

# GEMÜ 1434 $\mu$ Pos

Intelligent electro-pneumatic positioner

EN

## Operating instructions



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**Quick commissioning****⚠ CAUTION****Hazardous situation**

- ▶ Risk of injury or damage possible.
- For correct commissioning, the product must be calibrated to the process valve by means of the initialization process.
- During this commissioning, the valve is automatically opened and closed several times. It must therefore be ensured in advance that this does not lead to a dangerous situation.

**NOTICE****Operating errors**

- Prior to commissioning, familiarize yourself with operation of the product.

**NOTICE****Incorrect initialization**

- Always carry out initialization without operating medium pressure on the process valve

**NOTICE**

- For delivery of the product assembled on a valve at the factory, the complete construction is already ready for operation at a control pressure of 5.5 to 6 bar without operating pressure. A reinitialization is recommended if the plant is operated with a different control pressure or if the mechanical end positions have been changed (e.g. seal replacement on the valve or actuator replacement). The initialization is retained even in the event of voltage cutoff.

**NOTICE**

- For delivery of the product without factory setting (e.g. for delivery without valve) initialization must be carried out once for correct operation. This initialization must be repeated every time that the process valve is changed (e.g. seal replacement or actuator replacement).

1. Mount the product on the process valve mechanically using the mounting kit.
2. Connect the product pneumatically:
  - ⇒ Supply the connector **1** with pneumatic control air supply (max. 8/10 bar).
  - ⇒ Connect the connector **2** to the control air connector of the process valve.
3. Connect the product electrically:
  - ⇒ Connect 24 V DC supply voltage – pin 1: +24 V; pin 3: GND (LED POWER lights up, LED OPEN, ERROR, CLOSED flash) <sup>1)</sup>.
  - ⇒ Connect set value signal – pin 2: Iw+/Uw+; pin 3: GND (Iw-/Uw-) <sup>2)</sup>.
4. Start automatic initialisation (speed-<sup>AP</sup> function):
  - ⇒ Briefly activate 24 V DC initialisation impulse ( $t > 100$  ms) on pin 5 (LED OPEN/CLOSED flash alternately) and deactivate it again <sup>3)</sup>.
  - ⇒ The initialisation phase lasts a few minutes, during which the process valve is opened and closed several times. The initialisation process is ended automatically.
5. The product is ready for operation and responds to an externally specified set value signal.

<sup>1)</sup> Provided that an initialisation has not been previously carried out, otherwise deviating operating status display.

<sup>2)</sup> Set value signal is not required for initialisation and can optionally be connected later.

<sup>3)</sup> If the input has not been wired on the system side, the separately obtained initialisation kit 1434 000 ZIK can be used for this. Alternatively, for connectors without cable, the housing of the M12 connector, with which the product has been connected, can be opened and a temporary wire bridge can be attached from pin 1 to pin 5.

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## 1 General information

### 1.1 Information

- The descriptions and instructions apply to the standard versions. For special versions not described in this document the basic information contained herein applies in combination with any additional special documentation.
- Correct installation, operation, maintenance and repair work ensure faultless operation of the product.
- Should there be any doubts or misunderstandings, the German version is the authoritative document.
- Contact us at the address on the last page for staff training information.

### 1.2 Symbols used

The following symbols are used in this document:

Symbol	Meaning
●	Tasks to be performed
▶	Response(s) to tasks
–	Lists

### 1.3 LED symbols

LED conditions	Symbol
Off	○
Lit (on)	●
Flashes on briefly, f=1.66 Hz; 0.30 s on/0.3 s off	⦿
Flashes slowly, f=3.33 Hz; 0.15 s on/0.15 s off	⦿
Flashes fast, f=1.66 Hz; 0.15 s on/0.45 s off	⦿

### 1.4 Definition of terms

#### Working medium

The medium that flows through the GEMÜ product.

#### Control function

The possible actuation functions of the GEMÜ product.

#### Control medium

The medium whose increasing or decreasing pressure causes the GEMÜ product to be actuated and operated.

#### Speed-<sup>AP</sup> function

Speed Assembly and Programming, a particularly user-friendly commissioning function for fast mounting, automated setting and initialization of GEMÜ products. Dependent on type, activation uses an external impulse signal or existing precautions on the device (magnetic or housing switch). Changeover to normal operating mode takes place automatically after successful completion.

### 1.5 Warning notes

Wherever possible, warning notes are organised according to the following scheme:

SIGNAL WORD	
Possible symbol for the specific danger	<b>Type and source of the danger</b> <ul style="list-style-type: none"> <li>▶ Possible consequences of non-observance.</li> <li>● Measures for avoiding danger.</li> </ul>

Warning notes are always marked with a signal word and sometimes also with a symbol for the specific danger.

The following signal words and danger levels are used:

<b>⚠ DANGER</b>	
	<b>Imminent danger!</b> <ul style="list-style-type: none"> <li>▶ Non-observance can cause death or severe injury.</li> </ul>
<b>⚠ WARNING</b>	
	<b>Potentially dangerous situation!</b> <ul style="list-style-type: none"> <li>▶ Non-observance can cause death or severe injury.</li> </ul>
<b>⚠ CAUTION</b>	
	<b>Potentially dangerous situation!</b> <ul style="list-style-type: none"> <li>▶ Non-observance can cause moderate to light injury.</li> </ul>
<b>NOTICE</b>	
	<b>Potentially dangerous situation!</b> <ul style="list-style-type: none"> <li>▶ Non-observance can cause damage to property.</li> </ul>

The following symbols for the specific dangers can be used within a warning note:

Symbol	Meaning
	Danger of explosion

## 2 Safety information

The safety information in this document refers only to an individual product. Potentially dangerous conditions can arise in combination with other plant components, which need to be considered on the basis of a risk analysis. The operator is responsible for the production of the risk analysis and for compliance with the resulting precautionary measures and regional safety regulations.

The document contains fundamental safety information that must be observed during commissioning, operation and maintenance. Non-compliance with these instructions may cause:

- Personal hazard due to electrical, mechanical and chemical effects.
- Hazard to nearby equipment.
- Failure of important functions.
- Hazard to the environment due to the leakage of dangerous materials.

The safety information does not take into account:

- Unexpected incidents and events, which may occur during installation, operation and maintenance.
- Local safety regulations which must be adhered to by the operator and by any additional installation personnel.

### Prior to commissioning:

1. Transport and store the product correctly.
2. Do not paint the bolts and plastic parts of the product.
3. Carry out installation and commissioning using trained personnel.
4. Provide adequate training for installation and operating personnel.
5. Ensure that the contents of the document have been fully understood by the responsible personnel.
6. Define the areas of responsibility.
7. Observe the safety data sheets.
8. Observe the safety regulations for the media used.

### During operation:

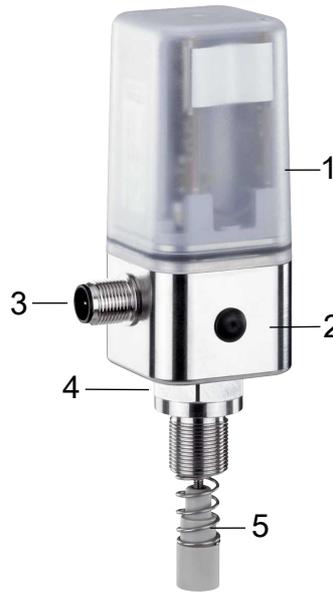
9. Keep this document available at the place of use.
10. Observe the safety information.
11. Operate the product in accordance with this document.
12. Operate the product in accordance with the specifications.
13. Maintain the product correctly.
14. Do not carry out any maintenance work and repairs not described in this document without consulting the manufacturer first.

### In cases of uncertainty:

15. Consult the nearest GEMÜ sales office.

## 3 Product description

### 3.1 Construction

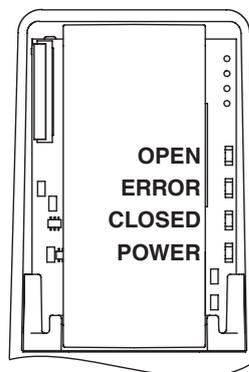


Item	Name	Materials
1	Housing cover	Polypropylene (UV-stabilised)
2	Housing base	Anodized aluminium or stainless steel
3	Electrical connection	Threaded piece: Stainless steel (1.4305), insert: PA
4	Adapter piece	Stainless steel (1.4305)
5	Mounting kit, valve specific	Materials, parts valve specific
	Seals	EPDM and NBR

### 3.2 LED displays

#### 3.2.1 Status LEDs

Using the status LEDs, the different operating conditions of the product can be determined.

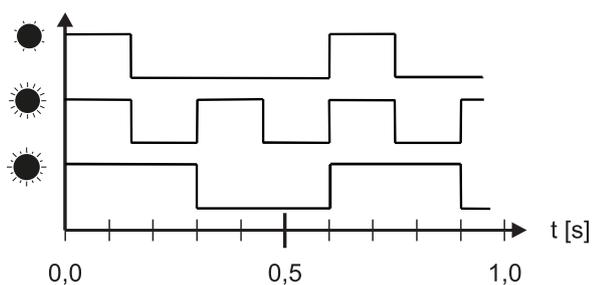


LED	Colour	Function
<b>OPEN</b>	Yellow	Process valve is opening/in OPEN position
<b>ERROR</b>	Red	Error
<b>CLOSED</b>	Orange	Process valve is closing/in CLOSED position
<b>POWER</b>	Yellow	Power

The function of the LED can differ in the case of an active ERROR LED (see operating instructions).

### 3.2.2 LED conditions

Function	OPEN	ERROR	CLOSED	POWER
Position reached	○	○	○	●
Valve in OPEN end position	●	○	○	●
Valve in CLOSED end position	○	○	●	●
Valve OPENS	☀	○	○	●
Valve CLOSES	○	○	☀	●
Initialisation phase	☀	○	☀	●



LED condition	Symbol
Lit (on)	●
Off	○
Flashes on briefly, f=1.66 Hz; 0.30 s on/0.3 s off	☀
Flashes slowly, f=3.33 Hz; 0.15 s on/0.15 s off	☀
Flashes fast, f=1.66 Hz; 0.15 s on/0.45 s off	☀

### 3.3 Description

The GEMÜ 1434  $\mu$ Pos digital electro-pneumatic positioner is used to control small to medium nominal size process valves with single acting linear actuators. The solid compact housing has a transparent cover. LEDs for status indication are integrated. Due to factory preconfiguration, this product does not require a display with operating keys. Pneumatic and electrical connections are arranged so as to save space and enable easy access. All these features make the GEMÜ 1434  $\mu$ Pos a cost-effective solution for control valves with basic requirements.

### 3.4 Function

The GEMÜ 1434  $\mu$ Pos digital electro-pneumatic positioner is an intelligent digital positioner designed for mounting to pneumatic actuators. The product is directly mounted to the actuator as standard. The travel sensor is already integrated in the positioner.

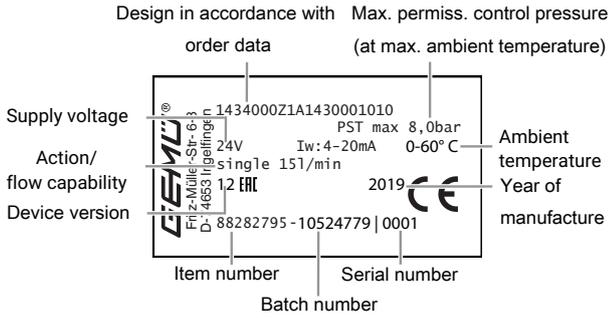
Optionally, the product can be ordered for an external mounting type, in which a separate travel sensor is connected using an M12 connector.

The travel sensor measures the current position of the valve and reports it to the electronic system of the product. The electronic system then compares the actual value of the valve with the set value specified and readjusts the valve accordingly in the event of a control error.

The optional actual value output provides the valve position currently determined (in same direction according to rule diagram) as an analogue value.

For correct operation, the positioner must first be calibrated (initialised) to the connected process valve. This is carried out using the automatic initialisation function, which can be activated by a momentary voltage pulse at the programming input. Once this has been carried out, the positioner automatically switches to the normal operating mode and responds to the specified external set value signal.

**3.5 Product label**



**NOTICE**

**Device version**

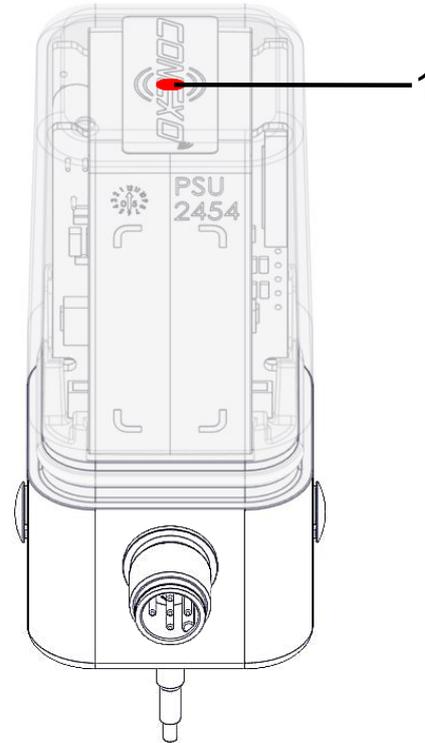
► These instructions are valid for devices from device version 10. It is possible to determine which firmware has been used on the basis of the device version. For older devices (device version older than 10), different operating instructions with potentially different operating specifications are used.

Device version	Firmware version	Effective from	Changes
10	V2.0.0.0	09/2013	
11	V2.0.0.2	12/2013	Optimization of initialisation routine for normally open valves
12	V2.0.0.4	12/2016	Optimization of actuation behaviour of small-volume linear actuators with low stroke

**4 GEMÜ CONEXO**

**Order variant**

In the corresponding design with CONEXO, this product has an RFID chip (1) for electronic identification purposes. The position of the RFID chip can be seen below. The CONEXO pen helps read out information stored in the RFID chips. The CONEXO app or CONEXO portal is required to view this information.



For further information please read the operating instructions for CONEXO products or the CONEXO datasheet.

Products such as the CONEXO app, the CONEXO portal and the CONEXO pen are not included in the scope of delivery and need to be ordered separately.

## 5 Correct use

### DANGER



#### Danger of explosion

- ▶ Risk of severe injury or death.
- Do **not** use the product in potentially explosive zones.
- The product can control valves in potentially explosive areas using special wiring (installation of the positioner outside the EX area).

### WARNING

#### Improper use of the product

- ▶ Risk of severe injury or death.
- ▶ Manufacturer liability and guarantee will be void.
- Only use the product in accordance with the operating conditions specified in the contract documentation and in this document.

The product is not intended for use in potentially explosive areas.

The product with integrated pilot valves is designed for linear actuators, has a microprocessor-controlled intelligent position control as well as an analogue travel sensor system (potentiometer) and is connected in a force-locking way with the actuator spindle by means of a mounting kit (spring, operating bush). The valve position and the integrated travel sensor can be monitored via the electrical connections. The pneumatic actuator is directly operated and controlled by means of the pilot valves.

## 6 Order data

The order data provide an overview of standard configurations.

Please check the availability before ordering. Other configurations available on request.

Note: Pneumatic connecting components (union and compressed air tube) for the connection between the process valve and positioner are included with each positioner with a pneumatic connection (7) code 2 and 3.

Note: A valve specific mounting kit is required for assembly. For designing the mounting kit, the valve type, nominal size, control function and actuator size must be stated.

### Order codes

1 Type	Code
Electro-pneumatic positioner µPos	1434

2 Fieldbus	Code
Without (3-wire version)	000

3 Accessory	Code
Accessory	Z

4 Action	Code
Single acting	1

5 Set value input	Code
4–20 mA, set value specification	A
0–20 mA, set value specification	B
0–10 V, set value specification	C

6 Accessory housing material	Code
Stainless steel base, PP cover	07
3.2315, AlMgSi1/AlSi1MgMn	14

7 Pneumatic connection	Code
Air supply M5 connection thread, outlet M5 connection thread	1
Air supply via push-in connector, angle, for 4 mm tube, outlet via push-in connector, angle, for 4 mm tube	2
Air supply via push-in connector, angle, for 6 mm tube, outlet via push-in connector, angle, for 6 mm tube	3
Air supply via push-in connector, angle, for 1/4" mm tube, outlet via push-in connector, angle, for 1/4" mm tube	U

8 Option	Code
Without	00
4–20 mA, actual value output	A0
0–20 mA, actual value output	B0
0–10 V, actual value output	C0

9 Flow rate	Code
15 l/min	01

10 Travel sensor version	Code
Potentiometer, 10 mm length	010
Potentiometer, 30 mm length	030
Remote potentiometer, M12 connector	S01

11 Type of design	Code
Standard	
Dead zone presetting 2%	2442
Dead zone presetting 5%	2443
Inversed direction, for quarter turn valves control function NO (2)	6960

12 CONEXO	Code
Without	
Integrated RFID chip for electronic identification and traceability	C

**Order example**

Ordering option	Code	Description
1 Type	1434	Electro-pneumatic positioner μPos
2 Fieldbus	000	Without (3-wire version)
3 Accessory	Z	Accessory
4 Action	1	Single acting
5 Set value input	A	4–20 mA, set value specification
6 Accessory housing material	14	3.2315, AlMgSi1/AlSi1MgMn
7 Pneumatic connection	3	Air supply via push-in connector, angle, for 6 mm tube, outlet via push-in connector, angle, for 6 mm tube
8 Option	00	Without
9 Flow rate	01	15 l/min
10 Travel sensor version	010	Potentiometer, 10 mm length
11 Type of design		Without
12 CONEXO		Without

## 7 Technical data

### 7.1 Medium

<b>Working medium:</b>	Compressed air and inert gases
<b>Dust content:</b>	Class 3, max. particle size 5 µm, max. particle density 5 mg/m <sup>3</sup>
<b>Pressure dew point:</b>	Class 3, max. pressure dew point -20 °C
<b>Oil content:</b>	Class 3, max. oil concentration 1 mg/m <sup>3</sup> Quality classes to DIN ISO 8573-1

### 7.2 Temperature

<b>Storage temperature:</b>	-10 – 60 °C
-----------------------------	-------------

### 7.3 Pressure

<b>Operating pressure:</b>	0 to 10 bar (max. 40 °C) 0 to 8 bar (max. 60 °C) The applied pressure must not exceed the maximum control pressure of the process valve.
<b>Flow rate:</b>	15 NI/min
<b>Air consumption:</b>	0 NI/min (when idle)

### 7.4 Product compliance

<b>EMC Directive:</b>	2014/30/EU
	Technical standards used:
Interference emission:	DIN EN 61000-6-4 (Sep. 2011) Interference emission class: Class A Interference emission group: Group 1
Interference resistance:	DIN EN 61000-6-2 (March 2006)

### 7.5 Mechanical data

<b>Installation position:</b>	Optional
<b>Protection class:</b>	IP 65 acc. to EN 60529 IP 67 in accordance with EN 60529, achieved with piped air outlet. Replace with M5 adapters for connection 3 and E threaded plug connectors (1434 000 Z2, 2 pieces required) for this purpose.
<b>Weight:</b>	220 g
<b>Travel sensor:</b>	Integrated for direct mounting

	Travel sensor version	
	Code 010	Code 030
<b>Detection range:</b>	0–10 mm	0–30 mm
<b>Operating range:</b>	0–10 mm	0–30 mm
<b>Resistance:</b>	1 kΩ	3 kΩ
<b>Minimum travel sensor change:</b>	3% (only relevant for initialisation)	
<b>Correlation - Travel sensor<sup>1)</sup> spindle/valve position</b>	Retracted (top) ± 100% (valve open) Extended (bottom) ± 0% (valve closed)	

1) Design code 6960: Inversed mode of action compared with description (Travel sensor signal inversed). For valves with inverted correlation.

## 7.6 Electrical data

### 7.6.1 Power supply

<b>Supply voltage:</b>	24 V DC (-5/+10%)
<b>Power consumption:</b>	≤ 4 W
<b>Reverse battery protection:</b>	yes
<b>Duty cycle:</b>	Continuous duty
<b>Electrical protection class:</b>	III
<b>Electrical connection type:</b>	X1: Connector (A-coded), 1 x 5-pin M12 X3*: Plug (A-coded), 1 x 5-pin M12 * Only for travel sensor version with remote potentiometer (code S01).

### 7.6.2 Analogue input

<b>Set value input:</b>	4–20 mA (code A) 0–20 mA (code B) 0–10 V (code C)
<b>Input type:</b>	passive
<b>Input load:</b>	0/4–20 mA: 50 Ω + approx. 0.7 V voltage drop due to reverse battery protection 0–10 V: 100 kΩ
<b>Accuracy/linearity:</b>	≤ ±0.3% of full flow
<b>Temperature drift:</b>	≤ ±0.3% of full flow
<b>Resolution:</b>	12 bit
<b>Reverse battery protection:</b>	yes
<b>Overload proof:</b>	Yes (up to max. 30 V DC)

### 7.6.3 Analogue output

<b>Note:</b>	The analogue output must be ordered using the ordering option "Option".
<b>Actual value output:</b>	4–20 mA (ordering option code A0) 0–20 mA (ordering option code B0) 0–10 V (ordering option code C0)
<b>Output type:</b>	active
<b>On-load current:</b>	0–10 V: Max. 10 mA
<b>Load resistor:</b>	0/4–20 mA: Max. 600 Ω
<b>Accuracy/linearity:</b>	≤ ±1% of full flow
<b>Temperature drift:</b>	≤ ±0.5% of full flow

<b>Resolution:</b>	12 bit
<b>Short-circuit proof:</b>	yes
<b>Overload proof:</b>	Yes (up to max. 30 V DC)

#### **7.6.4 Programming input initialisation (speed-AP function)**

<b>Input voltage:</b>	24 V DC
<b>Input current:</b>	1.3 mA at 24 V DC
<b>High level:</b>	>14 V DC
<b>Low level:</b>	< 8 V DC

#### **7.6.5 Travel sensor input (for travel length code S01 – remote potentiometer)**

<b>Supply voltage <math>U_{p+}</math>:</b>	Typically 3.3 V DC
<b>Resistance range of remote potentiometers:</b>	1 to 10 k $\Omega$
<b>Input voltage range:</b>	0 to UP+
<b>Input resistance:</b>	1.2 M $\Omega$
<b>Accuracy/linearity:</b>	$\leq \pm 0.3\%$ of full flow
<b>Temperature drift:</b>	$\leq \pm 0.3\%$ of full flow
<b>Resolution:</b>	12 bit

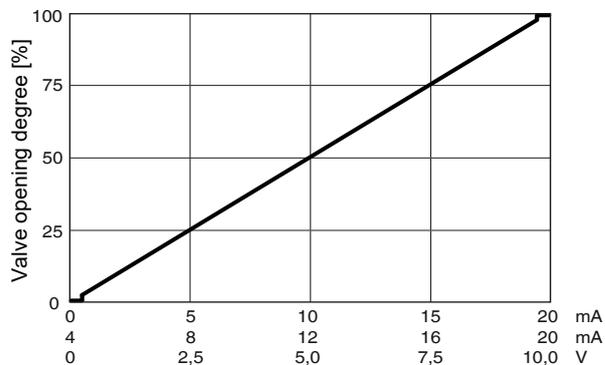
### 7.6.6 Positioner data

**Note:**

Interferences to the set value signal can affect positioner activities

Following diagram valid for valves with standard correlation between spindle position and valve position.

(See section "Mechanical data, correlation between travel sensor spindle/valve position")

**Control diagram:**


The GEMÜ 1434  $\mu$ Pos digital electro-pneumatic positioner automatically detects the control function of the valve during initialization: Normally open (NO) or normally closed (NC).

For the 0/4 mA or 0 V signal specification, the position of the valve is closed.

The close tight function integrated as standard ensures that the valve is moved completely to the end position when the signal Open or Close valve is given.

**Control error:**

$\leq 1\%$  (standard)

$\leq 2\%$  (K-no. 2442)

$\leq 5\%$  (K-no. 2443)

**Initialisation:**

Automatic via 24 V DC signal

**Close tight function:**

Closed:  $W \leq 0.5\%$

Open:  $W \geq 99.5\%$

**8 Dimensions**

**8.1 Direct mounting**

**8.1.1 Travel sensor version code 010/030**

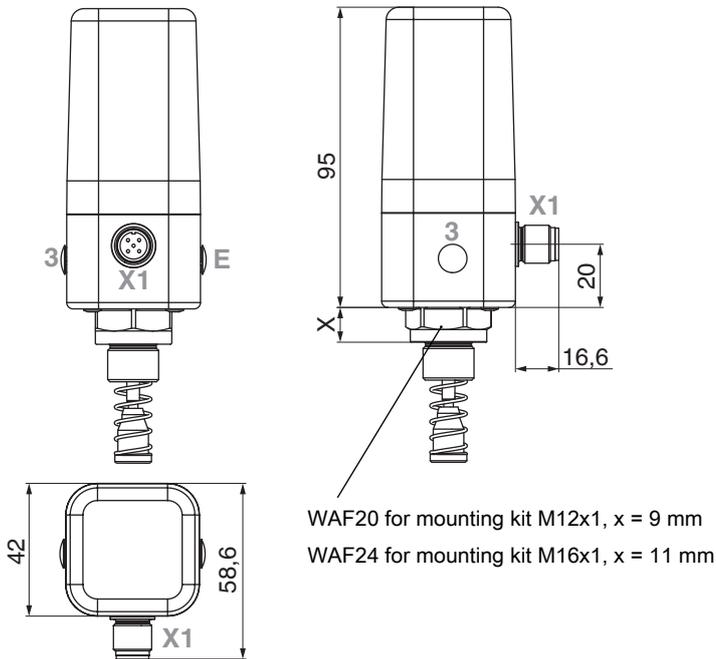
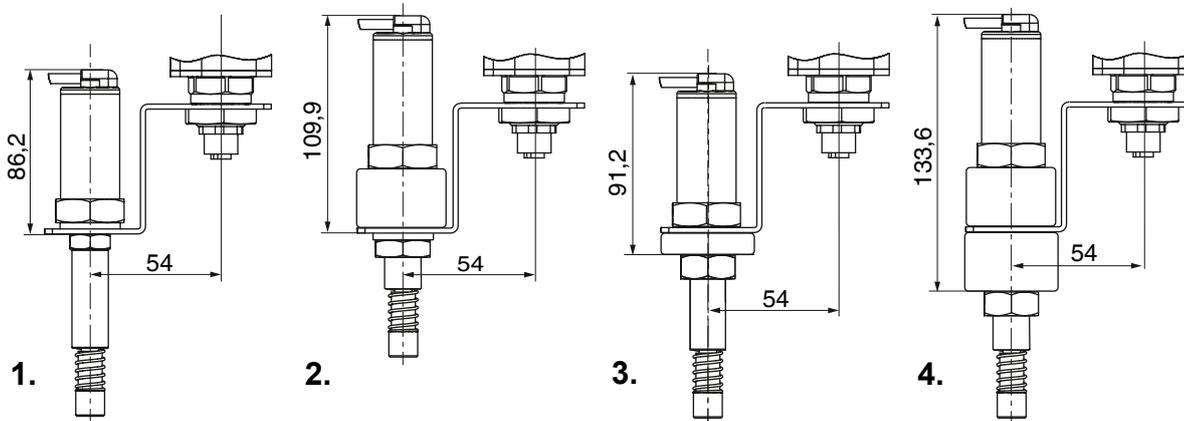


Figure including mounting kit

Dimensions in mm

**8.2 Direct mounting via mounting bracket**

**8.2.1 Travel sensor version code S01 + mounting kit 1444**



Dimensions in mm

See mounting options – valve-specific GEMÜ 1444 000 Z... mounting kit

**Version dependent on valve used**

1. Normally closed valve, M16 adaption thread – standard
2. Normally closed valve, M16 adaption thread – special construction type for GEMÜ 9415
3. Normally closed valve, M22 adaption thread
4. Normally open or double acting valve, M16 or M22 adaption thread

### 8.3 Remote mounting

#### 8.3.1 Travel sensor version code S01

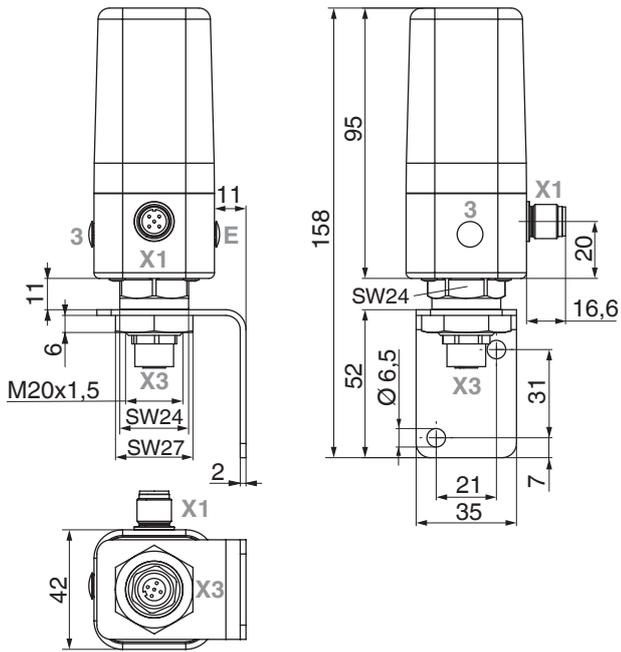


Figure including separately available mounting bracket

Dimensions in mm

## 9 Manufacturer's information

### 9.1 Delivery

- Check that all parts are present and check for any damage immediately upon receipt.

The product's performance is tested at the factory. The scope of delivery is apparent from the dispatch documents and the design from the order number.

### 9.2 Transport

1. Only transport the product by suitable means. Do not drop. Handle carefully.
2. After the installation dispose of transport packaging material according to relevant local or national disposal regulations / environmental protection laws.

### 9.3 Storage

1. Store the product free from dust and moisture in its original packaging.
2. Avoid UV rays and direct sunlight.
3. Do not exceed the maximum storage temperature (see chapter "Technical data").
4. Do not store solvents, chemicals, acids, fuels or similar fluids in the same room as GEMÜ products and their spare parts.

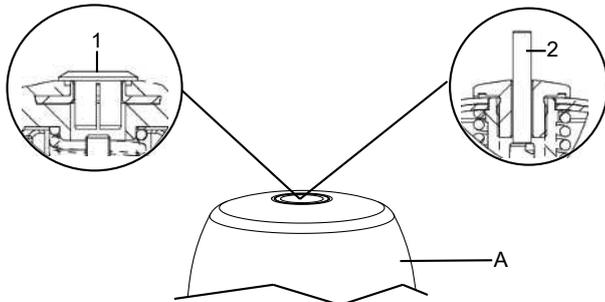
## 10 Mounting

The positioner with travel sensor version 10 mm (code 010) or 30 mm (code 030) must be mounted directly on the valve. For this, follow the instructions in chapter 10.2 Mounting kit assembly: Direct mounting.

The positioner with connection for an external travel sensor (code S01) can be mounted using a mounting bracket on the wall or in another suitable position. The external travel sensor must be mounted directly on the valve. For this, follow the instructions in chapter 10.3 Mounting kit assembly: With mounting bracket/external.

### 10.1 Preparations for mounting to the valve

1. Move the actuator **A** into zero position (actuator vented).
2. Remove optical position indicator **2** and / or protective cap **1** from the actuator top.



### 10.2 Mounting kit assembly: Direct mounting

Item	Name	Item	Name
1	Spindle	7	Flange plate
2	Spring	8	Screws
3	Operating bush	9	Pressure disc*
4	Distance piece	10	O-ring*
5	O-ring	11	O-ring*
6	Adapter		

\* Included depending on version.

**⚠ CAUTION**

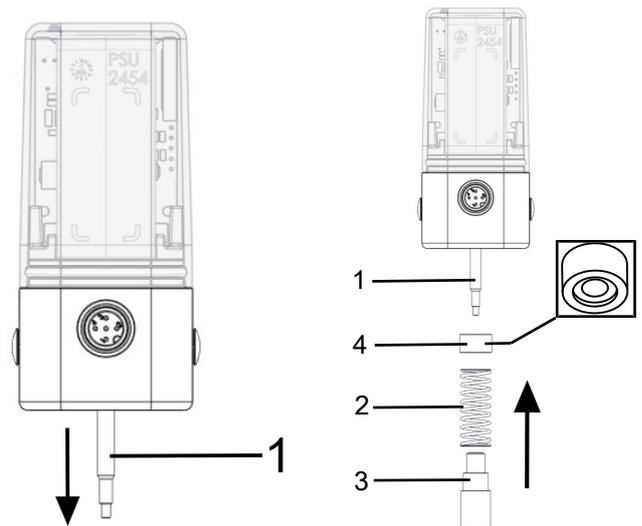
**Pretensioned spring!**

- ▶ Damage to the device.
- Slowly release the tension in the spring.

**⚠ CAUTION**

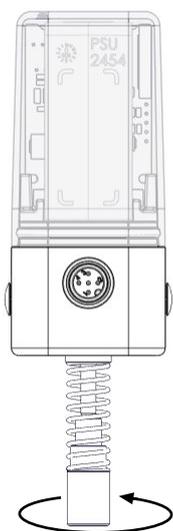
**Do not scratch the spindle!**

- ▶ A damaged spindle surface may cause failure of the travel sensor.

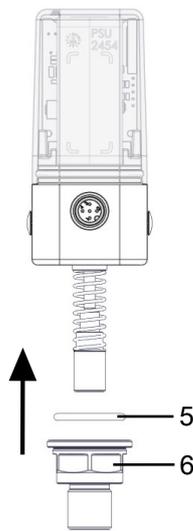


1. Pull out the spindle 1.

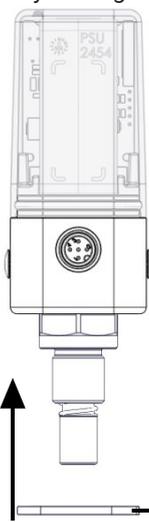
2. Align the indentation of the distance piece 4 to the spring and push it over the spindle 1 using the spring 2 and fix it in place using the operating bush 3.



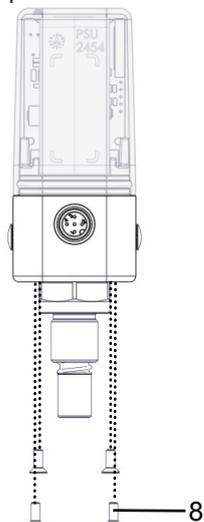
3. Tighten the operating bush **3** by turning it clockwise.



4. Affix the O-ring **5** and the adapter **6**.



5. Attach the flange plate **7**

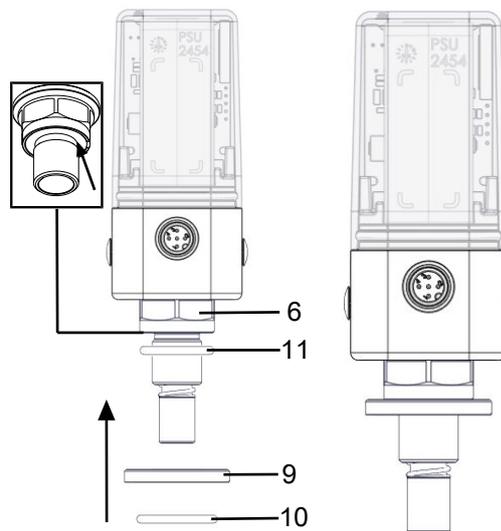


6. Screw the flange plate on tight using screws **8** (1 – 1,5 Nm).

- Push in the spindle until it pushes against the spring and then slowly release the pressure on the spring.

### NOTICE

- ▶ For some valves (e.g. GEMÜ 650 and GEMÜ 687) it is necessary to fit a pressure disc between the threaded adapter and the actuator head. This is included in the required mounting kits, sometimes with an additional O-ring (only GEMÜ 650 with normally open and double-acting control function – code 2+3).
- ▶ If the pressure disc does not have a groove for a seal, this will already be inserted in the groove provided at the adapter opening of the actuator head (e.g. GEMÜ 687 with normally open control function – code 2).



Insert the O-ring **11** (if included) into the corresponding disc **9** over the adapter **6** and groove on the adapter **6**.

If included: Push the pressure disc **9** into the corresponding disc **9** over the adapter **6** and insert the O-ring **10** in the intended groove of the pressure disc.

### 10.3 Mounting kit assembly: With mounting bracket/ external

#### ⚠ CAUTION

#### Pretensioned spring!

- ▶ Damage to the device.
- Slowly release the tension in the spring.

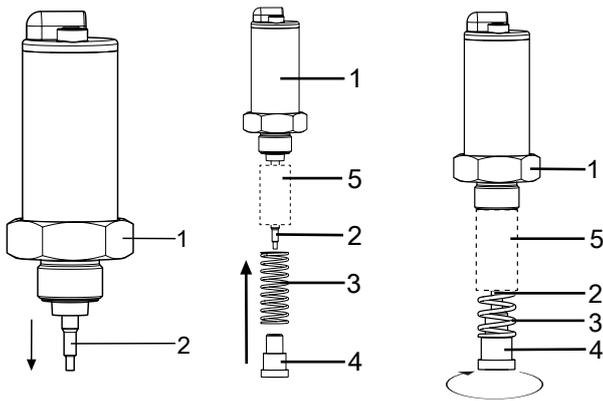
#### ⚠ CAUTION

#### Do not scratch the spindle!

- ▶ A damaged spindle surface may cause failure of the travel sensor.

Item	Name
1	Travel sensor
2	Spindle
3	Spring
4	Operating spindle
5	Guide bush*

\*Included depending on version



1. Pull the spindle **2** out of the travel sensor **1**.
2. If included, push the guide bush **5** taper over the spindle **2** first.
3. Push the spring **3** over the spindle **2** and secure with the operating bush **4**.
4. Tighten the operating bush **4** by turning it clockwise.
  - Push in the spindle until it pushes against the spring and then slowly release the pressure on the spring.

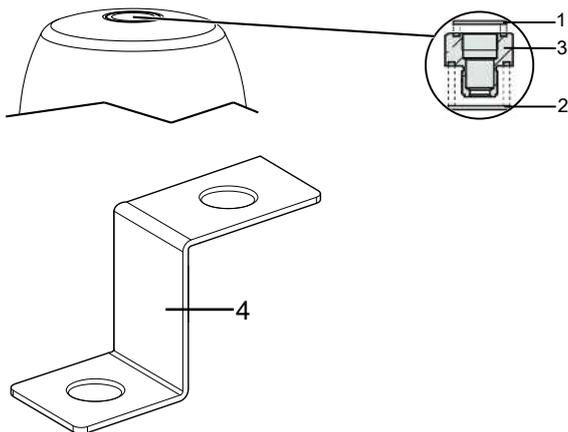
**10.4 Installing the adapter**

With some mounting kits it is necessary to install an adapter as well. These adapters are included with the required mounting kits. Valves with a normally open and double acting control function (code 2+3) also include additional O-rings (1+2).

**NOTICE**

- The adapter only needs to be mounted if included.
- There are two variants for mounting the adapter.

- **One adapter included with or without mounting bracket.**
- **Two adapters included (identical or different design) with mounting bracket.**



1. Move the actuator to the closed position.
2. Place O-rings **1** and **2** into adapter **3**.

**If one adapter is included:**

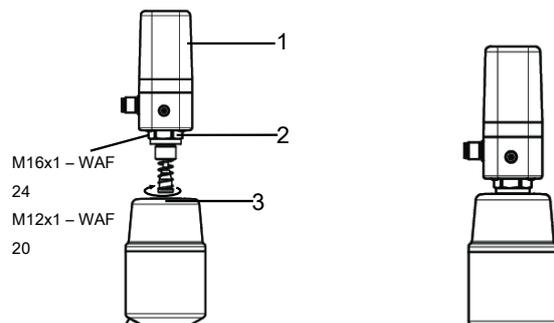
3. Screw the adapter **3** into the actuator opening as far as it will go and tighten.

⇒ In some cases, if included, a mounting bracket may also need to be mounted under the adapter (see chapter 10.6, Direct mounting with mounting bracket type 2). Otherwise, the mounting bracket included is mounted later.

**If two adapters are included with mounting bracket:**

4. The mounting bracket **4** is fixed through the travel sensor later.
5. Screw the appropriate adapter **3.1** into the actuator opening as far as it will go and tighten.
  - ⇒ The mounting bracket is mounted later with the second adapter (see chapter 10.6, Direct mounting with mounting bracket type 4).

**10.5 Direct mounting**



1. Mount the mounting kit on the positioner (see “Mounting kit assembly: Direct mounting”, page 18).
2. Move the actuator to the open position.
3. Guide the product **1** as far as it will go into the actuator opening **3** or the adapter and screw in the clockwise direction against the initial spring tension.

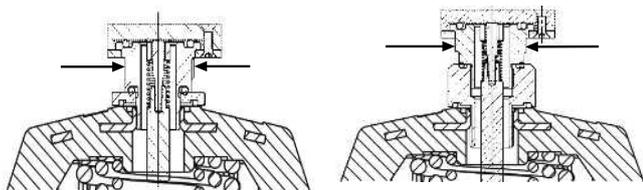
**NOTICE****Wrong mounting kit**

- ▶ If no initial spring tension can be felt, it may be the case that the wrong mounting kit with too short an operating bush has been used.
- ▶ If the spring locks and the positioner cannot be correctly mounted on the valve, it may be the case that the wrong mounting kit with too long an operating bush has been used or that a required adapter has not been used.
- ▶ In both cases, check the mounting kit parts and that they are being used correctly and in their entirety.

4. Tighten the product **1** with the flat (size depending on version) of the adapter **2**.
5. Turn the housing clockwise to align the pneumatic or electrical connections.

**CAUTION****Incorrect installation of the product.**

- ▶ Damage to the housing.
- Only tighten the product using the spanner flats provided for this purpose.



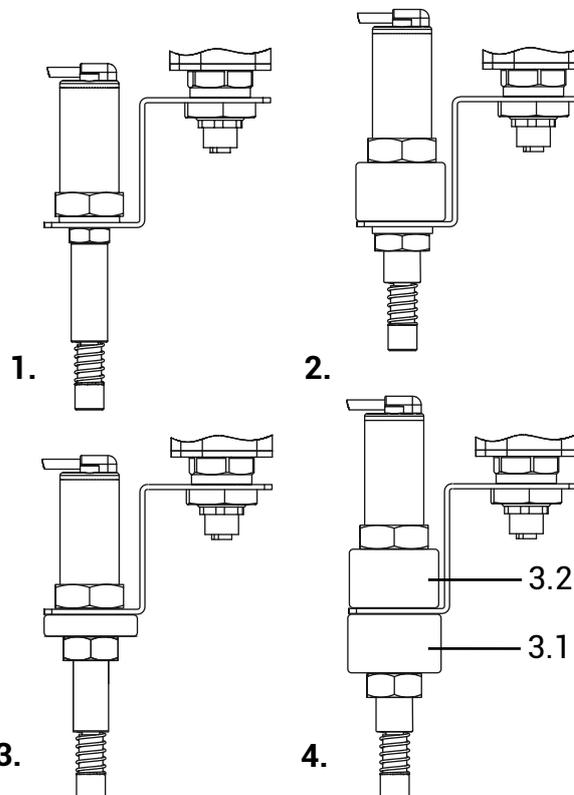
The product with mounting kit. The product with mounting kit and adapter.

- Mounting with or without the adapter depends on the requirements of the construction. If an adapter is required, it is included.
6. Connect the pneumatic supply to the positioner **1** and connect to the process valve **3**.

**10.6 Direct mounting with mounting bracket****NOTICE**

- ▶ The construction of the product with a mounting bracket is used for valves which have larger position changes than the integrated travel sensor on the positioner can detect.

The following four versions are available:

**Version 1:**

Mounting bracket is fastened via the travel sensor without an adapter.

**Version 2:**

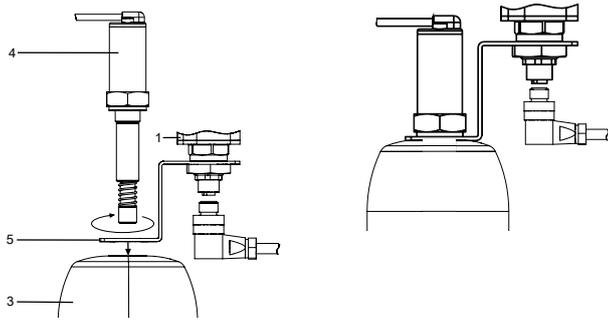
Mounting bracket is secured via the adapter. Travel sensor is screwed into the adapter.

**Version 3:**

Mounting bracket is fastened via the travel sensor and the adapter screwed into the actuator opening.

**Version 4:**

Mounting bracket is fastened between the screwed-in adapter in the actuator opening and a second adapter. The travel sensor is screwed into the upper adapter. O-rings are located between the adapters.



1. Mount the mounting kit on the travel sensor 4. (see "Mounting kit assembly: With mounting bracket/external", page 19)
2. Move the actuator to the open position.
3. Depending on the version, attach the mounting bracket 5 to the actuator 3 or adapter 3.1 and guide the travel sensor 4 through the mounting bracket as far as it will go into the actuator opening and screw in place in the clockwise direction against the initial spring tension. Tighten the travel sensor 4 using a suitable open-end wrench WAF 27.

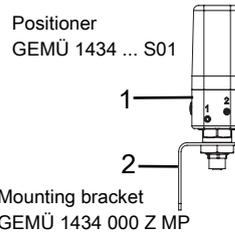
### NOTICE

#### Wrong mounting kit

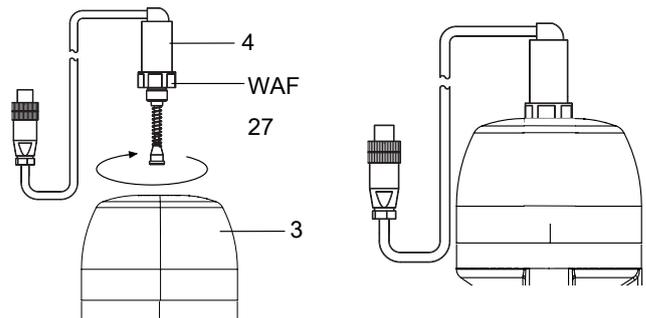
- ▶ If no initial spring tension can be felt, it may be the case that the wrong mounting kit with too short an operating bush has been used.
- ▶ If the spring locks and the positioner cannot be correctly mounted on the valve, it may be the case that the wrong mounting kit with too long an operating bush has been used or that a required adapter has not been used.
- ▶ In both cases, check the mounting kit parts and that they are being used correctly and in their entirety.

4. Mount the positioner 1 on the mounting bracket 5.
5. Connect the travel sensor 4 to the positioner 1 electrically.
6. Connect the pneumatic supply to the positioner 1 and connect to the process valve 3.

### 10.7 Remote mounting



1. Attach the positioner 1 in a suitable position (the separately available GEMÜ 1434 000 ZMP mounting bracket can be used for this).
2. Mount the mounting kit on the travel sensor 4. (see "Mounting kit assembly: With mounting bracket/external", page 19)
3. Move the actuator to the open position.



4. Guide the travel sensor 4 as far as it will go into the actuator opening 3 or the adapter and screw in the clockwise direction against the initial spring tension.

**NOTICE****Wrong mounting kit**

- ▶ If no initial spring tension can be felt, it may be the case that the wrong mounting kit with too short an operating bush has been used.
- ▶ If the spring locks and the positioner cannot be correctly mounted on the valve, it may be the case that the wrong mounting kit with too long an operating bush has been used or that a required adapter has not been used.
- ▶ In both cases, check the mounting kit parts and that they are being used correctly and in their entirety.

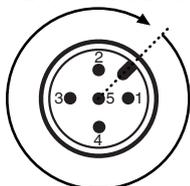
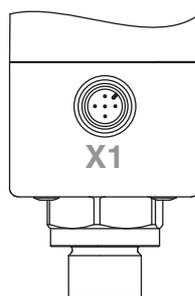
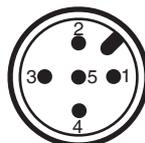
5. Tighten the travel sensor **4** using a suitable open-end wrench **WAF 27**.
6. Connect the travel sensor **4** to the positioner **1** electrically.
7. Connect the pneumatic supply to the positioner **1** and connect to the process valve **3**.

**11 Electrical connection****NOTICE****Risk: Electrostatic discharge**

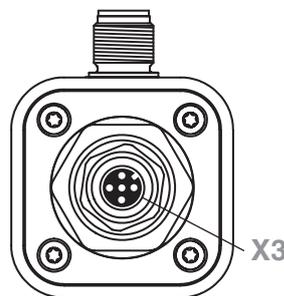
- ✓ Destruction of electronic components
- When mounting the potentiometer, take the necessary ESD safety precautions.

**NOTICE****Risk of cable break**

- ▶ Overtightening can result in damage to the internal cables.
- Turn electrical connections once by max. 360°.

**11.1 Pin assignment****Position of the connectors****Pin assignment**

Pin	Signal name
1	Uv, 24 V DC supply voltage
2	I+/U+, set value input
3	I-/U-, GND Uv-
4	I+/U+, actual value output (optional)
5	U, initialisation 24 V DC, started by an impulse signal t > 100 ms (speed <sup>-AP</sup> function)

**Version with external actual value potentiometer (code S01)****Position of the connectors****Pin assignment**

Pin	Signal name
1 <sup>1)</sup>	UP-, potentiometer output, supply voltage (-)
2	UPsig, potentiometer wiper voltage input
3 <sup>1)</sup>	UP+, output potentiometer supply voltage (+)
4	n.c.
5	n.c.

- 1) Potentiometer signal is processed internally inverted.

**11.2 Electrical connection**

- Connect the product in accordance with the pin assignment.

**12 Installation in potentially explosive areas**

⚠ **DANGER**

**Danger of explosion**

- ▶ Risk of severe injury or death.
- Do **not** use the product in potentially explosive zones.
- The product can control valves in potentially explosive areas using special wiring (installation of the positioner outside the EX area).

Using technical installation measures, the product can control valves that are located in potentially explosive areas (provided that the valve and the travel sensor have an appropriate approval). The applicable area (zone) is dependent on the type of ignition protection of the valve or the travel sensor.

For this, the remote mounting type (code S01) of the positioner has to be used and the electrical connection between the travel sensor and positioner must be established using suitable safety barriers.

For the electrical connection, use operating instructions for GEMÜ 4232.

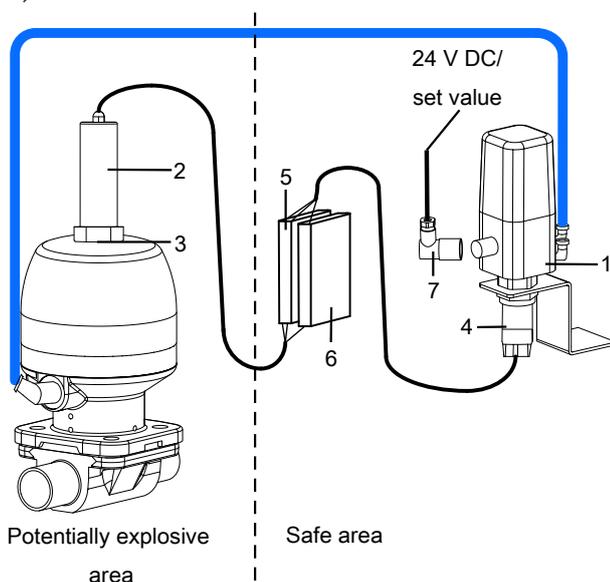
The product is **not** ATEX compliant and must therefore **not** be installed or operated in potentially explosive zones.

The GEMÜ 4232 travel sensor (ATEX version) can only be used in potentially explosive areas if used in conjunction with an ATEX compliant safety barrier. The safety barrier needs to have been designed specifically for use with passive resistor elements or potentiometers and must have its own operating instructions.

The following components have to be used for this type of operation (the specified safety barriers are an example. Alternative safety barriers with similar characteristics can be used on-site):

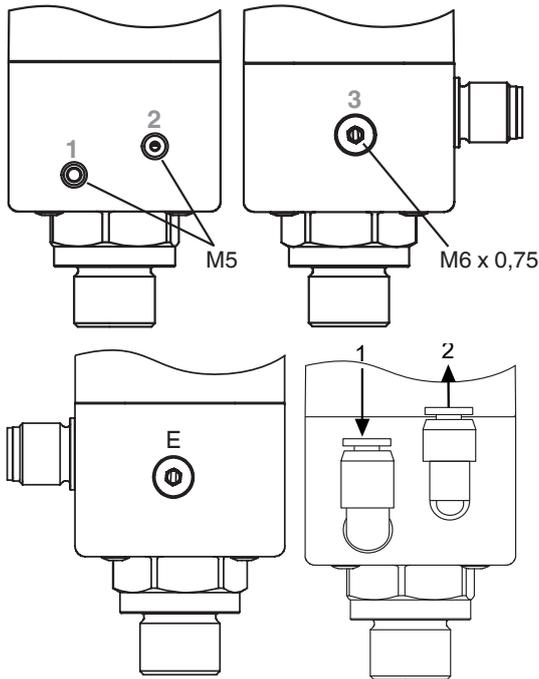
Safety barriers A (5) and B (6) can alternatively also be mounted in the potentially explosive area, provided that they have their own explosion protection approval.

1. Positioner 1434 remote mounting	1434000Z1... ..S01	
2. Travel sensor 4232 in explosion-proof design	4232000Z14... ..00 X*	
3. Travel sensor mounting kit	4232S01Z...*	
4. M12 connector between travel sensor and positioner	1219000Z0300S-G00M0M125A	Order number: 88208779
5. Safety barrier A (two-channel)	Safety barrier P626	Order number: 99014203
6. Safety barrier B (one-channel)	Safety barrier P630	Order number: 99014207
7. M12 connector X1 (optional)	1219000Z0300D-W00M0M125A	Order number: 88208750
* Exact design dependent on valve		



## 13 Pneumatic connection

### 13.1 Standard, single acting



No.	Designation	Connection size
1	Air supply connection P	M5
2	Working connection for process valve A1	M5
3	Venting connection R with integrated check valve	M6 x 0.75*
E	Housing ventilation with integrated check valve	M6 x 0.75*

\* Only relevant for exhaust air duct and/or increase of protection class.

Fail safe function	
Error	Working connection A1
Electrical power supply failure	vented
Pneumatic supply failure	undefined
This fail safe function is not a substitute for specific plant safety requirements.	

Safety reaction	
Error	Working connection A1
Set value < 4.0 mA*	vented
Set value > 20 mA or 10 V	vented
* only for design with 4–20 mA set value input (code A)	

### 13.2 Information for use in damp conditions

The following information is intended to help when installing and operating the product in damp conditions.

1. Cables and pipework must be laid so that condensate or rain water that remains on the pipework/cables cannot enter the screw fittings of the product's M12 plugs.
2. Check that all cable glands of the M12 plugs and the fittings are mechanically secured.

### 13.3 Converting to protection class IP 67

#### NOTICE

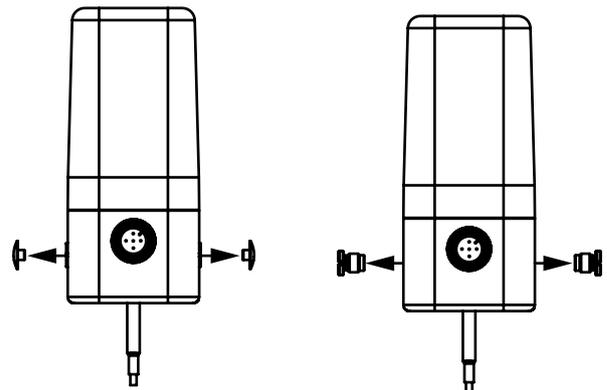
- Required appropriate pneumatic connections with M5 connection thread and pneumatic lines are not included in the kit and must be provided by the user.

The conversion kit **1434 000 Z2** comprises:

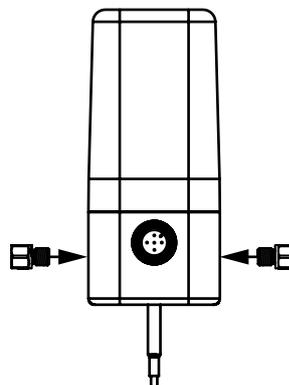
- 1x threaded adapter, M6x0.75 to M5
- 1x O-ring

The conversion kit 1434 000 Z2 is required for **piped air outlet 1x** and for conversion to **protection class IP67 2x**. For an exhaust air duct, only connection **3** must be used in accordance with the following description. To increase the protection class, connection **3** and **E** must be used accordingly.

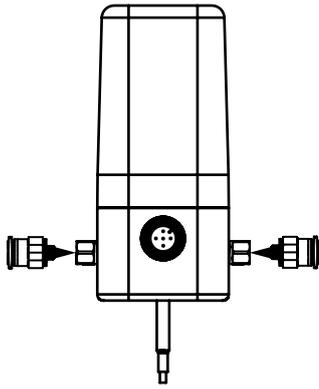
1. Switch off the pneumatic control air supply.



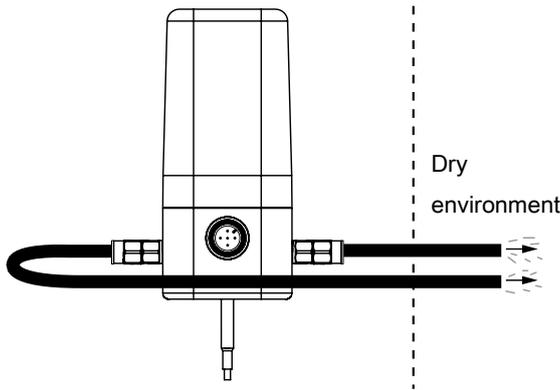
2. Remove protective caps from the vent holes using an appropriate tool.
3. Unscrew vent screws anticlockwise from the vent holes using an Allen key **WAF3** and remove.



4. Screw the threaded adapter with mounted O-ring into the vent holes and tighten carefully.



5. Screw the pneumatic connections (not included in the scope of delivery) into the threaded adapter and tighten carefully.



- 6. Make sure that the ventilation lines are always depressurized.
- 7. Connect the ventilation lines tension-free and without any bends or knots and install them in a dry environment.

## 14 Commissioning

<b>⚠ CAUTION</b>	
	<p><b>Hazardous situation</b></p> <ul style="list-style-type: none"> <li>▶ Risk of injury or damage possible.</li> <li>● For correct commissioning, the product must be calibrated to the process valve by means of the initialization process.</li> <li>● During this commissioning, the valve is automatically opened and closed several times. It must therefore be ensured in advance that this does not lead to a dangerous situation.</li> </ul>

<b>NOTICE</b>
<p><b>Incorrect initialization</b></p> <ul style="list-style-type: none"> <li>● Always carry out initialization without operating medium pressure on the process valve</li> </ul>

<b>NOTICE</b>
<ul style="list-style-type: none"> <li>● For delivery of the product assembled on a valve at the factory, the complete construction is already ready for operation at a control pressure of 5.5 to 6 bar without operating pressure. A reinitialization is recommended if the plant is operated with a different control pressure or if the mechanical end positions have been changed (e.g. seal replacement on the valve or actuator replacement). The initialization is retained even in the event of voltage cutoff.</li> </ul>

<b>NOTICE</b>
<ul style="list-style-type: none"> <li>● For delivery of the product without factory setting (e.g. for delivery without valve) initialization must be carried out once for correct operation. This initialization must be repeated every time that the process valve is changed (e.g. seal replacement or actuator replacement).</li> </ul>

1. Use suitable connectors.
2. Connect the control medium lines tension-free and without any bends or knots.
3. Connect the pneumatic tubes and activate the pneumatic control air supply of max. 8 or 10 bar.
4. Connect the connection cable tension-free and without any bends or knots.
5. Switch on supply voltage.
6. POWER LED on.
7. Briefly apply initialisation voltage 24 V DC to pin 5 (pulse t > 100 ms)\*.
8. Deactivate initialisation voltage.
  - ⇒ OPEN and CLOSED LEDs flash alternately
  - ⇒ Automatic initialisation is carried out. The initialisation phase lasts a few minutes, during which the process valve is opened and closed several times. The initialisation process is ended automatically.

**NOTICE****No set value applied after initialisation**

- ▶ Without a set value specification (for the 4–20 mA design), once initialisation has been completed, error message no. 2 (see “”, page 28) appears, which is automatically acknowledged when the set value signal > 4 mA is applied.

**NOTICE****Initialization is active for an unusually long time**

- ▶ For actuators with a large air volume (filling volume), in some circumstances it can take several minutes until initialization can be completed. Initialization is only unsuccessful if an error message (see “LED messages”, page 28) appears with LED signalling.

- Specify analogue set value 4–20 mA/0–20 mA/0–10 V.
- Following initialisation, the process valve can be positioned in accordance with the set value signal.

\* If the input has not been wired on the system side, the separately obtained initialisation kit 1434 000 ZIK can be used for this. Alternatively, for connectors without cable, the housing of the M12 connector, with which the product has been connected, can be opened and a temporary wire bridge can be attached from pin 1 to pin 5.

Function	OPEN	ERROR	CLOSE	POWER
Min. set value (0/4 mA/0 V)	○	○	●	●
Intermediate position	○	○	○	●
Max. set value (20 mA/10 V)	●	○	○	●
Positioner in initialisation phase <sup>1)</sup>	☀	○	☀	●

- LEDs flash alternately

**15 Operation**

The product is operated by means of a setpoint device which can be used to influence the position of the valve.

## 16 Troubleshooting

### 16.1 LED messages

LED conditions	Symbol
Off	
Lit (on)	
Flashes on briefly, f=1.66 Hz; 0.30 s on/0.3 s off	
Flashes slowly, f=3.33 Hz; 0.15 s on/0.15 s off	
Flashes fast, f=1.66 Hz; 0.15 s on/0.45 s off	

Meaning	Error number	OPEN	ERROR	CLOSED	POWER
Set value > 20.5 mA/10.25 V	Error no. 1				
Set value < 3.5 mA	Error no. 2				
Positioner not initialised	Error no. 3				
Positioner not calibrated	Error no. 4				
Device error	Error no. 5				
Positioner operating with lower quality	Warning no. 1	? <sup>1)</sup>		? <sup>1)</sup>	

1) In this case, the display of the OPEN and CLOSED LEDs is dependent on the position of the valve and is therefore irrelevant.

### 16.2 Troubleshooting

Error	Error cause	Error clearance
Positioner operating with lower quality	During initialisation, the internal valves could not be measured exactly.	Check process valve for leakage. Check and ensure free and easy movement of the process valve. Prevent unstable medium pressure during initialisation (if possible turn off media pressure).
Positioner not initialised	Device was not initialised	Carry out initialisation
Positioner not calibrated	Device faulty	Return to service
Set value too high	Set value signal > 20.5 mA/10.25 V	Check set value signal
Set value signal too low	Set value signal < 3.5 mA	Check set value signal
Device error	No pneumatic air supply, leakage in pneumatic system	Check pneumatic air supply, check pneumatic connections

## 17 Inspection and maintenance

### WARNING

#### The equipment is subject to pressure!

- ▶ Risk of severe injury or death.
- Depressurize the plant.
- Completely drain the plant.

### NOTICE

#### Exceptional maintenance work!

- ▶ Damage to the GEMÜ product.
- Any maintenance work and repairs not described in these operating instructions must not be performed without consulting the manufacturer first.

The operator must carry out regular visual examination of the products depending on the operating conditions and the potential danger in order to prevent leakage and damage.

1. Have servicing and maintenance work performed by trained personnel.
2. Wear appropriate protective gear as specified in plant operator's guidelines.
3. Shut off plant or plant component.
4. Secure plant or plant component against recommissioning.
5. Depressurize the plant or plant component.
6. Actuate products which are always in the same position four times a year.

### 17.1 Spare parts

No spare parts are available for this product. If it is faulty, please return it to GEMÜ for repair.

### 17.2 Cleaning the product

- Clean the product with a damp cloth.
- Do **not** clean the product with a high pressure cleaning device.

## 18 Disassembly

1. Disassemble in reverse order to assembly.
2. Unscrew the electrical wiring.
3. Deactivate the control medium.
4. Disconnect the control medium line(s).
5. Disassemble the product. Observe warning notes and safety information.

## 19 Disposal

1. Pay attention to adhered residual material and gas diffusion from penetrated media.
2. Dispose of all parts in accordance with the disposal regulations/environmental protection laws.

## 20 Returns

Legal regulations for the protection of the environment and personnel require that the completed and signed return delivery note is included with the dispatch documents. Returned goods can be processed only when this note is completed. If no return delivery note is included with the product, GEMÜ cannot process credits or repair work but will dispose of the goods at the operator's expense.

1. Clean the product.
2. Request a return delivery note from GEMÜ.
3. Complete the return delivery note.
4. Send the product with a completed return delivery note to GEMÜ.

**21 Declaration of conformity according to 2014/30/EU (EMC Directive)**

# EU Declaration of Conformity

*in accordance with 2014/30/EU (EMC Directive)*

We, GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG  
Fritz-Müller-Straße 6-8  
74653 Ingelfingen-Criesbach, Germany

declare that the product listed below complies with the safety requirements of the EMC Directive 2014/30/EU.

**Description of the product:** GEMÜ 1434

**Technical standards used:**

- DIN EN 61326-1 (industrial processes)

**Interference resistance:** EN 61000-6-2

**Interference emission:** EN 61000-6-3

2021-01-22



Joachim Brien  
Head of Technical Department





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Subject to alteration

08.2021 | 88594778

