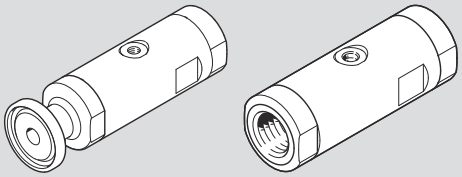
VZQA-C-M22U

Pinch valve



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Operating instruction

8179536
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[8179538]

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1 Applicable documents

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

Document	Product	Table of contents
Assembly instructions	Seal cartridge VAVC-Q2-M22U	Changing the seal cartridge

Tab. 1: Applicable documents

2 Safety

2.1 Safety instructions

- Only use the product in its original condition without unauthorised modifications.
- Only use the product if it is in perfect technical condition.
- Take into account the ambient conditions at the location of use.
- Observe the specifications on the product labelling.
- Store the product in a cool, dry environment protected from UV and corrosion. Keep storage times short. Storage temperature ➔ 11 Technical data.

Media

- Use only media in accordance with the specifications ➔ 11 Technical data.
- Use only media to which the materials used for the seal cartridge and cover are resistant. For evaluation of the media resistance ➔ www.festo.com.
- Use only media that will not cause dangerous reactions if mixed.

Piping

Depending on the flow medium and the operating conditions, pressure peaks that exceed the permissible pressure range may develop in the system.
If the seal cartridge fails, the operating medium may enter the flow media circuit. The pressure in the flow medium circuit may increase accordingly.

- Design the flow media circuit for at least the set operating pressure.
- It may be necessary to include a pressure-relief valve in the media line to comply with the limit values.

The separation between the media spaces is no longer guaranteed if wear causes the seal cartridge to leak. The flow medium may then enter into the pilot circuit and escape, e.g. at a silencer.

- Use an appropriate check valve to protect the pilot circuit against ingress of the flow medium.
- Secure possible outlet points of the medium in such a way that persons cannot come into contact with the medium.

The service life of the seal cartridge depends on the medium used, the operating pressure and the switching speed.

- Limit the switching speed with a suitable throttle valve or control valve.

Very high temperatures may damage the seal cartridge ➔ 11 Technical data.

- Do not weld piping in close proximity to the valve.

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 pinch valve controls gaseous, dusty and solid media as well as mixtures of substances in piping systems.
The pinch valve VZQA-C-M22U-...-...S1 can be used in the food zone.

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 ➔ www.festo.com/catalogue.

4 Product overview

4.1 Product design

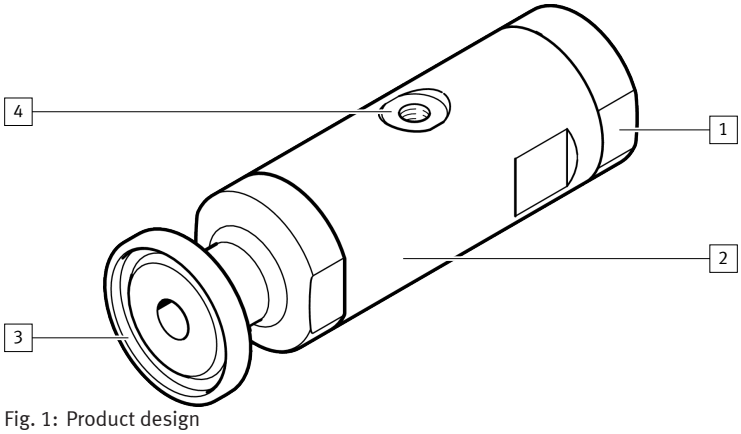

Fig. 1: Product design

1 Housing cover
2 Housing
3 Threaded connection or clamp ferrule for connecting media-carrying piping
4 Operating medium port

Inside the valve is a replaceable seal cartridge with a tubular shut-off element.

4.2 Function

The pinch valve is a pneumatically actuated 2/2-way valve. In its normal position the valve is open (N/O).

Fig. 2: Circuit symbol

If the valve is pressurised with operating pressure, the tubular shut-off element is pinched shut and the valve is closed. After removal of the operating pressure, the shut-off element is opened by its intrinsic tension and the pressure of the medium. The free passage when the valve is opened ensures minimum flow resistance and prevents the valve becoming blocked or clogged.

5 Mounting

Requirements

- The piping system is unpressurised and medium is not flowing through it.
- The lines are clean.
- The pipe ends are mounted.
- All transport packaging has been removed. The material used in the packaging has been specifically chosen for its recyclability.
- Protective measures are installed in the system, e.g. flow control valves or control valve, check valve, pressure-relief valve.

VZQA-C-M22U			-6	-15	-25	-50
Flow control valve, control valve	Recommended standard nominal flow rate	[l/min]	10	40	40	40
	Recommended nominal width	[mm]	0.5	1	1	1

Tab. 2: Mounting

5.1 Cleaning the valve

- There may be traces of residual grease on the valve as a result of the production process. Clean the valve immediately before mounting.

5.2 Connecting the flow medium pipe

NOTICE

To eliminate direct access to the valve opening during operation, connect a line to both ports, even if the valve is located at the end of the piping.

For VZQA-C-M22U-...-G/-T with female thread:

- Screw connection [3] to the pipe.

VZQA-C-M22U		-6	-15	-25	-50
VZQA-C-M22U-...-G/-T-...V4 VZQA-C-M22U-...-G/-T-...AL	[Nm]	15	35	40	40
VZQA-C-M22U-...-G/-T-...POM	[Nm]	–	8	10	–

For VZQA-C-M22U-...-S1/-S5/-S12 with clamping socket:
- Close the clamp ferrule of the pipe and the clamp ferrule of the valve with the seal together and tighten them with the clamp of the clamp seal.

5.3 Connecting the operating medium pipe

1. Mount a fitting on the port [4] for the operating medium.

VZQA-C-M22U		-6	-15	-25	-50
Max. screw-in depth	[mm]	4.5	5	6	8

2. Connect the pipe for the operating medium.

6 Commissioning

Requirements
- Protective measures are installed in the system, e.g. flow control valves or control valve, check valve, pressure-relief valve.
- The valve is fully mounted and connected.

6.1 Checking operating conditions

1. Check the operating conditions and limit values ➔ 11 Technical data.
   To ensure a long service life for the seal cartridge keep the pressure difference between the medium pressure and the operating pressure as low as possible.
   Use a throttle valve or a control valve ➔ 5 Mounting.
2. Check that the connections are tight.
3. Take into account the compatibility of the devices in the system for the maximum pressure and the pressure peaks. If necessary, adjust the application parameters.

6.2 Commissioning the valve

⚠ WARNING

Risk of injury from combustion and chemical burns.
The valve only closes completely if the required differential pressure between the medium pressure and the operating pressure is ensured. Otherwise, medium can escape and injure people.
- Secure possible outlet points of the medium (e.g. line ends) to prevent any contact with the medium.
- Wear specified protective equipment.

⚠ CAUTION

Risk of crushing inside the valve.
The shut-off element inside the valve closes with great force. Fingers can be crushed.
- Do not reach inside the valve.
- Do not commission the valve until it is fully assembled.

1. Feed in flow medium.
2. Apply operating pressure to the valve.
   ↳ The valve closes.
3. Actuate the valve several times, approx. 10 times.

7 Operation

⚠ WARNING

Risk of injury due to hot surface.
The valve can become hot if the temperature of the medium is high.
- Do not touch the valve during operation or immediately afterward.

1. Observe the operating conditions.
2. Comply with the permissible limit values.
3. Comply with maintenance conditions ➔ 8 Maintenance.
4. Recommendation: switch the valve several times per day.

After longer idle times:
- Actuate the valve several times and check that it functions correctly.

8 Maintenance

⚠ WARNING

Risk of injury from combustion and chemical burns.
The media in the piping system and the valve can be hot and under pressure. Traces of medium can remain in the product and can escape when open or dismantled.
- Allow the valve and piping to cool and depressurize them.
- Wear specified protective equipment.

8.1 Checking and cleaning the valve

- Inspect the valve regularly from the outside for leakage and function.
- Clean the valve regularly.

8.2 Checking and replacing the seal cartridge

NOTICE

The seal cartridge may only be changed by qualified technicians in accordance with the assembly instructions ➔ 1 Applicable documents.

The seal cartridge is subjected to mechanical loads and ageing. A damaged or worn seal cartridge results in leakage.
- Check the seals and seal cartridge regularly and replace if necessary. The intervals depend on the medium.
- Replace seal cartridge and seals if they are damaged. Use a seal cartridge with the same specification.
- Replace the seal cartridge at the specified interval:
  - VZQA-C-M22U-6/-15/-25: maximum 0.5 million switching cycles.
  - VZQA-C-M22U-50: maximum 300000 switching cycles.

9 Fault clearance

Malfunction	Cause	Remedy
Valve does not close or closes too slowly	Medium pressure is too high or operating pressure too low	– Set differential pressure to min. 0.25 MPa (2.5 bar, 36.25 psi) by increasing operating pressure or reducing pressure of medium
	Too many or too large contaminants in the medium	
	Valve clogged	– Clean the valve or replace the seal cartridge
	Operating medium port blocked	– Clean or replace the operating medium port
	Seal cartridge faulty	– Replace seal cartridge
Valve does not open or opens too slowly	Medium pressure too low	– Increase medium pressure
	Shut-off element is stuck together because the material of the shut-off element is not suited for the medium	– Replace product with a product variant made of appropriate materials
	Operating pressure is still present	– Shut off operating pressure
Leakage	Seal cartridge faulty	– Replace seal cartridge

Tab. 3: Fault clearance

10 Removal

⚠ WARNING

Risk of injury from combustion and chemical burns.
The media in the piping system and the valve can be hot and under pressure. Traces of medium can remain in the product and can escape when open or dismantled.
- Allow the valve and piping to cool and depressurize them.
- Wear specified protective equipment.

1. De-pressurise the piping and the operating medium piping.
2. Allow the valve and piping to cool.
3. Drain the piping and valve completely.

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- Make sure no one is located in front of the outlet opening.
- Collect the outflowing flow medium in a suitable container.

4. Disconnect the operating medium line from the valve.
5. Disconnect the piping connections and remove the valve.

VZQA-C-M22U		-6	-15	-25	-50
Design		Pinch valve, pneumatically actuated			
Nominal width DN		6	15	25	50
Actuation type		Pneumatic			
Sealing principle		Soft			
Mounting position		Any			
Type of mounting		In-line installation			
Valve function		2/2, open, monostable			
Flow direction		Reversible			
Reset method		Rebound resilience			
Type of control		Externally controlled			
Switching time on	[ms]	125	250	250	200
Flow rate Kv[1]	[m³/h]	0.7	5	18	72
Switching time off	[ms]	125	250	250	1000
Pressure of medium	[MPa]	0 ... 0.4			0 ... 0.2
	[bar]	0 ... 4			0 ... 2
	[psi]	0 ... 58			0 ... 29
Operating pressure	[MPa]	0.1 ... 0.65			0 ... 0.45
	[bar]	1 ... 6.5			0 ... 4.5
	[psi]	14.5 ... 94.25			0 ... 65.25
Burst pressure	[MPa]	1.6			
	[bar]	16			
	[psi]	232			
Nominal pressure PN of process valve		10			
Ambient temperature	[°C]	–5 ... +60			
Product weight		➔ www.festo.com/catalogue			
Max. viscosity	[mm²/s]	4000			
Differential pressure					
VZQA-C-M22U-...-...N	[MPa]	0.25			–
	[bar]	2.5			–
	[psi]	36.25			–
VZQA-C-M22U-...-...E	[MPa]	0.25			
	[bar]	2.5			
	[psi]	36.25			
VZQA-C-M22U-...-...S1	[MPa]	0.25		0.30	–
	[bar]	2.5		3	–
	[psi]	36.25		43.5	–
Operating medium					
VZQA-C-M22U-...-...N		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]			–
VZQA-C-M22U-...-...E		Compressed air in accordance with ISO 8573-1:2010 [7:4:1]			
VZQA-C-M22U-...-...S1		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]			–
Medium					
VZQA-C-M22U-...-...N		Compressed air in accordance with ISO 8573-1:2010 [–:–:–]			–
VZQA-C-M22U-...-...E		Compressed air in accordance with ISO 8573-1:2010 [–:–:1], water			
VZQA-C-M22U-...-...S1		Compressed air in accordance with ISO 8573-1:2010 [–:–:–]			–
Food-safe					
VZQA-C-M22U-...-...E		Supplementary material information ➔ www.festo.com			
VZQA-C-M22U-...-...S1		Yes, declaration of conformity ➔ www.festo.com			–
Temperature of medium					
VZQA-C-M22U-...-...N	[°C]	–5 ... +60			–
VZQA-C-M22U-...-...V4E	[°C]	–5 ... +100			
VZQA-C-M22U-...-...ALE	[°C]	–5 ... +100			
VZQA-C-M22U-...-...POME	[°C]	–5 ... +80			
VZQA-C-M22U-...-...V4S1	[°C]	–5 ... +150			–
VZQA-C-M22U-...-...ALS1	[°C]	–5 ... +150			–
VZQA-C-M22U-...-...POMS1	[°C]	–5 ... +80			–
VZQA-C-M22U-...-V4V4E-4-EXA	[°C]	–5 ... +90			–
Storage temperature					
VZQA-C-M22U-...-...N	[°C]	6 ... 8			–
VZQA-C-M22U-...-...E	[°C]	6 ... 8			5 ... 25
VZQA-C-M22U-...-...S1	[°C]	5 ... 30			–
VZQA-C-M22U-...-V4V4E-4-EXA	[°C]	6 ... 8			–
Angle seat fitting connection					
VZQA-C-M22U-...-G		G 1/4	G 1/2	G 1	G 2
VZQA-C-M22U-...-T		1/4 NPT	1/2 NPT	1 NPT	2 NPT

VZQA-C-M22U	-6	-15	-25	-50
VZQA-C-M22U-...-S1	Clamp ferrule in accordance with ASME BPE, type A			–
VZQA-C-M22U-...-S5	Clamp ferrule in accordance with DIN 32676-A			
VZQA-C-M22U-...-S12	–		Clamp ferrule in accordance with ASME BPE, type B	
Operating medium port	M5	G 1/8		
Housing material				
VZQA-C-M22U-...-V...	High-alloy stainless steel			
VZQA-C-M22U-...-AL	Wrought aluminium alloy			
Housing cover material				
VZQA-C-M22U-...-...V4	High-alloy stainless steel			
VZQA-C-M22U-...-...AL	Wrought aluminium alloy			
VZQA-C-M22U-...-...POM	POM			–
Seal material	FPM			VMQ
Shut-off element material				
VZQA-C-M22U-...-...N	NBR			–
VZQA-C-M22U-...-...E	EPDM			
VZQA-C-M22U-...-...S1	Silicone			–

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

Tab. 4: Technical data