



bar

# bar-PCS

Start-up and pressure protection automatic system  
for compressed air networks

Operating manual



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Read this manual carefully and keep it at the unit.  
Take into account and observe the safety instructions.

## General information

This operating manual is a part of the unit. The operating manual must be kept over the entire lifetime of the unit.

The operating manual must be passed to any subsequent owner of the unit.

In addition to this operating manual, the generally applicable, statutory and other regulations and legal provisions - as well as those of the operator's land - and all valid environmental protection regulations must also be observed!

The locally applicable regulations of the professional association or other supervisory authorities must be always observed!

## Reference documents

This manual, the data mentioned and design data sheets, additional assembly and maintenance instructions as well as further information - also in other language versions, can be obtained from:

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## Safety instructions and warnings

Read this manual carefully before the commissioning and follow all instructions.

In this manual, various kinds of safety instructions and warnings are used:

 <b>Danger</b>
Indicates an immediate danger. Failure to observe this instruction may result in death or serious injury.
 <b>Warning</b>
Indicates an threatening danger. Failure to observe this instruction may result in serious injury or property damage.
 <b>Caution</b>
Indicates a possible danger. Failure to observe this instruction may result in property damage.
 <b>Note</b>
Indicates notes and tips for a better understanding of the instruction or an improved handling of the device.

### Scope of application

This operating manual applies to the bar-PCS, a module of Valve-Controlsystems bar-vacotrol. It is addressed to the user of the device, that is the person that works on and with the device. This is not a technical manual. For questions that go beyond the contents of this manual, please call our customer service.

### Copyright

The unit and this manual are protected by copyright. Reproduction without permission will be prosecuted. We reserve all rights to this operating manual, even the rights of reproduction and/or duplication in any imaginable way, e.g. by photocopying, printing, on any data recording media or in translated form. Reproduction of this manual is only permitted with the written authorization of bar GmbH. The technical status at the time of delivery of the unit and manual is decisive, if no other information is given. We reserve the right to make technical changes without special announcement. Previous manuals become invalid. The general conditions of sales and delivery of bar GmbH are applicable.

## Exclusion of liability

We guarantee the faultless functioning of our product in accordance with our advertising, with the product information given by us and with these instructions. Further product properties are not guaranteed. We assume no liability for the efficiency and error-free operation if the product is used differently than described in the section "Intended use".

Compensations for damages are generally excluded, unless the intent or gross negligence on the part of bar GmbH is proven, or if promised product features are not available. If this product is used in environments for which it is not appropriate or do not comply with the technical standards, then bar GmbH is not responsible for the consequences.

We accept no liability for damage to equipment and systems in the surroundings of the product, which is caused by a defect of the product or in this manual. We are not responsible for the infringement of patents and/or other rights of third parties outside the Federal Republic of Germany.

We are not liable for damages caused by improper operation and non-compliance with the instructions in this manual. We are not liable for lost profits and consequential damages caused by non-compliance with safety and warning notes. We accept no liability for damage caused by the use of accessories and/or wearing parts that have not been delivered or certified by bar GmbH.

The products of bar GmbH are designed for a long service life. They correspond to the state of the art in science and technology and were individually checked in all functions. before delivery. The electrical and mechanical design meets the applicable standards and guidelines. bar GmbH performs constantly tests of the products and the market in order to stimulate the continuous development and improvement of their products.

**In the event of faults or technical problems, please contact the customer service listed on the last page. Appropriate actions will be taken immediately. The warranty conditions of bar GmbH shall apply, which we would be pleased to send to you on request.**

## Designated use

PCS is a start-up and pressure protection automatic system with internal valves for the construction of pneumatic rotary actuators of the series actubar or actuators according to VDI/VDE 3845 with a pivoting angle of max. 90°. By means of internal valves and a pressure switch, the PCS coordinates the functional process of OPEN and CLOSE movement of the shut-off valve as a function of the feed-in pressure of the compressed air preparation plant in the compressed air network.

Any other use of this device is considered to be improper use. If you have questions, or want to use the device for any other purpose, please contact our customer service. We can help you with any possible necessary configurations.

## Warranty

The warranty conditions of bar GmbH shall apply, which we would be pleased to send to you on request in the frame of our general terms of business.

bar GmbH performs constantly studies of the products and the market in order to stimulate the continuous development and improvement of their products. The products of bar GmbH are designed for a long service life. They correspond to the state of the art in science and technology and were individually checked in all functions. before delivery. The electrical and mechanical design meets the applicable standards and guidelines.

We guarantee the faultless functioning of our product in accordance with our advertising, with the product information published by us and with these instructions. Further product properties are not guaranteed. We assume no liability for the efficiency and error-free operation if the product is used differently than described in the operating manual.

For this device, we assume the guarantee for faultless quality for a period of twelve months as part of our warranty conditions. Wearing parts are excluded from this warranty. The claim expires if interventions are made by unauthorized persons who have not been authorized for this purpose by bar GmbH. If this product is used in environments for which it is not appropriate or do not comply with the technical standards, then we are not responsible for the consequences.

Within the warranty period we repair damages or defects, without charge, which can be traced back to faulty manufacturing, if they are reported immediately to us after their discovery, at the latest however within twelve months after delivery. The service takes place at our discretion by free repair of defective parts or replacement by faultless parts.

Compensation for damages are generally excluded, unless the intent or gross negligence on the part of bar GmbH is proven, or if promised product features are not available.

If the purchaser is entitled to claim compensation for damages, it expires at the end of the applicable period of limitations. The same applies to claims from the customer in connection with measures to prevent damage (for example, product recalls). In case of claims for damages under the Product Liability Act, the legal provisions for limitation periods apply.

bar GmbH accepts no liability for damage to equipment and systems in the surroundings of the product, which is caused by a defect of the product or in this manual. We are not responsible for the infringement of patents and/or other rights of third parties outside the Federal Republic of Germany.

In the event of faults or technical problems, please contact our customer service. We assure you that appropriate actions will be taken immediately.

Send the units for which a guarantee is claimed, freight prepaid, and with a copy of the invoice or delivery note to bar GmbH. Contact our customer service before returning.

## ***Obligations of the customer***

The operator of this unit must ensure that only persons who

- know the rules of occupational safety and accident prevention
- have been trained in the operation of this unit
- have read and understood these manual completely

Persons who operate this unit are obliged

- to observe all the rules of occupational safety and accident prevention
- to read this manual completely

## ***Authorised personnel***

Persons are regarded as authorized, who have a completed professional training, technical experience, and knowledge of relevant standards and guidelines, and are able to assess the tasks assigned to them and to recognize dangers early.

Operator of the PCS:

Persons are regarded as authorized, who were trained in the operation of the bar-PCS and have read and understood these manual completely.

Personnel for installation and maintenance

Persons are regarded as authorized, who were trained in all matters of the control system and have read and understood these manual completely.

## **Design layout**

The electro-pneumatic control unit **PCS** is installed in a cast housing specially developed for the realization of **bar-vacotrol**<sup>®</sup> solutions which is directly mounted on the **actubar**<sup>®</sup> rotary actuator and on actuators with interface according to VDI/VDE 3845 with a maximum pinion diameter up to 70mm.

The pneumatic connection between the control unit and the **actubar**<sup>®</sup> rotary actuator is tubeless. The pneumatic connection is made for the PCS on the housing of the control unit.

The electrical connection is made to terminal strips inside the device.

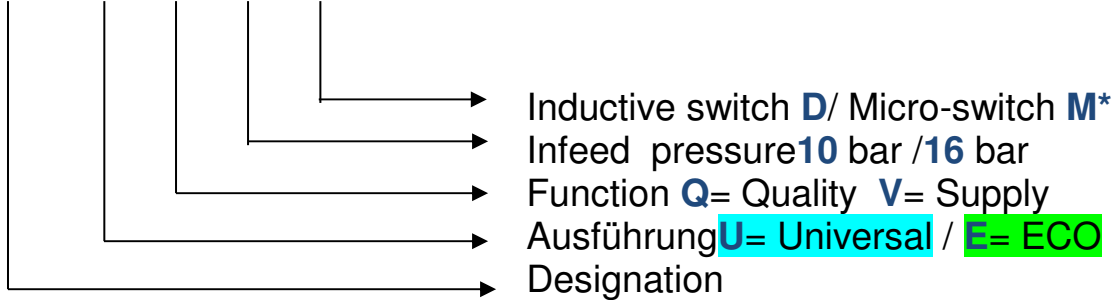
The following functional assemblies are located in and on the housing

- Sequence control system with the connection, control and display interface
- Functional block
- Multiple valve block
- The position indicator system

mounted to compact **actuator box PCS**

## Version overview

**PCS - U - Q - 10 - M**



\*only ECO version

**Version Universal** has four different operating modes:

Control operation (adjustable pulse width) at a fixed pulse rate:

- Pressure filling
- Step filling

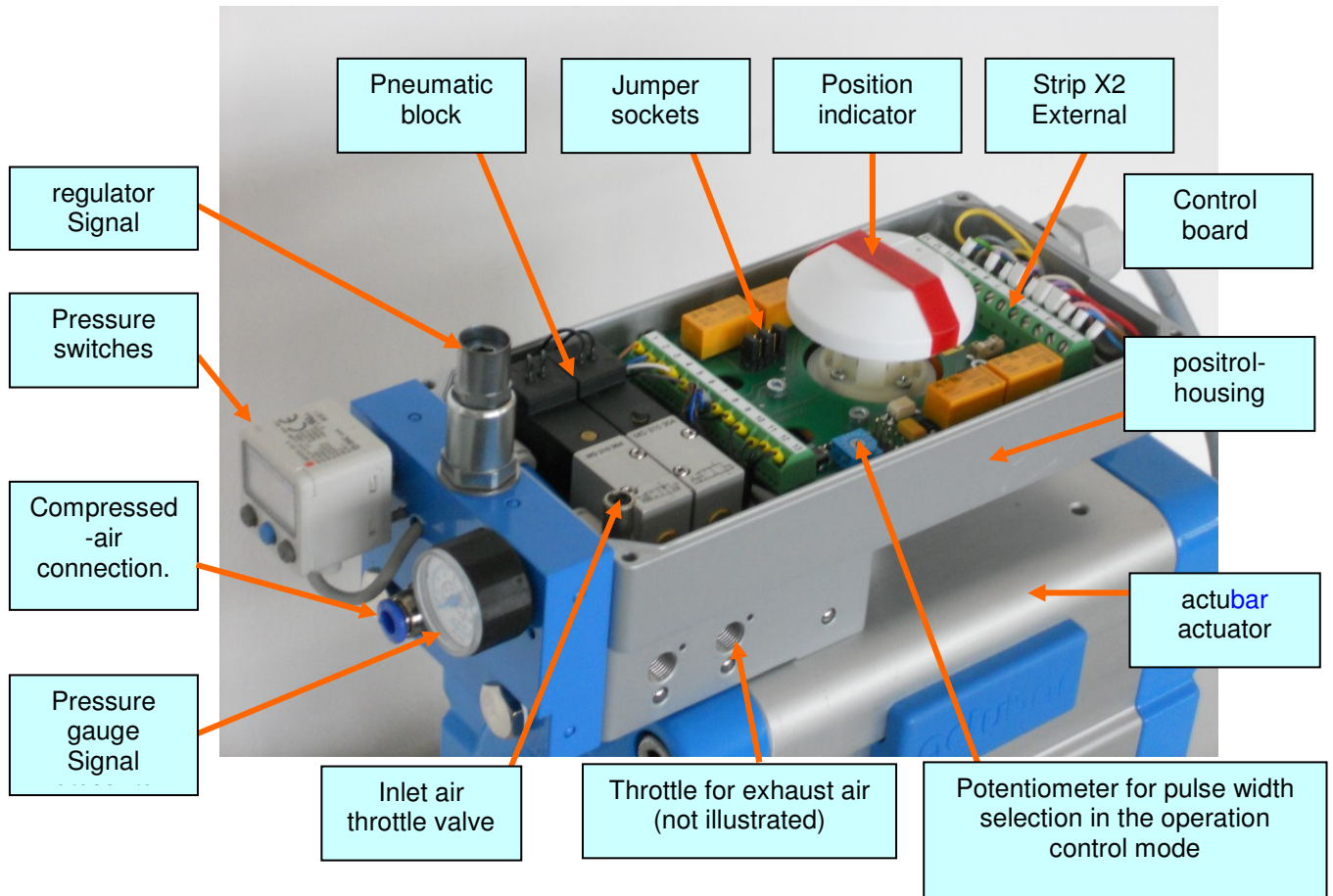
Regulating operation (pressure controlled):

- Pressure filling
- Step filling

For more information, see chapter "Setting Possibilities"

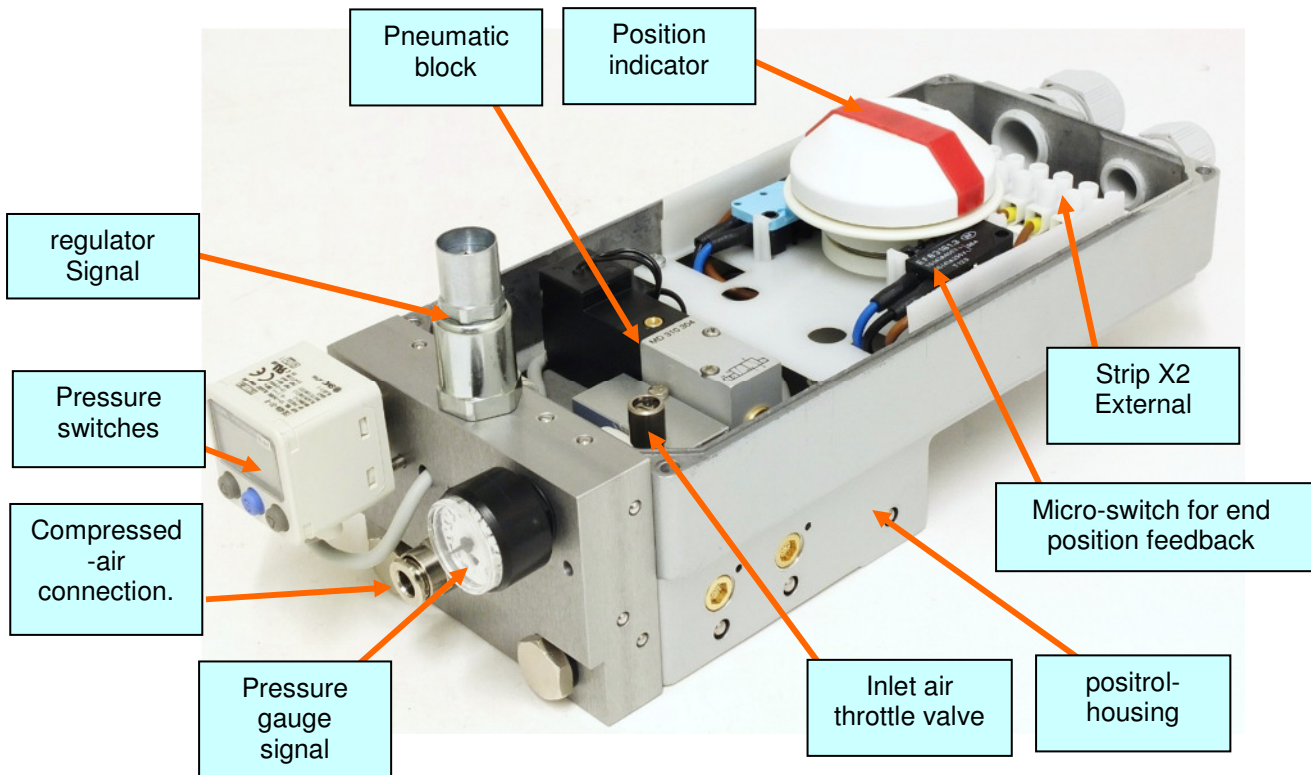
**Version ECO** has only the mode Pressure filling- Regulating operation.

## Version PCS-U-Q





## Version PCS-U-Q





**Version PCS-...-Q-... „Safe Quality“**

The valve closes even at power failure and if operating pressure is still present. In case of power failure an "emergency manual activation" of the start and pressure-maintaining system is possible.

Safe compressed air quality		
Voltage	Pressure	PCS
0	0	off
0	1	off
1	0	off
1	1	up

**Version PCS-...-V-... „Safe Supply“**

In case of power failure and operating pressure still present, the start and pressure-maintaining system remains open.

Safe compressed air supply		
Voltage	Pressure	PCS
0	0	off
0	1	up
1	0	off
1	1	up

**i Note**

If after ending the operation the power supply for the start and pressure-maintaining system is turned off, then the PCS version starts the supply! This may result in emptying the compressed air system incl. reserve tank!

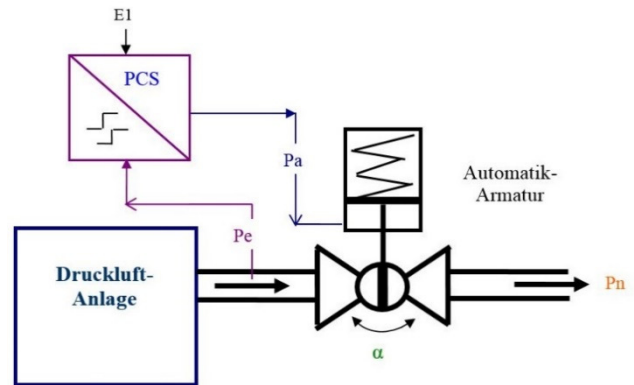
**Spannung:** 0 = keine Spannung  
 1 = Spannung liegt an  
**Druck:** 0 = anstehender Druck ist kleiner als Einstellwert  
 1 = anstehender Druck ist größer als Einstellwert

## Image of the plant

- E1** – External start
- Pa** – Infeed pressure in the actuator
- Pe** – Infeed pressure in the compressed air supply
- Pn** – System pressure
- $\alpha$**  – Position ball valve or flap

The start and pressure-maintaining system **PCS-U** can be operated in the control mode or regulating mode.

The **PCS-E (ECO)** can be operated only in the control mode or regulating mode Pressure filling (Typ R).



## Technical data

<b>Materials:</b>	housing	GD-AISI 10Mg (Aluminium cast)
	Screws	A2-70 (stainless steel)
	Sight glass	PMMA
	Light guide	TPE
	Cable connection	PA
<b>Pivoting angle</b>		0-90°
<b>Protection type</b>		IP65
<b>Mounting position</b>		any desired
<b>Ambient temperature</b>		-10°C to +50°C
<b>Ambient humidity</b>		10-90%, not condensing
<b>Weight</b>		approx. 1.8kg
<b>Supply voltage</b>		24V DC
<b>Clamping rail</b>		Terminal range up to 0,75 mm <sup>2</sup>
<b>Cable to PLT</b>		Ø 7 bis 13 mm, 0,5 mm <sup>2</sup> , Cable length: any desired
<b>Pneumatic connection P</b>		G-1/8" Steckmatic for ø6mm hose diameter
<b>Air quality</b>		Filtered air acc. to DIN ISO 8573-1/class 4
<b>Feed in pressure Pe to P</b>		3 to 16 bar
<b>Actuator pressure Pa</b>		2 to 8 bar
<b>Pulse width range</b>		In 16 steps adjustable between >0 bis <1000ms

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## **Delivery and unpacking**

### ***Delivery check***

The device is delivered by bar GmbH and transported by an appropriate transport company or parcel service. At the time of delivery to you, you must check:

- Does the number of delivered transport containers correspond to the delivery note of bar GmbH?
- Is the packaging free of visible damages?
- Are the unit and accessories free of visible damages?
- Are there evidences of not gentle handling during the transport (e.g., burns, scratches, colour)

To have all the right for claim against the transport company, you have to document the possible transport damages (e.g. with photographs and a written protocol) before unpacking the unit. bar GmbH is not responsible for transport damages and can take over no liability for that.

### ***Scope of delivery***

Carefully remove the transport packaging. Please observe all laws and regulations regarding the disposal of packaging materials.

Check the delivery against the delivery note and the order documents. Report any differences immediately to bar GmbH. Later complaints with regard to incomplete delivery cannot be accepted.



## Installation, pneumatic and electrical connection, initialization and commissioning

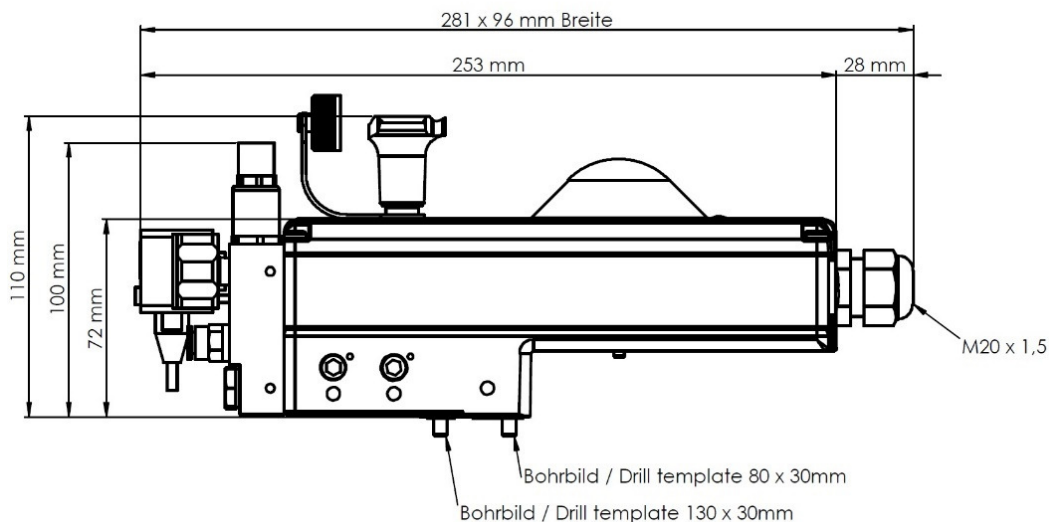
### Warning

The installation must be carried out by qualified personnel. Otherwise there is a risk of faulty installation.

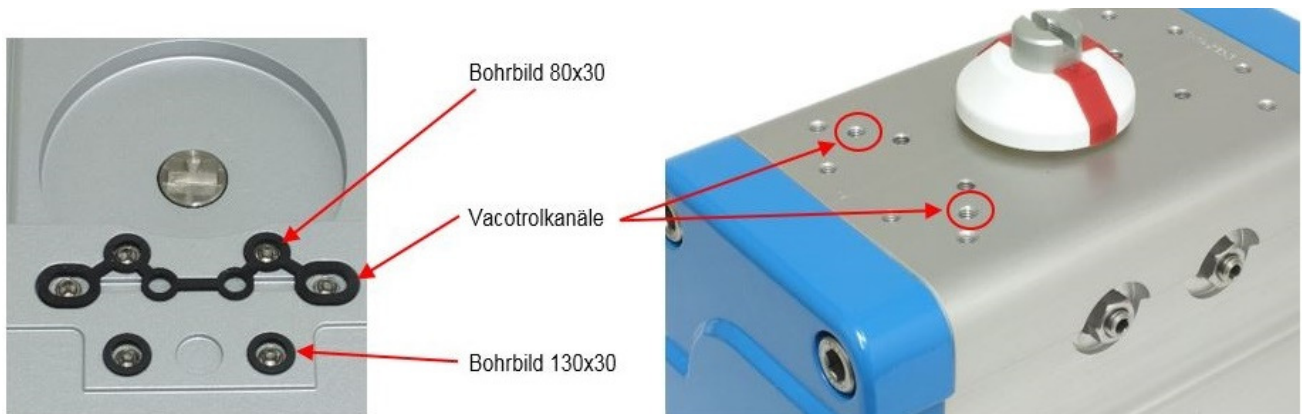
### Note

The control unit can be mounted on rotary actuators acc.to VDI/VDE 3845 in which the drive pinion, incl. the thrust disc is no greater than  $\varnothing 68\text{mm}$

## Installation of the PCS



- Remove / install the accompanying locking screws according to the desired hole pattern on the bottom case.
- Close with the accompanying locking screws the Vacotrol channels, provided that the PCS is not mounted on actuator of type actubar with vacotrol interface.
- Remove the protective film and stick the sealing strip and the sealing rings according to the figure. In order to achieve optimum adhesion, the contact surface must be cleaned and degreased.

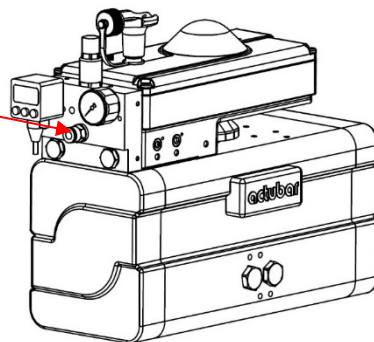


- Open the PCS and place it on the rotary actuator.
- Avoid carefully during the installation and commissioning any entry of dust, dirt and moisture into the open housing.
- Guide the pin of the position indicator into the corresponding groove of the rotary actuator.
- Fix the PCS using the supplied assembly material.
- Note when replacing the housing cover its mounting orientation. The flexible light guide must be free of kinks on the LEDs on the PCB.

## Pneumatic Connection

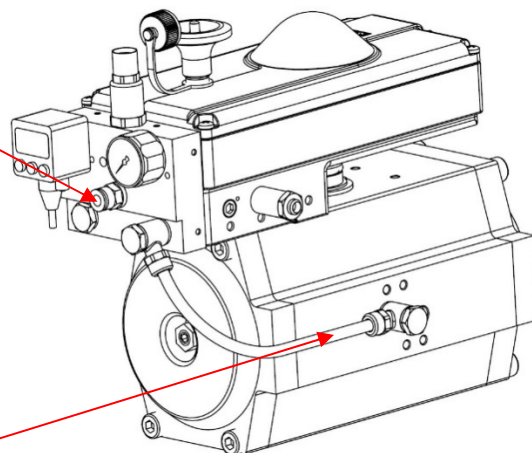
PCS on the actuator of type actubar: **Supply air connection PCS G-1/8“**

**Supply air Pe**



PCS on the actuator acc. to VDI/VDE 3845: **Supply air connection PCS G-1/8“**

**Supply air Pe**

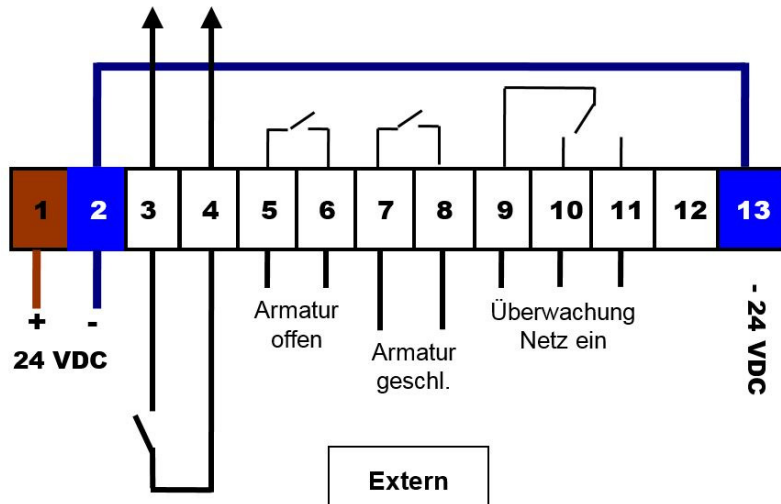


**Work channel 2**  
**Connect with the actuator using the tubing set**



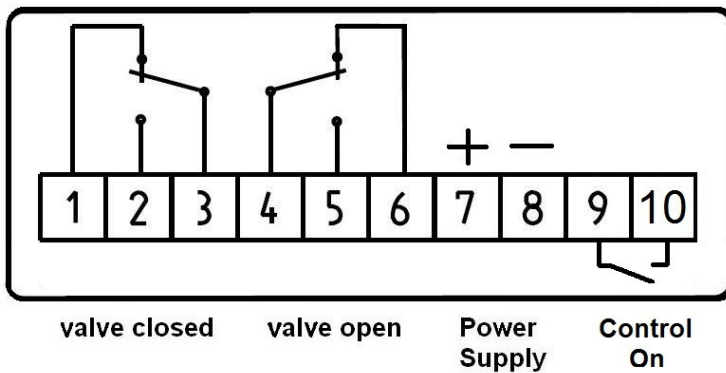
## Electrical connection

### PCS-U:



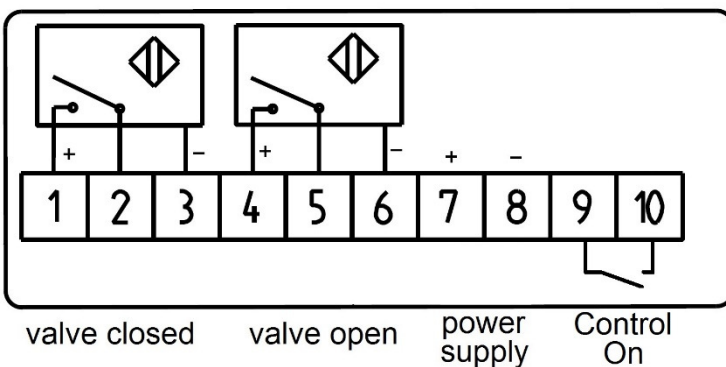
**Warning**  
 Only qualified experts may carry out the electric installation. Otherwise there is a risk of electric shock.

### PCS-E with micro-switches



**Caution**  
 No reverse polarity protection!

### PCS-E with inductive-switches



**Caution**  
 No reverse polarity protection!



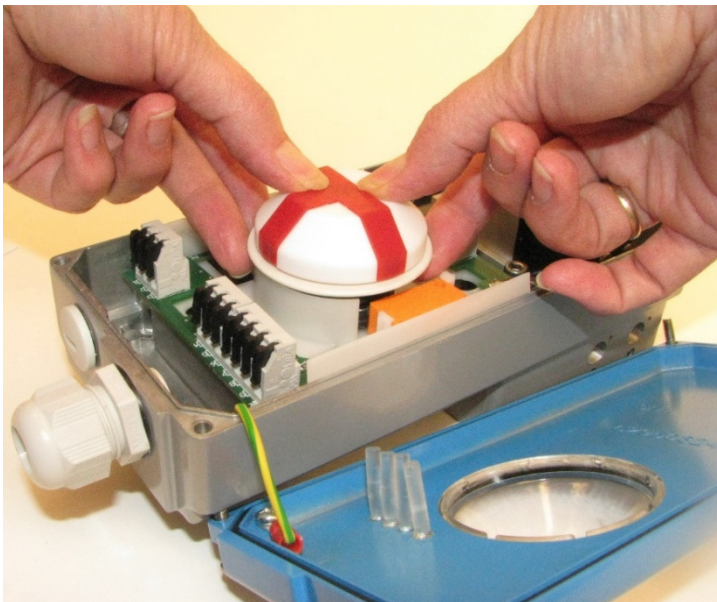
## Commissioning of PCS-E

### Warning

The installation must be carried out by qualified personnel. Otherwise there is a risk of faulty installation.

### Warning

Check the tightness of all screw connections (screw plugs, locking screws and silencers) before connecting to a pressure line. Otherwise there is a risk of parts being ejected.



a: Position indicator

b: plastic disk

1. Open the cover of the PCS-E.
2. Press with the thumb on the position indicator (a) and pull out the plastic disc (b) upwards.  
The trip cam turn automatically to the initial position. The device is now ready for automatic self-adjustment
3. Switch the rotary actuator in each direction 1x each.
4. The switch points are now adjusted.
5. Check if the position indicator matches the valve position. If not, remove the position indicator (a) carefully upwards out and put it in the correct position back into the seating.

6. Connect the air supply
7. Now switch on the power supply and set the desired parameters according to section "Setting Possibilities" on the pressure switch.
8. Check electrically if the signals are present in the end positions of the actuator at the terminals. If not, repeat steps 1-5 and check all electrical connections
9. Close the cover, check the correct position of the cover gasket and tighten the screws for securing the cover.

**⚠ Attention:**

After each change of the end positions and after modifications to the actuator, steps 1 - -9 must always be performed.

10. If all checks are passed successfully, the installation and commissioning is completed.
11. For the setup of the pressure switch, see chapter "**Setup of pressure regulator and throttle valve**"

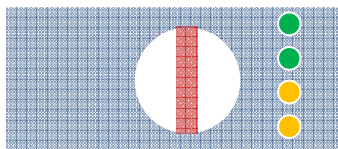
## Sequence control system of the PCS

The sequence control system is implemented on the device with a control board.

The following are connected on the control board:

- the magnetic valves
- the pressure switch.
- the position indicator system
- the terminal strip **X2** of the external interface

System indicators (only **PCS-U**)



**H1 – network on**  
**H2 – pressure OK**  
**H3 – flap closed**  
**H4 – flap opened**

is done with four LEDs, which are located on the control board and their optical signals are guided via optical fibers to the optical detector on the housing cover .

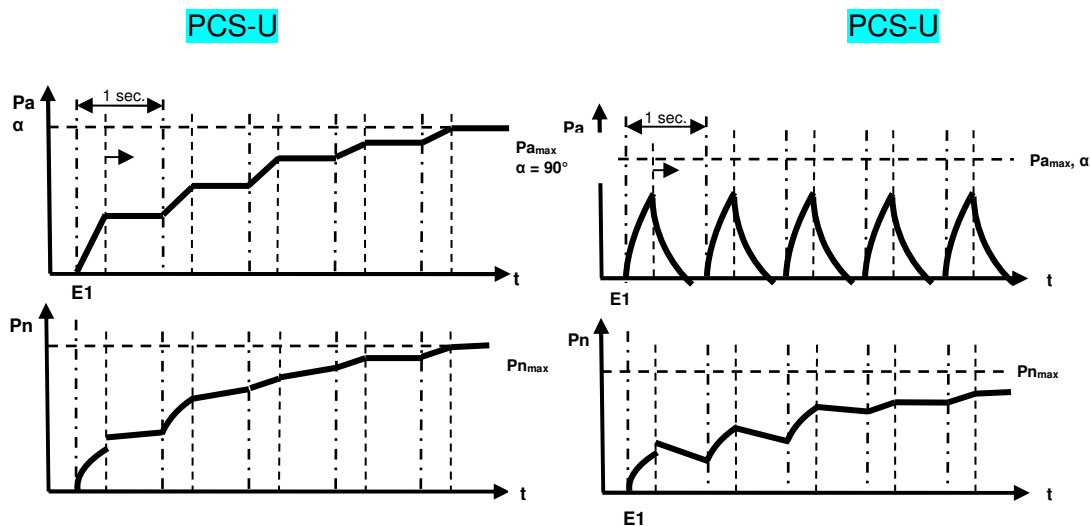
## Control mode (only PCS-U)

In the control mode, the switching on of the actuator or of the valve is done as a direct function of the preset switching point.

Once the preset switching point is reached, the control begins to work. At a constant pulse frequency of 1Hz, the pulse width is adjustable.

The pulsating operation when starting always ends when reaching the end position. If the the inlet pressure decreases below the preset pressure switching point, then the valve is closed.

## There are two different operating modes:



### Stepwise filling – Typ S

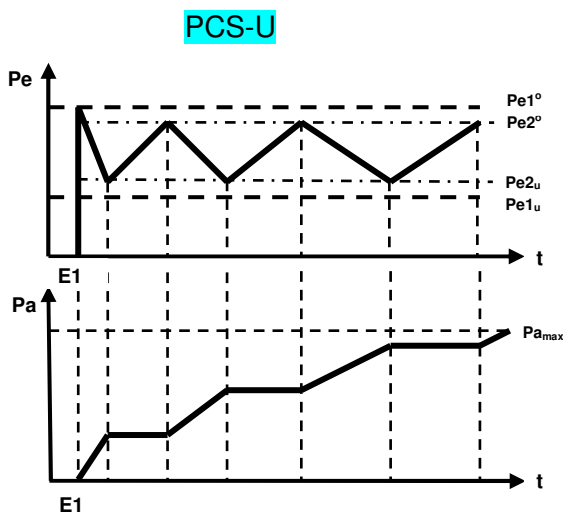
The actuator and therefore the valve will be driven stepwise at a constant frequency and the selected pulse width.

### Pressure filling – Typ S

The valve is opened and closed at a pulsating constant frequency and with the pulse width selected.

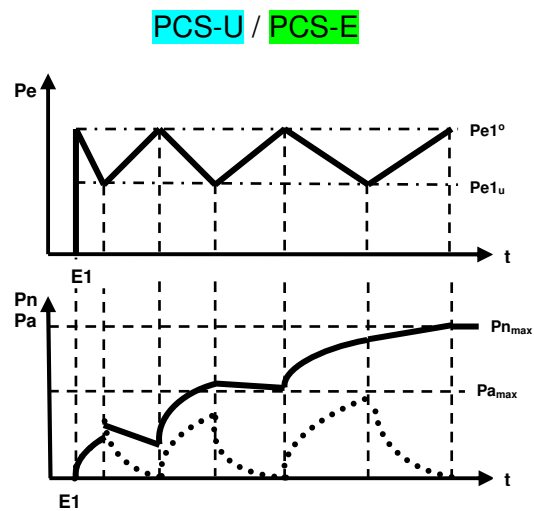
## Control mode

In the regulating mode, the operation of the actuator and of the valve is performed depending on the preset pressure value on the pressure switch. The preset hysteresis determines here the quality of the control. There are two different operating modes:



### Stepwise filling – Typ R

The actuator and valve are driven stepwise depending on the set pressure setpoint



### Pressure filling – Typ R

The valve is opened and closed pulsatingly, depending on the setpoint for the pressure.

The desired mode is the set for both PCS modes via a jumper on the control board.

By means of process-specific settings of the digital pressure switch, advantageous combinations of modes are possible.

The **PCS version ECO** can be operated only in the regulating mode Pressure filling (Typ R).

## Setup of pressure regulator and throttle valve

- Ensure that no power is present (**PCS-E**)
- Switch on compressed air
- Loosen the fastening on regulator
- Adjust the regulator by means of an Allen screwdriver until the desired operating pressure for the operation of the actuator is displayed on the pressure gauge.
- Actuate the manual control of the 3/2-way valve (press)
- Adjust the flow rate at the exhaust of the throttle valve
- Fix the locking mechanism on the regulator

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## Pressure switch

The Setting specification applies to the pressure switch **ISE40A** with one or two switching points. It is tailored to the **PCS** pressure holding system and does not describe all the setting possibilities of the pressure switch.



The diagram shows the SMC ISE40A pressure switch with the following components labeled:

- Output (OUT1) display (orange)**: Lights up, when OUT1 is activated.
- Output (OUT2) display (orange)**: Lights up, when OUT2 is activated.
- ▲ Button**: To change the mode or increase the ON / OFF switching point. Also used for switching to the peak value display mode.
- ▼ Button**: To change the mode or increase the ON / OFF switching point. Also used for switching to the lowest value display mode.
- SET button**: Used for switching the mode and for confirmation of a set value.
- LCD**: Displays the current pressure, setting mode, the selected display unit and the error code. Continuously red or green display; or switch between red and green depending on the output value. Four different display settings are available.

### Measurement mode

- Switch on the power supply
- After about 5 seconds, the pressure switch is in the measurement mode

### Function selection mode

- Press the **S** button in the measurement mode for min. 3 sec. until the die function indication **[F0]** occurs.
- By means of the arrow keys **▲** or **▼**, the function **[Fxx]** can be selected

No.	Function
<b>F0</b>	Change the units of measure
<b>F1</b>	Parameter setting OUT 1
<b>F2</b>	Parameter setting OUT 2
<b>F3</b>	Set the response time

- Press the **S** button for min. 3 sec. to return to the measurement mode

## Display of the pressure switch

Mode/Function	digital display	Mode/Function	
<b>Measurement mode</b> After switching on, after about 5 seconds the pressure switch is in the measurement mode.		<b>F0 – physical unit</b> with   select and with  confirm	wechselnde Anzeige  Anzeigeeinheit      Einstellwert
<b>Pressure point P<sub>1</sub><sup>o</sup></b> with   Edit	1x wechselnde Anzeige  oberer Druckpunkt P <sub>1</sub> , bzw. P <sub>2</sub> eingestellter Wert	<b>F01 / F02 OUT 1/2</b> Set the pressure points Select output 1 or 2	wechselnde Anzeige  Ausgangsmodus      Einstellwert
<b>pressure point P<sub>2</sub><sup>o</sup></b> with   Edit	1x wechselnde Anzeige  oberer Druckpunkt P <sub>1</sub> , bzw. P <sub>2</sub> eingestellter Wert	Set the P <sub>1</sub> <sup>o</sup> and P <sub>2</sub> <sup>o</sup>	wechselnde Anzeige  oberer Druckpunkt P <sub>1</sub> , bzw. P <sub>2</sub> eingestellter Wert  1x
<b>Me<sub>1</sub></b> >2s with select and with  confirm	 .....	Set the hysteresis for P <sub>1</sub> / P <sub>2</sub> $P_{1^o} - H_{1} = P_{1u}$	wechselnde Anzeige  Hysterese      Einstellwert
<b>Keys lock</b> <b>witk</b> >5s with select and with  confirm	 entriegeln      verriegeln	<b>F81 - PIN – Query at unlocking the key lock.</b> Switching on/off with and with  confirm	wechselnde Anzeige  Sicherheitscode      Einstellwert



### ***Set the OUT1 and OUT2 switch points***

- The pressure switch is in the measurement mode
- Press **S** button **1x** – Switching point **P\_1<sup>o</sup>** of the output OUT1 is displayed with its preset value
- Press **S** button **2x** – Switching point **P\_2<sup>o</sup>** of the output OUT2 is displayed with its preset value
- By means of the arrow keys **▲** or **▼**, the set values of the switch points P\_1 or P\_2 are changed.
- If the **S** button is pressed for min 3 sec., then the setting is applied and the measurement mode is activated again.

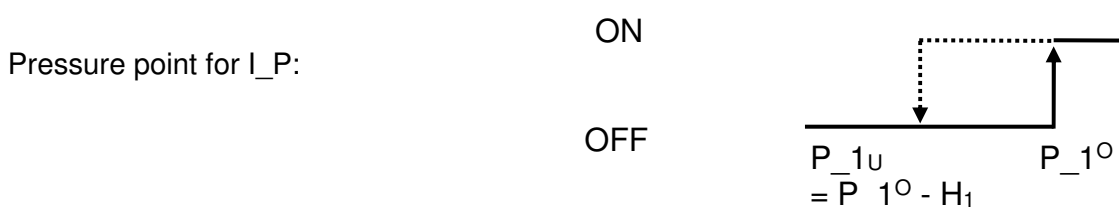
### ***[F0] - Selection of the units of measure***

- Press the **S** button in the measurement mode for min. 3 sec. until the die function indication [**F0**] occurs.
- Press **S** button briefly to go to units switching.
- By means of the arrow keys **▲** or **▼**, select the desired measurement unit - the drive box is delivered with the unit "bar".
- Press **S** button briefly to go to display mode.
- If the **S** button is pressed for min 3 sec., then the setting is applied and the measurement mode is activated again.



## **[F1] – set OUT1 – switching point & hysteresis**

- Press the **S** button in the measurement mode for min. 3 sec. until the die function indication **[F0]** occurs.
- By means of the arrow keys **▲** or **▼**, select the desired **[F1]** function.
- Press **S** button briefly to go to display mode.
- By means of the arrow keys **▲** or **▼**, select the “**hysteresis**“ **[HY5]**
- Press **S** button briefly to to set "**Normal output Normal open**" **[I\_P]**.
- Press **S** button briefly - pressure adjustment mode **[P\_1]**
- By means of the arrow keys **▲** or **▼**, the pressure settings can be changed
- Press **S** -button briefly to confirm the preset pressure and the current hysteresis is shown- **[H\_1]** ↔ **[hysteresis value]**.
- By means of the arrow keys **▲** or **▼**, set the desired hysteresis and store the value with the S button.
- Press the **S** button for min. 3 sec. to activate the measurement mode again.



## **[F2] – set OUT1 – switching point & hysteresis**

- The hysteresis **[H\_2]** for the switching point **[P\_2]** is analog.

### [F3] – Set the response time

The turning on of an output OUT1 or OUT2 can be delayed if necessary after reaching the adjusted set point, to prevent the fluttering of the output.

- Press the **S** button in the measurement mode for min. 3 sec. until the die function indication [F0] occurs.
- By means of the arrow keys ▲ or ▼, select the desired [F3] function.
- Press **S** button briefly and with the arrow keys ▲ or ▼, select the desired response time between 2,5 to 2000 ms.
- Store the value with the **S** button
- Press the **S** button for min. 3 sec. to activate the measurement mode again.

### Puls with for Stepwise filling /Pressure filling– Type S (only PCS-U)

- Set the jumper acc. to 4.4 for setting the S operating mode
- Switch on the compressed air (pressure switch must be set and indicates OK)
- Switch on the control unit via Network on
- Set the pulse width by means of the discrete potentiometer

### Jumper settings (only PCS-U)

Function		J1	J2	J3	J4	J5	Remark
Pressure filling– Type S	Safe Quality	1	0	1	1	1	a)
	Safe Supply	0	1	1	1	1	a)
Pressure filling– Type S	Safe Quality	1	0	0	0	1	a)
	Safe Supply	0	1	0	0	1	a)
Pressure filling– Type R	Safe Quality	1	0	1	0	1	b)
	Safe Supply	0	1	1	0	1	b)
Pressure filling– Type R	Safe Quality	1	0	1	0	1	a)
	Safe Supply	0	1	1	0	1	a)

1 – connected

0 – nor connected

Remark a)  $P2 \leq 1 \text{ bar}$ , and also  $H2 < P2$   
 b) Setting possibility 1:  $Pe1^o \geq Pe2^o$  und  $Pe1_u \leq Pe2_u$  oder  
 Setting possibility 2:  $Pe1^o \leq Pe2_u$   
**Please observe:**  $Pe1_u$  bzw.  $Pe2_u \geq 3,5 \text{ bar}$

Example values for Pressure filling– Type R

Setting possibility 1:  $Pe1^o = 6,5 \text{ bar}$ ,  $Pe2^o = 6 \text{ bar}$ ,  $Pe2_u = 5 \text{ bar}$ ,  $Pe1_u = 4 \text{ bar}$



Setting possibility 2:  $Pe2^o = 6,5$  bar,  $Pe2_u = 4,5$  bar,  $Pe1^o = 4$  bar,  $Pe1_u = 3,5$  bar

## Status at delivery

The **drive box PCS** is delivered in the selected mode Pressure filling - Type R with the set values:

- P1 = 6,5 bar → Pe1°
- H1 = 2,5 bar → Pe1<sub>u</sub> = 4 bar
- P2 = 1,0 bar → Pe2°
- H2 = 0,5 bar → Pe2<sub>u</sub> = 0,5 bar

The accessory kit of **PCS-U** includes two more jumpers to set the operating modes.

## Manual emergency operation




For the **PCS-...-Q** version, the emergency manual operation is carried out via an additional mechanical "emergency manual activation". For this purpose, the safety cap must be removed and the ball lock pin is introduced into the hole while pressing the button. The "emergency manual activation" functions with latching/ spring return.

## Elimination of error

Failure description	Possible cause	Elimination of error
The actuator makes no movement	Missing pressure Missing voltage	Check the pressure pipeline Check the control pressure Check the electrical connection.
The control does not reach the end position in control operation	Pulse width too short Exhaust air too little throttled	Increase the pulse width via the potentiometer Throttle the exhaust air

## Cleaning and maintenance

Cleaning	Maintenance
 <b>Caution</b>	
<p>Never use abrasive cleaners or materials to the housing of the PCS This can cause damage to the sight glass or paint</p>	
<ul style="list-style-type: none"> <li>• Clean the housing of the PCS with a clean, slightly damp cloth.</li> </ul>	<ul style="list-style-type: none"> <li>• The PCS is maintenance-free.</li> </ul>
<ul style="list-style-type: none"> <li>• For persistent dirt, use a mild commercial household cleaners as instructed on the packaging of the cleaner.</li> </ul>	<ul style="list-style-type: none"> <li>• For defects occurring within the warranty period, remove the PCS and send the device <b>after</b> telephone arrangement to the address specified end of the operating instructions.</li> </ul>

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*Englische Version auf Anforderung – English version on request*

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