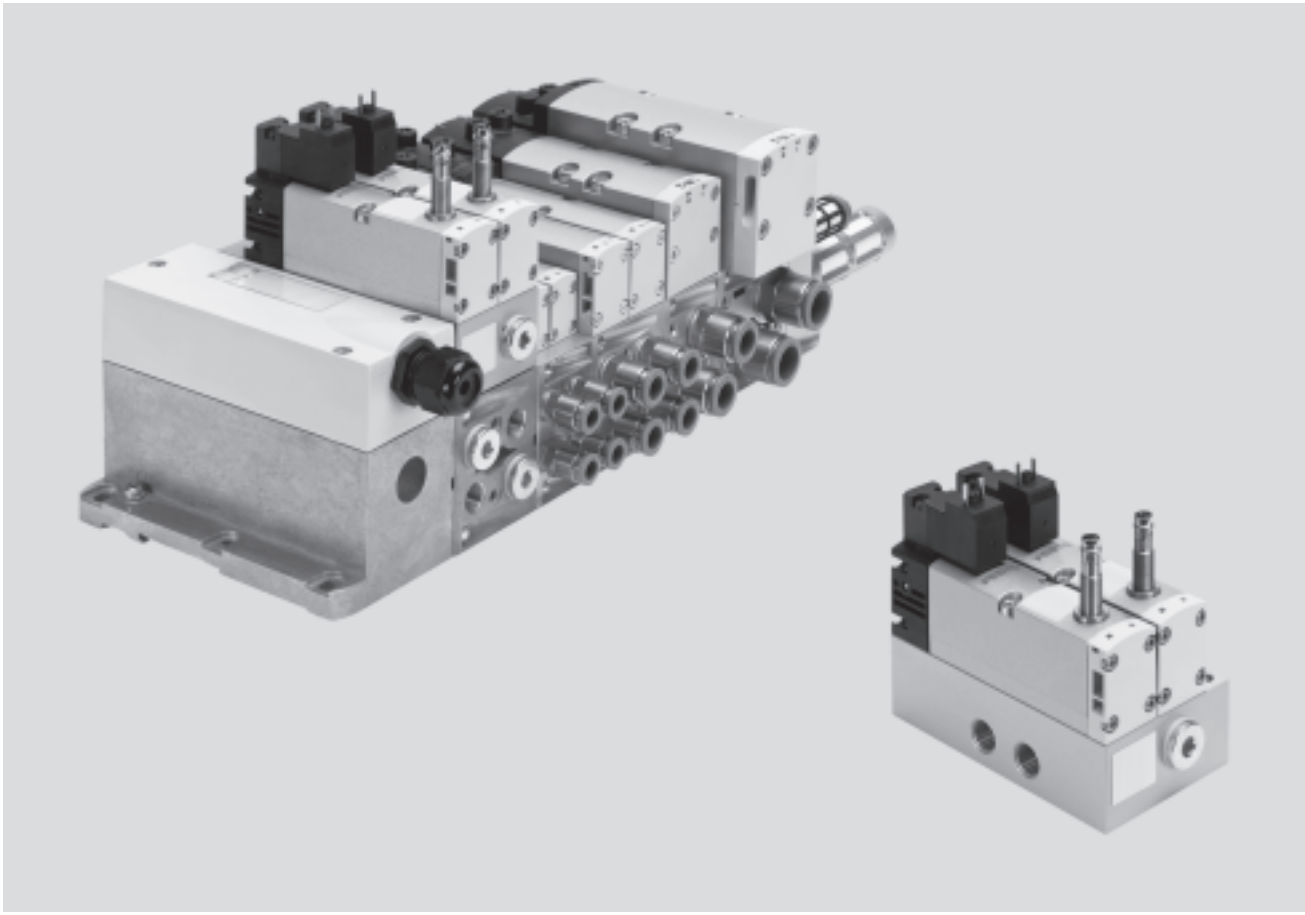
Control block VOFA with safety function

FESTO

New

Control block VOFA with safety function

Key features



Innovative

- Can be used as a press safety valve for safe reversing of a hazardous movement (5/2-way solenoid valve)
- Can be used as a press safety valve for safe venting (3/2-way solenoid valve function, not available as a variant for installation on a valve terminal)
- Purely mechanical solution as a press safety valve, without integrated diagnostics

Versatile

- Control block can be selected as version for valve terminal VTSA/ VTSA-F
- Control block can be selected as individual pneumatic connection
- High pressure range of 3 ... 10 bar
- Flow rates of up to 950 l/min

Reliable

- Sturdy and durable metal components
- Designed as a purely mechanical solution with regard to safety

Easy to mount

- Ready-to-install and tested unit
- Lower selection, ordering, installation and commissioning costs
- Mounting via through-hole (with individual pneumatic connection)
- Mounting as sandwich construction on manifold sub-base of the valve terminal

Note

The control block as a decentralised individual connection variant must not be converted to a 3/2-way solenoid valve function by the customer without authorisation as this invalidates the IFA approval.
An IFA certificate is linked to the certified safety function of the component.

Control block VOFA with safety function

Key features

Description

The control block is designed for two-channel actuation of pneumatic drive components such as double-acting cylinders and can be used to realise the following safety measures:

- Protection against unexpected start-up (EN 1037)
- Reversing hazardous movements provided the reversing movement will not lead to any further hazards (with 5/2-way single solenoid valve function)
- Safe venting (with 3/2-way valve function in normally closed position)

The control attributes of the control block enable Performance Level e (up to Category 4, corresponds to the highest risk level) to be achieved for the safety measures. The Performance Level (PL) is a measure of the reliability of a safety function.
The control block has been developed and manufactured in accordance with the basic and proven safety principles of EN ISO 13849-1 and
EN ISO 13849-2.

The requirements of EN ISO 13849-1 and EN ISO 13849-2 (e.g. CCF, DC) must be taken into consideration for implementation and operation of the component and for use in higher categories (2 to 4).
When using this product in machines or systems subject to specific C standards, the requirements specified in these standards must be observed.

The control block with safety function is designed for installation in machines and automation systems and must only be used in industrial applications (high-demand mode).
The control block with safety function is suitable for use as a press safety valve to EN 962.

Further information and technical data in the support portal
➔ Internet: safety-related guidelines

Pneumatic/electrical interlinking

Function

The safety function is achieved through two-channel pneumatic interlinking of two single solenoid 5/2-way valves, width 26 mm, within the control block:

- Port 4 is only pressurised if both solenoid valves are in switching position.

Port 2 is always pressurised if at least one of the two solenoid valves is in normal position. The valve is reset via a mechanical spring.

The switching operation of the solenoid valves can be monitored by sensing the proximity sensor at the solenoid valves (switching position sensing).

This is done by linking the control signal and signal change of the proximity sensor so that it is possible to check whether the piston spools of the solenoid valves are reaching or leaving the normal position (expectations).

The piston spools of the solenoid valves are designed so that pneumatic short circuits between ports 2 and 4 are ruled out (freedom from overlap).

The two solenoid valves must be actuated via two independent channels in order to achieve the desired Category 4 (Performance Level e, to EN ISO 13849-1).

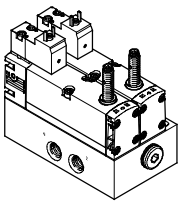
The valves used are always 5/2-way solenoid valves. The function of a 3/2-way valve is achieved by sealing ports 2 and 3 with blanking plugs.

Control block VOFA with safety function

Key features

Version

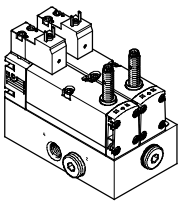
Decentralised individual connection variant (VOFA-L26-...)



With the decentralised individual connection variant, the electrical connection for the control block is established as an individual connection to ISO 15407-1. The pneumatic connection is also established as an individual connection. With this variant, the two 5/2-way solenoid valves are pneumatically interlinked via two channels by means of the individual sub-base.

The electrical connection for the solenoid valves is established separately via a standardised square plug to EN 175301-803, type C.
The piston position sensing feature of the inductive PNP or NPN proximity sensor is realised using a push-in connector in the size M8x1 to EN 61076-2-104.

3/2-way solenoid valve function

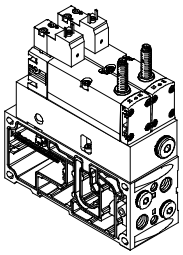


The function as a 3/2-way solenoid valve, normally closed, is intended for use for safe venting.

Note

The 3/2-way solenoid valve function is only available as a decentralised individual connection variant (VOFA-L26-...).

Version for valve terminal VTSA/VTSA-F (VOFA-B26-...)

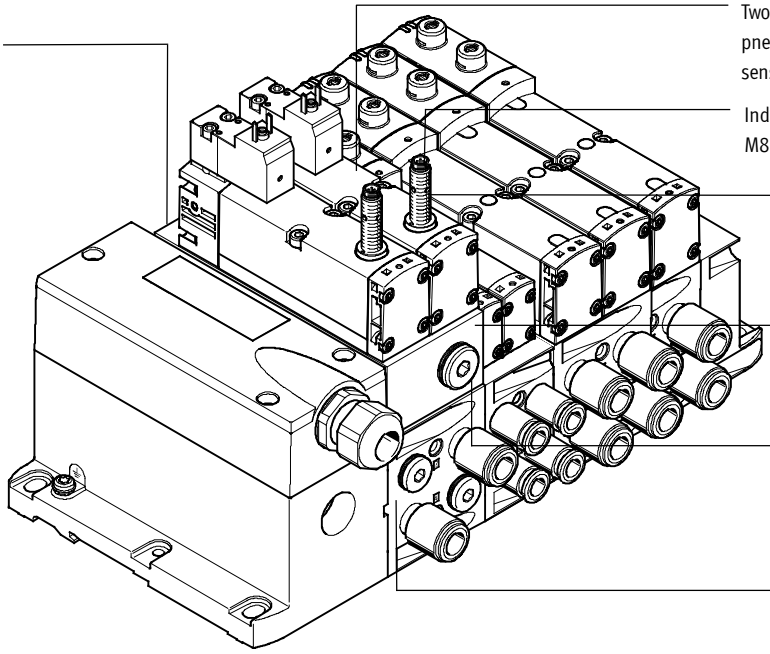


With the version of the control block for valve terminal VTSA/VTSA-F, the valves are actuated separately from the valve terminal via an individual electrical connection. The pneumatic connection is established via the valve terminal VTSA/VTSA-F.
With the variant for valve terminals, the two 5/2-way solenoid valves are pneumatically interlinked via two channels by means of an intermediate plate in a sandwich construction.

The electrical connection for the solenoid valves is established separately via a standardised square plug to EN 175301-803, type C.
The piston position sensing feature of the inductive PNP or NPN proximity sensor is realised using a push-in connector in the size M8x1 to EN 61076-2-104.

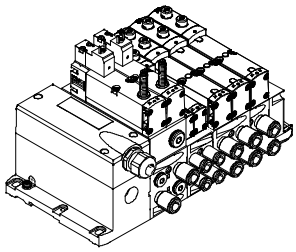
Control block VOFA with safety function

Key features



Equipment options

Control block for valve terminals



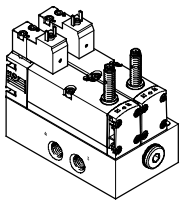
5/2-way solenoid valves, single solenoid, connected in series, interlinked via two channels
- Mechanical spring
- Switching position sensing via inductive sensors with PNP or NPN output
- Protection against unexpected start-up to EN 1037
- Reversing

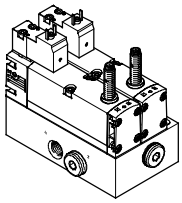
Application:
- Protection against unexpected start-up
- Safe reversing
- Drives in manually loaded devices

Note

The 3/2-way solenoid valve function is not suitable for sandwich construction (on valve terminals).

Control block as decentralised individual connection variant





5/2-way solenoid valves, single solenoid, connected in series, interlinked via two channels
- Mechanical spring
- Switching position sensing via inductive sensors with PNP or NPN output
- Protection against unexpected start-up to EN 1037
- 5/2-way solenoid valves, reversing
- 3/2-way solenoid valve function, safe venting

Application:
5/2-way solenoid valves, single solenoid, connected in series, interlinked via two channels
- Protection against unexpected start-up
- Drives in manually loaded devices
- 5/2-way solenoid valves, safe reversing
- 3/2-way solenoid valve function, safe venting

Note

The control block as a decentralised individual connection variant must not be converted to a 3/2-way solenoid valve function by the customer without authorisation as this invalidates the IFA approval. An IFA certificate is linked to the certified safety function of the component.

New

Control block VOFA with safety function

Key features

Special features

Control block for valve terminals VTSA/VTSA-F

Electrical connection

- Electrical connection to EN 175301-803, type C (square plug)
- 3-pin sensor push-in connector M8

Pneumatic connection

- Via valve terminal VTSA/VTSA-F
- Pilot air supply via valve terminal
- Interlinked via two channels with intermediate plate in sandwich construction (output 2 is parallel, output 4 is connected in series)

Control block as decentralised individual connection variant

Electrical connection

- Electrical connection to EN 175301-803, type C (square plug)
- 3-pin sensor push-in connector M8

Pneumatic connection

- Individual pneumatic connection
- Internal pilot air supply
- Interlinked via two channels with individual sub-base (output 2 is parallel, output 4 is connected in series)

Applications

This control block is suitable for use as a press safety valve to EN 962.

This valve is a safety component in accordance with the Machinery Directive 2006/42/EC.

Valve terminal configurator

➔ Internet: www.festo.com

A valve terminal configurator is available to help you select a suitable VTSA/VTSA-F valve terminal.
The control block VOFA for the valve terminal is ordered using this valve terminal configurator.
This makes it much easier to order the right product.

The valve terminals are fully assembled according to your order specification and are individually tested. This reduces assembly and installation time to a minimum.

You order a control block VOFA for the valve terminal VTSA using the order code:

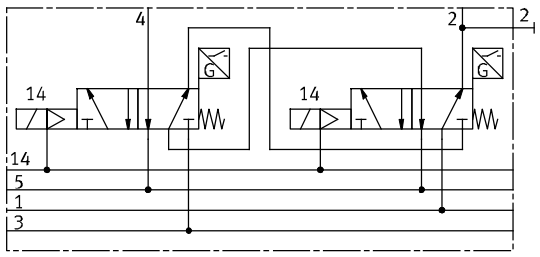
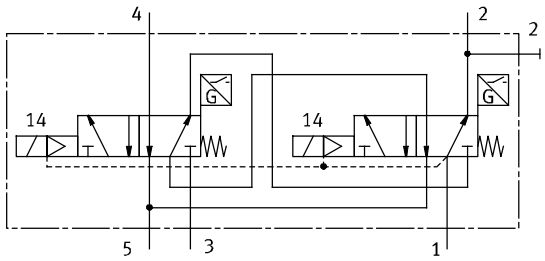
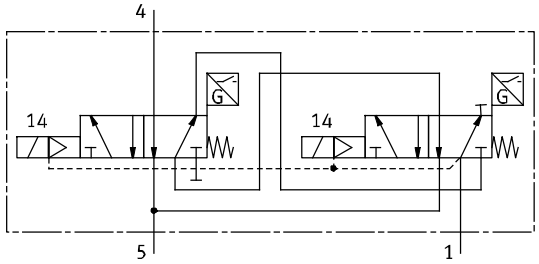
Ordering system for VTSA
➔ Internet: vtsa

You order a control block VOFA for the valve terminal VTSA-F using the order code:

Ordering system for VTSA-F
➔ Internet: vtsa-f

Control block VOFA with safety function

Key features

Valve function	
Circuit symbol1)	Description
	Control block for valve terminal VTSA/VTSA-F with 2x 5/2-way solenoid valve, single solenoid • Pneumatic connection via valve terminal • Mechanical spring return • With NPN sensor (code SN) or PNP sensor (code SP) • Fulfils the safety function – Safe reversing – Protection against unexpected start-up (EN 1037)
	Control block as decentralised individual connection variant with 2x 5/2-way valve, single solenoid • As individual pneumatic connection • Mechanical spring return • With NPN or PNP sensor • Fulfils the safety function – Safe reversing – Protection against unexpected start-up (EN 1037)
	Control block as decentralised individual connection variant with function as 3/2-way solenoid valve, normally closed (the function is achieved by sealing ports 2 and 3 with blanking plugs) • As individual pneumatic connection • Mechanical spring return • With NPN or PNP sensor • Fulfils the safety function – Safe venting – Protection against unexpected start-up (EN 1037)

1) The symbol represents a valve with a proximity sensor with a switching output signal, in the illustration an N/O contact. In accordance with ISO 1219-1, this symbol applies to both N/O contacts as well as N/C contacts. The switching element function of all sensors used here is an N/C contact.

Note

- The solenoid valves each have their own electrical connection.
- 2x 5/2-way solenoid valves are pneumatically interlinked via two channels by means of an individual sub-base/intermediate plate (output 2 is parallel, output 4 is connected in series).
- Output 4 is only switched if both valves are in switching position 14.

Control block VOFA with safety function

Technical data

Safety-related characteristics				
Control block		VOFA-L26-T52-...	VOFA-L26-T32C-...	VOFA-B26-T52-... on valve terminal
Conforms to		EN 13849-1		
Safety function		Security against manipulation, protection against unexpected start-up (up to Category 4, Performance Level e)		
		Reversing of a movement	Venting	Reversing of a movement
Performance Level (PL)		Security against manipulation, protection against unexpected start-up (up to Category 4, Performance Level e)		
Reliable component		Yes		
Note on forced checking procedure		Switching frequency at least 1/week		
Certificate issuing authority		IFA 1001179		
CE marking (see declaration of conformity)		To EU Machinery Directive		
Max. positive test pulse with 0 signal	[µs]	1,000		
Max. negative test pulse with 1 signal	[µs]	800		
Shock resistance		Shock test with severity level 2, to EN 60068-2-27		
Vibration resistance		Transport application test with severity level 2, to EN 60068-2-6		

General technical data				
Control block		VOFA-L26-T52-...	VOFA-L26-T32C-...	VOFA-B26-T52-... on valve terminal
Design		Piston spool valve		
Standard nominal flow rate	[l/min]	950	950	830
Reset method		Mechanical spring		
Sealing principle		Soft		
Exhaust function		With flow control		
Actuation type		Electric		
Non-overlapping		Yes		
Type of control		Piloted		
Direction of flow		Non-reversible		
Exhaust function		With flow control		
Suitability for vacuum		–		
Nominal size	[mm]	9		
Pilot air supply		Internal		Via valve terminal
Type of mounting		Via through-hole, on manifold sub-base		
Mounting position		Any		
Manual override		–		
Valve switching status display		Via accessories		
Pneumatic connections				
Supply	1	G¼		Via the manifold sub-base of the valve terminal
Exhaust	3/5	G¼		
Working lines	2/4	G¼		
Pilot air supply	14	–		
Pressure gauge		G¼		G¼

Control block VOFA with safety function

Technical data

Operating and environmental conditions					
Control block		VOFA-L26-T52-...	VOFA-L26-T32C-...	VOFA-B26-T52-... on valve terminal	
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]			
Pilot medium		Compressed air to ISO 8573-1:2010 [7:4:4]			
Note about the operating/pilot medium		Lubricated operation possible (required during subsequent operation)			
Operating pressure	[bar]	3 ... 10		0 ... 10	
Operating pressure for valve terminal with internal pilot air supply	[bar]	–		3 ... 10	
Pilot pressure	[bar]	3 ... 10			
Noise level LpA	[dB(A)]	85			
Ambient temperature	[°C]	–5 ... +50			
Temperature of medium	[°C]	–5 ... +50			
CE marking (see declaration of conformity)		To EU Machinery Directive			
Fire protection classification to UL94		HB			
Corrosion resistance class CRC		0			

Electrical data – Control block					
Control block			VOFA-L26-T52-...	VOFA-L26-T32C-...	VOFA-B26-T52-... on valve terminal
Electrical connection			Plug to EN 175301-803, type C, without protective earth conductor		
Nominal operating voltage		[V DC]	24		
Permissible voltage fluctuations		[%]	–15/+10		
Surge resistance		[kV]	2.5		
Degree of contamination			3		
Power consumption		[W]	1.8		
Max. magnetic disruption field		[mT]	60		
Piston position sensing			Normal position via sensor		
Duty cycle		[%]	100		
Protection class to EN 60529			IP65, NEMA 4 (for all types of signal transmission in assembled state)		
Protection against direct and indirect contact			PELV (Protective Extra-Low Voltage) Protected to EN 60950/IEC 950		
Valve switching time	On	[ms]	22	20	22
	Off	[ms]	56	53	59
Valve sensor switching time[1)]	On	[ms]	60	58	60
	Off	[ms]	11	11	11

1) Valve sensor switching time off: period of time from coil being energised to sensor being switched off when using a PNP sensor.
Valve sensor switching time on: period of time from coil being de-energised to 0-L edge at the sensor when using a PNP sensor.

Note

With a duty cycle of 100%, the control block must be de-energised once a week.

Control block VOFA with safety function

Technical data

Electrical data – Sensor (to EN-60947-5-2)		
Electrical connection		Cable, 3-wire
		Plug M8x1, 3-pin
Cable length	[m]	2.5
Switching output		PNP or NPN
Switching element function		N/C contact
Switching status display		Yellow LED
Operating voltage range	[V DC]	10 ... 30
Residual ripple	[%]	±10
Sensor idle current	[mA]	Max. 10
Max. output current	[mA]	200
Voltage drop	[V]	Max. 2
Max. switching frequency	[Hz]	5,000
Protection against short circuit		Pulsed
Protection against polarity reversal for sensor		For all electrical connections
Measuring principle		Inductive

Materials	
Sub-base/manifold sub-base	Wrought aluminium alloy
Valve	Die-cast aluminium, PA
Seals	NBR, FPM
Screws	Galvanised steel
Sensor housing	High-alloy stainless steel
Sensor cable sheath	PUR
Note on materials	Contains PWIS (paint-wetting impairment substances), RoHS-compliant

Control block VOFA with safety function

Technical data

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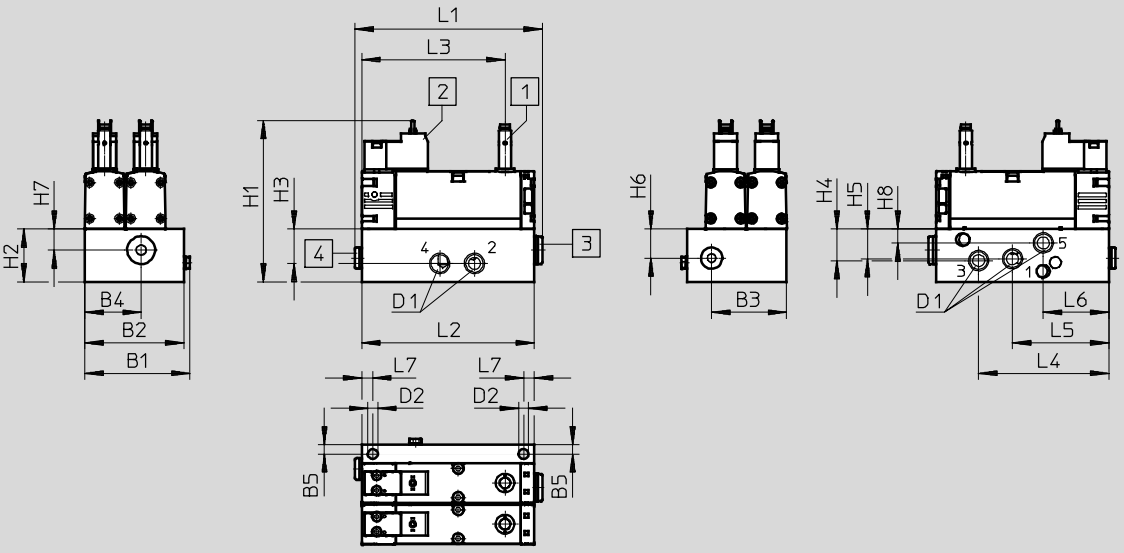
Dimensions Download CAD data ➔ **www.festo.com**

Decentralised individual connection variant



1 Proximity sensor PNP or NPN, size M8x1, plug connection to EN 61076-2-104

2 Electrical connection to EN 175301-803, type C

3 Pneumatic connection G¼ sealed with blanking plug

4 Pneumatic connection G⅛ sealed with blanking plug

Type	B1	B2	B3	B4	B5	D1	D2	H1	H2	H3	H4	H5	H6	H7	H8
VOFA-L26-T52-M-G14-1C1-APP	69	65	49.5	37	6	G¼	6.5	105.8	34.6	22.6	20.7	19.5	19.1	13.8	9.1
VOFA-L26-T52-M-G14-1C1-ANP															

Type	L1	L2	L3	L4	L5	L6	L7
VOFA-L26-T52-M-G14-1C1-APP	122.9	113.1	93.8	85.3	63.1	42.9	7.1
VOFA-L26-T52-M-G14-1C1-ANP							

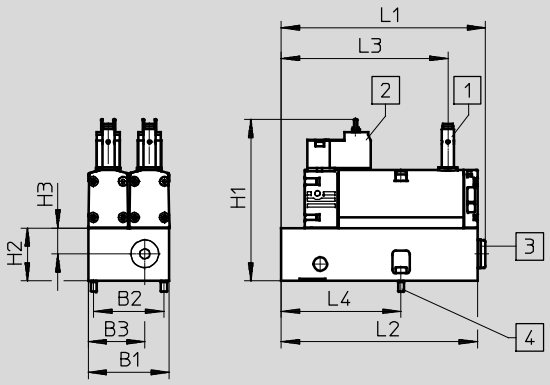
Control block VOFA with safety function

Technical data

FESTO

Dimensions Download CAD data ➔ **www.festo.com**

Version for valve terminal VTSA/VTSA-F



1 Proximity sensor PNP or NPN, size M8x1, plug connection to EN 61076-2-104

2 Electrical connection to EN 175301-803, type C

3 Pneumatic connection G¼ sealed with blanking plug

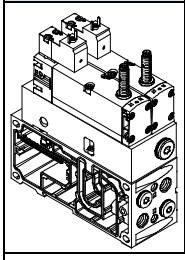
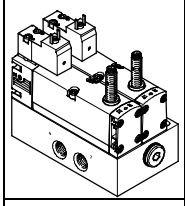
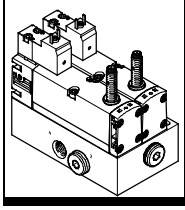
4 2x screw with internal hex (2.5 A/F), M4x12 (included in the scope of delivery)

Type	B1	B2	B3	H1	H2	H3	L1	L2	L3	L4
VOFA-B26-T52-M-1C1-APP	53	46	37	105.8	34.6	17	133.7	128.5	109.2	78.5
VOFA-B26-T52-M-1C1-ANP										

Control block VOFA with safety function

Ordering data – Control block

Ordering data

	Valve function	Code	Switching output	Width [mm]	Weight [g]	Part No.	Type
Control block, version for valve terminal VTSA/VTSA-F							
	5/2-way valve, single solenoid, mechanical spring return, with switching position sensing via inductive sensor and 3-pin sensor push-in connector M8, mounted on intermediate plate for pneumatic interlinking	SP [2]	PNP	53	1,112	– [1]	**VOFA-B26-T52-M-1C1-APP**
		SN [2]	NPN	53	1,112	– [1]	**VOFA-B26-T52-M-1C1-ANP**
Control block, as decentralised individual connection variant							
	5/2-way valve, single solenoid, mechanical spring return, with switching position sensing via inductive sensor and 3-pin sensor push-in connector M8, mounted on individual sub-base	–	PNP	65	1,168	**569819**	**VOFA-L26-T52-M-G14-1C1-APP**
		–	NPN	65	1,168	**569820**	**VOFA-L26-T52-M-G14-1C1-ANP**
	Function as 3/2-way solenoid valve, normally closed, mechanical spring return, with switching position sensing via inductive sensor and 3-pin sensor push-in connector M8, mounted on individual sub-base	–	PNP	65	1,138	**574011**	**VOFA-L26-T32C-M-G14-1C1-APP**
		–	NPN	65	1,138	**574012**	**VOFA-L26-T32C-M-G14-1C1-ANP**

1) The control block with safety function can only be ordered via the valve terminal configurator and therefore does not have a separate part number.
2) Code letter within the order code for a valve terminal configuration.

Note

The sensors contained in the valves must not be replaced. Incorrect assembly can result in malfunctions or damage to the valve. Please contact Festo in the event of a malfunction.

Control block VOFA with safety function

Accessories

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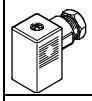
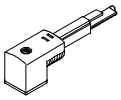
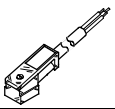
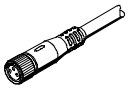
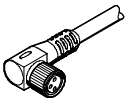
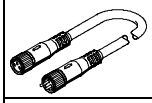
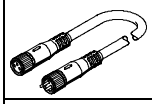
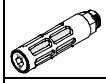
Ordering data					
	Description			Part No.	Type
Plug socket for electrical connection of individual valves					
	Angled socket, 3-pin, screw terminal, cable connector		PG7	**151687**	**MSSD-EB**
			M12	**539712**	**MSSD-EB-M12**
Illuminating seal for plug pattern to EN 175301-803, type C					Technical data ➔ Internet: meb-ld
	For plug socket MSSD			**151717**	**MEB-LD-12-24DC**
Connecting cable for electrical connection of individual valves					
	Angled socket, 3-pin, with switching status display via LED		2.5 m	**151688**	**KMEB-1-24-2,5-LED**
			5 m	**151589**	**KMEB-1-24-5-LED**
			10 m	**193457**	**KMEB-1-24-10-LED**
	Angled socket, 4-pin, with switching status display via LED		2.5 m	**174844**	**KMEB-2-24-2,5-LED**
			5 m	**174845**	**KMEB-2-24-5-LED**
Connecting cable for electrical connection of sensors for switching position sensing					
	Straight socket, 3-pin, plug M8		2.5 m	**541333**	**NEBU-M8G3-K-2,5-LE3**
	Straight socket, 3-pin, plug M8		5 m	**541334**	**NEBU-M8G3-K-5-LE3**
	Angled socket, 3-pin, plug M8		2.5 m	**541338**	**NEBU-M8-W3-K-2,5-LE3**
	Angled socket, 3-pin, plug M8		5 m	**541341**	**NEBU-M8W3-K-5-LE3**
	Straight socket, straight plug, 3-pin, 4-pin plug M8		2.5 m	**554037**	**NEBU-M8G3-K-2,5-M8G4**
	Modular system for connecting cables		–	**–**	**NEBU-...** ➔ Internet: nebu
Silencer					
	Connecting thread		G¼	**2316**	**U-¼**
Push-in fitting					
	Connecting thread G¼ for tubing O.D.	12 mm	10 pieces	**186350**	**QS-G¼-12**
		10 mm	10 pieces	**186101**	**QS-G¼-10**
		8 mm	10 pieces	**186099**	**QS-G¼-8**
Blanking plug					
	Connecting thread	G¼	10 pieces	**3569**	**B-¼**