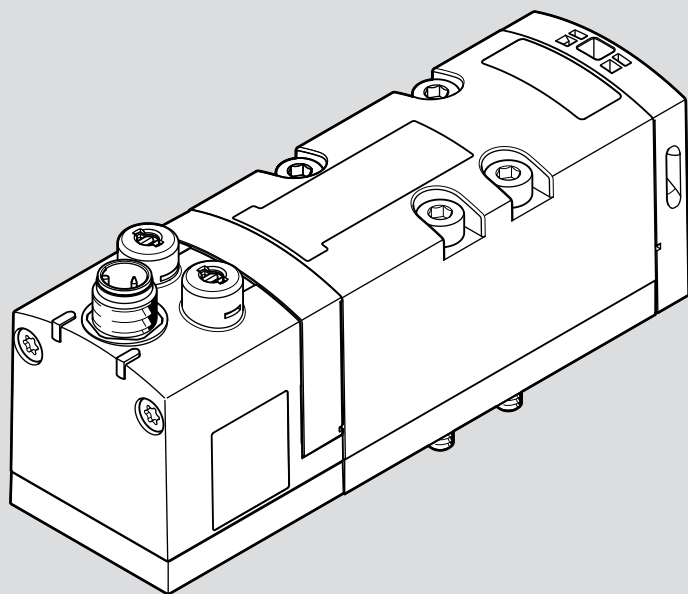


VSVA-B-TR1

Solenoid valve

FESTO

Operating instructions



8236062

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Original instructions

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1 About this document

1.1 Applicable documents



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

Document	Product	Contents
Assembly instructions	Cover cap VAMC-S6-CH/-CS	Assembly and actuation
Assembly instructions	Cover cap VAMC-B-S6-CTR	Assembly and actuation

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.
- Before working on the product: Switch off the power supply, ensure that it is off and secure it against being switched on again.
- Before working on the product, switch off the compressed air supply and lock it to prevent it from being switched on again.
- Store the product in a cool, dry environment protected from UV and corrosion. Keep storage times short.

2.2 Intended use

The solenoid valve with timer function can automatically switch back after the set shutdown time when the power supply is switched off.

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 Design

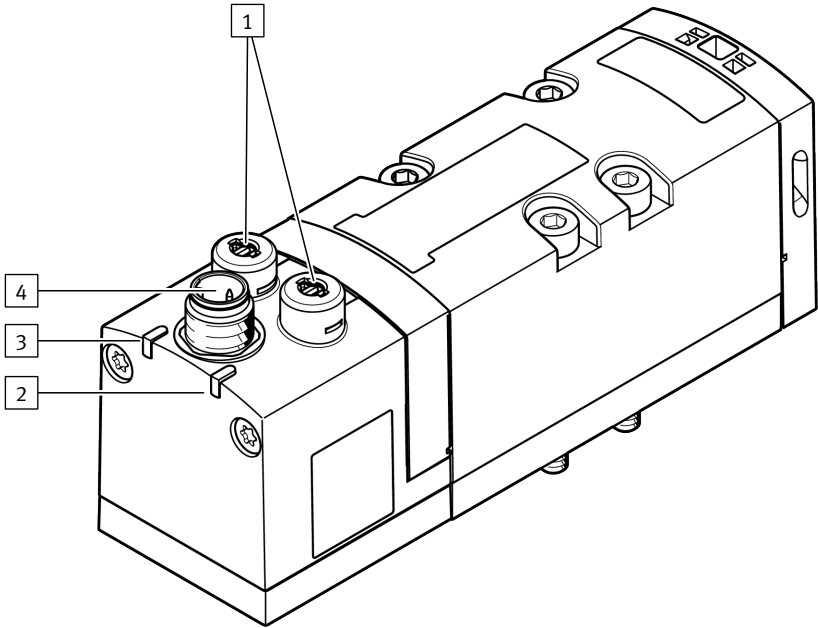


Fig. 1: Product design

- 1

Manual override
- 2

LED 12
- 3

LED 14
- 4

Electrical connection

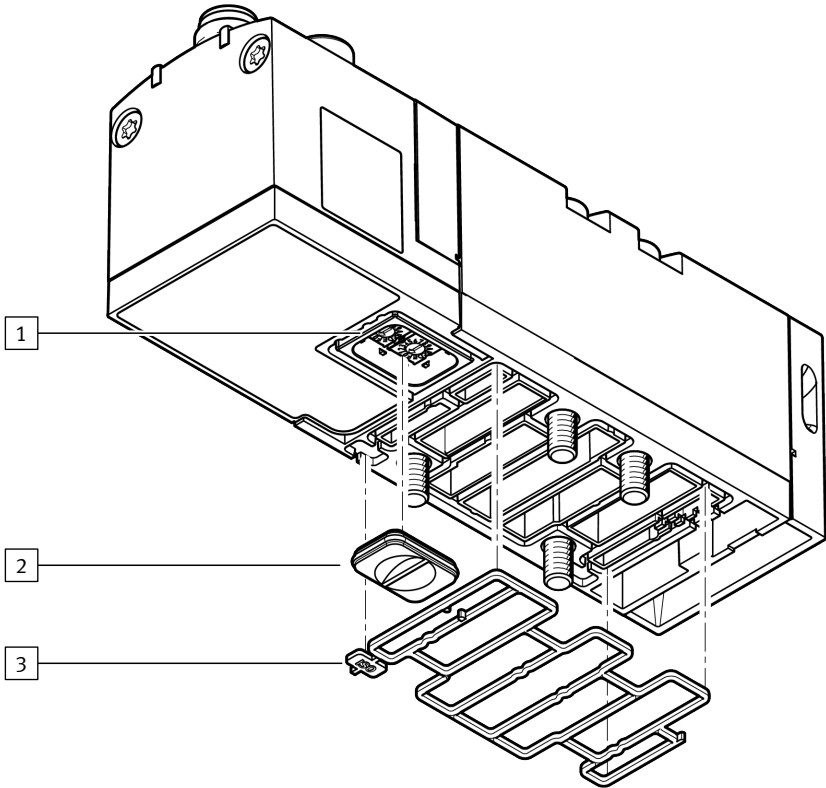


Fig. 2: Product design

- 1

Rotary switches
- 2

Rotary switch cover
- 3

Seal

5 **Function**

5.1 **Function**

The solenoid valve is used as a 5/2-way valve to control a pneumatic drive. The solenoid valve with timer function is a double solenoid valve with ISO plug pattern, which switches back automatically by charged capacitors after the power supply is switched off. It switches back after a period previously set on the solenoid valve.

LED indicator

Solenoid coil 14 is switched via pin 4 and the internal capacitor is charged. LED 14 is on continuously.

i

Note: the signal duration must be at least 6 minutes to ensure a full charge of the capacitor → Holding time as a function of the charging time.

After disconnection of the voltage from pin 4, the integrated timer starts and switches the solenoid valve back after the preset time (switch-off time). LED 12 flashes at 5-second intervals until the solenoid valve has switched over. Then both LEDs are off. The solenoid valve can be switched back before the time expires via pin 2.

i

The internal electronics and LED 12 are powered by the capacitor. After disconnection of the voltage, LED 12 flashes for the preset period if the capacitor is sufficiently charged.

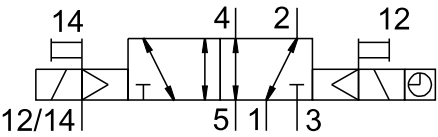


Fig. 3: Circuit symbol

6 **Mounting**

Seal assembly

The type of auxiliary pilot air can be selected by rotating the seal (→ Tab. 2 Auxiliary pilot air, → Fig. 4).

Labelling		ISO
Auxiliary pilot air	Ducted	Non-ducted
Port	12	–

Tab. 2: Auxiliary pilot air

i

The position of the seal is also visible if the solenoid valve is installed.

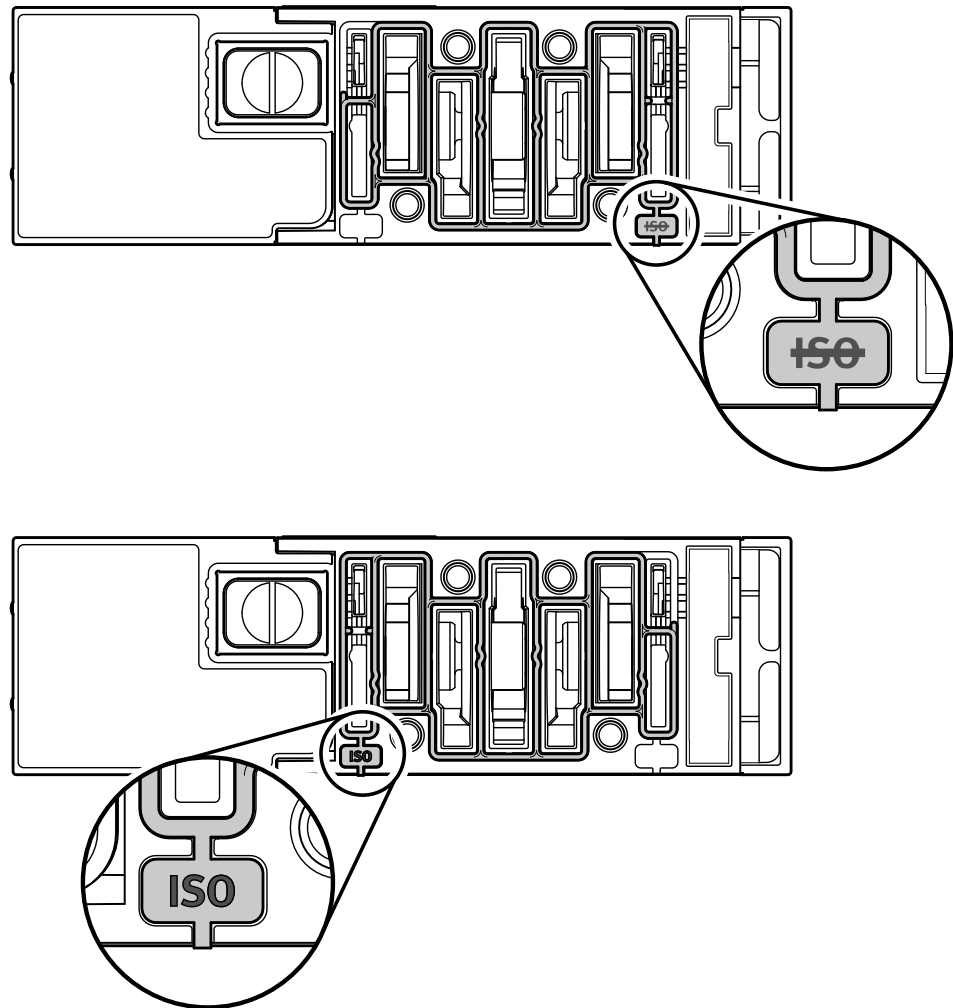


Fig. 4: Seal position

1. Ensure the seal is in the correct position.
2. Align the seal.

Mounting solenoid valve

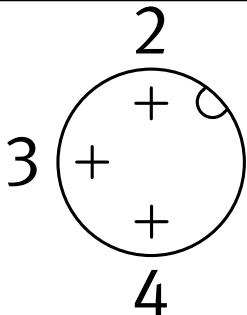


Set the switch-off time of the solenoid valve before the final installation of the solenoid valve → 8.1 Commissioning tasks.

1. Place the solenoid valve on the sub-base.
2. Tighten the retaining screws. Tightening torque: 3 Nm ± 20%.

7 Installation, electrical

7.1 Installation work, electrical

Plug, M12x1, 3-pin		
Port	Pin	Function
	2	Solenoid coil 12
	3	com
	4	Solenoid coil 14

Tab. 3: Pin allocation

8 Commissioning

8.1 Commissioning tasks



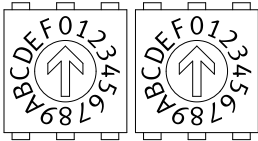
The solenoid valve can only be finally mounted after the switch-off time has been set.

The switch-off time of the solenoid valve must be set by 2 rotary switches before mounting and commissioning:

The rotary switch S1 defines the time unit, the rotary switch S2 defines a factor that multiplied by S1 sets the switch-off duration.



Adjust the rotary switches with a slot screwdriver.

Setting timer				
Rotary switches	S1	Shutdown time	S2	Factor
	0	1 sec	0	0
	1	2 sec	1	1
	2	5 sec	2	2
	3	10 sec	3	3
	4	30 sec	4	4
	5	60 sec	5	5
	6	2 min	6	6
	7	5 min	7	7
	8	10 min	8	8
	9	30 min	9	9
	A-F	SF ¹⁾	A-F	ST ¹⁾

1) Special function reserved for functions not yet implemented

Tab. 4: Timer setting

1. Remove the cover of the rotary switches.
2. Use rotary switch S1 to set a time unit.
3. Use rotary switch S2 to set the factor.
4. Replace the cover of the rotary switches.

Pneumatic commissioning with manual override (MO)

The solenoid valve can be mechanically switched with the manual override (→ Fig. 1).



A solenoid valve that has been actuated by a pending electric signal cannot be reset by actuating the manual override. The electrical signal is dominant in this case.

- Reset the electrical signal before operating the manual override.

1. Switch on the compressed air supply.
2. Reset electrical signals at actuated solenoid valves.
3. Test the functioning and operation of every solenoid valve-actuator combination by actuating the corresponding manual override.
4. With detenting actuation of the MO:
After testing the solenoid valves, ensure that all MOs are unlocked so the solenoid valve can switch when it is subsequently electrically actuated.
5. Switch off the compressed air supply after testing the solenoid valves.

Non-detenting actuation, automatic reset

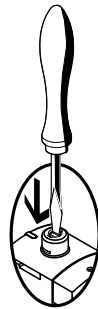


Fig. 5

1. Use a screwdriver to push in the plunger of the MO until the solenoid valve switches.
⇒ The solenoid valve takes the switching position.
2. Keep the plunger of the MO pressed.
⇒ The solenoid valve remains in switching position.

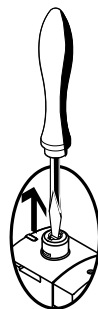


Fig. 6

- Release the plunger.
⇒ Spring returns the MO plunger to its initial position.
The solenoid valve returns to normal position.

Detenting actuation,
manual reset

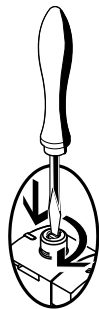


Fig. 7

- 1. Use a screwdriver to push in the plunger of the MO until the solenoid valve switches.
⇒ The solenoid valve takes the switching position.
- 2. Turn the plunger 90° clockwise to the stop and leave it in position.
⇒ The solenoid valve remains in switching position.

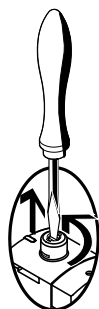


Fig. 8

- 1. Turn the plunger 90° anti-clockwise to the stop.
- 2. Release the plunger.
⇒ The solenoid valve returns to normal position.



The detenting/non-detenting function of the MO can be restricted by fitting a cover cap → www.festo.com/catalogue.
Information on the installation of the cover caps → Tab. 1 Applicable documents.

9 **Diagnostics**

9.1 **Diagnostics**

LED		Meaning	Action
	ON OFF	Voltage is applied to pin 4, actuation of solenoid coil 14	LED 14 lights, capacitor is being charged
	ON OFF	Voltage has been disconnected from pin 4	LED 12 flashes at 5-second intervals until the solenoid valve has switched over

Tab. 5: LED table with LED response

10 Technical data

10.1 General technical data

VSVA-B-TR1	
Certificates, declaration of conformity	➔ www.festo.com/sp
Valve design	Sub-base valve
Design	Piston gate valve
Actuation type	electrical
Operating medium	Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Pilot medium	Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Ambient temperature [°C]	–5 ... +50
Temperature of medium [°C]	–5 ... +50
Max. storage time [months]	48
Shock resistance	Shock test with severity level 2
Vibration resistance	Transport application test with severity level 2
Mounting position	any
Type of control	piloted
Manual override	Operation of manual override non-detenting/detenting
Degree of protection	IP65

Tab. 6: Technical data, general

10.2 Technical data, electrical

VSVA-B-TR1	
Certificates, declaration of conformity	➔ www.festo.com/sp
Operating voltage [V DC]	24
Permissible voltage fluctuation	±10 %
Maximum current consumption [mA] during charging ≤ 4 s	130
Maximum current consumption during charging > 4 s	65
After charging	6
Duty cycle	100%
Immunity to interference	Fulfilled
Interference emission	Fulfilled
Electrical connection	Central plug, round design, M12x1, 3-pin
Solenoid design	in accordance with VDE 0580
Characteristic coil data D1 (ISO [W] size 1), 24 V DC	1.6

Tab. 7: Technical data, electrical

10.3 Technical data, pneumatic

VSVA-B-TR1		
Certificates, declaration of conformity		➔ www.festo.com/sp
Operating pressure	[MPa]	-0.09 ... 1
	[bar]	-0.9 ... 10
	[psi]	-13.05 ... 145
Pilot pressure	[MPa]	0.3 ... 1
	[bar]	3 ... 10
	[psi]	43.5 ... 145
Nominal operating pressure, nominal pilot pressure	[MPa]	0.6
	[bar]	6
Burst pressure	[MPa]	> 2
	[bar]	> 20
Nominal width	[mm]	D1 (ISO size 1): 11
Valve flow rate ± 15%	[l/min]	2000
Size	[mm]	42

Tab. 8: Technical data, pneumatic

10.4 Characteristic curves

Timing diagram

The capacitor charges during $t_{1, 2, \dots, n}$, while voltage is applied to pin 4 (solenoid coil 14). On disconnection of the voltage the solenoid valve initially remains in position for the set period Δt . Then the solenoid valve automatically switches back. The solenoid valve can be manually switched back at any time by a switching signal at pin 2 (solenoid coil 12):

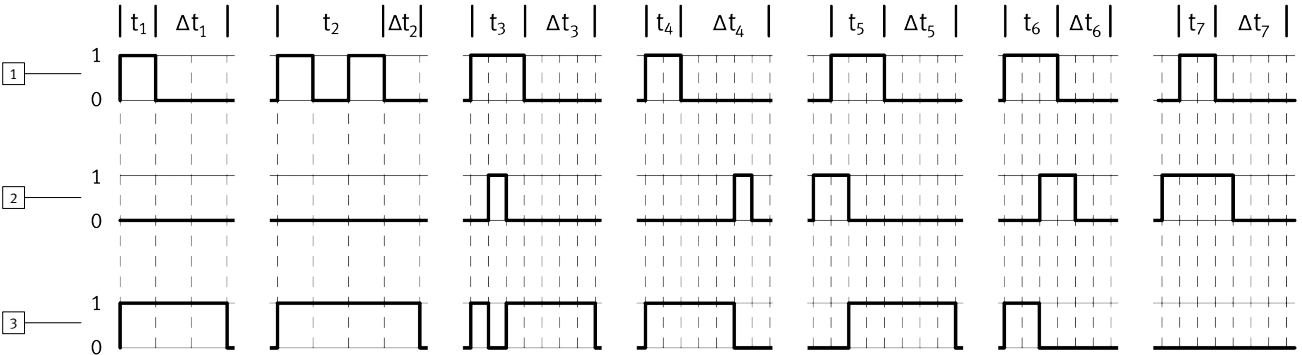


Fig. 9: Position of the solenoid valve as a function of the voltage input (seven differently set solenoid valves)

- 1 Signal on (14)
- 2 Signal on (12)
- 3 Solenoid valve in switching position 14 (1), switching position 12 (0)

Holding time as a function of the charging time

A charging time t_2 of 6 min guarantees a maximum holding time t_1 of 4.5 h. The corresponding maximum holding times for charging times less than 6 minutes can be read from the graph.

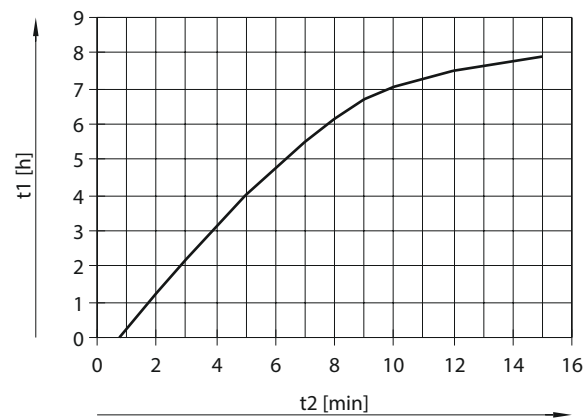


Fig. 10: Holding time as a function of the charging time

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