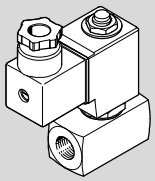
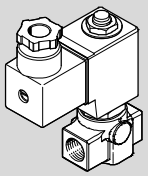
Solenoid valve
VZWD-L-M22C-M





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Operating instructions

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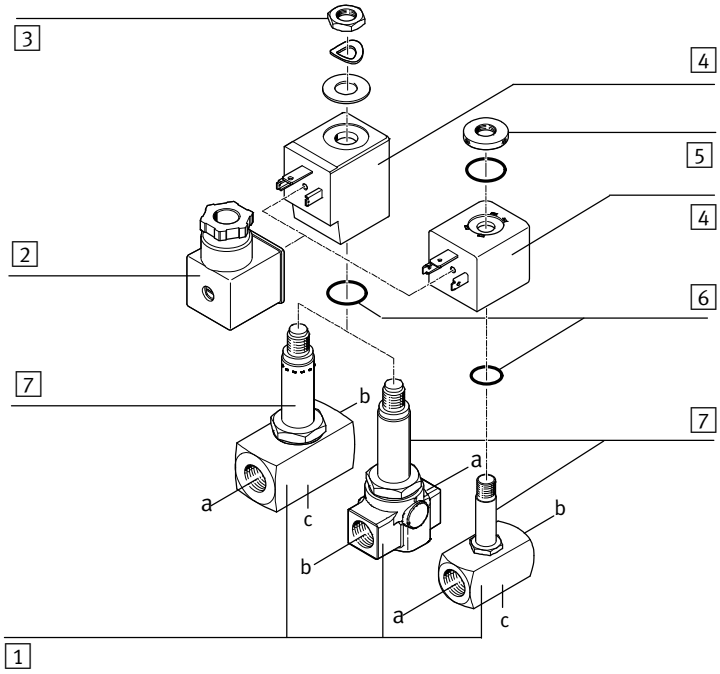
[8065856]

Original: de

Solenoid valve VZWD-L-M22C-M ..... English

1 Design



1 Valve body[1)]
a: Port 1: Input
b: Port 2: Output
c: Arrow for direction of flow
2 Electrical plug with seal and mounting screw
3 Solenoid coil mounting with shaped rubber part, retaining washer and hex nut
4 Solenoid coil[1)]
5 Solenoid coil mounting with O-ring and knurled nut
6 O-ring
7 Armature guiding tube

1) Construction type-dependent

Fig. 1

2 Function

Solenoid valve VZWD is a directly actuated 2/2-way valve with solenoid coil. In these types of valve the armature is press-fitted to the valve seat with the seal by means of spring force.
Solenoid valve VZWD is closed in the de-energised state (Normally Closed - NC). When current flows, the excited magnet pulls the armature against the force action of the spring to the counter core. The valve opens.

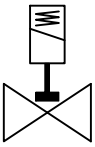


Fig. 2

Directly actuated valves do not require any differential pressure. If a differential pressure exists between the input and output, this is supported by the sealing of the valve seat. When the valve is opened the closing force resulting from the differential pressure must also be overcome by the spring action.

3 Application

Solenoid valves of the VZWD series are intended to be used for controlling the flow of gaseous and liquid media in rigid piping systems.
The valve is suitable for vacuum operation with p_{abs} › 100 mbar.

- The product may only be used in its original state without unauthorised modifications. Dismantling the armature guiding tube is not permitted.
- Take into consideration the operating conditions at the location of use. Provide sufficient thermal circulation.
- Only use the product if it is in perfect technical condition.
- Only use media in accordance with specification. Before using other media, please contact our customer support.
- Operation with chemically unstable gases, abrasive media and hard materials is not permitted.
- Only use the solenoid valve in the flow direction indicated.
- Wear suitable personal protective clothing, e.g. safety shoes and safety gloves.
- Comply with all applicable national and international regulations.
- Dispose of the product in an environmentally friendly manner. When doing this, also take residual media into account (potential recycling of hazardous waste).

Return to Festo
Hazardous substances can endanger the health and safety of personnel and cause damage to the environment. To prevent hazards, the product should only be returned upon explicit request by Festo.
– Consult your regional Festo contact.
– Complete the declaration of contamination and attach it to the outside of the packaging.
– Comply with all of the legal requirements for the handling of hazardous substances and the transport of dangerous goods.

4 Product variants

Characteristic	Value	Description
Type	VZWD	Solenoid valve, directly actuated
Valve type	L	In-line valve
Valve function	M22C	2/2-way valve, normally closed (NC)
Reset method	M	Mechanical spring
Connection to valves and fittings	G18, G14 N18, N14	Pipe thread in accordance with DIN ISO 228 NPT pipe thread in accordance with ANSI B 1.20.1
Nominal size	10, 15, 20, 25, 30, 40, 50, 60	1 mm, 1.5 mm, 2 mm, 2.5 mm, 3 mm, 4 mm, 5 mm, 6 mm
Sealing material	V	FPM
Nominal operating voltage	1, 2A, 3A	24 V DC, 110 V AC (50-60 Hz), 230 V AC (50-60 Hz)
Electrical connection	P4	Plug socket, 3-pin
Medium pressure	4, 5, 8, 15, 22, 30, 40, 45, 50, 85, 90	max. 4 bar, max. 5 bar, max. 8 bar, max. 15 bar, max. 22 bar, max. 30 bar, max. 40 bar, max. 45 bar, max. 50 bar, max. 85 bar, max. 90 bar
Corrosion protection	–, R1	Standard (brass), Stainless steel

Fig. 3

5 Transport and storage

- When shipping used products: Comply with all legal requirements for handling hazardous substances and transporting dangerous goods.
  For return to Festo ➔ Kapitel 3.
- Store the product in a cool, dry, UV- and corrosion-protected environment.

6 Installation

➔ **Note**

Installation should only be conducted by qualified specialized personnel.
Avoid mechanical stresses, particularly on the solenoid coil and the armature guiding tube.

Requirements
– The piping system is unpressurized, and no medium flows in it.
– The lines are clean.
– The lines ends are mounted.
– The power supply is switched off.

Clean valve
Residues of grease may be evident on the product due to the production process used.

- Clean valve immediately before installation.

Connect lines

1. Bring the solenoid valve into its installation position. Observe the flow direction. The permissible flow direction is either marked by an arrow on the valve body or the input and output are numbered (1 = input, 2 = output). In vacuum mode, connect up vacuum at output end.
2. Screw the valve plugs into the pipeline ends. Comply with the permissible tightening torques (➔ Fig. 6).
3. Establish the electrical connection. For this purpose use only the associated socket type (➔ Fig. 7).
   – Connect electrical cables to the socket.
   – Attach seal to the electrical contacts.
   – Put on plug and lock with fastening screw (tightening torque 0.3...0.5 Nm).
4. Connect the power supply.

7 Commissioning

➔ **Note**

Commissioning only by qualified specialist personnel.
When incompressible media are used (e.g. neutral water) pressure surges arise in the piping system because of the switching of the valve. Before commissioning, check the compatibility of the devices in the system in order to avoid damage to them. If necessary adjust your application parameters.

- Note the information on the rating plate.
- Only start up the solenoid valve when it is fully installed and fitted.
- Check the connection points for tightness.
- Before commissioning, check to ensure the operating conditions and permissible limit values have been observed (➔ Technical Data).

8 Operation

⚠ **Warning**

Risk of injury due to hot surface!
The valve can become hot while in operation.
- Do not touch the valve during operation or immediately afterward.

- Comply with the operating conditions.
- Always observe the permissible limit values.

9 Maintenance and care

- Every 6 months, check product from the outside for leakage and function.
- Clean product regularly. The permissible cleaning agent is soap suds.

10 Disassembly

⚠ **Warning**

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

➔ **Note**

Disassembly of the valve only by qualified specialized personnel.

1. De-pressurize the pipeline.
2. Switch off the power supply.
3. Empty the pipeline and valve completely.
   – Ensure that no one is in front of the outlet opening.
   – Catch discharging media in a suitable container.
4. Remove the solenoid valve from the pipeline (electrical socket connection, mounting bracket and screws).

Replacement of the solenoid coil
In the case of repair, the solenoid coil can be replaced.
Dismantling:
1. Switch off the power supply.
2. Disconnect the electrical plug connection.
3. Leave the solenoid valve and solenoid coil to cool.
4. Loosen the retaining nut and remove the solenoid coil from the armature guiding tube.

Mounting:
1. Push the O-ring and solenoid coil over the armature guiding tube.
2. Fasten the solenoid coil with a shaped rubber part, retaining washer and hex nut or with an O-ring and knurled nut (design-dependent).
   – Tightening torque: 2 Nm.

11 Troubleshooting

Malfunction	Possible cause	Remedy
Solenoid valve does not close	Solenoid valve faulty.	• Replace solenoid valve.
	Flow direction is incorrect.	• Install the solenoid valve according to the connection designation.
	Nominal voltage still applied.	• Check electrical connection.
Solenoid valve does not open	Solenoid coil or solenoid valve faulty.	• Replace solenoid coil. • Replace solenoid valve.
	Medium pressure is too high.	• Lower medium pressure.
	Nominal voltage is interrupted or insufficient.	• Check voltage.

Fig. 4

12 Technical Data

General		VZWD-...
Valve function		2/2-way, closed, single solenoid
Constructional design		poppet valve, directly actuated
Actuation type		Electrical
Mounting position		Any
Sealing principle		Soft
Medium		Compressed air in accordance with ISO8573-1:2010 [7:4:4], Inert gases, Water, Mineral oil, Neutral liquids[1)]
Direction of flow		Non-reversible
Max. viscosity	[mm^2/s]	22
Grade of filtration	[µm]	40
Temperature of medium	[°C]	–10 ... +80
Ambient temperature	[°C]	–10 ... +35
Protection class		IP65
Note on material for housing		Brass, Brass casting, High-alloy stainless steel
Note on material for seals		FPM

1) Other media on request

Fig. 5

Characteristics		VZWD-...							
Nominal size	[mm]	1,0	1,5	2,0	2,5	3,0	4,0	5,0	6,0
Standard nominal flow rate	[l/min]	60	95	140	170	210	310	375	430
Flow factor K_v	[m^3/h]	0.06	0.09	0.13	0.16	0.2	0.3	0.35	0.4
Medium pressure [1)]		In accordance with the details on the name plate							
Switching time air on[2)]									
– Solenoid coil VACS-H0P	[ms]	25							
– Solenoid coil VACS-H1P	[ms]	20							
Switching time air off[2)]									
– Solenoid coil VACS-H0P	[ms]	10							
– Solenoid coil VACS-H1P	[ms]	18							
Max. tightening torque									
– Pipe connection 1/8"	[Nm]	10							
– Pipe connection 1/4"	[Nm]	35							
– Coil mounting	[Nm]	2							
Weight									
– Solenoid coil VACS-H0P and VZWD-...-G18/N18	[kg]	0.30							
– Solenoid coil VACS-H0P and VZWD-...-G14/N14	[kg]	0.35							
– Solenoid coil VACS-H1P, VZWD-..., housing = brass-die cast	[kg]	0.55							
– Solenoid coil VACS-H1P, VZWD-..., housing = brass	[kg]	0.60							
– Solenoid coil VACS-H1P, VZWD-...-G18/N18, housing = stainless steel	[kg]	0.50							
– Solenoid coil VACS-H1P, VZWD-...-G14/N14, housing = stainless steel	[kg]	0.65							

1) Vacuum operation with p_{abs} > 100 mbar possible
2) Longer switching times for liquid media dependent on the viscosity

Fig. 6

Electrical data		VZWD-...1	VZWD-...2A	VZWD-...3A
Nominal voltage				
– Direct current	[V DC]	24 (± 10 %)	–	–
– Alternating current (50/60 Hz)	[V AC]	–	110 (± 10 %)	230 (± 10 %)
Rated output for solenoid coil VACS-H0P	[W]	6.8	–	–
	[VA]	–	10.5/8[1)]	10.5/7.6[1)]
Rated output for solenoid coil VACS-H1P	[W]	11.0	–	–
	[VA]	–	19/16[1)]	18/15[1)]
Surge resistance	[kV]	–	2.5	4.0
Duty cycle	[%]	100 (continuous duty)		
Electrical connection		Device plug to DIN EN 175301, form A		
Conductor cross section of connecting cable	[mm^2]	0.75 ... 1.5		
Cable diameter of connecting cable	[mm]	5 ... 9		

1) Switching power/holding capacity

Fig. 7