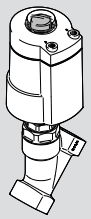
VZXA-...-T...-...-K-75-...-PM

Angle seat valve with piston actuator



FESTO

Festo SE & Co. KG
Ruiter Straße 82
73734 Esslingen
Deutschland
+49 711 347-0

www.festo.com

Operating instructions

8171511
2022-07a
[8171513]

8171511

1 Applicable Documents

All available documents for the product ➔ www.festo.com/sp.

2 Safety

2.1 General safety instructions

- Only use the product in its original condition without unauthorised modifications.
- Only use the product if it is in perfect technical condition.
- Use the valve only in the indicated flow direction.
- Take into account the ambient conditions at the location of use.
- Store the product in a cool, dry environment protected from UV and corrosion. Keep storage times short.

Media

- Use only media in accordance with the specifications ➔ 13 Technical data.
- Use only media that will not cause dangerous reactions if mixed.
- Do not operate the product with chemically unstable gases, abrasive media or solid materials.
- If water is used: up to approx. 1000 ppm of chloride content is permitted. Avoid tensile stresses.
- When using saturated water vapour: take vapour pressure into account when designing the valve.
- If aggressive media are used: limit temperature of medium to 65 °C.

Drive

- Do not open the drive, because the drive is under pressure or there is a tensioned spring.
- Avoid mechanical stresses on the valve. Do not use the drive as a lever.

Return to Festo

Hazardous substances can endanger the health and safety of persons and cause damage to the environment. To prevent hazards, the product should only be returned if explicitly requested by Festo.

- Consult your regional Festo contact.
- Complete the declaration of contamination and attach it to the outside of the packaging.
- Comply with all legal requirements for the handling of hazardous substances and the transport of dangerous goods.

2.2 Intended use

The angle seat valve VZXA-...-K is intended to shut-off gaseous or liquid media in piping systems.

- Use only the product variant VZXA-B-... to control liquid media.

2.3 Training of qualified personnel

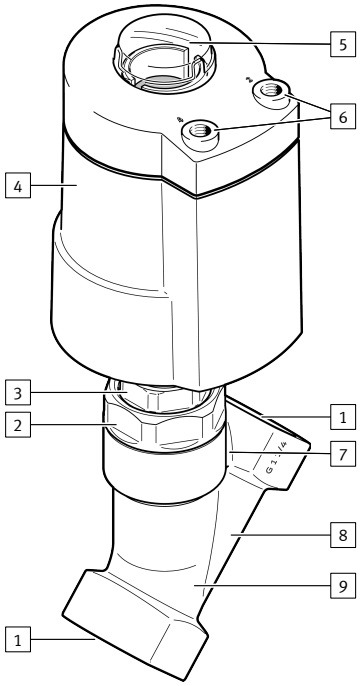
Work on the product may only be carried out by qualified personnel who can evaluate the work and detect dangers.The qualified personnel have knowledge and experience in process automation.

3 Additional information

- Contact the regional Festo contact if you have technical problems ➔ www.festo.com.
- Accessories and spare parts ➔ www.festo.com/catalogue.

4 Product overview

4.1 Design

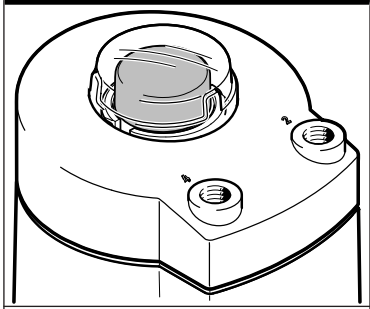
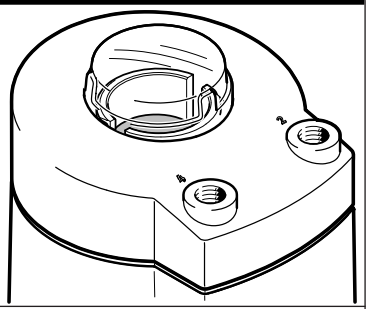


1 Pipe connection; feeding or forwarding, depending on the flow direction
2 Spanner flat
3 Interface screw
4 Drive housing
5 Position indicator
6 Pneumatic ports (2) and (4)
7 Leakage hole
8 Arrow for flow direction
9 Angle seat fitting

Fig. 1: Product design

Position indicator

The pneumatic position indicator shows the position of the actuator stem.

Indicator cylinder above	Indicator cylinder below
	
Actuator stem retracted, valve opened	Actuator stem extended, valve closed

Tab. 1: Position indicator

4.2 Function

The angle seat valve VZXA-...-K is an externally controlled 2/2-directional control valve with piston drive. The valve seat is slanted approx. 40° to the media flow. To close the valve, the valve drive presses the valve disc with the piston rod into the valve seat in a force fit.

The supply of the operating medium regulates an external valve, which is primarily electrically controlled. The external valve must also be installed in the drive's supply line.

The drive can be rotated 360° around the valve body.

Flow over valve seat

The valve is closed by spring force with the flow of the medium.

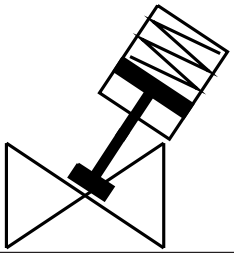
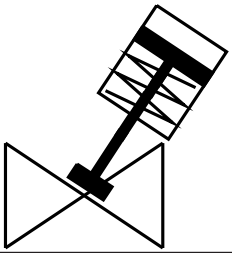
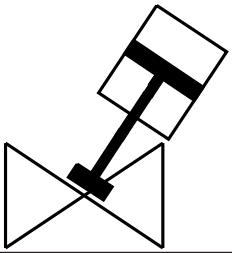
- The pressure of the medium supports the closing of the valve.
- The valve is opened by the operating pressure.
- This flow variant is only suitable for gaseous media, because use of incompressible media causes pressure surges in the piping.

Flow under valve seat

The valve is closed against the media flow by spring force or by operating pressure.

- The pressure of the medium assists the opening of the valve.
- In some designs pressure of medium that is too high or operating pressure that is too low can result in the valve not closing completely.

Control function

Single-acting		Double-acting
		
Closed by spring force or by reduced spring force (normally closed - NC)	Opened by spring force (normally open - NO)	Opened and closed by alternating exposure to the operating medium

Tab. 2: Control function

5 Transport

For dispatch of used products:
– Comply with all legal requirements for the handling of hazardous substances and the transport of dangerous goods. For returns to Festo ➔ 2 Safety.

6 Installation

Requirements
– The piping system is unpressurised and medium is not flowing through it.
– The pipe ends are mounted.
– The connecting lines and fittings are clean.
– Remove all transport packaging. The material used in the packaging has been specifically chosen for its recyclability. Exception: oiled paper belongs in the residual waste.

6.1 Cleaning the valve

Traces of residual grease may be evident on the product due to the production process.
• Clean the valve immediately before mounting.

6.2 Mounting the valve

1. Bring the valve into its mounting position.
   – Note the flow direction. The permissible flow direction is marked on the angle seat fitting by an arrow
2. Connect the piping to the angle seat fitting.
   – Tightening torque ➔ Tab. 3 Pipe connection tightening torque
3. Connect the operating medium connecting line.
   – Pneumatic port (2): operating medium
   – Pneumatic port (4): exhaust port for single-acting drives or operating medium for double-acting drives
4. For single-acting drives mount the silencer in the exhaust port or use a tubing connection for guided exhaust air.

Port size		1/2	3/4	1	1 1/4	1 1/2	2
Max. tightening torque for pipe connection	[Nm]	105	200	350	450	540	620

Tab. 3: Pipe connection tightening torque

7 Commissioning

⚠ WARNING

Risk of injury from manipulation in the operating area of the angle seat valve.
Limbs can be cut or severed.
• Operate the angle seat valve only if it is fully mounted.

Requirements
– The valve is fully mounted and connected.

7.1 Checking operating conditions

1. Check the operating conditions and critical limits ➔ 13 Technical data.
2. Check that the connection points are tight.
3. Check that the devices in the system are compatible with the maximum pressure, including pressure peaks. If necessary, adjust the application parameters.

7.2 Commissioning the valve with single-acting drives

1. Supply the medium.
2. Slowly pressurise the valve to the operating pressure. The operating pressure required for reliable switching of the valve depends on the pressure of the medium ➔ 13.2 Technical data, pneumatic.
3. Check the function and the direction of the individual pneumatic actuators.

7.3 Commissioning the valve with double-acting drives

1. Slowly pressurise the valve to the operating pressure. The operating pressure required for reliable switching of the valve depends on the pressure of the medium ➔ 13.2 Technical data, pneumatic.
2. Supply the medium.
3. Check the function and the direction of the individual pneumatic actuators.

8 Operating

⚠ WARNING

Risk of injury from touching hot surfaces.
Angle seat fitting and actuator can become hot if the temperature of medium is high. Severe burns are possible.
• Do not touch the angle seat valve during operation or immediately afterward.

– Comply with the operating conditions.
– Comply with the maintenance conditions ➔ 9 Maintenance.
After longer idle times:
– Actuate the valve several times and check for correct function.

9 Maintenance

⚠ WARNING

Risk of injury from touching hot surfaces.
Angle seat fitting and actuator can become hot if the temperature of medium is high. Severe burns are possible.
• Allow the angle seat valve to cool off before working on it.

– Inspect the outside of the product regularly for leakage.
– Test the function of the product regularly.
– Clean the product regularly with a standard commercial cleaning agent.

10 Fault clearance

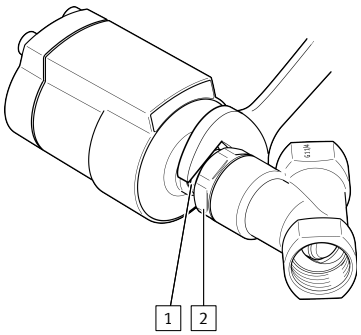
Malfunction	Cause	Remedy
Valve does not close or closes too slowly.	VZXA-B: pressure of medium is too high or operating pressure too low.	Set required differential pressure or adjust operating pressure ➔ 13 Technical data.
	Medium contains too many or too large contaminants.	Comply with operating conditions.
Valve does not open or opens too slowly.	VZXA-A: operating pressure is too low or pressure of medium too low.	Adjust operating pressure or medium pressure.
	VZXA-B: operating pressure is too low.	Adjust operating pressure.
Medium leaks out of leakage hole.	Seal cartridge is faulty.	Replace the angle seat fitting.
Medium cannot be shut off.	Seat seal is defective.	Replace seat seal ➔ Spare parts documentation.

Tab. 4: Fault clearance

11 Modification

⚠ DANGER

Risk of injury from flying objects.
Unsecured parts under pressure can fly around and injure people.
• Before replacing wearing parts, depressurise the valve and piping.



1 Interface screw SW34
2 Spanner flat SW46 for counter holding

Fig. 2: Demounting drive

11.1 Demounting the drive from the angle seat fitting - in the mounted state

The drive can be demounted from the angle seat fitting without having to disconnect the valve from the piping system.
1. Depressurise the piping and allow the valve cool down.
2. Secure the drive with suitable equipment to prevent it from falling or slipping.
3. Extend the actuator stem.
   – Double-acting valves: pressurise port (4) (0.3 MPa; 3 bar; 43.5 psi).
   – Valves with NO control function: pressurise port (2) (0.3 MPa; 3 bar; 43.5 psi).
   – Valves with NC control function: exhaust the drive.
4. Loosen the interface screw [1].
5. Remove the drive from the angle seat fitting.
6. Shut off the operating pressure.

11.2 Demounting the drive from the angle seat fitting - – in the demounted state

1. Extend the actuator stem.
   – Double-acting valves: pressurise port (4) (0.3 MPa; 3 bar; 43.5 psi).
   – Valves with NO control function: pressurise port (2) (0.3 MPa; 3 bar; 43.5 psi).
   – Valves with NC control function: exhaust the drive.

2. Loosen the interface screw [1].
3. Remove the drive from the angle seat fitting.
4. Shut off the operating pressure.

11.3 Mounting drive on the angle seat fitting

1. Extend the actuator stem.
   - Double-acting valves: slowly pressurise port (4) (0.3 MPa; 3 bar; 43.5 psi).
   - Valves with NO control function: slowly pressurise port (2) (0.3 MPa; 3 bar; 43.5 psi).
   - Valves with NC control function: exhaust the drive.
2. Push the spindle of the angle seat fitting completely into the angle seat fitting.
3. Place the drive on angle seat fitting.
4. Tighten the interface screw [1].
   - Tightening torque: 50 Nm ± 10%
5. Shut off the operating pressure.

11.4 Rotating drive

1. Loosen the interface screw [1] with maximum ½ revolution.
2. Rotate the drive to the desired position.
3. Tighten the interface screw [1].
   - Tightening torque: 50 Nm ± 10%

12 Removal

⚠ DANGER

Risk of injury due to movement of pressurised parts.

The valve can switch if there is a drop in pressure. Limbs can be cut or severed.

- Before removal, move the valve to the closed position.
- Before removal, depressurise the valve and the piping.

⚠ WARNING

Risk of injury from touching hot surfaces.

Angle seat fitting and actuator can become hot if the temperature of medium is high. Severe burns are possible.

- Allow the angle seat valve to cool off before working on it.

1. De-pressurise the piping and the operating medium connecting line. Allow the valve and piping to cool.
2. Drain the piping and valve completely.
   - Make sure no one is located in front of the outlet opening.
   - Catch discharging media in a suitable container.
3. Disconnect the operating medium connection line from the valve.
4. Disconnect the piping connections and remove the valve.

13 Technical data

13.1 Technical data, general

VZXA-...-T...-...-K-75-...-PM		
Design		Poppet valve with piston drive
Actuation type		Pneumatic
Sealing principle		Soft
Mounting position		Any
Type of mounting		In-line installation
Valve function		2/2
Flow direction		Not reversible
Product weight		➔ www.festo.com/catalogue
Medium		
Medium VZXA-A-...		Compressed air grade of filtration 200 µm, inert gases[1)]
Medium VZXA-B-...		Compressed air grade of filtration 200 µm, inert gases, water, neutral liquid media, petroleum, petroleum-based hydraulic fluid, vapour
Pressure of medium	[MPa]	–0.09 ... 3, as specified on product labelling
	[bar]	–0.9 ... 30
	[psi]	–13.05 ... 435
Viscosity	[mm²/s]	≤ 600
Operating medium		
Operating medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Operating pressure	[MPa]	max. 0.7 ➔ 13.2 Technical data, pneumatic
	[bar]	max. 7 ➔ 13.2 Technical data, pneumatic
	[psi]	max. 101.5 ➔ 13.2 Technical data, pneumatic
Ambient conditions		
Temperature of medium		
VZXA-A-...	[°C]	–10 ... +60
VZXA-B-...	[°C]	–10 ... +180
Ambient temperature	[°C]	0 ... 60
Drive degree of protection		IP65, IP67
Outdoor use		Weatherproof locations class C1 in accordance with EN 60654-1

VZXA-...-T...-...-K-75-...-PM	
Connection for angle seat fitting	
VZXA-...-TS6	Threaded collar in accordance with DIN ISO 228
VZXA-...-TS7	Threaded collar in accordance with ANSI/ASME B 1.20.1
VZXA-...-TS13	Threaded collar in accordance with DIN ISO 10226
Operating medium port	G 1/8
Information on materials	
Valve housing VZXA-...-V13	Stainless steel casting (1.4409)
Valve housing VZXA-...-V14	Stainless steel casting (ASTM A351-CF3M)
Valve housing VZXA-...-B1	Brass
Seat seal VZXA-...-T	PTFE
Drive housing	PA-reinforced
Piston drive seals	FPM
Actuator stem	High-alloy stainless steel

1) Other media on request

Tab. 5: Technical data, general, VZXA

13.2 Technical data, pneumatic

Nominal pressure, burst pressure and flow rate of angle seat fitting VZXA-...-T...

Port size		3/4	1	1 1/4	1 1/2	2
Nominal width DN		20	25	32	40	50
Nominal pressure of angle seat fitting PN to max. temperature of medium	[MPa]	4			2.5	
	[bar]	40			25	
	[psi]	580			362.5	
Burst pressure to max. temperature of medium	[MPa]	20			12.5	
	[bar]	200			125	
	[psi]	2900			1812.5	
Flow rate K_v[1)]						
VZXA-A-T...-...-V13/V14-...-K-75-...-PM	[m³/h]	14.5	21.5	33.0	44.9	54.6
VZXA-B-T...-...-V13/V14-...-K-75-...-PM	[m³/h]	13.5	22.6	30.3	41.4	50.1
VZXA-A-T...-...-B1-...-K-75-...-PM	[m³/h]	12.7	19.2	25.3	34.5	40.1
VZXA-B-T...-...-B1-...-K-75-...-PM	[m³/h]	11.8	17.2	24.4	32.9	38.8

1) Water, at 20 °C, pressure of medium 0.1 MPa at the valve inlet, free outlet

Tab. 6: Technical data, pneumatic, VZXA-...-T...

Pressure of medium and operating pressure VZXA-B-T...-...-K-75-...-S; media flow under valve seat, NO

Nominal width DN		20	25	32	40	50
Pressure of medium	[MPa]	0 ... 1.6			0 ... 1	0 ... 0.62
	[bar]	0 ... 16			0 ... 10	0 ... 6.2
	[psi]	0 ... 232			0 ... 145	0 ... 89.9
Min. operating pressure	[MPa]	0.34	0.4	0.5		
	[bar]	3.4	4	5		
	[psi]	49.3	58	72.5		

Tab. 7: Pressure of medium and operating pressure VZXA-B-T...-...-K-75-...-S

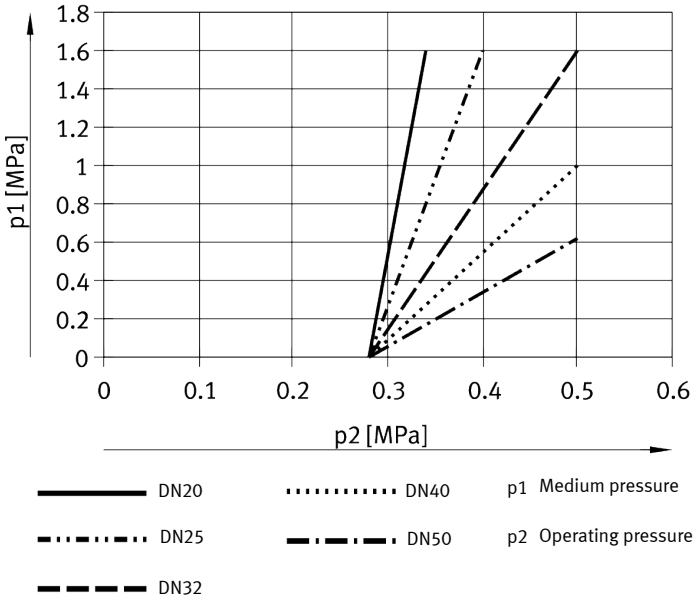


Fig. 3: Pressure of medium and operating pressure VZXA-B-T...-...-K-75-...-S

Pressure of medium and operating pressure VZXA-B-T...-...-K-75-...-D; media flow under valve seat, double-acting

Nominal width DN		20	25	32	40	55
Pressure of medium	[MPa]	0 ... 1.6				0 ... 1
	[bar]	0 ... 16				0 ... 10
	[psi]	0 ... 232				0 ... 145
Min. operating pressure	[MPa]	0.28			0.38	0.5
	[bar]	2.8			3.8	5
	[psi]	40.6			55.1	72.5

Tab. 8: Pressure of medium and operating pressure VZXA-B-T...-...-K-75-...-D

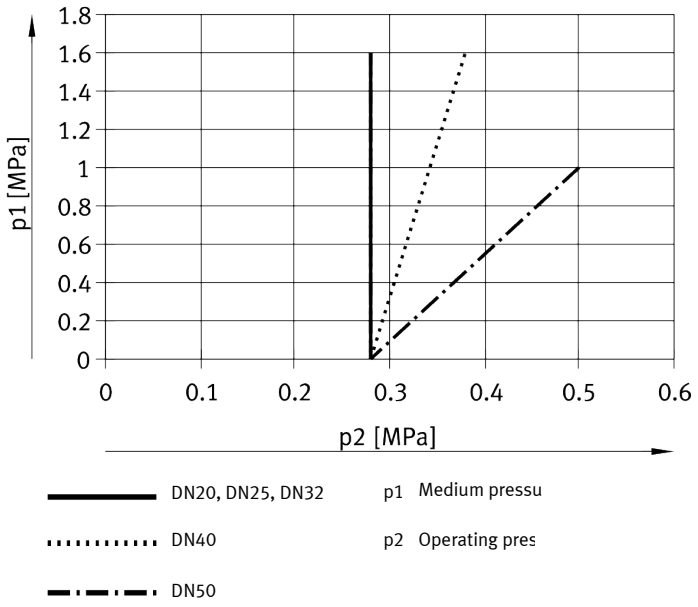


Fig. 4: Pressure of medium and operating pressure VZXA-B-T...-...-K-75-...-D

Pressure of medium and operating pressure VZXA-B-T...-...-K-75; media flow under valve seat, NC

Nominal width DN		20	25	32	40	50
Pressure of medium	[MPa]	–0.09 ... 3	–0.09 ... 2.3	–0.09 ... 1.35	–0.09 ... 0.93	–0.09 ... 0.56
	[bar]	–0.9 ... 30	–0.9 ... 23	–0.9 ... 13.5	–0.9 ... 9.3	–0.9 ... 5.6
	[psi]	–13.05 ... 435	–13.05 ... 333.5	–13.05 ... 195.8	–13.05 ... 134.9	–13.05 ... 81.2
Min. operating pressure	[MPa]	0.46				
	[bar]	4.6				
	[psi]	66.7				

Tab. 9: Pressure of medium and operating pressure VZXA-B-T...-...-K-75

Pressure of medium and operating pressure VZXA-B-T...-...-K-75-...-PR; media flow under valve seat, NC with reduced spring force

Nominal width DN		20	25	32	40
Pressure of medium	[MPa]	0 ... 1.6	0 ... 0.93	0 ... 0.48	0 ... 0.4
	[bar]	0 ... 16	0 ... 9.3	0 ... 4.8	0 ... 4
	[psi]	0 ... 232	0 ... 134.9	0 ... 69.6	0 ... 58
Min. operating pressure	[MPa]	0.22			
	[bar]	2.2			
	[psi]	31.9			

Tab. 10: Pressure of medium and operating pressure VZXA-B-T...-...-K-75-...-PR

Pressure of medium and operating pressure VZXA-A-T...-...-K-75-...-PR; media flow under valve seat, NC with reduced spring force

Nominal width DN		20	25	32	40	50
Pressure of medium	[MPa]	0 ... 1.6			0 ... 1.55	0 ... 0.8
	[bar]	0 ... 16			0 ... 15.5	0 ... 8
	[psi]	0 ... 232			0 ... 224.8	0 ... 116
Min. operating pressure	[MPa]	0.24	0.31	0.42	0.5	
	[bar]	2.4	3.1	4.2	5	
	[psi]	34.8	45	60.9	72.5	

Tab. 11: Pressure of medium and operating pressure VZXA-A-T...-...-K-75-...-PR

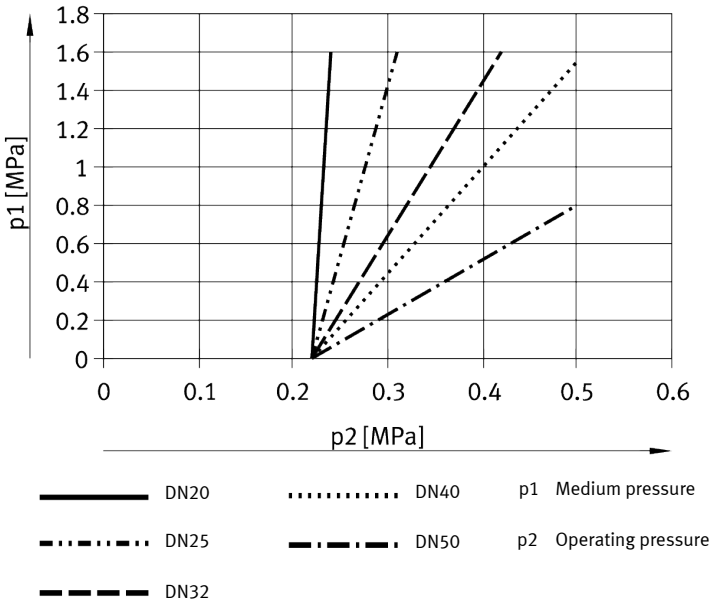


Fig. 5: Pressure of medium and operating pressure VZXA-A-T...-...-K-75-...-PR