

BA 5.7



Examples shown above, not all possible type variants are shown!

Operating instruction

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A) Introduction

This instruction may support the user to store, install, start-up, use and maintain EBRO Pinchvalves Series QV with a manual or pneumatic actuator.

 Attention	<p>It will be dangerous for the user if the following „attention“-, „warning“- and „danger“-notices are not observed, and the liability of the manufacturer may become ineffective.</p> <p>In case of any question to the manufacturer, see addresses in clause 8 <information>.</p>
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B) Valve destination



An **EBRO** Pinch valve **Series QV** is exclusively destined – after installation at or between flanges of a pipe system and after connection of the actuator – if any – to the plant control system, to let pass or shut off media of max. 5 bar pressure and at the specified temperature.

The valve opens under condition only, that the fluid has a higher pressure than the pneumatic pilot pressure.

To close the valve, the pilot pressure (pneumatic with compressed air or with water) shall be as per Table 1:

Table 1: Pilot pressure (overpressure) to close the Pinch valve

Fluid pressure [bar]	-0,5	0	1	1,5	2	2,5	3	3,5	4	4,5	5
Minimum pilot pressure [bar]	0,5	1	2	2,5	3	3,5	4	4,5	5	5,5	6
Maximum pilot pressure [bar]	1,5	2	3	3,5	4	4,5	5	5,5	6	6,5	7

 Note	<p>Vacuum Applications: for vacuum operation the pilot pressure must be precisely aligned with the fluid pressure to avoid a compression of the hose and to prevent a reduction or fully stop of the flow. Example: Operating pressure -0.5 bar (0.5 bar absolute) required pilot pressure -0.5 bar (0.5 bar absolute)</p>
 Note	<p>For bulk goods, the necessary pilot pressure may differ from these values.</p>

The maximum pilot pressure is limited to 7 bar for safety aspects.

The maximum service temperature depends from the material of the flexible hose and is marked at the valve nameplate.

The minimum service temperature is –20°C for gaseous fluids.

A Pinch valve shall be installed between flanges as per EN 1092-1 only. Any other flanges used as counter flanges shall be released by **EBRO-Armaturen**.

All requirements of clause 2.2 <Important information for the user> shall be observed.

As a standard, these series are used for bulk goods and fluids with a high content of solid particles and for pneumatic conveyance.

C) Safety information

C1 **General Safety Information**




The safety requirements apply for valves units same as for the piping system into which the valve is installed and same as for the plant control system, to which the actuator is connected. This instruction gives such advices only, which **shall be observed additionally**

More safety information may be included in the relevant manual of the actuator

C2 **Important information for the user**



It is not the valve manufacturer's liability, and therefore it shall be observed, that

⇒ the valve is only used as specified in clause 1 <valve destination>.

 Danger	No valve shall be used, whose certified pressure/temperature range is not sufficient for the operating conditions: The relevant documents <EBRO-Pinch valves QV> and the valve nameplate specify this admissible range relative to the valve hose material. EBRO Armaturen shall release any other range of application. Ignoring these requirements could mean danger for the life or health of the user and/or cause damage in the piping system.
 Danger	It shall be ensured, that the hose material is suitable for the kind of the fluid and its range of temperature. The valve manufacturer is not liable for damage resulting from improper hose material. Ignoring these requirements could mean danger for the life or health of the user and/or cause damage in the piping system.
 Danger	It shall be ensured, that the valve body material is suitable for the kind of the pilot fluid and its range of temperature. The valve manufacturer is not liable for damage resulting from improper pilot fluid conditions. Ignoring these requirements could mean danger for the life or health of the user and/or cause damage in the piping system.

- ⇒ the pipe system and the control system have been installed by experts and that these systems are regularly inspected. The stiffness of the body is designed to support additional pipework forces F_z not higher than ($F_z = 0,25 \cdot DN^2 \cdot PS$),
 (where $PS = \text{maximum admissible pressure at room temperature}$).
- ⇒ the valve has been connected to these systems by experts,
- ⇒ the flow velocity in the pipe system is limited to usual values and that abnormal conditions such as vibration, waterhammer, erosion, cavitation and a high content of solid – especially hard and sharp – particles in the fluid are agreed by the manufacturer,
- ⇒ at service temperature $>+50^\circ\text{C}$ the valve surfaces are protected from contact by the user,
- ⇒ only qualified personnel shall install, operate, maintain and repair the valve. Qualified in the meaning of this instruction is a person which is able to understand, to judge and to handle correctly any job taken and which is able to analyse the necessary safety aspects to eliminate foreseeable dangers.

C3 Special dangers

 Danger	<i>If a valve shall be disassembled from the pipe:</i> Take care, that the adjacent pipe system is completely drained at both valve ends , before the valve is disassembled from the pipe. Take special care to residual amounts of the fluid that remain trapped in the valve and/or in the adjacent pipe.
 Danger	<i>If a valve shall be disconnected from the pilot system:</i> Take care that the valve body and the adjacent pilot connection system are completely drained at all connection ends , before the valve is disassembled from the system. Take special care to residual amounts of the fluid that remain trapped in the valve and/or in the pilot system.

C4 Valve markings

Each Pinch valve is marked at the body or at the valve nameplate as follows:

for	Marking	Note
Manufacturer	EBRO-ARMATUREN	Adress see Clause 8 <Informations>
Valve Type	QV	see EBRO-Leaflet < 5.6 QV>
Serial-No.	z. B. 123456/012/001 *	Digits 1-6: EBRO-serial no. digits 7-9: position of order digits 10-12: consecutive no. of the position of order
DN	DN (and nominal value)	(at the valve body) i.e. DN80
PN	PN 10	PN is the standard for the connecting flanges
max. admiss. Temp.	TS (and nominal value)	upper limit for the fluid temperature
Max. zul. Druck	PS (and nominal value)	upper limit for the fluid pressure
Material	GAISi10Mg	Body material
	i.e.: EPDM	Hose material

NOTE: *) The year of manufacture is coded in the Serial-No.

The valve and the nameplate markings shall remain legible to identify the valve at any time later.

D) Shipment and storage

The valve shall be handled, shipped and stored with care.



- ⇒ Handle the valve with the protective packaging just until the installation into the pipework.
- ⇒ If the valve shall be stored before installation, store it at room temperature and protect the valve from harsh environmental conditions, such as dirt, debris and humidity.
- ⇒ Pinch valves shall be stored in a shaded room; specifically the hose shall be protected from sunshine and/or UV-light.

E) Installation

E1 General


The requirements for the installation apply for valve units same as for the pipework into which the valve is installed and as for the plant control system, to which the actuator (if any) is connected. This instruction gives such advices only, which **shall be observed additionally**.

At transport observe clause 3 (above).

 Attention	<i>Valves with pneumatic/hydraulic actuator:</i> As a rule, the supply of pilot pressure shall be adjusted for the following operation time t as follows: $t [\text{sec}] = DN [\text{mm}] / 25.$
 Note	The mating flange surfaces shall be conform to EN 1092-1 with flat mating faces (i.e. "stock-finish" form A or form B). Flanges of other standards or other kinds of mating faces normally do not fit and shall be released by EBRO.

E2 Preparation of installation

⇒ Check and be sure, that the valve pressure class, the connecting flange type & dimensions and the actuator data correspond to the plant data. See valve and actuator nameplates.

 Danger	No valve shall be used, whose certified pressure/temperature range is not sufficient for the operating conditions: The relevant documents <EBRO-Pinch valves QV> and the valve nameplate specify this admissible range relative to the valve hose material. EBRO shall release any other range of application. Ignoring these requirements could mean danger for the life or health of the user and/or cause damage in the piping system.
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⇒ Unpack the valve at the place of installation only and check and be sure, that the valve – specifically the elastic hose – and the actuator are free from damage. Valves or actuator units with visible damage shall not be installed.

⇒ The pipe flanges shall be installed in line with their mating faces being parallel.


⇒ The Pinch valve can be installed for both flow directions.

⇒ Inspect and be sure, that the pipe section is free from sharp particles to protect the hose.

E3 Steps to install the valve

⇒ At installation into an existing pipe system be sure, that the gap between is sufficient to protect the sealing surfaces of the Pinch valve from damage.



But the gap shall not be larger than necessary to limit additional load in the valve body.

 Attention	If it is necessary to weld at the adjacent pipework, the valve shall be disassembled from the pipe during the welding operation to protect the elastomeric liner from damage. Reinstall the valve not earlier until the temperature of the connecting flange is lower than 50°C.
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The pneumatic actuator shall be connected to the plant control system in the following steps:

- ▶ connect the tapped bore in the middle of the Pinch valve body to the pilot supply.
- ▶ as long as the Pinch valve shall remain closed the pilot pressure shall act. Refer to Clause 1 Table 1 for the necessary pilot pressure range.
- ▶ The Pinch valve opens automatically when the Pinch valve is evacuated at the tapped body bore via the solenoid valve.
- ▶ Respect any other instruction from the pilot pressure supply system – if any.

Last step of the installation: Make a functional test without medium: Open and close the valve to the closed position and check the correct function of the Pinch valve.


 Attention	Defaults of signals & signalisation could mean danger for the health of the user and/or cause damage in the piping system
 Danger	If the valve is used in end-of-line-service, take special care to assemble a protecting device behind or – at least – a danger warning to point out the danger of jamming one’s hand or fingers when the hose is closing.

⇒ At any trouble see clause 7 <Trouble shooting guide>.

F) Pressure test of the pipe system

The valve has been pressure tested by the manufacturer. Observe at the pipe system pressure test:


- ⇒ Flush new installed pipe systems carefully before the pressure test to be sure, that all sharp particulates have been flushed out,

 Attention	The pipe section <u>with the Pinch valve installed</u> shall not be tested higher than 5 bar. If the test pressure shall be >5 bar, then: <ul style="list-style-type: none"> ▶ a pilot pressure as per clause 1, Table 1 shall be connected to the tapped bore in the middle of the Pinch valve body before to protect the elastic hose; ▶▶ or the Pinch valve shall be disassembled before and shall be replaced by a dummy.
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- ⇒ In case of external leakage, observe clause 7 <Troubleshooting guide>.
- ⇒ If the pipe system shall be dried after the pressure test, observe the maximum admissible temperature, see the valve nameplate.


G) Normal service and inspection

Actuated valves shall be operated by the plant control system. The adjustment of the actuator shall not be changed as long as the valve operates correctly.

 Note	The hose is a wear part out of elastic material. In case of high operating frequency (>1x per minute) ensure the hose to be flowed through permanently to cool it
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Regular maintenance is not required for valves, but at a periodic inspection of the line sections no leakage to outside shall occur at the Pinch valve. In such cases observe section 7 <troubleshooting>.


Pinch valves remaining permanently in the same position should be opened and closed every 3 or 4 month.

 Danger	The hose is a wear part out of elastic material and – depending on aging and wear – should be replaced after 1, but not later than after 3 years – in case of high (i.e. >50% of the maximum admissible – see nameplate) fluid temperature even earlier. A damaged hose may damage the pilot fluid system: If an elastic hose material has never been <u>used before at a corrosive fluid</u> , disassemble the hose not later than after 4000 to 5000 hours, inspect and – if necessary – replace it.
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For replace observe clause 7.

H) Troubleshooting Guide

At any troubleshooting, respect the requirements of clause 2 <Safety instructions>.

 Danger	<p><i>If a valve is disassembled from the line and shall be brought out of the plant:</i> The valve including the hose shall be decontaminated properly.</p>
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Possible Defect	Remedy
Leakage at the flange connection	<p>Tighten the flange bolting, until the leakage disappears.</p> <p><i>If this doesn't stop the leakage:</i> Replace the gasket(s). Observe clause 2.3 <Special danger> and clause 4.3 <steps to install> and order spare parts and repair instruction from EBRO ARMATUREN.</p>
Leakage between the clamping flange and the body	<p>Disassemble the Pinch valve from the pipe section, observe clause 2.3 <Special danger> and clause 4 <Installation> and tighten the clamping flange connection. Before reinstallation check the tightness (by pilot pressure < 2 bar) use a detergent liquid to detect small leakage</p> <p><i>If this doesn't stop the leakage:</i> Replace the hose.</p> <p>Observe clause 2.3 <Special danger> and clause 4 <Installation> and order spare parts and repair instruction from EBRO ARMATUREN.</p>
Leakage in the seat or Defect of the valve functional parts	<p><i>Be sure that no hard or sharp-edged part is clamped in the hose:</i> Open & close the Pinch valve several times under differential pressure to flush out the blocking particle.</p> <p><i>If this doesn't stop the leakage or the functional defect:</i> Repair is necessary: The hose shall be replaced. Observe clause 2.3 <Special danger> and clause 4 <Installation> and order spare parts and repair instruction from EBRO ARMATUREN.</p> <p><i>If the hose has been damaged by the corrosive fluid:</i> Ask EBRO-ARMATUREN for a more corrosive-resistant hose material giving all necessary fluid information.</p> <p>Note: For special application the clamping flanges can be supplied in a rubber lined design.</p>
Functional defect at the pilot system in the Pinch valve	<p><i>First ensure the solenoid valve system to be without defect.</i></p> <p><i>Then ensure that the hose has no defect and that no service fluid is in contact with the pilot system. To check this:</i> The pinch valve shall be open (no pilot pressure!) then unclench carefully some turns the pilot pressure connection at the tapped bore in the middle of the Pinch valve body – do not unscrew it totally (Danger!)</p> <p>If this tapped bore connection is under pressure this indicates a leakage of the hose – it shall be replaced as soon as possible – see above.</p> <p>Observe clause 2.3 <Special danger> and clause 4 <Installation> and order spare parts and repair instruction from EBRO ARMATUREN.</p>