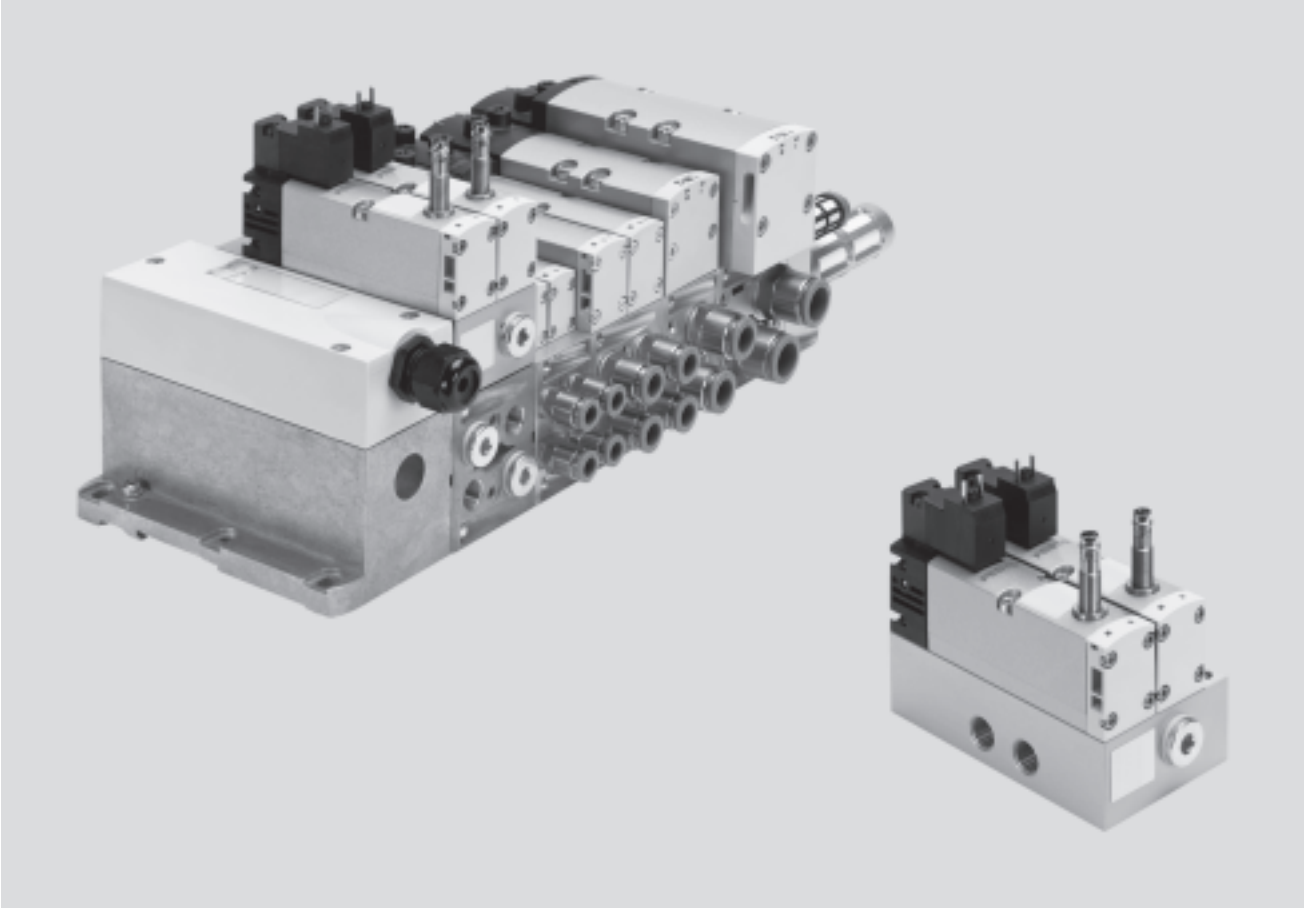
Control block VOFA with safety function

FESTO

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)
- 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)

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).

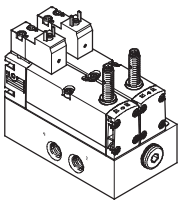
The valves used are always 2x 5/2-way solenoid valves. The function of a 3/2-way valve is achieved by sealing ports 2 and 3 with blanking plugs.

Control block VOFA with safety function

Key features

Version

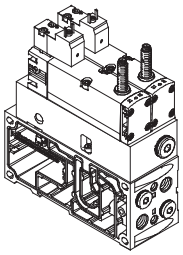
Decentralised individual connection variant (VOFA-L26-...)



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.

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

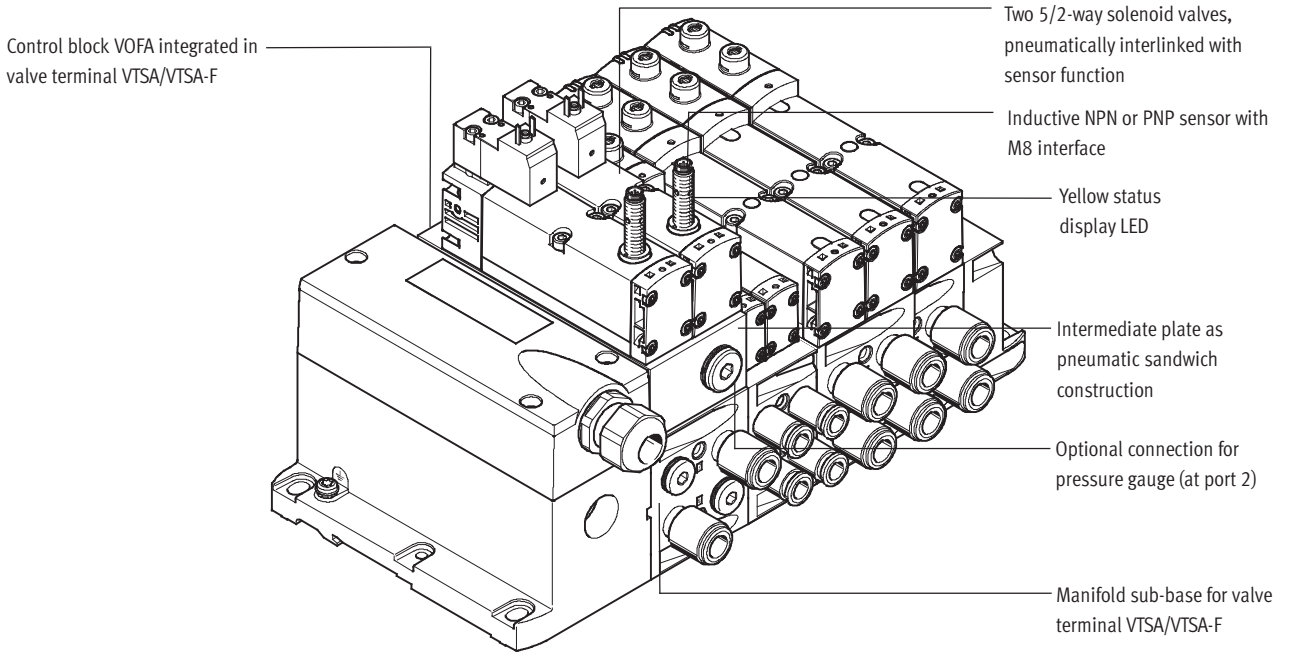


With the version of the control block for valve terminal VTSA/VTSA-F, the valves are actuated separately from the valve terminal via an individual electrical connection. The pneumatic connection is established via the valve terminal VTSA/VTSA-F.
With the variant for valve terminals, the two 5/2-way solenoid 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.

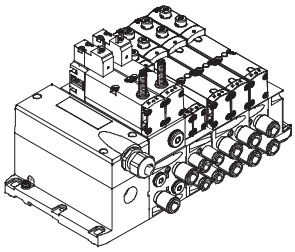
Control block VOFA with safety function

Key features



Equipment options

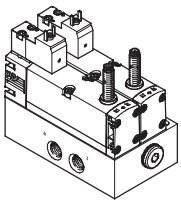
Control block for valve terminals



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

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

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

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

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:

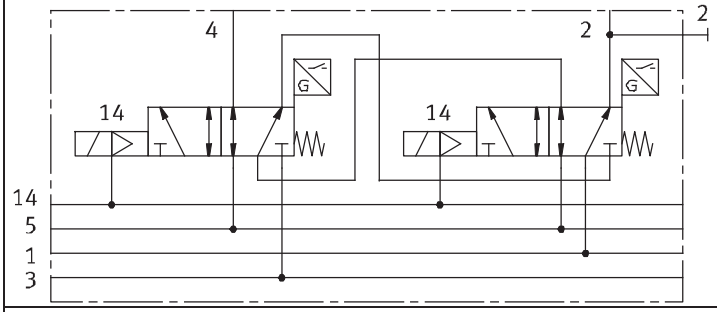
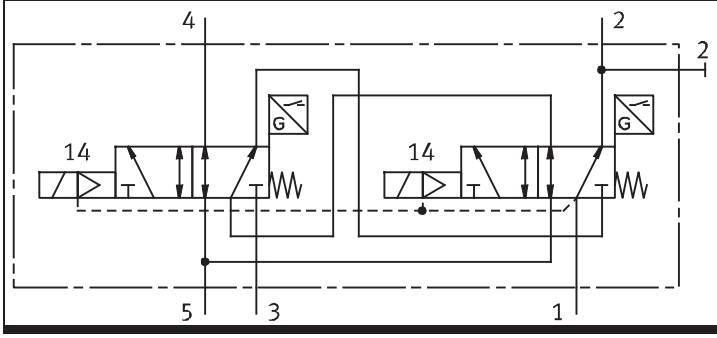
Ordering system for VTSA
➔ Internet: vtsa

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 symbol[1)]	Description
	Control block VOFA-B26-T52-... 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 VOFA-L26-T52-... 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)

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 2x 5/2-way solenoid valves each have their own electrical connection.
- The 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).

Control block VOFA with safety function

Technical data

Safety-related characteristics			
Control block		VOFA-L26-T52-...	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	
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		To EU Machinery Directive	
(see declaration of conformity)		To EU EMC Directive[1)]	
Max. positive test pulse with 0 signal[2)]	[µs]	1,000	
Max. negative test pulse with 1 signal[2)]	[µs]	800	
Shock resistance[2)]		Shock test with severity level 2, to EN 60068-2-27	
Vibration resistance[2)]		Transport application test with severity level 2, to EN 60068-2-6	

1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com ➔ Support ➔ User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

2) Please also note the safety-related applications and safety technology on the Support Portal

General technical data			
Control block		VOFA-L26-T52-...	VOFA-B26-T52-... on valve terminal
Design		Piston spool valve	
Standard nominal flow rate	[l/min]	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		–	
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

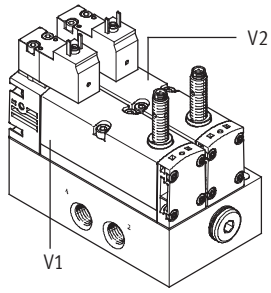
Technical data

Fault and failure types

VOFA-L26-T52-...

Cause:	**Effect:**
• Failure of the solenoid valve V2 to switch back completely	... can result in incomplete reversal of the cylinder movement.
• Failure of the solenoid valve V1 to switch back completely	... can result in the pressure present at working port 4 not being reduced.
• Failure of the two solenoid valves (V1 and V2) to switch back completely at the same time	... can result in the loss of the safety function.

Solenoid valve designations



- V1 – The closest solenoid valve
- V2 – The furthest solenoid valve

Operating and environmental conditions			
Control block		VOFA-L26-T52-...	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	
Fire protection classification to UL94		HB	
Corrosion resistance class CRC		0	

Control block VOFA with safety function

Technical data

Electrical data – Control block				
Control block			VOFA-L26-T52-...	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	
Switching position display			With accessories	
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	22
	Off	[ms]	56	59
Valve sensor switching time[1)]	On	[ms]	60	60
	Off	[ms]	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

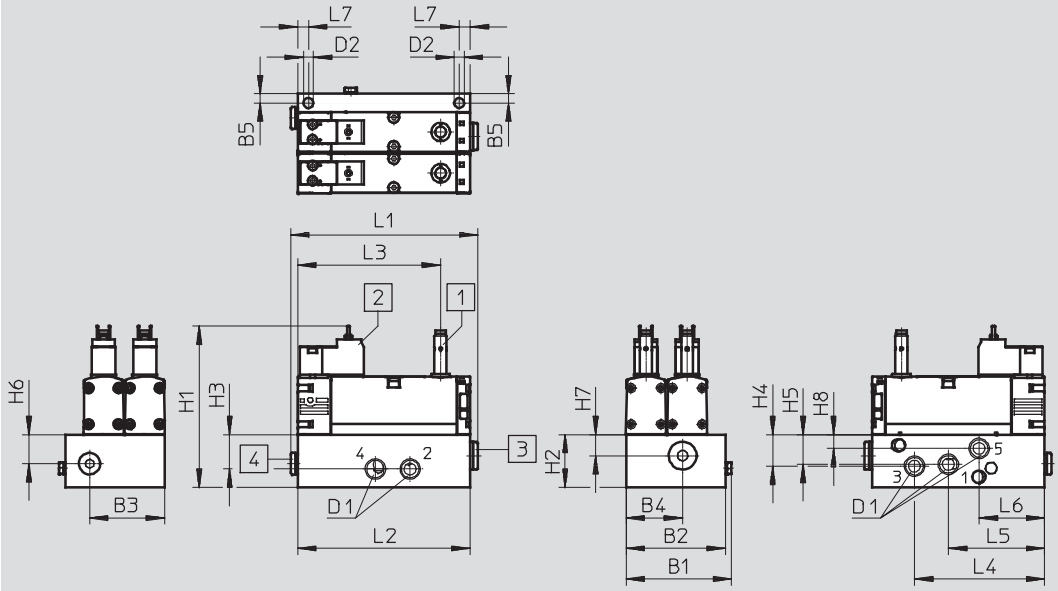
With a duty cycle of 100%, the control block must be de-energised once a week.

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
Housing	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

Dimensions Download CAD Data ➔ **www.festo.com/us/cad**

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															

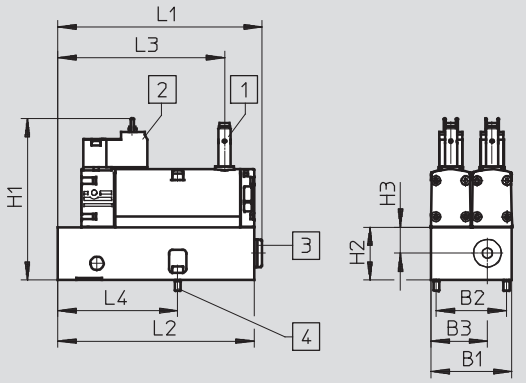
Type	L1	L2	L3	L4	L5	L6	L7
VOFA-L26-T52-M-G14-1C1-APP	122.9	113.1	93.8	85.3	63.1	42.9	7.1
VOFA-L26-T52-M-G14-1C1-ANP							

Control block VOFA with safety function

Technical data

Dimensions Download CAD Data ➔ **www.festo.com/us/cad**

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

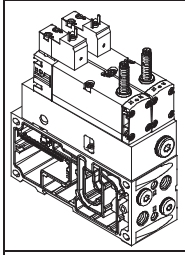
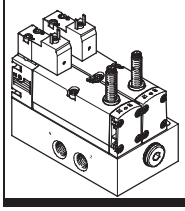
3 Pneumatic connection G¼ sealed with blanking plug

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	1,138	**569819**	**VOFA-L26-T52-M-G14-1C1-APP**
		–	NPN	65	1,138	**569820**	**VOFA-L26-T52-M-G14-1C1-ANP**

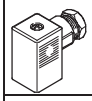
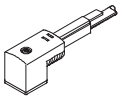
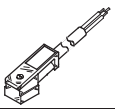
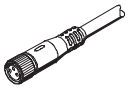
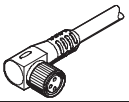
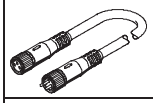
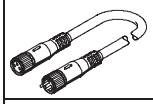
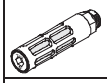
1) The control block with safety function can only be ordered via the valve terminal configurator and therefore does not have a separate part number.
2) Code letter within the order code for a valve terminal configuration.

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

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	**151689**	**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**

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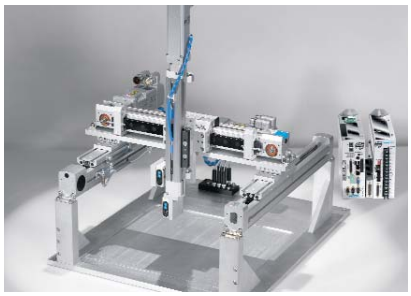

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