

**Combi switchbox with integrated
3/2 way pilot valve****ATEX**

for pneumatically operated linear actuators

OPERATING INSTRUCTIONS

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1. Safety instructions

Please read the following safety instructions carefully and observe them!

1.1. Explanation of symbols and signs

Important information is marked using the following symbols in these operating instructions:



DANGER

Imminent threat of danger.

If not observed, death or very serious injury will result.



WARNING

A possibly dangerous situation.

If not observed, death or very serious injury may result.



CAUTION

A possibly dangerous situation.

If not observed, slight or minor injury and or damages to property may result.



ATTENTION

Possibly a harmful situation.

If not observed, the product or something in its vicinity may be damaged.



Important

Application hints and other especially useful information about the GEMÜ 4226.

1.2. General information

The prerequisite for perfect function of the combi switchbox GEMÜ 4226:

- Proper transport, storage, installation, mounting, commissioning, operation inspection, servicing, troubleshooting / fault clearance, repair work, assembly, disassembly, removal and disposal exclusively by trained, authorised and qualified specialist staff whilst observing the accident prevention regulations.
- the relevant safety regulations for the installation and operation of electrical systems
- Operation according to these operating instructions
- Observation of the contents of these operating instructions and other documents (data sheets etc.).

Correct assembly, operation and servicing or repair work ensure faultless position indicator operation.

The combi switchbox GEMÜ 4226 must be used according to these directions. All information in these operating instructions regarding all works on the switchbox must be observed and applied. If the information is not observed, the operator's guarantee rights and the manufacturer's legal liability cease. The manufacturer shall undertake no responsibility for this combi switchbox if these safety instructions are not observed.

The manufacturer shall undertake no responsibility for this combi switchbox, if these safety instructions are not observed.

The regulations, norms and guidelines named in these instructions are only applicable in Germany. If the combi switchbox GEMÜ 4226 is used in other countries, the local regulations must be observed. When dealing with harmonised European norms, standards and guidelines, these apply within the Single European Market, the operator must also adhere to national rules if applicable.

The descriptions and instructions in these safety instructions refer to standard designs.

The safety instructions do not take into account:

- coincidences and events which may occur during assembly, operation and servicing
- local safety regulations which must be adhered to by the operator – also with respect to any additional assembly staff.



Important

If you have any questions, please do not hesitate to ask your closest GEMÜ sales office. (www.gemue.de)

1.3. Correct use

The combi switchbox GEMÜ 4226 is suitable for single acting linear valves.

The switchbox can indicate two positions – "OPEN" and "CLOSED".

This end position feedback takes place via two inductive proximity switches according to NAMUR EN 50227.

The pneumatic valve actuator is directly activated by one integrated 3/2 way pilot valve.

Switching rod and actuating spindle have a positive connection without axial play.

The electrical connection is via cable gland.

The combi switchbox GEMÜ 4226 is suitable for use as defined in the data sheet.

Please observe the instructions set out below to ensure perfect functioning of our products as well as adhering to the information on the product labels.

If these instructions and the instructions in the general operating instructions are not observed, guarantee and product liability on the GEMÜ 4226 cease.

Only use the GEMÜ 4226 as a combi switchbox in accordance with the data sheet.

Any other use or use and beyond this is not permitted.

When planning the use of the device and when operating it, please pay attention to relevant generally known technical safety regulations. Designers, plant constructors and operators are always responsible for the positioning and installation of the combi switchbox GEMÜ 4226.



IMPORTANT

- The areas of responsibility should be defined precisely and the monitoring of the staff and their competence carried out by the operator.
- Train staff that have insufficient knowledge or, if necessary, have them trained (by the manufacturer / supplier on order by the operator)
- Ensure that all staff understand the safety instructions.
- Stay within the electrical and technical data limitations (operating data) of the valve. These are clearly stated in the technical documentation (data sheet etc.)
- It is of paramount importance to ensure the electrical safety of the host devices.
- **Adhere to legal regulations!**

Failure to observe these safety instructions will lead to endangerment to persons, the environment and the combi switchbox GEMÜ 4226. Failure to observe the safety instructions may lead to default of claims.

1.4. Information on equipment and protective systems for intended use in potentially explosive atmospheres

- Intended for use with process valves whose opening/closing speed does not exceed 1 meter/second.
- Metallically isolated components (e.g. types with connectors...) must be properly earthed by the user (see directive 1999/92/EC (ATEX 137))
- Any work must be carried out by trained staff in accordance with construction regulations for the operation of installations in potentially explosive atmospheres
- The general safety regulations for potentially explosive atmospheres and the GEMÜ "Supplement to operating instructions" according to EC directive 94/9/EC must be observed.
- **Danger information:** Danger of static build up when incorrectly cleaned
- **Marking with Index X:** For special conditions and operation limits see documentation and EX type examination certificates
- **Text of warning sign:** Cleaning only with antistatic agents.
- **Assembly information:** Only carry out work in Ex-free atmosphere and avoid static built up

Adhere to legal regulations!

1.5. Repair

When repairing explosion proof devices observe relevant national regulations.

For the Federal Republic of Germany the following applies:

Repairs of parts on which the explosion protection depends must either be entirely checked by the manufacturer or by an acknowledged expert or authority and certified by their test mark or a certificate.

Only use genuine spare parts!

1.6. Information on assembly and cleaning

The following information may help when assembling and operating the combi switchbox GEMÜ 4226 in wet conditions where protection to IP65 is not sufficient.

- Lay the cable and piping so that the condensate or rain water that stays on the piping / lead cannot run into the cable glands of the combi switchbox GEMÜ 4226
- Check that all cable glands and fittings are tight
- Each time before closing check the housing seal for correct position and potential damage
- Close all covers immediately after use



CAUTION

Under no circumstances whatsoever may the combi switchbox GEMÜ 4226 be cleaned with a high pressure cleaning device, the protection class IP65 is not sufficient for this!

2. Manufacturere's information

2.1. Packaging

The combi switchbox is packed in a cardboard box which can be recycled as paper.

2.2. Delivery and performance

Check the goods for completeness and damages immediately upon receipt.

The scope of delivery is apparent from the dispatch documents and the design from the order number.

The performance of the combi switchbox is checked at the factory.

If a combi switchbox is ordered as a complete unit with a valve, these parts and the accessories belonging to them are supplied ready assembled and adjusted.

The combi switchbox GEMÜ 4226 is the ready for immediate operation

2.3. Storage

Store the combi switchbox dry in their original packaging. Avoid UV rays and direct sun irradiation.

2.4. Tool needed for installation and assembly

The tools required for installation and assembly are not included in the scope of delivery.

3. Mechanical mounting

When installing and operating explosion protected electrical systems the relevant regulations for installation and operation (e.g. IEC / EN60079-14 and VDE 0100 / valid national regulations) must be observed.



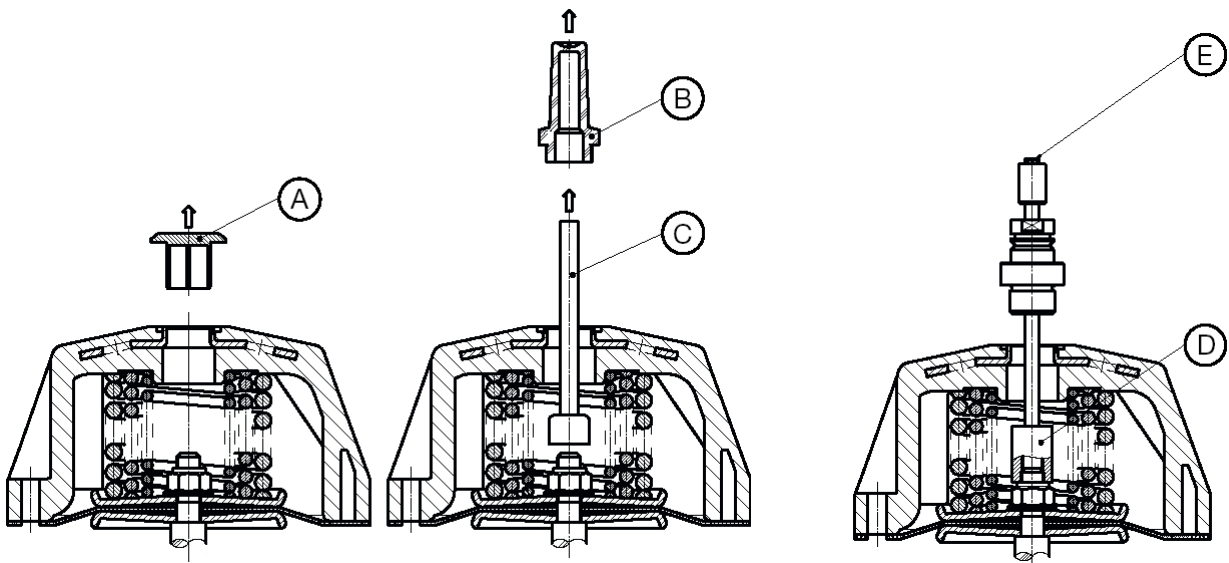
IMPORTANT

- Observe the information given on product labels, in product documentation and EC type examination certificate.
- Components may only be retrofitted when agreed with the manufacturer and in compliance with EC type examination certificate.
- Connect cable carefully, do not damage individual wires!
- When connecting multiwire or finewire cables, prepare the wire ends.
- Always use suitable pinch tools for pinching wire end ferrules in order to achieve consistent compression quality.
- Strongly tighten all clamping points, also those not used.

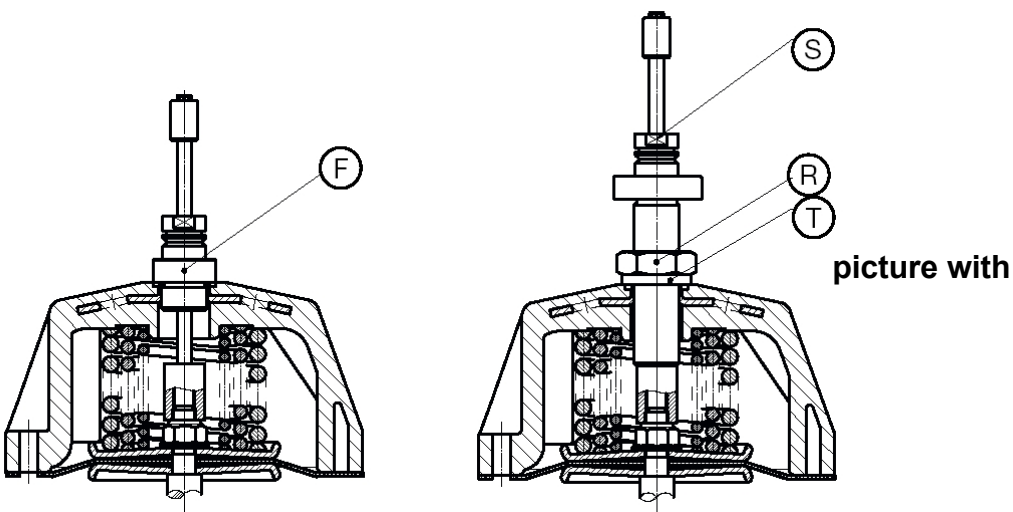
Potential earth for metal housing in potentially explosive atmosphere: minimum 4 mm². Secure connections against self-loosening.

Mount the combi switchbox GEMÜ 4226 with the operating spindle and seals to the actuator head.

Procedure for retrofitting to a process valve:



- Move the valve to the OPEN position
- Remove cap **A** and/or optical position indicator **B**, **C** from top of actuator
- Screw in adapter **D** using wrench surface **E**

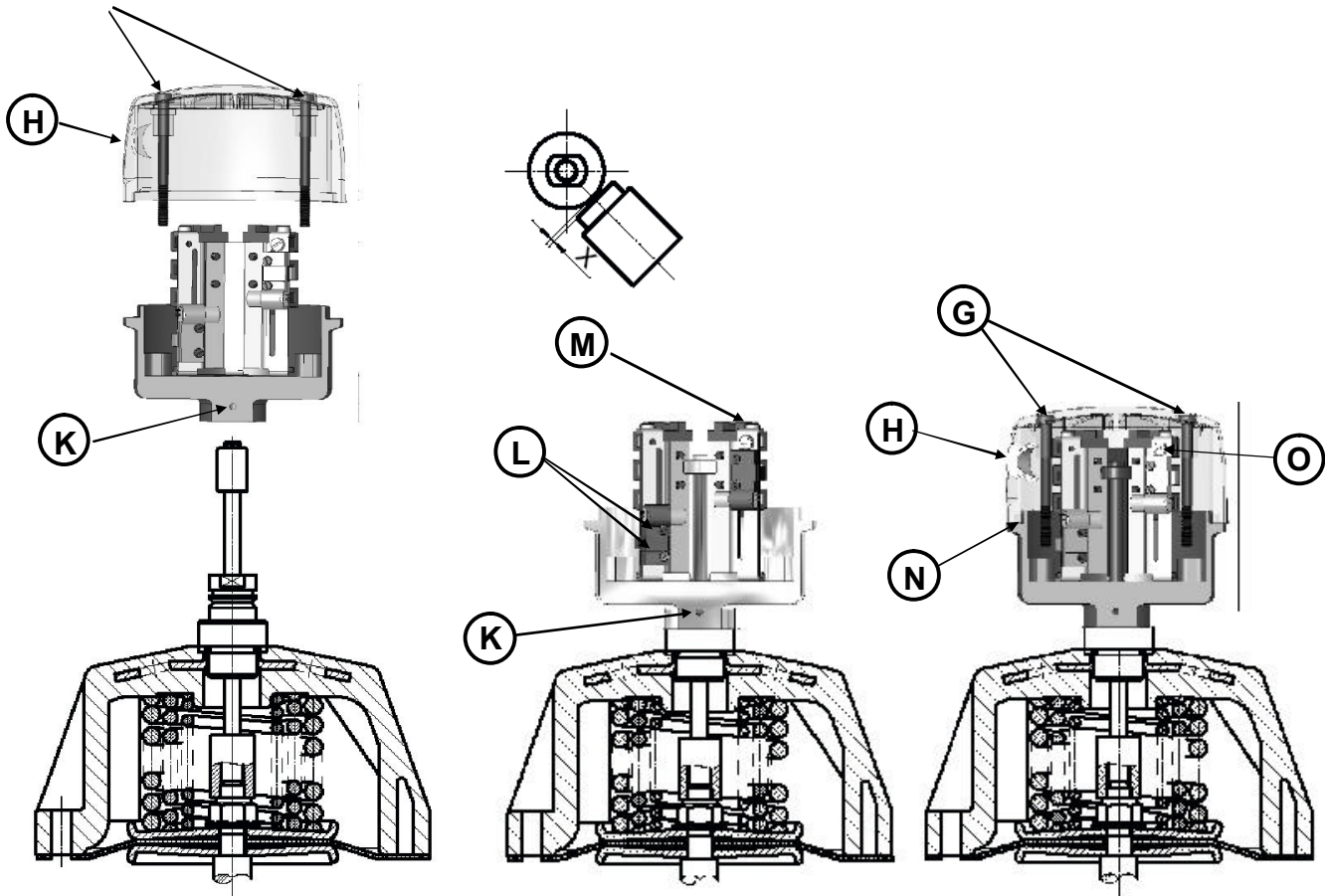


- Screw in bush **F**

Special feature for stroke limiter:



- **Important! To ensure correct installation and prevent damage, screw in the stroke limiter until resistance is felt!**
- Set stroke limiter with wrench surface **S**
- Fix nut **R** against the actuator top
- Only use O-ring seal **T** when installing stroke limiters for control functions 2 and 3



- Unscrew screw **G**
- Lift cover **H**
- Loosen grub screw **K**
Slip combi switchbox into bush **F** (taking care that control cams do not damage the switches)!
- Turn the combi switchbox into the desired connection direction and lock grub screw **K** in place.

Switch positions:

- Loosen both locking screws **L**
- Loosen locking screw **O**
- Adjust switch for CLOSED position in the axial direction using screw **M**.
Adjust switch for OPEN position by hand.
The switch may also slip in the radial direction. Therefore check the switching distance after setting the axial switch points as follows: $X = 0,7 \dots 1,1 \text{ mm}$
Ensure that the button is completely covered by the control cam to get a clear switching signal
- Tighten both locking screws **L**
- Tighten locking screw **O**
- Ensure correct mounting position of seal **N**
- Put on cover **H**
- Screw in screw **G**

i IMPORTANT

Take care that all sealing elements and threaded connections are correctly installed!

i IMPORTANT

After diaphragm change (and / or readjustment of the stroke limiter) readjust the switch points!

i IMPORTANT

Please observe the technical data of the respective data sheets!

4. Operation, Maintenance, Elimination of errors

The operator of an electrical system in a potentially explosive atmosphere must keep the production facilities in a proper condition and operate and monitor them properly and carry out service and maintenance work ((EN 60079-14).

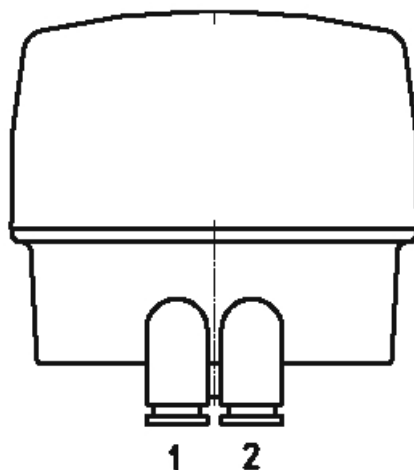
Maintenance work and work for eliminating errors may only be carried out by trained staff. With regard to the type of ignition protection, only genuine GEMÜ parts may be used as replacement parts (e.g. cover, seal / cable glands).

Before re-commissioning the valid laws and directives must be observed. Before carrying out maintenance work and / or eliminating errors the given safety instructions must be observed such as for example

DO NOT OPEN WHEN LIVE!

Only clean with a damp cloth!

5. Pneumatic connections

**Key**

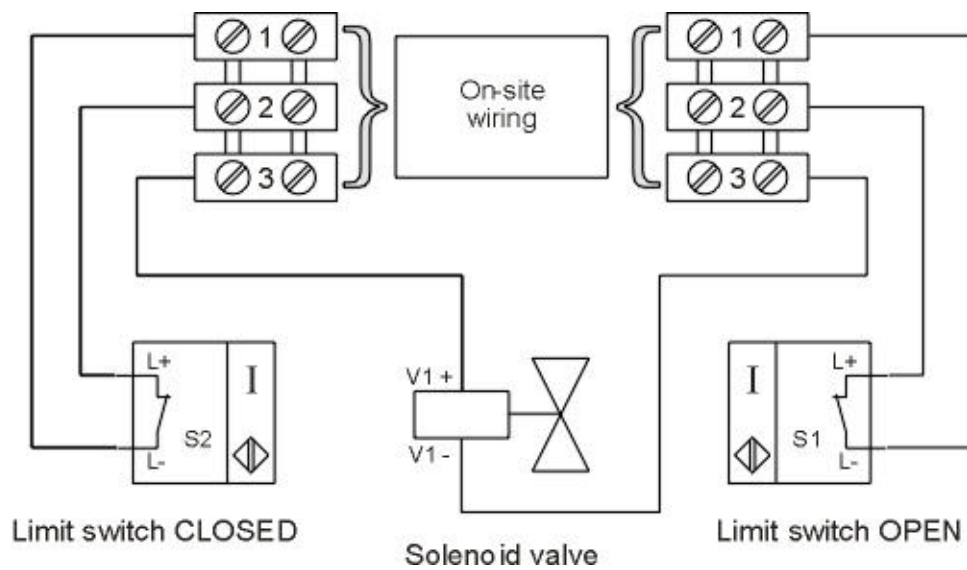
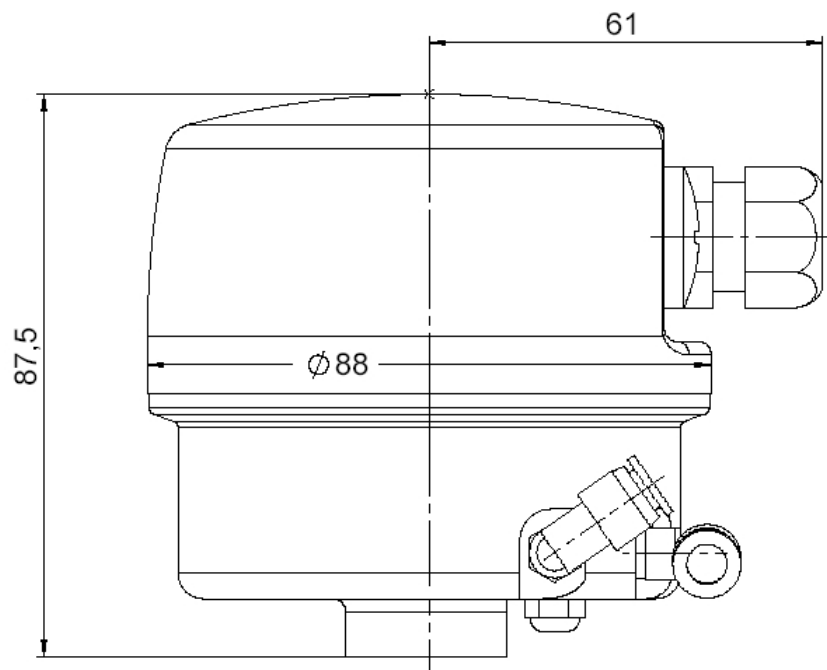
1 (P) = air supply

2 = outlet

i IMPORTANT

Air supply: 4...7 bar

Attention: Note maximum control pressure of pneumatic valve actuator!

6. Electrical connection**7. Dimensions****8. Technical data**

Operating conditions

Medium	lubricated / unlubricated air 5 µm
Ambient temperature	-10°C to +50°C
Protection class	IP 65
Intended for use with process valves whose opening / closing speed does not exceed 1 metre / second.	
Metallically isolated components have to be connected to the potential earth via charge eliminators by the user (see directive 1999/92/EC (ATEX 137) and national provisions)	

Solenoid valve

Rated voltage	24V DC -5% / +15%
Power consumption	0.1 W
Working pressure	4-7 bar
Flow factor kv	min. 8 l/min / 7 bar
Life expectancy	20.000.000 cycles

Proximity switch

Rated voltage	8 V NAMUR
Rated current, undamped	= 3 mA
Rated current, damped	< 1 mA
Max. switching frequency	1.0 kHz
Inductive proximity switch	P+F NJ 1,5-6,5-15N

Materials

Housing cover	Polysulfone PSU
Housing base	Stainless steel 1.4301
Guide piece	1.4305
Operating spindle	1.4104
Damping piece	1.4104

Electrical connection

Electrical connection	M16 cable gland
Cable diameter	5.5 to 10 mm
Recommended cross section of wire	0.75 mm²
Potential equalisation	standed wire, yellow/green H07 V-K 4.0

Explosion protection

Marking according to ATEX:

Mechanical device	II 2G IIB X
Electrical components	EEx II 2G ia IIB T6-T4

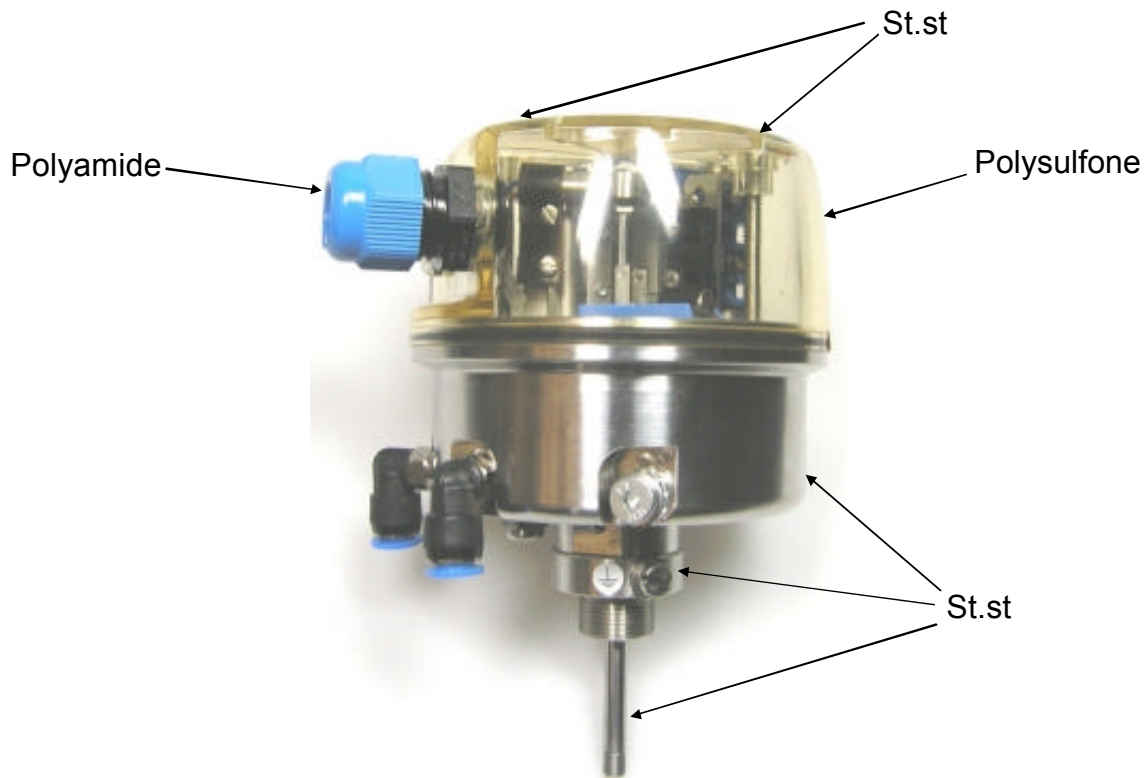
Note on index X: The original manufacturer's EC type examination data for the electrical components of the intrinsically safe electrical circuit must be observed.

Electrical OEM-components:

Solenoid valve	ATEX marking	EEX ia IIC T6
	EC type examination certificate number	INERIS 00ATEX0031X
Proximity switch	ATEX marking	II 2G EEx ia IIC T6
	EC type examination certificate number	PTB 00 ATEX 2048 X
Cable gland	ATEX marking	II 2G EEx e II
	EC type examination certificate number	PTB 99 ATEX 3101 X
Terminal	ATEX marking	II 2G EEx e II or I M2 EEx e I

9. Disposal

Disposal of the individual components should be separated by materials (materials see below). Dispose of metal and plastic internal components separately.



10. Reselling

If reselling used combi switchboxes, inform GEMÜ.

If used combi switchboxes are sold, the manufacturer's guarantee and liability expire.

The purchaser must be informed of the previous installation and use of the combi switchbox with respect to media, media concentration, pressure, temperature and ambient conditions.

11. Returns

Returns must always be made with a declaration of return (copy specimen on the following page or download from the GEMÜ internet site).

If not completed, GEMÜ cannot process

1. Credits
2. Repair works

but disposal at the operator's expense.

Goods return declaration (copy specimen)

Legal regulations for the protection of the environment and personnel require that you include the completed and signed goods return declaration with the dispatch documents.

If this declaration is not completed or not included with the dispatch documents, your return will not be processed!

If the valve / device was operated with poisonous, corrosive, flammable, aggressive or water-endangering media, all medium wetted parts must be emptied carefully, decontaminated and rinsed. Select an appropriate transport container, label it with the name of medium which the valve / device had made contact. This serves to avoid personal injury or damage to property from remains of media.

Company details:

Company
Address
.....
Contact person
Telephone number
Fax number
E-Mail

Valve / device information

Type:
Year of manufacture:
Serial number:
Ambient temperature:
Media:
.....
.....
Concentration:
.....
.....
Operating temperature:
Operating pressure:
Viscosity:
Solids content:

Reason for return:

.....
.....
.....
.....
.....
.....

Please tick the relevant warning labels:



radioactive



explosive



corrosive



poisonous



harmful to health



bio-hazardous



oxidising



harmless

We herewith declare that the returned parts were cleaned and that according to danger protection regulations there is no danger from remains of media for persons or for the environment.

Location, Date

Stamp / signature

12. Manufacturer's declaration / information

Handling, assembly and commissioning, in addition to setting and adjustment of the machine must be performed only by authorized specialist staff.

Note:

Connection and adjustments may only be carried out by authorised specialist staff. The manufacturer shall assume no liability whatsoever for damages caused by improper or third-party actions. In case of doubt, contact us before commissioning.

Note on staff training

Please contact us at the address below for staff training information.

Should there be any doubts or misunderstandings in the preceding text, the German version of this document is the authoritative document! (Copy available upon request)