

## Electrical positioner, option 4R



### Mounting and operating instructions

Translation of the German mounting and operating instructions version 2017/02

## Preface

These mounting and operating instructions help you to ensure the designated, safe and economical use of the electrical positioner, option 4R, positioner in short. These instructions are intended for any person commissioning, operating, servicing, maintaining, cleaning or disposing of this positioner. These are in particular customer service technicians, trained specialists, qualified and authorized operating personnel.

Any such person must understand and take note of the contents of these mounting and operating instructions. Always keep these mounting and operating instructions in the vicinity of the positioner. Follow the instructions in the operating instructions to avoid hazards and to increase the reliability and the service life of the positioner.

In addition to the information in these mounting and operating instructions, it is imperative to observe the mandatory regulations for accident prevention applicable in the country of use and at the installation site as well as the relevant technical rules for safe and professional work.

## Availability

If these mounting and operating instructions are lost or become unusable, you can request a new copy from the GSR Ventiltechnik GmbH & Co. KG. If you sell the valve or pass it on in a different way, also supply these mounting and operating instructions.

## Layout marks in the text

Various elements of the mounting and operating instructions are provided with defined layout marks. This is how you can easily differentiate between the following elements:

normal text

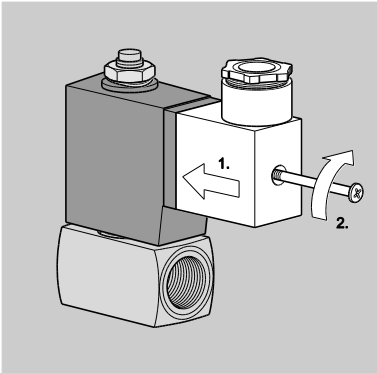
- list
- operation step



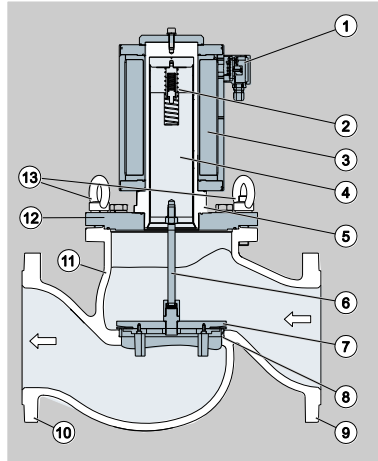
Tips contain additional information on economical use of the valve.

### Formatting attributes in figures

The figures contain illustrations in different shades of grey. Elements, that are important for an action previously described are highlighted in white. Movements to be carried out are made clear using movement or directional arrows. If several handling steps are shown in a figure, the sequence is made clear using numbers (1., 2., ...):



References to elements in a legend or running text are indicated by position numbers (1), (2), etc.:



### Contact with manufacturer

If this manual leaves any of your questions unanswered, contact:

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## Safety

### Proper use

The positioner is mounted to a pneumatically driven open/close valve. This unit forms a proportional valve.

Proper use also includes the observance and compliance with all specifications in these instructions, in particular the safety instructions. Any other use or use going beyond this is considered improper use.

### Improper use

GSR Ventiltechnik GmbH & Co. KG cannot be held liable for damage arising from improper use.

### Notes on residual risks

The positioner has been built in accordance with state-of-the-art standards, the recognized safety rules and relevant standards. Sources of danger have been eliminated as far as possible by means of the construction or using corresponding devices.

Nevertheless, residual risks may occur during the operation of the positioner.

Dangers to persons or impairments of the positioner and other material property may occur under the following conditions:

- If the positioner is mounted, operated or maintained by unqualified or untrained personnel.
- In case of improper use of the positioner.

### Prohibition of unauthorized constructional changes and modifications

- Do not make any unauthorized conversions or modifications to the positioner. Conversions or

modifications without the consent of the GSR Ventiltechnik GmbH & Co. KG are not allowed.

- Never bridge or bypass the existing protective devices.

### Basic safety instructions

#### Avoiding risk of burns

Risk of burns from hot surfaces. The surface of the valve and other parts of the device may become very hot. This depends on the temperature of the media used and is particularly true for continuous operation.

- Wear protective gloves.
- Allow the valve and other parts of the system to cool before starting any maintenance or cleaning work.

#### Avoiding injuries due to pressure in the piping system

- Release the pressure from the piping system before maintenance or repair work.
- Do not perform any maintenance or repair work at the valves while they are under pressure.

#### Avoiding injuries due to electrocution

- Only qualified electricians may perform any work on the power supply.
- Turn off the power supply before starting any maintenance or repair work.
- Make sure that the electrical specifications specified on the nameplate are met.
- Protect the electrical connections from moisture.
- Ground the valve with a wire to the appropriate threaded holes.

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## Layout attributes of the danger notes

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### **DANGER**

Notes with the word DANGER warn against a dangerous situation which leads to severe injuries or death.

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### **WARNING**

Notes with the word WARNING warn against a dangerous situation which may lead to severe injuries or death.

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### **CAUTION**

Notes with the word CAUTION warn against a situation which may lead to minor injuries.

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## Layout attributes of notes on material and environmental damage

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### ***ATTENTION***

These notes warn against a situation which leads to material or environmental damage.

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## Description

The present mounting and operating instructions apply to the positioner, option 4R.

### Functional description

The positioner, option 4R is mounted to a pneumatic valve and allows you to operate the valve as a proportional valve.

The positioner can be mounted to three different actuator sizes 50, 80 and 125.

The positioner can be mounted to the actuator without having to disconnect the valve from the medium line.

The positioner contains an optical LED seven-segment display which shows the valve stroke position in %.

In addition, the input and output signals can be manually set on the positioner.

## Retrofitting the positioner

### Qualification of the personnel

Ensure that the retrofitting is carried out by trained persons only. The persons must be trained in the following topics:

- Dismounting the valves
- Mounting the valves
- Dealing with low voltage
- Safety regulations applicable in the country of operation

### Dismounting the position indicator



#### CAUTION

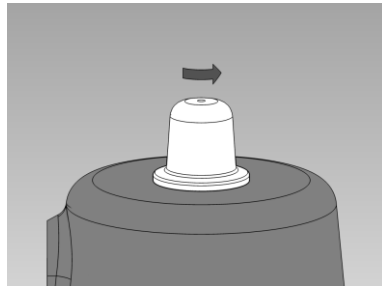
Risk of burns due to hot surfaces. The valve and other plant components can become hot due to high media temperature.

- Wear protective gloves.
- Let the valve cool down before starting work.

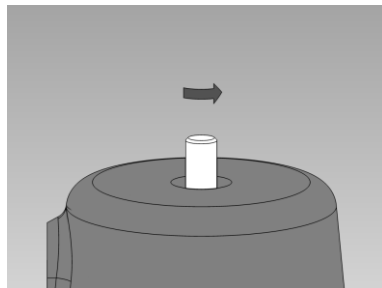
To dismantle the available position indicator, proceed as follows:

- Depressurize the pipe in which the valve is installed.
- Collect the escaping media in a suitable container.
- Connect the compressed air supply to the compressed air connection of the drive chamber.

- Switch on the compressed air supply.
- Position the pliers at the protective cap.
- Unscrew the protective cap counter-clockwise out of the cylinder.

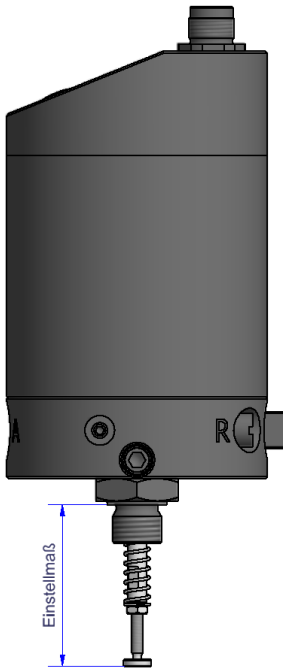


- Position the pliers at the pin of the position indicator.
- Screw out the pin counter-clockwise from the cylinder.

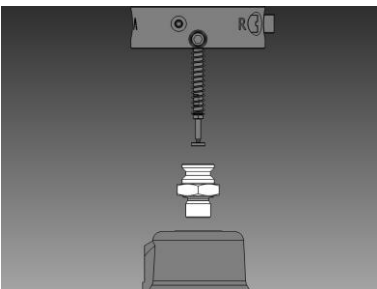


### Mounting the positioner

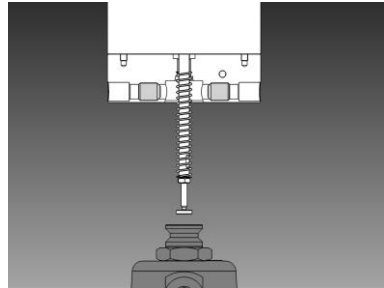
- Adjust the spindle extension according to the setting dimensions specified in the technical data.
- Glue the spindle extension in the adjusted position with a glue point.
- Use the "WEICON Contact V 250 Black" for gluing.



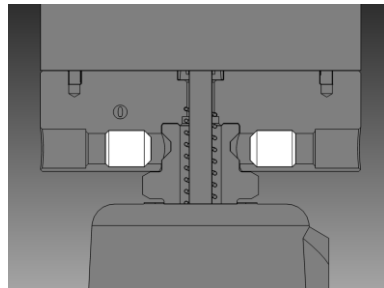
- Screw the screw connection on the cylinder.



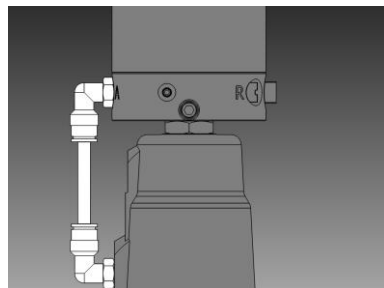
- Put the positioner on the cylinder.



- Fasten the positioner using the two stud bolts.



- Mount the hose with the hose connections to the cylinder.



- The mounting of the positioner is complete.

## Checking the function of the valve and its tightness

**To check the function of the cylinder and its tightness, proceed as follows:**

- Connect the compressed air supply to the compressed air connection of the drive chamber.
- Switch on and off the compressed air supply to check if the drive is functioning flawlessly.
- Spray the cylinder with the leak detection spray.
- Switch on the compressed air supply.
- Check if air is escaping.
- If the cylinder is leaky, search for the cause and eliminate it.

## Putting the positioner into operation

### ATTENTION

Damage to the positioner caused by wrong operating voltage.

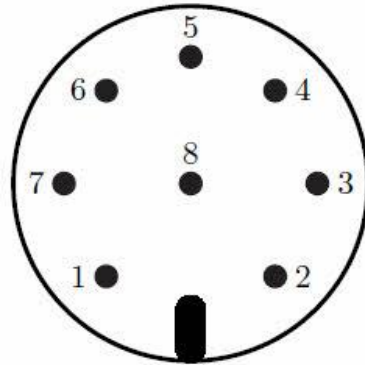
- Connect position display only to an operating voltage which corresponds to the technical data.

## Connecting the positioner


The supply voltage of the positioner is 24V DC  $\pm 10\%$ . The positioner has two input and two output signals. The input and output signals are divided into current and direct voltage signals. The signals are explained in the table.

Description	Range	Pin/color of the stranded wire
Input signal	4 - 20mA	7 / Blue
Output signal	4 - 20mA	8 / Red
Input signal	0 - 10V DC	4 / Yellow
Output signal	0 - 10V DC	5 / Gray
Supply voltage	24V DC $\pm 10\%$	2 / Brown
Ground	0V	3 / Green
Digital/constant output 1	0 - 5V DC	6 / Pink
Digital/constant output 2	0 - 5V DC	1 / White

- Connect the electrical positioner to voltage.
- Connection type: Multipole with round plug connector M12x1, 8-pole, A-coded.
- The power supply is provided via 24 V DC.



- 1 = White
- 2 = Brown
- 3 = Green
- 4 = Yellow
- 5 = Gray
- 6 = Pink
- 7 = Blue
- 8 = Red

 The length of the cable connected to the positioner must not exceed 30 meters.

## Operating the positioner

The operating panel of the positioner contains the keys "SET", "↑", "↓" and the display (dark gray rectangle field).



## Putting the positioner into operation

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The keys "SET", "↑" and "↓" can be used to make different settings on the positioner. The position display shows the position of the valve in percent. The position of the valve is proportional to the input signal. The output signal shows the actual valve position (ACTUAL position) of the positioner.

The user can use the operating panel of the positioner to make various settings. The device settings can be made directly during the operation. However, the positioner cannot be activated as long as it is in the menu mode.

In the standard mode, the arrow keys "↑" and "↓" cannot be actuated or no actions will be carried out if they are pressed except if the positioner is in the manual mode. Only after pressing the "SET" key for more than 2s, the 7-segment display "SET" appears.



Use the arrow keys ("↑" and "↓") to navigate through the menus. Once the desired option from the table has been selected, press the "SET" key to confirm. After that, a further submenu or "In" (stands for "Save in memory") will appear. If the secondary menu for initialization has been called up and an upper position of the valve is to be initialized, the "2-0" symbol must be called up in the main menu and then the "2-1" symbol must be confirmed by pressing the "SET" key. Once that is done, "In" will appear in the display for approx. 1s. This means that the upper position has been saved in the memory. All settings which can be made on the positioner are listed in the table. The numbers and letters in the HM and UM columns of the table correspond to the display in the positioner.

HM	UM	Description
SET	-	The main menu is activated by pressing the key for longer than 2 seconds. Now, it is possible to change between individual menus using the keys "↑" and "↓" and "#".
1-0	-	Manual or automatic mode. In this menu, the input signal of the positioner is set.
-	1-1	Manual mode: The positioner is set such that it can be moved upward or downward using arrow keys. The automatic mode is switched off. Once "In" disappears, the main menu is exited.
-	1-2	Automatic mode: The positioner is set such that it can only be moved via an input signal. The manual mode is switched off. Once "In" disappears, the main menu is exited.
-	OUT	Output. Back to 1-0.
2-0	-	Manual initialization of the positioner.
-	2-1	Initialization of the upper position. The upper position of the valve is transferred to the memory.
-	2-2	Initialization of the lower position. The lower position of the valve is transferred to the memory.
-	OUT	Output. Back to 2-0.
3-0	-	Selection of the input signal.
-	3-1	Input signal 0 to 10V DC is set.
-	3-2	Input signal 4 to 20mA is set.
-	OUT	Output. Back to 3-0.
4-0	-	Selection of the output signal.
-	4-1	Output signal 0 to 10V DC is set.
-	4-2	Output signal 4 to 20mA is set.
-	OUT	Output. Back to 4-0.
5-0	-	Further settings.
-	5-1	Factory settings. Input and output signals are set to 4-20mA and the initialization * of the positioner takes place automatically.
-	5-2	Open option for further program settings.
-	OUT	Output. Back to 5-0.
OUT	-	Output. The main menu is exited.

## Putting the positioner into operation

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\* First, the "upper" position of the valve is approached, at that time, the display shows "O.b". After approx. 3 minutes, "In" is briefly displayed, which means that the "upper" valve position has been saved in the memory. Once "In" disappears from the display, the valve approaches the "lower" valve position. After approx. 3 minutes, "In" is briefly displayed. When "In" disappears, "SIG" is shown for half a minute. This means that the input and output signals are set to standard (standard signal 4-20mA).

-  Press and hold the button "↑" or "↓" in manual mode to move the actuator faster.
-  Automatic detection of end positions of the valve and the settings are set to "standard".

## "FailSave" option

The positioner has a "FailSave" option. This is the end position of the proportional valve when the supply voltage is disconnected or the input signal is lost. You can choose from three variants. It is preset at the factory as the position of the control valves is crucial for the corresponding option. The "lower valve

position" option is set as the standard "FailSave" option. Once the voltage supply or input signal is interrupted, the valve comes into the closed position.

## "Upper valve position" option

With the "upper valve position" option, the valve comes into the open position once the voltage supply or input signal is lost.



### CAUTION

Risk of injury caused by flying out parts when dismantling the cylinder.

- Depressurize the cylinder to dismount it.
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## "Preserving the position" option

With the "preserving the position" option, the valve remains in the current position if the voltage supply or input signal is lost.



## Technical data

Supply voltage:	24 ±10% V DC
Current consumption:	100 mA
Power:	2.4 W
Input signal 1:	0 - 10V DC
Input signal 2:	4 - 20mA
Output signal 1:	0 - 10V DC
Output signal 2:	4 - 20mA
Output signal 3:	0 or 5V DC
Output signal 4:	0 or 5V DC
Resolution:	0.5% of max. stroke
Repeat accuracy:	< 1%
Hysteresis:	< 1%
Response sensitivity:	< 1%
Setting range:	1:200
Coverage:	0 - 23mm
Electrical connection:	M12x1 8-pin
Control pressure:	4 to 10 bar(a)
Setting dimension:	Cyl. size 50 NC 27mm Cyl. size 80 NC 31mm Cyl. size 125 NC 44mm Cyl. size 50 NO 19mm Cyl. size 80 NO 21mm Cyl. size 125 NO 54mm