

# Operating Instructions for AKO Pinch Valve type VZ



## Important Information:

Please ensure you read these operating instructions before each installation.

Faulty installation or incorrect commissioning can lead to damage in the plant or equipment and to personal injuries. The firm AKO does not give any guarantee for damage resulting from improper handling or due to the use of third party parts. Our VZ valves are designed as defined by the Pressure Devices Directive (EC Directive RL97/23/EC) for Group II fluids. Valves for use with Group I fluids can be produced on request. AKO does not accept any responsibility for the resistance of the valve materials.

## Storage:

Please store pinch valves dry, protected of sunlight, wetness and any aggressive enviromental.

## Structure:

AKO's VZ pinch valve essentially comprises three principal components:

- valve housing (two-part - upper and lower casing halves)
- sleeve (elastomer hose in contact with the medium)
- actuation (handwheel or electric drive)

The valve is designed so that all the moving components (apart from the actuation) are located inside the pinch valve.

The lower case half incorporates a bore with a vent plug. The medium being delivered would escape here or at the actuator should the sleeve begin to leak as a result of a fault. This bore can optionally be fitted with a leak monitor which requires that the pinch valve is mounted such that the bore is located at the lowest point.

The AKO pinch valve is, thanks to its innovative technology, an extremely low maintenance and hence low-cost valve.

## The functional principle of a mechanical Pinch Valve:

Operating the actuator causes a mechanical system to drive two pinch bars which compress a flexible elastomer hose (sleeve) and thus close the pinch valve. This creates a lip-shaped closing pattern. When the actuator is run in the opposite direction, the sleeve opens to create a free passage. This process is supported by opening tabs which connect the sleeve with the pinch bars. The opening and closing motions of the sleeve reduce the build-up of medium sediment on the sleeve wall. Solids (up to a certain size) in the medium are enclosed by the sleeve as it closes - thereby ensuring the tightness of the closed valve. However, the sleeve will no longer close tight if there is a large volume of coarse solids.

Technical details subject to change without notice

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### Technical operating data:

DN 80 = max. 6,0 bar operating pressure

The AKO pinch valve is supplied with a flange connection complying with DIN PN10/16 and/or ANSI 150. Further technical data may be found in the data sheet.

### Selection of the materials for the individual valve parts:

The selection of the correct materials depends on a number of factors, such as: medium properties (pressure, temperature etc.), ambient criteria (temperature, weather etc.) and customer/application specifications.

We would be pleased to advise you in the selection of the correct sleeve.

The sleeve is the only component that comes into contact with the medium being delivered and simultaneously acts as the flange gasket.

Please ensure adequate UV protection when storing sleeves. UV radiation leads to premature aging of the sleeve and all types of plastic parts.

### Controlling:

The following actuators are possible:

- Handwheel (the valve is opened or closed by means of physical rotating force at the handwheel)
- Electric rotary drive (the valve is opened or closed by means of an actuating or regulating drive)

Where actuating components manufactured by third parties are used, their regulations and instructions must be observed.



### Safety Instructions:

- Before any sleeve change, valve cleaning or intervention in the pinch valve it must be established with certainty that the actuator cannot start the pinch valve moving (e.g. isolate electrical supply or remove the fuse).
- When controlling the pinch valve it is imperative that you ensure that no bodies or tools or other parts can get into the pinch valve.
- The respective safety data sheets must be observed before each contact with the media / products.
- The pinch valve must not be touched while media with high temperatures are being transported. ( risk of burns!!!)
- The pinch valve may only ever be dismantled if the plant has been switched off and depressurised.
- Suitable pressure limiters and / or safety valves must be installed to prevent the max. permissible operating/control pressure (PS) from being exceeded.
- "Unstable gases" may **not** be used as an operating medium.
- Please note that, depending on the medium used and in which environments the valve is installed, static charges can result.
- When designing the valve materials with respect to resistance against the operating media, the control components (control air pipe, magnetic valve, etc.) must also be taken into consideration, as the operating medium can get into the control pipe if the sleeve is defective.
- If the flange connection between the pipe and the valve is not properly made, there can be leaks which could result in injury to persons.

If handled and used properly, and AKO original parts are used, we give the actual valid guarantee regulated by law for all valves. Parts subject to wear are not covered by the guarantee.

For further questions, please contact us.

### Note:

Modifications to the valve of any kind will void the guarantee and warranty obligations.

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### Installation (assembly in the plant):

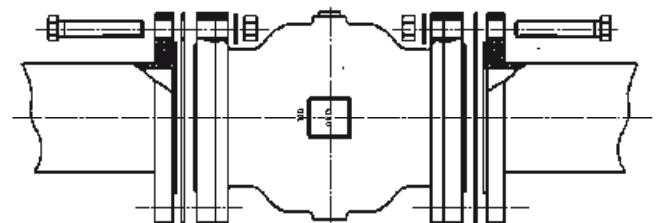
- Inspect the pinch valve for external damage.
- Always test with a function test before fitting the pinch valve.
- No flange gasket is required between the pipe and the pinch valve as the sleeve is formed such that also it acts as the seal. Make sure that the sealing faces of the sleeve are smooth and have not suffered cuts or other damage, as otherwise the sealing effect will be impaired.
- The valve's installation dimensions, such as the length etc. may be found in the appropriate technical data sheet.
- The internal diameter of the pinch valve and the internal diameter of the pipe must be identical to preclude deposition and turbulence.
- The medium to be delivered may flow in either direction.
- The pipe flanges should have grooves on the sealing face to improve the sealing performance (minimum average roughness  $R_z = 160\mu\text{m}$ ). Here, too, the sealing surface must be clean and undamaged.
- Tip: If it is intended that the pinch valve is to be freely positioned in the pipe, or must be positioned at a specific point, slip-on flanges must be selected as the counterflange as the arrangement of the connecting drillings in the pinch valve cannot be changed.
- There must be at least twice the face-to-face length of a pinch valve (of the relevant nominal diameter) between an elbow and the pinch valve as pipe length, as a shorter length will lead to premature wear on the sleeve because of the turbulence generated.
- The pipe must be supported/suspended on either side so that it can bear the weight of the valve and delivered medium and that the pipe flanges are parallel with one another.
- Heavy actuators (rotary drives etc.) must be additionally supported/suspended or blocked up accordingly so that no stresses can build up in the valve.

**Caution: The limit switches will have to be readjusted if a rotary drive is fitted on the pinch valve and if this is twisted or removed (refer to manufacturer's specifications).**

- The pinch valve is now fitted between the pipe flanges in the pipeline and aligned. Stresses and the introduction of external forces and torques must absolutely be avoided when the valve is fitted in the pipe. Similarly, significant vibrations in the plant can lead to damage to the valve or the connectors.
- No sharp objects/tools may be used in the installation as these can cause damage to the valve.
- Use the connecting bolts (number and size) listed in the table. The bolts must be suitable for the counterflange and be of the correct length. This means that 2 to 3 thread pitches will still be visible after the nut once the bolted connection has been tightened.
- The bolts must be tightened evenly (first 50%, then 100%) and crosswise (or in a star pattern) to the specified torque (see table).
- Now the pinch valve must be opened and closed several times. Retighten the connecting bolts to the specified torque.
- The valve can now be pressurized on the medium side. It may be necessary to retighten the flange bolts several times during operation to ensure that the sealing effect is established. Should there nevertheless still be leaks at the flange connection, it may be necessary to increase the torque on the connecting bolts in 5Nm increments. A maximum however of 150% of the specified value.
- Excessive tightening torque or uneven tightening of the connecting bolts can damage the sleeve.

Flange connecting bolts and tightening torques  
(bolts lightly greased)

DN	80
Bolts (no.)	4
Thread (metric)	M16
Tightening torque (Nm)	40



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## Maintenance/changing the sleeve:

### Maintenance:

AKO pinch valves do not need any particular maintenance. The sleeves are subject to wear depending on the medium delivered. The sleeve can be replaced simply and quickly on site. On request, we can also change the sleeve in our works.

The internal mechanism should be inspected at half-yearly intervals, cleaned and regreased. Particular attention should be paid to the moving parts such as the compression bearings, drive spindle, guide rods, drive square etc. The sleeve must not come into contact with lubricant as the sleeve material can be impaired if not compatible. The maintenance intervals must be abbreviated if the valve is switched frequently, or if the valve is permanently regulated.

Where actuating components manufactured by third parties are used, their regulations and instructions must be observed.

### Changing the sleeve:

#### Removal:

- The plant must be shut down for the full duration of the sleeve change procedure. An adequate means of shutting off the flow of product must be provided.
- Ensure that the pipe and the pinch valve are depressurized.
- Undo all power supply cables, where present.
- Undo flange connecting bolts and take the valve out of the plant.

**Caution: Residual amounts of the delivered medium may escape from the valve.  
(Take corresponding safety measures).**

- Set the valve to the OPEN position.
- Now remove the bolts connecting the two halves of the casing.
- The two halves of the casing can now be taken apart.
- Clamp the unit removed, consisting of the closing mechanism and the sleeve by the upper crossbar in a vice with protective jaws so that the sleeve is facing upwards.
- Now the bolts clamping the opening tabs on the sleeve must be undone sufficiently that the opening tabs can be withdrawn.
- The sleeve can now be pushed out to the side.

#### Assembly:

- The valve is reassembled in the reverse order to removal.
- Bolt tightening torques:
  - Bolts clamping the opening tabs = M5 -> 5 Nm
  - Casing half connecting bolts = M10 -> 45 Nm
- On completion of assembly and following a function test the valve will be ready for fitting again.
- Please take note of the instructions for installation (fitting in the plant).

**Caution: The limit switches will have to be checked for correct setting or readjusted if a rotary drive is fitted on the pinch valve (refer to manufacturer's specifications).**

#### Note:

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