Technologies GmbH,
- complying with the specifications and markings in the type plate,
- complying with the threshold values specified in the data sheet and the instructions,
- monitoring equipment / protection devices are connected correctly,
- service and repair work not described in these instructions are performed by Bühler Technologies GmbH,
- genuine spare parts are used.

These operating instructions are a part of the equipment. The manufacturer reserves the right to change performance-, specification- or technical data without prior notice. Please keep these instructions for future reference.

Signal words for warnings

DANGER	Signal word for an imminent danger with high risk, resulting in severe injuries or death if not avoided.
WARNING	Signal word for a hazardous situation with medium risk, possibly resulting in severe injuries or death if not avoided.
CAUTION	Signal word for a hazardous situation with low risk, resulting in damaged to the device or the property or minor or medium injuries if not avoided.
NOTICE	Signal word for important information to the product.

Warning signs

These instructions use the following warning signs:

	Warns of a general hazard		Warns of limbs being crushed
	Warns of voltage		General notice
	Warns not to inhale toxic gasses		Unplug from mains
	Warns of corrosive liquids		Wear respiratory equipment
	Warns of explosive areas		Wear a safety mask
	Warns of hot surfaces		Wear gloves

2.2 General hazard warnings

Installation into a complete system can pose new hazards on which the manufacturer of this sample gas pump has no bearing. If necessary, perform a risk assessment of the complete system this product will be installed into.

When configuring and building the complete system the relevant national safety regulations for the installation site and the generally applicable state of the art must be observed. These can be determined through applicable harmonised standards, among other things, e.g. **IEC 60079-14**. Additional national regulations pertaining to initial operation, operation, maintenance, repairs and disposal must be observed.

When conveying flammable gasses, avoid potential exothermic reactions in your system, do not use materials with a catalytic effect in the conveyor lines. Dangerous rises in temperature could result. Sample gas pump materials in contact with media are listed in this operating manual to facilitate the safety assessment.

Adiabatic compression is part of the physical operating principle of bellows pumps. Dangerous rises in temperature cannot be ruled out with improper exceeding of the operating parameters. Conveying flammable gasses then pose an explosion hazard.

Avoid these dangerous circumstances. If necessary, the complete system should be secured against flashback. Follow these notices and the applicable national regulations, prevent malfunctions to avoid personal injury and property damage.

The operator of the system must ensure:

- The equipment is only installed by a professional familiar with the safety requirements and risks,
- Safety notices and operating instructions are available and observed,
- The permissible data and operating conditions are observed,
- Protective devices are used and mandatory maintenance is performed,
- Legal regulations are observed during disposal.

Maintenance, Repair

Please note during maintenance and repairs:

- Repairs to the unit must be performed by Bühler authorised personnel.
- Only perform conversion-, maintenance or installation work described in these operating and installation instructions.
- Always use genuine spare parts.
- Do not install damaged or defective spare part. If necessary, visually inspect prior to installation to determine any obvious damage to the spare parts.

Always observe the applicable safety and operating regulations in the respective country of use when performing any type of maintenance.

DANGER

Electrical voltage

Electrocution hazard.



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



DANGER

Danger of explosions, danger of poisoning from poisonous corrosive gases

During maintenance work, depending on the medium used, explosive and/or poisonous corrosive gases could escape, and this could lead to a danger of explosion or could be hazardous to health.



- a) Inspect the leak tightness of your sampling system before putting the device into operation.
- b) Ensure that gases that are hazardous to health are discharged safely.
- c) Turn off the gas supply before beginning any maintenance or repair work and flush the gas lines with inert gas or air. Secure the gas supply so that it cannot be turned on unintentionally.
- d) Protect yourself during maintenance from poisonous / corrosive gases. Wear appropriate protective equipment.



DANGER**Potentially explosive atmosphere**

Explosion hazard if used in hazardous areas.

The device is not suitable for operation in hazardous areas with potentially explosive atmospheres.

DANGER**Explosion hazard**

Life and explosion risk may result from gas leakage due to improper use.

- a) Use the devices only as described in this manual.
- b) Regard the process conditions.
- c) Check tubes and hoses for leakage.

DANGER**Adiabatic compression (explosion hazard)!**

In case of adiabatic compression, high gas temperatures may occur. The operator is responsible to consider this situation.

Make sure to obey the allowed technical specifications and ambient conditions, take special attention to the media temperature with respect to temperature class T4. These vary in addition to gas composition and ambient conditions. Where necessary, the operator must install temperature sensors for monitoring and must automatically shut down the sample gas pump should the temperature exceed the limits.

DANGER**DANGER - Explosion danger in case of high temperatures**

Temperature of the device depends on the medium temperature. Correlation between medium temperature and **temperature classes** is given in chapter "Technical data". Observe maximum temperature classes T4 for the pumps and the allowed ambient temperatures and medium temperatures.

DANGER**Danger of explosion due to exothermic reactions**

Avoid catalytic materials in the conveyor pipelines and other materials, e.g. male stud couplers, connecting to the sample gas pump.

Depending on the particular medium conveyed (e.g. ethylene oxide), a polymerisation of the medium may occur. Heat build-ups are possible and constitute an ignition source. If necessary, for clarification consult a technical department that possesses sufficient chemical expertise.

DANGER**Explosion hazard**

Flammable media fed into the pump may only be heated to a maximum of 80 % of their respective ignition temperature.

CAUTION**Tilting risk**

Damage of the device

Secure the device against any sudden translocation during maintenance.

CAUTION**Hot surface**

Burning hazard

According to the product type and operation conditions, the temperature of the housing may exceed 50 °C during operation.

Depending on the conditions at the installation site it may be necessary to provide these areas with appropriate warning signs.