Operating Instructions
BACK-PURGE-UNIT

Endress+Hauser
People for Process Automation

Described Product

Product name: BACK-PURGE-UNIT

Manufacturer

Endress+Hauser SICK GmbH+Co. KG
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Legal notice

Original document

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Content

1 About this Document

Note

These operating instructions:

- contains information required during the life cycle of the unit.
- are available to all those who work with the unit.

Please read these operating instructions carefully and make sure that you understand the content fully before working with the unit.

1.1 Limitation of Liability

Note

Applicable standards and regulations, the latest state of technological development and many years of knowledge and experience have all been taken into account when assembling the data and information contained in these operating instructions. The manufacturer accepts no liability for damage caused by:

- Failing to observe the operating instructions.
- Incorrect use.
- Use by untrained personnel.
- Unauthorized conversions.
- Technical modifications.
- Use of unauthorized spare parts, consumables and accessories.
- Unauthorized modifications, adjustments and/or manipulation of software.

With special variants, where optional extras have been ordered, or owing to the latest technical changes, the actual scope of delivery may vary from the features and illustrations shown here.

1.2 Purpose of this Document

This operating instructions provides important information concerning the description, the installation and the operation of the BACK-PURGE-UNIT.

1.3 Target Group

This document is intended for qualified personnel which are authorized to carry out installation and operation of the BACK-PURGE-UNIT.

1.4 Further Information

Special local conditions

Follow all local laws, technical rules and company-internal operating directives applicable at the respective installation site of the unit.

Preserving the documents

These operating instructions and the additional technical documentation and information must be:

- available for reference
- passed on to new owners

1.5 Additional Technical Documentation/Information

- Operating instructions of the system components.
- Technical System-Documentation.
  Depending on the technical system execution the Technical System-Documentation includes different information, for e.g.:
  - gas flow diagram
  - wiring diagram
  - terminal diagram
  - parts lists
  - dimensions drawings
  - technical data

1.6 Document Conventions

▶ Instructions

Refer to another document

All units of measurement in this document are originally metric units.

Subject to change without notice. Images might differ from actual design.

1.7 Abbreviations Used

BB	Blow back
COU	Counter
IMP	Impulse
LOGO	Siemens logic module
RoHS	Restiction of Hazardous Substances
TIM	Timer

2 Important Safety Instructions

2.1 Intended Use

The BACK-PURGE-UNIT is intended for the purging of the sampling probe filter.

2.2 Supplemental Directives

- ▶ Read and understand this document carefully prior to working on the system or any other of its components.
- ▶ Only fully trained professionals from the respective field are permitted to work on the system.
- ▶ Follow all operational procedures.
- ▶ Follow all local regulations.
- ▶ Follow all local regulations regarding working with gas and electrical components.
- ▶ Entry to system area is only permitted to authorized personnel.
- ▶ Wear personal protective equipment (PPE) while on the system area.

System Damage

Damage to any system components or parts can lead to malfunction of the entire System.

- ▶ Do not ignore damaged or broken parts, refer to this manual and contact SICK support immediately.
- ▶ Do not install damaged parts.

2.3 Requirements for the Qualification of Personnel

Only qualified personnel from the respective field are permitted to work on the system.

- Qualified personnel have the specialist training, skills, and experience, as well as knowledge of the relevant regulations and standards, to be able to perform tasks delegated to them and to detect and to avoid any potential dangers independently.
- Electricians have the specialist training, skills, and experience, as well as knowledge of the relevant standards and provisions to be able to carry out work on electrical systems and to detect and avoid any potential dangers independently.

2.4 System Warranty

If you disregard the safety and hazard precautions, no warranty claim for damages will be honored. If you alter parts of the System by your own initiative, all warranty claims will be forfeited.

- ▶ Regard all safety and hazard precautions.
- ▶ Use only material supplied or approved by SICK for the system maintenance.
- ▶ Do not alter the system.
- ▶ Unauthorized modifications, adjustments and/or manipulations to the software are not permitted.

2.5 RoHS Directive

This product is designed for applications in large industrial plants according to Article 2 (4) e, RoHS 2011/65/EU and can therefore only be used in such systems.

The product is neither suitable nor approved for use outside of theses systems. SICK cannot assume any kind of warranty or liability for use outside of these systems.

2.6 Safety Conventions

The warnings used in this manual have the following meanings:

DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

indicates a hazardous situation which, if not avoided, could result in minor or moderate injuries.

NOTICE

Indicates a situation which that can lead to material damage if not avoided.

2.7 Warning Sings

Sings	Significance
	Hazard (general)
	Hazard by voltage
	Hazard in potentially explosive areas
	Risk of explosion
	Hazard by flammable materials
	Hazard by oxidizing substances
	Hazard by toxic substances
	Hazard by acidic substances
	Hazard by high temperature of surfaces
	Hazard for the environment, nature and organic life

2.8 Mandatory Signs

Mandatory signs indicate a measure that is required to protect personal health and / or avoid the risk of personal injury.

Mandatory signs on the system must not be removed or covered. Damaged or missing mandatory signs (stickers) must be replaced.

Sign	Significance
	Read instructions manual
	Wear safety gloves
	Wear safety boots
	Disconnect before maintenance or repair

2.9 Safety Messages

DANGER

Toxic gases.

Risk of intoxication by inhalation. Serious injuries or death.

- Operate the system only in sufficient ventilated areas or rooms.
- Use gas monitoring.
- Perform leakage test in appropriate time intervals.

DANGER

Risk of explosions in potentially explosive areas.

Death or serious injury will occur.

- Do not use the system in potentially explosive areas.

DANGER

Hazardous explosive gases.

Death or serious injury will occur.

- Do not close or block the exhaust outlet.
- Do not operate the system in closed rooms.
- Use gas monitoring.
- Perform leakage tests in appropriate time intervals.

DANGER

Hazardous voltage.

The system is supplied with mains voltage from the grid. Danger of electrocution - contact will cause electric shock, burn or death.

- Always exercise caution when handling cables and connectors.
- Be aware of the risk of secondary accidents occurring if you are startled.
- Before working on the system:
  - Follow operational procedures such as Lockout-Tagout.
  - Check that there is no residual voltage by measuring AC voltages.

WARNING

Hot surfaces.

Contact may cause burn. The surfaces of heated gas lines may be hot.

- Do not touch the surfaces.
- Wear safety gloves.

3 Product Description

The BACK-PURGE-UNIT (BPU) purges the sampling probe filter. The purging process obtains the functionality of the sampling probe.

Depending on the application, the purging operations are carried out at specified circuit programs.

The BACK-PURGE-UNIT can be used for purging sample probes with one or two back purging valves.

3.1 One Back Purging Valve - Back Purge Unit Components

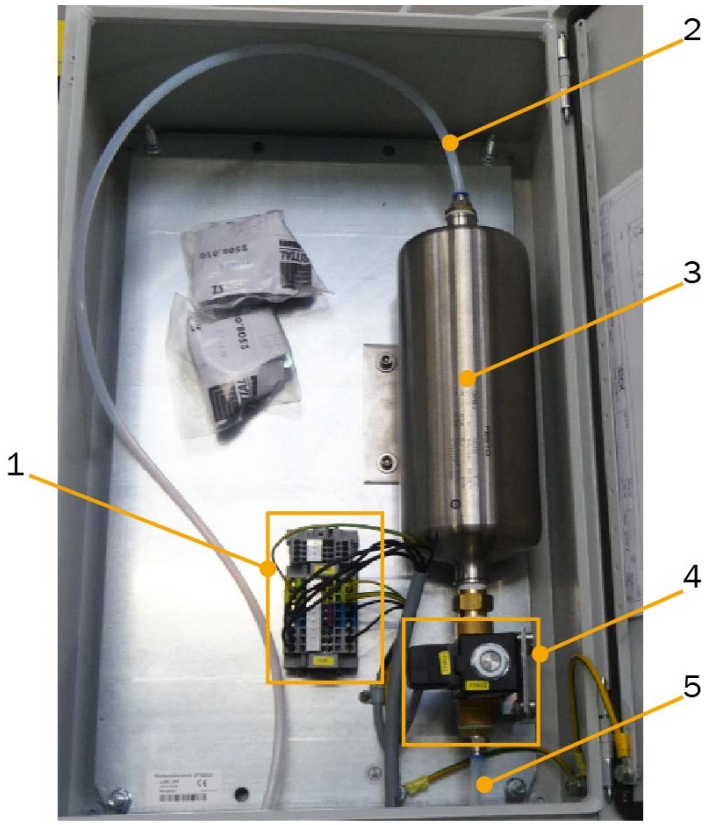

Fig. 1: BPU with one back purging valve - inside components

Legend	
1	Power supply terminal block
2	Control air inlet hose
3	Purge air cylinder
4	Solenoid valve
5	Purge air hose to the probe

3.1.1 Sample Probe with One Back Purging Valve

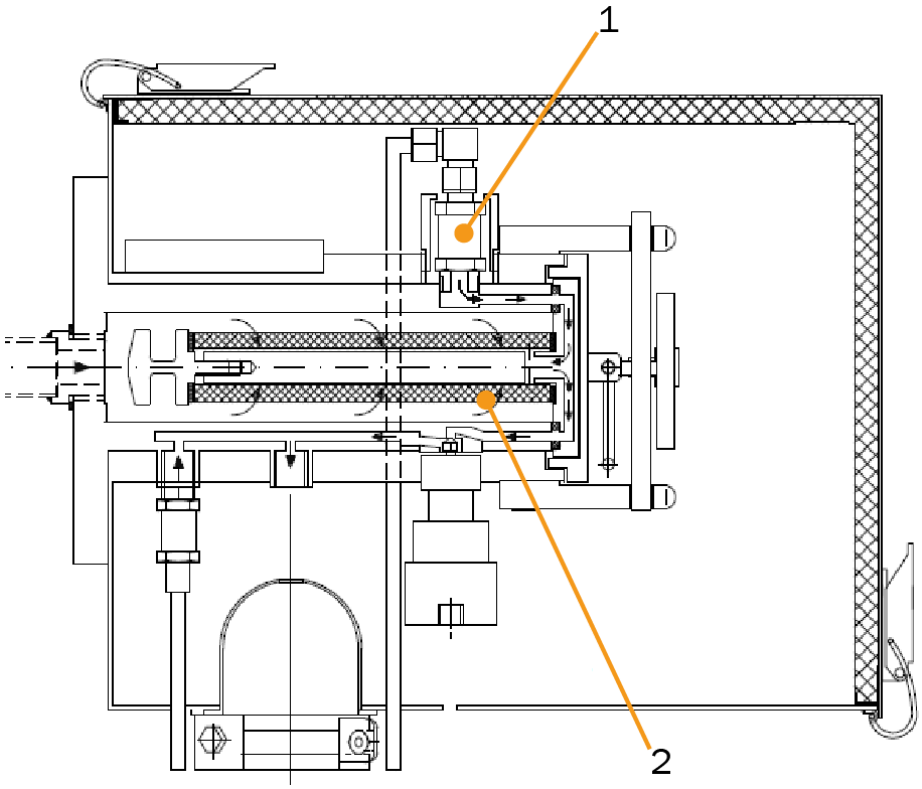

Fig. 2: Sample probe with one back purging valve (example)

Legend	
1	Back purging check valve
2	Filter

For further and detail information about the sample probe, refer to the correspondent Operating Instructions.

3.2 Two Back Purging Valves - Back Purge Unit Components

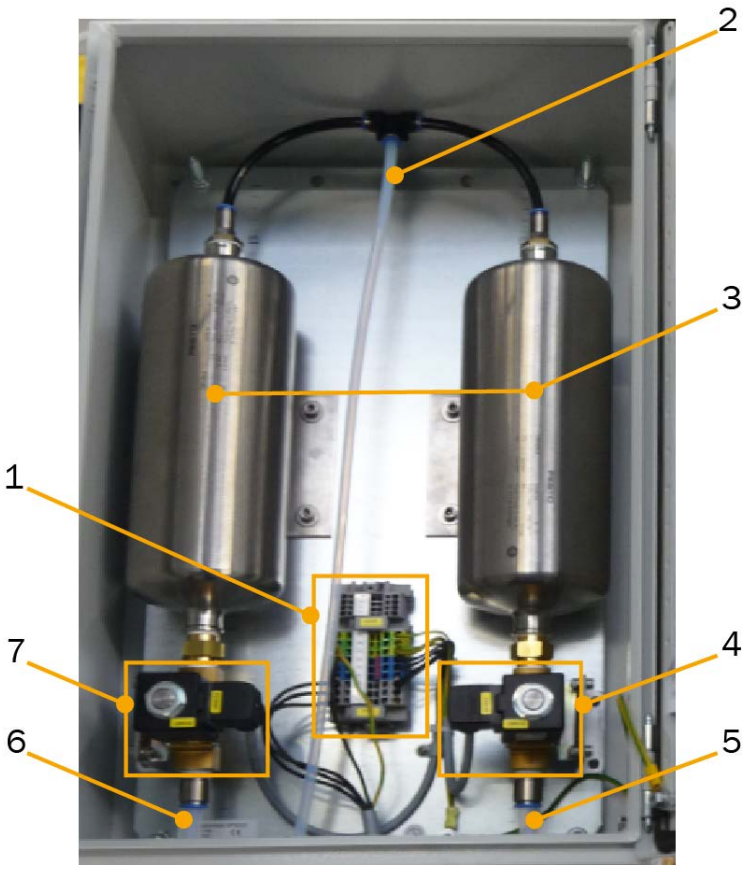

Fig. 3: BPU with two back purging valves - inside components

Legend	
1	Power supply terminal block
2	Control air inlet hose
3	Purge air cylinders
4	Solenoid valve
5	Purge air hose to the probe diameter 12x1 mm for filter chamber purging
6	Purge air hose to the probe diameter 12x1 mm for filter purging
7	Solenoid valve

3.2.1 Sample Probe with Two Back Purging Valves

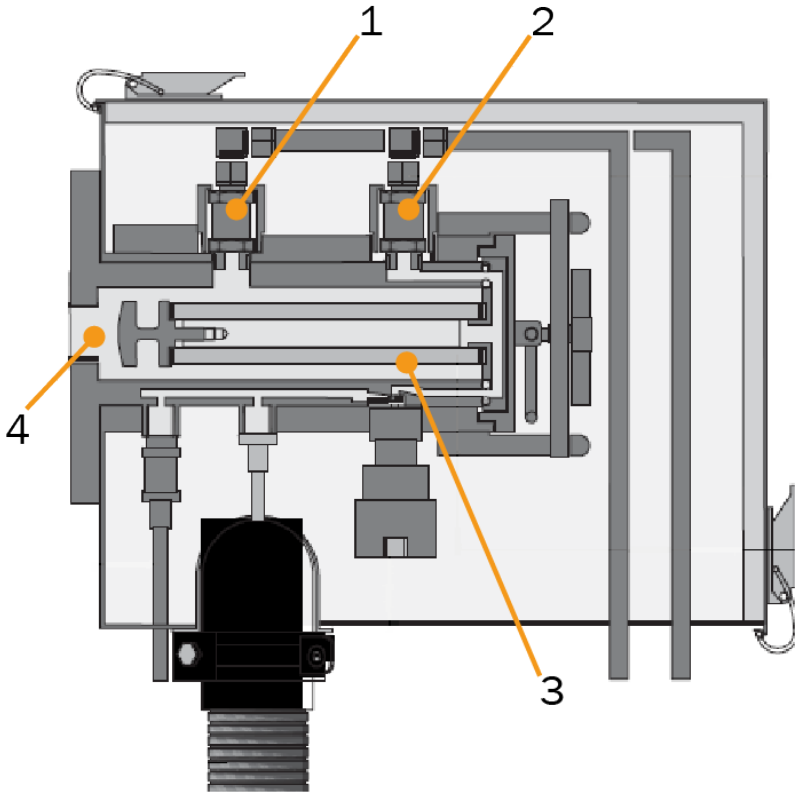

Fig. 4: Sample probe with two back purging valves (example)

Legend	
1	Back purging check valve (filter chamber purging)
2	Back purging check valve (filter purging)
3	Filter
4	Filter chamber

For further and detail information about the sample probe refer, to the correspondent Operating Instructions.

3.3 System Integration

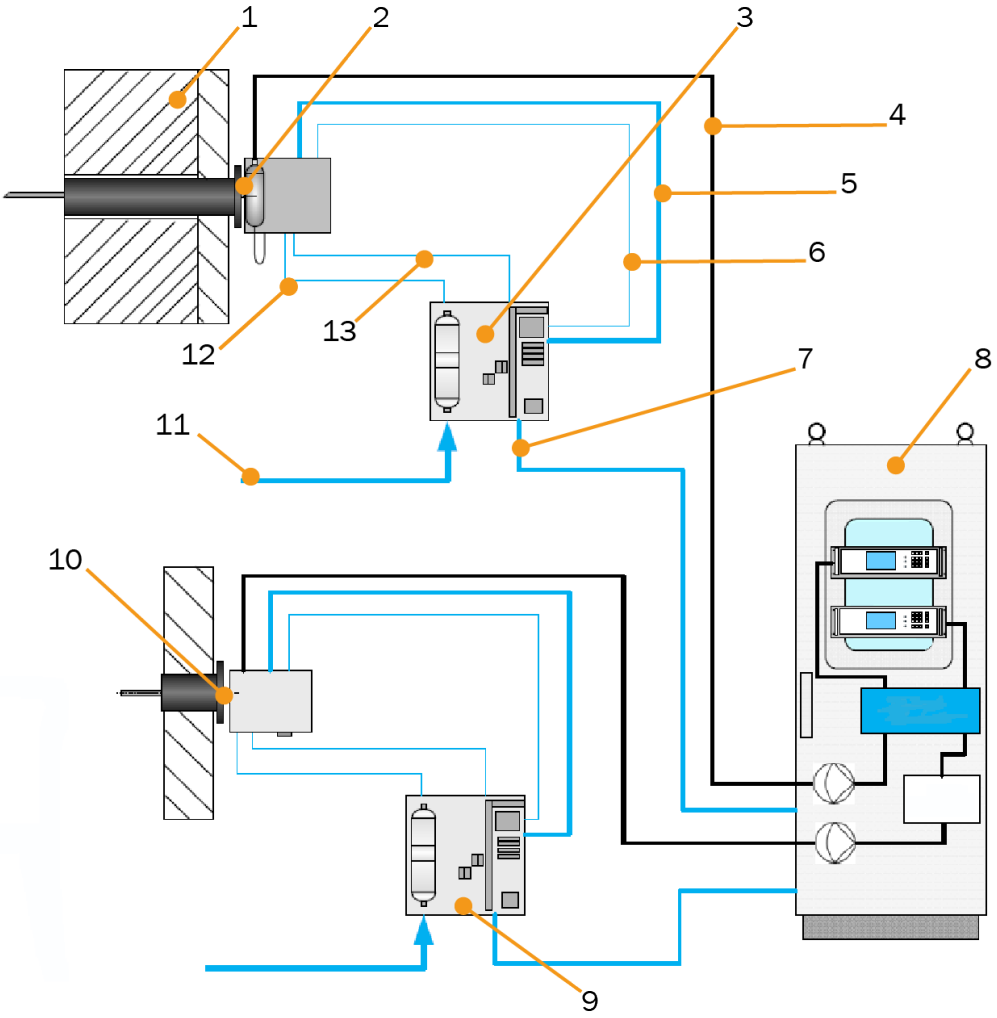

Fig. 5: System integration of the BACK-PURGE-UNIT (example)

Legend	
1	Stack
2	Sample Probe
3	Back Purge Unit
4	Heated sample gas line
5	Power supply gas sampling system
6	Signal cable temperature control sample filter
7	Power supply
8	Analysis system
9	Back Purge Unit
10	Sample Probe
11	Instrument air supply
12	Hose (air for pneumatic valve)
13	Hose for back purge air

3 PRODUCT DESCRIPTION

4 Installation

4.1 Requirements for an Outdoor Installation

When installed outdoors, protection against direct sunlight must be installed.

4.2 Back Purge Unit - One Back Purging Valve

How to connect the Back Purge Unit (BPU) to the probe:

- Connect the BPU to the power supply (using the bundle of pipes and cables).
- Connect the power supply terminal block of the BPU with the power supply terminal block of the probe.
- Connect the control air inlet hose to the air supply.
- Connect the purge air solenoid valve to the inlet valve of the probe, using a 12mm diameter compressed-air tube (e.g. from Festo).

4.3 Back Purge Unit - Two Back Purging Valves

How to connect the Back Purge Unit (BPU) to the probe:

- Connect the BPU to the power supply (using the bundle of pipes and cables).
- Connect the power supply terminal block of the BPU with the power supply terminal block of the probe.
- Connect the control air inlet hose to the air supply.
- Connect the purge air solenoid valves with the inlet valves of the probe, using 12mm diameter compressed-air tubes (e.g. from Festo).

Fig. 6: BPU with to solenoid valves

Legend	
1	Solenoid valve for filter purging
2	Solenoid valve for chamber purging

For further and detailed information about the connections, refer to the gas flow and the wiring diagram in the Technical System-Documentation.

5 Operation

5.1 Operation Methods

Two operation methods are possible:

- Internal triggering (operation carried out by LOGO!).
- External triggering (operation carried out by customer control unit).

For further and detailed Information about the Siemens LOGO! control unit, refer to the respective operating instructions.

5.2 Internal Triggering - Back Purging Filter and Filter Chamber

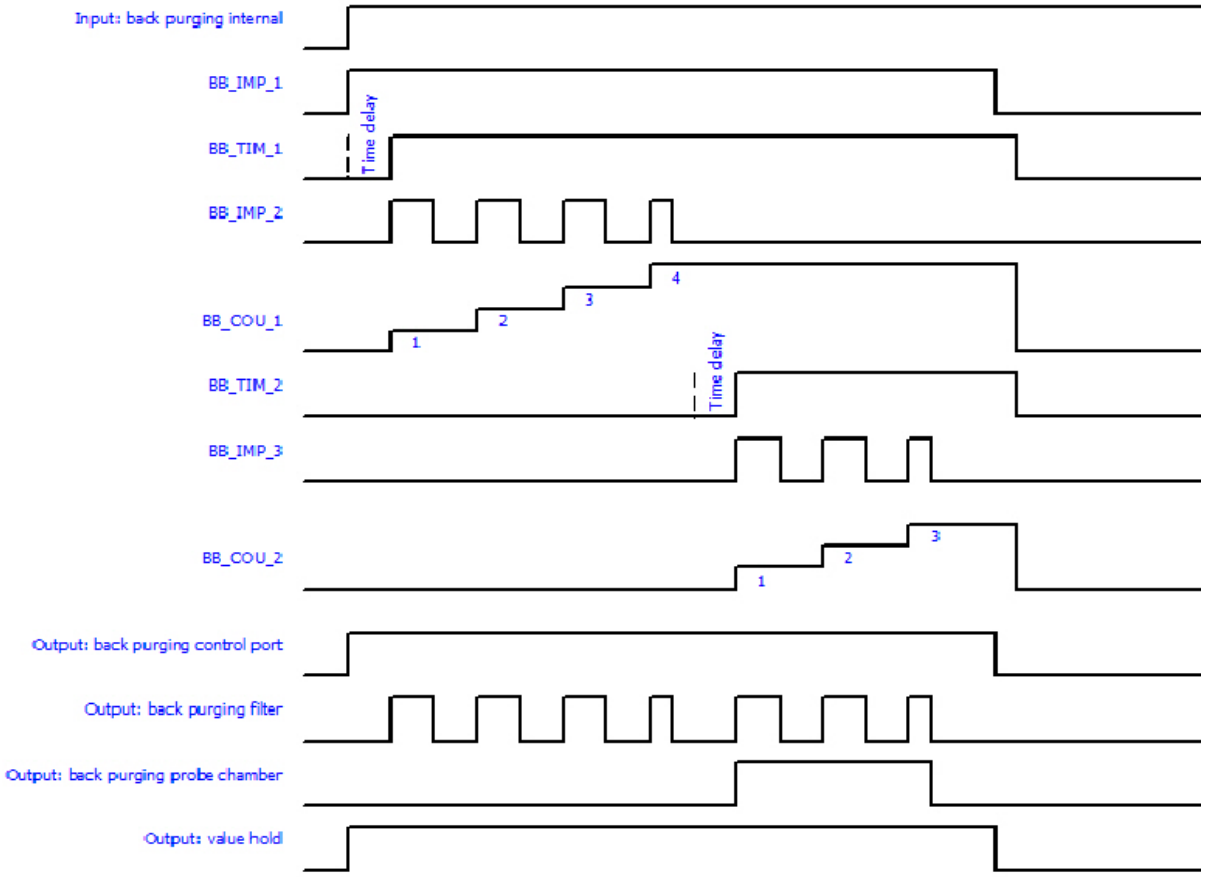

Fig. 7: Cycle time diagram - back purging internal triggering (example)

LOGO! variable	Instruction
BB_IMP_1	Duration control of the back purging process.
BB_TIM_1	Time delay for closing the sample gas outlet before back purging starts. Due to pneumatic functionality note the length of the pneumatic lines.

Filter purging

LOGO! variable	Instruction
BB_IMP_2	Pulse pause time for back purging the filter.
BB_COU_1	Number of impulses for BB_IMP_2.

Chamber and filter purging

LOGO! variable	Instruction
BB_TIM_2	Time delay until filter chamber purging starts.
BB_IMP_3	Pulse pause time for back purging the filter chamber.
BB_COU_2	Number of impulses for BB_IMP_3.

5.3 External Triggering - Back Purging Filter and Filter Chamber

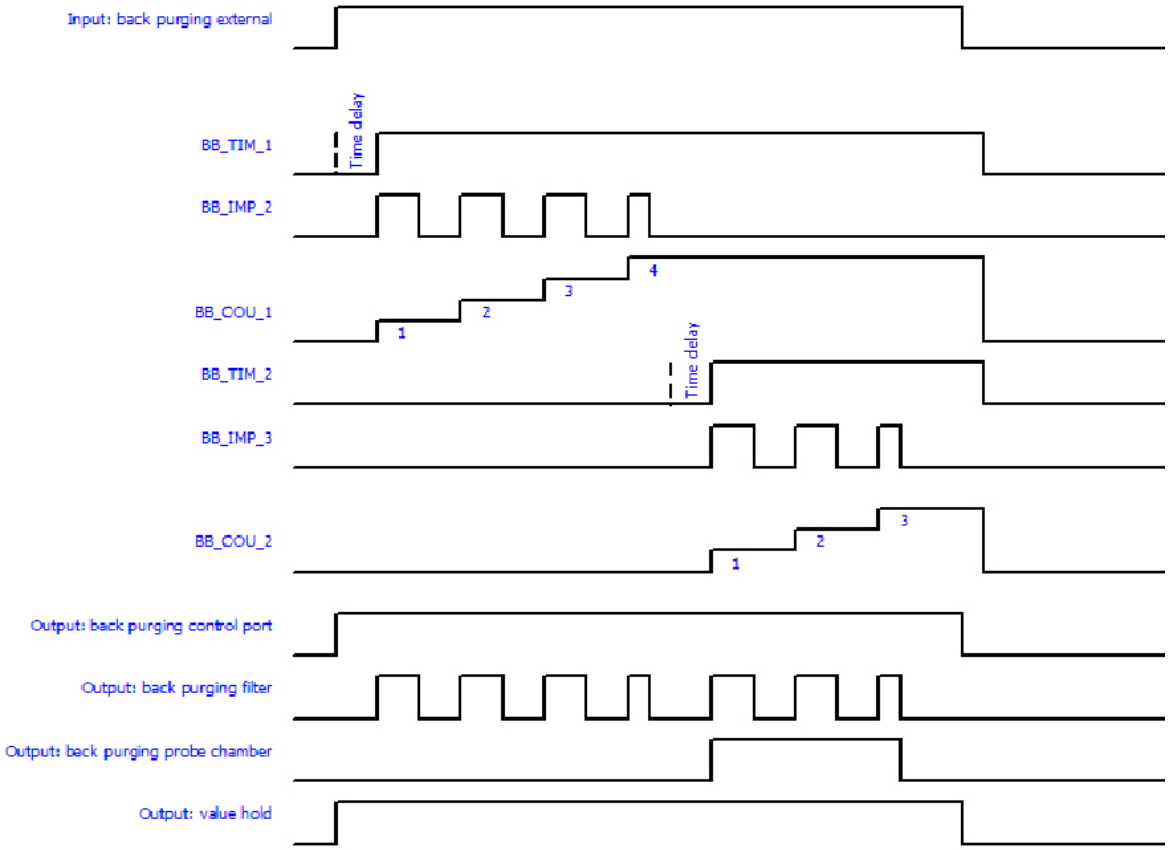

Fig. 8: Cycle time diagram - back purging external triggering (example)

Note

External flow chart without BB_IMP_1.
The input signal for the duration of the backwash process must be provided by the operator.

LOGO! variable	Instruction
BB_TIM_1	Time delay for closing the sample gas outlet before back purging starts. Due to pneumatic functionality note the length of the pneumatic lines.

Filter purging

LOGO! variable	Instruction
BB_IMP_2	Pulse pause time for back purging the filter.
BB_COU_1	Number of impulses for BB_IMP_2.

Chamber and filter purging

LOGO! variable	Instruction
BB_TIM_2	Time delay until filter chamber purging starts.
BB_IMP_3	Pulse pause time for back purging the filter chamber.
BB_COU_2	Number of impulses for BB_IMP_3.

5.4 Internal Triggering - Back Purging Filter

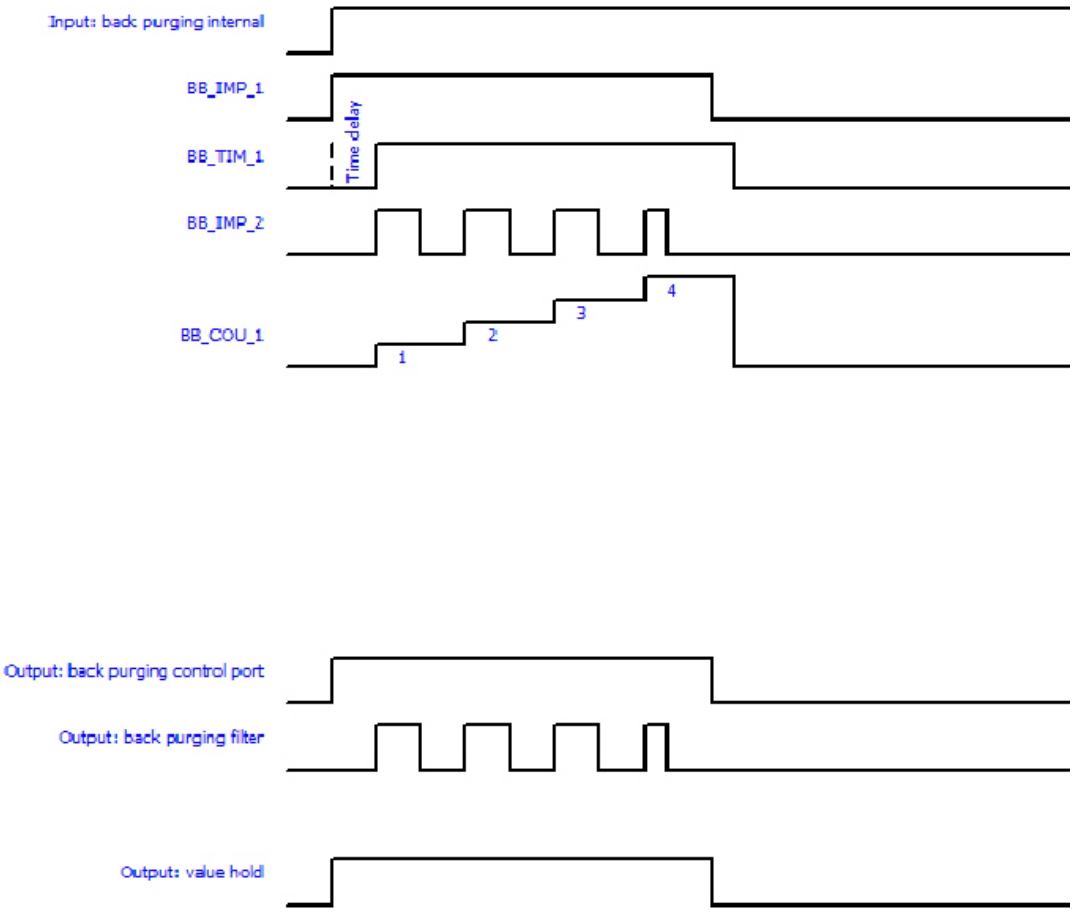

Fig. 9: Cycle time diagram - internal triggering, without chamber purging (example)

LOGO! variable	Instruction
BB_IMP_1	Duration control of the back purging process.
BB_TIM_1	Time delay for closing the sample gas outlet before back purging starts. Due to pneumatic functionality note the length of the pneumatic lines.

Filter purging

LOGO! variable	Instruction
BB_IMP_2	Pulse pause time for back purging the filter.
BB_COU_1	Number of impulses for BB_IMP_2.

5.5 External Triggering - Back Purging Filter

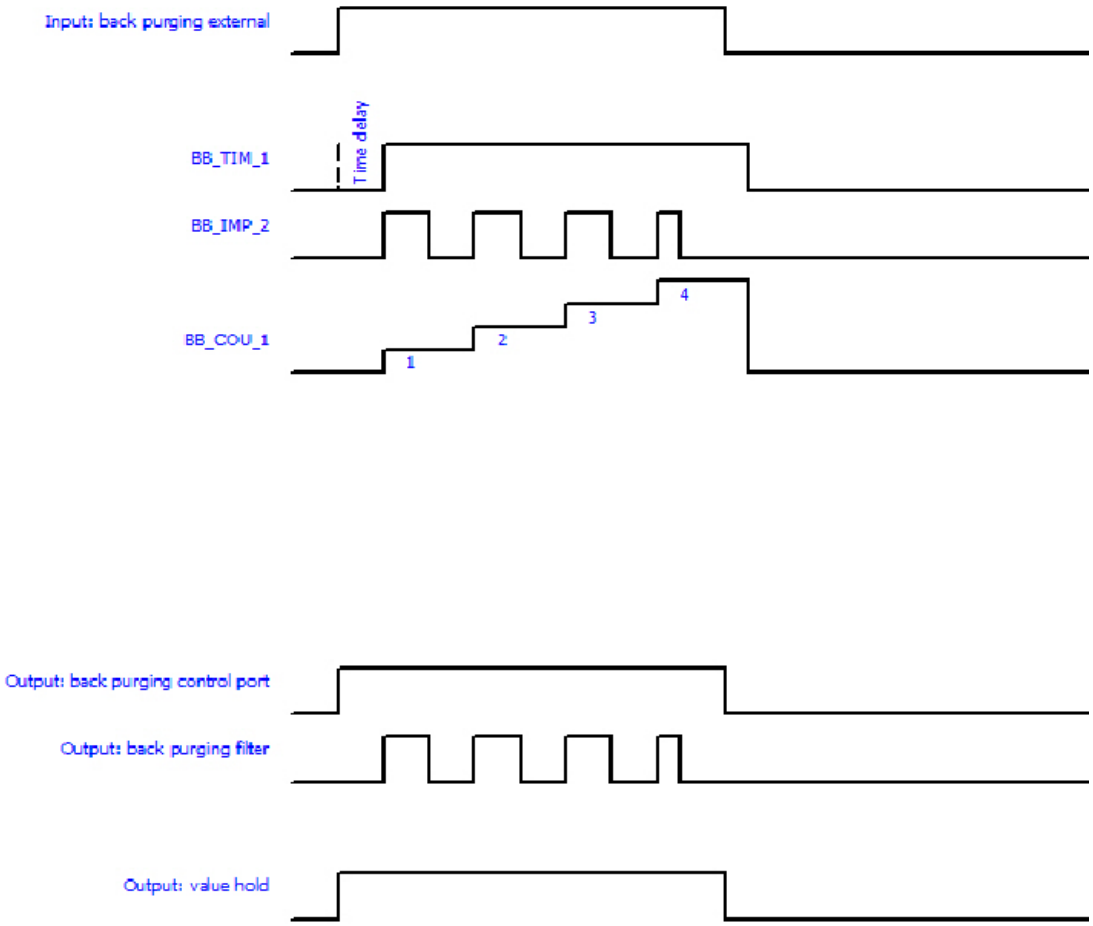

Fig. 10: Cycle time diagram - external triggering, without chamber purging (example)

Note

External flow chart without BB_IMP_1.
The input signal for the duration of the backwash process must be provided by the operator.

LOGO! variable	Instruction
BB_TIM_1	Time delay for closing the sample gas outlet before back purging starts. Due to pneumatic functionality note the length of the pneumatic lines.

Filter purging

LOGO! variable	Instruction
BB_IMP_2	Pulse pause time for back purging the filter.
BB_COU_1	Number of impulses for BB_IMP_2.

6 Technical Data

Technical Data	
Dimensions	Width x Height x Depth: 380 x 650 x 230 mm incl. wall bracket
Weight	21 kg
Power supply	115V, 50 Hz 230V, 50 Hz 24V AC/DC
Power consumption	Max. 80 VA
Instrument air supply	Compressed air according to ISO 8573-1:2020 [2:2:2] max. 6 bar
Temperature	-10 bis +50 °C
Protection class	IP 54

Note

When installed outdoors, protection against direct sunlight must be installed.

7 Disposal

Note

Note the relevant currently valid local and legal environment regulations and directives for the disposal of industrial and electronic waste.

Only qualified personnel may shut down, decommission, transport and dispose of the equipment.

Note

The applicable local and statutory environmental regulations and guidelines for the disposal of industrial and electrical waste must be observed.

WARNING

Hazardous corrosive or toxic condensate liquid.

Serious injuries and harmful to the environment.

- Use appropriate safety gloves.
- Use appropriate respiration protection.
- Safely drain condensate.
- This waste must be disposed of, according to local and legal regulations and as hazardous waste.

Disposal of batteries, electrical and electronic equipment

According to international directives and regulations, batteries, accumulators and electrical or electronic devices must not be disposed of as household waste.

The owner is obliged to dispose of the equipment at the end of its service life at the appropriate public collection points.

This symbol on the product, packaging or in this document indicates that a product is subject to these regulations.

The following assemblies may contain substances that must be disposed of separately:

Electronics: capacitors, accumulators, batteries

Displays: Liquid in the LC-Displays

Sample gas lines:
Toxic substances of the sample gas can penetrate or adhere to soft materials of the gas path (e.g. hoses, sealing rings). Such effects must be taken into account during disposal.

Gas analyzer:

Detailed information on the disposal of analyzers can be found in the corresponding operating instructions.

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