

# *tecno easy*

Proportional pressure regulation valve

Type series PRE-U3

Operating instructions

Version 01

ID no.: PS09575A



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# 1 Notes about using the operating instructions

## 1.1 About these instructions

These operating instructions describe how to work, operate, and maintain the product tecno easy. They provide important notes for safe and efficient use of the product.

1. The operating instructions are part of the product. Keep the operating instructions carefully.
2. Transfer the operating instructions to any subsequent owner or user.

For additional information, contact the manufacturer at the following address:

HOERBIGER Flow Control GmbH  
Südliche Römerstraße 15  
86972 Altenstadt  
Germany

Information on the Internet: [www.hoerbiger.com](http://www.hoerbiger.com)

## 1.2 Warnings used

Warnings warn about dangers that can occur when handling the product. There are four danger levels with the following signal words:

Signal word	Meaning
DANGER	Identifies a danger with high risk that can cause death or severe injury.
WARNING	Identifies a danger with a medium risk that can cause death or severe injury.
CAUTION	Identifies a danger with a low risk that can cause slight or moderate injury.
NOTICE	Identifies a danger that can cause property damage.

## 1.3 Symbols



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This symbol indicates useful and important information.

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- ✓ This symbol stands for a prerequisite that must be fulfilled before performing an action.
- ⇒ This symbol stands for an individual action to be performed.
- 1. Numbers indicate several steps to be performed in an action instruction: Step 1
- 2. Step 2
  - ↳ This symbol stands for the intermediate result of an action.
  - ↳ This symbol stands for the result of an entire action instruction.

## 1.4 Abbreviations

Term / Abbreviation	Explanation
GND	Ground
EMC	Electromagnetic compatibility

## 2 Basic safety instructions

### 2.1 General notes

The product was constructed, manufactured, and tested according to the following standards and safety regulations:

- EMC directive 2004/108/EC

Furthermore, the following harmonized standards and other standards were applied:

- EN 61000-6-2 Electromagnetic compatibility (EMC); generic standard for immunity to interference; industrial sector
- EN 61000-6-4 Electromagnetic compatibility (EMC); generic standard for emitted interference; industrial sector

For this specification, a screened connection cable must be used.

The CE mark is on the valve's type plate.

### 2.2 Intended use

The piezoelectrically-activated proportional pressure regulation valves serve to electrically control pneumatic pressure. The device will only be used for compressed air and approved gases.

1. To ensure perfect, risk-free function and a long life span of the device, follow the notes in these operating instructions and adhere to the usage conditions and permissible data according to the data sheet and type plate.
2. The usage planning and operation of the device must be done according to the recognized rules of technology.
3. Prevent unintentional activations or impermissible interference by taking suitable measures.



#### **⚠ WARNING**

##### **Personal injury and property damage possible**

- Only have settings on the valve made by authorized specialized personnel trained by the manufacturer with suitable tools.



#### **⚠ WARNING**

##### **Use is forbidden in case of:**

- Use of aggressive gases that can damage the valve
- Use of pneumatic variables that lie outside the area of application (see *Technical data, page 11*).

## 2.3 Personnel qualification

Unqualified personnel cannot detect risks and is therefore subject to greater dangers.

1. Only commission qualified personnel with the activities described in these instructions.
2. Make sure that the personnel adheres to the locally valid regulations and rules for safe and danger-conscious work.

The following target groups are addressed in these instructions:

**Trained person:** A trained person is somebody who has been trained extensively by the operator in his tasks in connection with the safe operation of the valves.

Training is conducted by specialized personnel.

**Electrically-qualified person:** An electrically-qualified person is somebody who, based on his specialized training, knowledge, and experience, as well as knowledge of the applicable regulations, can judge and perform the work with which he is commissioned and detect possible hazards independently.

**Pneumatically-qualified person:** A pneumatically-qualified person is somebody who, based on his specialized training, knowledge, and experience with respect to pneumatic components and systems as well as knowledge of the applicable regulations, can judge and perform the work with which he is commissioned and detect possible hazards – especially with respect to interactions between pneumatic, mechanical, electrical, and control-technical components – independently.

Activity	Authorization
<ul style="list-style-type: none"> <li>■ Assembly</li> </ul>	<ul style="list-style-type: none"> <li>■ Pneumatically-qualified person</li> <li>■ Trained person</li> </ul>
<ul style="list-style-type: none"> <li>■ Installation incl. electrical connection</li> <li>■ Initial start-up</li> <li>■ Troubleshooting</li> <li>■ Elimination of faults</li> <li>■ Taking out of service</li> </ul>	<ul style="list-style-type: none"> <li>■ Electrically-qualified person</li> <li>■ Trained person</li> </ul>

## 2.4 Dangers



Here you will find information about various types of dangers and damage that can occur in connection with operation of the product.

### Electricity

1. Only have the device connected to the power supply and control lines by an electrically-qualified person.
2. Only perform installation and maintenance work when the power is disconnected.

### Pressure

1. Only have the device assembled by a pneumatically-qualified person.
2. Only install pneumatic components when the compressed air system is depressurized.
3. During assembly and dismantling, adhere to the recognized rules of technology.
4. During work on pneumatic systems, heed the special safety regulations.

### Operation

1. Settings on the valve only by authorized personnel trained by the manufacturer with suitable tools.
2. Only use the device in industrial applications for compressed air and permissible gases. Adhere to the working pressure according to the data sheet.
3. The device is only approved for proper or intended use.
4. Do not open the device.
5. Do not remove type designations or seals that do not serve transport protection.
6. Heed the prescribed air purity.

### Repair and maintenance

1. Only have repair work on the valve performed by the manufacturer since only the manufacturer has the equipment for optimal adjustment after repair and can therefore guarantee perfect function.
2. Do NOT maintain the inner parts of the device.
3. Send the complete valve to the manufacturer for maintenance and service.

## 2.5 Responsibility of the operator

The assumed duties of the operator are:

1. Adherence to operational safety regulations.
2. Adherence to the valid national occupational safety regulations.
3. Adherence to the intended use of the valve.



### 3 Product description

#### 3.1 Connections

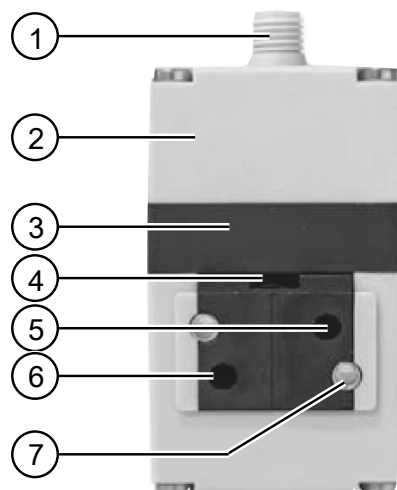


Fig. 1: Side view

1	Device plug M8, 3-pin	5	Working connection (2)
2	Control electronics	6	Compressed air supply (1)
3	Proportional pressure regulation valve	7	Holes for fastening screws M3
4	Ventilation (3)		

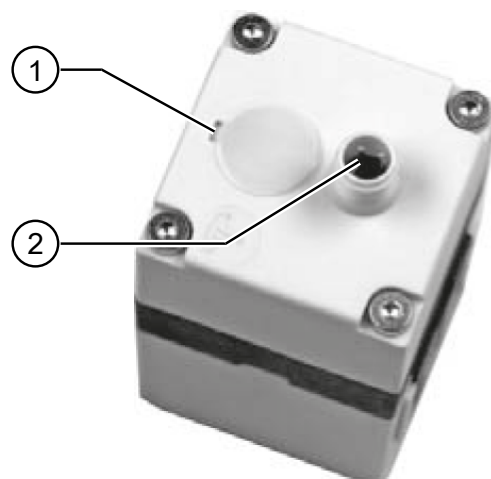


Fig. 2: Top view

1	Ventilation pilot valve	2	Device plug M8, 3-pin
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Fig. 3: Single connection plate

The single connection plate with symmetrical hole pattern enables mounting turned by 180°.

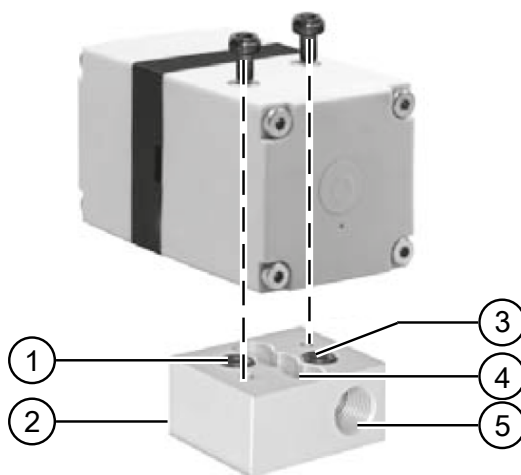


Fig. 4: Proportional pressure regulation valve, can be mounted on single connection plate or battery strip

1	Working connection with O-ring	4	Holes for fastening screws M3
2	Working connection (2)	5	Compressed air supply (1)
3	Air supply with O-ring		

## 3.2 Technical data

### General technical data

Designation	tecno easy
Model	PRE-U3: Target value specification via voltage
Actuation type	Piezoelectric pilot valve-controlled 3-way proportional pressure controller, electronically controlled
Fastening type	Flange <sup>1)</sup>
Connection size	2.5 mm
Threaded connection plate	G1/8
Weight	0.100 kg 0.155 kg with connection plate
Installation position	Any
Medium <sup>2)</sup>	Compressed air and nitrogen According to ISO 8573-1:2010 (6:3:4)
Flow direction	<ul style="list-style-type: none"> <li>■ ON: from 1 to 2</li> <li>■ OFF: from 2 to 3</li> </ul>
Storage temperature	-20 °C to +60 °C
Ambient temperature	0 °C to +50 °C
Medium temperature	0 °C to +50 °C
Material	Aluminum, brass, spring steel, plastic, elastomer
Protection type <sup>3)</sup>	IP 30, DIN EN 60529 A1:2000 <sup>2)</sup>
Behavior in case of power failure	Connection 2 ventilating
RoHs	Compliant

<sup>1)</sup> Flange plates with threaded connection, see accessories

<sup>2)</sup> For use of other media, inquire with the manufacturer

<sup>3)</sup> Only with connection plug mounted according to instructions

### Pneumatic characteristics

Pressure range	0 to 8 bar
Min. input pressure ( $p_{1_{min}}$ )	1.5 bar
Max. input pressure ( $p_{1_{max}}$ )	10 bar

Pressure range	0 to 8 bar
Min. output pressure ( $p_{2_{\min}}$ )	0 bar
Max. output pressure ( $p_{2_{\max}}$ )	8 bar
Nominal flow rate ( $Q_N$ )	200 l/min
Maximum flow rate ( $Q_{\max}$ )	350 l/min <sup>1)</sup>
Hysteresis (@ $p_{2_{\max}}$ ) <sup>2)</sup>	< 0.2 %
Repeat accuracy (@ $p_{2_{\max}}$ ) <sup>2)</sup>	< 0.2 %
Responsiveness (@ $p_{2_{\max}}$ ) <sup>2)</sup>	< 0.1 %
Linearity (@ $p_{2_{\max}}$ ) <sup>2) 3)</sup>	< 2.5 %
Leakage <sup>4)</sup>	$\leq 0.75$ NI/min
Internal air consumption <sup>5)</sup>	$\leq 1.0$ NI/min

<sup>1)</sup> With  $p_1 = 10$  bar and  $p_2 = 6.3$  bar,  $\Delta p = 1$  bar

<sup>2)</sup> With regard to end value  $p_{2_{\max}}$

<sup>3)</sup> At ambient temperature  $+20$  °C

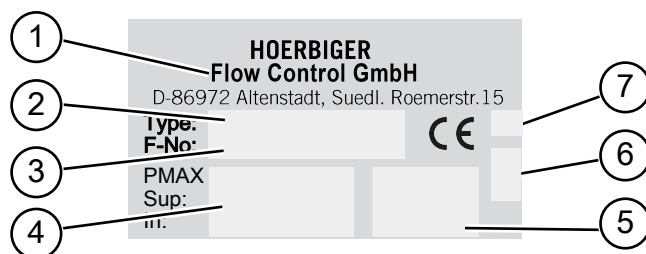
<sup>4)</sup> At  $p_{1_{\max}}$  and  $p_{2_{\min}}$  (0 bar)

<sup>5)</sup> Only with target value  $> 0$

### Electric characteristics

Model series	PRE-U3
Model	0 to 8 bar
Nominal voltage ( $U_N$ )	24 V DC $\pm 10$ %
Nominal voltage ( $P_N$ )	0.4 W
Ripple ( $U_N$ )	10 %
Current consumption ( $I_{B_{\max}}$ )	15 mA
Input resistance ( $R_E$ )	61.5 k $\Omega$
Target value input (W)	0 to 8 V
Resolution (W/ $p_2$ )	1 V/bar
Cable connection	M8; 3-pin
Electromagnetic compatibility (EMC)	Use screened connection cable
Immunity to interference	EN 61000-6-2
Emitted interference	EN 61000-6-4

### 3.3 Type plate



1	Address	5	Electrical connection assignment
2	Model	6	Technical state
3	Item no.	7	Production date (format YY/WW)
4	Technical data		

## 4 Assembly and installation

### 4.1 Assembly



#### **⚠ DANGER**

##### **Mortal danger due to electrical voltage!**

- Switch off current before assembling and dismantling the valve.



#### **⚠ WARNING**

##### **Danger of crushing due to uncontrolled movement of the machines**

Personal injury and/or property damage possible.

- Before restarting the system, take measures to prevent uncontrolled movement of the machines.
- Make sure that nobody is in the danger zone.



#### **⚠ WARNING**

##### **Personal injury or property damage due to overpressure**

Improperly connected or defective pneumatic connections can loosen under pressure and cause extremely severe injuries.

- Before assembly and dismantling of valves, switch off compressed air.
- Make sure that there is neither input nor output pressure on the valves.
- Only use components that are suitable for the permissible pressure ranges (see *Technical data, page 11*).
- Proceed according to the special country-specific safety regulations.

✓ The pipelines and flange surfaces are free of contamination.

✓ The input pressure is at least 1 bar greater than the maximum required output pressure.

1. Make sure that the appropriate O-rings or seals are inserted on the valve and the connection plate.
2. Optionally mount the valve on a connection plate for the direct connection of lines or on another pneumatic amplifier stage. **NOTICE! Tightening torque:** 50 ±5 Ncm



##### **Compromising of the valve function possible**

- Make sure that the ventilation connection and the pilot ventilation connection are not covered. Back pressure on one of these connections compromises the function of the valve.
- Protect valve against excessive heat radiation.
- Protect valve against adverse ambient conditions such as spray water or dirt, in order to guarantee the protection type according to the data sheet.

## 4.2 Electrical installation



### **⚠ DANGER**

#### **Mortal danger due to electrical voltage!**

- Only have the device connected to the power supply and control lines by a specialist.
- Installation may only be done when the device is de-energized.
- Secure against unintentional switching on.
- Check electric cables for damage before connecting.

1. For connection, use the included cable or a cable of equal quality with appropriate device outlet according to chapter *Electrical connection diagram/plug assignment*, page 15.
2. Connect cable to the device outlet and tighten screws by hand. **NOTICE! There may be no mechanical load on the cable.**
3. Read the type plate. Using the item number (identified as “F-No”), find the classification of the device in question.
4. Connect the individual wires of the cable according to the connection assignment under *Electrical connection diagram/plug assignment*, page 15.

## 4.3 Electrical connection diagram/plug assignment

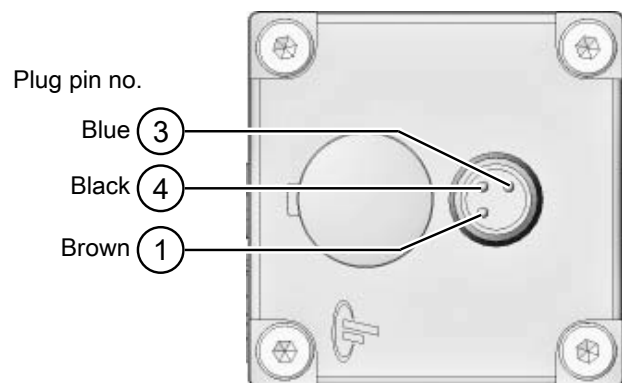


Fig. 5: Connection scheme

1	Power supply 24 V DC / 15 mA	4	Target input (voltage)
3	GND target value and supply		

## 5 Start-up

### 5.1 Start-up



#### **⚠ WARNING**

##### **Danger of crushing due to uncontrolled movement of the machines**

Personal injury and/or property damage possible.

- Before restarting the system, take measures to prevent uncontrolled movement of the machines.
- Make sure that nobody is in the danger zone.



##### **Faults due to electromagnetic radiation**

- Do not mount valve directly in the area of devices with high electromagnetic radiation.
- To adhere to the regulations according to EMC directive 2004/108/EC, use screened lines.

- ✓ The power supply is switched off.
  - ✓ There is no input or output pressure.
1. Check proper mounting.
  2. Open compressed air supply.
  3. Switch on electric signal control.



## 6 Service



### Compromising of the valve function due to incorrect cleaning

- Do not use cleansers that contain solvents for cleaning work.
- No solvents or solids may penetrate the openings for ventilation and manual activation.



### **⚠ WARNING**

### Personal injury and property damage due to improper servicing

Malfunctions can result.

- In case of fault, do NOT service the device.
- In case of fault, shut the device down immediately.
- Remove the complete valve and send it to the manufacturer's local agent for servicing.

### 6.1 Inspection and maintenance plan

Work to be performed	ir	d	w	¼ y	y	oh
<ul style="list-style-type: none"> <li>■ Check pneumatic connections for leaks</li> </ul>				X		
<ul style="list-style-type: none"> <li>■ Check electrical cable for cracks, kinks, and damage to the cable insulation.</li> <li>■ Replaced damaged lines.</li> </ul>				X		
<ul style="list-style-type: none"> <li>■ Check type plates to ensure they are present, visible, legible, and complete; replace if necessary</li> </ul>					1	
<ul style="list-style-type: none"> <li>■ Check fastening screws to ensure they are tight, tighten if necessary</li> </ul>				X		
<b>Legend:</b> ir= if required, d = daily, w = weekly , ¼ = quarterly, y = annually, oh = operating hours						

## 7 Transport and storage

1. Store the product in level, dry rooms that are free of dust and vibrations.
2. In case of longer unpackaged storage, seal all pneumatic connections of the valve with tape that can be removed without leaving residues.

For more information, see *Technical data, page 11*.

## 8 Troubleshooting

1. Customers and third parties should not make any changes to or perform any troubleshooting on the device.
2. Send the defective product to the manufacturer or its local representative for servicing.

## 9 Decommissioning and disposal

### 9.1 Decommissioning/dismantling



#### **⚠ WARNING**

##### **Risk of injury due to pressure**

- Do not perform any work on the valve when it is pressurized.
- 
- ✓ The power supply is switched off.
  - ✓ There is no input or output pressure.
  - ✓ The machines/systems (e.g. actuators) have been moved into a safe switch state (control positions).
- ⇒ Dismantle.

### 9.2 Disposal

The disposal of the packaging and used parts is the customer's responsibility.

- ⇒ Dispose of the product according to the local regulations at approved collection points or have removed by approved disposal companies.

## 10 Appendix

### 10.1 Product observation

Our goal is continuous enhancement of our products and close cooperation with the customer. Please tell us about faults or problems with the valve.

### 10.2 Material defects and defects of title

These operating instructions and technical details with respect to the specifications and figures in these operating instructions are subject to change without notice.

The company HOERBIGER Flow Control GmbH makes no quality or durability guarantees, and also no guarantees about suitability for a particular purpose. These must be agreed upon expressly in writing. Public statements, promotions, and advertising do not constitute quality specifications for the product.

The operator's claims relating to material defects and defects of title assume that he presses this claim in writing immediately, at the latest within two working days. HOERBIGER Flow Control GmbH is in no case responsible for damage to the product itself or consequential damages caused by the product that are caused by improper handling of the product.

Insofar as HOERBIGER Flow Control GmbH is responsible for a defect, HOERBIGER Flow Control GmbH will, at its option, provide rectification or substitute performance.

Liability of HOERBIGER Flow Control GmbH – regardless of the legal justification – exists only in case of intention or gross negligence, negligent injury of life, body, health for defects that were fraudulently concealed or whose absence was guaranteed expressly in writing. Furthermore, according to the product liability law for personal injury or property damage to privately used objects.

In case of negligent injury of essential contract duties, HOERBIGER Flow Control GmbH is also liable, also in case of slight negligence, however limited to the contract-typical, foreseeable damages. Additional claims are excluded.

In case individual regulations of these operating instructions, the applicable legal regulations or other instructions of HOERBIGER Flow Control GmbH are disregarded, material defects and defects of title are terminated.

In particular, HOERBIGER Flow Control GmbH is not responsible for failures or faults that are caused by modifications by the customer or other persons. In such cases, the repair costs due will be invoiced. These will also be invoiced for the checking of the device if no fault could be found on the device.

There are no claims to the availability of previous versions and to the ability to refit devices delivered to the respective current series state.

## 10.3 Declaration of conformity

The current declaration of conformity is included in the scope of delivery and it can be found in the download area on the company's website:

<http://www.hoerbiger.com/>

