GEMÜ 1436 eco cPos

Intelligent electro-pneumatic positioner

EN **Operating instructions**

further information
webcode: GW-1436 eco

Contents

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.

Diaphragm size

Uniform seat size of GEMÜ diaphragm valves for different nominal sizes.

1.5 Warning notes

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

SIGNAL WORD	
Possible symbol for the specific danger	Type and source of the danger ▶Possible consequences in case of non-compliance ●Measures for avoiding danger

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

The following signal words and danger levels are used:

⚠ DANGER

Imminent danger!

▶ Non-observance can cause death or severe injury

⚠ WARNING

Potentially dangerous situation!

▶ Non-observance can cause death or severe injury

⚠ CAUTION

Potentially dangerous situation!

▶ Non-observance can cause moderate to light injury

NOTICE

Potentially dangerous situation!

▶ Non-observance can cause damage to property

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

Symbol	Meaning
	Danger of explosion
	Corrosive chemicals!
	Leakage!

Symbol	Meaning
	The equipment is subject to pressure!

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	Display elements	Polyester film
2	Housing cover	PSU
3	Housing base	PP 30
4	Mounting kit, valve specific	Materials, parts valve specific

3.2 Description

The GEMÜ 1436 eco cPos digital electro-pneumatic positioner is used to control pneumatically operated process valves with single acting linear or quarter turn actuators. The positioner, travel sensor, switching valves and status LEDs are integrated into the robust and compact housing. Due to factory preconfiguration, this product does not require a display with operating keys. The pneumatic and electrical connections are arranged in one mounting direction to save space and enable easy access. All these features make this positioner a cost-effective solution for control tasks with basic requirements.

3.3 Function

The product is an intelligent electro-pneumatic positioner for mounting to pneumatic actuators.

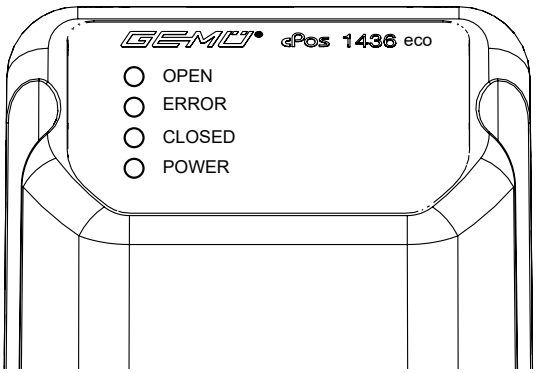
The product is directly mounted on the actuator as standard. The travel sensor is already integrated in the positioner (the product can be optionally ordered with an M12 connector for remote mounting of the travel sensor).

The travel sensor measures the current position of the valve and reports it to the electronic system of the product, which correlates the actual value of the valve with the set value and adjusts the valve if necessary. The integrated actual value output provides the valve position currently determined (in same direction as the rule diagram) as an analogue value.

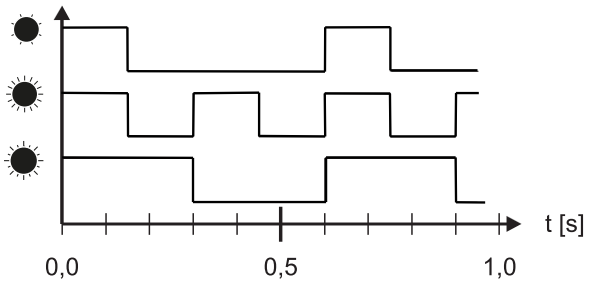
3.4 LED displays

3.4.1 Status LEDs

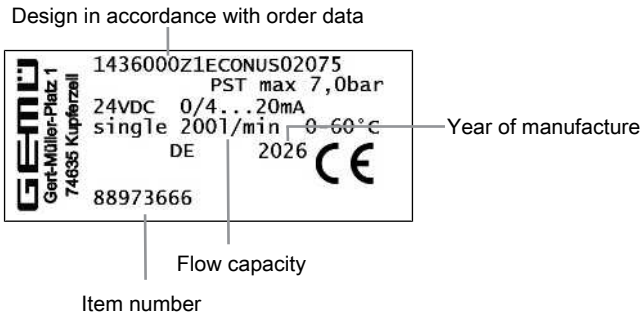
Using the status LEDs, the different operating conditions of the product can be determined.



- OPEN
- ERROR
- CLOSED
- POWER
- **Position reached**
- **Valve in OPEN end position**
- **Valve in CLOSED end position**
- **Valve OPENS**
- **Valve CLOSES**
- **Initialisation phase**



3.5 Product label



NOTICE

Device version

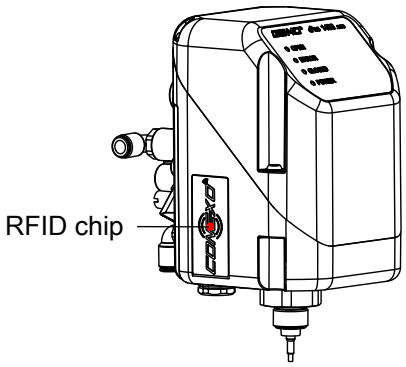
► These instructions apply to devices with device version 10 or higher. The device version provides information about the firmware used. For older devices (device version lower than 10), a different operating manual with potentially different operating instructions must be used. A change in the device version may also be due to hardware changes, which is why several device versions may describe the same firmware version.

Device version	Firmware version	Valid from	Changes
10	V2.0.0.0		
11	V2.0.3.5		
12	V2.0.3.5		
13	V2.0.3.6		

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 display 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 Intended 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.

- ● Use the product in accordance with the technical data.

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.

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
Positioner, electro-pneumatic cPos	1436

2 Fieldbus	Code
Without	000

3 Accessory	Code
Accessory	Z

4 Action	Code
Single acting	1

5 Device version	Code
Positioner Economy	ECON

6 Option	Code
Without	00
Pneumatic connections for ¼" tube	US

7 Flow rate	Code
150 l/min	01
200 l/min	02

8 Travel sensor length	Code
Potentiometer, 30 mm length	030
Potentiometer, 50 mm length	050
Potentiometer, 75 mm length	075
Potentiometer, 90° travel	090
Remote potentiometer, M12 connector	S01

9 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

10 Special version	Code
UL approval	U

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

Order example

Ordering option	Code	Description
1 Type	1436	Positioner, electro-pneumatic cPos
2 Fieldbus	000	Without
3 Accessory	Z	Accessory
4 Action	1	Single acting
5 Device version	ECON	Positioner Economy
6 Option	00	Without
7 Flow rate	01	150 l/min
8 Travel sensor length	030	Potentiometer, 30 mm length
9 Type of design		Standard
10 CONEXO		Without

7 Technical data

7.1 Medium

Working medium: Compressed air and inert gases

Dust content: ≤ 10 mg/m³/particle size ≤ 40 µm (class 7)

Pressure dew point: Class 4, max. pressure dew point +3 °C

Oil content: Class 4, max. oil concentration 5 mg/m³
Quality classes to DIN ISO 8573-1

7.2 Temperature

Ambient temperature: 0 — 60 °C

Storage temperature: 0 — 60 °C

7.3 Product conformity

EMC Directive: 2014/30/EU
Technical standards used:

UL approval: UL listed for Canada and USA
Certificate: E515574

7.4 Pressure

Operating pressure: 1.5 — 7 bar
The applied pressure must not exceed the maximum control pressure of the process valve.

Flow rate:

Flow rate (code)	Specification l / min [1)]	Specification Nl / min [2)]
Code 01	150 l/min	84 Nl/min
Code 02	200 l/min	100 Nl/min

1) Reference condition: 6 → 0 bar at 25 °C

2) Reference condition: 6 → 5 bar at 25 °C

Air consumption: 0 Nl/min (when idle)

7.5 Mechanical data

Installation position: Optional

Protection class: IP 65 acc. to EN 60529

Weight: 600 g

Travel sensor: Integrated for direct mounting

	Linear design			Quarter turn design
Detection range:	0 - 30 mm	0 - 50 mm	0 - 75 mm	Angle of rotation 0 - 93°
Operating range:	0 - 30 mm	0 - 50 mm	0 - 75 mm	Angle of rotation 0 - 93°
Resistance R:	3 kΩ	5 kΩ	5 kΩ	3 kΩ
Minimum travel sensor change:	≥ 1 % (only relevant for initialisation)			
Correlation - Travel sensor [1] **spindle/valve position**	Retracted (top) ≙ 100 % (valve open)			90° ≙ 100 % (valve open)
	Extended (bottom) ≙ 0 % (valve closed)			0° ≙ 0 % (valve closed)

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

7.6 Operating conditions

Ambient conditions: Use in indoor spaces
(only relevant for UL)

7.7 Acoustic data

Noise emission: > 80 dB (A)

7.8 Electrical data

7.8.1 Power supply

Supply voltage:	24 V DC (-5/+10%)
Power consumption:	≤ 3.5 W
Reverse polarity protection:	Yes
Duty cycle:	Continuous duty
Electrical protection class:	III
Electrical connection type:	X1: Connector (A-coded), 1 x 5-pin M12 X4*: Plug (A-coded), 1 x 5-pin M12 * Only for travel sensor version with remote potentiometer (code S01).

7.8.2 Analogue inputs

Set value input:	4–20 mA
Input type:	passive
Input resistance:	50 Ω (+ approx. 0.7 V voltage drop due to reverse battery protection)
Accuracy/linearity:	≤ ±0.3% of full scale value
Temperature drift:	≤ ±0.3% of full scale value
Resolution:	12 bit
Reverse polarity protection:	Yes
Overload proof:	Yes (up to ± 24 V DC)

7.8.3 Analogue output

Actual value output:	4–20 mA
Output type:	Active
Load resistor:	Max. 600 Ω
Accuracy:	≤ ±1% of full scale value
Temperature drift:	≤ ±0.5% of full scale value
Resolution:	12 bit
Short-circuit proof:	Yes
Overload proof:	Yes (up to ± 24 V DC)

7.8.4 Programming input initialization (speed-AP function)

Input voltage:	24 V DC
Input current:	1.3 mA at 24 V DC
High level:	>14 V DC

Low level: < 8 V DC

7.8.5 Travel sensor input (for travel length code S01 – remote potentiometer)

Note: Travel sensor input galvanically isolated from supply voltage, not galvanically isolated from the set value/actual value inputs and actual value output.

Input voltage range: 0 to U_{P+}

Supply voltage UP+: Typically 10 V DC

Resistance range of remote potentiometers: 1 to 10 kΩ

Input resistance: 330 kΩ

Accuracy/linearity: ≤ ±0.3% of full scale value

Temperature drift: ≤ ±0.3% of full scale value

Resolution: 12 bit

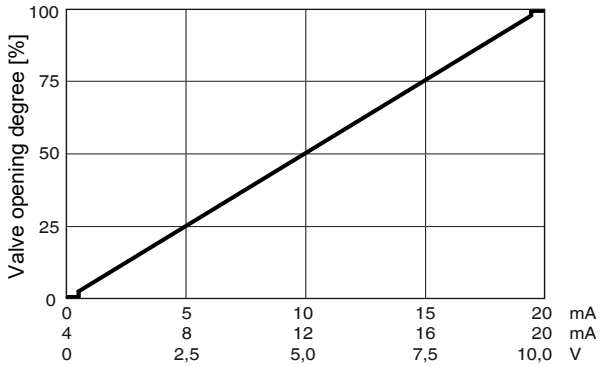
Short-circuit proof: Yes

Overload proof: Yes (up to ± 24 V DC)

7.8.6 Positioner data

Note: The following diagram is valid for valves with a standard assignment of the spindle position to the valve position.
(See section "Mechanical data, correlation between travel sensor spindle/valve position")

Control diagram:



During initialization the product automatically detects the control function of the valve, Normally Open (NO) or Normally Closed (NC) and adjusts itself by default so that the valve is closed when the signal is 4 mA.

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.

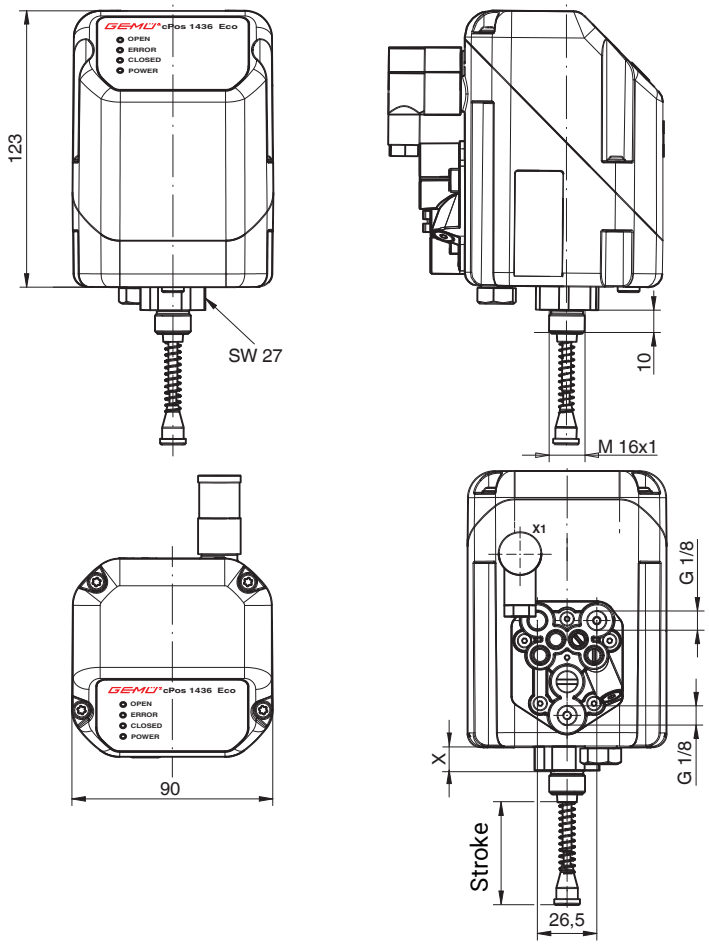
System deviation (dead zone): 1 % default setting
≤ 2.0 % (preset, K-no. 2442)
≤ 5.0 % (preset, K-no. 2443)

Initialization: Automatic via 24 V DC signal

Close tight function: Closed: W ≤ 0.5%
Open: W ≥ 99.5%

8 Dimensions

8.1 Positioner dimensions

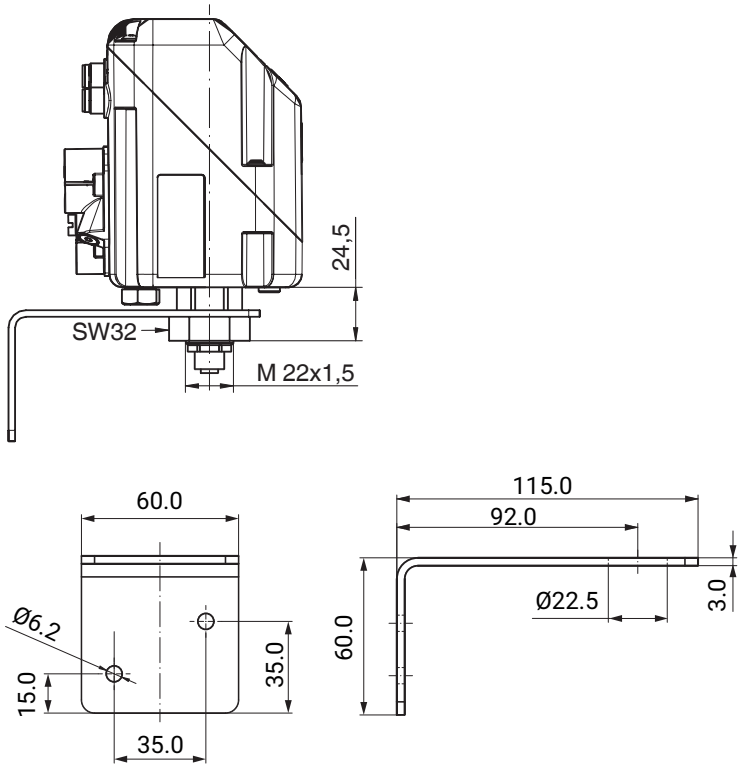


Travel length Code	X
030	10.3
050	32.5
075	57.5

Dimensions in mm

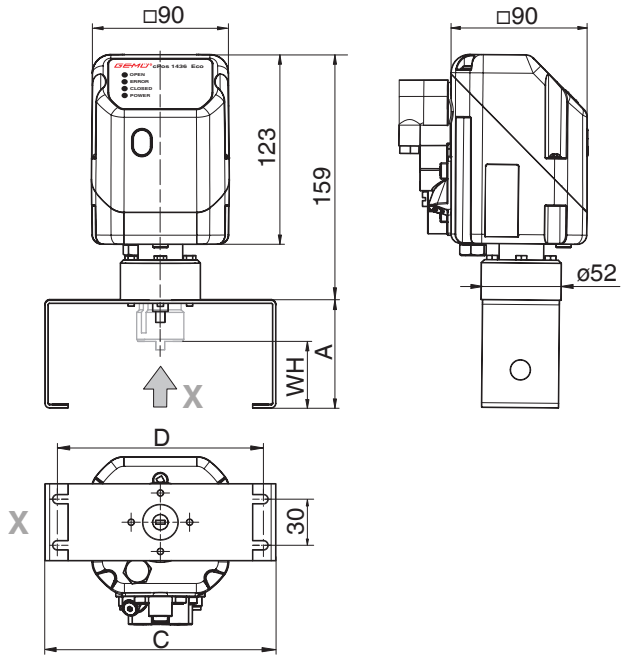
8.2 Remote mounting with mounting bracket

The product with separately available mounting bracket GEMÜ 1436 000 ZMP



Dimensions in mm

8.3 Direct mounting to quarter turn actuators



Shaft height WH	Hole spacing D	A	C
20	80	40	100
30	80	50	100
50	130	70	150

Dimensions in mm

9 Mounting options

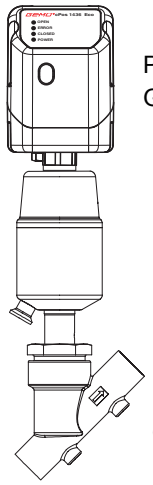
9.1 Mounting the positioner to linear actuators

9.1.1 Direct mounting

For direct mounting of the positioner on a valve with linear actuator, you need the following components

- GEMÜ 1436...ECON positioner in travel sensor version code 030, 050 or 075 (dependent on the stroke of the valve used)
- GEMÜ 1436 S01 Z... valve specific mounting kit for mounting the positioner

(At the time of ordering, specify the valve type with nominal size and control function)



Positioner
GEMÜ 1436 eco... 030 / 050 / 075

GEMÜ globe valve

9.1.2 Remote mounting

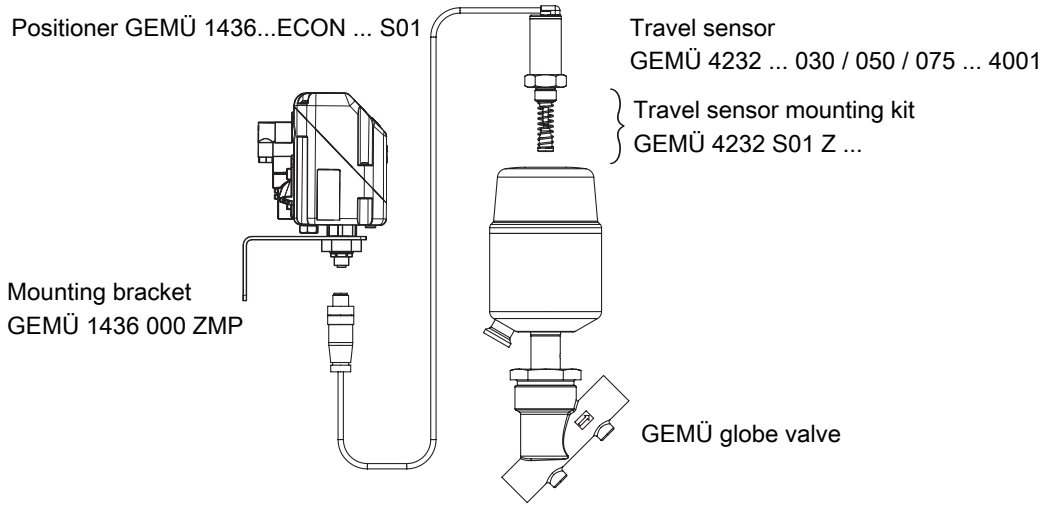
For remote mounting of the positioner on a valve with linear actuator, you need the following components

- GEMÜ 1436...ECON positioner in travel sensor version code S01 (remote potentiometer)
- Travel sensor GEMÜ 4232 ... 030, 050 or 075 ... 4001

Travel sensor version dependent on the valve used, cable length dependent on the required distance between the valve and positioner

- GEMÜ 4232 S01 Z... valve specific mounting kit for mounting the travel sensor
- GEMÜ 1436 000 ZMP mounting bracket (optional) for fixing the positioner

(At the time of ordering, specify the valve type with nominal size and control function and the required distance to the mounting location of the positioner)



By using remote mounting and additional, deviating components, the valve can also be used in potentially explosive areas (provided that this is approved). In this case, the positioner must be installed outside the potentially explosive area and the connection with the travel sensor established via safety barriers.

The electrical connection and the installation must be carried out in accordance with the specifications in the operating instructions.

Applicable area (zone) dependent on the type of ignition protection of the valve or travel sensor.

The following deviating, supplementary components are to be used for this type of operation:

- Travel sensor in explosion-protected design GEMÜ 4232 ... 030/050/075 ... 0000 ... X
  Travel sensor version dependent on the valve used, cable length dependent on the distance between the critical (potentially explosive) and safe zone
- Connector between travel sensor and positioner, GEMÜ 1219000Z0300SG00M0M125A, order number: 88208779
- Safety barrier A two-channel, safety barrier P626, order number: 99014203 *
- Safety barrier B one-channel, safety barrier P630, order number: 99014207 *

* Alternative safety barriers with similar characteristics can be used on-site – technical properties available on request

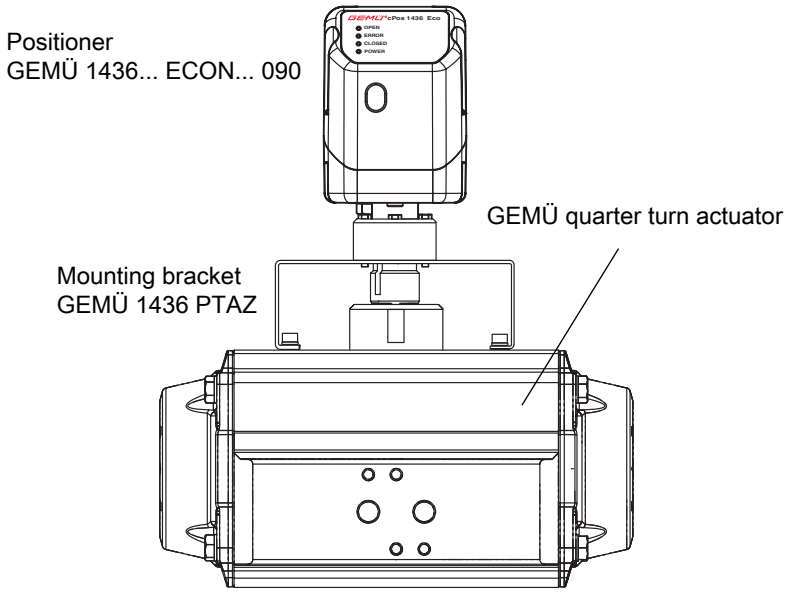
9.2 Mounting the positioner to quarter turn actuators

9.2.1 Direct mounting

For direct mounting of the positioner on a valve with quarter turn actuator, you need the following components

- Positioner GEMÜ 1436 ... ECON ... 090
- GEMÜ 1436 PTAZ … 090 000 valve specific mounting kit for mounting the positioner

(When ordering, specify valve type with actuator flange size)

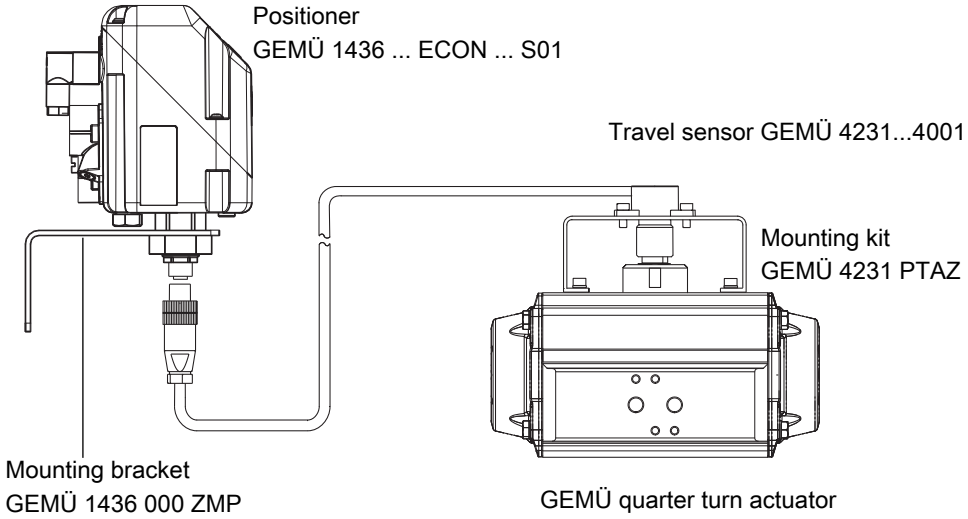


9.2.2 Remote mounting

For remote mounting of the positioner on a valve with quarter turn actuator, you need the following components

- GEMÜ 1436...ECON positioner in travel sensor version code S01 (remote potentiometer)
- GEMÜ 4231...4001 travel sensor (cable length dependent on the required distance between the valve and positioner)
- 4231PTAZ... ...090 000 valve specific mounting kit for mounting the travel sensor
- GEMÜ 1436 000 ZMP mounting bracket (optional) for fixing the positioner

(At the time of ordering, specify the actuator flange size and the required distance to the mounting location of the positioner)



By using remote mounting and additional, deviating components, the valve can also be used in potentially explosive areas (provided that this is approved). In this case, the positioner must be installed outside the potentially explosive area and the connection with the travel sensor established via safety barriers.

The electrical connection and the installation must be carried out in accordance with the specifications in the operating instructions.

Applicable area (zone) dependent on the type of ignition protection of the valve or travel sensor.

The following deviating, supplementary components are to be used for this type of operation:

- GEMÜ 4231 ... 0000 travel sensor
  cable length dependent on the required distance between critical (potentially explosive) and safe zone
- Connector between travel sensor and positioner, GEMÜ 1219000Z0300SG00M0M125A, order number: 88208779
- Safety barrier A two-channel, safety barrier P626, order number: 99014203 *
- Safety barrier B one-channel, safety barrier P630, order number: 99014207 *

* Alternative safety barriers with similar characteristics can be used on-site – technical properties available on request

10 Manufacturer's information

10.1 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.

10.2 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.

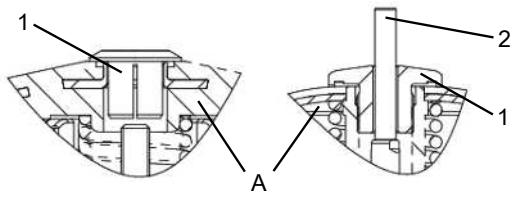
10.3 Storage

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.
5. Close the compressed air connections with protection caps or sealing plugs.

11 Installation

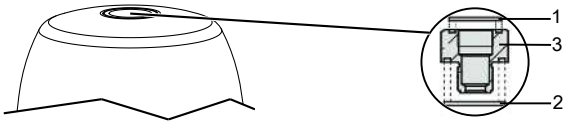
11.1 Preparations for assembly to the valve

1. Move the actuator to the open position.
2. Remove optical position indicator **2** and / or protective cap **1** from the actuator top.



11.2 Threaded adapter assembly (linear actuator)

With some mounting kits, it is necessary to install a threaded adapter as well. This threaded adapter is enclosed 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).



1. Move the actuator to the closed position.
2. Place O-rings **1** and **2** into threaded adapter **3**.
3. Screw threaded adapter **3** into the actuator opening as far as it will go and tighten.

11.3 Linear travel sensor mounting kit assembly for remote mounting

NOTICE

Pre-tensioned spring!

► Damage to the device.

● Slowly release the spring.

NOTICE

Do not scratch the spindle!

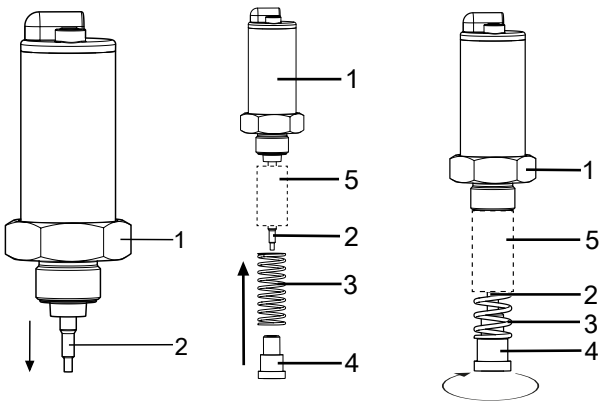
► Damage to the spindle surface can lead to failure of the position sensor.

Item	Name
1	Travel sensor
2	Spindle
3	Spring
4	Operating bush
5	Guide bush*
6	Threaded adapter**

*Included depending on version

**If a threaded adapter is included, it must be screwed into the actuator top of the process valve

The process described below refers to the mounting kit assembly for direct and remote mounting. For direct mounting, the travel sensor that is shown is integrated in the housing of the positioner.

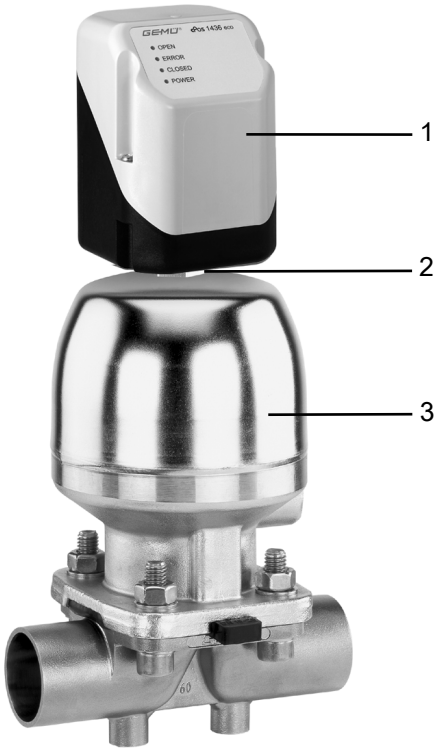


1. Pull the spindle **2** out of the travel sensor **1**.
2. If included, push the guide bush **5** taper over the spindle **2** first.
3. Push the spring **3** over the spindle **2** and secure with the operating bush **4**.
4. Tighten the operating bush **4** by turning it clockwise.
5. Push in the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

11.4 Installing the positioner

11.4.1 Mounting to linear actuators

11.4.1.1 Mounting the positioner



Place the product **1** with the travel sensor **2** on the actuator **3** and mount with a suitable WAF27 open-end wrench.

NOTICE

Damage to internal stop

► Do not turn the internal stop when assembling the product.

If correctly mounted to the corresponding valve, the product can be turned 320°.

11.4.1.2 Mounting the external travel sensor

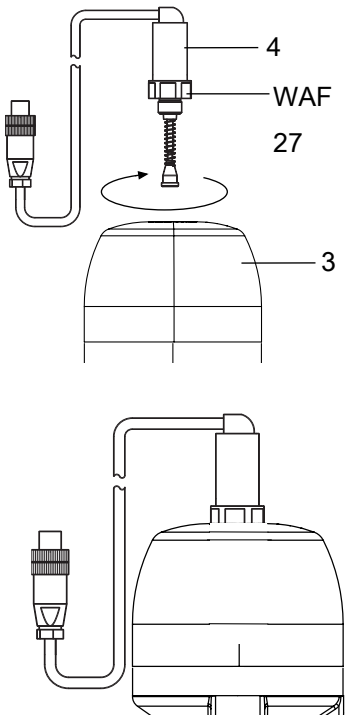
1. Secure the product **1** in a suitable position.

NOTICE

Mounting bracket

► The GEMÜ 1445 000 ZMP mounting bracket, which is available separately, can be used for this.

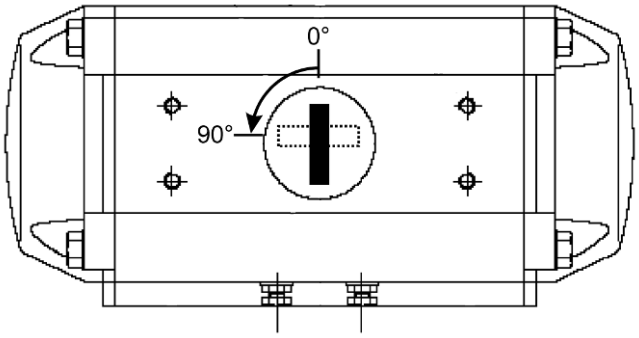
2. Complete the travel sensor. (see “Linear travel sensor mounting kit assembly for remote mounting“, page 19)
3. Place the travel sensor **2** on the actuator **3** and mount with a suitable WAF27 open-end wrench.



11.4.2 Mounting the quarter turn actuators

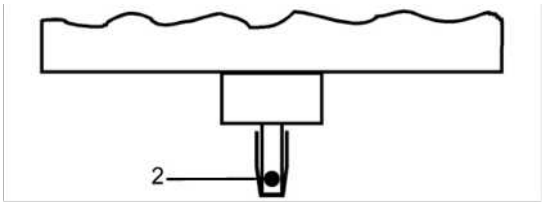
11.4.2.1 Preparing the quarter turn actuators

1. The actuator must be in the zero position (actuator vented).
   For double acting actuators, move the actuator to the closed position.
2. Remove the screw **10** for fixing the optical position indicator.
3. Determine the rotational direction of the actuator. When viewed from above, the rotational direction of the actuator must be anticlockwise, when the actuator moves from the CLOSED to the OPEN position. In cases where the actuator turns in a clockwise direction, the travel sensor's end position, contrary to given instructions, needs to be in the opposite direction.



11.4.2.2 Completing the travel sensor

1. Before mounting the travel sensor on the actuator, make sure that the shaft height and the hole pattern in the actuator match the dimensions of the mounting bracket **6**.



2. The shaft of the rotary travel sensor is provided with a marking **2**.

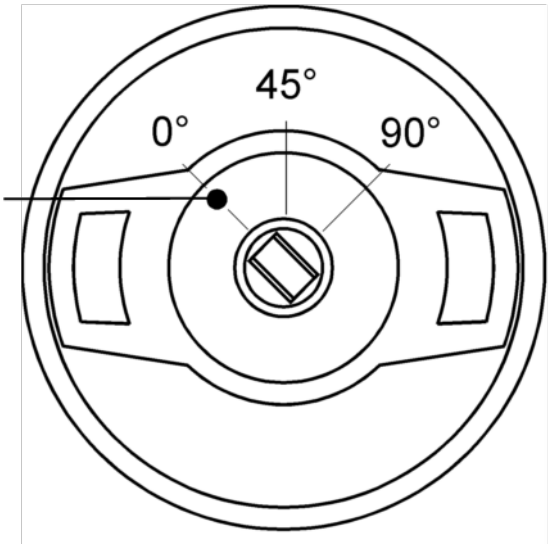


Fig. 1: Internal rotary travel sensor

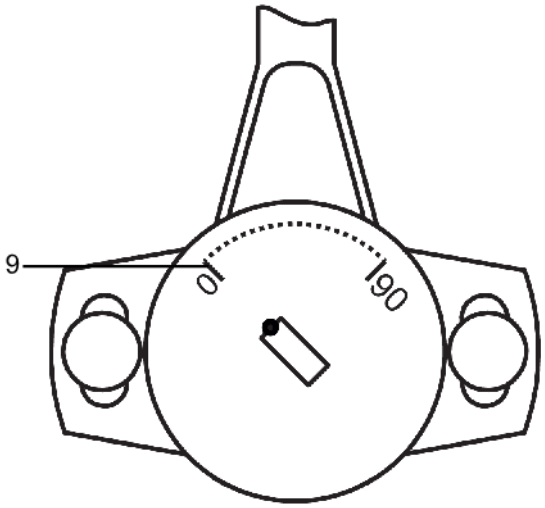


Fig. 2: External rotary travel sensor

NOTICE

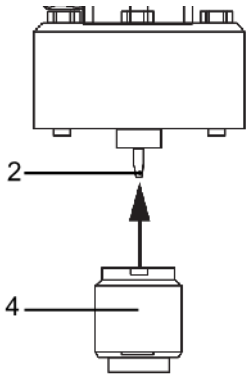
Setting the marking

- ► Set marking **2** so that it is in correct alignment with the 0° marking on the underside of travel sensor housing **8**.
- ► In the design with an external travel sensor version 9, the 0° marking can be found on the left side of the cable exit (the electrical turn range can be found 90° clockwise from that position).

NOTICE

Information on the positioner

- ► The slotted holes should be positioned in the centre of the screws. In the case that the travel is not correctly set, (determined by checking the mounting), the retainer needs to be changed slightly while adapting settings



3. Place adapter 4 onto the shaft of the rotary travel sensor 2 without twisting the shaft.

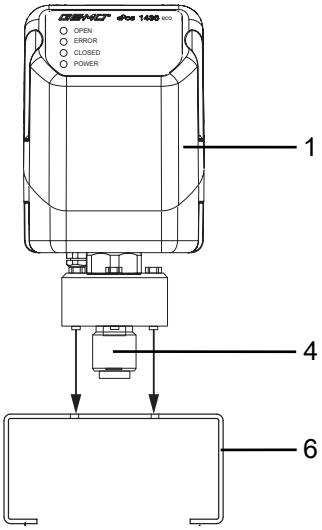


Fig. 3: Internal rotary travel sensor

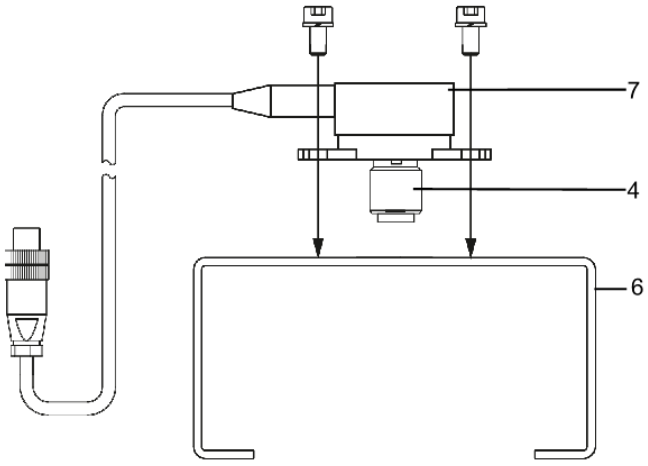


Fig. 4: External rotary travel sensor

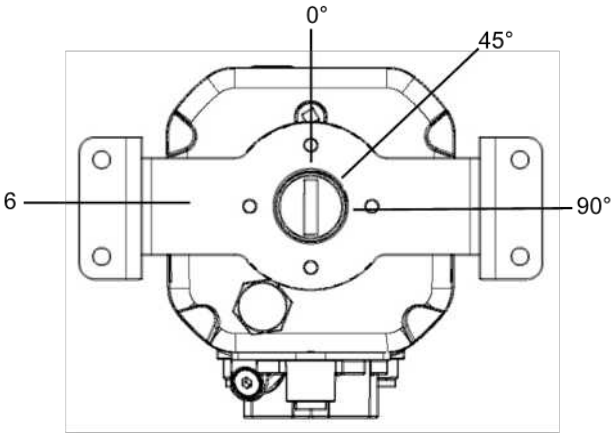
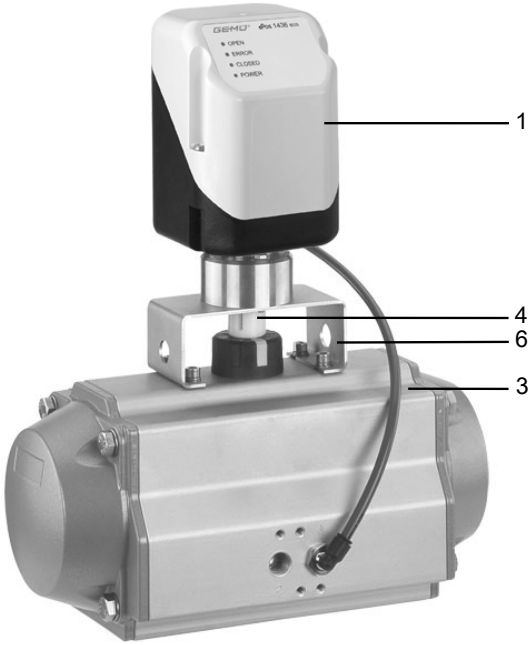


Fig. 5: Rotary travel sensor with mounting bracket from below

11.4.2.3 Mounting the positioner

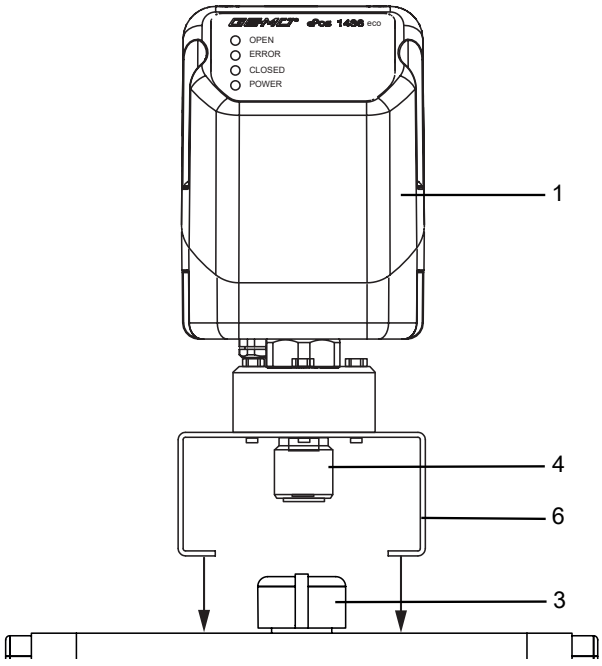
Direct mounting:

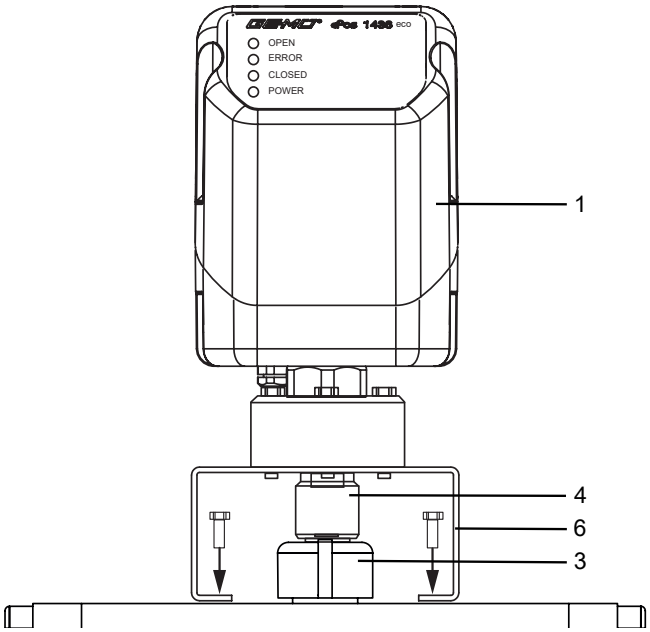


1. Place the product **1** with adapter **4** and mounting bracket **6** on the actuator **3**.

NOTICE

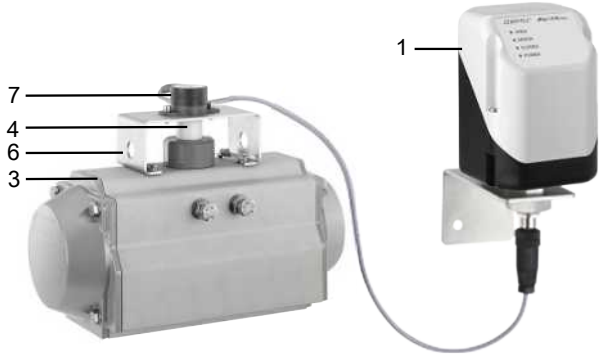
► The adapter lug **4** must engage in the actuator shaft groove.





2. Mount the mounting bracket **6** on the actuator **3** using the screws, washers and spring washers provided

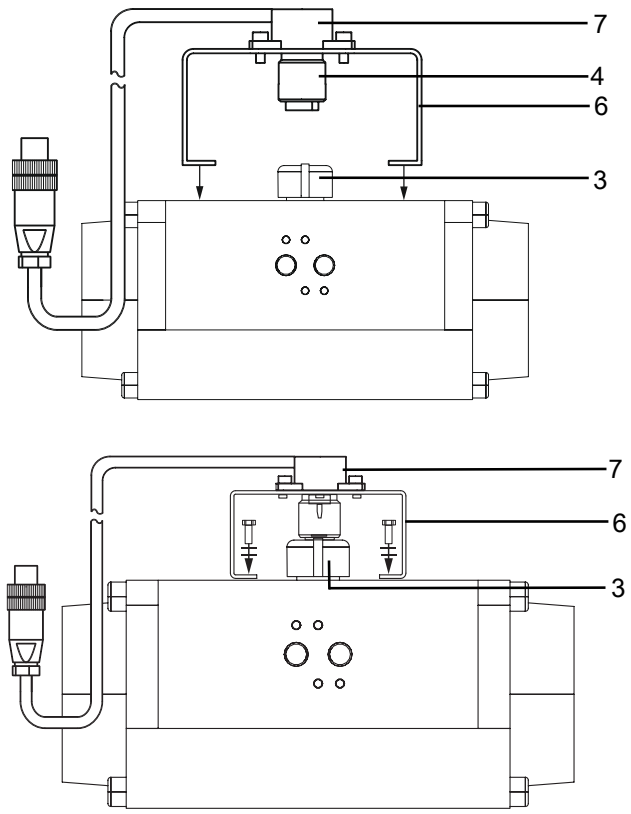
Remote mounting:



3. Fix the positioner 1 somewhere suitable.
4. Complete the rotary travel sensor. (see “Completing the travel sensor“, page 21)
5. Place the travel sensor **7** with adapter **4** and mounting bracket **6** on the actuator **3**.

NOTICE

► The adapter lug **4** must engage in the actuator shaft groove.



6. Mount the rotary travel sensor **7** and mounting bracket **6** on the drive **3** using the screws, washers and spring washers provided.

11.4.2.4 Checking the mechanical mounting

1. Connect the product to the power and air supply.
2. The following message is displayed:

3. The mounted actuator can be moved to the OPEN and CLOSED positions using the ⊞ and ⊟ buttons. The displayed valve position must be between 1% and 99%. If the display leaves this area, check the mechanical mounting again and, if necessary, readjust the orientation of the rotary travel sensor.

11.4.2.5 Mounting the mounting bracket

NOTICE

- Ensure adequate stability of the base used for attachment.
- The product must be protected against mechanical stress by the operator.
- Do not use the product as a foothold.

1. Push the product connection adapter through the hole in the mounting bracket and fix it with the enclosed nut.
2. Use the bolt holes and appropriate fixings to attach the mounting bracket securely.

12 Pneumatic connection

⚠ CAUTION

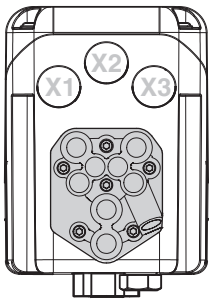
► Observe the maximum control pressure of the actuator.

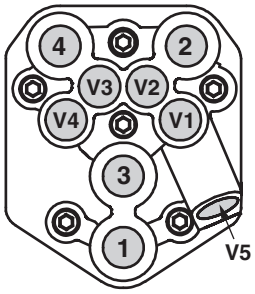
⚠ CAUTION

Flailing broken pneumatic lines.

► Risk of injury.

● Comply with the general safety measures when handling compressed air.





1. Connect the pneumatic positioner output A1 (single-acting) or A1 and A2 (double-acting) to the pneumatic control air inlet of the pneumatic actuator.
2. Connect auxiliary power (supply air) to supply air connection P 1 (max. 7 bar or 101 psi).

Connection in accordance with DIN ISO 1219-1	Designation	Size
1	Air supply connection	G1/8
3	Venting connection with silencer	G1/8
V1	Supply air throttle for connector 2	-
V2	Exhaust air throttle for connector 2	-
V3	Exhaust air throttle for connector 4*	-
V4	Supply air throttle for connector 4*	-
V5	Check valve	-
2	Working connection for process valve (control function 1 and 2)	G1/8
4	Working connection for process valve (control function 3)	G1/8

* only double acting type (code 3)

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

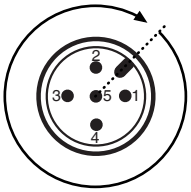
13 Electrical connection

NOTICE

Risk of cable break

► Overtightening can result in damage to the internal cables.

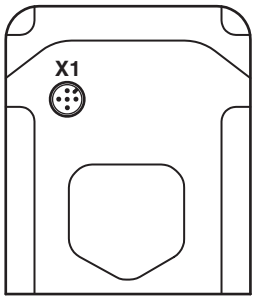
● Turn electrical connections once by max. 360°.



NOTICE

Voltage cutoff

► To ensure safe start-up of the positioner following interruption of the power supply, the power interruption must be longer than three seconds.



Connection	Pin	Signal name
 X1 M12 plug A coding	1	Uv, 24 V DC supply voltage
	2	I+, 4–20 mA set value input
	3	Uv, I-, GND
	4	I+, 4–20 mA position feedback
	5	Uv, initialization 24 V DC, Starting initialization using an impulse signal

14 Fail safe function

Fail safe function:

No.	Error	Outlet A1	Outlet A2
1	Power supply failure	Single acting: vented Double acting: vented	Single acting: non existent Double acting: pressurized
2	Compressed air supply failure	Single acting: vented Double acting: not defined	Single acting: non existent Double acting: Closed
This fail safe function is not a substitute for specific plant safety requirements.			

Adjustable safety reactions:

No.	Error	Outlet A1	Outlet A2
1	Set value < 4.0 mA (range below I Min W can be adjusted from 0...22 mA)	Single acting: adjustable function Double acting: adjustable function (Open, Close*, Hold, Safe)	Single acting: - Double acting: adjustable function (Open, Close*, Hold, Safe)
2	Set value > 20.0 mA (range below I Max W can be adjusted from 0...22 mA)		
3	Actual value < 4.0 mA (range below I Min X can be adjusted from 0...22 mA)		
4	Actual value > 20.0 mA (range below I Max X can be adjusted from 0...22 mA)		
*Close = default setting. The valve is moved to the CLOSED position No. 3 and 4 only available for device version code PA01			

15 Commissioning

⚠ WARNING

Corrosive chemicals!

► Risk of caustic burns

● Wear appropriate protective gear.

● Completely drain the plant.

⚠ CAUTION

Flailing broken pneumatic lines.

► Risk of injury.

● Comply with the general safety measures when handling compressed air.

⚠ CAUTION

Leakage!

► Emission of dangerous materials

● Provide for precautionary measures against exceeding the maximum permissible pressure that may be caused by pressure surges (water hammer).

⚠ CAUTION

Cleaning agent!

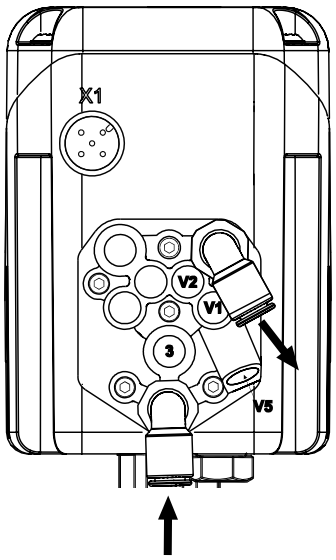
► Damage to the GEMÜ product

● The plant operator is responsible for selecting the cleaning material and performing the procedure.

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.

1. Commission the product.
2. Use suitable connectors.
3. Connect the control medium lines tension-free and without any bends or knots.



4. Connect the pneumatic tubes and activate the pneumatic control air supply of max. 8 to 10 bar.
5. Connect the connection cable tension-free and without any bends or knots.
6. Switch on supply voltage.
7. POWER LED on.
8. Briefly apply initialisation voltage 24 V DC to pin 5 (pulse t > 100 ms)*.
9. 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.

10. Specify analogue set value 4–20 mA/0–20 mA/0–10 V.
11. 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.

Displays the positioner at a min. set value.

LED	Symbol
OPEN	○
ERROR	○
CLOSED	●
POWER	●

Displays the positioner at a max. set value.

LED	Symbol
OPEN	●
ERROR	○
CLOSED	○
POWER	●

Displays the positioner at a mid position of the set value.

LED	Symbol
OPEN	○
ERROR	○
CLOSED	○
POWER	●

16 Operation

⚠ CAUTION

Flailing broken pneumatic lines.

► Risk of injury.
● Comply with the general safety measures when handling compressed air.

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

17 Troubleshooting

17.1 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	? [1]		? [1]	

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

17.2 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
Positioner moves very slowly	Throttle screws are screwed in too far	Check and readjust throttle screws

18 Inspection and maintenance

⚠ WARNING

The equipment is subject to pressure!

► Risk of severe injury or death

● Depressurize the plant or plant component.

● Completely drain the plant or plant component.

NOTICE

Use of incorrect spare parts!

► Damage to the GEMÜ product

► The manufacturer liability and guarantee will be void.

● Use only genuine parts from GEMÜ.

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 examinations of the products, depending on the operating conditions and the potentially hazardous situations, 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 the plant operator's guidelines.
3. Disconnect from power supply.
4. Shut off plant or plant component.
5. Secure plant or plant component against recommissioning.
6. Depressurize the plant or plant component.
7. Actuate products that are always in the same position four times a year.

18.1 Spare parts

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

18.2 Cleaning the product

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

19 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.

20 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.

21 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.

22 UL certificate

CERTIFICATE OF COMPLIANCE

Certificate Number	E515574
Report Reference	E515574-20200630
Issue Date	2020-JULY-08
Issued to:	GEMU VALVES INC Suite 110-112, Bldg 2600 3800 Camp Creek Pky Atlanta GA 30331
This certificate confirms that representative samples of	PROCESS CONTROL EQUIPMENT, ELECTRICAL Open Type Electro-Pneumatic Positioner/Controller models: 1235, 1236, and 1436 Eco Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	UL 61010-1 Safety Requirements For Electrical Equipment For Measurement, Control, And Laboratory Use - Part 1: General Requirements CSA C22.2 NO. 61010-1-12 Safety Requirements For Electrical Equipment For Measurement, Control, And Laboratory Use - Part 1: General Requirements
Additional Information:	See the UL Online Certifications Directory at https://iq.ulprospector.com for additional information.

This *Certificate of Compliance* does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at http://ul.com/aboutul/locations/

Page 1 of 1

23 EU Declaration of Conformity

CE Version 1

GEMÜ

EU-Konformitätserklärung

EU Declaration of Conformity

Wir, die Firma — We, the company

GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
Gert-Müller-Platz 1
74635 Kupferzell
Deutschland

erklären hiermit in alleiniger Verantwortung, dass die nachfolgend bezeichneten Produkte den Vorschriften der genannten Richtlinien entspricht.

hereby declare under our sole responsibility that the below-mentioned products complies with the regulations of the mentioned Directives.

Produkt:	GEMÜ 1436 eco	**Product:**	GEMÜ 1436 eco
Produktname:	Intelligenter elektropneumatischer Stellungsregler	**Product name:**	Intelligent electro-pneumatic positioner

Richtlinien/Verordnungen: — **Directives/Regulations:**

EMC 2014/30/EU

Folgende harmonisierte Normen (oder Teile hieraus) wurden angewandt: — **The following harmonized standards (or parts thereof) have been applied:**

DIN EN 61000-6-2 (11/2019); DIN EN 61000-6-4 (09/2020); DIN EN 61326-1(Industrie) (07/2013); EN ISO 1983:2013

i.V. M. Barghoorn
Leiter Globale Technik

Kupferzell, 26.01.2026

GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
Gert-Müller-Platz 1, 74635 Kupferzell, Deutschland

www.gemu-group.com
info@gemue.de

GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
Gert-Müller-Platz 1, 74635 Kupferzell, Germany
Phone +49 (0) 7940 1230 · info@gemue.de
www.gemu-group.com

Subject to alteration

05.2026 | 88903208