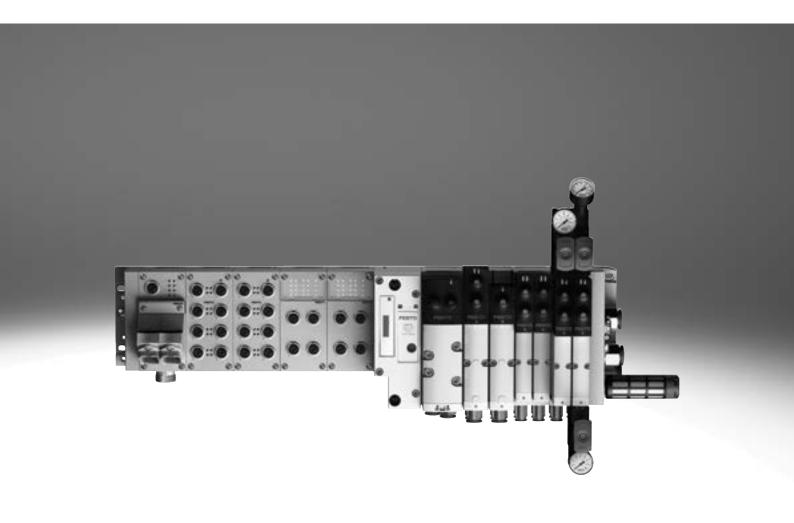
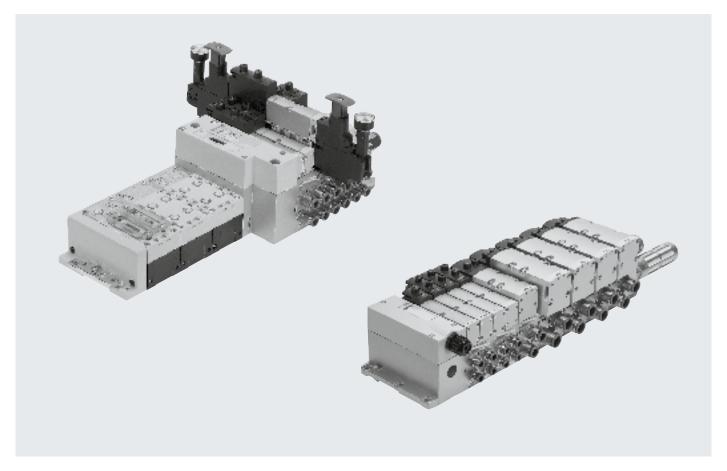
# Valve terminal VTSA/VTSA-F, NPT

# **FESTO**





# Innovative

- High-performance valves in a sturdy metal housing
- Five valve sizes on one valve terminal (width 65 mm with adapter)
- Standardised from the multi-pin plug to the fieldbus connection and control block
- Dream team: fieldbus valve terminal suitable for electrical peripherals CPX. This means:
  - Forward-looking internal communication system for actuating the valves and CPX modules
- Four valve sizes on one valve terminal without adapters
- Valve functions for integration in control architectures of higher categories to EN ISO 13849-1

### Flexible

- Modular system offering a range of configuration options
- Up to 32 solenoid coils
- Conversions and extensions are possible at any time
- Possible to integrate innovative function modules
- Flexible air supply and variable pressure zones
- · Reverse operation
- High pressure range
- -0.9 ... 10 bar, flow rate range 550 ... 4000 l/min
- Wide range of valve functions
- Valves: 24 V DC

# Reliable

- Sturdy and durable metal components
  - Valves
  - Manifold sub-bases
  - Seals
- Fast troubleshooting with LEDs on the valves and diagnostics via fieldbus
- Reliable servicing thanks to valves that can be replaced quickly and easily
- Manual override, either non-detenting, non-detenting/detenting or concealed
- Durable thanks to tried-and-tested piston spool valves
- Large and durable labelling system
- 100% duty cycle

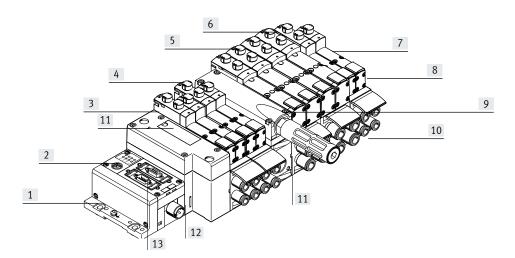
# Easy to install

- Ready-to-install and tested unit
- Reduced selection, ordering, installation and commissioning costs
- Secure mounting on a wall or H-rail
- Manifold sub-bases can be extended using four screws, sturdy duct separation on metal support



The key features, valves and functions of width 65 mm are described separately in the chapter "Adaptation to width 65 mm", ISO size 3

→ page 180.



- [1] Quick to mount: directly using screws or H-rail
- [2] CPX diagnostic interface for handheld devices (channel-oriented diagnostics down to the individual valve)
- [3] Pneumatic interface to CPX
- [4] Widths 18 mm, 26 mm, 42 mm and 52 mm can be combined on one valve terminal without an adapter
- [5] Reduced downtimes: on-site LED diagnostics
- [6] Safe operation: manual override non-detenting, non-detenting/detenting or concealed
- [7] Versatile: 32 valve positions/32 solenoid coilsOne valve series for a wide range of flow rates
- [8] Comprehensive range of valve functions
- Modular: air supply plate facilitates the creation of multiple pressure zones as well as numerous additional exhaust and supply ports
- [10] Practical: large connections, flow-optimised ducts, sturdy metal threads or pre-assembled push-in connections for compressed air tubing with standardised O.D.
- [11] Convenient: large inscription labels

- [12] Reliable: valves, outputs and logic voltage can be switched off separately
- [13] Simple electrical connections
  - Fieldbus interface via CPX
  - Multi-pin plug connection with pre-assembled cable or terminal strip (Cage Clamp®)
  - Control block via CPX
  - AS-Interface
  - Individual connection
  - IO-Link®
  - AP interface

#### **Equipment options**

Valve functions

- 2x 2/2-way valve, single solenoid, pneumatic spring, normally closed
- 2x 3/2-way valve, single solenoid
- Normally open
- Normally open, reversible
- Normally closed
- Normally closed, reversible
- 2x 3/2-way valve, single solenoid
- 1x normally open, 1x normally closed
- 1x normally open, 1x normally closed, reversible

- 5/2-way solenoid valve
  - Single solenoid, pneumatic spring/mechanical spring
  - Double solenoid
  - Double solenoid with dominant signal
- 5/2-way valves for special functions, single solenoid
  - Mechanical spring
  - Switching position sensing via inductive sensors with PNP or NPN output
  - Protection against unexpected start-up to EN 1037
  - Reversing
- 5/3-way solenoid valve
  - Mid-position pressurised
  - Mid-position closed
  - Mid-position exhausted

- 5/3-way solenoid valve for special functions
  - Switching position 14 is retained (switching position 14 is retained in the event of an emergency off application/power failure), there is no spring return to switching position 12.
  - Only for valve terminal (plug-in)
  - Mid-position exhausted or mid-position 1→2, 4→5
  - Switching position 14 is retained
  - pneumatic spring return

- 5/3-way solenoid valve for special functions
  - Switching position 12 is retained (switching position 12 is retained in the event of an emergency off application/power failure), there is no spring return to switching position 14.
  - Only for valve terminal (plug-in)
  - Mid-position exhausted or mid-position 1→4, 2→3
  - Switching position 12 is retained
- pneumatic spring return
- Soft-start valve for slow and safe pressure build-up
  - High degree of safety
  - Sensing function provides feedback on switching operation

# - 🖣 - Note

The key features, valves and functions of width  $65\,\mathrm{mm}$  are described separately in the chapter "Adaptation to width  $65\,\mathrm{mm}$ ", ISO size  $3\,\mathrm{mm}$ 

→ page 180.

#### Special features

Individual valve on individual sub-base up to width 52 mm

# Plug-in

- · Electrical connection via standardised 4-pin M12 plug or via 4-pin spring-loaded terminal for configuration by the user
- Available with internal/external pilot air supply

Valve terminal with individual connection

- Max. 20 valve positions/max. 20 solenoid coils
- Any compressed air supply
- Any number of pressure zones

# Square plug or plug-in, with integrated switching position sensing

- · Electrical connection to DIN EN 175301-803 type C (square plug) or
- · For configuration by the user via 4-pin spring-loaded terminal or
- Cable with open end

Valve terminal with multi-pin plug connection

- · Max. 32 valve positions/max. 32 solenoid coils
- Parallel, modular valve links
- Any compressed air supply

# Valve terminal with fieldbus connection and electrical peripherals

### **CPX** terminal

- Max. 32 valve positions/max. 32 solenoid coils
- Any compressed air supply
- Any number of pressure zones

#### AS-Interface

- 1 to 8 valve positions/ max. 8 solenoid coils
- Soft-start valve for slow and safe pressure build-up

#### Can be combined

- Width 18 mm: flow rate of VTSA up to 550 l/min, VTSA-F up to 700 l/min
- Width 26 mm: flow rate of VTSA up to 1100 l/min, VTSA-F up to 1350 l/min
- Width 42 mm: flow rate of VTSA up to 1300 l/min, VTSA-F up to 1860 l/min
- Width 52 mm: valve flow rate up to 2900 l/min
- Widths 18 mm, 26 mm, 42 mm, 52 mm and 65 mm can be combined on a single valve terminal (using an adapter)

# Note

- Valve terminal VTSA complies with ISO 15407-2 in width 18 and 26 mm and
- with ISO 5599-2 in width 42 and 52 mm

# AP interface

- Max. 12 valve positions/ max. 24 solenoid coils
- · Connection to an AP bus master

- Any number of pressure zones

# I-Port

- · Max. 16 valve positions/max. 32 solenoid coils
- · Connection to an I-Port master
- · Direct mounting of a bus node

# 10-Link®

- Max. 16 valve positions/max. 32 solenoid coils
- Connection to an IO-Link® master

Valve terminal configurator			→ Internet: www.festo.com
A valve terminal configurator is available to help you select a suitable valve terminal VTSA/VTSA-F, making it much	you select a suitable valve cording to your order specification and	Order a valve terminal VTSA using the order code:	Order a valve terminal VTSA-F using the order code:
easier to order the right product.	assembly and installation time to a	Ordering system for VTSA	Ordering system for VTSA-F
	minimum.	→ Internet: vtsa	→ Internet: vtsa-f
		Ordering system for CPX  → Internet: cpx	Ordering system for CPX  → Internet: cpx
Ordering data – Product options			
	Configurable product This product and all its product options can be ordered using the configurator.	The configurator can be found at  → www.festo.com/catalogue/  Enter the part number or the type.	Part no.         Type           539216         VTSA-MP-NPT           539218         VTSA-FB-NPT           547964         VTSA-F-MP-NPT           547966         VTSA-F-FB-NPT           555565         VTSA-ASI-NPT           555567         VTSA-F-ASI-NPT

### Individual pneumatic connection

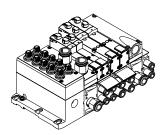


Valves on individual sub-bases up to width 52 mm can be used for actuators further away from the valve terminal.

The electrical connection is established either via a standard 4-pin M12 plug, 24 V DC (EN 61076-2-101), a

4-pin spring-loaded terminal or a cable with open end 24 V DC, which are configured by the user.

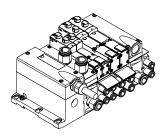
# Valve terminal with individual electrical connection



Control signals from the controller to the valve terminal are transmitted via an individual connecting cable. The valve terminal can be equipped with a maximum of 20 valves and a maximum of 20 solenoid coils.

The electrical connection is established via a 5-pin M12 plug, 24 V DC.

### Valve terminal with multi-pin plug connection



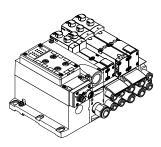
Control signals from the controller to the valve terminal are transmitted via a pre-assembled multi-core cable or a multi-pin plug connection assembled by the user (spring-loaded terminal). This substantially reduces installation time.

The valve terminal can be equipped with a maximum of 32 valves and a maximum 32 solenoid coils.

#### Variants

- Multi-pin plug connection with terminal strip (spring-loaded terminal), 24 V DC
- Pre-assembled connecting cable, 24 V DC
- Sub-D plug connector for assembly by the user, 37-pin
- Round plug connector M23, 19-pin, 24 V DC

#### **AS-Interface connection**



A special feature of the AS-Interface is the simultaneous transmission of data and supply power via a two-core cable. The encoded cable profile prevents connection with incorrect polarity. The valve terminal with AS-Interface is available in the following versions:

- With one to eight modular valve positions (max. 8 solenoid coils). This corresponds to one to eight valves VSVA.
- With all available valve functions

The connection technology used for the inputs can be selected as with CPX: M8, M12, Sub-D, spring-loaded terminal (terminals to IP20).

#### More information

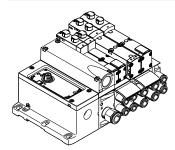
→ Internet: as-interface

# · 🖣 - Not

The valve terminal VTSA/VTSA-F with AS-Interface connection is based on the same electrical links as the valve terminal with multi-pin plug connection. This means a valve terminal with multi-pin plug connection can be converted using an AS-Interface module (→ page 135). The technical specifications of the AS-Interface system must be observed in this case.

- → Page 62
- → Internet: as-interface

### Valve terminal with I-Port/IO-Link® connection

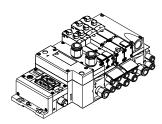


The connection to a higher-order controller can be achieved by:

- Connection to an I-Port master from Festo (e.g. CPX-CTEL)
- Direct mounting of a bus node on the I-Port interface
- Connection to an IO-Link® master (in IO-Link® mode)

The valve terminal can comprise a maximum of 32 solenoid coils or 16 valve positions.

#### Valve terminal with fieldbus interface from the CPX system

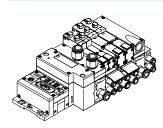


An integrated fieldbus node manages the communication connection with a higher-order PLC. This enables a space-saving pneumatic and electrical solution to be implemented. Valve terminals with fieldbus interfaces from the CPX system can be configured with up to 16 manifold sub-bases. With 2 solenoid coils per connection, up to 32 solenoid coils can thus be actuated.

#### Variants

- PROFIBUS
- DeviceNet
- CANopen
- CC-Link
- EtherNet/IP
- EtherCAT
- Modbus TCP
- PROFINET
- POWERLINK
- Sercos III
- → Internet: cpx

### Valve terminal with control block connection from the CPX system



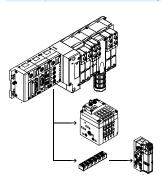
A controller integrated in the Festo valve terminal enables the construction of stand-alone control units with protection to IP65 without a control cabinet thanks to two different operating modes.

In the slave operating mode, these valve terminals can be used for intelligent preprocessing and are therefore ideal modules for designs using decentralised intelligence.

In the master operating mode, terminal groups can be designed with many options and functions that can autonomously control a medium-sized machine/system.

→ Internet: cpx

#### CP string extension from the CPX system



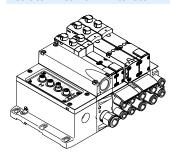
The optional CP string extension enables additional valve terminals and I/O modules to be connected to the field-bus node of the CPX terminal on up to 4 CP strings. Different input and output modules as well as valve terminals MPA-S and CPV can be connected.

The maximum length of the CP string extension is 10 metres, which means that the extension modules can be mounted directly on-site. All the required electrical signals are transmitted via the CP cable, which in turn means that no further installation is needed on the extension module.

One CP string offers:

- 32 input signals
- 32 output signals for output modules 24 V DC or solenoid coils
- Logic and sensor supply for the input modules
- Load voltage supply for the valve terminals
- Logic supply for the output module
- → Internet: cpi

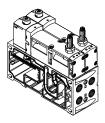
#### Valve terminal with AP interface



Control signals from the controller to the valve terminal are transmitted via the AP bus protocol from Festo. The valve terminal can comprise a maximum of 24 solenoid coils or 12 valve positions.

# Key features – Valves

### Solenoid valve with switching position sensing, width 18 mm, 26 mm



The 5/2-way single solenoid valve with spring return in width 26 mm features switching position sensing.

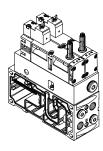
The normal position of the piston spool is monitored.

It is available as a plug-in or individual connection valve with pilot valves to ISO 15218 and square plug type C. This valve is not a safety device in accordance with the Machinery Directive 2006/42/EC.

It is suitable for use in safety-related parts of control systems to EN ISO 13849-1.

→ Page 138

### Control block with safety function, width 26 mm



5/2-way solenoid valve These valves are used for special applications, for example for:

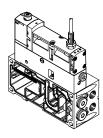
- Protection against unexpected startun
- · Safe reversing
- Drives in manually loaded devices

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

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

→ Page 148

### Pilot air switching valve, width 18 mm, 26 mm



The pilot air switching valve is a combination of a 5/2-way solenoid valve with switching position sensing and the intermediate plate VABF-S4-...-S. It enables the pilot air to be verifiably switched on and off (sensing function) from duct 1 to 14 for the entire pressure zone or valve terminal.

Switching position sensing is carried out using an inductive PNP proximity switch with cable and M12x1 push-in connector to EN 61076-2-104.

This valve is not a safety device in accordance with the Machinery Directive 2006/42/EC.

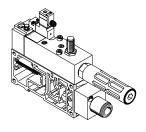
It is suitable for use in safety-related parts of control systems to EN ISO 13849-1.

→ Page 155



The pilot air switching valve can only be operated on the valve terminal VTSA/VTSA-F in combination with a right end plate for external pilot air type VABE-S6-1RZ-.... Port 14 on the right end plate must then be sealed.

# Soft-start valve, module width 43 mm



The soft-start valve is separately electrically actuated, independently of the multi-pin plug connection, AS-Interface or fieldbus interface, via a square plug of type C to EN 175301-803 or optionally via an M12 adapter.

The valve can optionally be ordered with a sensor that monitors switching of the soft-start valve. The soft-start valve can supply the valve terminal or one or more pressure zones with working air.

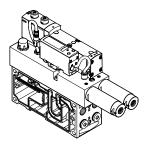
The pressure build-up for each pressure zone is optimised for the application directly at the valve terminal by setting the switch-over pressure and the filling time.

A maximum of 5 soft-start valves can be integrated on one valve terminal in this way.

→ Page 164

# Key features – Valves

### Vacuum block, module width 53 mm



5/3-way solenoid valve, with switching position 12 retained.

The vacuum block is screwed to a manifold sub-base for 2 valve positions, width 26 mm, and thus integrated into the valve terminal VTSA/VTSA-F.

The vacuum block is supplied with power and the vacuum is sensed via a standardised 4-pin M12 plug.

The vacuum block is used in conjunction with a suction gripper to pick up, hold and place components. An adjustable ejector pulse is used for setting the components down.

The vacuum block is equipped with an air saving function.

If the electrical or pneumatic supply fails, the valve moves to switching position 12 "generate vacuum".

→ Page 174

### 5/3-way solenoid valve for special functions

For holding, blocking a movement (mechanically)

5/3-way solenoid valve for special functions; port 2 is pressurised, port 4 exhausted. Switching position 14 is retained (code SA).

5/3-way solenoid valve for special functions; port 2 is pressurised, port 4 exhausted. Switching position 12 is retained (code SE).

Possible applications:

- Using lifting cylinders
- Using rotary cylinders

Possible applications:

- Using lifting cylinders
- Using rotary cylinders

For pressureless switching, self-holding, pneumatic operation

5/3-way solenoid valve for special functions (3 phases). Mid-position is exhausted. Switching position 14 is retained.

5/3-way solenoid valve for special functions (3 phases). Mid-position is exhausted. Switching position 12 is retained.

Possible applications:

Pneumatic manual clamps for devices (inserting stations)

Possible applications:

Pneumatic manual clamps for devices (inserting stations)

# Peripherals

# Modular pneumatic peripherals

The modular design of the valve terminal VTSA/VTSA-F enables outstanding flexibility right from the planning stage and offers maximum ease of service in operation.

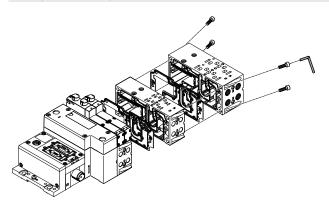
The system consists of manifold sub-bases and valves.

The manifold sub-bases are screwed together, thus forming the support system for the valves.

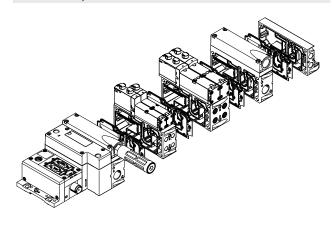
Inside the manifold sub-bases are the connection ducts for supplying compressed air to and exhausting the valve terminal as well as the working ports for the pneumatic cylinders for each valve.

Each manifold sub-base is connected to the next using four screws. Individual valve terminal sections can be isolated and further blocks easily inserted by loosening these screws. This ensures that the valve terminal can be rapidly and reliably extended.

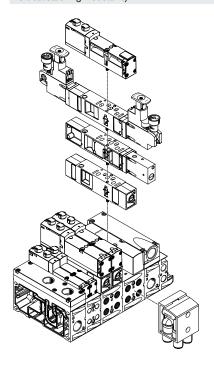
# Basic system modularity



# Valve modularity



# Vertical stacking modularity





See also "Adaptation to width 65 mm, ISO size 3"  $\rightarrow$  page 180

# Peripherals

# Modular electrical peripherals

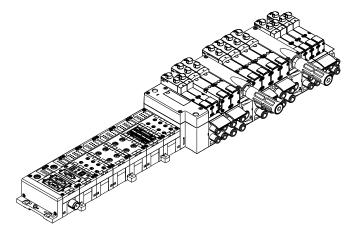
The valves are actuated differently depending on whether a multi-pin terminal or fieldbus terminal is used.

The VTSA/VTSA-F with CPX interface is based on the internal bus system of the CPX and uses this communication system for all solenoid coils and a range of electrical input and output functions.

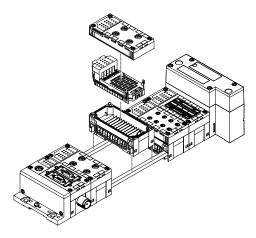
The parallel sub-base links enable the following:

- Transmission of switching information
- Compact design
- Position-based diagnostics
- Separate power supply for valves
- Flexible conversion without address shifting
- Option of CP interface
- CPX-CEC as stand-alone controller with access via Ethernet and web server
- Transmission of status, parameter and diagnostic data
- → Internet: cpx

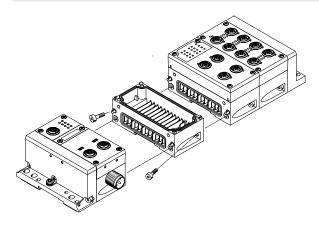
# VTSA/VTSA-F with electrical peripherals CPX



# Modularity with electrical peripherals CPX



#### CPX terminal in metal design



The CPX modules in metal design are mechanically connected to one another using an angled fitting.
The CPX terminal can thus be expanded at any time.



# Note

The CPX manifold blocks are also available in metal. This means a complete solution in a sturdy metal design can be selected for applications of the valve terminal VTSA/VTSA-F in welding environments.

### Valve terminal widths

Order code for VTSA:

- 44E-... for the electric components
- 44P-... for the pneumatic components Order code for VTSA-F:
- 45E-... for the electric components
- 45P-... for the pneumatic components

Regardless of the type of control (e.g. multi-pin plug, fieldbus, etc.), valve terminals VTSA/VTSA-F

- 26 mm • 42 mm
- 52 mm

of widths • 18 mm

400 l/min to 2900 l/min For the VTSA-F of: 700 l/min to 2900 l/min

of:

to be covered on one valve terminal. A wide range of valve functions and vertical stacking components are available for all widths.

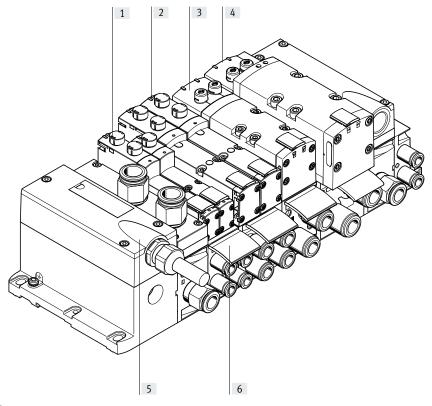
can be combined without adapters.

This enables a flow range for the VTSA

Valves with a width of 65 mm can be mixed with other widths. However, these are only configured after the adapter plate VABA and are thus always at the end of the valve terminal configuration.

See "Adaptation to width 65 mm, ISO size

→ page 180

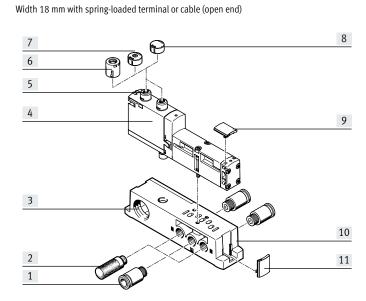


		Description	→ Page/Internet
[1]	Valve	Width 18 mm	98
[2]	Valve	Width 26 mm	106
[3]	Valve	Width 42 mm	114
[4]	Valve	Width 52 mm	121
[5]	Multi-pin plug connection	Via multi-pin cable, 24 V DC	135
[6]	Inscription labels	For manifold sub-base, sub-base, 90°-connection plate	137

# Individual sub-base, width 18 mm, ISO 15407-2

Order code: Individual sub-bases can be equipped

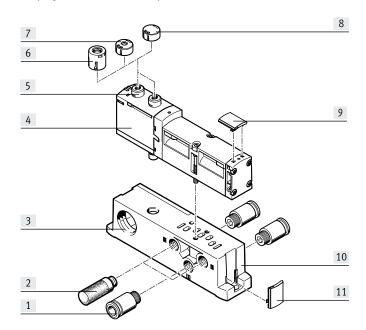
Using individual part numbers with any valve.



		Description	→ Page/Internet
[1]	Fitting	1/8 NPT for working air/exhaust ports (1, 3, 5) and working ports (2, 4)	209
[2]	Silencer	U-1/8-B-NPT for exhaust ports (3, 5)	210
[3]	Electrical connection	Spring-loaded terminal, cable (open end)	-
[4]	Valve VSVA	Width 18 mm	98
[5]	Manual override	Non-detenting/detenting, per solenoid coil	-
[6]	Cover cap, heavy duty	For manual override, non-detenting heavy duty, detenting via accessory	134
[7]	Cover cap, coded	For non-detenting manual override (limited function)	134
[8]	Cover cap, concealed	MO concealed by cover cap – operation of MO prevented	134
[9]	Inscription label holder	For valves	137
[10]	Individual sub-base	For valve VSVA	208
[11]	Inscription label holder	For manifold block	137

# Individual sub-base, width 26 mm, ISO 15407-2

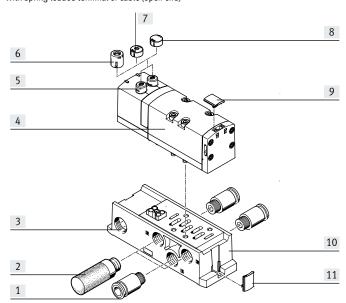
With spring-loaded terminal or cable (open end)



		Description	→ Page/Internet
[1]	Fitting	1/4 NPT for working air/exhaust ports (1, 3, 5) and working ports (2, 4)	209
[2]	Silencer	U-1/4-B-NPT for exhaust ports (3, 5)	210
[3]	Electrical connection	Spring-loaded terminal, cable (open end)	_
[4]	Valve VSVA	Width 26 mm	106
[5]	Manual override	Non-detenting/detenting, per solenoid coil	_
[6]	Cover cap, heavy duty	For manual override, non-detenting heavy duty, detenting via accessory	134
[7]	Cover cap, coded	For non-detenting manual override (limited function)	134
[8]	Cover cap, concealed	MO concealed by cover cap – operation of MO prevented	134
[9]	Inscription label holder	For valves	137
[10]	Individual sub-base	For valve VSVA	208
[11]	Inscription label holder	For manifold block	137

# Individual sub-base, width 42 mm, ISO 5599-2

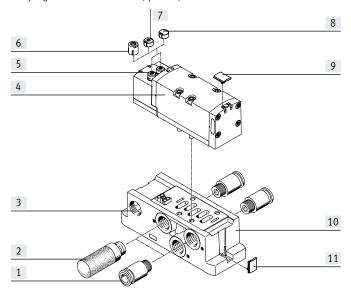
With spring-loaded terminal or cable (open end)



		Description	→ Page/Internet
[1]	Fitting	3/8 NPT for working air/exhaust ports (1, 3, 5) and working ports (2, 4)	209
[2]	Silencer	U-3/8-B-NPT for exhaust ports (3, 5)	210
[3]	Electrical connection	Spring-loaded terminal, cable (open end)	-
[4]	Valve VSVA	Width 42 mm	114
[5]	Manual override	Non-detenting/detenting, per solenoid coil	-
[6]	Cover cap, heavy duty	For manual override, non-detenting heavy duty, detenting via accessory	134
[7]	Cover cap, coded	For non-detenting manual override (limited function)	134
[8]	Cover cap, concealed	MO concealed by cover cap – operation of MO prevented	134
[9]	Inscription label holder	For valves	137
[10]	Individual sub-base	For valve VSVA	208
[11]	Inscription label holder	For manifold block	137

# Individual sub-base, width 52 mm, ISO 5599-2

With spring-loaded terminal or cable (open end)



		Description	→ Page/Internet
[1]	Fitting	1/2 NPT for working air/exhaust ports (1, 3, 5) and working ports (2, 4)	209
[2]	Silencer	U-1/2-B-NPT for exhaust ports (3, 5)	210
[3]	Electrical connection	Spring-loaded terminal, cable (open end)	-
[4]	Valve VSVA	Width 52 mm	121
[5]	Manual override	Non-detenting/detenting, per solenoid coil	-
[6]	Cover cap, heavy duty	For manual override, non-detenting heavy duty, detenting via accessory	134
[7]	Cover cap, coded	For non-detenting manual override (limited function)	134
[8]	Cover cap, concealed	MO concealed by cover cap – operation of MO prevented	134
[9]	Inscription label holder	For valves	137
[10]	Individual sub-base	For valve VSVA	208
[11]	Inscription label holder	For manifold block	137

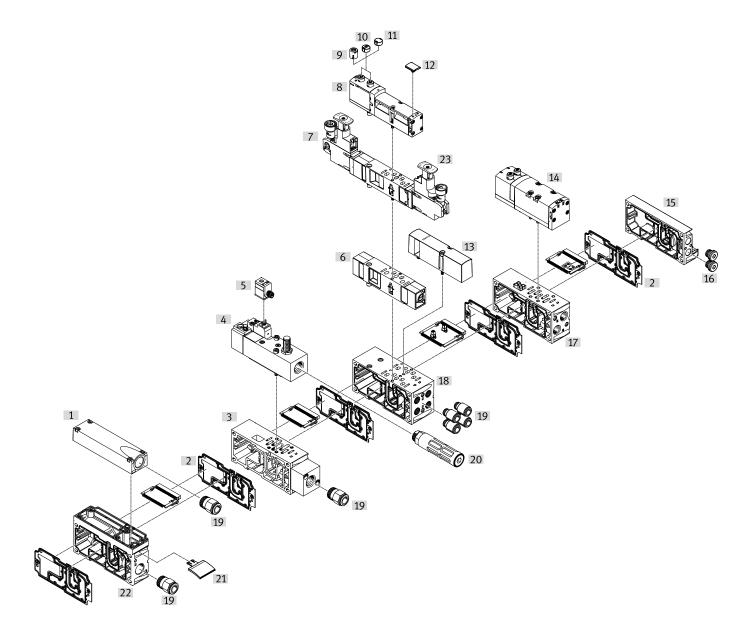
# Pneumatic components of the valve terminal

The manifold sub-bases for valves with a width of 18 or 26 mm are suitable for either

- 2 single solenoid valves or
- 2 double solenoid valves depending on the size.

The manifold sub-bases for valves with a width of 42 or 52 mm are suitable for

- 1 single solenoid valve or
- 1 double solenoid valve
- Double solenoid valve positions can be equipped with any valve or a blanking plate.
- Single solenoid valve positions can only be equipped with single solenoid valves or a blanking plate.



Pneu	Pneumatic components of the valve terminal			
		Description	→ Page/Internet	
[1]	Exhaust port cover	For ducted exhaust air (ports 3 and 5 combined)	129	
[2]	Duct separation/seal	-	129	
[3]	Manifold sub-base	For soft-start valve	172	
[4]	Soft-start valve	For slow and safe pressure build-up	172	
[5]	Plug socket	-	173	
[6]	Throttle plate	-	134	
[7]	Pressure regulator plate	-	130	
[8]	Valve	Width 18 mm or 26 mm	98, 106	
[9]	Cover cap, heavy duty	For manual override, non-detenting heavy duty, detenting via accessory	134	
[10]	Cover cap, coded	For non-detenting manual override (limited function)	134	
[11]	Cover cap, concealed	MO concealed by cover cap – operation of MO prevented	134	
[12]	Inscription label holder	For valve	137	
[13]	Blanking plate	For unused valve position (vacant position)	134	
[14]	Valve	Width 42 mm or 52 mm	114, 121	
[15]	End plate with pilot air selector	-	128	
[16]	Blanking plug	-	210	
[17]	Manifold sub-base VTSA	For valves with a width of 42 mm or 52 mm	128	
[17]	Manifold sub-base VTSA-F	For valves with a width of 42 mm or 52 mm	128	
[18]	Manifold sub-base VTSA	For valves with a width of 18 mm or 26 mm	128	
[18]	Manifold sub-base VTSA-F	For valves with a width of 18 mm or 26 mm	128	
[19]	Fittings	-	209	
[20]	Silencer	-	210	
[21]	Inscription label holder	For manifold sub-base, sub-base, 90°-connection plate	137	
[22]	Supply plate	-	129	
[23]	Control element	Regulator knobs in different versions	34	



Special applications for the valve terminal, such as:

- Solenoid valve with switching position sensing
- Control block with safety function
- Pilot air switching valve
- Soft-start valve
- Vacuum block

are listed after → Accessories – General

#### Valve terminal with individual electrical connection

Order code for VTSA:

- 44E-... for the electric components
- 44P-... for the pneumatic components Order code for VTSA-F:
- 45E-... for the electric components
- 45P-... for the pneumatic components

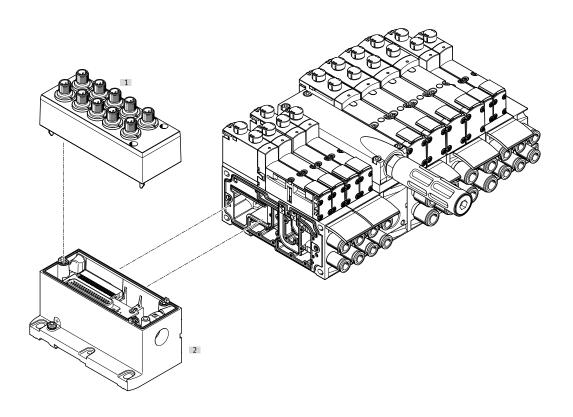
Valve terminals VTSA/VTSA-F with individual electrical connection can be expanded with up to 20 valves with max. 20 solenoid coils.

The manifold sub-bases for valves with a width of 18 or 26 mm are suitable for either

- 2 single solenoid valves or
- 2 double solenoid valves and the manifold sub-bases for valves with a width of 42, 52 and 65 mm are suitable for
- 1 single solenoid valve or
- 1 double solenoid valve depending on the size.

- Double solenoid valve positions can be equipped with any valve or a blanking plate.
- Single solenoid valve positions can only be equipped with single solenoid valves or a blanking plate.
- The electrical connection is established via a 5-pin M12 plug (24 V DC).
- Valves with a width of 65 mm cannot be mixed with other widths – these are always at the end of the valve terminal configuration. See "Adaptation to width 65 mm, ISO size 3"
- → Page 180

		Description	→ Page/Internet
[1]	Cover	For individual connection	135
[2]	Multi-pin plug connection	Individual connection with M12, 10-way or 6-way (including cover)	135



### Valve terminal with electrical multi-pin plug connection

Order code for VTSA:

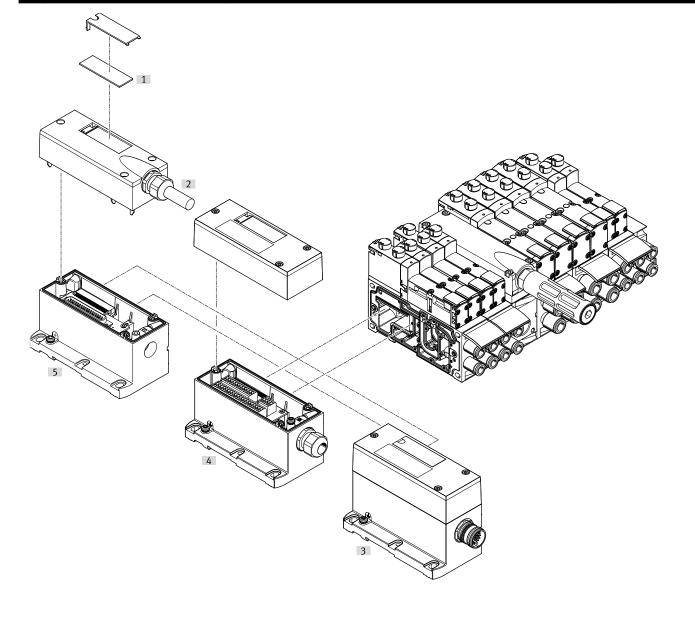
- 44E-... for the electric components
- 44P-... for the pneumatic components Order code for VTSA-F:
- 45E-... for the electric components
- 45P-... for the pneumatic components

Valve terminals VTSA/VTSA-F with electrical multi-pin plug connection can be expanded with up to 32 valves with max. 32 solenoid coils. The manifold sub-bases for valves with a width of 18 or 26 mm are suitable for

- 2 single solenoid valves or
- 2 double solenoid valves and the manifold sub-bases for valves with a width of 42, 52 and 65 mm are suitable for
- 1 single solenoid valve or
- 1 double solenoid valve

- Double solenoid valve positions can be equipped with any valve or a blanking plate.
- Single solenoid valve positions can only be equipped with single solenoid valves or a blanking plate.
- The following multi-pin plug connections to IP65 are available:
- 37-pin Sub-D connection (24 V DC): the connecting cable can be ordered in lengths of 2.5 m, 5 m and 10 m for max. 8, 22 or 32 solenoid coils respectively.
- Terminal strip (24 V DC), 19-pin round plug (24 V DC)
- Valves with a width of 65 mm cannot be mixed with other widths – these are always at the end of the valve terminal configuration. See "Adaptation to width 65 mm, ISO size 3"
- → Page 180

		Description	→ Page/Internet
[1]	Inscription labels	Large, for multi-pin plug connection	_
[2]	Multi-pin cable	-	136
[3]	Multi-pin plug connection	Via M23 round plug connection, 24 V DC	135
[4]	Multi-pin plug connection	Via terminal strip (CageClamp) 24 V DC	135
[5]	Multi-pin plug connection	Via multi-pin cable, 24 V DC	135



#### Valve terminal with AS-Interface connection

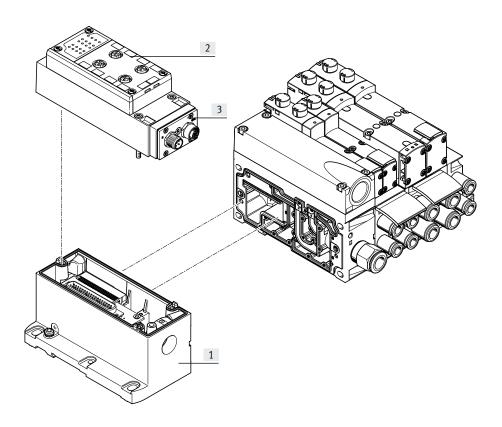
Order code for VTSA:

- 52E-... for the electric components
- 44P-... for the pneumatic components Order code for VTSA-F:
- 52E-... for the electric components
- 45P-... for the pneumatic components

Valve terminals VTSA/VTSA-F with AS-Interface connection can be expanded with up to 8 valves with max. 8 solenoid coils. The manifold sub-bases for valves with a width of 18 or 26 mm are suitable for either

- 2 single solenoid valves or
- 2 double solenoid valves and the manifold sub-bases for valves with a width of 42, 52 and 65 mm are suitable for
- 1 single solenoid valve or
- 1 double solenoid valve depending on the size.

- Double solenoid valve positions can be equipped with any valve or a blanking plate.
- Single solenoid valve positions can only be equipped with single solenoid valves or a blanking plate.
- Valves with a width of 65 mm cannot be mixed with other widths – these are always at the end of the valve terminal configuration. See "Adaptation to width 65 mm, ISO size 3"
- → Page 180



		Description	→ Page/Internet
[1]	Multi-pin plug connection	Can be ordered together with the AS-Interface module as an electrical connection for AS-Interface	135
[2]	Manifold block for AS-Interface	-	136
[3]	AS-Interface module	-	135

### Valve terminal with I-Port/IO-Link® connection

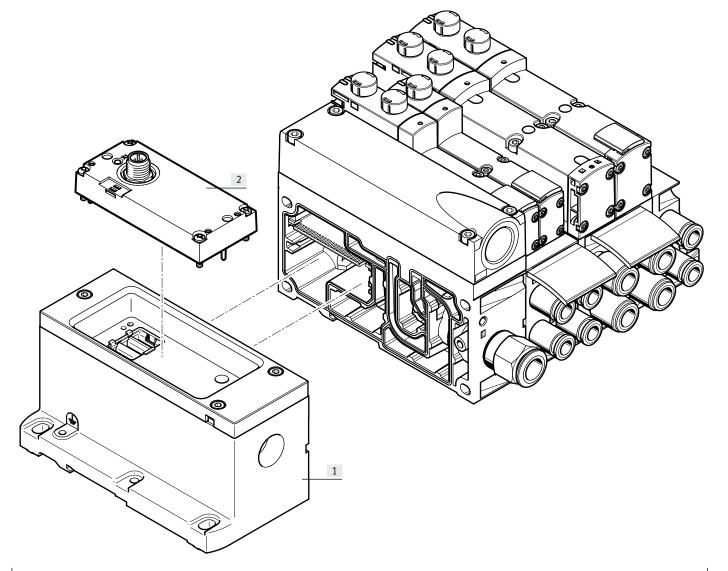
Order code for VTSA:

- 44E-... for the electric components
- 44P-... for the pneumatic components Order code for VTSA-F:
- 45E-... for the electric components
- 45P-... for the pneumatic components

Valve terminals VTSA/VTSA-F with I-Port/IO-Link® connection can be expanded with up to 16 valves with max. 32 solenoid coils. The manifold sub-bases for valves with a width of 18 or 26 mm are suitable for either

- 2 single solenoid valves or
- 2 double solenoid valves and the manifold sub-bases for valves with a width of 42 or 52 mm are suitable for
- 1 single solenoid valve or
- 1 double solenoid valve depending on the size.

- Double solenoid valve positions can be equipped with any valve or a blanking plate.
- Single solenoid valve positions can only be equipped with single solenoid valves or a blanking plate.



		Description	→ Page/Internet
[1]	Multi-pin plug connection	-	135
[2]	I-Port/IO-Link® connection	Electrical interface IO-Link®	135

### Valve terminal with AP interface

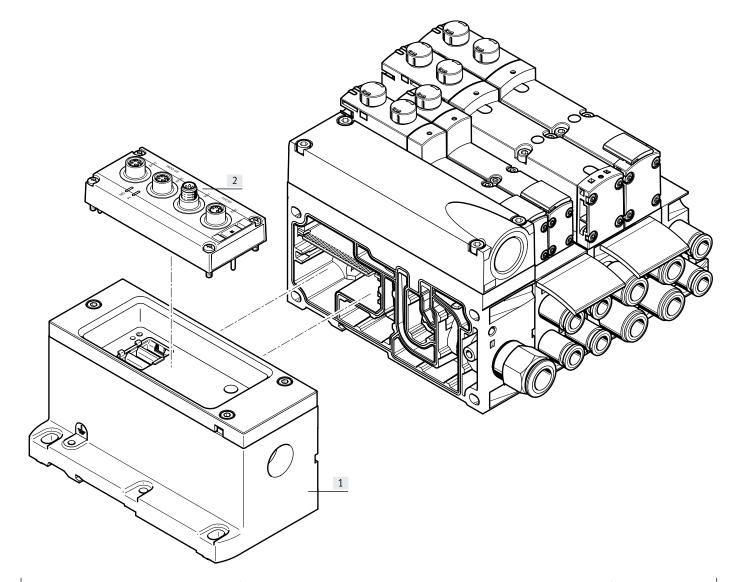
Order code for VTSA:

- 44E-... for the electric components
- 44P-... for the pneumatic components Order code for VTSA-F:
- 45E-... for the electric components
- 45P-... for the pneumatic components

VTSA/VTSA-F valve terminals with AP interface can be expanded with up to 12 valves with a maximum of 24 solenoid coils. The manifold sub-bases for valves with a width of 18 or 26 mm are suitable for either

- 2 single solenoid valves or
- 2 double solenoid valves and the manifold sub-bases for valves with a width of 42 or 52 mm are suitable for
- 1 single solenoid valve or
- 1 double solenoid valve

- Double solenoid valve positions can be equipped with any valve or a cover plate.
- Single solenoid valve positions can only be equipped with single solenoid valves or a cover plate.



		Description	→ Page/Internet
[1]	Multi-pin plug connection	-	135
[2]	AP interface	Electrical interface protocol AP-COM	69

#### Valve terminal with fieldbus interface, control block (electrical peripherals CPX)

Order code:

- 50E-... for the electrical peripherals, plastic variant
- 51E-... for the electrical peripherals, metal variant
- 53E-... for the electrical peripherals, for control cabinet installation
- For VTSA:
- 44P-... for the pneumatic components For VTSA-F:
- 45P-... for the pneumatic components

Valve terminals VTSA/VTSA-F with fieldbus interface can be expanded with up to 32 valves with max. 32 solenoid coils. The manifold sub-bases for valves with a width of 18 or 26 mm are suitable for either.

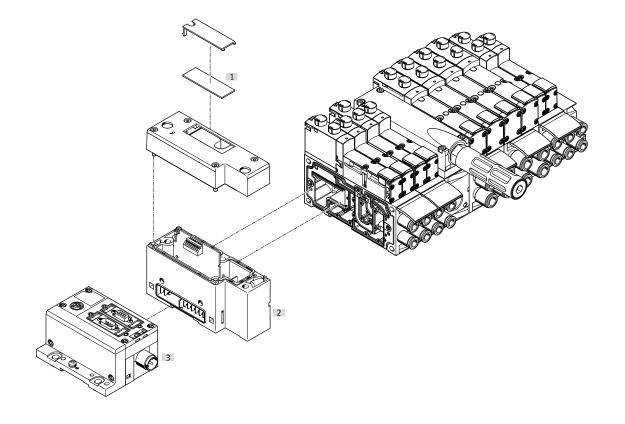
- 2 single solenoid valves or
- 2 double solenoid valves and the manifold sub-bases for valves with a width of 42, 52 and 65 mm are suitable for
- 1 single solenoid valve or
- 1 double solenoid valve depending on the size.

- Double solenoid valve positions can be equipped with any valve or a blanking plate.
- Single solenoid valve positions can only be equipped with single solenoid valves or a blanking plate.

Each valve position can be equipped with any valve or a blanking plate. The rules for CPX apply to the equipment that can be used with the electrical peripherals CPX. In general:

- Max. 10 electrical modules
- Digital inputs/outputs
- Analogue inputs/outputs

- Parameterisation of inputs and outputs
- Integrated, convenient diagnostics
- Preventive maintenance concepts
- Valves with a width of 65 mm cannot be mixed with other widths – these are always at the end of the valve terminal configuration. See "Adaptation to width 65 mm, ISO size 3"
- → Page 180



		Description	→ Page/Internet
[1]	Inscription labels	Large, for pneumatic interface CPX	-
[2]	Pneumatic interface	-	135
[3]	Fieldbus interface	=	срх

#### Valve terminal with fieldbus/multi-pin plug connection and individually electrically actuated valve

In applications with specific emergency off conditions, it may be necessary to switch one or more valves separately from the valve terminal controller.

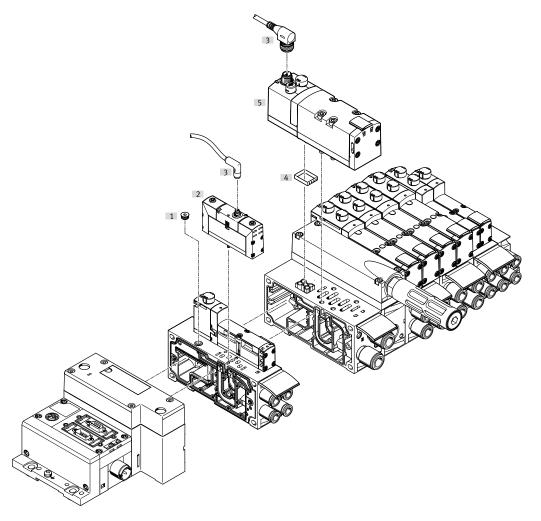
Standards-based valves (VSVA) with individual electrical connection (round or square plug) are therefore mounted on the valve terminal.

In order for degree of protection IP65 to be achieved, the functionless opening in the sub-base for the electrical connection must be sealed.

A sealing cap is available for width 18 mm and 26 mm.

With manifold or individual sub-bases, valves with width 42 mm and 52 mm must be used with a seal to comply with the IP protection class (see → page 134).

For centrally controlling the valve terminal via a multi-pin plug connection or fieldbus interface, the occupied valve position acts like a vacant position, i.e. the assigned address in the fieldbus node or the corresponding connection in the multi-pin plug connection is occupied.



		Description	→ Page/Internet
[1]	Sealing cap	For sealing the electrical connection on the sub-base	134
[2]	Valve	Width 18 mm or width 26 mm	vsva
[3]	Connecting cable	-	vsva
[4]	Seal	For ensuring the IP degree of protection (with width 42 mm and 52 mm)	134
[5]	Valve	Width 42 mm or width 52 mm	vsva



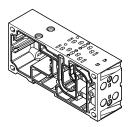
# Note

Standards-based valves VSVA can be used on the valve terminal. A vacant position must be provided for this in the valve terminal configurator.

The appropriate standards-based valve VSVA can be ordered on the Internet at:

→ vsva

#### Manifold sub-base



VTSA/VTSA-F is based on a modular system which consists of manifold sub-bases and valves. The VTSA-F manifold sub-bases are designed to optimise the flow rate. Manifold sub-bases are available for valve widths 18 mm and 26 mm in a double grid, i.e. two valves per manifold sub-base. For valves with a width of 42 mm or 52 mm, there are manifold sub-bases with one valve per sub-base. The manifold sub-base contains

a duct seal and an electrical linking module. They can be freely mixed within a valve terminal. The manifold sub-bases are screwed together, thus forming the support system for the valves. Inside the manifold sub-bases are the connection ducts for supplying compressed air to and exhausting the valve terminal as well as the working ports for the pneumatic cylinders for each valve. Each manifold sub-base is connected to the next using four

screws. Individual valve terminal sections can be isolated and further manifold sub-bases can be inserted by loosening these screws. This ensures that the valve terminal can be rapidly and reliably extended.

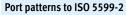
See also "Adaptation to width 65 mm, ISO size 3"

→ Page 180

### Port patterns to ISO 15407-2

Width 18 mm (size 02)

Width 26 mm (size 01)

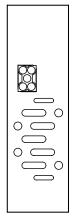


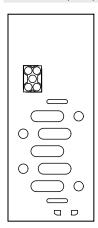
Width 42 mm (size 1)

Width 52 mm (size 2)









### Port patterns - High-flow sub-bases with optimised flow rate (no standard)

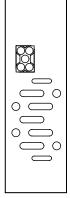
Width 18 mm

Width 26 mm

Width 42 mm







- 🏺 - Note

The illustrations shown represent the pneumatic ISO port patterns.

The port patterns on the valve terminal VTSA-F do not correspond to the ISO standard.

Code		Type	Width				No. of valve positions (solenoid coils) <sup>1)</sup>	Working ports (2, 4)	
			18 mm	26 mm	42 mm	52 mm		Code M Large	Code N Small
<b>Nanifold</b>	sub-base for double solenoid va								
١		VABV-S4-2S-N18-2T2	•	_	-	_	2 (4)	QB-1/8-5/16-U	-
K								-	QB-1/8-1/4-U
		VABV-S4-1S-N14-2T2	-	•	-	-	2 (4)	QB-1/4-3/8-U	_
K								_	QB-1/4-5/16-U
		VABV-S2-1S-N38-T2	-	_	•	-	1 (2)	QB-3/8-1/2-U	_
K	000							_	QB-3/8-3/8-U
K		VABV-S2-2S-N12-T2	-	_	-	•	1 (2)	QB-1/2-1/2-U	-
	sub-base for single solenoid val					1	2 (2)	OD 4 /0 5 /4 ( )	1
K		VABV-S4-2S-N18-2T1	•	_	_	-	2 (2)	QB-1/8-5/16-U	- OD 1/0 1/4 II
									QB-1/8-1/4-U
		VABV-S4-1S-N14-2T1	-	•	_	_	2 (2)	QB-1/4-3/8-U	-
<								-	QB-1/4-5/16-U
		VABV-S2-1S-N38-T1	-	-	•	-	1 (1)	QB-3/8-1/2-U	-
K								-	QB-3/8-3/8-U
		VABV-S2-2S-N12-T1	-	-	-	-	1 (1)	QB-1/2-1/2-U	_
IK								-	-

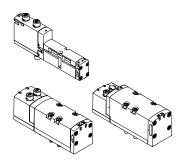
<sup>1)</sup> Value in brackets is max. number of solenoid coils that can be actuated

de	Туре	Width				No. of valve positions (solenoid coils) <sup>1)</sup>	Working ports (2, 4)	
		18 mm	26 mm	42 mm	52 mm		Code M Large	Code N Small
nifold sub-base for doubl								
	VABV-S4-2S-G18-2T2		_	_	_	2 (4)	QS-G1/8-8	_
		_					_	QS-G1/8-6
	VABV-S4-1S-G14-2T2			_	_	2 (4)	QS-G1/4-10	
			_				_	QS-G1/4-8
	VABV-S2-1S-G38-T2				_	1 (2)	QS-G3/8-12	_
			_	_	_		-	QS-G3/8-10
	VABV-S2-2S-G12-T2					1 (2)	QS-G1/2-16	_
K		_	_	_			-	QS-G1/2-12
anifold sub-base for single								
aillotu sub-base for siligte	VABV-S4-2S-G18-2T1					2 (2)	QS-G1/8-8	
	VADV-54-25-010-211	•	-	-	-	2 (2)	-	QS-G1/8-6
	VABV-S4-1S-G14-2T1					2 (2)	QS-G1/4-10	Q3-01/6-0
	VADV-54-15-014-211	-	•	-	-	2 (2)	Q3-01/4-10 _	QS-G1/4-8
	VABV-S2-1S-G38-T1					1 (1)	QS-G3/8-12	Q3-G1/4-6 _
	VABV-32-13-038-11	_	_	•	-	1 (1)	Q3-Q3/8-12 _	QS-G3/8-10
<b>─</b>   <b>※</b>	VABV-S2-2S-G12-T1					1 (1)	QS-G1/2-16	Q3-G3/8-10
	VABV-32-23-012-11					1 (1)	Q3-G1/2-16	05 61/2 12
		-	-	-	•		_	QS-G1/2-12

<sup>1)</sup> Value in brackets is max. number of solenoid coils that can be actuated

90°-co	90°-connection plate for working ports 2 and 4 with NPT thread									
Code		Туре	Width 18 mm	26 mm	42 mm	52 mm	Connections	Working ports (2, 4) on the 90°-con- nection plate		
Р	P	VABF-S4A2G2-N	- -	-	-	- - -	2 and 4	1/8 NPT 1/4 NPT 3/8 NPT		
			_	-	_	•		1/2 NPT		

#### Sub-base valve



All valves are fitted with piston spool and patented sealing system, which ensures efficient sealing, a broad operating pressure range and long service life.

Sub-base valves can be quickly replaced since the tubing connections remain on the manifold sub-base.

Irrespective of the valve function, there are sub-base valves with one solenoid coil (single solenoid) or with two solenoid coils for double solenoid or double valve functions.

### Reverse/vacuum operation

Select reverse operation (code Z) if you wish to operate an actuator (cylinder) with different pressures for the forward and return stroke.

Please note that the valves must then be operated via a separate pressure zone.

The reversible 3/2-way solenoid valves are also suitable for vacuum operation.

Reverse operation is only possible in pressure zones with external pilot air supply.



#### Note

- If a pressure zone is in reverse operation, the supply pressure is connected to port 3/5 and the air is exhausted via port 1 at all valve positions in this pressure zone.
- Reversible pressure regulators cannot be selected when a pressure zone is in reverse operation.
- With reversible pressure regulators, only the valve at this position is in reverse operation.
- When using 5/3-way valves in reverse operation, the mid-position function switches from exhausted to pressurised and vice versa.

# Blanking plate

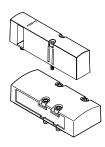


Plate without valve function for reserving valve positions on a valve terminal.

Valve and blanking plates are mounted on the manifold sub-base using screws.

# Design

### Valve replacement

The valves are attached to the metal manifold sub-base using two or four screws, which means that they can be easily replaced.

The sturdy mechanical manifold subbase guarantees efficient, durable sealing.

#### Extension

Vacant positions can be fitted with valves at a later date. The dimensions, mounting points and existing pneumatic installations remain unchanged during this process.

For more information and technical data on extension, refer to the user manual:

→ Internet: VTSA/VTSA-F

Valve fund	ction Circuit symbol	Valve	Width				Description
code	Circuit Symbol	code	18 mm	26 mm	42 mm	52 mm	Description
VC	12/14 (14)	T22C	•	•	•	•	2x 2/2-way valve, single solenoid  Normally closed  pneumatic spring return
VV	112/114 11 1 11 (14) (5) (3)	T22CV	•	•	•	-	2x 2/2-way valve, single solenoid  Reverse operation  Normally closed  pneumatic spring return  Vacuum operation possible at 3 and 5
N	12/14 1 5 3	T32U	•	•	•	•	2x 3/2-way valve, single solenoid  Normally open  pneumatic spring return  Operating pressure > 3 bar
К	12/14 1 5 3	T32C	•	-	-	•	2x 3/2-way valve, single solenoid  Normally closed  pneumatic spring return  Operating pressure > 3 bar
Н	12/14 1 5 3	Т32Н	•	•	•	•	2x 3/2-way valve, single solenoid  Normal position  1x normally closed  1x normally open  pneumatic spring return  Operating pressure > 3 bar
P	30/50 5 1 3 12 (14) (1) (5/3) (1)	T32F	•	-	-	•	2x 3/2-way valve, single solenoid  Reverse operation only  Normally open  pneumatic spring return
Q	32/54 5 1 3 12 (14) (1) (5/3) (1)	T32N	•	-	-	•	2x 3/2-way valve, single solenoid Reverse operation only Normally closed pneumatic spring return
R	30/54 5 1 3 12 30/54 (14) (1) (5/3) (1)	T32W	•	•	•	•	2x 3/2-way valve, single solenoid  Reverse operation only  Normal position  1x normally closed  1x normally open  pneumatic spring return

# - 🖣 - Note

A filter must be installed upstream of valves operated in vacuum mode. This prevents any foreign matter in the intake air getting into the valve (e.g. when operating a suction cup).

Valve fund	ction Circuit symbol	Valve	Width				Description
code	Circuit Symbol	code	18 mm	26 mm	42 mm	52 mm	Description
М	14 4 2 12 14 5 1 3	M52-A	•	•	•	-	5/2-way valve, single solenoid  Reverse operation  pneumatic spring return
0	14 4 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	M52-M	-	•	•	•	5/2-way valve, single solenoid  Reverse operation  Mechanical spring return
J	14 4 2 12 (14) 5 1 3	B52	•	•	•	•	5/2-way valve, double solenoid
D	14 4 2 12 12 (14) 5 1 3	D52	•	•	•	•	5/2-way valve, double solenoid  Dominant signal at port 14 on the control side
SO SQ SS	14 7 5 1 3	M52-M	•	-	-	-	5/2-way valve <sup>2)</sup> , single solenoid, as plug-in or via pilot valve with pneumatic interface to ISO 15218  See also special valve function in the separate chapter "Solenoid valve with switching position sensing"  → page 138
SO SQ SS	4 2 G 14 5 1 3	M52-M	-	•	-	-	5/2-way valve <sup>2)</sup> , single solenoid, as plug-in or via pilot valve with pneumatic interface to ISO 15218 See also special valve function in the separate chapter "Solenoid valve with switching position sensing"  → page 138
SP SN	14 14 14 14 15 13 14 15 13 15 15 15 15 15 15 15 15 15 15 15 15 15	T52-M	-	•	-	-	2x 5/2-way single solenoid valve, with switching position sensing, pneumatically linked via two ducts as special valve function "control block with safety function"  → page 148
В	14 W 4 2 W 12 (14) 5 1 3	P53U	•	•	•	•	5/3-way solenoid valve  • Mid-position pressurised <sup>1)</sup> • Mechanical spring return
G	14 W 4 2 W 12 (14) 5 1 3	P53C	•	•	•	•	5/3-way solenoid valve  • Mid-position closed <sup>1)</sup> • Mechanical spring return
E	14 W 4 2 W 12 (14) 5 1 3	P53E	•	•	•	-	5/3-way solenoid valve  • Mid-position exhausted 1)  • Mechanical spring return

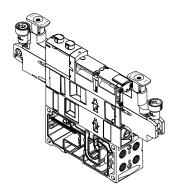
<sup>1)</sup> If neither solenoid coil is energised, the valve is moved to its mid-position by a mechanical spring. If the two coils are permanently energised one after the other, the valve remains in the switching position of the coil that was activated first

<sup>2)</sup> The symbol represents a valve with a proximity switch 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 and N/C contacts. All sensors used here have an N/C contact as the switching element function.

Valve fun	ction						
Terminal code	Circuit symbol	Valve code	Width	26	/2	F2	Description
SA	14 W 4 2 12 12 12 12 12 12 13 13	P53ED	18 mm	26 mm ■	42 mm _	52 mm _	5/3-way solenoid valve, for special functions as switching position 14 is retained  • Pressureless switching, self-latching loop, pneumatic operation  • Mid-position exhausted, switching position 14 is retained  • Mechanical spring return
SB	14 W 4 2 14(12) 14 5 1 3	P53AD	•	•	-	-	5/3-way solenoid valve, for special functions as switching position 14 is retained  • Holding, blocking a movement (mechanically)  • Mid-position port 2 pressurised, port 4 exhausted, switching position 14 is retained  • Mechanical spring return
SD	12 W 4 2 12 12 12 12 13 13	P53BD	•	•	-	-	5/3-way solenoid valve, for special functions as switching position 14 is retained  • Holding, blocking a movement (mechanically)  • Mid-position port 4 pressurised, port 2 exhausted, switching position 14 is retained  • Mechanical spring return
SE	14 - 4 2 W 12 12/14 5 1 3	P53EP	•	•	-	-	5/3-way solenoid valve, for special functions as switching position 12 is retained  • Pressureless switching, self-latching loop, pneumatic operation  • Mid-position exhausted, switching position 12 is retained  • Mechanical spring return
VG	14 W 4 2 W 12 14 12 5 1 3	P53F	-	-	•	•	5/3-way solenoid valve  • Positioning  • Mid-position port 2 pressurised, port 4 closed <sup>1)</sup> • Mechanical spring return
VB	-	-	-	•	-	-	Vacuum generator with ejector pulse and adjustable air saving function (plate for 2 valve positions, sensor SDE3 with display and M12 connection)
L	-	_	•	•	•	•	For valve terminal only: Cover plate for vacant valve position

<sup>1)</sup> If neither solenoid coil is energised, the valve is moved to its mid-position by a mechanical spring. If the two coils are permanently energised one after the other, the valve remains in the switching position of the coil that was activated first.

# Vertical stacking



Additional function units can be added to each valve position between the base plate (manifold sub-base) and the valve.

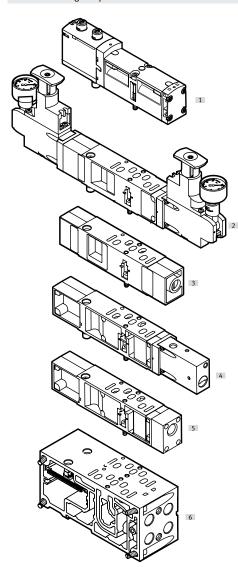
These functions are known as vertical stacking modules and enable special functions or control of an individual valve position. It is possible to link several valve sizes on one valve terminal.



### Note

Certain combinations are not recommended due to the design of the individual vertical stacking components.

# Vertical stacking components

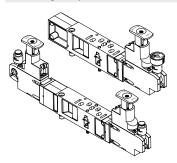


The following component sequence is recommended for valve positions with vertical stacking:

- [1] Valve VSVA
- [2] Pressure regulator plate
- [3] Throttle plate
- [4] Vertical pressure shut-off plate
- [5] Vertical supply plate
- [6] Manifold sub-base

#### Vertical stacking

Pressure regulator plate



An adjustable pressure regulator can be installed between the base plate (manifold sub-base) and the valve to control the force of the triggered actuator.

This pressure regulator maintains a largely constant output pressure (secondary side) independent of pressure fluctuations (primary side) and air consumption. Also suitable for valves with symmetrical coil layout.

Standard version:

- Standard port pattern to ISO 15407-2 or ISO 5599-2
- For pressure regulation up to 6 bar or up to 10 bar
- Without pressure gauge (optional)
- Regulator knob with 3 positions (locked, reference position, freely positionable)

# · 🖥 - Note

With the A, B and AB pressure regulators VABF-S...-1-..., the regulated pressure should not be less than 2 bar.

Use the reversible A, B or AB pressure regulators for regulated pressure of less than 2 bar.

# - Note

Please note when reordering pressure regulators in sizes 42 mm and 52 mm:

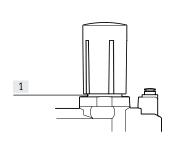
The part number on the regulator plate refers only to the standard version.

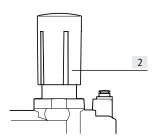
When reordering pressure regulators with additional features, such as a lockable rotary knob, extended design etc., only use the VABF configurator.

→ Internet: vabf-s2

# Rotary knob for pressure regulator for width 42 mm and 52 mm

Setting the pressure

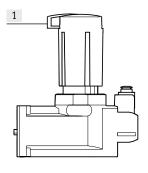




- [1] Pull the rotary knob upward out of the locking position [1] into the setting position [2]
- [2] Set the required pressure at the setting position [2] using the rotary knob
- [3] After setting the pressure, push the rotary knob back down to the locking position 1]

# Rotary knob for pressure regulator for width 42 mm and 52 mm

Locking the rotary knob



After setting the pressure, the rotary knob can be locked against unauthorised actuation.

To do this, the blue locking element is pushed out and secured with a padlock.

The rotary knob is now fixed in place and cannot be moved.

### - 📗 -

Note

The position of the rotary knob using the locking element is determined by the pressure setting.

If a number of pressure regulators are installed next to one another, there may not always be enough space to push out the locking elements.

To ensure that the rotary knob can still be locked, it can be pulled off completely, rotated 60° or 120° and pushed back on.

[1] Locking element, pushed out

#### Vertical stacking

Energy efficiency through dual-pressure operation or through operation with reversible pressure regulators

Saving energy starts with compressed air generation. It is possible to achieve energy savings of up to 10% per 1 bar drop in pressure. Therefore, wherever possible reduce the pressure to the minimum required.

To save additional energy, you can operate valves in dual-pressure mode in a separate pressure zone.

To do this, the valves used must be operated in reverse mode, i.e. with reversed flow direction (see also information on → page 96). In dual-pressure operation, the valves are then supplied with pressure separately via ducts 3 and 5. The air is exhausted via duct 1.

Requirements for dual-pressure operation:

- Exhaust ducts 3 and 5 in the pressure zone are completely separate.
- Valves are used that can be operated in reverse mode.

# Advantages of dual-pressure operation:

It is possible to save energy if a valve can be supplied with different pressures. The advantages are:

- Saves energy because the return stroke can be carried out using reduced force, e.g. 3 bar instead of 6 bar.
- Just one valve is required, as in the case of vacuum application with ejector pulse for example (e.g. duct 3 for vacuum switching, duct 5 for the ejector pulse).
- A reduction in compressed air consumption of up to 50% is possible if two different pressures can be applied to the valve (return stroke uses reduces pressure).

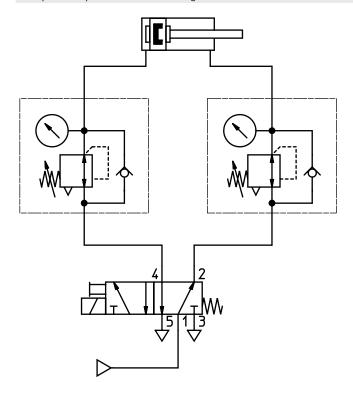
# Advantages of reversible operation:

If compressed air is applied to the pressure regulator upstream of the valve (circuit diagram 2), exhausting is directly via the solenoid valve.

This has the following advantages:

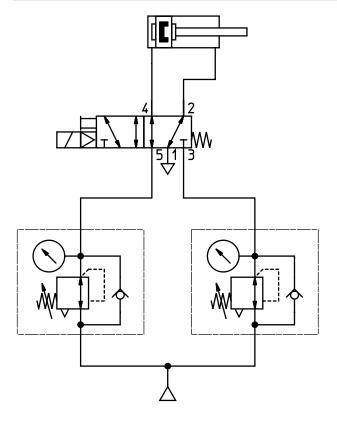
- Increased exhaust capacity, exhausting is up to 50% quicker
- Lower wear on the pressure regulator
- Can be adjusted very accurately, perfect for very low operating pres-
- No quick exhaust valves are required.
- · Fast cycle times
- The pressure regulator can be adjusted independently of the valve position because operating pressure is permanently present at the pressure regulator.

### Dual-pressure operation with standard regulator



Circuit diagram 1:
Pressure is regulated downstream of the valve

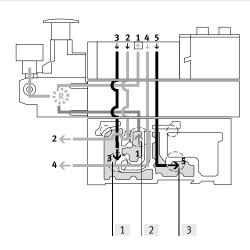
# Dual-pressure operation with reversible controller



Circuit diagram 2: Pressure is regulated upstream of the valve

#### Vertical stacking

Mode of operation of the pressure regulator plate (P regulator) for port 1; code: ZA, ZAY, ZF, ZFY



This pressure regulator regulates the pressure upstream of the valve in duct 1. Ducts 2 and 4 thus have the same regulated pressure.

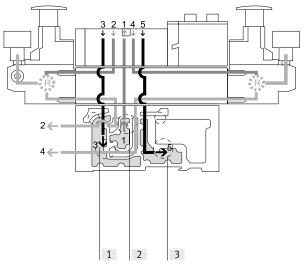
During exhausting, the air flow in the valve is exhausted from duct 2 to duct 3 and from duct 4 to duct 5.

- Advantages
- The pressure regulator is not affected by the exhaust process, since the
  pressure is regulated upstream of
  the valve.
- The pressure regulator can always be adjusted, since the pressure from the valve terminal is always present.
- [1] Duct 3 (exhaust air)
- [2] Duct 1 (working air)
- [3] Duct 5 (exhaust air)

### Application examples

- An equal working pressure is required at working ports 2 and 4.
- A working pressure (e.g. 3 bar) lower than the operating pressure present at the valve terminal (e.g. 8 bar) is required.

Mode of operation of the pressure regulator plate (AB regulator) for ports 2 and 4; code: ZD, ZDY, ZI, ZIY



This pressure regulator regulates the pressure in ducts 2 and 4 after the pressure medium flows through the valve. During exhausting, the exhaust flow in the valve is from duct 2 to duct 3 and from duct 4 to duct 5 via the pressure regulator.

Example with the following switching position:

The working air flows from duct 1 of the manifold sub-base via the valve to duct 2, it is then regulated and made available at port 2 of the manifold sub-base. At the same time, exhausting takes place via duct 4 of the manifold sub-base via the regulator and via the valve into duct 5 of the manifold sub-base.

# Constraints

The pressure regulator cannot be adjusted in the exhaust position. For example, the pressure regulator for duct 4 cannot be adjusted

when the valve is pressurised in the switching position from duct 1 to duct 2 and exhausted from duct 4 to duct 5.

- [1] Duct 3 (exhaust air)
- [2] Duct 1 (working air)
- [3] Duct 5 (exhaust air)

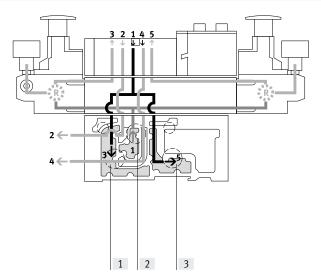
### Application examples

Two different working pressures are required at ports 2 and 4 instead of the

valve terminal operating pressure

#### Vertical stacking

Mode of operation of the pressure regulator plate (AB regulator, reversible) for ports 2 and 4, reversible; code: ZE, ZEY, ZJ, ZJY



With this pressure regulator, the working air (duct 1) is split and routed directly to both pressure regulators. In each case the regulated working air is present in ducts 3 and 5 on the valve. The valve is thus operated in reverse mode.

#### This means that:

- Duct 3 routes the working pressure to port 2
- Duct 5 routes the working pressure to port 4
- [1] Duct 3 (exhaust air)
- [2] Duct 1 (working air)
- [3] Duct 5 (exhaust air)

Example with the following switching position:

The working air in duct 1 is split between ducts 3 and 5 in the regulator and flows from here to the valve. In the valve, the working air is routed to port 2 of the manifold sub-base. The exhaust air is simultaneously routed via duct 4 of the manifold sub-base and via the valve to regulator duct 1, where it is split between ducts 3 and 5 and then discharged via the manifold sub-base.

#### Application examples

- Two different pressures are required in ducts 2 and 4 instead of the valve terminal's operating pressure.
- Quick exhausting is required.
- The pressure regulator must always be adjustable.



#### Note

- Reversible pressure regulator
  plates should only be combined
  with valves that can be operated in
  reverse mode.
- Valves in valve positions with vertical pressure shut-off plates are operated with internal pilot air, even when the valve terminal is operated with external pilot air supply.
- The following combination of reversible valve terminals with vertical stacking components is not permitted:
- Reversible pressure regulator plates
- Throttle plates
- Vertical pressure shut-off plates
- Vertical supply plates

#### Advantages

- Fast cycle times
- 50% higher exhaust flow rate, as air is not exhausted via the pressure regulator. The load on the pressure regulator is also reduced.
- No quick exhaust valves are required.
- Operating pressure is always present at the pressure regulator, as the pressure is regulated upstream of the valve, i.e. the regulator can always be adjusted.

#### Disadvantages

- 2x 3/2-way solenoid valves (code N, K, H) cannot be used, as pressure is present at ports 3 and 5.
- A practical combination with a throttle plate is not possible.

Code		Туре	Width				Pressure up to	regulation	Description	
			18 mm	26 mm	42 mm	52 mm	6 bar	10 bar		
Pressure	regulator plate for port 1 (P regulator)									
ZA	0	VABF-SR1C2-C-10		-	-	•	_	•	Regulates the operating pres-	
ZAY <sup>2)</sup>	1 - 4   2   + 1	VABF-SR1C2-C-10E		•	•	-	-		sure in duct 1 upstream of the	
ZF	1  🗲	VABF-SR1C2-C-6	•	-	-	-	-	-	solenoid valve	
ZFY <sup>2)</sup>	14 5 1 3 12	VABF-SR1C2-C-6E	•	•	•	•	•	-		
Pressure	regulator plate for port 2 (B regulator)					-				
ZC	<u> </u>	VABF-SR2C2-C-10	•	-	•	-	-	-	Regulates the operating pres-	
ZCY <sup>2)</sup>		VABF-SR2C2-C-10E	•	•	•	-	_	•	sure in duct 2 downstream of	
ZH	]	VABF-SR2C2-C-6		-	•	•	-	-	the solenoid valve	
ZHY <sup>2)</sup>	14 5  1  3  12	VABF-SR2C2-C-6E	•	•	•	•	•	-		
	regulator plate for port 4 (A regulator)					1	·			
ZB <sup>2)</sup>	S	VABF-SR3C2-C-10	•	•	•	•	-	•	Regulates the operating pres-	
ZG <sup>2)</sup>	14 5  1  3  12	VABF-SR3C2-C-6	•	•	•	•	•	-	sure in duct 4 downstream of the solenoid valve	
Pressure	regulator plate for ports 2 and 4 (AB regu	ulator)								
ZD	S	VABF-SR4C2-C-10		-		•	_	-	Regulates the working pressur	
ZDY <sup>2)</sup>	4 2	VABF-SR4C2-C-10E	•	•	•	-	-	•	in ducts 2 and 4 downstream the solenoid valve	
ZI	<u>┨</u> ╎┌ <del>╿┊╘┋</del> ┩┼┼┘╎└┼┼ <del>┩┋</del> ═╬ <sub>╸</sub> ╇┐│	VABF-SR4C2-C-6	•	•	•	•	•	-	- 🖣 - Note	
ZIY <sup>2)</sup>	14 5  1  3  12	VABF-SR4C2-C-6E	•	•	•	•	•	_	These pressure regulator plate cannot be combined with reversible 2x 3/2-way solenoid valves (code P, Q, R).	

<sup>1)</sup> Width variants 42 mm and 52 mm (ISO 5599-2, ISO 1 and ISO 2) can be selected via the pressure regulator configurator VABF-S2

<sup>2)</sup> Also suitable for valves with symmetrical design

# Valve terminal VTSA/VTSA-F, NPT

# Key features – Pneumatic components

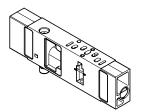
Code		Туре	Width				Pressure up to	regulation	Description
			18 mm	26 mm	42 mm	52 mm	6 bar	10 bar	
Pressure	regulator plate for port 2, reversible (B re	egulator)							
ZL	\(\begin{array}{c c c c c c c c c c c c c c c c c c c	VABF-SR6C2-C-10	•	•	•	•	-	•	Reversible pressure regulator for port 2
ZLY <sup>2)</sup>		VABF-SR6C2-C-10E	•	•	•	■	-	•	
ZN		VABF-SR6C2-C-6	•	•	•	•	•	-	
ZNY <sup>2)</sup>	14 5    1     3     12	VABF-SR6C2-C-6E	•	•	•	•	-	_	
ressure	regulator plate for port 4, reversible (A re	egulator)							
ZK <sup>2)</sup>		VABF-SR7C2-C-10	•		•	•	-	•	Reversible pressure regulator for port 4
ZM <sup>2)</sup>	14 5  1  3  12	VABF-SR7C2-C-6	•	•	•	•	•	-	
	regulator plate for ports 2 and 4, reversi	ble (AB regulator)							
ZE	4 2	VABF-SR5C2-C-10	•	•	•	•	-	•	Reversible pressure regula for ports 2 and 4     Pressure regulation up- stream of the solenoid valv     Routes the operating pres-
ZEY <sup>2)</sup>	14 5   1   3   12	VABF-SR5C2-C-10E	•	•	•	•	-	•	sure from duct 1 to ducts 3 and 5 • Routes the exhaust air fron duct 1 to ducts 3 and 5
ZJ		VABF-SR5C2-C-6		•	•	•	•	-	- Note  These pressure regulator plat
									cannot be combined with standard 2x 3/2-way solenoid valves (code N, K, H).
<sup>7</sup> ]Y <sup>2)</sup>		VABF-SR5C2-C-6E	•	•		•	•	-	Reversible 2x 3/2-way solend valves (code P, Q, R) must not be operated in a separate prosure zone in combination with these pressure regulators.

 $<sup>1) \</sup>quad \text{Width variants 42 mm and 52 mm (ISO 5599-2, ISO 1 and ISO 2) can be selected via the pressure regulator configurator VABF-S2}$ 

<sup>2)</sup> Also suitable for valves with symmetrical design

#### Vertical stacking

Throttle plate



The throttle plate has two flow control valves on which the exhaust air flow rate at exhaust ports 3 or 5 can be adjusted.

This enables the movement of the drive to be initiated and the required speed to be set on the valve terminal using the manual override. Ducts 3 and 5 can be adjusted independently of each other.

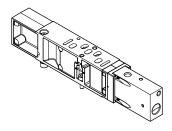


#### Note

On reversible valve terminals, the working air is controlled in ducts 3 and 5 upstream of the valve.

Code			Туре	Width			Description	
				18 mm	26 mm	42 mm	52 mm	
	X	14   2   1   1   1   1   1   1   1   1   1	VABF-S4F1B1-C	•	•	•	•	Restricts the exhaust air downstream of the valve in ducts 3 and 5

#### Vertical pressure shut-off plate



This is equipped with a switch with which the compressed air supply can be shut off. A solenoid valve or downstream vertical stacking plate can thus be replaced without switching off the overall air supply. If the control chain has a redundant connection, the cycle can continue even in the case of a cyclical control system.

When the shut-off function is activated, the exhaust air/return air is discharged from the activated valve. This is done via an M5 threaded connection or via duct 3 in the case of width 18 and 26 mm, and via duct 3 in the case of width 42 and 52 mm.



#### Note

The operating pressure of the valve terminal must lie within the range of the required pilot pressure (i.e. min. 3 bar). When using the end plate with pilot air selector, only the switching position with code W and U can be used.

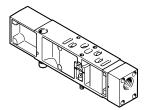
Code		Туре	Width				Description	
			18 mm	26 mm	42 mm	52 mm		
ZT	33 11 15 14	VABF-S4L1D1-C	•	•	-	-	3/2-way valve for shutting off the operating pressure at the valve position     Blocks ducts 1 and 14 for the valve position     Supplies the valve position with internal pilot air	
	14 5 1 3 12	VABF-S2L1D1-C	-	-	•	•	Pressure separation on the valve assembly	
ZS	33 12 3 11 15 14	VABF-SL1D2-C		•	-	-	3/2-way valve for shutting off the operating pressure at the valve position     Blocks ducts 1 and 14 for the valve position     Supplies the valve position with internal pilot air     Pressure separation can be shut off on the valve assembly using a key	



#### Note

The vertical pressure shut-off plates VABF-... are provided only in combination with solenoid valves VSVA-...T1L from Festo. In the vertical pressure shut-off plate only ducts 1 and 14, and not duct 12, are blocked.

# Vertical supply plate



This plate enables a valve to be supplied with individual operating pressure independently of the operating pressure of the valve terminal.

As additional compressed air supply for a valve. To supply an additional pressure zone.

Code		Туре	Width				Description
			26 mm	18 mm	42 mm	52 mm	
ZU	14 5 1 3 12	VABF-SP1A3	•	•	•	•	Plate with port 11 for supplying individual operating pressure to a valve position, duct 1
ZV	11 14 5 1 3 12	VABF-SP1A14C	•	•	•	•	Plate with port 11 for supplying individual operating pressure to a valve position, ducts 1 and 14

#### Compressed air supply and exhausting

Right end plate, internal pilot air supply



- Code V
- (no port 14)

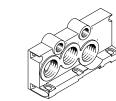


- Code V1, V3
- (port 14 is sealed with a blanking plug)

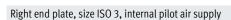


Right end plate, external pilot air supply

• Code X



• Code X1, X3

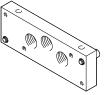




Code V2, for width 65 mm

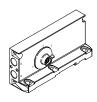


Right end plate, size ISO 3, external pilot air supply



• Code X2, for width 65 mm

#### Right end plate with pilot air selector



The valve terminal VTSA/VTSA-F can be supplied with compressed air at one or more points. This is a reliable way of ensuring that all functional components will always offer good performance, even with large-scale extensions.

- Code Z, Y, W, U
- Code Z: selector position 1, external pilot air supply
- · Code Y: selector position 2, internal pilot air supply

• Code W: selector position 3, external pilot air supply (ducted)

• Code U: selector position 4, internal pilot air supply (ducted)

The valve terminal is generally supplied via supply plates (max. 16 per valve terminal) and/or via the right end plate. When using valves with a width of 65 mm, the compressed air can also be supplied and exhausted using the adapter plate VABA-....

Exhausting is either via silencers or ports for ducted exhaust air on the supply plates and/or on the right end plate.



Compressed air supply and exhausting for size ISO 3 is described in a separate chapter on adaptation to width 65 mm (internal/external pilot air is regulated via MUH plate (solenoid valve)).

#### Supply plates, exhaust port 3/5 separated



• Code K

Supply plates, exhaust port 3/5 common



• Code L

#### Additional compressed air supply/duct separation

Additional supply plates can be used to ensure the compressed air supply for larger valve terminals or to create additional pressure zones.

These can be selected at any point upstream or downstream of the manifold sub-bases.

Supply plates contain ports for:

- Compressed air supply (1)
- Exhaust port (3/5) common or separate

Depending on your order, the exhaust ducts are either ducted or exhausted via silencers.

VTSA/VTSA-F with ducted exhaust air: When the exhaust air is ducted, exhausting can take place via a supply plate or a right end plate (code V or X). If duct separation is required, there are three different options:

- Duct separation 1, 3, 5: code S
- Duct separation 1: code T
- Duct separation 3, 5: code R

If a combination of duct separation (S, T or R) and one or two supply plates is required, the following variants can be selected:

- Supply plate with duct separation on the left: code SU, TU, RU
- Supply plate with duct separation on the right: code US, UT, UR
- 2 supply plates with intermediate duct separation: code USU, UTU, URU.

Supply p	olates 	l <del></del>	Width				Description
Code		Туре	18 mm	26 mm	42 mm	52 mm	Description
U		Exhaust port 3/5 common VABF-S6-1-P1A7-N12     Exhaust port 3/5 separate VABF-S6-1-P1A6-N12	•	•	•	•	Supply plate without duct separation (no R, S or T selected)
SU TU RU			•	•	•	•	Supply plate with duct separation on the left, if R, S or T is selected
US UT UR			•	•	•	•	Supply plate with duct separation on the right, if R, S or T is selected
USU UTU URU			•	•	•	•	2 supply plates with duct separation in centre, if R, S or T selected

#### Right end plate

Right end plates with different port sizes are available depending on the flow rate required.

With the following right end plates, the outlet direction of the ports is aligned with the horizontal stacking direction. Right end plates with pilot air supply/pilot exhaust air

- Internal pilot air supply: code V, V1, V2 and V3 (ducts 1 and 14 are connected)
- External pilot air supply: code X, X1, X2 and X3, as well as XP1, XP2, XP3 and XS

For end plates with pilot air selector, the outlet direction of the ports is to the front of the valve terminal. This means that all the ports on the valve terminal can be combined in one outlet direction.

The special feature of the end plates with pilot air selector is the selector switch itself, which has four settings for different pilot air supply/pilot exhaust air.

End plates with pilot air selector switch set at the factory for:

- External pilot air supply: selector position 1 (code Z)
- Internal pilot air supply: selector position 2 (code Y)
- External pilot air supply, ducted pilot exhaust air: selector position 3 (code W)
- Internal pilot air supply, ducted pilot exhaust air: selector position 4 (code U)



#### - Note

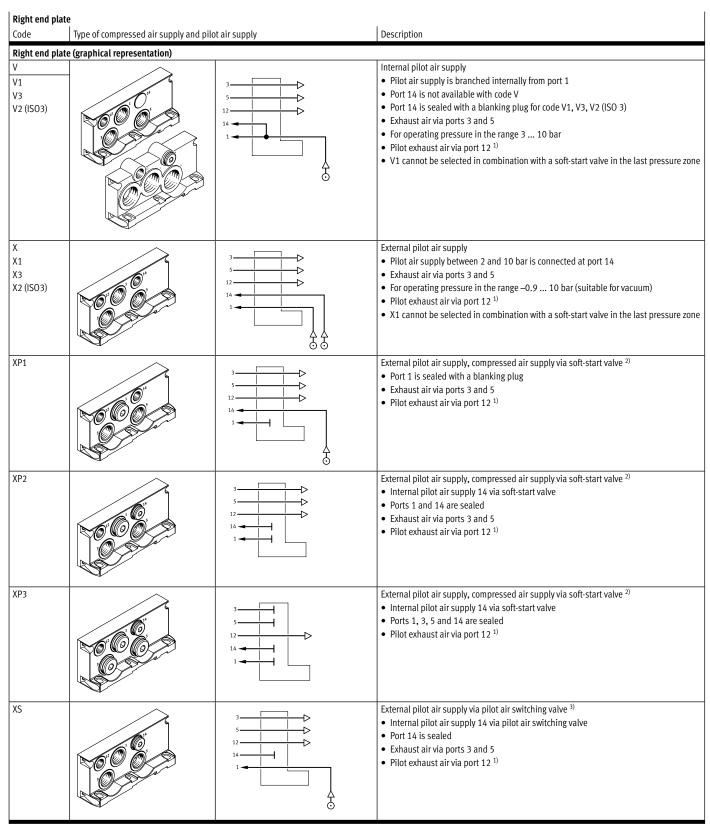
- The end plate with pilot air selector must be used in combination with a supply plate.
- The reversible 3/2-way solenoid valves (code P, Q, R) must only be operated in selector position 1 or 2.
- Ducted pilot exhaust air via port 12 is only possible with rotated seals on the valve.

Right end p	late, variants				
Code	Blanking plug in duct	Pilot air supply	Ducted pilot exhaust air 1)	Connecting thread	
			Position of the seal on solenoid valve ("ISO" is visible)	1, 3, 5	12, 14
٧	-	Internal	-	1/2 NPT	1/4 NPT
V1	14		-	3/4 NPT	1/4 NPT
V2	14		-	1 NPT	1/8 NPT
V3	14		•	3/4 NPT	1/4 NPT
Х	-	External	-	1/2 NPT	1/4 NPT
X1	-		-	3/4 NPT	1/4 NPT
Х2	-		-	1 NPT	1/8 NPT
Х3	-		•	3/4 NPT	1/4 NPT
XP1 <sup>2)</sup>	1	External, via soft-start valve	-	1/2 NPT	1/4 NPT
XP2 3)	1, 14	("gradual pressure build-up")	-	1/2 NPT	1/4 NPT
XP3 <sup>3)</sup>	1, 3, 5, 14		-	1/2 NPT	1/4 NPT
XS <sup>4)</sup>	14	External, via pilot air switching valve ("switchable pilot air")	-	1/2 NPT	1/4 NPT

- 1) Pilot exhaust air is ducted on the end plate via port 12 and exhausted (done by turning the seal on the solenoid valve to position "ISO")
- 2) Not possible in combination with soft-start valve code PQ, PP, PO (with internal pilot air supply)
- 3) Not possible in combination with soft-start valve code PN, PM, PK (with external pilot air supply)
- 4) Only possible in combination with pilot air switching valve code SS with intermediate plate code ZO

Right end pla	Right end plate with pilot air selector							
Code	Pilot air supply	Selector position	Ducted pilot exhaust air 1)	Connecting thread 12, 14				
			Position of the seal on solenoid valve ("ISO" is visible)					
Z	External	1	-	1/4 NPT				
Υ	Internal	2		1/4 NPT				
1	Internat	2	_	1/4 NF1				
W	External (ducted)	3	-	1/4 NPT				

<sup>1)</sup> Pilot exhaust air is ducted on the end plate via port 12 and exhausted (done by turning the seal on the solenoid valve to position "ISO")

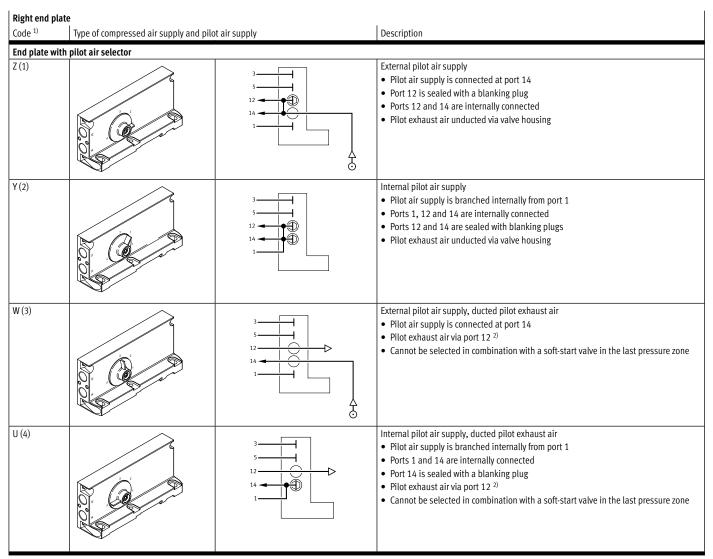


- 1) Ducted pilot exhaust air is only possible with rotated seals on the valve
- Application with XP1, XP2, XP3 and soft-start valve in combination with valves of width 52 mm: please note the maximum flow rate of the soft-start valve in this pressure zone
- 3) Application with XS and pilot air switching valve in combination with intermediate plate



The key features, valves and functions of width 65 mm are described separately in the chapter "Adaptation to width 65 mm, ISO size 3"  $\,$ 

→ page 180.



- 1) Selector setting in brackets
- 2) Ducted pilot exhaust air is only possible with rotated seals on the valve (pilot exhaust air 82/84 including venting air for valves)



The reversible 3/2-way solenoid valves (code P, Q, R) must only be operated in selector position 1 or 2.

<b>Configur</b> Code	ation of all pneumatic connections with	NPT thread	Connection (duct)	Designation	Code M Push-in connector, large	Code N Push-in connector, small
Right en	d plate					
V			1	Push-in fitting	QS-1/2-5/8-U	QB-1/2-1/2-U
		3 5 12	3 and 5	Silencer or Push-in fitting	U-1/2-B-NPT or QS-1/2-5/8-U	U-1/2-B-NPT or QB-1/2-1/2-U
		14	12	Silencer or Push-in fitting	U-1/4-B-NPT or QB-1/4-3/8-U	U-1/4-B-NPT or QB-1/4-5/16-U
X			1	Push-in fitting	QS-1/2-5/8-U	QB-1/2-1/2-U
		3 5 12	3 and 5	Silencer or Push-in fitting	U-1/2-B-NPT or QS-1/2-5/8-U	U-1/2-B-NPT or QB-1/2-1/2-U
		14	12	Silencer or Push-in fitting	U-1/4-B-NPT or QB-1/4-3/8-U	U-1/4-B-NPT or QB-1/4-5/16-U
		\$ \$	14	Push-in fitting	QB-1/4-3/8-U	QB-1/4-5/16-U
V1			1	Barbed hose fitting	N-3/4-P-19-NPT <sup>1)</sup>	_
V3		3 5 12	3 and 5	Silencer or Barbed hose fitting	U-3/4-B-NPT <sup>1)</sup> or N-3/4-P-19-NPT <sup>1)</sup>	-
		14	12	Silencer or Push-in fitting	U-1/4-B-NPT or QB-1/4-1/2-U	U-1/4-B-NPT or QB-1/4-3/8-U
		<u>\$</u>	14	Plug	B-1/4-NPT	B-1/4-NPT
X1			1	Barbed hose fitting	N-3/4-P-19-NPT <sup>1)</sup>	-
Х3		3 5 12	3 and 5	Silencer or Barbed hose fitting	U-3/4-B-NPT or N-3/4-P-19-NPT <sup>1)</sup>	_
		14	12	Silencer or Push-in fitting	U-1/4-B-NPT or QB-1/4-1/2-U	U-1/4-B-NPT or QB-1/4-3/8-U
		<u> </u>	14	Push-in fitting	QB-1/4-1/2-U	QB-1/4-3/8-U

<sup>1)</sup> For tubing with I.D. 19 mm. Use tubing clips to DIN 3017



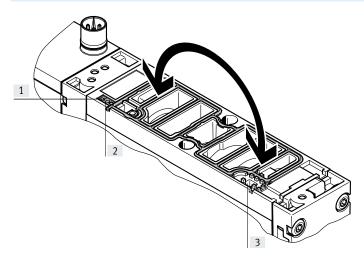
The key features, valves and functions of width 65 mm are described separately in the chapter "Adaptation to width 65 mm, ISO size  $3^{\prime\prime}$ 

→ page 180.

Configura Code <sup>1)</sup>	ation of all pneumatic connections with	NPT thread	Connection	Designation	Code M Push-in connector, large	Code N Push-in connector, small
End plate	with pilot air selector					
Z (1)		3 5 12 14 1	12	Blanking plug Push-in fitting	B-1/4-NPT QB-1/4-3/8-U	B-1/4-NPT QB-1/4-5/16-U
Y(2)		3 5 12 14	12 14	Blanking plug Blanking plug	B-1/4-NPT B-1/4-NPT	B-1/4-NPT B-1/4-NPT
W (3)		3 5 12 14 1	12	Silencer or Push-in fitting Push-in fitting	U-1/4-B-NPT or QB-1/4-3/8-U QB-1/4-3/8-U	U-1/4-B-NPT or QB-1/4-5/16-U QB-1/4-5/16-U
U (4)		3 5 12 14	12	Silencer or Push-in fitting Blanking plug	U-1/4-B-NPT or QB-1/4-3/8-U B-1/4-NPT	U-1/4-B-NPT or QB-1/4-5/16-U B-1/4-NPT

<sup>1)</sup> Selector setting in brackets

#### Using the seals with ducted/unducted pilot exhaust air



Unducted pilot exhaust air:

- The seal is visible in the display window on control side 14.
- The "ISO" mark is visible on the inscription label on the seal surface.

Ducted pilot exhaust air:

- The seal is visible in the display window on control side 12.
- The "ISO" mark is visible on the inscription label on the seal surface.
- [1] Inscription label
- Display window on control side 14 ("ISO" is visible)
- Display window on control side 12 [3] ("ISO" is visible)

#### Pilot air supply

The port for the pneumatic supply is located on the supply plates or the right end plate.

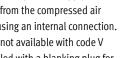
The ports differ for the following types of pilot air supply:

- Internal
- External

#### Internal pilot air supply

Internal pilot air supply can be selected if the working pressure is between 3 and 10 bar.

In this case the pilot air supply is branched from the compressed air supply 1 using an internal connection. Port 14 is not available with code V and is sealed with a blanking plug for code V1, V2, V3.



When using valves with a width of 65 mm, ISO size 3, the internal/external pilot air supply for the valves with a width of 18 ... 52 mm is provided via the adapter

The external pilot air supply for the valves with a width of 65 mm is provided via the right end plate IEPR ....

# Note

If a gradual pressure build-up is required in the system by using a soft-start valve, then external pilot air should be selected so that the pilot pressure is already applied in full at the point of switch-on.

#### External pilot air supply

If the supply pressure is less than 3 bar, you must operate your valve terminal VTSA/VTSA-F using external pilot air supply.

The pilot air supply is then supplied via port 14 on the right end plate. This is the case even if the valve terminal is operated with different pressure zones.

# Creating pressure zones and separating exhaust air

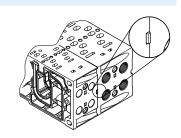
The valve terminal VTSA/VTSA-F offers a number of options for creating pressure zones if different working pressures are required.

Pressure zones are created by isolating the internal supply ducts between the manifold sub-bases by appropriate duct separation. Compressed air is supplied and exhausted via a supply plate.

The position of the supply plates and duct separations can be freely selected for VTSA/VTSA-F.

Duct separations are integrated exworks as per your order.
Duct separations can be distinguished by their coding, even when the valve

terminal is assembled.



<b>Creating</b> Code	pressure zones   Separating seal			Width				Description
couc	Illustrated examples	Coding	Basic representation	18 mm	26 mm	42 mm	52 mm	Description
T			3		-		-	Duct 1 separate
S			5 5 12 14 1	•	•	•	•	Ducts 1, 3 and 5 separate
R			8 3 —   — — — — — — — — — — — — — — — — —	•	•	•	•	Ducts 3 and 5 separate
TL		Colour-coded in red	7L 3 5 12 14 1 1 1	•	•	•	•	Duct 1 and 14 separated
К		Colour-coded in green	5 —   — — — — — — — — — — — — — — — — —	•	•	•	•	Ducts 1, 3, 5 and 14 separate
L		Colour-coded in white	3 5 12 14 1	•	•	•	•	Duct 14 separate

#### Example: Compressed air supply and pilot air supply, right end plate

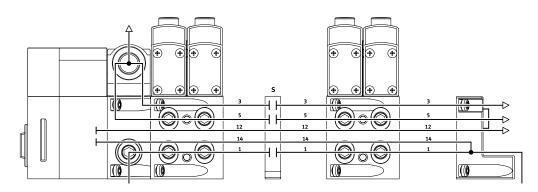
Internal pilot air supply, silencer/ducted exhaust air

Right end plate: code V and V1

Optional duct separation

The diagram on the right shows an example of the configuration and connection of the compressed air supply with internal pilot air supply:

- Port 14 is not available with code V and is sealed with a blanking plug for code V1.
- The air is exhausted via the silencer at exhaust port 3/5.
- Duct separations can optionally be used to create pressure zones.



#### Example: Compressed air supply and pilot air supply, right end plate

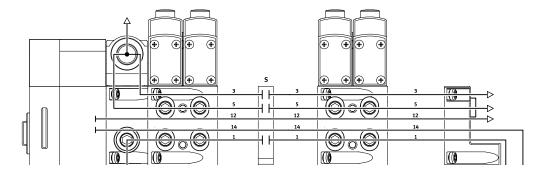
External pilot air supply, silencer/ducted exhaust air

Right end plate: code X and X1

Optional duct separation

The diagram on the right shows an example of the configuration and connection of the compressed air supply with external pilot air supply:

- Port 14 on the right end plate is equipped with a fitting for this.
- The air is exhausted via the silencer at exhaust port 3/5.
- Duct separations can optionally be used to create pressure zones.



# Key features – Pneumatic components – Compressed air supply and pressure zones, examples

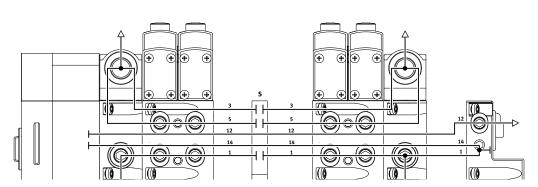
#### Example: Compressed air supply and pilot air supply via end plate with pilot air selector

Internal pilot air supply, ducted exhaust air/silencer

Right end plate: code U

The diagram on the right shows an example of the configuration and connection of the compressed air supply with internal pilot air supply:

- Port 14 on the right end plate is tightly sealed.
- The air is ducted or discharged via the silencer at exhaust port 3/5.
- The selector switch on the pilot air selector is in position 4.
- Duct separations can optionally be used to create pressure zones.



Optional duct separation

#### Example: Compressed air supply and pilot air supply via end plate with pilot air selector

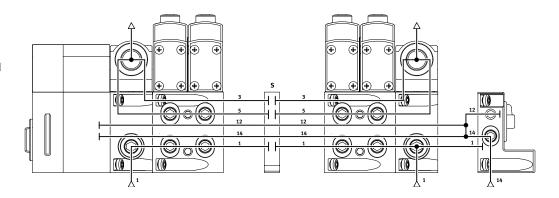
External pilot air supply, ducted exhaust air/silencer

Right end plate: code Z

Optional duct separation

The diagram on the right shows an example of the configuration and connection of the compressed air supply with external pilot air supply:

- Port 14 on the right end plate is equipped with a fitting for this.
- Port 12 is sealed with a blanking plug since it is internally connected with port 14.
- The air is ducted or discharged via the silencer at exhaust port 3/5.
- The selector switch on the pilot air selector is in position 1.
- Duct separations can optionally be used to create pressure zones.

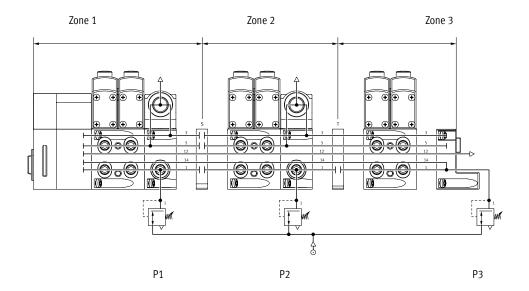


# Key features – Pneumatic components – Compressed air supply and pressure zones, examples

#### **Examples: Creating pressure zones**

VTSA/VTSA-F with CPX terminal

With the VTSA/VTSA-F, up to 16 pressure zones can be created (up to 32 pressure zones if only size 1, ISO 5599-2, is fitted). The diagram shows an example of the configuration and connection of three pressure zones using duct separations – with internal pilot air supply.





Examples with pressure zones and soft-start valve are described separately in the chapter "Soft-start valve"

→ page 167.

## Key features - Mounting

#### Valve terminal mounting

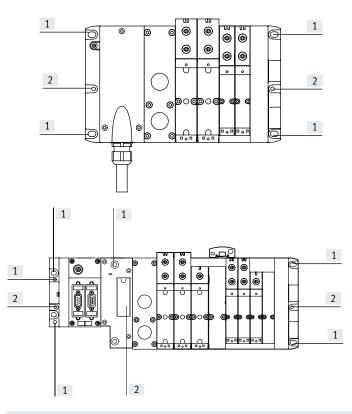
Sturdy valve terminal mounting thanks to:

- Through-holes for wall mounting
- Additional mounting brackets
- H-rail mounting for VTSA/VTSA-F (horizontal mounting position permitted)



Further information on mounting the valve terminal, arranged by valve terminal configuration, can be found online.

#### Wall mounting, general



- [1] Drilled hole for M6 screw
- [2] Drilled hole for H-rail mounting

The valve terminal VTSA/VTSA-F is screwed onto the mounting surface using M6 screws. The mounting holes are located at the following points:

- Multi-pin plug
  - 2 each on the multi-pin manifold block and the right end plate
- Fieldbus, CPX:
  - 2 each on the left (CPX) and right (VTSA/VTSA-F) end plate and the pneumatic interface
- I-Port/IO-Link<sup>®</sup> (4 in total); 2 each on the I-Port/IO-Link<sup>®</sup> interface and on the right end plate

Mounting brackets can be mounted on pneumatic supply plates and manifold sub-bases. If using CPX components, see:

→ Internet: cpx

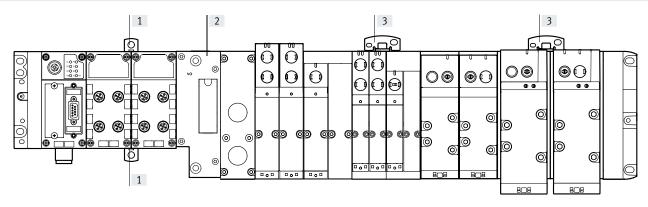
### - 🖣 - Note

Wall mounting of the VTSA/VTSA-F with more than five pneumatic modules

Note the following instructions:

- Additionally use mounting brackets of the type VAME-S6-W-M46
- Mount these on each fourth plate (manifold sub-base, supply plate or exhaust plate), counting from left to right, starting after the pneumatic interface.
- No mounting bracket is required next to the right end plate.
- Always use the pre-assembled mounting brackets when mounting factory pre-assembled valve terminals on a wall.

Wall mounting with CPX polymer design



- [1] Additional wall mounting for polymer CPX terminal
- [2] Pneumatic interface

In the case of CPX terminals of polymer design with 4 and more interlinking blocks, additional wall mountings of the type CPX-BG $\square$ RW must be used every 100 ...150 mm. These mountings are clipped in at the top and bottom between the CPX modules.

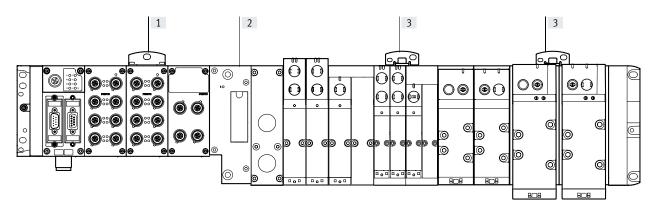
- [3] Additional wall mounting for VTSA/VTSA-F
- (with drilled hole for M5 and M6 screw)

In the case of the VTSA/VTSA-F, mounting brackets must be mounted on the wall as instructed above.

Brackets of the type VAME-S6-W-M46 must be used as an additional wall mounting.

# Key features - Mounting

#### Wall mounting with CPX metal design



- [1] Additional wall mounting for CPX metal design
- [2] Pneumatic interface

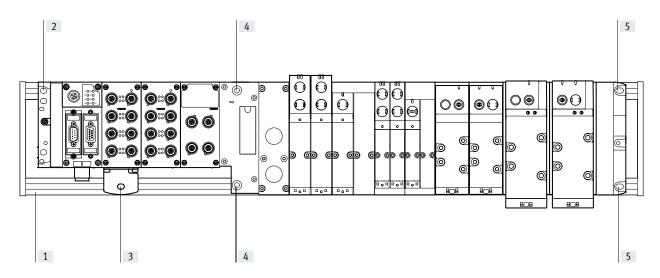
In the case of CPX terminals of metal design with 4 and more interlinking blocks, additional wall mountings of the type CPX-M-BG $\square$ RW must be used every 100 ...150 mm. These wall mountings are screwed in at the top of the corresponding CPX module.

[3] Additional wall mounting for VTSA/VTSA-F (with drilled hole for M5 and M6 screw)

In the case of the VTSA/VTSA-F, mounting brackets must be mounted on the wall as instructed above.

Brackets of the type VAME-S6-W-M46 must be used as an additional wall mounting.

#### Mounting on support system with CPX metal design



- [1] Support system (DIN mounting rail)
- [2] Upper mounting for CPX metal design, left end plate on DIN mounting rail
- [3] Lower mounting for CPX metal design on DIN mounting rail with mounting bracket CPX-M-BG-VT-2X
- [4] Mounting for pneumatic interface on DIN mounting rail
- [5] Mounting for right end plate on DIN mounting rail

If a metal terminal CPX with VTSA pneumatic components is mounted on DIN mounting rails, it may be necessary to have one or more mounting brackets on the CPX side to compensate for the length. It is possible to compensate for the length by using special mounting brackets CPX-M-BG-VT-2X. The mounting bracket connects the metal terminal CPX to the DIN mounting rail.

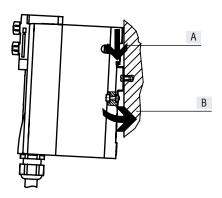
- · 🖣 Note
- Only metal CPX modules with VTSA/VTSA-F modules of width 18 ... 52 mm must be used.
- The number of mounting brackets required depends on the number of CPX modules installed and whether any system feeds are present.

Further information about mounting the valve terminal can be found in the assembly instructions in the Festo Support Portal

→ www.festo.com/sp

# Key features – Mounting

H-rail mounting



The valve terminal VTSA/VTSA-F is hooked onto the H-rail (see arrow A). It is then swivelled onto the H-rail and secured in place with the clamping component (see arrow B).

The following VTSA/VTSA-F mounting is required for H-rail mounting of the valve terminal:

• CPX-CPA-BG-NRH

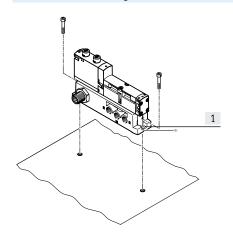
This enables the valve terminal to be mounted on an H-rail to EN 60715.



#### Note

- Wall mounting is recommended if more than one vertical stacking element or a long valve terminal design is required.
- Vibration/shock loads are not permissible with H-rail mounting.
- Only a horizontal mounting position is permissible for H-rail mounting.

#### Individual valve mounting



[1] Vertical mounting holes

The individual sub-base for wall mounting is designed for integration into a system or machine. It is mounted vertically.

#### Display and operation

Each solenoid coil is allocated an LED which indicates its switching status.

- Indicator 12 shows the signal status of the pilot control for output 2
- Indicator 14 shows the signal status of the pilot control for output 4

#### Manual override (MO):

The manual override enables the valve to be switched when not electrically actuated or energised.

The valve is switched by pushing the manual override. The set switching status can also be locked by turning the manual override.

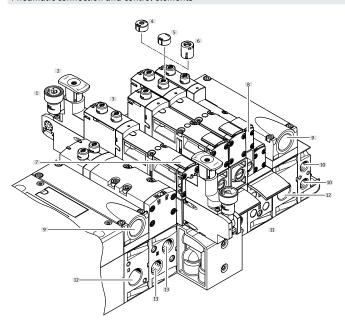
#### **Alternatives:**

- The cover cap (code N) limits the function of the manual override, preventing it from being locked. The valve can then only be actuated as non-detenting.
- The cover cap (code V) can be used to secure the manual override against accidental actuation.
- The heavy-duty cover cap protects the manual override located on the valve. The valve can be actuated as non-detenting or as detenting via accessory.



Special valve variants with pre-assembled cover caps for the manual override are available for valve terminal VTSA/VTSA-F.

#### Pneumatic connection and control elements



- 1] Pressure gauge (optional)
- [2] Adjusting knob for optional pressure regulator plate
- [3] Manual override (MO) (for each pilot solenoid coil, non-detenting or non-detenting/detenting)
- [4] Cover cap for MO, non-detenting
- [5] Cover cap for MO, concealed
- [6] Cover cap for MO, non-detenting, heavy-duty, detenting via accessory
- [7] Inscription label holder for valve
- [8] Adjusting screw of optional throttle plate
- [9] Exhaust ports "Valves" (3/5)

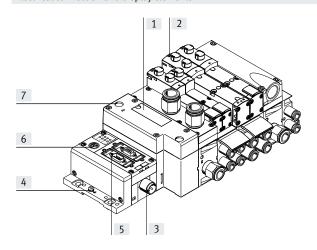
- [10] Pilot ports 12 and 14 for supplying the external pilot air
- [11] Inscription label holder for subbase
- [12] Supply port 1 (operating pressure)
- [13] Working ports 2 and 4, per valve position



#### - Note

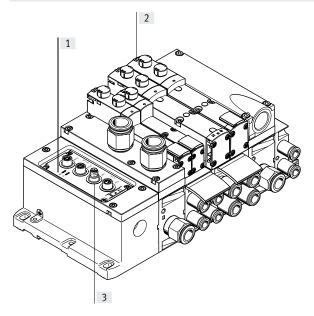
A manually operated valve (manual override) cannot be reset electrically. Conversely, an electrically actuated valve cannot be reset using the mechanical manual override.

#### Electrical connection and display elements



- [1] Inscription area and covering for H-rail mounting
- [2] Yellow LEDs: signal status indication for the pilot solenoid coils
- [3] Power supply connection
- [4] Earthing connection
- [5] Fieldbus interface (bus-specific)
- [6] Service interface
- [7] Red LED: common error display for valves

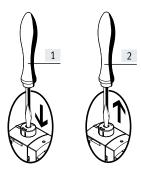
Electrical connection and display elements for AP interface



- [1] LED indicators for operating status/diagnostics of the pneumatic interface
- [2] Yellow LEDs: signal status indication for the pilot solenoid coils
- [3] AP interface with connections

#### Manual override (MO) - Function

MO with automatic return (non-detenting)



[1] Press in the plunger of the manual override using a pointed object or screwdriver.The valve is in the switching posi-

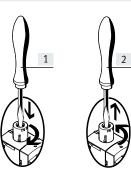
[2] Remove the pointed object or screwdriver.

tion.

The spring force pushes the plunger of the manual override back

The valve returns to its normal position (not with double solenoid valve code J or D).

#### MO with detent (concealed)



- [1] Press in the plunger of the manual override using a pointed object or screwdriver until the valve switches and then turn the plunger 90° clockwise until the stop is reached.
  - Valve remains in the switching position.
- [2] Turn the plunger 90° anti-clock-wise until the stop is reached and then remove the pointed object or screwdriver. The spring force pushes the plunger of the manual override back. The valve returns to its normal position (not with double solenoid valve code J or D).

#### Cover caps for manual override

Cover cap for MO, heavy-duty, with automatic reset (non-detenting/detenting via accessory)



[1] Non-detenting:

Push in key for MO. The valve is in the switching position.

Detenting:

Turn the coded key in switching position clockwise through 90° until the stop is reached. Valve remains in the switching position. In this position the key is latched and cannot be removed.

Cover cap for MO, with automatic return (non-detenting)



[1] Restricted function, non-detenting: push in the plunger of the MO cap using a pointed object or screwdriver. The valve is in the switching position.



[2] Turn the key 90° anti-clockwise until the stop is reached. The key is now unlatched. The spring force of the manual override pushes the key back out. The valve returns to its normal position (not with double solenoid valve code J or D).



[2] Remove the pointed object or screwdriver.

The spring force pushes the plunger of the manual override back.

The valve returns to its normal position (not with double solenoid valve code J or D).

#### Cover cap for MO, concealed



When concealed by the cover cap, the MO can be secured against accidental actuation.



#### Note

Cover caps for the manual override can be ordered separately as accessories. There are also VSVA valve variants with pre-assembled cover caps.

Overview of valve variants and co	over caps for	manual override (MO)		
Illustration	Terminal code	Description of valve terminal order code	Manual override (MO)	Valve code identification on the rating plate sticker <sup>1)</sup>
Solenoid valve VSVA without cov	er cap			
	R	Without cover cap on MO	Non-detenting, detenting	VSVA-BMZD
Solenoid valve VSVA with pre-ass	sembled cov	er cap on MO		
	В	MO non-detenting/heavy duty with cover cap, can be used as detenting via accessory (key), as valve variant	Non-detenting, detenting via accessory (key)	VSVA-BMZTR
	С	MO can only be used as non-detenting with coded cover cap, as valve variant	Non-detenting	VSVA-BMZH
	D	MO concealed by cover cap – operation of MO prevented, as valve variant	Concealed	VSVA-BMZ
Cover caps for MO		I		<u> </u>
E CONCINCIONAL MO	N	MO can only be used as non-detenting with coded cover cap	Non-detenting	VSVA-BMZD
	V	MO concealed by cover cap – operation of MO prevented	Concealed	VSVA-BMZD
	A	MO non-detenting/heavy duty with cover cap, detenting via accessory (key)	Non-detenting, detenting via accessory	VSVA-BMZD
Accessories for manual override,	heavy duty			
	_	Coded key (accessory) for actuating the MO, non-detenting/heavy duty, for detenting position	For manual override, detenting	_

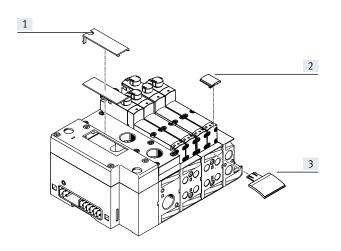
<sup>1)</sup> As an example, the part code for a 5/2-way single solenoid valve, mechanical spring return is used here (e.g. VSVA-B-M52-MZTR-A2-1T1L)



Cover caps for non-detenting/heavy duty manual override, detenting via accessory, are provided for one-off use only.

If they are used more than once, reliable locking of the cover cap cannot be  $% \left( 1\right) =\left( 1\right) \left( 1$ guaranteed.

#### Inscription system



- [1] Inscription area (approx. 20 x 45 mm)
- 2] Inscription label holder for valve ASCF-T-S6 (17 x 12.5 mm), ASCF-T-S6-Z
- [3] Inscription label holder for manifold sub-base ASCF-M-S6, ASCF-M-S2-2

Inscription label holders can be applied to the valves and manifold sub-bases to identify them. They can be ordered by entering the code B or T in the order code for accessories. Scope of delivery: inscription label holder including inscription label. The following inscription labels can be used as spares:

- Inscription label holder for valve type ASCF-T-S6: part no. 540888
- Inscription label holder with additional fields for marking valve type ASCF-T-S6-Z: part no. 8106532

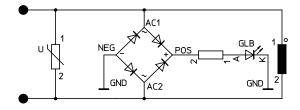
- Inscription label holder for manifold sub-base type ASCF-M-S6: part no. 540889
- Inscription label holder for manifold sub-base (for valve width 52 mm) type ASCF-M-S2-2: part no. 562577 Large inscription labels can be attached to the pneumatic interface as an alternative or in addition to the smaller labels.

#### **Protective circuit**

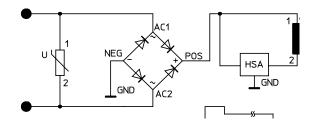
Each solenoid coil VSVA is provided with a spark arresting protective circuit and protected against polarity reversal.

The 24 V DC version of width 52 mm additionally features integrated holding current reduction.

24 V DC version (width 18 to 42 mm)



24 V DC version (width 52 mm)



- Note

All control signals of the solenoid coils of a valve terminal share a common load (independent of whether multi-pin, AS-i or CPX).

#### Individual valve

Valves on individual sub-bases can be used for actuators that are further away from the valve terminal.

- Electrical connection M12, 4-pin 24 V DC
- 4-pin clamped terminal connection for configuration by the user 24 V DC
- Cable (open end) for configuration by the user 24 V DC

#### Individual electrical connection

A maximum of 20 solenoid coils can be actuated. 2 solenoid coils per valve can be addressed.

Individual electrical connection:

- M12
- 6-way or 10-way
- 5-pin
- 24 V DC

#### Electrical multi-pin plug connection

The following multi-pin plug connection variants are offered for the valve terminal VTSA/VTSA-F:

- Sub-D multi-pin plug connection
   (37-pin for 24 V DC): This valve terminal can be equipped with
   1 ... 16 valve positions (with double solenoid valves), or with
   1 ... 32 valve positions (with single solenoid valves). A maximum of
   32 solenoid coils can be actuated.
- Terminal box (terminal strip for 24 V DC): This valve terminal can be equipped with 1 ... 16 valve positions (with double solenoid valves), or with 1 ... 32 valve positions (with single solenoid valves).

A maximum of 32 solenoid coils can be actuated.

Multi-pin node (round plug): electrical multi-pin plug connection with round plug, 19-pin to CNOMO
 E03.62.530.N, connecting thread M23 for 24 V DC. The valve terminal can be fitted with max. 16 solenoid coils.

The valves are switched by positive or negative logic (PNP or NPN). Mixed operation is not permissible because all control signals of the solenoid coils of a valve terminal share a common load.

Each pin on the multi-pin plug (Sub-D) or terminal box (terminal strip) can actuate exactly one solenoid coil. If the maximum configurable number of valve positions is 32, this means that 32 valves can be addressed, each with a single solenoid coil.

With 16 or fewer valve positions, 2 solenoid coils per valve can be addressed.

# - Note

Use the following 37-pin connecting cables from Festo to connect the valve terminal VTSA/VTSA-F with Sub-D multi-pin plug connection:

- NEBV-...-LE10 for max. 8 solenoid coils
- NEBV-...-LE26 for max. 22 solenoid coils
- NEBV-...-LE27 for max. 23 solenoid coils
- NEBV-...-LE37 for max. 32 solenoid coils
- NECV-S1W37 pre-assembled plug connector

#### **AS-Interface connection**

Valve terminals VTSA/VTSA-F with AS-Interface connection can be expanded with up to 8 valves with max. 8 solenoid coils. The valve terminal with AS-Interface connection is based on the same electrical links as the valve terminal with multi-pin plug connection.

This means a valve terminal with multi-pin plug connection can be converted using an AS-Interface module.
The technical specifications of the AS-Interface system must be observed in this case.

#### - 🎚 -

Note

AS-Interface module VAEM-S6-S-FAS-4-4E Always operate the AS-Interface module with additional power supply if 4 solenoid coils (width 52 mm) are supplied with current simultaneously.

More information can be found at:

→ Internet: as-interface

#### Fieldbus interface/control block

All functions and features of the electrical peripherals CPX are permitted in connection with the CPX interface. This means that:

- The valves and electrical outputs are supplied via the operating voltage connection CPX
- The valves are supplied and switched off independently via a separate connection on the CPX



Note

More information can be found at:

→ Internet: cpx

#### I-Port/IO-Link®

Valve terminals VTSA/VTSA-F with I-Port/IO-Link® connection can be expanded with up to 16 valves with max. 32 solenoid coils.

The valve terminal with I-Port/IO-Link® connection is based on the same electrical interlinking as the valve terminal with multi-pin plug connection.

This means a valve terminal with multi-pin plug connection can be converted using an I-Port/IO-Link® module. The technical specifications of the I-Port/IO-Link® system must be observed in this case.

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#### Note

AS-i module VAEM-S6-S-FAS-4-4E. Always operate the AS-i module with additional power supply if max. 4 solenoid coils (width 52 mm) are simultaneously supplied with current.

More information can be found at:

→ Internet: i-port, IO-Link®

#### AP interface

VTSA/VTSA-F valve terminals with AP interface can be expanded with up to 12 valves with a maximum of 24 solenoid coils.

The valve terminal with AP interface is based on the same electrical linkage as the valve terminal with multi-pin plug connection.

This means a valve terminal with multi-pin plug connection can be converted using an AP interface.

The technical specifications of the AP interface must be observed in this case.



#### - Note

AS-i module VAEM-S6-S-FAS-4-4E. Always operate the AS-i module with additional power supply if max. 4 solenoid coils (width 52 mm) are simultaneously supplied with current. More information can be found at:

→ Internet: ap

#### Rules for addressing

Address allocation

Address allocation doesn't depend on whether single or double solenoid valves are fitted.

Addresses are assigned in ascending order without gaps, from left to right.

Single solenoid valve

A valve position for actuating one solenoid coil (VABV...T1) occupies one address. Double solenoid valve

A valve position for actuating two solenoid coils (VABV...T2) occupies two addresses. The following allocation applies in this case:

- Coil 14: lower-value address
- Coil 12: higher-value address

#### Connecting cable

The wire colours refer to the following pre-assembled connecting cables from Festo:

- NEBV-...-LE10 for valve terminal with max. 8 solenoid coils
- NEBV-...-LE26 for valve terminal with max. 22 solenoid coils
- NEBV-...-LE27 for valve terminal with max. 23 solenoid coils
- NEBV-...-LE37 for valve terminal with max. 32 solenoid coils

		Pin <sup>2)</sup>	Address/coil	Wire colour 1)		Pin <sup>2)</sup>	Address/coil	Wire colour 1)
	_	1	0	WH		17	16	WH PK
DIN 4		2	1	BN		18	17	PK BN
PIN 1 -	0 0 PIN 2	3	2	GN		19	18	WH BU
	0 0	4	3	YE		20	19	BN BU
		5	4	GY		21	20	WH RD
	0 0	6	5	PK		22	21	BN RD
	0 0	7	6	BU		23	22	GY GN
		8	7	RD		24	23	YE GY
		9	8	GY PK		25	24	PK GN
	0 0	10	9	RD BU		26	25	YE PK
		11	10	WH GN		27	26	GN BU
	0 0	12	11	BN GN		28	27	YE BU
		13	12	WH YE		29	28	GN RD
	0 0	14	13	YE BN		30	29	YE RD
W. 40	PIN 3	7 15	14	WH GY		31	30	GN BK
'IN 19 -		16	15	GY BN		32	31	GY BU
		Conduc	ctor	l	L		1	
- Note		33	0 V <sup>3)</sup>	YE BK		35	0 V <sup>3)</sup>	BN BK
e drawing shows a plan view of the Sub-D			0 V <sup>3)</sup>	WH BK		36	0 V <sup>3)</sup>	BK
-	e connecting cable NEBV		g					
		37	FE	VT		T-	_	_

<sup>1)</sup> To IEC 757

<sup>2)</sup> Pin 9 ... 35: not allocated in the case of connecting cable NEBV-...-LE10 Pin 23 ... 33: not allocated in the case of connecting cable NEBV-...-LE26 Pin 24 ... 33: not allocated in the case of connecting cable NEBV-...-LE27

Connect O V for positive-switching control signals, 24 V for negative-switching control signals, a valve terminal share a common load!

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# Key features – Electrical components

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# Dimensions Connecting cable NEBV... [1] Cable fitting M20x1.5 Type B1 H1 H2 H3 L1 L2

	Cable sheath	Connecting cable	Length [m]	Part no.	Туре
$\sim$	TPE-U(PUR)	For max. 8 solenoid coils, 10-core	2.5	539240	NEBV-S1W37-E-2.5-LE10
			5	539241	NEBV-S1W37-E-5-LE10
			10	539242	NEBV-S1W37-E-10-LE10
	>	For max. 22 solenoid coils, 26-core	2.5	539243	NEBV-S1W37-E-2.5-LE26
~	~		5	539244	NEBV-S1W37-E-5-LE26
			10	539245	NEBV-S1W37-E-10-LE26
		For max. 32 solenoid coils, 37-core	2.5	539246	NEBV-S1W37-K-2.5-LE37
			5	539247	NEBV-S1W37-K-5-LE37
			10	539248	NEBV-S1W37-K-10-LE37
	PVC	For max. 8 solenoid coils, 10-core	2.5	543271	NEBV-S1W37-KM-2.5-LE10
			5	543272	NEBV-S1W37-KM-5-LE10
			10	543273	NEBV-S1W37-KM-10-LE10
		For max. 23 solenoid coils, 27-core	2.5	543274	NEBV-S1W37-KM-2.5-LE27
			5	543275	NEBV-S1W37-KM-5-LE27
			10	543276	NEBV-S1W37-KM-10-LE27
		For max. 32 solenoid coils, 37-core	2.5	543277	NEBV-S1W37-KM-2.5-LE37
			5	543278	NEBV-S1W37-KM-5-LE37
			10	543279	NEBV-S1W37-KM-10-LE37

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NEBV-..

	Terminal	Coil/address	Terminal	Coil/address
ach solenoid coil is assigned to a specific terminal on the terminal stri n order for the valves to be actuated.	р			
	1	0	17	16
	2	1	18	17
0 19	3	2	19	18
	4	3	20	19
[ <del>]</del> ]	5	4	21	20
	6	5	22	21
	7	6	23	22
	8	7	24	23
	9	8	25	24
	10	9	26	25
	11	10	27	26
0V <sup>1)</sup> 20 31	12	11	28	27
0 <b>V</b> 20 31	13	12	29	28
	14	13	30	29
	15	14	31	30
	16	15	32	31
- Note	Conductor			
ne drawing shows a plan view of the multi-pin terminal strip (Cage	33	0 V	35	0 V
lamp).	34	0 V	36	0 V

Pin allocation – Multi-pin, round plug, 24 V DC; electrical control code MP4						
	Address	Pin <sup>1)</sup>		Address	Pin <sup>1)</sup>	
	0	15		8	17	
	1	7		9	9	
// <sub>4</sub> + + + + .8	2	5		10	2	
$\left(\left(\begin{array}{cccccccccccccccccccccccccccccccccc$	3	4		11	13	
\\\^3\pmu_{\pm48}\pm\^7\pm\9\]\	4	16		12	11	
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	5	8		13	10	
12 11	6	3		14	1	
	7	14		15	18	

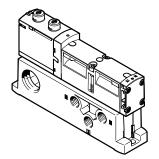
Pin allocation – Multi-pin plug, round plug, 24 V DC; electrical actuation – CNOMO allocation						
	Pin	Valve position/sole- noid coil	Pin	Valve position/sole- noid coil		
	1	8/14	11	7/14		
	2	6/14	12	FE		
120 1	3	4/14	13	6/12		
110 18 2	4	2/12	14	4/12		
	5	2/14	15	1/14		
	6 0 V <sup>1)</sup>	0 V <sup>1)</sup>	16	3/14		
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	7	1/12	17	5/14		
97 06 05	8	3/12	18	8/12		
	9	5/12	19	Not assigned		
	10	7/12				

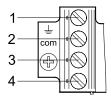
<sup>1)</sup> Pin 6: 0 V for positive-switching control signals; connect 24 V for negative-switching control signals; mixed operation is not permitted!

Pin 12: earth

Pin 19: not allocated

#### Electrical connection, individual valve 24 V DC up to width 52 mm





Pin assignment for assembly by the

user

With positive logic:

Pin1 – Not allocated

Pin2 – U<sub>B</sub> for coil 12

Pin3 - 0 V for coil 12 and 14

Pin4 – U<sub>B</sub> for coil 14

With negative logic:

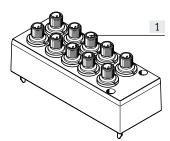
Pin1 - Not allocated

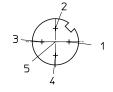
Pin2 - 0 V for coil 12

Pin3 - U<sub>B</sub> for coil 12 and 14

Pin4 - 0 V for coil 14

#### Individual electrical connection, 6-way or 10-way, 24 V DC, code MP2/MP3 for valve terminal up to width 52 mm





[1] Connection plug M12x1, 5-pin

Pin assignment M12 With positive logic:

Pin1 - Not allocated

Pin2 - U<sub>B</sub> for coil 12

Pin3 - 0 V for coil 12 and 14

Pin4  $-U_B$  for coil 14

Pin5 - Functional earth

Pin assignment M12

With negative logic:

Pin1 - Not allocated

Pin2 - 0 V for coil 12 Pin3 - U<sub>B</sub> for coil 12 and 14

Pin4 – 0 V for coil 14

Pin5 - Functional earth



- Mixed operation of positive-switching (PNP) and negative-switching (NPN) control signals is not permissible because all control signals of the solenoid coils of a valve terminal share a common load.
- All M12 connections (MP2/MP3) within a valve terminal share a common load.

#### Instructions for use

#### **Operating materials**

Operate your system with unlubricated compressed air, if possible. Festo valves and cylinders are designed so that, if used as intended, they will not require additional lubrication and will still achieve a long service life.

The quality of compressed air downstream of the compressor must correspond to that of unlubricated compressed air. If possible, do not operate the entire system with lubricated compressed air. The lubricators should, where possible, always be installed directly upstream of the actuator requiring them.

Incorrect additional oil and too high an oil content in the compressed air reduce the service life of the valve terminal.

Use Festo special oil OFSW-32 or the alternatives listed in the Festo catalogue (as specified in DIN 51524 HLP32; basic oil viscosity 32 CST at 40°C).

#### **Bio-oils**

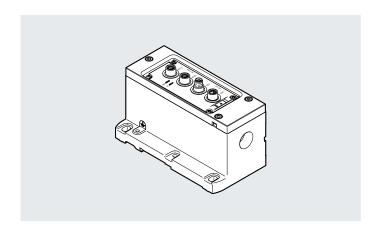
When using bio-oils (oils which are based on synthetic or native esters, e.g. rapeseed oil methyl ester), the maximum residual oil content of 0.1 mg/m³ must not be exceeded (see ISO 8573-1:2010 Class 2).

#### Mineral oils

When using mineral oils (e.g. HLP oils to DIN 51524, parts 1 to 3) or similar oils based on poly-alpha-olefins (PAO), the maximum residual oil content of 5 mg/m³ must not be exceeded (see ISO 8573-1:2010 Class 4).

A higher residual oil content is not permitted, regardless of the compressor oil, because permanent lubrication would otherwise be flushed out over a period of time.

Control signals from the controller to the valve terminal are transmitted via the AP bus protocol from Festo.



## Application

The AP interface connects the VTSA valve terminal with up to 12 valves (24 valve coils) to a CPX-AP system.

#### Implementation

The AP interface is used for direct integration of the VTSA valve terminal into the decentralised IO system.

General technical data				
AP interface				
Connection position	On top			
Reverse polarity protection	Yes			
Number of pins/wires	4			
Maximum number of valve positions	12			
Max. no. of solenoid coils	24			

General data				
Diagnostics via LED	Diagnostics per module			
	Power supply load			
Diagnostics via internal communication	Switch-off load supply			
	Electronics/sensors overvoltage			
	Load undervoltage			
Module parameters	Configuration of voltage monitoring load supply PL			
	Response in error state			

Technical data – Electrics				
Nominal operating voltage	[V AC]	110		
	[V DC]	24		
Nominal operating voltage for electrics/sensors	[V DC]	24		
Nominal operating voltage, load	[V DC]	24		
Permissible voltage fluctuations, electrics/sensors	[%]	± 25		
Permissible voltage fluctuations, load	[%]	± 10		
Intrinsic current consumption of electrics/sensors	[mA]	typ. 34 mA		
Intrinsic current consumption of load	[mA]	typ. 16 mA		
Max. power supply	[A]	2 x 4 A (external fuse required)		
Power failure buffering	[ms]	10		
Mains buffering of load	[ms]	3		
Fuse protection (short circuit)		Internal electronic fuse per channel		
Power supply				
Function		Incoming electronics/sensors and load		
Connection type		Plug		
Connection technology		M8x1, A-coded		
Number of pins/wires		4		
Voltage transmission				
Function		Outgoing electronics/sensors and load		
Connection type		Socket		
Connection technology		M8x1, A-coded		
Number of pins/wires		4		

Technical data – Mechanical components		
Product weight	[g]	712
Dimensions W x L x H	[mm]	71 x 142 x 84

Materials				
Cover	Die-cast aluminium			
Threaded sleeve	Nickel-plated brass			
Note on materials	RoHS-compliant			
LABS (PWIS) conformity	VDMA24364-B2-L			

Ambient temperature	[°C]	+5 +50		
Note on ambient temperature		Note ambient temperature derating according to IEC 61131-2:2017		
Storage temperature	[°C]	-20 +60		
Relative humidity	[%]	595		
		Non-condensing		
Corrosion resistance class CRC <sup>1)</sup>		2		
CE marking (see declaration of conformity) <sup>2)</sup>		To EU EMC Directive		
		To EU RoHS Directive		
Certification		RCM		
Degree of protection		IP65		
Note on degree of protection		In mounted state		
		Seal unused connections		
Nominal operating altitude	[m]	≤ 2000 m above sea level		
Maximum cable length	[m]	50, system communication		
Maximum setup altitude	[m]	3500		
Note on the maximum setup altitude		> 2000 m ASL (< 79.5 kPa)		
		Note ambient temperature derating according to IEC 61131-2:2017		

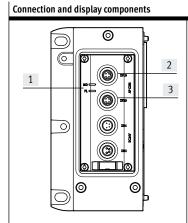
<sup>1)</sup> Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements that are in direct contact with a normal industrial environment.

<sup>2)</sup> More information: www.festo.com/catalogue/...  $\rightarrow$  Support/Downloads.

p: t			
Pin assignment	Pin	Allocation	Description
M8, D-coded, socket	1	Autocation	Description
AP in (AP-COM)	1	TX-	AP bus, transmission signal positive
AF III (AF-COM)	2	RX+	AP bus, receive signal positive
1		TX+	
	3		AP bus, receive signal negative
4 (0 0) 2	4	RX-	AP bus, transmission signal negative
3			
AP out (AP-COM)	1	RX-	AP bus, transmission signal positive
1	2	TX+	AP bus, receive signal positive
	3	RX+	AP bus, receive signal negative
4002	4	TX-	AP bus, transmission signal negative
3		2/1/05	Court allow for laterium language
Power out (voltage transmission)	1	24 V PS	Supply voltage for electronics and sensors
4 - 2	2	0 V PL	Supply voltage for valves and outputs
7002	3	0 V PS	Supply voltage for electronics and sensors
3 0 1	4	24 V PL	Supply voltage for valves and outputs
M8, D-coded, plug			
Power In (power supply)	1	24 V PS	Supply voltage for electronics and sensors
	2	0 V PL	Supply voltage for valves and outputs
2 4	3	0 V PS	Supply voltage for electronics and sensors
1 + + 3	4	24 V PL	Supply voltage for valves and outputs

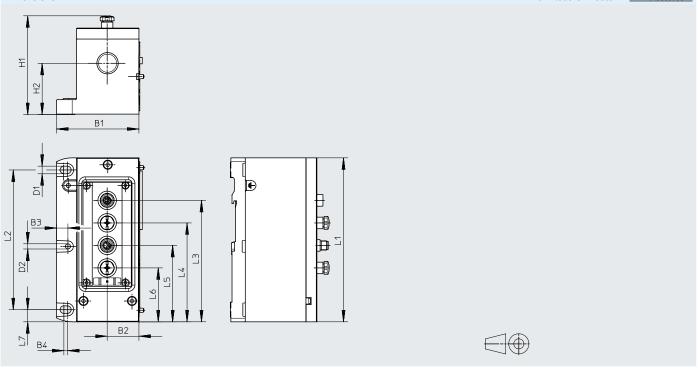




- 1] LED displays for module diagnostics (MD) and power load (PL)
- [2] AP in (AP-COM)
- [3] AP out (AP-COM)
- [4] Power in (power supply)
- [5] Power out (voltage transmission)

#### **Dimensions**

Download CAD data → www.festo.com



Туре	B1	B2	В3	B4	D1		D2	H1	H2
VABA-S6-1-AP	71.3	27.5	9.8	3	6.6	5	4.5	85.5	44.4
Туре	L1	L2	L3		_4	L	.5	L6	L7
VABA-S6-1-AP	142	121	105.2	. 8	5.7	66	5.2	46.7	10.5

Ordering data – AP interf	dering data – AP interface								
	Description	Part no.	Туре						
	AP interface for operation in an AP system	8152356	VABA-S6-1-AP						

- **[]** - Valve width to ISO 15407-2

• 18 mm

• 26 mm to ISO 5599-2

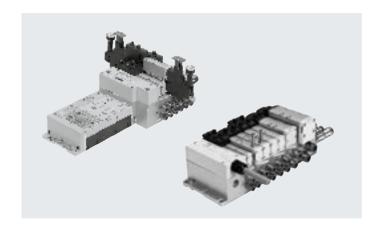
• 42 mm (ISO 1)

• 52 mm (ISO 2)

- **\** - Voltage 24 V DC

- 11 -

Flow rate<sup>1)</sup>
Width 18 mm: up to 550 (700) l/min
Width 26 mm: up to 1100 (1350) l/min
Width 42 mm: up to 1300 (1860) l/min
Width 52 mm:
up to 2900 l/min



1) Flow rates in brackets apply to VTSA-F

General technical data					
Terminal type VTSA/VTSA-F	VTSA is the standard version, VTSA-F is the version with optimised flow rate				
Valve sizes	Widths 18 mm, 26 mm, 42 mm, 52 mm, extendable with adapter to 65 mm				
Actuation type	Electrical				
Electrical control	With multi-pin plug: multi-pin				
	With fieldbus: integrated controller, fieldbus, Industrial Ethernet				
Type of control	Piloted				
Exhaust function, can be throttled	Via throttle plate				
Type of mounting	Wall mounting				
	On H-rail to EN 60715				
Mounting position	Any				
Manual override	Detenting, non-detenting, concealed				
Suitable for vacuum	Yes				
Valve terminal design	Modular, valve sizes can be mixed				
Max. no. of valve positions	32 <sup>1)</sup>				
Pneumatic connections – NPT thread					
Pneumatic connection	Via manifold sub-base				
Supply port 1	Dependent on the end plate or supply plate used (and adapter plate when using ISO size 3 valves)				
Exhaust port 3/5 Dependent on the end plate or supply plate used (and adapter plate when using ISO size 3 valves)					
Working ports 2/4	Dependent on the connection type selected				
External pilot air supply port 14	Dependent on the end plate used (and adapter plate when using ISO size 3 valves)				
Pilot exhaust air port 12 Dependent on the end plate used (and adapter plate when using ISO size 3 valves)					

<sup>1)</sup> Dependent on the electrical interface and the manifold sub-bases used

 $<sup>| \</sup>label{eq:normalized} | \label{eq:normalized} |$  Note: This product conforms to ISO 1179-1 and ISO 228-1.

# Valve terminal VTSA/VTSA-F, NPT

Valve function (with valve code)	Termi-	Width 18 mm			Width 26 mm				
	nal code	Valve	Valve on valve terminal VTSA	Valve on valve terminal VTSA-F	Valve	Valve on valve terminal VTSA	Valve on valve terminal VTSA-F		
5/2-way double solenoid (B52)	J	750	550	700	1400	1100	1350		
5/2-way double solenoid with dominant signal (D52)	D	750	550	700	1400	1100	1350		
5/2-way single solenoid, pneumatic spring (M52A)	M	750	550	700	1400	1100	1350		
5/2-way single solenoid, mechanical spring (M52M)	0	750	550	700	1400	1100	1350		
5/3-way closed (P53C)	G	700	450	650	1400 <sup>1)</sup> 700 <sup>2)</sup>	1000 <sup>1)</sup> 700 <sup>2)</sup>	1350 <sup>1)</sup> 700 <sup>2)</sup>		
5/3-way exhausted (P53E)	E	700 <sup>1)</sup> 330 <sup>2)</sup>	450 <sup>1)</sup> 330 <sup>2)</sup>	480 <sup>1)</sup> 330 <sup>2)</sup>	1400 <sup>1)</sup> 700 <sup>2)</sup>	1000 <sup>1)</sup> 700 <sup>2)</sup>	1350 <sup>1)</sup> 700 <sup>2)</sup>		
5/3-way pressurised (P53U)	В	700 <sup>1)</sup> 330 <sup>2)</sup>	450 <sup>1)</sup> 330 <sup>2)</sup>	480 <sup>1)</sup> 330 <sup>2)</sup>	1400 <sup>1)</sup> 700 <sup>2)</sup>	1000 <sup>1)</sup> 700 <sup>2)</sup>	1350 <sup>1)</sup> 700 <sup>2)</sup>		
5/3-way exhausted, switching position 14 detenting (P53ED)	SA	-	380 <sup>1)</sup> 310 <sup>2)</sup>	430 <sup>1)</sup> 360 <sup>2)</sup>	1400 <sup>1)</sup> 700 <sup>2)</sup>	1000 <sup>1)</sup> 700 <sup>2)</sup>	1350 <sup>1)</sup> 700 <sup>2)</sup>		
5/3-way exhausted, switching position 12 detenting (P53EP)	SE	-	380 <sup>1)</sup> 300 <sup>2)</sup>	460 <sup>1)</sup> 350 <sup>2)</sup>	1400 <sup>1)</sup> 700 <sup>2)</sup>	1000 <sup>1)</sup> 700 <sup>2)</sup>	1350 <sup>1)</sup> 700 <sup>2)</sup>		
5/3-way, port 2 pressurised, 4 exhausted, switching position 14 detenting (P53AD)	SB	-	380 <sup>1)</sup> 350 <sup>2)</sup>	440 <sup>1)</sup> 400 <sup>2)</sup>	700 <sup>1)</sup> 700 <sup>2)</sup>	700 <sup>1)</sup> 700 <sup>2)</sup>	700 <sup>1)</sup> 700 <sup>2)</sup>		
5/3-way, port 4 pressurised, 2 exhausted, switching position 14 detenting (P53BD)	SD	-	370 <sup>1)</sup> 340 <sup>2)</sup>	430 <sup>1)</sup> 360 <sup>2)</sup>	-	850 <sup>1)</sup> 820 <sup>2)</sup>	950 <sup>1)</sup> 860 <sup>2)</sup>		
2x3/2-way single solenoid, closed (T32C)	К	600	400	550	1250	900	1150		
2x3/2-way single solenoid, open (T32U)	N	600	400	550	1250	900	1150		
2x3/2-way single solenoid, open/closed (T32H)	Н	600	400	550	1250	900	1150		
2x3/2-way single solenoid, closed (T32N)	Q	600	400	550	1250	900	1150		
2x3/2-way single solenoid, open (T32F)	Р	600	400	550	1250	900	1150		
2x3/2-way single solenoid, open/closed (T32W)	R	600	400	550	1250	900	1150		
2x2/2-way single solenoid, closed (T22C)	VC	700	500	650	1350	1000	1300		
2x2/2-way single solenoid, closed (T22CV)	VV	700	500	650	1350	1000	1300		

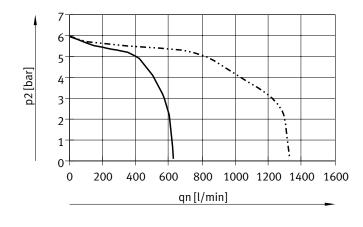
Switching position
 Mid-position

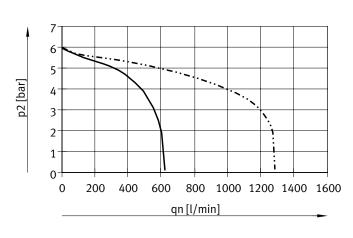
Standard nominal flow rate of valve/valve terminal [l/min	]								
Valve function (with valve code)	Termi-	Width 42 mm			Width 52 mm				
	nal code	Valve	Valve on valve terminal VTSA	Valve on valve terminal VTSA-F	Valve	Valve on valve terminal VTSA	Valve on valve terminal VTSA-F		
5/2-way double solenoid (B52)	J	2000	1300	1860	4000	2900	2900		
5/2-way double solenoid with dominant signal (D52)	D	2000	1300	1860	4000	2900	2900		
5/2-way single solenoid, pneumatic spring (M52A)	M	2000	1300	1860	4000	2900	2900		
5/2-way single solenoid, mechanical spring (M52M)	0	2000	1300	1860	4000	2900	2900		
5/3-way closed (P53C)	G	1900 <sup>1)</sup> 950 <sup>2)</sup>	1200 <sup>1)</sup> 800 <sup>2)</sup>	1690 <sup>1)</sup> 830 <sup>2)</sup>	3600 <sup>1)</sup> 1700 <sup>2)</sup>	2800 <sup>1)</sup> 1700 <sup>2)</sup>	2800 <sup>1)</sup> 1700 <sup>2)</sup>		
5/3-way exhausted (P53E)	E	1900 <sup>1)</sup> 950 <sup>2)</sup>	1200 <sup>1)</sup> 800 <sup>2)</sup>	1690 <sup>1)</sup> 830 <sup>2)</sup>	3600 <sup>1)</sup> 1700 <sup>2)</sup>	2800 <sup>1)</sup> 1700 <sup>2)</sup>	2800 <sup>1)</sup> 1700 <sup>2)</sup>		
5/3-way pressurised (P53U)	В	1900 <sup>1)</sup> 950 <sup>2)</sup>	1200 <sup>1)</sup> 800 <sup>2)</sup>	1690 <sup>1)</sup> 830 <sup>2)</sup>	3600 <sup>1)</sup> 1700 <sup>2)</sup>	2800 <sup>1)</sup> 1700 <sup>2)</sup>	2800 <sup>1)</sup> 1700 <sup>2)</sup>		
5/3-way, 1 to 2 pressurised, 4 to 5 closed (P53F)	VG	1700 <sup>1)</sup> 700 <sup>2)</sup>	1400 <sup>1)</sup> 800 <sup>2)</sup>	1700 <sup>1)</sup> 700 <sup>2)</sup>	3000 <sup>1)</sup> 900 <sup>2)</sup>	2300 <sup>1)</sup> 900 <sup>2)</sup>	2300 <sup>1)</sup> 900 <sup>2)</sup>		
2x3/2-way single solenoid, closed (T32C)	К	1600	1200	1300	3000	2400	2400		
2x3/2-way single solenoid, open (T32U)	N	1600	1200	1300	3000	2400	2400		
2x3/2-way single solenoid, open/closed (T32H)	Н	1600	1200	1300	3000	2400	2400		
2x3/2-way single solenoid, closed (T32N)	Q	1600	1200	1300	3000	2400	2400		
2x3/2-way single solenoid, open (T32F)	Р	1600	1200	1300	3000	2400	2400		
2x3/2-way single solenoid, open/closed (T32W)	R	1600	1200	1300	3000	2400	2400		
2x2/2-way single solenoid, closed (T22C)	VC	1600	1400	1500	4000	2800	2800		
2x2/2-way single solenoid, closed (T22CV)	W	1600	1400	1500	_				

Switching position
 Mid-position

#### Flow rate qn as a function of output pressure p2 with pressure regulator plates (P regulator plate) for port 1

6 bar 10 bar

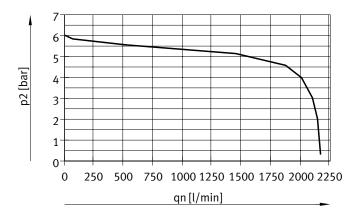


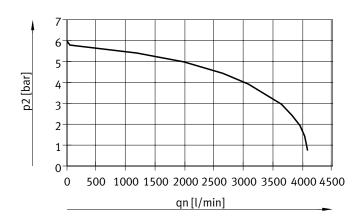


----- Width 18 mm
----- Width 26 mm

Width 18 mm
Width 26 mm

#### Input pressure 10 bar, regulated pressure set to 6 bar



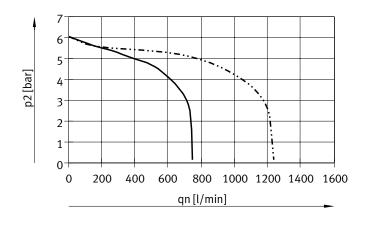


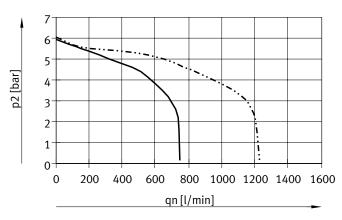
Width 42 mm (ISO 1)

Width 52 mm (ISO 2)

#### Flow rate qn as a function of output pressure p2 with pressure regulator plates (AB regulator plates) for port 2, 4 or ports 4/2

6 bar 10 bar

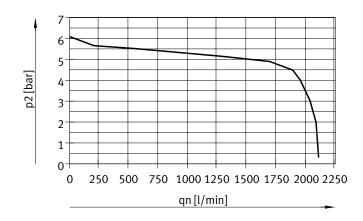


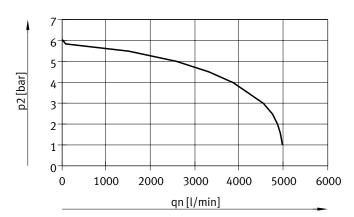


----- Width 18 mm

------ Width 18 mm

#### Input pressure 10 bar, regulated pressure set to 6 bar



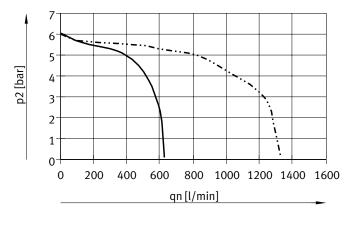


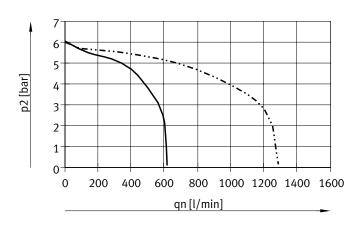
Width 42 mm (ISO 1)

Width 52 mm (ISO 2)

#### Flow rate qn as a function of output pressure p2 with pressure regulator plates (AB regulator plates, rev.) for ports 4/2, reversible

6 bar 10 bar

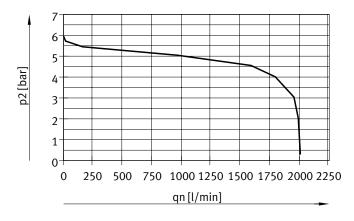


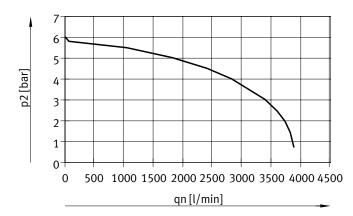


----- Width 18 mm

----- Width 18 mm

#### Input pressure 10 bar, regulated pressure set to 6 bar

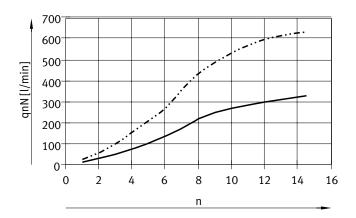




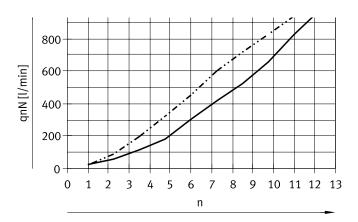
Width 42 mm (ISO 1)

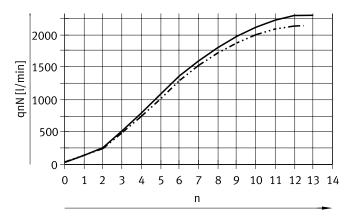
Width 52 mm (ISO 2)

#### Flow rate qn as a function of flow control



----- Width 18 mm





Width 42 mm (ISO 1)

Flow control screw from  $2 \rightarrow 3$ Flow control screw from  $4 \rightarrow 5$ 

n = revolutions of the adjusting screw

Width 52 mm (ISO 2)

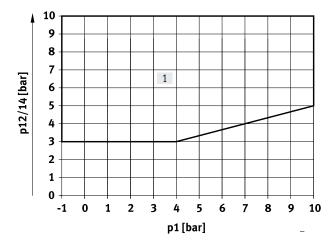
Flow control screw from 2 → 3

■ • • Flow control screw from  $4 \rightarrow 5$ 

n = revolutions of the adjusting screw

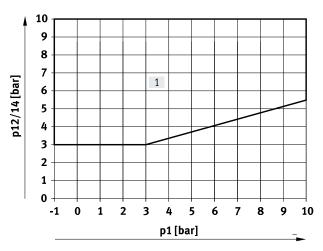
#### Pilot pressure p12/14 as a function of operating pressure p1

For 3/2-way solenoid valves (T32, T22)



[1] Operating range for valves with external pilot air supply

For 5/2-way solenoid valves (M52, B52, D52, P53)



[1] Operating range for valves with external pilot air supply

Standard nominal flow rate with vertical stacking [l/min]									
Widths	18 mm	26 mm	42 mm	52 mm					
Throttle plate									
VABF-S4-2-F1B1-C	See characteristic curve	-	-	-					
VABF-S4-1-F1B1-C	-	See characteristic curve	_	-					
VABF-S2-1-F1B1-C	-	-	1100	-					
VABF-S2-2-F1B1-C	-	_	_	See characteristic curve					
Vertical supply plate									
VABF-S4-2-P1AG18	430	-	_	-					
VABF-S4-1-P1AG14	-	900	-	-					
VABF-S2-1-P1AG38	-	-	1300	-					
VABF-S2-2-P1AG12	-	_	_	2800					
Vertical pressure shut-off plate									
VABF-S4-2-L1D1-C	400	-	_	-					
VABF-S4-2-L1D2-C 1)	320	-	-	-					
VABF-S4-1-L1D1-C	-	800	_	-					
VABF-S4-1-L1D2-C <sup>1)</sup>	-	620	-	-					
VABF-S2-1-L1D1-C	-	-	1200	-					
VABF-S2-2-L1D1-C	-	-	_	1950					

<sup>1)</sup> Lockable with key

Operating and environmental con-	ditions	
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Pilot medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Notes on operating/		Lubricated operation possible (in which case lubrication will always be required)
pilot medium		
External	[bar]	-0.9 +10
	[MPa]	-0.09 +1
Internal	[bar]	310
	[MPa]	0.3 1
Pilot pressure	[bar]	310
	[MPa]	0.3 1
Noise level LpA	[dB(A)]	85
Ambient temperature	[°C]	_5 +50
Temperature of medium	[°C]	_5 +50
Storage temperature	[°C]	-20 +60
Relative humidity	[%]	090
Certification		BIA
		C-Tick
		c UL us – Recognized (OL)
CE marking (see		To EU EMC Directive 1)
declaration of conformity)		
KC marking		KC EMC
Corrosion resistance class CRC <sup>3)</sup>		0

<sup>1)</sup> For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... 

Support/Downloads.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

<sup>2)</sup> Solenoid valves with code VC (2/2-way type ... T22C), N (3/2-way type ... T32U), K (3/2-way type ... T32C), H (3/2-way type ... T32H) must not be operated with vacuum; the operating pressure here is 3 ... 10 bar

<sup>3)</sup> Corrosion resistance class CRC 0 to Festo standard FN 940070

No corrosion stress. Applies to small, visually unimportant standard parts such as threaded pins, circlips and clamping sleeves which are usually only available on the market in a phosphated or burnished version (and possibly oiled) as well as to ball bearings (for components < CRC 3) and plain bearings.

Electrical data – Individual electrical connection									
Load voltage supply for valves (U <sub>val</sub> )									
Operating voltage	[V DC]	24 ±10%							
Max. residual current at 24 V DC	[A]	10							
Duty cycle		100%							
Degree of protection		IP65, NEMA 4 (for all types of signal transmission when mounted)							

Electrical data – Multi-pin plug connection									
Load voltage supply for valves (U <sub>val</sub> )									
Operating voltage	[V DC]	24 ±10%							
Max. total current	[A]	6							
Current rating at 40°C	[A]	1							
Surge resistance	[kV]	1.5							
Pollution degree		3							
Duty cycle		100%							
Degree of protection		IP65, NEMA 4 (for all types of signal transmission when mounted)							

Electrical data – With CPX terminal								
Power supply for electronics (U <sub>EL/SEN</sub> )								
Operating voltage	[V DC]	24 ±10%						
Max. intrinsic current consumption	[mA]	20						
at 24 V DC								
Duty cycle		100%						
Load voltage supply for valves (U <sub>val</sub> )								
Operating voltage	[V DC]	24 ±10%						
Diagnostic message undervoltage U <sub>OFF</sub>	[V]	21.6 21.5						
load voltage outside the functional range								
Degree of protection		IP65, NEMA 4 (for all types of signal transmission when mounted)						

Materials	
Manifold sub-base	Die-cast aluminium
Valve	Die-cast aluminium, PA
Seals	FPM, NBR, HNBR
Supply plate	Die-cast aluminium
Right end plate	Die-cast aluminium
Pneumatic interface for CPX	Die-cast aluminium
Throttle plate	Die-cast aluminium
Pressure regulator plate	Die-cast aluminium, PA
Multi-pin manifold block	Die-cast aluminium
Cover for the pneumatic interface and multi-pin plug	PA PA
connection	
Note on materials	RoHS-compliant RoHS-compliant

# Valve terminal VTSA/VTSA-F, NPT

Product weight							
Approx. weight	]						
Width	18 mm	26 mm	42 mm	52 mm			
Multi-pin node with Sub-D or terminal strip <sup>1)</sup>	550						
Multi-pin node with M12 individual connection	760	,					
Pneumatic interface CPX <sup>1)</sup>	1470						
Electrical interface for AS-Interface	300						
AS-Interface module	850						
Supply plate <sup>2)</sup>							
Exhaust plate with 3 and 5 common	617						
Exhaust air cover with 3 and 5 separate	597						
Right end plate <sup>3)</sup>							
With threaded connections	339			336			
Selector switch	281			-			
Manifold sub-base <sup>4)</sup>	447	634	340, 330 <sup>5)</sup>	610			
90°-connection plate <sup>3)</sup>	170	230	176	359			
Pressure regulator plate							
For port 1 (P)	350	402	640	1190			
For port 4 or 2 (A or B)	367	448	640	1230			
For ports 4 and 2 (A/B)	611	692	920	1990			
Throttle plate	228	320	220	565			
Vertical supply plate <sup>3)</sup>	140	191	340	605			
Vertical pressure shut-off plate	209	273	600	1030			
Vertical pressure shut-off plate (lockable with key)	231	290	-	-			
Blanking plate	34	73	68	146			

<sup>1)</sup> With sheet metal seal, printed circuit board

<sup>2)</sup> With sheet metal seal and electrical link

With screws
 With sheet metal seal, electrical interlinking module, inscription label holder, 4 screws
 Manifold sub-base optimised for flow rate, HS

# Dimensions Valve terminal with individual electrical connection The property of the propert

- [1] Solenoid valve, width 18 mm
- [2] Solenoid valve, width 26 mm
- [3] Solenoid valve, width 42 mm
- [4] Cover cap/manual override
- [5] Threaded connection 1/2 NPT
- [6] Threaded connection 3/8 NPT
- [7] Threaded connection 1/4 NPT
- [8] Threaded connection 1/8 NPT
- [9] H-rail
- [10] H-rail mounting
- [11] Mounting hole
- [12] Additional mounting bracket
- [13] Inscription label holder
- [14] Individual connection
- [15] End plate

- [16] 90°-connection plate 43 mm, 3/8 NPT
- [17] 90°-connection plate 54 mm, 1/4 NPT
- [18] M12 plug 5-pin (6-way or 10way)
- [19] Solenoid valve, width 52 mm  $\,$
- [20] Supply plate

- NO2 Number of manifold sub-bases 38 mm
- NO1 Number of manifold sub-bases 54 mm
- N1 Number of manifold sub-bases 43 mm
- N2 Number of manifold sub-bases 59 mm
- Number of supply plates (only with end plate with pilot air selector)

Dim.	B1	B2	В	3   1	B4 B5	Б	6 B7	B8	В9	B1	0 B1	1 B1	2 B	13 B	14	B15	B16	B17	B18	B19	B20
[mm]	150.5	142	2 12	21	57 46	3	3 18	48	26	24	21	.3 1	2 29	9.6	23 :	19.6	19.5	19	10.5	6.6	4.5
Dim.	L2	L3	L	.4	L5	L6	L7	L8	L9		L10	L11	L12	L13	L14	L1	5	L16	L17	L18	L19
[mm]	92.4	71.3	n2	x59	n01x54	54	n1x43	43	43.	5 n0	2x38	nx38	38	37.3	24	20	.5	20	14.1	9.8	6.3
Dim.	L20	L21	L22	D1ø	D2Ø	H1	H2	Н3	H4	H5	Н6	H7	H8	H9	H10	H11	H1	2 H:	13 H1	4   H15	H16
[mm]	5.5	3	2	18.5	4.5	125	121.3	118.2	118	103	107.8	90.3	87	65	44	25.7	24	.5 1	2 6	3.5	0.5

Width	L1
18 mm	71.3 + n02 x 38 + n x 38 + 37.3
26 mm	71.3 + n01 x 54 + n x 38 + 37.3
42 mm	71.3 + n1 x 43 + n x 38 + 37.3
52 mm	71.3 + n2 x 59 + n x 38 + 37.3
Mixture of 18 mm, 26 mm, 42 mm and 52 mm	71.3 + n02 x 38 + n01 x 54 + n1 x 43 + n2x59 + n x 38 + 37.3

Note: This product conforms to ISO 1179-1 and ISO 228-1.

#### **Dimensions** Download CAD data → www.festo.com Valve terminal with multi-pin plug connection 17 7 14 5 8 15 L22 12 H18 H12 5 9 10 [1] Solenoid valve [9] H-rail [17] 90°-connection plate 54 mm, N02 Number of manifold sub-bas-Width 18 mm [10] H-rail mounting es 38 mm 1/4 NPT [2] Solenoid valve [11] Mounting hole [18] Proximity switch M12x1 N01 Number of manifold sub-bas-Width 26 mm [12] Additional mounting bracket [19] Plug socket M12x1 es 54 mm [3] Solenoid valve [13] Inscription label holder [20] Electrical connection to Number of manifold sub-bas-N1 Width 42 mm [14] Multi-pin plug connection EN 175301-803, type C es 43 mm Cover cap/manual override [15] End plate [21] Solenoid valve, width 52 mm Number of manifold sub-bas-[4] [16] 90°-connection plate 43 mm, [5] Threaded connection 1/2 NPT [22] Supply plate es 59 mm Threaded connection 3/8 NPT 3/8 NPT [23] Soft-start valve Number of supply plates (only [6] n [7] Threaded connection 1/4 NPT with end plate with pilot air Threaded connection 1/8 NPT selector) [8] Dim. ВЗ В6 В7 В8 В9 B10 B11 B12 B13 B14 B16 B17 B18 B20 150.5 142 121 57 46 33 18 48 26 27 12 29.6 19.5 19 10.5 6.6 4.5 [mm] 23 Dim. L4 L5 L6 L7 L8 L9 L10 L11 L12 L13 L14 L15 L16 L18 L19 L20 L21 L2 L3 92.4 n2x59 n01x54 54 n1x43 43 n02x38 nx38 38 37.3 20.5 20 9.8 [mm] 71.3 43.5 36 6.3 5.5 3 Dim. L22 D1ø D2Ø Н1 H2 Н3 Н4 Н5 Н6 Н7 Н8 Н9 H10 H11 H12 H13 H14 H15 H16 H17 H18

Width	[11
18 mm	71.3 + n02 x 38 + n x 38 + 37.3
26 mm	71.3 + n01 x 54 + n x 38 + 37.3
42 mm	71.3 + n1 x 43 + n x 38 + 37.3
52 mm	71.3 + n2 x 59 + n x 38 + 37.3
Mixture of 18 mm, 26 mm, 42 mm and 52 mm	71.3 + n02 x 38 + n01 x 54 + n1 x 43 + n2 x 59 +n x 38+ 37.3

107.8

103

90.3

90.3

18.5

4.5

143.9

133.3

125

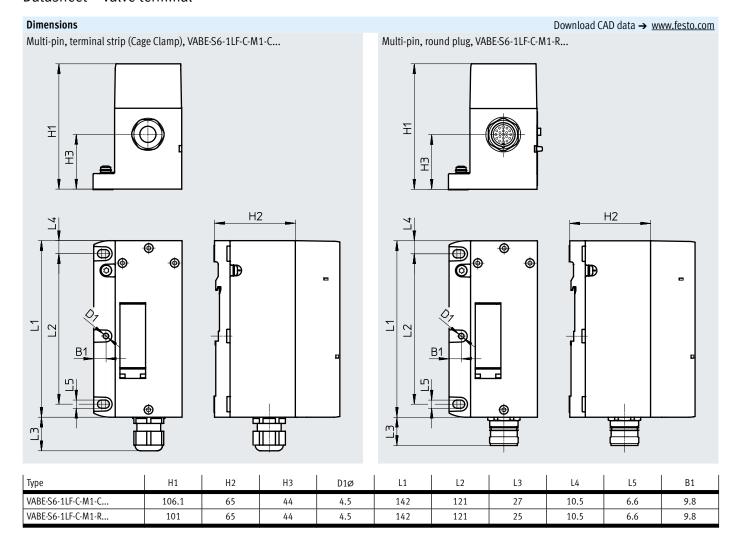
121.3

118.2

106.3

[mm]

<sup>♦</sup> Note: This product conforms to ISO 1179-1 and ISO 228-1.



#### **Dimensions** Download CAD data → www.festo.com AP interface 4 17 3 2 16 18 1 L18 12 11 D2 13 [1] Solenoid valve 18 mm [6] Threaded connection G3/8, [14] End plate [9] H-rail [2] Solenoid valve 26 mm 3/8 NPT [10] H-rail mounting [15] Proximity switch M12x1 Solenoid valve 42 mm Threaded connection G1/4, [11] Mounting hole [16] Cover cap/manual override [7] Solenoid valve 52 mm 1/4 NPT [12] Additional mounting bracket [17] Soft-start valve 43 mm [4] [5] Threaded connection G1/2, [8] Threaded connection G1/8, [13] Inscription label [18] Supply plate 1/2 NPT 1/8 NPT Туре В1 B2 В3 В4 В6 В7 B10 B12 B13 B16 B18 B19 B20 D2 VTSA-ASI-. 150.5 142 121 57 33 18 28 12 29.6 19.5 10.5 6.6 4.5 4.5 Type Н1 Н2 НЗ Н4 Н5 Н6 Н7 Н8 Н9 H10 H12 H13 H15 VTSA-ASI-. 143.9 125 121.3 85.5 90.3 104.5 118.2 171 65 44.4 24.5 12 3.5 Type L1 Valve size 18 mm 02: 71.3 + n02 x 38 + n x 38 + 37.3 Valve size 26 mm 01: 71.3 + n01 x 54 + n x 38 + 37.3

71.3 + n1 x 43 + n x 38 + 37.3

71.3 + n2 x 59 + n x 38 + 37.3

02 + 01 + 1 + 2

71.3 + n02 x 38 + n01 x 54 + n1 x 43 + n2 x 59 + n x 38 + 37.3

L10

n02<sup>4)</sup> x 38

L11

n<sup>5)</sup> x 38

L12

L13

37.3

L18

9.8

L19

1)	Number of manifold sub-bases 59 mm

12

92.4

13

71.3

L4

n2<sup>1)</sup> x 59

Valve size 42 mm

Valve size 52 mm

42 mm and 52 mm

Туре

VTSA-ASI-..

Mixture of 18 mm, 26 mm,

15

n01<sup>2)</sup> x 54

L7

n1<sup>3)</sup> x 43

L9

43.5

L21

L22

Number of manifold sub-bases 54 mm

<sup>3)</sup> Number of manifold sub-bases 43 mm

<sup>4)</sup> Number of manifold sub-bases 38 mm

<sup>5)</sup> Number of manifold sub-bases

#### **Dimensions** Download CAD data → www.festo.com Valve terminal with AS-Interface connection 19 3 2 17 5 5 7 5 6 8 14 Н9 83 10 [1] Solenoid valve, width 18 mm [7] Threaded connection 1/4 NPT [16] Proximity switch M12x1 N02 Number of manifold sub-bas-[2] Solenoid valve, width 26 mm Threaded connection 1/8 NPT [17] Cover cap/manual override es 38 mm [3] Solenoid valve, width 42 mm [9] H-rail [18] Soft-start valve, width 43 mm N01 Number of manifold sub-bas-Solenoid valve, width 52 mm [10] H-rail mounting [19] Supply plate es 54 mm Threaded connection 1/2 NPT [11] Mounting hole N1Number of manifold sub-bas-Threaded connection 3/8 NPT [12] Additional mounting bracket es 43 mm [13] Inscription label N2Number of manifold sub-bas-[14] End plate es 59 mm [15] Plug M12 Number of supply plates n

Dim.	B1	В	2 B	3 B	i B	6   1	37 I	B10	B12	В	13	B14	B16	B1	8	B19	B20
[mm]	150.5	14	2 12	21 57	7 3	3	18	28	12	2	9.6	23	19.5	10.	5	6.6	4.5
l 5:	ادا	ا ا		۱	1	ا ا	1		144	1	1	يين ا	1	. 1 .		100	
Dim.	L2	L3	L4	L5	L7	L9	L10		L11	L12	L13	L16	L18	3 L	19	L20	L21
[mm]	92.4	71.3	n2x59	n01x54	n1x43	43.5	n02x3	8	nx38	43	37.3	20	9.8	3 6	.3	5.5	3
					1		1								1	-	
Dim.	L22	D2Ø	H1	H2	Н3	H4	H5	Н	6	H7	Н8	H9	H10	H12	H13	H14	H15
[mm]	2	4.5	143.9	125	118.2	121.3	118.6	17	71	90.3	104.5	65	44	24.5	12	6	3.5

Width	L1
18 mm	71.3 + n02 x 38 + n x 38 + 37.3
26 mm	71.3 + n01 x 54 + n x 38 + 37.3
42 mm	71.3 + n1 x 43 + n x 38 + 37.3
52 mm	71.3 + n2 x 59 + n x 38 + 37.3
Mixture of 18 mm, 26 mm, 42 mm and 52 mm	71.3 + n02 x 38 + n01 x 54 + n1 x 43 + n2 x 59 + n x 38 + 37.3

# Dimensions Valve terminal with fieldbus interface The property of the proper

- [1] Solenoid valve, width 18 mm
- [2] Solenoid valve, width 26 mm
- [3] Solenoid valve, width 42 mm
- [4] Cover cap/manual override
- [5] Threaded connection 1/2 NPT
- [6] Threaded connection 3/8 NPT
- [7] Threaded connection 1/4 NPT
- [/] Timeaded connection 1/4 Ni
- [8] Threaded connection 1/8 NPT
- [9] H-rail

- [10] H-rail mounting
- [11] Mounting hole
- [12] Additional mounting bracket
- [13] Inscription label holder
- [14] Pneumatic interface CPX
- [15] End plate
- [16] CPX module/bus node
- [17] 90°-connection plate 43 mm, 3/8 NPT
- [18] 90°-connection plate 54 mm, 1/4 NPT
- [19] Proximity switch M12x1

- [20] Plug socket M12x1
- [21] Electrical connection to EN 175301-803, type C
- [22] Hole for additional mounting, diameter 6.4 2x
- [23] Solenoid valve, width 52 mm
- [24] Supply plate
- [25] Soft-start valve

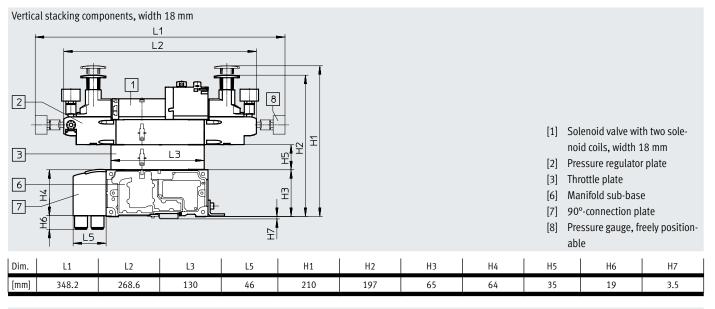
- NO2 Number of manifold sub-bases 38 mm
- NO1 Number of manifold sub-bases 54 mm
- N1 Number of manifold sub-bases 43 mm
- N2 Number of manifold sub-bases 59 mm
- n Number of supply plates (only with end plate with pilot air selector)
- m Number of CPX modules

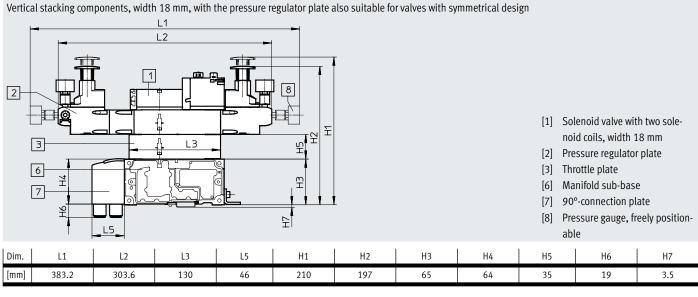
Dim.	B1	B2	В3	B4	B5	B6	В7	B8	В9	B10	B11	B12	B13	B14	B16	B17	B18	B19	B20	B21	B22	B23	B24
[mm]	107.3	142	121	57	46	33	18	48	26	78	66	12	29.6	23	19.5	19	10.5	6.6	4.5	65	18.9	7.5	4.4
Dim.	L2	L3	L4	1 .	.5	L6	L7	L8	ı	L9	L1	10	L11	L12	L13	L14	L15	L1	7   L	18	L19	L21	L22
[mm]	92.4	50	n2x5	_	x54	54	n1x43	43	ı	nx50.1	n02	_	nx38	38	37.3	1	20.5	_	-	_	6.3	3	2
Dim.	L23	L24	L25	H1	H2	Н3	H4	н	15	Н6	H7	Н8	Н9	H10	H11	H12	H13	H14	H15	H16	H17	H18	H19
[mm]	30.4	23.7	1.5	143.9	133.3	125	121.3	11	8.2	103	106.8	87	90.3	92.9	55.1	65	25.8	25.7	24.5	12	6	3.5	10.8

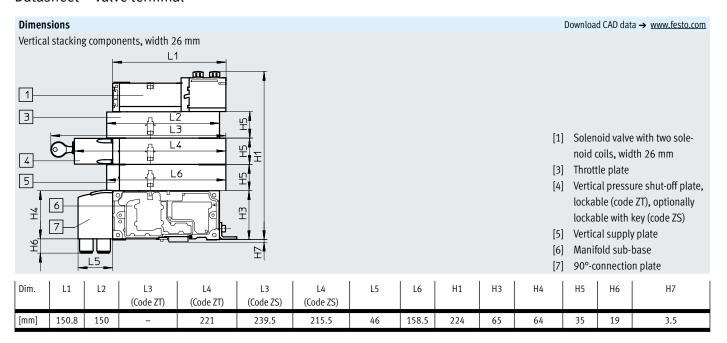
Width	L1
18 mm	30.4 + m x 50.1 + 50 + n02 x 38 + n x 38 + 37.3
26 mm	30.4 + m x 50.1 + 50 + n01 x 54 + n x 38 + 37.3
42 mm	30.4 + m x 50.1 + 50 + n1 x 43 + n x 38 + 37.3
52 mm	30.4 + m x 50.1 + 50 + n2 x 59 + n x 38 + 37.3
Mixture of 18 mm, 26 mm, 42 mm and 52 mm	30.4 + m x 50.1 + 50 + n02 x 38 + n01 x 54 + n1 x 43 + n2x59 + n x 38 + 37.3

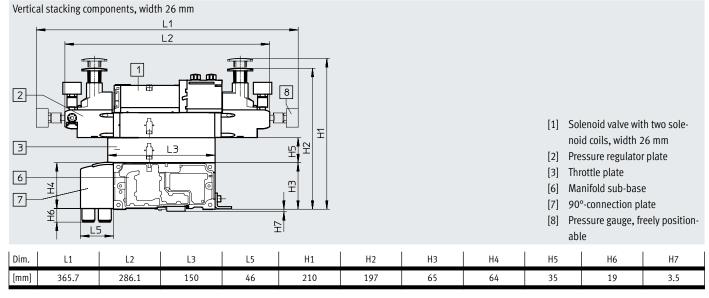
<sup>♦</sup> Note: This product conforms to ISO 1179-1 and ISO 228-1.

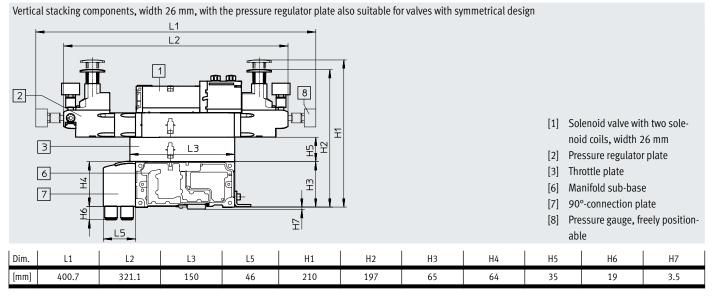
#### **Dimensions** Download CAD data → www.festo.com Vertical stacking components, width 18 mm 1 3 [1] Solenoid valve with two sole-L4 noid coils, width 18 mm [3] Throttle plate L6 5 [4] Vertical pressure shut-off plate lockable (code ZT), optionally 6 lockable with key (code ZS) 7 [5] Vertical supply plate Manifold sub-base [6] \_L5 [7] 90°-connection plate L5 Dim. L1 L2 L3 L4 L3 L4 L6 Н1 Н3 Н4 Н5 Н6 Н7 (Code ZT) (Code ZT) (Code ZS) (Code ZS) [mm] 133.8 130 203.7 222.3 198.3 46 142 224 65 64 35 19 3.5





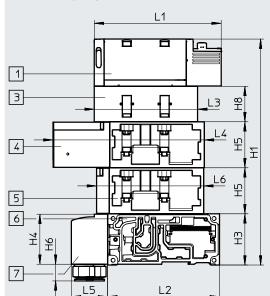






#### **Dimensions**

Vertical stacking components, width 42 mm

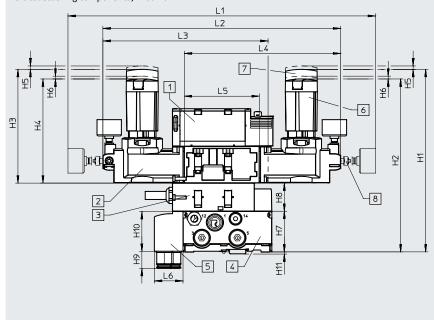


Download CAD data → www.festo.com

- [1] Solenoid valve
- [3] Throttle plate
- [4] Vertical pressure shut-off plate
- [5] Vertical supply plate
- [6] Manifold sub-base
- [7] 90°-connection plate

Dim.	L1	L2	L3	L4	L5	L6	H1	Н3	H4	H5	Н6	H7	H8
[mm]	137.8	142	105.3	173.8	46	117.6	236	65	64	45.3	25.7	3.5	28

Vertical stacking components, width 42 mm



- [1] Solenoid valve
- [2] Pressure regulator plate
- [3] Throttle plate
- [4] Manifold sub-base
- [5] 90°-connection plate
- [6] Short rotary knob, lockable (standard)
- [7] Long rotary knob, lockable
- [8] Pressure gauge, freely positionable

Dim.	L1	L2	L3	L4	L5	L6	H1	H2	Н3	H4	H5	H6	H7	H8	H9	H10	H11
[mm]	410.3	311.6	216.1	207.1	102.6	46	220	205	127	112	3	4.2	65	28	25.7	64	3.5



Pressure regulator plates for symmetrical valves with widths of 42 mm and 52 mm can only be ordered via the pressure regulator configurator VABF-S2.

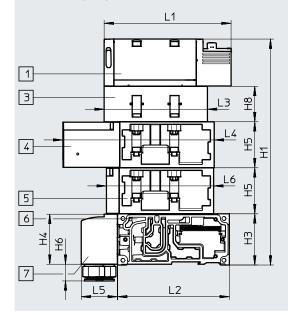
→ Internet: vabf-s2

The following can be selected using the pressure regulator configurator VABF-S2:

- Rotary knob, short version with locking element (standard)
- Rotary knob, long version with locking element
- Rotary knob with integrated lock

#### Dimensions

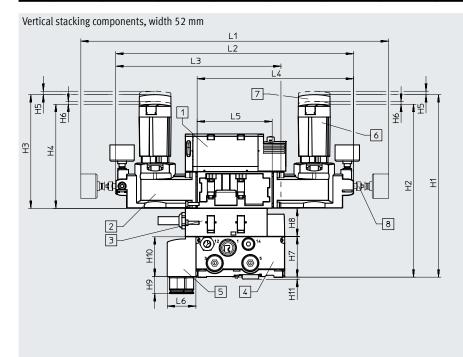
Vertical stacking components, width 52 mm



Download CAD data → www.festo.com

- [1] Solenoid valve
- [3] Throttle plate
- [4] Vertical pressure shut-off plate
- [5] Vertical supply plate
- [6] Manifold sub-base
- [7] 90°-connection plate

Dim.	L1	L2	L3	L4	L5	L6	H1	Н3	H4	H5	H6	H8	
[mm]	160.7	142	131	191.2	46	136	287.4	65	63.5	58.7	21.2	45	



- [1] Solenoid valve
- [2] Pressure regulator plate
- [3] Throttle plate
- [4] Manifold sub-base
- [5] 90°-connection plate
- [6] Short rotary knob, lockable (standard)
- [7] Long rotary knob, lockable
- [8] Pressure gauge, freely positionable

Dim.	L1	L2	L3	L4	L5	L6	H1	H2	Н3	H4	H5	Н6	H7	H8	H9	H10	H11
[mm]	492	380.4	264.2	250.2	120	45.8	291	276	181	166	5.5	4.5	65	45	27.4	63.5	3.5



#### Note

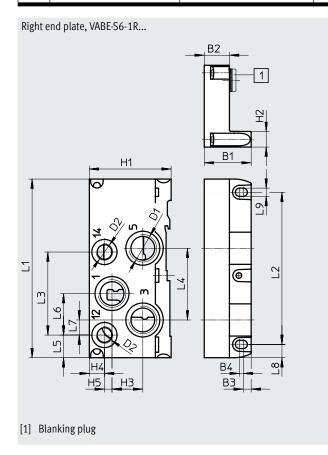
Pressure regulator plates for symmetrical valves with widths of 42 mm and 52 mm can only be ordered via the pressure regulator configurator VABF-S2.

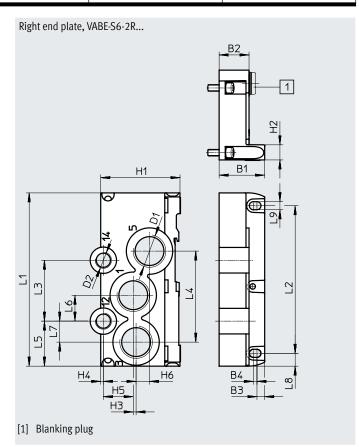
→ Internet: vabf-s2

The following can be selected using the pressure regulator configurator VABF-S2:

- Rotary knob, short version with locking element (standard)
- Rotary knob, long version with locking element
- Rotary knob with integrated lock

#### **Dimensions** Download CAD data → www.festo.com Supply plate with silencer 2 1 [1] Supply plate Exhaust port cover Silencer U-1/2-B-NPT L2 Threaded connection 1/2 NPT Dim. 142 107.5 75 31.5 38 [mm]





Туре	L1	L2	L3	L4	L5	L6	L7	L8	L9	D1	D2	H1	H2	Н3	H4	H5	Н6	B1	B2	В3	В4	With <sup>1)</sup>
VABE-S6-1R-G12	142	121	66	5.7	18	22	12	10.5	6.6	1/2 NPT	1/4 NPT	65	12.5	24.5	12	6	_	27 2	22	6.3	2	[1]
VABE-S6-1RZ-G12	142	121	00	57	10	22	12	10.5	0.0	1/2 NF1	1/4 NF1	05	12.5	24.5	12	0	_	3/.3	22	6.3	ر	-
VABE-S6-2R-G34	142	121	49.9	74.6	36.9	21.2	17 2	10.5	6.6	3/4 NPT	1/4 NPT	65	12.5	23	2.2	24.5	11	37.3	24.5	63	2	[1]
VABE-S6-2RZ-G34	142	121	43.3	74.0	30.9	21.2	17.2	10.5	0.0	3/4 INF I	1/4 INF I	03	12.5	2.5	2.2	24.5	11	37.3	24.5	6.3	ر	-

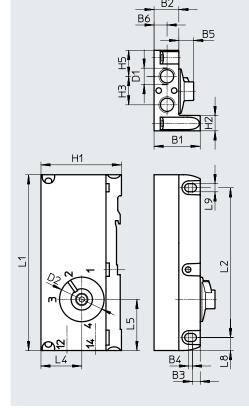
With blanking plug = internal pilot air supply, – without blanking plug = external pilot air supply Special feature: There is no port 14 for VABE-S6-1R-G12 (code V).

 $<sup>\</sup>mbox{\ensuremath{\psi}}$  · Note: This product conforms to ISO 1179-1 and ISO 228-1.

#### Dimensions

Download CAD data → www.festo.com

Right end plate with pilot air selector, VABE-S6-1RZ-N-B1



Туре		L1	L2	L5	L8	L9	D1	D2	H1	H2	Н3	H4	H5	B1	B2	В3	B4	B5	В6
VABE-S6-1R	Z-N-B1	142	121	41.3	10.5	6.6	1/4 NPT	37	65.4	12.5	23	33	21	37.3	20	6.3	3	12	10.5

Note: This product conforms to ISO 1179-1 and ISO 228-1.

# Datasheet - Solenoid valves VSVA

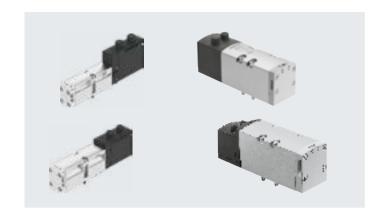
- **[]** - Valve width to ISO 15407-2

- 18 mm
- 26 mm to ISO 5599-2
- 42 mm (ISO 1)
- 52 mm (ISO 2)

- **\** - Voltage 24 V DC



Width 18 mm: up to 550 (700) l/min Width 26 mm: up to 1100 (1350) l/min Width 42 mm: up to 1300 (1860) l/min Width 52 mm: up to 2900 l/min



1) Flow rates in brackets apply to VTSA-F

General technical data for solen	oid valves	
Design		Piston spool valve
Sealing principle		Soft
Overlap		Overlap (excluding types P53AD, P53BD)
		Negative overlap (types P53AD, P53BD)
Reset method		Mechanical or pneumatic, depending on the type used
Actuation type		Electrical
Electrical connection		Plug to ISO 15407-2, 2-pin (single solenoid types) or 4-pin (double solenoid and 5/3-way types)
Type of control		Piloted
Degree of protection to EN 60529	)	IP65, NEMA 4 (for all types of signal transmission when mounted)
Exhaust function, can be throttle	d	Via individual sub-base, via throttle plate (not with valve type T22)
Type of mounting		On manifold sub-base, on individual sub-base
Mounting position		Any
Manual override		Detenting, non-detenting, concealed
Signal status indication		LED (except types with signal status display sensor, and part nos.: 560727 and 560728)
Sensor signal status indication		Yellow LED
Duty cycle	[%]	100
Pollution degree		3
Surge resistance	[kV]	2.5
Nominal operating voltage	[V DC]	24 (dependent on valve type)
Permissible voltage fluctuations	[%]	±10
Pneumatic connections		
Supply	1	Via the manifold sub-base of the valve terminal or via individual sub-base
Exhausting	3/5	
Working ports	2/4	
Pilot air supply	1 2/14	
Pilot exhaust air	8 2/84	Either ducted or unducted

#### Datasheet - Solenoid valves

Pneumatic character	istic data									
Terminal code	VC	VV	N	K	Н	P	Q	R	M	0
Valve code	T22C	T22CV	T32U	T32C	T32H	T32F	T32N	T32W	M52-A	M52-M
Flow direction										
Any	-	•	_	-	_	-	_	-	-	•
Reversible only	-	-	-	-	-	•	•	•	_	-
Not reversible	•	-		•	•	-	-	_	-	-
Reset method										
Pneumatic spring		•	•			•		•	•	_
Mechanical	_	_	-	-	-	-	-	-	_	•
Micchailicat										
spring										
	ristic data	D	В	G	E	SA	SB	SD	SE	VG
spring  Pneumatic character  Terminal code	ristic data   J   B52	D D52	B P53U	G P53C	E   P53E	SA P53ED	SB P53AD			
Spring  Pneumatic character Terminal code  Valve code	J									
spring  Pneumatic character Terminal code  Valve code  Flow direction	J				P53E	P53ED	P53AD	P53BI	) P53EP	
Pneumatic character Terminal code Valve code Flow direction Any	J B52	D52	P53U	P53C	P53E	P53ED	P53AD	P53BI	P53EP	P53F
Pneumatic character Terminal code Valve code Flow direction Any Reversible only	J   B52	D52	P53U ■	P53C	P53E	P53ED -	P53AD	P53BI	P53EP	P53F
Pneumatic character Terminal code Valve code Flow direction Any Reversible only Not reversible	B52	D52	P53U	P53C	P53E	P53ED -	P53AD	P53BI	P53EP	P53F
Pneumatic character Terminal code Valve code Flow direction Any Reversible only Not reversible Reset method	B52	D52	P53U	P53C	P53E	P53ED -	P53AD	P53BI	P53EP	P53F
spring  Pneumatic character	B52	D52	P53U	P53C	P53E	P53ED -	P53AD	P53BI	P53EP	P53F

#### Flow direction of solenoid valves

Solenoid valves only with reversible flow direction

- These valves must only be operated on pressure zones with reversible supply (3 and 5 with supply pressure 1 as exhaust air) or on a reversible pressure regulator. If necessary, create separate pressure zones with duct separation.
- Reversible 3/2-way solenoid valves do not permit the special function "ducted pilot exhaust air"
- Ports 12 and 14 on the end plate variants must be supplied with the same pressure.
- Right end plate with pilot air selector: can be realised via position 1 or
- Right end plate with threaded connections: 12 and 14 must be supplied with the same pressure level

Solenoid valves with any flow direction

- Valves with any flow direction such as the 5/2-way solenoid valve, code M, for example, are suitable for vacuum operation (standard valves such as the 2x 2/2-way solenoid valve with code VC, for example, must not be used for vacuum operation).
- An exception is the 2x 2/2-way solenoid valve with code VV (T22CV), which only allows vacuum operation at ports 3 and 5. The solenoid valve with code VV (T22CV) cannot be combined with other valve functions; a separate pressure zone is required.

# Datasheet – Solenoid valves

Operating and environmental cond	itions						
Operating medium			Compressed air to ISO 8573-1:2010 [7:4:4]				
Pilot medium			Compressed air to ISO 8573-1:2010 [7:4:4]				
Notes on operating/ pilot medium			Lubricated operation possible (in which case lubrication will always be required)				
Operating pressure, pilot air sup- [bar]			-0.9 +10 (valves with any flow direction and reversible valves)				
ply <sup>2)</sup>			3 10 (non-reversible valves)				
		[MPa]	-0.09 +1 (valves with any flow direction and reversible valves)				
			0.3 1 (non-reversible valves)				
Pilot pressure		[bar]	310				
		[MPa]	0.3 1				
Pilot air supply			External				
			Internal via valve terminal				
Ambient temperature		[°C]	-5 +50				
Relative humidity		[%]	090				
Certification			BIA (for characteristic SP and/or SN only)				
	Direct voltage 24 V DC		C-Tick (only size 52 mm and solenoid valves with sensor (position sensing))				
			c UL us – Recognized (OL)				
CE marking (see declaration of conformity)	Direct voltage 24 V DC		To EU EMC Directive 1)				

<sup>1)</sup> For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... -> Support/Downloads.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

<sup>2)</sup> Solenoid valves with code VC (2/2-way type ... T22C), N (3/2-way type ... T32U), K (3/2-way type ... T32C), H (3/2-way type ... T32H) must not be operated with vacuum; the operating pressure here is 3 ... 10 bar

# Datasheet - Solenoid valve width 18 mm

- **[]** - Valve width to ISO 15407-2 18 mm

- Flow rate
Valve width 18 mm:
VTSA up to 550 l/min
VTSA-F up to 700 l/min

- **\** - Voltage 24 V DC



Safety characteristics – Valve, width 18 mm						
Conforms to EN 13849-1/2						
CE marking (see declaration of	Direct voltage	To EU EMC Directive <sup>1)</sup> (solenoid valves with sensor only)				
conformity)	24 V DC					
Shock resistance		Shock test with severity level 2, to EN 60068-2-27				
Vibration resistant		Transport application test with severity level 2, to EN 60068-2-6				

<sup>1)</sup> For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... 

Support/Downloads.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Valve function (with valve code)	Termi-	Test pulses				
	nal code	Max. positive test pulse with logic 0 [μs]	Max. negative test pulse with logic 1 [μs]			
5/2-way double solenoid (B52)	J	1500	800			
5/2-way double solenoid with dominant signal (D52)	D	1700	1200			
5/2-way single solenoid (M52A)	М	1500	800			
5/2-way single solenoid (M52M)	0	1500	800			
5/3-way closed (P53C)	G	1500	800			
5/3-way exhausted (P53E)	E	1500	800			
5/3-way pressurised (P53U)	В	1500	800			
5/3-way exhausted, switching position 14 detenting (P53ED)	SA	1500	800			
5/3-way exhausted, switching position 12 detenting (P53EP)	SE	1500	800			
5/3-way, port 2 pressurised, 4 exhausted, switching position 14 detenting (P53AD)	SB	1500	800			
5/3-way, port 4 pressurised, 2 exhausted, switching position 14 detenting (P53BD)	SD	1500	800			
2x3/2-way single solenoid, closed (T32C)	К	1700	1200			
2x3/2-way single solenoid, open (T32U)	N	1700	1200			
2x3/2-way single solenoid, open/closed (T32H)	Н	1700	1200			
2x3/2-way single solenoid, closed (T32N)	Q	1700	1200			
2x3/2-way single solenoid, open (T32F)	Р	1700	1200			
2x3/2-way single solenoid, open/closed (T32W)	R	1700	1200			
2x2/2-way single solenoid, closed (T22C)	VC	1700	1200			
2x2/2-way single solenoid, closed (T22CV)	VV	1700	1200			

# Datasheet – Solenoid valve width 18 mm

Valve function (with valve code)	Termi-	Flow direction			Reset method	Weight	
	nal code	Any	Reversible only	Not reversible	Pneumatic spring	Mechanical spring	[g]
5/2-way double solenoid (B52)	J	•	_	_	-	_	172
5/2-way double solenoid with dominant signal (D52)	D	•	-	-	-	_	172
5/2-way single solenoid (M52A)	M	•	-	-	•	_	163
5/2-way single solenoid (M52M)	0	•	_	-	_	•	163
5/3-way closed <sup>1)</sup> (P53C)	G	•	-	-	-	•	191
5/3-way exhausted <sup>1)</sup> (P53E)	E	•	-	-	-	•	191
5/3-way pressurised <sup>1)</sup> (P53U)	В	•	-	-	-	•	191
5/3-way exhausted, switching position 14 detenting (P53ED)	SA	-	-	•	-	•	170
5/3-way exhausted, switching position 12 detenting (P53EP)	SE	-	_	•	-	-	170
5/3-way, port 2 pressurised, 4 exhausted, switching position 14 detenting (P53AD)	SB	•	-	-	-	•	172
5/3-way, port 4 pressurised, 2 exhausted, switching position 14 detenting (P53BD)	SD	-	-	•	-	•	172
2x3/2-way single solenoid, closed (T32C)	К	_	-	•	•	-	190
2x3/2-way single solenoid, open (T32U)	N	_	-	•	•	-	190
2x3/2-way single solenoid, open/closed (T32H)	Н	-	-	•	•	_	190
2x3/2-way single solenoid, closed (T32N)	Q	-	•	_	•	-	190
2x3/2-way single solenoid, open (T32F)	Р	_	•	-	•	_	190
2x3/2-way single solenoid, open/closed (T32W)	R	-	•	-	•	_	190
2x2/2-way single solenoid, closed (T22C)	VC	_	-	•	•	-	190
2x2/2-way single solenoid, closed (T22CV)	W	•	-	-	•	-	190

If neither solenoid coil is energised, the valve is moved to its mid-position by spring force.
 If both solenoid coils are energised at the same time, the valve remains in the previously assumed switching position.

# Datasheet - Solenoid valve width 18 mm

Valve function (with valve code)	Termi-	Flow rate						
	nal code	Valve	Valve on valve terminal VTSA	Valve on valve terminal VT- SA-F	Valve on individual sub- base			
5/2-way double solenoid (B52)	J	750	550	700	600			
5/2-way double solenoid with dominant signal (D52)	D	750	550	700	600			
5/2-way single solenoid (M52A)	М	750	550	700	600			
5/2-way single solenoid (M52M)	0	750	550	700	600			
5/3-way closed (P53C)	G	700	450	650	550			
5/3-way exhausted (P53E)	E	7001)	450 <sup>1)</sup>	4801)	500 <sup>1)</sup>			
		330 <sup>2)</sup>	330 <sup>2)</sup>	330 <sup>2)</sup>	330 <sup>2)</sup>			
5/3-way pressurised (P53U)	В	700 <sup>1)</sup>	450 <sup>1)</sup>	4801)	500 <sup>1)</sup>			
		330 <sup>2)</sup>	330 <sup>2)</sup>	330 <sup>2)</sup>	330 <sup>2)</sup>			
5/3-way exhausted, switching position 14 detenting	SA	-	380 <sup>1)</sup>	430 <sup>1)</sup>	390 <sup>1)</sup>			
(P53ED)			310 <sup>2)</sup>	360 <sup>2)</sup>	310 <sup>2)</sup>			
5/3-way exhausted, switching position 12 detenting	SE	-	380 <sup>1)</sup>	4601)	390 <sup>1)</sup>			
(P53EP)			300 <sup>2)</sup>	350 <sup>2)</sup>	320 <sup>2)</sup>			
5/3-way, port 2 pressurised, 4 exhausted, switching posi-	SB	-	380 <sup>1)</sup>	4401)	380 <sup>1)</sup>			
tion 14 detenting (P53AD)			350 <sup>2)</sup>	4002)	360 <sup>2)</sup>			
5/3-way, port 4 pressurised, 2 exhausted, switching posi-	SD	-	370 <sup>1)</sup>	4301)	4001)			
tion 14 detenting (P53BD)			340 <sup>2)</sup>	360 <sup>2)</sup>	350 <sup>2)</sup>			
			360 <sup>3)</sup>	4503)	390 <sup>3)</sup>			
			360 <sup>4)</sup>	450 <sup>4)</sup>	380 <sup>4)</sup>			
2x3/2-way single solenoid, closed (T32C)	K	600	400	550	500			
2x3/2-way single solenoid, open (T32U)	N	600	400	550	500			
2x3/2-way single solenoid, open/closed (T32H)	Н	600	400	550	500			
2x3/2-way single solenoid, closed (T32N)	Q	600	400	550	500			
2x3/2-way single solenoid, open (T32F)	Р	600	400	550	500			
2x3/2-way single solenoid, open/closed (T32W)	R	600	400	550	500			
2x2/2-way single solenoid, closed (T22C)	VC	700	500	650	500			
2x2/2-way single solenoid, closed (T22CV)	VV	700	500	650	500			

<sup>1)</sup> Switching position

#### Note

When using the solenoid valves VSVA-B-P53AD-...- or VSVA-B-P53BD-...- (terminal code SB or SD) for unobstructed exhausting (1 $\rightarrow$ 2 or  $1\rightarrow4)$  in the detenting or mid-position, the flow rate can reduce or drop to 0 l/min if the operating pressure is greater than 6 bar. This does not happen if a tube measuring at least 15 cm in length is used at port 2/4.

<sup>2)</sup> Mid-position

<sup>3)</sup> Switching position 4 → 5
4) Mid-position 2 → 3

# Datasheet – Solenoid valve width 18 mm

Valve switching times in [ms]				
Valve function (with valve code)	Termi- nal code	On	Off	Changeover
5/2-way double solenoid (B52)	J	-	-	11
5/2-way double solenoid with dominant signal (D52)	D	-	-	13
5/2-way single solenoid (M52A)	М	22	28	-
5/2-way single solenoid (M52M)	0	12	38	-
5/3-way closed (P53C)	G	15	44	-
5/3-way exhausted (P53E)	E	15	44	-
5/3-way pressurised (P53U)	В	15	44	-
5/3-way exhausted, switching position 14 detenting (P53ED)	SA	13 for control side 12 10 for control side 14	37 for control side 12	(24)
5/3-way exhausted, switching position 12 detenting (P53EP)	SE	10 for control side 12 13 for control side 14	30 for control side 12	(23)
5/3-way, port 2 pressurised, 4 exhausted, switching position 14 detenting (P53AD)	SB	12 for control side 12 9 for control side 14	28 for control side 12	-
5/3-way, port 4 pressurised, 2 exhausted, switching position 14 detenting (P53BD)	SD	12 for control side 12 9 for control side 14	28 for control side 12	-
2x3/2-way single solenoid, closed (T32C)	K	12	30	-
2x3/2-way single solenoid, open (T32U)	N	12	30	-
2x3/2-way single solenoid, open/closed (T32H)	Н	12	30	-
2x3/2-way single solenoid, closed (T32N)	Q	25	12	-
2x3/2-way single solenoid, open (T32F)	Р	25	12	-
2x3/2-way single solenoid, open/closed (T32W)	R	25	12	-
2x2/2-way single solenoid, closed (T22C)	VC	12	30	-
2x2/2-way single solenoid, closed (T22CV)	VV	12	30	-

Characteristic coil data, width 18 mm		
Valve function (with valve code)	Termi- nal code	Characteristic coil data at 24 V DC in [W]
5/2-way double solenoid (B52)	J	1.6
5/2-way double solenoid with dominant signal (D52)	D	1.3
5/2-way single solenoid (M52A)	М	1.6
5/2-way single solenoid (M52M)	0	1.6
5/3-way closed (P53C)	G	1.6
5/3-way exhausted (P53E)	E	1.6
5/3-way pressurised (P53U)	В	1.6
5/3-way exhausted, switching position 14 detenting (P53ED)	SA	1.6
5/3-way exhausted, switching position 12 detenting (P53EP)	SE	1.6
5/3-way, port 2 pressurised, 4 exhausted, switching position 14 detenting (P53AD)	SB	1.6
5/3-way, port 4 pressurised, 2 exhausted, switching position 14 detenting (P53BD)	SD	1.6
2x3/2-way single solenoid, closed (T32C)	K	1.3
2x3/2-way single solenoid, open (T32U)	N	1.3
2x3/2-way single solenoid, open/closed (T32H)	Н	1.3
2x3/2-way single solenoid, closed (T32N)	Q	1.3
2x3/2-way single solenoid, open (T32F)	Р	1.3
2x3/2-way single solenoid, open/closed (T32W)	R	1.3
2x2/2-way single solenoid, closed (T22C)	VC	1.3
2x2/2-way single solenoid, closed (T22CV)	VV	1.3

Materials						
Housing	Die-cast aluminium, PA					
Seals	FPM, NBR, HNBR					
Screws	Galvanised steel					
Note on materials	RoHS-compliant					

		SVA, MO non-detenting/detenting (D)	Valve	Width	Part no.	Туре	
	code		code				
enoid valves	'						
	VC	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return	T22C	18 mm	561155	VSVA-B-T22C-AZD-A2-1T1L	
	W	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return, Vacuum operation possible at 3 and 5	T22CV	18 mm	561159	VSVA-B-T22CV-AZD-A2-1T1L	
	N	2x 3/2-way valve, single solenoid, normally open	T32U	18 mm	539178	VSVA-B-T32U-AZD-A2-1T1L	
	K	2x 3/2-way valve, single solenoid, normally closed	T32C	18 mm	539176	VSVA-B-T32C-AZD-A2-1T1L	
	Н	2x 3/2-way valve, single solenoid, 1x normally open, 1x normally closed	T32H	18 mm	539180	VSVA-B-T32H-AZD-A2-1T1L	
	P	2x 3/2-way valve, single solenoid, reverse operation, normally open	T32F	18 mm	539179	VSVA-B-T32F-AZD-A2-1T1L	
	Q	2x 3/2-way valve, single solenoid, reverse operation, normally closed	T32N	18 mm	539177	VSVA-B-T32N-AZD-A2-1T1L	
	R	2x 3/2-way valve, single solenoid, reverse operation, 1x normally open, 1x normally closed	T32W	18 mm	539181	VSVA-B-T32W-AZD-A2-1T1L	
	M	5/2-way valve, single solenoid, pneumatic spring return	M52-A	18 mm	539184	VSVA-B-M52-AZD-A2-1T1L	
	0	5/2-way valve, single solenoid, mechanical spring return	M52-M	18 mm	539185	VSVA-B-M52-MZD-A2-1T1L	
	J	5/2-way valve, double solenoid	B52	18 mm	539182	VSVA-B-B52-ZD-A2-1T1L	
	D	5/2-way valve, double solenoid, with dominant signal	D52	18 mm	539183	VSVA-B-D52-ZD-A2-1T1L	
	В	5/3-way solenoid valve, mid-position pressurised	P53U	18 mm	539186	VSVA-B-P53U-ZD-A2-1T1L	
	G	5/3-way solenoid valve, mid-position closed	P53C	18 mm	539188	VSVA-B-P53C-ZD-A2-1T1L	
	E	5/3-way solenoid valve, mid-position exhausted	P53E	18 mm	539187	VSVA-B-P53E-ZD-A2-1T1L	
	SA	5/3-way solenoid valve, mid-position exhausted, switching position 14 detenting, mechan- ical spring return	P53ED	18 mm	8031814	VSVA-B-P53ED-ZD-A2-1T1L	
	SE	5/3-way solenoid valve, mid-position exhausted, switching position 12 detenting, mechan- ical spring return	P53EP	18 mm	8031818	VSVA-B-P53EP-ZD-A2-1T1L	
	SB	5/3-way solenoid valve, mid-position 1x exhausted from 4 to 5, 1x pressurised from 1 to 2, switching position 14 detenting, same function in both switching positions: pressurised from 1 to 4 and exhausted from 2 to 3, mechanical spring return	P53AD	18 mm	8031815	VSVA-B-P53AD-ZD-A2-1T1L	
	SD	5/3-way solenoid valve, mid-position 1x exhausted from 2 to 3, 1x pressurised from 1 to 4, switching position 14 detenting, same function in both switching positions: pressurised from 1 to 2 and exhausted from 4 to 5, mechanical spring return	P53BD	18 mm	8031817	VSVA-B-P53BD-ZD-A2-1T1L	

oracinis uata - Solellon	1	VA with cover cap for MO non-detenting/heavy duty, detenting via a  Valve function	Valve	Width	Part no.	Туре	
	code	valve fullction	code	Width	Pail IIO.	Туре	
Solenoid valves	couc		code				
Societion valves	VC	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return	T22C	18 mm	8033457	VSVA-B-T22C-AZTR-A2-1T1L	
	VV	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return, Vacuum operation possible at 3 and 5	T22CV	18 mm	8033458	VSVA-B-T22CV-AZTR-A2-1T1L	
	N	2x 3/2-way valve, single solenoid, normally open	T32U	18 mm	8033446	VSVA-B-T32U-AZTR-A2-1T1L	
	K	2x 3/2-way valve, single solenoid, normally closed	T32C	18 mm	8033444	VSVA-B-T32C-AZTR-A2-1T1L	
	Н	2x 3/2-way valve, single solenoid, 1x normally open, 1x normally closed	T32H	18 mm	8033448	VSVA-B-T32H-AZTR-A2-1T1L	
	P	2x 3/2-way valve, single solenoid, reverse operation, normally open	T32F	18 mm	8033447	VSVA-B-T32F-AZTR-A2-1T1L	
	Q	2x 3/2-way valve, single solenoid, reverse operation, normally closed	T32N	18 mm	8033445	VSVA-B-T32N-AZTR-A2-1T1L	
	R	2x 3/2-way valve, single solenoid, reverse operation, 1x normally open, 1x normally closed	T32W	18 mm	8033449	VSVA-B-T32W-AZTR-A2-1T1L	
	М	5/2-way valve, single solenoid, pneumatic spring return	M52-A	18 mm	8033452	VSVA-B-M52-AZTR-A2-1T1L	
	0	5/2-way valve, single solenoid, mechanical spring return	M52-M	18 mm	8033453	VSVA-B-M52-MZTR-A2-1T1L	
	J	5/2-way valve, double solenoid	B52	18 mm	8033450	VSVA-B-B52-ZTR-A2-1T1L	
	D	5/2-way valve, double solenoid, with dominant signal	D52	18 mm	8033451	VSVA-B-D52-ZTR-A2-1T1L	
	В	5/3-way solenoid valve, mid-position pressurised	P53U	18 mm	8033454	VSVA-B-P53U-ZTR-A2-1T1L	
	G	5/3-way solenoid valve, mid-position closed	P53C	18 mm	8033456	VSVA-B-P53C-ZTR-A2-1T1L	
	E	5/3-way solenoid valve, mid-position exhausted	P53E	18 mm	8033455	VSVA-B-P53E-ZTR-A2-1T1L	
	SA	5/3-way solenoid valve, mid-position exhausted, switching position 14 detenting, mechan- ical spring return	P53ED	18 mm	8039181	VSVA-B-P53ED-ZTR-A2-1T1L	
	SE	5/3-way solenoid valve, mid-position exhausted, switching position 12 detenting, mechan- ical spring return	P53EP	18 mm	8039190	VSVA-B-P53EP-ZTR-A2-1T1L	
	SB	5/3-way solenoid valve, mid-position 1x exhausted from 4 to 5, 1x pressurised from 1 to 2, switching position 14 detenting, same function in both switching positions: pressurised from 1 to 4 and exhausted from 2 to 3, mechanical spring return	P53AD	18 mm	8039184	VSVA-B-P53AD-ZTR-A2-1T1L	
	SD	5/3-way solenoid valve, mid-position 1x exhausted from 2 to 3, 1x pressurised from 1 to 4, switching position 14 detenting, same function in both switching positions: pressurised from 1 to 2 and exhausted from 4 to 5, mechanical spring return	P53BD	18 mm	8040110	VSVA-B-P53BD-ZTR-A2-1T1L	

Ordering data – VSVA so	lenoid valv	re with cover cap for MO, non-detenting (H)				
	Terminal code	Valve function	Valve code	Width	Part no.	Туре
Solenoid valves						
	VC	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return	T22C	18 mm	8033475	VSVA-B-T22C-AZH-A2-1T1L
	VV	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return, Vacuum operation possible at 3 and 5	T22CV	18 mm	8033476	VSVA-B-T22CV-AZH-A2-1T1L
	N	2x 3/2-way valve, single solenoid, normally open	T32U	18 mm	8033464	VSVA-B-T32U-AZH-A2-1T1L
	K	2x 3/2-way valve, single solenoid, normally closed	T32C	18 mm	8033462	VSVA-B-T32C-AZH-A2-1T1L
	Н	2x 3/2-way valve, single solenoid, 1x normally open, 1x normally closed	T32H	18 mm	8033466	VSVA-B-T32H-AZH-A2-1T1L
	Р	2x 3/2-way valve, single solenoid, reverse operation, normally open	T32F	18 mm	8033465	VSVA-B-T32F-AZH-A2-1T1L
	Q	2x 3/2-way valve, single solenoid, reverse operation, normally closed	T32N	18 mm	8033463	VSVA-B-T32N-AZH-A2-1T1L
	R	2x 3/2-way valve, single solenoid, reverse operation, 1x normally open, 1x normally closed	T32W	18 mm	8033467	VSVA-B-T32W-AZH-A2-1T1L
	М	5/2-way valve, single solenoid, pneumatic spring return	M52-A	18 mm	8033470	VSVA-B-M52-AZH-A2-1T1L
	0	5/2-way valve, single solenoid, mechanical spring return	M52-M	18 mm	8033471	VSVA-B-M52-MZH-A2-1T1L
	J	5/2-way valve, double solenoid	B52	18 mm	8033468	VSVA-B-B52-ZH-A2-1T1L
	D	5/2-way valve, double solenoid, with dominant signal	D52	18 mm	8033469	VSVA-B-D52-ZH-A2-1T1L
	В	5/3-way solenoid valve, mid-position pressurised	P53U	18 mm	8033472	VSVA-B-P53U-ZH-A2-1T1L
	G	5/3-way solenoid valve, mid-position closed	P53C	18 mm	8033474	VSVA-B-P53C-ZH-A2-1T1L
	Е	5/3-way solenoid valve, mid-position exhausted	P53E	18 mm	8033473	VSVA-B-P53E-ZH-A2-1T1L
	SA	5/3-way solenoid valve, mid-position exhausted, switching position 14 detenting, mechan- ical spring return	P53ED	18 mm	8039182	VSVA-B-P53ED-ZH-A2-1T1L
	SE	5/3-way solenoid valve, mid-position exhausted, switching position 12 detenting, mechan- ical spring return	P53EP	18 mm	8039191	VSVA-B-P53EP-ZH-A2-1T1L
	SB	5/3-way solenoid valve, mid-position 1x exhausted from 4 to 5, 1x pressurised from 1 to 2, switching position 14 detenting, same function in both switching positions: pressurised from 1 to 4 and exhausted from 2 to 3, Mechanical spring return	P53AD	18 mm	8039185	VSVA-B-P53AD-ZH-A2-1T1L
	SD	5/3-way solenoid valve, mid-position 1x exhausted from 2 to 3, 1x pressurised from 1 to 4, switching position 14 detenting, same function in both switching positions: pressurised from 1 to 2 and exhausted from 4 to 5, mechanical spring return	P53BD	18 mm	8040111	VSVA-B-P53BD-ZH-A2-1T1L

	Terminal	Valve function	Valve	Width	Part no.	Туре
	code		code			
oid valves						
_	VC	2x 2/2-way valve, single solenoid,	T22C	18 mm	8033493	VSVA-B-T22C-AZ-A2-1T1L
9		normally closed,				
		pneumatic spring return				
n and a second	VV	2x 2/2-way valve, single solenoid,	T22CV	18 mm	8033494	VSVA-B-T22CV-AZ-A2-1T1L
		normally closed,				
		pneumatic spring return,				
•		Vacuum operation possible at 3 and 5				
	N	2x 3/2-way valve, single solenoid,	T32U	18 mm	8033482	VSVA-B-T32U-AZ-A2-1T1L
		normally open				
	K	2x 3/2-way valve, single solenoid,	T32C	18 mm	8033480	VSVA-B-T32C-AZ-A2-1T1L
	"	normally closed	1,520	10	0033.00	
	Н	2x 3/2-way valve, single solenoid,	T32H	18 mm	8033484	VSVA-B-T32H-AZ-A2-1T1L
	"	1x normally open, 1x normally closed	13211	10 111111	0033404	VSVA B 19211 AZ AZ 1112
	P	2x 3/2-way valve, single solenoid,	T32F	18 mm	8033483	VSVA-B-T32F-AZ-A2-1T1L
	'	reverse operation,	1321	10 111111	0055405	V3VA-B-1321-A2-A2-111L
		normally open				
	Q	2x 3/2-way valve, single solenoid,	T32N	18 mm	8033481	VSVA-B-T32N-AZ-A2-1T1L
	١٩	reverse operation,	17211	10 111111	0055461	124V-D-135W-WT-WT-111F
		normally closed				
	R	2x 3/2-way valve, single solenoid,	T32W	18 mm	8033485	VSVA-B-T32W-AZ-A2-1T1L
	l K	reverse operation,	13200	10 111111	6055465	V3VA-B-132W-AZ-AZ-111L
		1x normally open, 1x normally closed				
	M	5/2-way valve, single solenoid,	M52-A	18 mm	8033488	VSVA-B-M52-AZ-A2-1T1L
	IVI	pneumatic spring return	INIJ2-A	10 111111	6033466	V3VA-B-W32-AZ-AZ-111L
	0	5/2-way valve, single solenoid,	M52-M	18 mm	8033489	VSVA-B-M52-MZ-A2-1T1L
	0	mechanical spring return	101.52-101	10 111111	6033469	V3VA-B-W32-W2-A2-111L
	-	5/2-way valve, double solenoid	B52	18 mm	8033486	VSVA-B-B52-Z-A2-1T1L
	'	3/2-way valve, double solellold	D 3 2	10 111111	8033480	V3VA-B-B32-2-A2-111L
	D	5/2-way valve, double solenoid,	D52	18 mm	8033487	VSVA-B-D52-Z-A2-1T1L
	"	with dominant signal	032	10 111111	6033467	V3VA-B-D32-2-A2-111L
	В	5/3-way solenoid valve,	P53U	18 mm	8033490	VSVA-B-P53U-Z-A2-1T1L
	0	mid-position pressurised	1730	10 111111	6033490	V3VA-B-F330-2-A2-111L
	G		P53C	18 mm	9022402	VSVA-B-P53C-Z-A2-1T1L
	١٥	5/3-way solenoid valve, mid-position closed	F55C	10 111111	8033492	V3VA-B-F33C-Z-AZ-111L
	-		DESE	10	0022404	VCVA D DEGE 7 AG 4T41
	E	5/3-way solenoid valve, mid-position exhausted	P53E	18 mm	8033491	VSVA-B-P53E-Z-A2-1T1L
	CA	1	DESED	10	0020402	VCVA D DESER 7 AS 4741
	SA	5/3-way solenoid valve,	P53ED	18 mm	8039183	VSVA-B-P53ED-Z-A2-1T1L
		mid-position exhausted, switching position 14 detenting, mechan-				
	CE	ical spring return	DESER	10	0020402	VCVA D DESERT AS ATAL
	SE	5/3-way solenoid valve, mid-position exhausted, switching position 12 detenting, mechan-	P53EP	18 mm	8039192	VSVA-B-P53EP-Z-A2-1T1L
		ical spring return				
	SB	5/3-way solenoid valve,	P53AD	18 mm	9020196	VSVA-B-P53AD-Z-A2-1T1L
	SD	mid-position 1x exhausted from 4 to 5, 1x pressurised from 1 to 2,	POSAU	18 111111	8039186	V5VA-B-P53AD-Z-AZ-111L
		switching position 14 detenting,				
		same function in both switching positions: pressurised from 1 to 4				
		and exhausted from 2 to 3,				
		mechanical spring return				
	SD	5/3-way solenoid valve,	P53BD	18 mm	8040112	VSVA-B-P53BD-Z-A2-1T1L
	ال ا	mid-position 1x exhausted from 2 to 3, 1x pressurised from 1 to 4,	טפכניון	10 111111	0040112	V3VA-D-F3300-L-M2-111L
		switching position 14 detenting,				
		same function in both switching positions: pressurised from 1 to 2				
		and exhausted from 4 to 5,				
	1	mechanical spring return	I	1		

# Datasheet – Solenoid valve width 26 mm

- **[]** - Valve width to ISO 15407-2 26 mm

- Flow rate
Valve width 26 mm:
VTSA up to 1100 l/min
VTSA-F up to 1350 l/min





Safety characteristics – Valve, width 26 mm						
Conforms to		EN 13849-1/2				
CE marking (see declaration of con-	Direct voltage	To EU EMC Directive <sup>1)</sup> (solenoid valves with sensor only)				
formity)	24 V DC					
Shock resistance		Shock test with severity level 2, to EN 60068-2-27				
Vibration resistant		Transport application test with severity level 2, to EN 60068-2-6				

<sup>1)</sup> For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... 

Support/Downloads.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Safety characteristics – Valve, width 26 mm						
Valve function (with valve code)		Test pulses				
	nal	Max. positive test pulse with logic 0 [µs]	Max. negative test pulse with logic 1 [µs]			
	code					
5/2-way double solenoid (B52)	J	1200	1100			
5/2-way double solenoid with dominant signal (D52)	D	1200	1100			
5/2-way single solenoid (M52A)	M	1200	1100			
5/2-way single solenoid (M52M)	0	1200	1100			
5/3-way closed (P53C)	G	1200	1100			
5/3-way exhausted (P53E)	E	1200	1100			
5/3-way pressurised (P53U)	В	1200	1100			
5/3-way exhausted, switching position 14 detenting (P53ED)	SA	1200	1100			
5/3-way exhausted, switching position 12 detenting (P53EP)	SE	1200	1100			
5/3-way, port 2 pressurised, 4 exhausted, switching position 14 detenting (P53AD)	SB	1200	1100			
5/3-way, port 4 pressurised, 2 exhausted, switching position 14 detenting (P53BD)	SD	1200	1100			
2x3/2-way single solenoid, closed (T32C)	K	1500	1200			
2x3/2-way single solenoid, open (T32U)	N	1500	1200			
2x3/2-way single solenoid, open/closed (T32H)	Н	1500	1200			
2x3/2-way single solenoid, closed (T32N)	Q	1500	1200			
2x3/2-way single solenoid, open (T32F)	Р	1500	1200			
2x3/2-way single solenoid, open/closed (T32W)	R	1500	1200			
2x2/2-way single solenoid, closed (T22C)	VC	1500	1200			
2x2/2-way single solenoid, closed (T22CV)	VV	1500	1200			

# Datasheet – Solenoid valve width 26 mm

Valve function (with valve code)		Flow direction			Reset method		Weight
	nal code	Any	Reversible only	Not reversible	Pneumatic spring	Mechanical spring	[g]
5/2-way double solenoid (B52)	J	•	_	_	_	_	276
5/2-way double solenoid with dominant signal (D52)	D	•	-	-	_	-	276
5/2-way single solenoid (M52A)	M	•	-	-	•	-	293
5/2-way single solenoid (M52M)	0	•	-	-	_	•	293
5/3-way closed <sup>1)</sup> (P53C)	G	•	-	-	-	•	320
5/3-way exhausted <sup>1)</sup> (P53E)	E	•	-	-	-	•	320
5/3-way pressurised <sup>1)</sup> (P53U)	В	•	-	-	-	•	320
5/3-way exhausted, switching position 14 detenting (P53ED)	SA	-	-	-	-	•	291
5/3-way exhausted, switching position 12 detenting (P53EP)	SE	_	-	•	_	•	291
5/3-way, port 2 pressurised, 4 exhausted, switching position 14 detenting (P53AD)	SB	•	-	-	-	-	301
5/3-way, port 4 pressurised, 2 exhausted, switching position 14 detenting (P53BD)	SD	-	-	•	-	-	301
2x3/2-way single solenoid, closed (T32C)	K	-	-	•	•	-	335
2x3/2-way single solenoid, open (T32U)	N	_	-	•	•	_	335
2x3/2-way single solenoid, open/closed (T32H)	Н	-	-	•	•	-	335
2x3/2-way single solenoid, closed (T32N)	Q	-	•	-	•	-	335
2x3/2-way single solenoid, open (T32F)	Р	-	•	-	•	-	335
2x3/2-way single solenoid, open/closed (T32W)	R	_	•	-	•	_	335
2x2/2-way single solenoid, closed (T22C)	VC	_	-	•	•	-	335
2x2/2-way single solenoid, closed (T22CV)	VV		_	_		_	335

<sup>1)</sup> If neither solenoid coil is energised, the valve is moved to its mid-position by spring force.

If both solenoid coils are energised at the same time, the valve remains in the previously assumed switching position.

# Datasheet - Solenoid valve width 26 mm

Valve function (with valve code)	Termi-	Flow rate						
	nal code	Valve	Valve on valve terminal VTSA	Valve on valve terminal	Valve on individual sub-			
	code		VISA	VTSA-F	base			
5/2-way double solenoid (B52)	J	1400	1100	1350	1200			
5/2-way double solenoid with dominant signal (D52)	D	1400	1100	1350	1200			
5/2-way single solenoid (M52A)	M	1400	1100	1350	1200			
5/2-way single solenoid (M52M)	0	1400	1100	1350	1200			
5/3-way closed (P53C)	G	1400 <sup>1)</sup>	1000 <sup>1)</sup>	1350 <sup>1)</sup>	1200 <sup>1)</sup>			
		7002)	700 <sup>2)</sup>	700 <sup>2)</sup>	700 <sup>2)</sup>			
5/3-way exhausted (P53E)	E	1400 <sup>1)</sup>	1000 <sup>1)</sup>	1350 <sup>1)</sup>	1200 <sup>1)</sup>			
		700 <sup>2)</sup>	700 <sup>2)</sup>	700 <sup>2)</sup>	700 <sup>2)</sup>			
5/3-way pressurised (P53U)	В	1400 <sup>1)</sup>	1000 <sup>1)</sup>	1350 <sup>1)</sup>	1200 <sup>1)</sup>			
		700 <sup>2)</sup>	700 <sup>2)</sup>	700 <sup>2)</sup>	700 <sup>2)</sup>			
5/3-way exhausted, switching position 14 detenting (P53ED)	SA	1400 <sup>1)</sup>	1000 <sup>1)</sup>	1350 <sup>1)</sup>	1200 <sup>1)</sup>			
		7002)	700 <sup>2)</sup>	700 <sup>2)</sup>	700 <sup>2)</sup>			
5/3-way exhausted, switching position 12 detenting (P53EP)	SE	1400 <sup>1)</sup>	1000 <sup>1)</sup>	1350 <sup>1)</sup>	1200 <sup>1)</sup>			
		700 <sup>2)</sup>	700 <sup>2)</sup>	700 <sup>2)</sup>	700 <sup>2)</sup>			
5/3-way, port 2 pressurised, 4 exhausted, switching position	SB	7001)	700 <sup>1)</sup>	7001)	7001)			
14 detenting (P53AD)		700 <sup>2)</sup>	700 <sup>2)</sup>	700 <sup>2)</sup>	700 <sup>2)</sup>			
5/3-way, port 4 pressurised, 2 exhausted, switching position	SD	-	850 <sup>1)</sup>	950 <sup>1)</sup>	9001)			
14 detenting (P53BD)			820 <sup>2)</sup>	860 <sup>2)</sup>	840 <sup>2)</sup>			
2x3/2-way single solenoid, closed (T32C)	K	1250	900	1150	1100			
2x3/2-way single solenoid, open (T32U)	N	1250	900	1150	1100			
2x3/2-way single solenoid, open/closed (T32H)	Н	1250	900	1150	1100			
2x3/2-way single solenoid, closed (T32N)	Q	1250	900	1150	1100			
2x3/2-way single solenoid, open (T32F)	Р	1250	900	1150	1100			
2x3/2-way single solenoid, open/closed (T32W)	R	1250	900	1150	1100			
2x2/2-way single solenoid, closed (T22C)	VC	1350	1000	1300	1100			
2x2/2-way single solenoid, closed (T22CV)	W	1350	1000	1300	1100			

<sup>1)</sup> Switching position

# - 🏺 - Note

The solenoid valves VSVA-B-P53BD...-A1-1T1L (terminal code SD) can be operated without restrictions at an operating pressure of less than 6 bar. At an operating pressure of more than 6 bar, the actual flow rate must not exceed 1900 l/min

(e.g. 10-->2 bar), otherwise these solenoid valves may switch unintentionally (to the mid-position or switching position 14).

At high pressures, this can be achieved, for example, using a flow control valve/orifice. (e.g. a reducing nipple on port 2 or 4 to reduce it from G1/4 to G1/8).

<sup>2)</sup> Mid-position

#### Datasheet – Solenoid valve width 26 mm

Valve switching times in [ms], width 26 mm			1	ı
Valve function (with valve code)	Termi-	On	Off	Changeover
	nal			
	code			
5/2-way double solenoid (B52)	J	-	-	18
5/2-way double solenoid with dominant signal (D52)	D	-	_	21
5/2-way single solenoid (M52A)	M	25	45	-
5/2-way single solenoid (M52M)	0	20	65	-
5/3-way closed (P53C)	G	22	65	_
5/3-way exhausted (P53E)	E	22	65	-
5/3-way pressurised (P53U)	В	22	65	_
5/3-way exhausted, switching position 14 detenting (P53ED)	SA	22 for control side 12	49 for control side 12	33
		9 for control side 14		
5/3-way exhausted, switching position 12 detenting (P53EP)	SE	10 for control side 12	50 for control side 14	40
		22 for control side 14		
5/3-way, port 2 pressurised, 4 exhausted, switching position	SB	19 for control side 12	36 for control side 12	32
14 detenting (P53AD)		9 for control side 14		
5/3-way, port 4 pressurised, 2 exhausted, switching position	SD	16 for control side 12	26 for control side 12	_
14 detenting (P53BD)		9 for control side 14	36 for control side 14	
2x3/2-way single solenoid, closed (T32C)	K	20	38	_
2x3/2-way single solenoid, open (T32U)	N	20	38	_
2x3/2-way single solenoid, open/closed (T32H)	Н	20	38	_
2x3/2-way single solenoid, closed (T32N)	Q	32	30	-
2x3/2-way single solenoid, open (T32F)	Р	32	30	-
2x3/2-way single solenoid, open/closed (T32W)	R	32	30	-
2x2/2-way single solenoid, closed (T22C)	VC	20	38	-
2x2/2-way single solenoid, closed (T22CV)	VV	20	38	_

Characteristic coil data, width 26 mm		
Valve function (with valve code)	Termi- nal code	Characteristic coil data at 24 V DC in [W]
5/2-way double solenoid (B52)	J	1.6
5/2-way double solenoid with dominant signal (D52)	D	1.3
5/2-way single solenoid (M52A)	M	1.6
5/2-way single solenoid (M52M)	0	1.6
5/3-way closed (P53C)	G	1.6
5/3-way exhausted (P53E)	E	1.6
5/3-way pressurised (P53U)	В	1.6
5/3-way exhausted, switching position 14 detenting (P53ED)	SA	1.6
5/3-way exhausted, switching position 12 detenting (P53EP)	SE	1.6
5/3-way, port 2 pressurised, 4 exhausted, switching position 14 detenting (P53AD)	SB	1.6
5/3-way, port 4 pressurised, 2 exhausted, switching position 14 detenting (P53BD)	SD	1.6
2x3/2-way single solenoid, closed (T32C)	K	1.3
2x3/2-way single solenoid, open (T32U)	N	1.3
2x3/2-way single solenoid, open/closed (T32H)	Н	1.3
2x3/2-way single solenoid, closed (T32N)	Q	1.3
2x3/2-way single solenoid, open (T32F)	Р	1.3
2x3/2-way single solenoid, open/closed (T32W)	R	1.3
2x2/2-way single solenoid, closed (T22C)	VC	1.3
2x2/2-way single solenoid, closed (T22CV)	VV	1.3

Materials					
Housing	Die-cast aluminium, PA				
Seals	FPM, NBR, HNBR				
Screws	Galvanised steel				
Note on materials	RoHS-compliant				

	Termina	l Valve function	Valve	Width	Part no.	Туре
	code		code			
enoid valves						
	VC	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return	T22C	26 mm	561149	VSVA-B-T22C-AZD-A1-1T1L
	VV	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return, Vacuum operation possible at 3 and 5	T22CV	26 mm	561153	VSVA-B-T22CV-AZD-A1-1T1L
	N	2x 3/2-way valve, single solenoid, normally open	T32U	26 mm	539152	VSVA-B-T32U-AZD-A1-1T1L
	К	2x 3/2-way valve, single solenoid, normally closed	T32C	26 mm	539150	VSVA-B-T32C-AZD-A1-1T1L
	Н	2x 3/2-way valve, single solenoid, 1x normally open, 1x normally closed	T32H	26 mm	539154	VSVA-B-T32H-AZD-A1-1T1L
	P	2x 3/2-way valve, single solenoid, reverse operation, normally open	T32F	26 mm	539153	VSVA-B-T32F-AZD-A1-1T1L
	Q	2x 3/2-way valve, single solenoid, reverse operation, normally closed	T32N	26 mm	539151	VSVA-B-T32N-AZD-A1-1T1L
	R	2x 3/2-way valve, single solenoid, reverse operation, 1x normally open, 1x normally closed	T32W	26 mm	539155	VSVA-B-T32W-AZD-A1-1T1L
	M	5/2-way valve, single solenoid, pneumatic spring return	M52-A	26 mm	539158	VSVA-B-M52-AZD-A1-1T1L
	0	5/2-way valve, single solenoid, mechanical spring return	M52-M	26 mm	539159	VSVA-B-M52-MZD-A1-1T1L
	J	5/2-way valve, double solenoid	B52	26 mm	539156	VSVA-B-B52-ZD-A1-1T1L
	D	5/2-way valve, double solenoid, with dominant signal	D52	26 mm	539157	VSVA-B-D52-ZD-A1-1T1L
	В	5/3-way solenoid valve, mid-position pressurised	P53U	26 mm	539160	VSVA-B-P53U-ZD-A1-1T1L
	G	5/3-way solenoid valve, mid-position closed	P53C	26 mm	539162	VSVA-B-P53C-ZD-A1-1T1L
	E	5/3-way solenoid valve, mid-position exhausted	P53E	26 mm	539161	VSVA-B-P53E-ZD-A1-1T1L
	SA	5/3-way solenoid valve, mid-position exhausted, switching position 14 detenting, mechan- ical spring return	P53ED	26 mm	560727	VSVA-B-P53ED-ZD-A1-1T1L
	SE	5/3-way solenoid valve, mid-position exhausted, switching position 12 detenting, mechan- ical spring return	P53EP	26 mm	8026638	VSVA-B-P53EP-ZD-A1-1T1L
	SB	5/3-way solenoid valve, mid-position 1x exhausted from 4 to 5, 1x pressurised from 1 to 2, switching position 14 detenting, same function in both switching positions: pressurised from 1 to 4 and exhausted from 2 to 3, me	P53AD	26 mm	560728	VSVA-B-P53AD-ZD-A1-1T1L
	SD	5/3-way solenoid valve, mid-position 1x exhausted from 2 to 3, 1x pressurised from 1 to 4, switching position 14 detenting, same function in both switching positions: pressurised from 1 to 2 and exhausted from 4 to 5, mechanical spring return	P53BD	26 mm	8031816	VSVA-B-P53BD-ZD-A1-1T1L

Oraering data – Soleno		/A with cover cap for MO non-detenting/heavy duty, detenting via a	1	1	Dort	Time
	code	Valve function	Valve code	Width	Part no.	Type
Calamaid walvaa	code		code			
Solenoid valves	VC	2x 2/2-way valve, single solenoid,	T22C	26 mm	8033032	VSVA-B-T22C-AZTR-A1-1T1L
		normally closed, pneumatic spring return				
	VV	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return, Vacuum operation possible at 3 and 5	T22CV	26 mm	8033033	VSVA-B-T22CV-AZTR-A1-1T1L
	N	2x 3/2-way valve, single solenoid, normally open	T32U	26 mm	8033015	VSVA-B-T32U-AZTR-A1-1T1L
	K	2x 3/2-way valve, single solenoid, normally closed	T32C	26 mm	8033013	VSVA-B-T32C-AZTR-A1-1T1L
	Н	2x 3/2-way valve, single solenoid, 1x normally open, 1x normally closed	T32H	26 mm	8033017	VSVA-B-T32H-AZTR-A1-1T1L
	P	2x 3/2-way valve, single solenoid, reverse operation, normally open	T32F	26 mm	8033016	VSVA-B-T32F-AZTR-A1-1T1L
	Q	2x 3/2-way valve, single solenoid, reverse operation, normally closed	T32N	26 mm	8033014	VSVA-B-T32N-AZTR-A1-1T1L
	R	2x 3/2-way valve, single solenoid, reverse operation, 1x normally open, 1x normally closed	T32W	26 mm	8033018	VSVA-B-T32W-AZTR-A1-1T1L
	M	5/2-way valve, single solenoid, pneumatic spring return	M52-A	26 mm	8033021	VSVA-B-M52-AZTR-A1-1T1L
	0	5/2-way valve, single solenoid, mechanical spring return	M52-M	26 mm	8033022	VSVA-B-M52-MZTR-A1-1T1L
	J	5/2-way valve, double solenoid	B52	26 mm	8033019	VSVA-B-B52-ZTR-A1-1T1L
	D	5/2-way valve, double solenoid, with dominant signal	D52	26 mm	8033020	VSVA-B-D52-ZTR-A1-1T1L
	В	5/3-way solenoid valve, mid-position pressurised	P53U	26 mm	8033023	VSVA-B-P53U-ZTR-A1-1T1L
	G	5/3-way solenoid valve, mid-position closed	P53C	26 mm	8033025	VSVA-B-P53C-ZTR-A1-1T1L
	Е	5/3-way solenoid valve, mid-position exhausted	P53E	26 mm	8033024	VSVA-B-P53E-ZTR-A1-1T1L
	SA	5/3-way solenoid valve, mid-position exhausted, switching position 14 detenting, mechan- ical spring return	P53ED	26 mm	8033028	VSVA-B-P53ED-ZTR-A1-1T1L
	SE	5/3-way solenoid valve, mid-position exhausted, switching position 12 detenting, mechan- ical spring return	P53EP	26 mm	8033035	VSVA-B-P53EP-ZTR-A1-1T1L
	SB	5/3-way solenoid valve, mid-position 1x exhausted from 4 to 5, 1x pressurised from 1 to 2, switching position 14 detenting, same function in both switching positions: pressurised from 1 to 4 and exhausted from 2 to 3, mechanical spring return	P53AD	26 mm	8033029	VSVA-B-P53AD-ZTR-A1-1T1L
	SD	5/3-way solenoid valve, mid-position 1x exhausted from 2 to 3, 1x pressurised from 1 to 4, switching position 14 detenting, same function in both switching positions: pressurised from 1 to 2 and exhausted from 4 to 5, mechanical spring return	P53BD	26 mm	8039187	VSVA-B-P53BD-ZTR-A1-1T1L

	Terminal	Valve function	Valve	Width	Part no.	Туре
	code		code			
noid valves						
	VC	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return	T22C	26 mm	8033055	VSVA-B-T22C-AZH-A1-1T1L
	v	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return, Vacuum operation possible at 3 and 5	T22CV	26 mm	8033056	VSVA-B-T22CV-AZH-A1-1T1L
	N	2x 3/2-way valve, single solenoid, normally open	T32U	26 mm	8033038	VSVA-B-T32U-AZH-A1-1T1L
	К	2x 3/2-way valve, single solenoid, normally closed	T32C	26 mm	8033036	VSVA-B-T32C-AZH-A1-1T1L
	Н	2x 3/2-way valve, single solenoid, 1x normally open, 1x normally closed	T32H	26 mm	8033040	VSVA-B-T32H-AZH-A1-1T1L
	P	2x 3/2-way valve, single solenoid, reverse operation, normally open	T32F	26 mm	8033039	VSVA-B-T32F-AZH-A1-1T1L
	Q	2x 3/2-way valve, single solenoid, reverse operation, normally closed	T32N	26 mm	8033037	VSVA-B-T32N-AZH-A1-1T1L
	R	2x 3/2-way valve, single solenoid, reverse operation, 1x normally open, 1x normally closed	T32W	26 mm	8033041	VSVA-B-T32W-AZH-A1-1T1L
	M	5/2-way valve, single solenoid, pneumatic spring return	M52-A	26 mm	8033044	VSVA-B-M52-AZH-A1-1T1L
	0	5/2-way valve, single solenoid, mechanical spring return	M52-M	26 mm	8033045	VSVA-B-M52-MZH-A1-1T1L
	J	5/2-way valve, double solenoid	B52	26 mm	8033042	VSVA-B-B52-ZH-A1-1T1L
	D	5/2-way valve, double solenoid, with dominant signal	D52	26 mm	8033043	VSVA-B-D52-ZH-A1-1T1L
	В	5/3-way solenoid valve, mid-position pressurised	P53U	26 mm	8033046	VSVA-B-P53U-ZH-A1-1T1L
	G	5/3-way solenoid valve, mid-position closed	P53C	26 mm	8033048	VSVA-B-P53C-ZH-A1-1T1L
	E	5/3-way solenoid valve, mid-position exhausted	P53E	26 mm	8033047	VSVA-B-P53E-ZH-A1-1T1L
	SA	5/3-way solenoid valve, mid-position exhausted, switching position 14 detenting, mechan- ical spring return	P53ED	26 mm	8033051	VSVA-B-P53ED-ZH-A1-1T1
	SE	5/3-way solenoid valve, mid-position exhausted, switching position 12 detenting, mechan- ical spring return	P53EP	26 mm	8033058	VSVA-B-P53EP-ZH-A1-1T1L
	SB	5/3-way solenoid valve, mid-position 1x exhausted from 4 to 5, 1x pressurised from 1 to 2, switching position 14 detenting, same function in both switching positions: pressurised from 1 to 4 and exhausted from 2 to 3, mechanical spring return	P53AD	26 mm	8033052	VSVA-B-P53AD-ZH-A1-1T1L
	SD	5/3-way solenoid valve, mid-position 1x exhausted from 2 to 3, 1x pressurised from 1 to 4, switching position 14 detenting, same function in both switching positions: pressurised from 1 to 2 and exhausted from 4 to 5, me	P53BD	26 mm	8039188	VSVA-B-P53BD-ZH-A1-1T1L

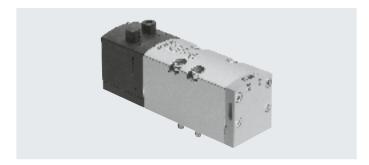
		ve with cover cap for MO, concealed  Valve function	Valve	Width	Part no.	Туре
	code		code			,,
enoid valves						
	VC	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return	T22C	26 mm	8033078	VSVA-B-T22C-AZ-A1-1T1L
	W	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return, Vacuum operation possible at 3 and 5	T22CV	26 mm	8033079	VSVA-B-T22CV-AZ-A1-1T1L
	N	2x 3/2-way valve, single solenoid, normally open	T32U	26 mm	8033061	VSVA-B-T32U-AZ-A1-1T1L
	K	2x 3/2-way valve, single solenoid, normally closed	T32C	26 mm	8033059	VSVA-B-T32C-AZ-A1-1T1L
	Н	2x 3/2-way valve, single solenoid, 1x normally open, 1x normally closed	T32H	26 mm	8033063	VSVA-B-T32H-AZ-A1-1T1L
	Р	2x 3/2-way valve, single solenoid, reverse operation, normally open	T32F	26 mm	8033062	VSVA-B-T32F-AZ-A1-1T1L
	Q	2x 3/2-way valve, single solenoid, reverse operation, normally closed	T32N	26 mm	8033060	VSVA-B-T32N-AZ-A1-1T1L
	R	2x 3/2-way valve, single solenoid, reverse operation, 1x normally open, 1x normally closed	T32W	26 mm	8033064	VSVA-B-T32W-AZ-A1-1T1L
	М	5/2-way valve, single solenoid, pneumatic spring return	M52-A	26 mm	8033067	VSVA-B-M52-AZ-A1-1T1L
	0	5/2-way valve, single solenoid, mechanical spring return	M52-M	26 mm	8033068	VSVA-B-M52-MZ-A1-1T1L
	J	5/2-way valve, double solenoid	B52	26 mm	8033065	VSVA-B-B52-Z-A1-1T1L
	D	5/2-way valve, double solenoid, with dominant signal	D52	26 mm	8033066	VSVA-B-D52-Z-A1-1T1L
	В	5/3-way solenoid valve, mid-position pressurised	P53U	26 mm	8033069	VSVA-B-P53U-Z-A1-1T1L
	G	5/3-way solenoid valve, mid-position closed	P53C	26 mm	8033071	VSVA-B-P53C-Z-A1-1T1L
	E	5/3-way solenoid valve, mid-position exhausted	P53E	26 mm	8033070	VSVA-B-P53E-Z-A1-1T1L
	SA	5/3-way solenoid valve, mid-position exhausted, switching position 14 detenting, mechan- ical spring return	P53ED	26 mm	8033074	VSVA-B-P53ED-Z-A1-1T1L
	SE	5/3-way solenoid valve, mid-position exhausted, switching position 12 detenting, mechan- ical spring return	P53EP	26 mm	8033081	VSVA-B-P53EP-Z-A1-1T1L
	SB	5/3-way solenoid valve, mid-position 1x exhausted from 4 to 5, 1x pressurised from 1 to 2, switching position 14 detenting, same function in both switching positions: pressurised from 1 to 4 and exhausted from 2 to 3, mechanical spring return	P53AD	26 mm	8033075	VSVA-B-P53AD-Z-A1-1T1L
	SD	5/3-way solenoid valve, mid-position 1x exhausted from 2 to 3, 1x pressurised from 1 to 4, switching position 14 detenting, same function in both switching positions: pressurised from 1 to 2 and exhausted from 4 to 5, mechanical spring return	P53BD	26 mm	8039189	VSVA-B-P53BD-Z-A1-1T1L

#### Datasheet – Solenoid valve width 42 mm

- **[]** - Valve width to ISO 5599-2 42 mm (ISO 1)

Flow rate Width 42 mm: VTSA up to 1300 l/min VTSA-F up to 1860 l/min

- **\** - Voltage 24 V DC



Safety characteristics – Valve, width 42 mm						
Conforms to	EN 13849-1/2					
Shock resistance	Shock test with severity level 2, to EN 60068-2-27					
Vibration resistant	Transport application test with severity level 2, to EN 60068-2-6					

Safety characteristics – Valve, width 42 mm Valve function (with valve code)	Termi-	Test pulses	
valve function (with valve code)	nal code	Max. positive test pulse with 0 signal [µs]	Max. negative test pulse with 1 signal [μs]
5/2-way double solenoid (B52)	J	1400	900
5/2-way double solenoid with dominant signal (D52)	D	1600	1100
5/2-way single solenoid (M52A)	M	1400	900
5/2-way single solenoid (M52M)	0	1400	900
5/3-way closed (P53C)	G	1400	900
5/3-way exhausted (P53E)	E	1400	900
5/3-way pressurised (P53U)	В	1400	900
5/3-way, 1 to 2 pressurised, 4 to 5 closed (P53F)	VG	-	-
2x3/2-way single solenoid, closed (T32C)	K	1600	1100
2x3/2-way single solenoid, open (T32U)	N	1600	1100
2x3/2-way single solenoid, open/closed (T32H)	Н	1600	1100
2x3/2-way single solenoid, closed (T32N)	Q	1600	1100
2x3/2-way single solenoid, open (T32F)	Р	1600	1100
2x3/2-way single solenoid, open/closed (T32W)	R	1600	1100
2x2/2-way single solenoid, closed (T22C)	VC	1600	1100
2x2/2-way single solenoid, closed (T22CV)	VV	1600	1100

#### Datasheet – Solenoid valve width 42 mm

Valve function (with valve code)	Termi-	ermi- Flow direction			Reset method		Weight
	nal code	Any	Reversible only	Not reversible	Pneumatic spring	Mechanical spring	[g]
5/2-way double solenoid (B52)	J	•	_	-	-	_	439
5/2-way double solenoid with dominant signal (D52)	D	•	-	-	-	_	439
5/2-way single solenoid (M52A)	М	•	-	-	•	-	426
5/2-way single solenoid (M52M)	0	•	-	_	_		426
5/3-way closed <sup>1)</sup> (P53C)	G	•	-	-	_	•	456
5/3-way exhausted <sup>1)</sup> (P53E)	E	•	-	-	_	•	456
5/3-way pressurised <sup>1)</sup> (P53U)	В	•	-	-	_	•	456
5/3-way, 1 to 2 pressurised, 4 to 5 closed (P53F)	VG	•	-	-	_	_	456
2x3/2-way single solenoid, closed (T32C)	K	-	-	•		-	442
2x3/2-way single solenoid, open (T32U)	N	-	-	•	•	-	442
2x3/2-way single solenoid, open/closed (T32H)	Н	-	-	•	•	-	442
2x3/2-way single solenoid, closed (T32N)	Q	-	•	-	•	-	442
2x3/2-way single solenoid, open (T32F)	Р	_	•	_	•	_	442
2x3/2-way single solenoid, open/closed (T32W)	R	-	•	-	•	-	442
2x2/2-way single solenoid, closed (T22C)	VC	-	-	•	•	_	442
2x2/2-way single solenoid, closed (T22CV)	VV		_	_	•	_	442

 $<sup>1) \</sup>quad \text{If neither solenoid coil is energised, the valve is moved to its mid-position by spring force.} \\$ If both solenoid coils are energised at the same time, the valve remains in the previously assumed switching position.

Valve function (with valve code)	Termi-	Flow rate			
	nal code	Valve	Valve on valve terminal VTSA	Valve on valve terminal VT- SA-F	Valve on individual subbase
5/2-way double solenoid (B52)	J	2000	1300	1860	1500
5/2-way double solenoid with dominant signal (D52)	D	2000	1300	1860	1500
5/2-way single solenoid (M52A)	M	2000	1300	1860	1500
5/2-way single solenoid (M52M)	0	2000	1300	1860	1500
5/3-way closed (P53C)	G	1900 <sup>1)</sup> 950 <sup>2)</sup>	1200 <sup>1)</sup> 800 <sup>2)</sup>	1690 <sup>1)</sup> 830 <sup>2)</sup>	1400 <sup>1)</sup> 800 <sup>2)</sup>
5/3-way exhausted (P53E)	E	1900 <sup>1)</sup> 950 <sup>2)</sup>	1200 <sup>1)</sup> 800 <sup>2)</sup>	1690 <sup>1)</sup> 830 <sup>2)</sup>	1400 <sup>1)</sup> 800 <sup>2)</sup>
5/3-way pressurised (P53U)	В	1900 <sup>1)</sup> 950 <sup>2)</sup>	1200 <sup>1)</sup> 800 <sup>2)</sup>	1690 <sup>1)</sup> 830 <sup>2)</sup>	1400 <sup>1)</sup> 800 <sup>2)</sup>
5/3-way, 1 to 2 pressurised, 4 to 5 closed (P53F)	VG	1700 <sup>1)</sup> 700 <sup>2)</sup>	1400 <sup>1)</sup> 800 <sup>2)</sup>	1700 <sup>1)</sup> 700 <sup>2)</sup>	1400 <sup>1)</sup> 700 <sup>2)</sup>
2x3/2-way single solenoid, closed (T32C)	К	1600	1200	1300	1200
2x3/2-way single solenoid, open (T32U)	N	1600	1200	1300	1200
2x3/2-way single solenoid, open/closed (T32H)	Н	1600	1200	1300	1200
2x3/2-way single solenoid, closed (T32N)	Q	1600	1200	1300	1200
2x3/2-way single solenoid, open (T32F)	Р	1600	1200	1300	1200
2x3/2-way single solenoid, open/closed (T32W)	R	1600	1200	1300	1200
2x2/2-way single solenoid, closed (T22C)	VC	1600	1400	1500	1400
2x2/2-way single solenoid, closed (T22CV)	W	1600	1400	1500	1400

Switching position
 Mid-position

#### Datasheet – Solenoid valve width 42 mm

Valve switching times in [ms], width 42 mm				
Valve function (with valve code)	Termi- nal code	On	Off	Changeover
5/2-way double solenoid (B52)	J	_	-	16
5/2-way double solenoid with dominant signal (D52)	D	<del>-</del>	-	19
5/2-way single solenoid (M52A)	M	27	45	-
5/2-way single solenoid (M52M)	0	22	60	-
5/3-way closed (P53C)	G	22	65	38
5/3-way exhausted (P53E)	E	22	65	38
5/3-way pressurised (P53U)	В	22	65	38
5/3-way, 1 to 2 pressurised, 4 to 5 closed (P53F)	VG	22	65	38
2x3/2-way single solenoid, closed (T32C)	K	20	38	-
2x3/2-way single solenoid, open (T32U)	N	20	38	-
2x3/2-way single solenoid, open/closed (T32H)	Н	20	38	-
2x3/2-way single solenoid, closed (T32N)	Q	34	28	-
2x3/2-way single solenoid, open (T32F)	Р	34	28	-
2x3/2-way single solenoid, open/closed (T32W)	R	34	28	-
2x2/2-way single solenoid, closed (T22C)	VC	20	38	-
2x2/2-way single solenoid, closed (T22CV)	VV	20	38	-

Characteristic coil data, width 42 mm		
Valve function (with valve code)	Termi- nal code	[W]
5/2-way double solenoid (B52)	J	1.6
5/2-way double solenoid with dominant signal (D52)	D	1.3
5/2-way single solenoid (M52A)	M	1.6
5/2-way single solenoid (M52M)	0	1.6
5/3-way closed (P53C)	G	1.6
5/3-way exhausted (P53E)	E	1.6
5/3-way pressurised (P53U)	В	1.6
5/3-way, 1 to 2 pressurised, 4 to 5 closed (P53F)	VG	1.6
2x3/2-way single solenoid, closed (T32C)	К	1.3
2x3/2-way single solenoid, open (T32U)	N	1.3
2x3/2-way single solenoid, open/closed (T32H)	Н	1.3
2x3/2-way single solenoid, closed (T32N)	Q	1.3
2x3/2-way single solenoid, open (T32F)	Р	1.3
2x3/2-way single solenoid, open/closed (T32W)	R	1.3
2x2/2-way single solenoid, closed (T22C)	VC	1.3
2x2/2-way single solenoid, closed (T22CV)	VV	1.3

Max. current consumption per solenoid coil							
Туре		T22, T32	B52, D52, M52, P53				
At nominal voltage 24 V DC (valves with holding current reduction)							
Nominal pick-up current	[mA]	60	72				
Nominal current following current reduction	[mA]	-	-				
Time until current reduction	[ms]	30	30				

Materials	
Housing	Die-cast aluminium, PA
Seals	FPM, NBR, HNBR
Screws	Galvanised steel
Note on materials	RoHS-compliant

	Terminal code	Valve function with MO detenting/non-detenting (D)	Valve code	Width	Part no.	Туре
d valves						
	VC	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return	T22C	42 mm	561340	VSVA-B-T22C-AZD-D1-1T1L
	W	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return, Vacuum operation possible at 3 and 5	T22CV	42 mm	561344	VSVA-B-T22CV-AZD-D1-1T1L
	N	2x 3/2-way valve, single solenoid, normally open	T32U	42 mm	543692	VSVA-B-T32U-AZD-D1-1T1L
	K	2x 3/2-way valve, single solenoid, normally closed	T32C	42 mm	543690	VSVA-B-T32C-AZD-D1-1T1L
	Н	2x 3/2-way valve, single solenoid, 1x normally open, 1x normally closed	T32H	42 mm	543694	VSVA-B-T32H-AZD-D1-1T1L
	P	2x 3/2-way valve, single solenoid, reverse operation, normally open	T32F	42 mm	543693	VSVA-B-T32F-AZD-D1-1T1L
	Q	2x 3/2-way valve, single solenoid, reverse operation, normally closed	T32N	42 mm	543691	VSVA-B-T32N-AZD-D1-1T1L
	R	2x 3/2-way valve, single solenoid, reverse operation, 1x normally open, 1x normally closed	T32W	42 mm	543695	VSVA-B-T32W-AZD-D1-1T1L
	М	5/2-way valve, single solenoid, pneumatic spring return	M52-A	42 mm	543698	VSVA-B-M52-AZD-D1-1T1L
	0	5/2-way valve, single solenoid, mechanical spring return	M52-M	42 mm	543699	VSVA-B-M52-MZD-D1-1T1L
	J	5/2-way valve, double solenoid	B52	42 mm	543696	VSVA-B-B52-ZD-D1-1T1L
	D	5/2-way valve, double solenoid, with dominant signal	D52	42 mm	543697	VSVA-B-D52-ZD-D1-1T1L
	В	5/3-way solenoid valve, mid-position pressurised	P53U	42 mm	543700	VSVA-B-P53U-ZD-D1-1T1L
	G	5/3-way solenoid valve, mid-position closed	P53C	42 mm	543702	VSVA-B-P53C-ZD-D1-1T1L
	E	5/3-way solenoid valve, mid-position exhausted	P53E	42 mm	543701	VSVA-B-P53E-ZD-D1-1T1L
	VG	5/3-way solenoid valve, mid-position pressurised 1 to 2, 4 to 5 closed	P53F	42 mm	8000464	VSVA-B-P53F-ZD-D1-1T1L

	Terminal code	Valve function	Valve code	Width	Part no.	Туре
id valves						
	VC	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return	T22C	42 mm	8034781	VSVA-B-T22C-AZTR-D1-1T1L
	VV	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return, Vacuum operation possible at 3 and 5	T22CV	42 mm	8034782	VSVA-B-T22CV-AZTR-D1-1T1L
	N	2x 3/2-way valve, single solenoid, normally open	T32U	42 mm	8034770	VSVA-B-T32U-AZTR-D1-1T1L
	K	2x 3/2-way valve, single solenoid, normally closed	T32C	42 mm	8034768	VSVA-B-T32C-AZTR-D1-1T1L
	Н	2x 3/2-way valve, single solenoid, 1x normally open, 1x normally closed	Т32Н	42 mm	8034772	VSVA-B-T32H-AZTR-D1-1T1L
	Р	2x 3/2-way valve, single solenoid, reverse operation, normally open	T32F	42 mm	8034771	VSVA-B-T32F-AZTR-D1-1T1L
	Q	2x 3/2-way valve, single solenoid, reverse operation, normally closed	T32N	42 mm	8034769	VSVA-B-T32N-AZTR-D1-1T1L
	R	2x 3/2-way valve, single solenoid, reverse operation, 1x normally open, 1x normally closed	T32W	42 mm	8034773	VSVA-B-T32W-AZTR-D1-1T1L
	М	5/2-way valve, single solenoid, pneumatic spring return	M52-A	42 mm	8034776	VSVA-B-M52-AZTR-D1-1T1L
	0	5/2-way valve, single solenoid, mechanical spring return	M52-M	42 mm	8034777	VSVA-B-M52-MZTR-D1-1T1L
	J	5/2-way valve, double solenoid	B52	42 mm	8034774	VSVA-B-B52-ZTR-D1-1T1L
	D	5/2-way valve, double solenoid, with dominant signal	D52	42 mm	8034775	VSVA-B-D52-ZTR-D1-1T1L
	В	5/3-way solenoid valve, mid-position pressurised	P53U	42 mm	8034778	VSVA-B-P53U-ZTR-D1-1T1L
	G	5/3-way solenoid valve, mid-position closed	P53C	42 mm	8034780	VSVA-B-P53C-ZTR-D1-1T1L
	E	5/3-way solenoid valve, mid-position exhausted	P53E	42 mm	8034779	VSVA-B-P53E-ZTR-D1-1T1L
	VG	5/3-way solenoid valve, mid-position pressurised 1 to 2, 4 to 5 closed	P53F	42 mm	8034783	VSVA-B-P53F-ZTR-D1-1T1L

	Terminal code	Valve function with MO non-detenting (H)	Valve code	Width	Part no.	Туре
noid valves						
	VC	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return	T22C	42 mm	8034812	VSVA-B-T22C-AZH-D1-1T1L
	W	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return, Vacuum operation possible at 3 and 5	T22CV	42 mm	8034813	VSVA-B-T22CV-AZH-D1-1T1L
	N	2x 3/2-way valve, single solenoid, normally open	T32U	42 mm	8034801	VSVA-B-T32U-AZH-D1-1T1L
	K	2x 3/2-way valve, single solenoid, normally closed	T32C	42 mm	8034799	VSVA-B-T32C-AZH-D1-1T1L
	Н	2x 3/2-way valve, single solenoid, 1x normally open, 1x normally closed	Т32Н	42 mm	8034803	VSVA-B-T32H-AZH-D1-1T1L
	Р	2x 3/2-way valve, single solenoid, reverse operation, normally open	T32F	42 mm	8034802	VSVA-B-T32F-AZH-D1-1T1L
	Q	2x 3/2-way valve, single solenoid, reverse operation, normally closed	T32N	42 mm	8034800	VSVA-B-T32N-AZH-D1-1T1L
	R	2x 3/2-way valve, single solenoid, reverse operation, 1x normally open, 1x normally closed	T32W	42 mm	8034804	VSVA-B-T32W-AZH-D1-1T1L
	М	5/2-way valve, single solenoid, pneumatic spring return	M52-A	42 mm	8034807	VSVA-B-M52-AZH-D1-1T1L
	0	5/2-way valve, single solenoid, mechanical spring return	M52-M	42 mm	8034808	VSVA-B-M52-MZH-D1-1T1L
	J	5/2-way valve, double solenoid	B52	42 mm	8034805	VSVA-B-B52-ZH-D1-1T1L
	D	5/2-way valve, double solenoid, with dominant signal	D52	42 mm	8034806	VSVA-B-D52-ZH-D1-1T1L
	В	5/3-way solenoid valve, mid-position pressurised	P53U	42 mm	8034809	VSVA-B-P53U-ZH-D1-1T1L
	G	5/3-way solenoid valve, mid-position closed	P53C	42 mm	8034811	VSVA-B-P53C-ZH-D1-1T1L
	Е	5/3-way solenoid valve, mid-position exhausted	P53E	42 mm	8034810	VSVA-B-P53E-ZH-D1-1T1L
	VG	5/3-way solenoid valve, mid-position pressurised 1 to 2, 4 to 5 closed	P53F	42 mm	8034814	VSVA-B-P53F-ZH-D1-1T1L

	Terminal code	Valve function	Valve code	Width	Part no.	Туре
valves						
	VC	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return	T22C	42 mm	8034843	VSVA-B-T22C-AZ-D1-1T1L
	W	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return, Vacuum operation possible at 3 and 5	T22CV	42 mm	8034844	VSVA-B-T22CV-AZ-D1-1T1L
	N	2x 3/2-way valve, single solenoid, normally open	T32U	42 mm	8034832	VSVA-B-T32U-AZ-D1-1T1L
	К	2x 3/2-way valve, single solenoid, normally closed	T32C	42 mm	8034830	VSVA-B-T32C-AZ-D1-1T1L
	Н	2x 3/2-way valve, single solenoid, 1x normally open, 1x normally closed	T32H	42 mm	8034834	VSVA-B-T32H-AZ-D1-1T1L
	Р	2x 3/2-way valve, single solenoid, reverse operation, normally open	T32F	42 mm	8034833	VSVA-B-T32F-AZ-D1-1T1L
	Q	2x 3/2-way valve, single solenoid, reverse operation, normally closed	T32N	42 mm	8034831	VSVA-B-T32N-AZ-D1-1T1L
	R	2x 3/2-way valve, single solenoid, reverse operation, 1x normally open, 1x normally closed	T32W	42 mm	8034835	VSVA-B-T32W-AZ-D1-1T1L
	М	5/2-way valve, single solenoid, pneumatic spring return	M52-A	42 mm	8034838	VSVA-B-M52-AZ-D1-1T1L
	0	5/2-way valve, single solenoid, mechanical spring return	M52-M	42 mm	8034839	VSVA-B-M52-MZ-D1-1T1L
	J	5/2-way valve, double solenoid	B52	42 mm	8034836	VSVA-B-B52-Z-D1-1T1L
	D	5/2-way valve, double solenoid, with dominant signal	D52	42 mm	8034837	VSVA-B-D52-Z-D1-1T1L
	В	5/3-way solenoid valve, mid-position pressurised	P53U	42 mm	8034840	VSVA-B-P53U-Z-D1-1T1L
	G	5/3-way solenoid valve, mid-position closed	P53C	42 mm	8034842	VSVA-B-P53C-Z-D1-1T1L
	E	5/3-way solenoid valve, mid-position exhausted	P53E	42 mm	8034841	VSVA-B-P53E-Z-D1-1T1L
	VG	5/3-way solenoid valve, mid-position pressurised 1 to 2, 4 to 5 closed	P53F	42 mm	8034845	VSVA-B-P53F-Z-D1-1T1L

#### Datasheet – Solenoid valve width 52 mm

- **[]** - Valve width to ISO 5599-2 52 mm (ISO 2)

- N - Flow rate
Width 52 mm:
VTSA up to 2900 l/min
VTSA-F up to 2900 l/min





Safety characteristics for valve		
Conforms to		EN 13849-1/2
CE marking (see declaration of	Direct voltage	To EU EMC Directive 1)
conformity)	24 V DC	
KC marking		KCEMC
Shock resistance		Shock test with severity level 2, to EN 60068-2-27
Vibration resistant		Transport application test with severity level 2, to EN 60068-2-6

<sup>1)</sup> For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... -> Support/Downloads.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Safety characteristics – Valve, width 52 mm			
Valve function (with valve code)	Termi-	Test pulses	
	nal code	Max. positive test pulse with logic 0 [µs]	Max. negative test pulse with logic 1 [μs]
5/2-way double solenoid (B52)	J	1000	3500
5/2-way double solenoid with dominant signal (D52)	D	1000	3500
5/2-way single solenoid (M52A)	M	1000	3500
5/2-way single solenoid (M52M)	0	1000	3500
5/3-way closed (P53C)	G	1000	3500
5/3-way exhausted (P53E)	E	1000	3500
5/3-way pressurised (P53U)	В	1000	3500
5/3-way, 1 to 2 pressurised, 4 to 5 closed (P53F)	VG	-	-
2x3/2-way single solenoid, closed (T32C)	K	1000	3500
2x3/2-way single solenoid, open (T32U)	N	1000	3500
2x3/2-way single solenoid, open/closed (T32H)	Н	1000	3500
2x3/2-way single solenoid, closed (T32N)	Q	1000	3500
2x3/2-way single solenoid, open (T32F)	Р	1000	3500
2x3/2-way single solenoid, open/closed (T32W)	R	1000	3500
2x2/2-way single solenoid, closed (T22C)	VC	1000	3500

#### Datasheet – Solenoid valve width 52 mm

Valve function (with valve code)	Termi-	Flow direction			Reset method		Weight
	nal code	Any	Reversible only	Not reversible	Pneumatic spring	Mechanical spring	[g]
5/2-way double solenoid (B52)	J	•	-	-	-	_	732
5/2-way double solenoid with dominant signal (D52)	D	•	-	_	-	-	732
5/2-way single solenoid (M52A)	М	•	_	_	•	-	702
5/2-way single solenoid (M52M)	0	•	-	-	-	•	702
5/3-way closed <sup>1)</sup> (P53C)	G	•	-	-	-	•	780
5/3-way exhausted <sup>1)</sup> (P53E)	E	•	-	-	-	•	780
5/3-way pressurised <sup>1)</sup> (P53U)	В	•	-	-	-	•	780
5/3-way, 1 to 2 pressurised, 4 to 5 closed (P53F)	VG	•	_	_	-	-	780
2x3/2-way single solenoid, closed (T32C)	K	-	-	•	•	-	740
2x3/2-way single solenoid, open (T32U)	N	-	-	•	•	-	740
2x3/2-way single solenoid, open/closed (T32H)	Н	-	-	•	•	-	740
2x3/2-way single solenoid, closed (T32N)	Q	-	-	_	•	-	740
2x3/2-way single solenoid, open (T32F)	Р	-	-	_	•	_	740
2x3/2-way single solenoid, open/closed (T32W)	R	-	-	_	•	-	740
2x2/2-way single solenoid, closed (T22C)	VC	_	_	•	•	-	740

If neither solenoid coil is energised, the valve is moved to its mid-position by spring force.
 If both solenoid coils are energised at the same time, the valve remains in the previously assumed switching position.

Valve function (with valve code)	Termi-	ni- Flow rate					
	nal	Valve	Valve on valve terminal	Valve on valve terminal VT-	Valve on individual sub-		
	code		VTSA	SA-F	base		
5/2-way double solenoid (B52)	J	4000	2900	2900	3400		
5/2-way double solenoid with dominant signal (D52)	D	4000	2900	2900	3400		
5/2-way single solenoid (M52A)	М	4000	2900	2900	3400		
5/2-way single solenoid (M52M)	0	4000	2900	2900	3400		
5/3-way closed (P53C)	G	3600 <sup>1)</sup>	2800 <sup>1)</sup>	2800 <sup>1)</sup>	3200 <sup>1)</sup>		
		1700 <sup>2)</sup>	1700 <sup>2)</sup>	1700 <sup>2)</sup>	1700 <sup>2)</sup>		
5/3-way exhausted (P53E)	E	3600 <sup>1)</sup>	2800 <sup>1)</sup>	2800 <sup>1)</sup>	3200 <sup>1)</sup>		
		1700 <sup>2)</sup>	1700 <sup>2)</sup>	1700 <sup>2)</sup>	1700 <sup>2)</sup>		
5/3-way pressurised (P53U)	В	3600 <sup>1)</sup>	2800 <sup>1)</sup>	2800 <sup>1)</sup>	3200 <sup>1)</sup>		
		1700 <sup>2)</sup>	1700 <sup>2)</sup>	1700 <sup>2)</sup>	1700 <sup>2)</sup>		
5/3-way, 1 to 2 pressurised, 4 to 5 closed (P53F)	VG	3000 <sup>1)</sup>	2300 <sup>1)</sup>	2300 <sup>1)</sup>	2600 <sup>1)</sup>		
		900 <sup>2)</sup>	900 <sup>2)</sup>	900 <sup>2)</sup>	900 <sup>2)</sup>		
2x3/2-way single solenoid, closed (T32C)	K	3000	2400	2400	2600		
2x3/2-way single solenoid, open (T32U)	N	3000	2400	2400	2600		
2x3/2-way single solenoid, open/closed (T32H)	Н	3000	2400	2400	2600		
2x3/2-way single solenoid, closed (T32N)	Q	3000	2400	2400	2600		
2x3/2-way single solenoid, open (T32F)	Р	3000	2400	2400	2600		
2x3/2-way single solenoid, open/closed (T32W)	R	3000	2400	2400	2600		
2x2/2-way single solenoid, closed (T22C)	VC	4000	2800	2800	3400		

<sup>1)</sup> Switching position

<sup>2)</sup> Mid-position

#### Datasheet – Solenoid valve width 52 mm

Valve switching times in [ms], width 52 mm							
Valve function (with valve code)	Termi- nal code	On	Off	Changeover			
5/2-way double solenoid (B52)	J	-	-	18			
5/2-way double solenoid with dominant signal (D52)	D	-	-	18			
5/2-way single solenoid (M52A)	M	40	45	-			
5/2-way single solenoid (M52M)	0	20	60	_			
5/3-way closed (P53C)	G	23	60	38			
5/3-way exhausted (P53E)	E	23	60	38			
5/3-way pressurised (P53U)	В	23	60	38			
5/3-way, 1 to 2 pressurised, 4 to 5 closed (P53F)	VG	23	60	38			
2x3/2-way single solenoid, closed (T32C)	K	20	35	_			
2x3/2-way single solenoid, open (T32U)	N	20	35	_			
2x3/2-way single solenoid, open/closed (T32H)	Н	20	35	-			
2x3/2-way single solenoid, closed (T32N)	Q	20	35	_			
2x3/2-way single solenoid, open (T32F)	Р	20	35	-			
2x3/2-way single solenoid, open/closed (T32W)	R	20	35	_			
2x2/2-way single solenoid, closed (T22C)	VC	14	35	-			

Characteristic coil data, width 52 mm		
Valve function (with valve code)	Termi- nal code	[W]
5/2-way double solenoid (B52)	J	4.6
5/2-way double solenoid with dominant signal (D52)	D	4.6
5/2-way single solenoid (M52A)	M	4.6
5/2-way single solenoid (M52M)	0	4.6
5/3-way closed (P53C)	G	4.6
5/3-way exhausted (P53E)	E	4.6
5/3-way pressurised (P53U)	В	4.6
5/3-way, 1 to 2 pressurised, 4 to 5 closed (P53F)	VG	4.6
2x3/2-way single solenoid, closed (T32C)	K	4.6
2x3/2-way single solenoid, open (T32U)	N	4.6
2x3/2-way single solenoid, open/closed (T32H)	Н	4.6
2x3/2-way single solenoid, closed (T32N)	Q	4.6
2x3/2-way single solenoid, open (T32F)	Р	4.6
2x3/2-way single solenoid, open/closed (T32W)	R	4.6
2x2/2-way single solenoid, closed (T22C)	VC	4.6

Maximum current consumption per solenoid	Maximum current consumption per solenoid coil, width 52 mm								
At nominal voltage 24 V DC (valves with holding current reduction)									
Nominal pick-up current	[mA]	165							
Nominal current following current reduction	[mA]	35							
Time until current reduction	[ms]	30							

Materials							
Housing	Die-cast aluminium, PA						
Seals	FPM, NBR, HNBR						
Screws	Galvanised steel						
Note on materials	RoHS-compliant RoHS-compliant						

	Terminal code	Valve function	Valve code	Width	Part no.	Туре
id valves						
	VC	2x 2/2-way valve, single solenoid, normally closed, pneumatic spring return	T22C	52 mm	560831	VSVA-B-T22C-AZD-D2-1T1L
	N	2x 3/2-way valve, single solenoid, normally open	T32U	52 mm	560827	VSVA-B-T32U-AZD-D2-1T1L
<b>\</b>	K	2x 3/2-way valve, single solenoid, normally closed	T32C	52 mm	560825	VSVA-B-T32C-AZD-D2-1T1L
	Н	2x 3/2-way valve, single solenoid, 1x normally open, 1x normally closed	T32H	52 mm	560829	VSVA-B-T32H-AZD-D2-1T1L
	P	2x 3/2-way valve, single solenoid, reverse operation, normally open	T32F	52 mm	560828	VSVA-B-T32F-AZD-D2-1T1L
	Q	2x 3/2-way valve, single solenoid, reverse operation, normally closed	T32N	52 mm	560826	VSVA-B-T32N-AZD-D2-1T1L
	R	2x 3/2-way valve, single solenoid, reverse operation, 1x normally open, 1x normally closed	T32W	52 mm	560830	VSVA-B-T32W-AZD-D2-1T1L
	М	5/2-way valve, single solenoid, pneumatic spring return	M52-A	52 mm	560820	VSVA-B-M52-AZD-D2-1T1L
	0	5/2-way valve, single solenoid, mechanical spring return	M52-M	52 mm	560821	VSVA-B-M52-MZD-D2-1T1L
	J	5/2-way valve, double solenoid	B52	52 mm	560818	VSVA-B-B52-ZD-D2-1T1L
	D	5/2-way valve, double solenoid, with dominant signal	D52	52 mm	560819	VSVA-B-D52-ZD-D2-1T1L
	В	5/3-way solenoid valve, mid-position pressurised	P53U	52 mm	560822	VSVA-B-P53U-ZD-D2-1T1L
	G	5/3-way solenoid valve, mid-position closed	P53C	52 mm	560824	VSVA-B-P53C-ZD-D2-1T1L
	Е	5/3-way solenoid valve, mid-position exhausted	P53E	52 mm	560823	VSVA-B-P53E-ZD-D2-1T1L
	VG	5/3-way solenoid valve, mid-position pressurised 1 to 2, 4 to 5 closed	P53F	52 mm	8000465	VSVA-B-P53F-ZD-D2-1T1L

Term	inal Valve function	Valve	Width	Part no.	Туре
code		code			
VC	2x 2/2-way valve, single solenoid,	T22C	52 mm	8034967	VSVA-B-T22C-AZTR-D2-1T1
	normally closed,				
$\geqslant$	pneumatic spring return				
N	2x 3/2-way valve, single solenoid,	T32U	52 mm	8034963	VSVA-B-T32U-AZTR-D2-1T1
· 기	normally open				
K	2x 3/2-way valve, single solenoid,	T32C	52 mm	8034961	VSVA-B-T32C-AZTR-D2-1T1
	normally closed				
Н	2x 3/2-way valve, single solenoid,	T32H	52 mm	8034965	VSVA-B-T32H-AZTR-D2-1T1
	1x normally open, 1x normally closed				
Р	2x 3/2-way valve, single solenoid,	T32F	52 mm	8034964	VSVA-B-T32F-AZTR-D2-1T1
	reverse operation,				
	normally open				
Q	2x 3/2-way valve, single solenoid,	T32N	52 mm	8034962	VSVA-B-T32N-AZTR-D2-1T1
	reverse operation,				
	normally closed				
R	2x 3/2-way valve, single solenoid,	T32W	52 mm	8034966	VSVA-B-T32W-AZTR-D2-1T1
	reverse operation,				
	1x normally open, 1x normally closed				
M	5/2-way valve, single solenoid,	M52-A	52 mm	8034956	VSVA-B-M52-AZTR-D2-1T1
	pneumatic spring return				
0	5/2-way valve, single solenoid,	M52-M	52 mm	8034957	VSVA-B-M52-MZTR-D2-1T1
	mechanical spring return				
J	5/2-way valve, double solenoid	B52	52 mm	8034954	VSVA-B-B52-ZTR-D2-1T1L
D	5/2-way valve, double solenoid,	D52	52 mm	8034955	VSVA-B-D52-ZTR-D2-1T1L
	with dominant signal				
В	5/3-way solenoid valve,	P53U	52 mm	8034958	VSVA-B-P53U-ZTR-D2-1T1L
	mid-position pressurised				
G	5/3-way solenoid valve,	P53C	52 mm	8034960	VSVA-B-P53C-ZTR-D2-1T1L
	mid-position closed				
E	5/3-way solenoid valve,	P53E	52 mm	8034959	VSVA-B-P53E-ZTR-D2-1T1L
	mid-position exhausted				
VG	5/3-way solenoid valve,	P53F	52 mm	8034968	VSVA-B-P53F-ZTR-D2-1T1L
	mid-position pressurised 1 to 2, 4 to 5 closed				

		Valve function	Valve code	Width	Part no.	Туре
	code		code			
l valves	Luc	I/-	1=	T		
	VC	2x 2/2-way valve, single solenoid,	T22C	52 mm	8034982	VSVA-B-T22C-AZH-D2-1T1L
		normally closed,				
` (F)	<del>ا ا ا</del>	pneumatic spring return	Tagu	F 2	000/070	VCVA D TOOLI AZII DO 4T41
	N	2x 3/2-way valve, single solenoid, normally open	T32U	52 mm	8034978	VSVA-B-T32U-AZH-D2-1T1L
	K	2x 3/2-way valve, single solenoid,	T32C	52 mm	8034976	VSVA-B-T32C-AZH-D2-1T1L
	l K	normally closed	1320	) JZ 111111	0034570	VSVA-D-152C-AZII-DZ-111E
	Н	2x 3/2-way valve, single solenoid,	T32H	52 mm	8034980	VSVA-B-T32H-AZH-D2-1T1LL
	''	1x normally open, 1x normally closed	1,52	32	003.500	10111211211121
	Р	2x 3/2-way valve, single solenoid,	T32F	52 mm	8034979	VSVA-B-T32F-AZH-D2-1T1L
		reverse operation,				
		normally open				
	Q	2x 3/2-way valve, single solenoid,	T32N	52 mm	8034977	VSVA-B-T32N-AZH-D2-1T1L
		reverse operation,				
		normally closed				
	R	2x 3/2-way valve, single solenoid,	T32W	52 mm	8034981	VSVA-B-T32W-AZH-D2-1T1L
		reverse operation,				
		1x normally open, 1x normally closed				
	M	5/2-way valve, single solenoid,	M52-A	52 mm	8034971	VSVA-B-M52-AZH-D2-1T1L
		pneumatic spring return				
	0	5/2-way valve, single solenoid,	M52-M	52 mm	8034972	VSVA-B-M52-MZH-D2-1T1L
		mechanical spring return				
	J	5/2-way valve, double solenoid	B52	52 mm	8034969	VSVA-B-B52-ZH-D2-1T1L
	D	5/2-way valve, double solenoid,	D52	52 mm	8034970	VSVA-B-D52-ZH-D2-1T1L
		with dominant signal				
	В	5/3-way solenoid valve,	P53U	52 mm	8034973	VSVA-B-P53U-ZH-D2-1T1L
		mid-position pressurised				
	G	5/3-way solenoid valve,	P53C	52 mm	8034975	VSVA-B-P53C-ZH-D2-1T1L
		mid-position closed				
	E	5/3-way solenoid valve,	P53E	52 mm	8034974	VSVA-B-P53E-ZH-D2-1T1L
		mid-position exhausted				
	VG	5/3-way solenoid valve,	P53F	52 mm	8034983	VSVA-B-P53F-ZH-D2-1T1L

1 -		Valve function	Valve	Width	Part no.	Туре
CO	ode		code			
ves						
VC	C	2x 2/2-way valve, single solenoid,	T22C	52 mm	8034997	VSVA-B-T22C-AZ-D2-1T1L
		normally closed,				
		pneumatic spring return				
N		2x 3/2-way valve, single solenoid,	T32U	52 mm	8034993	VSVA-B-T32U-AZ-D2-1T1L
<b>⋈</b> ∮∕∕ L		normally open				
V   K		2x 3/2-way valve, single solenoid,	T32C	52 mm	8034991	VSVA-B-T32C-AZ-D2-1T1L
		normally closed				
Н		2x 3/2-way valve, single solenoid,	T32H	52 mm	8034995	VSVA-B-T32H-AZ-D2-1T1I
		1x normally open, 1x normally closed				
P		2x 3/2-way valve, single solenoid,	T32F	52 mm	8034994	VSVA-B-T32F-AZ-D2-1T1L
		reverse operation,				
		normally open				
Q		2x 3/2-way valve, single solenoid,	T32N	52 mm	8034992	VSVA-B-T32N-AZ-D2-1T1
		reverse operation,				
_		normally closed				
R		2x 3/2-way valve, single solenoid,	T32W	52 mm	8034996	VSVA-B-T32W-AZ-D2-1T1
		reverse operation,				
<u> </u>		1x normally open, 1x normally closed		+		
M		5/2-way valve, single solenoid,	M52-A	52 mm	8034986	VSVA-B-M52-AZ-D2-1T1L
		pneumatic spring return	1450.14		222/225	1/51/4 D 1470 147 Do 4741
0		5/2-way valve, single solenoid,	M52-M	52 mm	8034987	VSVA-B-M52-MZ-D2-1T1I
		mechanical spring return				
ا		5/2-way valve, double solenoid	B52	52 mm	8034984	VSVA-B-B52-Z-D2-1T1L
D		5/2-way valve, double solenoid,	D52	52 mm	8034985	VSVA-B-D52-Z-D2-1T1L
		with dominant signal				
В		5/3-way solenoid valve,	P53U	52 mm	8034988	VSVA-B-P53U-Z-D2-1T1L
		mid-position pressurised				
G		5/3-way solenoid valve,	P53C	52 mm	8034990	VSVA-B-P53C-Z-D2-1T1L
		mid-position closed				
E		5/3-way solenoid valve,	P53E	52 mm	8034989	VSVA-B-P53E-Z-D2-1T1L
		mid-position exhausted				
VC	G	5/3-way solenoid valve,	P53F	52 mm	8034998	VSVA-B-P53F-Z-D2-1T1L
		mid-position pressurised 1 to 2, 4 to 5 closed				

Ordering data					
_	Code	Description		Part no.	Туре
Right end plate					
6000	V	With working air/exhaust air, internal pilot air supply, 1/2 NPT (no port 14)	539235	VABE-S6-1R-N12	
	V1	With working air/exhaust air, internal pilot air supply, 3/4 NPT (port 14 is sealed with a blanking plug)	560838	VABE-S6-2R-N34	
000	X	With working air/exhaust air, external pilot air supply, 1/2 NPT			VABE-S6-1RZ-N12
	X1	With working air/exhaust air, external pilot air supply, 3/4 NPT	560840	VABE-S6-2RZ-N34	
End plate with pilot a	ir selector				
	Y <sup>1)</sup>	Internal pilot air supply		539239	VABE-S6-1RZ-N-B1
	U <sup>1)</sup>	Internal pilot air supply, ducted pilot exhaust air			
	Z <sup>1)</sup>	External pilot air supply			
	W <sup>1)</sup>	External pilot air supply, ducted pilot exhaust air			
Manifold sub-base	nort nattern t	to ISO 15407-2 and ISO 5599-2			
Maiiiota sub-base, j	A	2 valve positions, 4 addresses, for double solenoid valves	18 mm	539223	VABV-S4-2S-N18-2T2
	В	2 valve positions, 4 addresses, for double solenoid valves	26 mm	539219	VABV-S4-1S-N14-2T2
	С	1 valve position, 2 addresses, for double solenoid valves	42 mm	542460	VABV-S2-1S-N38-T2
	D	1 valve position, 2 addresses, for double solenoid valves	52 mm	560843	VABV-S2-2S-N12-T2
	E	2 valve positions, 2 addresses, for single solenoid valves	18 mm	539225	VABV-S4-2S-N18-2T1
	F	2 valve positions, 2 addresses, for single solenoid valves	26 mm	539221	VABV-S4-1S-N14-2T1
	G	1 valve position, 1 address, for single solenoid valves	42 mm	542461	VABV-S2-1S-N38-T1
	Н	1 valve position, 1 address, for single solenoid valves	52 mm	560844	VABV-S2-2S-N12-T1
			l		
Manifold sub-base V			10	F46247	VADV C / QUE NAO QTQ
	A	2 valve positions, 4 addresses, for double solenoid valves	18 mm	546217	VABV-S4-2HS-N18-2T2
	В	2 valve positions, 4 addresses, for double solenoid valves	26 mm	546213	VABV-S4-1HS-N14-2T2
	С	1 valve position, 2 addresses, for double solenoid valves	42 mm	546221	VABV-S2-1HS-N38-T2
	D	1 valve position, 2 addresses, for double solenoid valves	52 mm	560843	VABV-S2-2S-N12-T2
4	E	2 valve positions, 2 addresses, for single solenoid valves	18 mm	546216	VABV-S4-2HS-N18-2T1
	F	2 valve positions, 2 addresses, for single solenoid valves	26 mm	546212	VABV-S4-1HS-N14-2T1
	G	1 valve position, 1 address, for single solenoid valves	42 mm	546220	VABV-S2-1HS-N38-T1
	Н	1 valve position, 1 address, for single solenoid valves	52 mm	560844	VABV-S2-2S-N12-T1

<sup>1)</sup> Code letter within the order code for a valve terminal configuration

0.4.4					
Ordering data – Duct se	Code	eal     Description	Weight [g]	Part no.	Туре
	S	Duct separation 1, 3, 5	57	539228	VABD-S6-1-P3-C
	Т	Duct separation 1	43	539227	VABD-S6-1-P1-C
	R	Duct separation 3, 5	54	539229	VABD-S6-1-P2-C
	L	Seal between sub-bases, duct 1, 3, 5 open, port 14 blocked (colour coding: white)	40	573191	VABD-S6-1-P7-C
	TL	Seal between sub-bases, duct 1 blocked, port 14 blocked (colour coding: red)  Note: additional pilot air supply required	43	8060483	VABD-S6-1-P8-C
	K	Seal between sub-bases, duct 1, 3, 5 blocked, port 14 blocked (colour coding: green)	57	8034612	VABD-S6-1-P6-C
Ordering data	Code	Description	Width	Part no.	Туре
90°-connection plate					
88	P	Outlet at bottom, connecting thread 1/8 NPT	18 mm	539720	VABF-S4-2-A2G2-N18
0		Outlet at bottom, connecting thread 1/4 NPT	26 mm	539722	VABF-S4-1-A2G2-N14
		Outlet at bottom, connecting thread 3/8 NPT	42 mm	546098	VABF-S2-1-A1G2-N38
		Outlet at bottom, connecting thread 1/2 NPT	52 mm	555703	VABF-S2-2-A1G2-N12
Supply plate					
Supply place				,	
	lı .	With exhaust plate 3/5 common 1/2 NPT		539233	VARF-S6-1-P1A7-N12
	K	With exhaust plate, 3/5 common, 1/2 NPT With exhaust air cover, 3/5 separate, 1/2 NPT		539233 539232	VABF-S6-1-P1A7-N12 VABF-S6-1-P1A6-N12
Vertical supply plate (ope	K	With exhaust air cover, 3/5 separate, 1/2 NPT			
	K	with exhaust air cover, 3/5 separate, 1/2 NPT  ssure 0.910 bar)  Connecting thread 1/8 NPT	18 mm		
Vertical supply plate (ope	K erating pre	with exhaust air cover, 3/5 separate, 1/2 NPT  ssure 0.910 bar)  Connecting thread 1/8 NPT Individual compressed air supply, duct 1 Connecting thread 1/4 NPT	18 mm 26 mm	539232	VABF-S6-1-P1A6-N12
Vertical supply plate (ope	K erating pre	Ssure 0.910 bar)  Connecting thread 1/8 NPT Individual compressed air supply, duct 1 Connecting thread 1/4 NPT Individual compressed air supply, duct 1 Connecting thread 3/8 NPT		539232	VABF-S6-1-P1A6-N12  VABF-S4-2-P1A3-N18
Vertical supply plate (ope	K erating pre	with exhaust air cover, 3/5 separate, 1/2 NPT  ssure 0.910 bar)  Connecting thread 1/8 NPT Individual compressed air supply, duct 1  Connecting thread 1/4 NPT Individual compressed air supply, duct 1  Connecting thread 3/8 NPT Individual compressed air supply, duct 1  Connecting thread 3/8 NPT Individual compressed air supply, duct 1  Connecting thread 1/2 NPT	26 mm	540174 540172	VABF-S6-1-P1A6-N12  VABF-S4-2-P1A3-N18  VABF-S4-1-P1A3-N14
Vertical supply plate (ope	K erating pre	SSURE 0.910 bar)  Connecting thread 1/8 NPT Individual compressed air supply, duct 1  Connecting thread 1/4 NPT Individual compressed air supply, duct 1  Connecting thread 3/8 NPT Individual compressed air supply, duct 1  Connecting thread 3/8 NPT Individual compressed air supply, duct 1  Connecting thread 1/2 NPT Individual compressed air supply, duct 1  Connecting thread 1/8 NPT	26 mm 42 mm	540174 540172 546094	VABF-S6-1-P1A6-N12  VABF-S4-2-P1A3-N18  VABF-S4-1-P1A3-N14  VABF-S2-1-P1A3-N38
Vertical supply plate (ope	K erating pre	SSURE 0.910 bar)  Connecting thread 1/8 NPT Individual compressed air supply, duct 1  Connecting thread 1/4 NPT Individual compressed air supply, duct 1  Connecting thread 3/8 NPT Individual compressed air supply, duct 1  Connecting thread 3/8 NPT Individual compressed air supply, duct 1  Connecting thread 1/2 NPT Individual compressed air supply, duct 1  Connecting thread 1/8 NPT Individual compressed air supply, ducts 1 and 14  Connecting thread 1/4 NPT	26 mm 42 mm 52 mm	540174 540172 546094 555787	VABF-S6-1-P1A6-N12  VABF-S4-2-P1A3-N18  VABF-S4-1-P1A3-N14  VABF-S2-1-P1A3-N38  VABF-S2-2-P1A3-N12
Vertical supply plate (ope	K erating pre	SSURE 0.910 bar)  Connecting thread 1/8 NPT Individual compressed air supply, duct 1  Connecting thread 1/4 NPT Individual compressed air supply, duct 1  Connecting thread 3/8 NPT Individual compressed air supply, duct 1  Connecting thread 3/8 NPT Individual compressed air supply, duct 1  Connecting thread 1/2 NPT Individual compressed air supply, duct 1  Connecting thread 1/8 NPT Individual compressed air supply, duct 1	26 mm 42 mm 52 mm 18 mm	540174 540172 546094 555787 8000694	VABF-S6-1-P1A6-N12  VABF-S4-2-P1A3-N18  VABF-S4-1-P1A3-N14  VABF-S2-1-P1A3-N38  VABF-S2-2-P1A3-N12  VABF-S4-2-P1A14-N18

	Code	Pressure regulation for port	Control range [bar]	[MPa]	Width	Part no.	Туре
ulator plate, wi	dth 18 mm						
	ZA	1	0.5 8.5	0.05 0.85	18 mm	540153	VABF-S4-2-R1C2-C-10
	ZF	1	0.5 6	0.05 0.6	18 mm	540151	VABF-S4-2-R1C2-C-6
	ZC	2	2 8.5	0.2 0.85	18 mm	540161	VABF-S4-2-R2C2-C-10
	ZH	2	2 6	0.2 0.6	18 mm	540159	VABF-S4-2-R2C2-C-6
1	ZB	4	2 8.5	0.2 0.85	18 mm	540157	VABF-S4-2-R3C2-C-10
-	ZG	4	2 6	0.20.6	18 mm	540155	VABF-S4-2-R3C2-C-6
	ZD	2 and 4	2 8.5	0.2 0.85	18 mm	540165	VABF-S4-2-R4C2-C-10
	ZI	2 and 4	2 6	0.2 0.6	18 mm	540163	VABF-S4-2-R4C2-C-6
	ZE	2 and 4, reversible	0.5 8.5	0.05 0.85	18 mm	540169	VABF-S4-2-R5C2-C-10
	ZJ	2 and 4, reversible	0.5 6	0.05 0.6	18 mm	540167	VABF-S4-2-R5C2-C-6
	ZL	2, reversible	0.5 8.5	0.05 0.85	18 mm	546252	VABF-S4-2-R6C2-C-10
	ZN	2, reversible	0.5 6	0.05 0.6	18 mm	546248	VABF-S4-2-R6C2-C-6
	ZK	4, reversible	0.5 8.5	0.05 0.85	18 mm	546254	VABF-S4-2-R7C2-C-10
	ZM	4, reversible	0.5 6	0.05 0.6	18 mm	546250	VABF-S4-2-R7C2-C-6
lator plate, wi	dth 26 mm						-
A CONTRACTOR OF THE CONTRACTOR	ZA	1	0.5 8.5	0.05 0.85	26 mm	540154	VABF-S4-1-R1C2-C-10
SER .	ZF	1	0.5 6	0.05 0.6	26 mm	540152	VABF-S4-1-R1C2-C-6
	ZC	2	2 8.5	0.2 0.85	26 mm	540162	VABF-S4-1-R2C2-C-10
	ZH ZH	2	2 6	0.20.6	26 mm	540160	VABF-S4-1-R2C2-C-6
	ZB	4	2 8.5	0.2 0.85	26 mm	540158	VABF-S4-1-R3C2-C-10
•	ZG	4	2 6	0.20.6	26 mm	540156	VABF-S4-1-R3C2-C-6
	ZD	2 and 4	2 8.5	0.2 0.85	26 mm	540166	VABF-S4-1-R4C2-C-10
	ZI	2 and 4	2 6	0.20.6	26 mm	540164	VABF-S4-1-R4C2-C-6
	ZE	2 and 4, reversible	0.5 8.5	0.05 0.85	26 mm	540170	VABF-S4-1-R5C2-C-10
	ZJ	2 and 4, reversible	0.5 6	0.05 0.6	26 mm	540168	VABF-S4-1-R5C2-C-6
	ZL	2, reversible	0.5 8.5	0.05 0.85	26 mm	546251	VABF-S4-1-R6C2-C-10
	ZN	2, reversible	0.5 6	0.05 0.6	26 mm	546247	VABF-S4-1-R6C2-C-6
	ZK	4, reversible	0.5 8.5	0.05 0.85	26 mm	546253	VABF-S4-1-R7C2-C-10
	ZM	4, reversible	0.5 6	0.05 0.6	26 mm	546249	VABF-S4-1-R7C2-C-6

	Code	Pressure regulation for port	Control range		Width	Part no.	Type
			[bar]	[MPa]			
egulator plate, width	42 mm						
_0	ZA	1	0.5 8.5	0.05 0.85	42 mm	546084	VABF-S2-1-R1C2-C-10
	ZF	1	0.5 6	0.05 0.6	42 mm	546083	VABF-S2-1-R1C2-C-6
	ZC	2	1.0 10	0.1 1	42 mm	546088	VABF-S2-1-R2C2-C-10
	ZH	2	1.0 6	0.1 0.6	42 mm	546087	VABF-S2-1-R2C2-C-6
	ZB	4	1.0 10	0.1 1	42 mm	546086	VABF-S2-1-R3C2-C-10
77	ZG	4	0.5 6	0.05 0.6	42 mm	546085	VABF-S2-1-R3C2-C-6
	ZD	2 and 4	1.0 10	0.1 1	42 mm	546090	VABF-S2-1-R4C2-C-10
	ZI	2 and 4	1.0 6	0.1 0.6	42 mm	546089	VABF-S2-1-R4C2-C-6
	ZE	2 and 4, reversible	0.5 10	0.05 1	42 mm	546092	VABF-S2-1-R5C2-C-10
	ZJ	2 and 4, reversible	0.5 6	0.05 0.6	42 mm	546091	VABF-S2-1-R5C2-C-6
	ZL	2, reversible	0.5 10	0.05 1	42 mm	546832	VABF-S2-1-R6C2-C-10
	ZN	2, reversible	0.5 6	0.05 0.6	42 mm	546831	VABF-S2-1-R6C2-C-6
	ZK	4, reversible	0.5 10	0.05 1	42 mm	546834	VABF-S2-1-R7C2-C-10
	ZM	4, reversible	0.5 6	0.05 0.6	42 mm	546833	VABF-S2-1-R7C2-C-6
egulator plate, width	52 mm						
	ZA	1	0.5 10	0.05 1	52 mm	555772	VABF-S2-2-R1C2-C-10
	ZF	1	0.5 6	0.05 0.6	52 mm	555771	VABF-S2-2-R1C2-C-6
	ZC	2	1.0 10	0.1 1	52 mm	555774	VABF-S2-2-R2C2-C-10
	ZH	2	1.0 6	0.1 0.6	52 mm	555773	VABF-S2-2-R2C2-C-6
	ZB	4	1.0 10	0.1 1	52 mm	555776	VABF-S2-2-R3C2-C-10
7	ZG	4	1.0 6	0.1 0.6	52 mm	555775	VABF-S2-2-R3C2-C-6
	ZD	2 and 4	1.0 10	0.1 1	52 mm	555778	VABF-S2-2-R4C2-C-10
	ZI	2 and 4	1.0 6	0.1 0.6	52 mm	555777	VABF-S2-2-R4C2-C-6
	ZE	2 and 4, reversible	0.5 10	0.05 1	52 mm	555780	VABF-S2-2-R5C2-C-10
	ZJ	2 and 4, reversible	0.5 6	0.05 0.6	52 mm	555779	VABF-S2-2-R5C2-C-6
	ZL	2, reversible	0.5 10	0.05 1	52 mm	555782	VABF-S2-2-R6C2-C-10
	ZN	2, reversible	0.5 6	0.05 0.6	52 mm	555781	VABF-S2-2-R6C2-C-6
	ZK	4, reversible	0.5 10	0.05 1	52 mm	555784	VABF-S2-2-R7C2-C-10
	ZM	4, reversible	0.5 6	0.05 0.6	52 mm	555783	VABF-S2-2-R7C2-C-6

Ordering data – Vert	ical stacking						
	Code	Pressure regulation for port	Control range		Width	Part no.	Туре
			[bar]	[MPa]			
Regulator plate for va	llves with symr	metrical design, width 18 mm					
<b>\$</b>	ZAY	1	0.5 8.5	0.05 0.85	18 mm	560756	VABF-S4-2-R1C2-C-10E
	ZFY	1	0.5 6	0.05 0.6	18 mm	560758	VABF-S4-2-R1C2-C-6E
	ZCY	2	2 8.5	0.2 0.85	18 mm	560763	VABF-S4-2-R2C2-C-10E
	ZHY	2	2 6	0.2 0.6	18 mm	560765	VABF-S4-2-R2C2-C-6E
	ZDY	2 and 4	2 8.5	0.2 0.85	18 mm	560767	VABF-S4-2-R4C2-C-10E
`	ZIY	2 and 4	2 6	0.2 0.6	18 mm	560769	VABF-S4-2-R4C2-C-6E
	ZEY	2 and 4, reversible	0.5 8.5	0.05 0.85	18 mm	560771	VABF-S4-2-R5C2-C-10E
	ZJY	2 and 4, reversible	0.5 6	0.05 0.6	18 mm	560773	VABF-S4-2-R5C2-C-6E
	ZLY	2, reversible	0.5 8.5	0.05 0.85	18 mm	560775	VABF-S4-2-R6C2-C-10E
	ZNY	2, reversible	0.5 6	0.05 0.6	18 mm	560777	VABF-S4-2-R6C2-C-6E
Regulator plate for va	lves with symr	metrical design, width 26 mm					
	ZAY	1	0.5 8.5	0.05 0.85	26 mm	560757	VABF-S4-1-R1C2-C-10E
	ZFY	1	0.5 6	0.05 0.6	26 mm	549876	VABF-S4-1-R1C2-C-6E
	ZCY	2	2 8.5	0.2 0.85	26 mm	560764	VABF-S4-1-R2C2-C-10E
	ZHY	2	2 6	0.2 0.6	26 mm	560766	VABF-S4-1-R2C2-C-6E
The state of	ZDY	2 and 4	2 8.5	0.2 0.85	26 mm	560768	VABF-S4-1-R4C2-C-10E
	ZIY	2 and 4	2 6	0.2 0.6	26 mm	560770	VABF-S4-1-R4C2-C-6E
	ZEY	2 and 4, reversible	0.5 8.5	0.05 0.85	26 mm	560772	VABF-S4-1-R5C2-C-10E
	ZJY	2 and 4, reversible	0.5 6	0.05 0.6	26 mm	560774	VABF-S4-1-R5C2-C-6E
	ZLY	2, reversible	0.5 8.5	0.05 0.85	26 mm	560776	VABF-S4-1-R6C2-C-10E
	ZNY	2, reversible	0.5 6	0.05 0.6	26 mm	560778	VABF-S4-1-R6C2-C-6E
Regulator plate for va	lives with symi	metrical design, width 42 mm <sup>1)</sup>					
C C C C C C C C C C C C C C C C C C C	ZAY	1	0.5 10	0.05 1	42 mm	_	VABF-S2-1-R1C2-C-10E
	ZFY	1	0.5 6	0.05 0.6	42 mm	_	VABF-S2-1-R1C2-C-6E
	ZCY	2	0.5 10	0.05 1	42 mm	_	VABF-S2-1-R2C2-C-10E
	ZHY	2	0.5 6	0.05 0.6	42 mm	_	VABF-S2-1-R2C2-C-6E
	ZBY	4	0.5 10	0.05 1	42 mm	-	VABF-S2-1-R3C2-C-10E
Ą	ZGY	4	0.5 6	0.05 0.6	42 mm	-	VABF-S2-1-R3C2-C-6E
	ZDY	2 and 4	0.5 10	0.05 1	42 mm	-	VABF-S2-1-R4C2-C-10E
	ZIY	2 and 4	0.5 6	0.05 0.6	42 mm	-	VABF-S2-1-R4C2-C-6E
	ZEY	2 and 4, reversible	0.5 10	0.05 1	42 mm	-	VABF-S2-1-R5C2-C-10E
	ZJY	2 and 4, reversible	0.5 6	0.05 0.6	42 mm	-	VABF-S2-1-R5C2-C-6E
	ZLY	2, reversible	0.5 10	0.05 1	42 mm	-	VABF-S2-1-R6C2-C-10E
	ZNY	2, reversible	0.5 6	0.05 0.6	42 mm	-	VABF-S2-1-R6C2-C-6E
	ZKY	4, reversible	0.5 10	0.05 1	42 mm	-	VABF-S2-1-R7C2-C-10E
	ZMY	4, reversible	0.5 6	0.05 0.6	42 mm	-	VABF-S2-1-R7C2-C-6E
Regulator plate for va	lves with sum	metrical design, width 52 mm <sup>1)</sup>					<u> </u>
CO PIGLE IOI VA	ZAY	1	0.5 10	0.05 1	52 mm	_	VABF-S2-2-R1C2-C-10E
	ZFY	1	0.5 6	0.05 0.6	52 mm	_	VABF-S2-2-R1C2-C-10L
	ZCY	2	0.5 10	0.05 1	52 mm	_	VABF-S2-2-R2C2-C-10E
	ZHY	2	0.5 6	0.05 0.6	52 mm	-	VABF-S2-2-R2C2-C-10E
	ZBY	4	0.5 10	0.05 1	52 mm	_	VABF-S2-2-R3C2-C-10E
- 1	ZGY	4	0.5 6	0.05 0.6	52 mm	-	VABF-S2-2-R3C2-C-6E
	ZDY	2 and 4	0.5 10	0.05 1	52 mm	-	VABF-S2-2-R4C2-C-10E
	ZIY	2 and 4	0.5 6	0.05 0.6	52 mm	_	VABF-S2-2-R4C2-C-6E
	ZEY	2 and 4, reversible	0.5 10	0.05 1	52 mm	-	VABF-S2-2-R5C2-C-10E
	ZJY	2 and 4, reversible	0.5 6	0.05 0.6	52 mm	-	VABF-S2-2-R5C2-C-6E
	ZLY	2, reversible	0.5 10	0.05 1	52 mm	-	VABF-S2-2-R6C2-C-10E
	ZNY	2, reversible	0.5 6	0.05 0.6	52 mm	-	VABF-S2-2-R6C2-C-6E
	4111						
	ZKY	4, reversible	0.5 10	0.05 1	52 mm	-	VABF-S2-2-R7C2-C-10E

<sup>1)</sup> These functions are only available via the pressure regulator configurator VABF-S2 for width 42 mm and 52 mm only (ISO 5599-2, ISO 1 and ISO 2)

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Ordering data	Code	Description		Width	Part no.	Туре
	couc	Description	<del> </del>	Width	Tareno.	Турс
Pressure gauge	Т	With cartridge connection for regula-	scale in bar/psi,	18 mm	F/2/07	PAGN-26-16-P10
	'	tor, 10 bar,	l '' '		543487	PAGN-26-16-P10
		toi, 10 bai,	for regulator plate code ZA, ZB, ZC,	26 mm 42 mm	548010	PAGN-40-16-P10
			ZD, ZE, ZK, ZL	52 mm	548010	PAGN-40-16-P10
	U	With cartridge connection for regula-	scale in bar/psi,	18 mm	543488	PAGN-26-10-P10
	١٥	tor, 6 bar,	display range 010 bar/0145 psi,	26 mm	343466	PAGN-26-10-P10
		toi, o bai,	for regulator plate code ZF, ZG, ZH, ZI,	42 mm	548009	PAGN-40-10-P10
			ZJ, ZM, ZN		548009	PAGN-40-10-P10
	WT	With cartridge connection for regula-		52 mm	542725	DACH 26 4 6M D40
	WI	tor, 10 bar	Scale in MPa, display range 016 bar/01.6 MPa, for regulator plate code ZA, ZB, ZC, ZD, ZE, ZK, ZL	18 mm	563735	PAGN-26-1.6M-P10
					542727	PAGN-40-1.6M-P10
				42 mm	563737	PAGN-40-1.6M-P10
	14/11	West and the constitution for any		52 mm	540704	DACH OC AM DAG
	WU	tor, 6 bar	Scale in MPa, display range 016 bar/01 MPa	18 mm	563736	PAGN-26-1M-P10
			for regulator plate code ZF, ZG, ZH, ZI, ZJ, ZM, ZN	26 mm	540700	DACH (O AM DAG
				42 mm	563738	PAGN-40-1M-P10
				52 mm		
	VT	With cartridge connection for regula-	Scale in psi/bar,	18 mm	563731	PAGN-26-232P-P10
		tor, 10 bar	display range 016 bar/0232 psi for regulator plate code ZA, ZB, ZC,	26 mm		
			ZD, ZE, ZK, ZL	42 mm	563733	PAGN-40-232P-P10
				52 mm		
	PS	With cartridge connection for regula-	Scale in psi/bar,	18 mm	563732	PAGN-26-145P-P10
		tor, 6 bar	display range 010 bar/0145 psi	26 mm		
			for regulator plate code ZF, ZG, ZH, ZI,	42 mm	563734	PAGN-40-145P-P10
			ZJ, ZM, ZN	52 mm		

ordering data	Code	Description		Part no.	Туре
artridge for regulato	r plate			•	•
	-	For tubing O.D. 4 mm	Pack of 1	172972	QSP10-4
	-	Adapter for pressure gauge (allows products with threaded connection G1/8 to be attached to the cartridge connection)	Pack of 6	565811	QSP10-G1/8
rottle plate					
rottle plate	X	controls the flow of exhaust air downstream of the valve to ducts 3 and 5	18 mm	540176	VABF-S4-2-F1B1-C
^ <b>*</b>	^	controls the now of exhaust all downstream of the valve to ducts 3 and 3	26 mm	540175	VABF-S4-1-F1B1-C
			42 mm	546095	VABF-S2-1-F1B1-C
TO TO THE PARTY OF	Day		52 mm	555789	VABF-S2-2-F1B1-C
rtical pressure shut					
	ZT	3/2-way valve for shutting off the operating pressure at the valve position Pressure separation can be shut off on the valve assembly	18 mm	542884	VABF-S4-2-L1D1-C
		Fressure separation can be shut on on the valve assembly	26 mm	542885	VABF-S4-1-L1D1-C
			42 mm 52 mm	546096 555791	VABF-S2-1-L1D1-C VABF-S2-2-L1D1-C
	ZS	3/2-way valve for shutting off the operating pressure at the valve position	18 mm	8001178	VABF-S4-2-L1D2-C
		Pressure separation can be shut off on the valve assembly using a key	26 mm	8001179	VABF-S4-1-L1D2-C
vering					
$\searrow$	L	Blanking plate for vacant position	18 mm	539213	VABB-S4-2-WT
R. C.			26 mm	539212	VABB-S4-1-WT
			42 mm	543186	VABB-S2-1-WT
•			52 mm	560845	VABB-S2-2-WT
	N	Cover cap for manual override, non-detenting	Pack of 10	541010	VAMC-S6-CH
9	V	Cover cap for manual override, concealed	Pack of 10	541011	VAMC-S6-CS
	A	Cover cap, heavy duty, for manual override, non-detenting heavy duty, detenting via accessory (key) (The cover cap is provided for one-off mounting only)	Pack of 10	4105147	VAMC-B-S6-CTR
9	-	Sealing cap for electrical links (with individual connection), size 18 mm and 26 mm	Pack of 10	547713	VABD-S4-E-C
	-	Seal (with individual connection), Width 42 mm and 52 mm	Pack of 2	571343	VABD-S2-1-S-C
cessories for manu	al override. h	eavy duty		<u> </u>	
	-	Coded key (accessory) for actuating the cover cap, heavy duty, for detenting position (VAMC-B-S6-CTR)	Pack of 1	1662543	АНВ-МЕВ-В



There is a wide range of preconfigured solenoid valves with cover cap for manual override and correct valve type code available to order in the sections on solenoid valves.

## Accessories – Electrical components

Ordering data		1		I	I
	Code	Description		Part no.	Туре
Multi-pin node for VTS	A/VTSA-F				
	Т	Terminal strip, 36-pin	🗐 - Note	543412	VABE-S6-1LF-C-M1-C36M
	MP1	Sub-D plug, 37-pin		543414	VABE-S6-1LT-C-M1-S37
	MP4	Round plug, 19-pin	Multi-pin node supplied without cover.	543415	VABE-S6-1LF-C-M1-R19
			Please order appropriate cover with ca-		
			ble separately.		
Individual electrical co	nnection for	VTSA/VTSA-F			
	-MP2		vidual connection M12, 6-way	549046	VABE-S6-LT-C-S6-R5
	-MP3	Multi-pin node with indi	vidual connection M12, 10-way	549047	VABE-S6-LT-C-S10-R5
0					
	-	Cover for individual conn	ection M12, 6-way	549048	VAEM-S6-C-S6-R5
	-	Cover for individual conn	ection M12, 10-way	549049	VAEM-S6-C-S10-R5
Pneumatic interface fo	r VTSA/VTSA				
(°, \$	-	For electrical terminal CF	YX in polymer	543416	VABA-S6-1-X1
	-	For electrical terminal CF		550663	VABA-S6-1-X2
	-	For electrical terminal CF with changed diagnostic		573613	VABA-S6-1-X2-D
Electrical interface IO-I	l Link <sup>®</sup>				
		IO-Link® interface for 16	valve positions	8152353	VABA-S6-1-PT
Electrical interface for	AS-Interface	_			
	-	4 inputs/4 outputs		549042	VABE-S6-1LF-C-A4-E
	-	8 inputs/8 outputs		549043	VABE-S6-1LF-C-A8-E
AS-Interface module fo	or VTSA/VTSA	1			
	_	4 inputs/4 outputs		549044	VAEM-S6-S-FAS-4-4E
	-	8 inputs/8 outputs		549045	VAEM-S6-S-FAS-8-8E

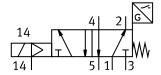
## Accessories – Electrical components

	Code	Description		Part no.	Туре
Manifold block for AS-I	nterface				
A S	Х	4x M12, 5-pin, double, socket		195704	CPX-AB-4-M12x2-5POL
	GW	4x M12, 5-pin, socket, metal thread		541254	CPX-AB-4-M12x2-5POL-R
	ı R	8x M8, 3-pin, socket		195706	CPX-AB-8-M8-3POL
	J	8x spring-loaded terminal, Cage Clamp, 4-pin		195708	CPX-AB-8-KL-4POL
	В	Sub-D, 25-pin, socket		525676	CPX-AB-1-SUB-BU-25POL
onnecting cable, Sub	D (TDE II/DI	ID) ID(5)			
onnecting capie, sub	GA	Connecting cable for max. 8 solenoid coils, 10-core	2.5 m	539240	NEBV-S1W37-E-2.5-LE10
	GB		5 m	539241	NEBV-S1W37-E-5-LE10
	GC		10 m	539242	NEBV-S1W37-E-10-LE10
	GD	Connecting cable for max. 22 solenoid coils, 26-core	2.5 m	539243	NEBV-S1W37-E-2.5-LE26
<b>↓</b>	GE		5 m	539244	NEBV-S1W37-E-5-LE26
G	GF		10 m	539245	NEBV-S1W37-E-10-LE26
	GG	Connecting cable for max. 32 solenoid coils, 37-core	2.5 m	539246	NEBV-S1W37-K-2.5-LE37
	GH		5 m	539247	NEBV-S1W37-K-5-LE37
	GI		10 m	539248	NEBV-S1W37-K-10-LE37
· · · · · · · · · · · · · · · · · · ·	D (D)(C ID(	-	<u>'</u>		
onnecting cable, Sub	GK	Connecting cable for max. 8 solenoid coils, 10-core	2.5 m	543271	NEBV-S1W37-KM-2.5-LE10
	GL	Connecting cable for max. 8 solenoid coils, 10-core	5 m	543271	NEBV-S1W37-KM-2.5-LE10
	GM	-	10 m	543273	NEBV-S1W37-KM-10-LE10
	GN	Connecting cable for max. 23 solenoid coils, 27-core	2.5 m	543274	NEBV-S1W37-KM-2.5-LE27
V 4	GO	Connecting capite for max. 25 solenoid cons, 27-core	5 m	543275	NEBV-S1W37-KM-5-LE27
	GP	-	10 m	543276	NEBV-S1W37-KM-10-LE27
	GQ	Connecting cable for max. 32 solenoid coils, 37-core	2.5 m	543277	NEBV-S1W37-KM-2.5-LE37
	GR	Connecting capite for max. 92 solenoid cons, 97 core	5 m	543278	NEBV-S1W37-KM-5-LE37
	GS	_	10 m	543279	NEBV-S1W37-KM-10-LE37
			120	3.3273	
over for multi-pin plu	g	Ta a constant			T
•	-	For configuration by the user		545974	NECV-S1W37
750					

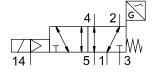
#### Accessories – General

	Code	Description		Part no.	Туре
nscription label holder	s/inscrintio	on lahels		-	
S	В	Clip-on inscription label holder for valve cap	Pack of 5	540888	ASCF-T-S6
<u>*</u>	Т	Inscription label holder for manifold blocks	Pack of 5	540889	ASCF-M-S6
	TD	Inscription label holder for manifold blocks, size 52 mm	Pack of 5	562577	ASCF-M-S2-2
	-	Inscription label for ISO 15407 valves with individual electrical connection (20 labels in frames)	Pack of 20	18182	IBS-9x20
					ASLR-L-S6-2016
H-rail mounting					
	-	VTSA/VTSA-F	Pack of 3	526032	CPX-CPA-BG-NRH
Wall mounting					
	-	Mounting bracket with a mounting hole for M5 screw	Pack of 5	539214	VAME-S6-10-W
	U	Mounting bracket with a mounting hole for M4 screw and a mounting hole for M6 screw	Pack of 1	567038	VAME-S6-W-M46
	AW	Mounting bracket for length compensation on the CPX side when mounting using support system Set comprising 1 angle bracket and 2 screws	Pack of 1	2721419	CPX-M-BG-VT-2X
User documentation					
) Ser documentation	D	User documentation for valve terminal VTSA/VTSA-F	German	538922	VTSA/VTSA-F-DE
	E		English	538923	VTSA/VTSA-F-EN
	S	-	Spanish	538924	VTSA/VTSA-F-ES
	F		French	538925	VTSA/VTSA-F-FR
	I	7	Italian	538926	VTSA/VTSA-F-IT
		1			

Valves with code SO, SQ, SS, width 18 mm



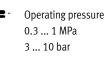
Valves with code SO, SQ, SS, width 26 mm

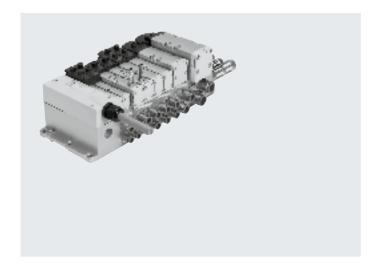


Flow rate up to 1100 l/min

Valve width 18 mm 26 mm

Voltage 24 V DC





#### ISO valves with switching position sensing for safety-related pneumatic components Function

The single solenoid 5/2-way valve with spring return in width 18 mm and 26 mm features valve diagnostics. It is available as a valve with plug-in or individual connection with pilot valves to ISO 15218 and square plug type C.

The normal position of the piston spool is monitored by the inductive

This valve is not a safety device in accordance with the Machinery Directive 2006/42/EC. When used in higher categories, the sensor signal from the valve must be evaluated by the control system.

This valve is suitable for use in safety-related parts of control systems to EN ISO 13849-1.

The control block has been developed and manufactured in accordance with the basic and proven safety principles of EN ISO 13849-2.

This valve is designed for installation in machines and automation systems and must only be used in industrial applications (high-demand mode).

Decentralised individual connection variant

Valve on individual sub-base (square plug or plug-in) with integrated switching position sensing.

The electrical connection is established via either a standardised 4-pin M12 plug 24 V DC (ISO 15407-2), a 4-pin spring-loaded terminal or a cable (open end) 24 V DC, which can be configured by the user.

The individual sub-base can be supplied with internal or external pilot air

depending on the version.

Variant for valve terminal VTSA/VTSA-F



The valves with integrated switching position sensing in plug-in design for valve terminal VTSA/VTSA-F can be used regardless of the type of electrical actuation (individual, multi-pin plug or fieldbus/control block connecPilot air supply:

The valve terminal can be supplied with internal or external pilot air via the various end plate variants.

Note

Valves in plug-in design are always supplied with pilot air via duct 14 in the manifold sub-base.

The circuit diagram represents a valve with a proximity switch with a N/O switching output signal. In accordance with ISO 1219-1, this symbol applies to both N/O and N/C contacts. The switching element function of the sensors used here is designed as an N/C contact.

#### Note

Pilot exhaust air port 12 is exhausted directly at the valve, without a connection. If the customer requests a "turned seal", exhaust air is vented at the end plates of the valve terminal, which doesn't conform to the ISO standard.

Safety data					
Conforms to	EN 13849-1/2				
CE marking (see declaration of conformity)	To EU EMC Directive 1)				
Shock resistance	Shock test with severity level 2, to EN 60068-2-27				
Vibration resistant	Transport application test with severity level 2, to EN 60068-2-6				

<sup>1)</sup> For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp → Certificates.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Safety data		
Valve function 5/2-way, single solenoid	Test pulses	
	Max. positive test pulse with logic 0 [µs]	Max. negative test pulse with logic 1 [µs]
VSVA-B-M52-MZA1-1T1L	1200	1100
VSVA-B-M52-MZA2-1T1L	1500	800
VSVA-B-M52-MZ-A1-1C1	1800	800

General technical data				
Valve	VSVA-B-M52-MZD-A2-1T1L	VSVA-B-M52-MZD-A1-1T1L	VSVA-B-M52-MZ-A1-1C1	
Width	18 mm	26 mm	26 mm	
Conforms to	ISO 15407-2		ISO 15407-1	
Design	Piston spool valve			
Sealing principle	Soft			
Overlap	Positive overlap			
Actuation type	Electrical	Electrical		
Type of control	Piloted			
Exhaust function, can be throttled	Via individual sub-base, via throttle pl	ate		
Lubrication	Lifetime lubrication			
Type of mounting	Via through-hole, on manifold sub-bas	se		
Mounting position	Any			
Manual override	Concealed			
Individual sub-base			→ Page 200	
Valve terminal			→ Page 73	

Standard nominal flow rate [l/min]				
Valve function	Flow rate			
	Valve	Valve on valve terminal VTSA	Valve on valve terminal VTSA-F	Valve on individual sub-base
VSVA-B-M52-MZ-A1-1C1-ANC	1400	1100	-	1100
VSVA-B-M52-MZ-A1-1C1-ANP	1400	1100	-	1100
VSVA-B-M52-MZ-A1-1C1-APC	1400	1100	-	1100
VSVA-B-M52-MZ-A1-1C1-APP	1400	1100	-	1100
VSVA-B-M52-MZD-A1-1T1L-ANC	1400	1100	1350	1200
VSVA-B-M52-MZD-A1-1T1L-ANP	1400	1100	1350	1200
VSVA-B-M52-MZD-A1-1T1L-APC	1400	1100	1350	1200
VSVA-B-M52-MZD-A1-1T1L-APP	1400	1100	1350	1200
VSVA-B-M52-MZD-A1-1T1L-APX-0.5	1400	1100	1350	1200
VSVA-B-M52-MZD-A2-1T1L-ANP	750	550	700	600
VSVA-B-M52-MZD-A2-1T1L-APP	750	550	700	600
VSVA-B-M52-MZD-A2-1T1L-APX-0.5	750	550	700	600

Valve switching times [ms]					
Valve		VSVA-B-M52-MZD-A2-1T1L	VSVA-B-M52-MZD-A1-1T1L	VSVA-B-M52-MZ-A1-1C1	
Width		18 mm	26 mm	26 mm	
Valve switching times	On	12	20	21	
	Off	38	54	41	
Sensor switching times	On	32	60	60	
	Off	9	11	11	

Electrical data for valve				
Valve		VSVA-B-M52-MZD-A2-1T1L	VSVA-B-M52-MZD-A1-1T1L	VSVA-B-M52-MZ-A1-1C1
Width		18 mm	26 mm	26 mm
Electrical connection		4-pin plug to ISO 15407-2		Plug to EN 175301-803, type C, without PE conductor
Nominal operating voltage	[V DC]	24		
Permissible voltage fluctuations	[%]	±10		-15/+10
Surge resistance	[kV]	2.5		
Pollution degree		3		
Power consumption	[W]	1.6		1.8
Switching position sensing		Normal position via sensor		
Duty cycle	[%]	100		
Degree of protection to EN 60529		IP65, NEMA 4 (for all types of signal tra	nsmission when mounted)	
Signal status indication		LED		Via accessories

Electrical data for sensor		
Electrical connection	-	Cable, 3-core
		Plug M8x1, 3-pin
Cable length	[m]	2.5
Switching output		PNP or NPN
Switching element function		N/C
Switching status indication		Yellow LED
Operating voltage range	[V DC]	10 30
Residual ripple	[%]	±10
Sensor no-load current	[mA]	š10
Max. output current	[mA]	200
Voltage drop	[V]	Š2
Max. switching frequency	[Hz]	5000
Short circuit current rating		Clocked
Reverse polarity protection for sen-		For all electrical connections
sor		
Measuring principle		Inductive
Switching position sensing		Valve normal position via sensor

Operating and environmental conditions					
Valve		VSVA-B-M521T1L	VSVA-B-M521C1		
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]			
Notes on operating/		Lubricated operation possible (in which case lubrication will always be required)			
pilot medium					
Operating pressure	[bar]	-0.9 10	-0.9 16		
	[MPa]	-0.09 1	-0.09 1.6		
Operating pressure for valve termi-	[bar]	310			
nal with internal pilot air supply	[MPa]	0.3 1			
Pilot pressure	[bar]	310			
	[MPa]	0.3 1			
Ambient temperature [°C]		-5 +50			
Temperature of medium [°C]		-5 +50			
Note on materials		RoHS-compliant			
Noise level LpA [dB(A)]		85			
CE marking (see declaration of conformity)		To EU EMC Directive <sup>1)</sup>			
UKCA marking (see declaration of conformity)		To UK EMC regulations <sup>1)</sup>			
KC marking		KCEMC			
Certification		C-Tick	C-Tick		
		c UL us - Recognized (OL)	-		

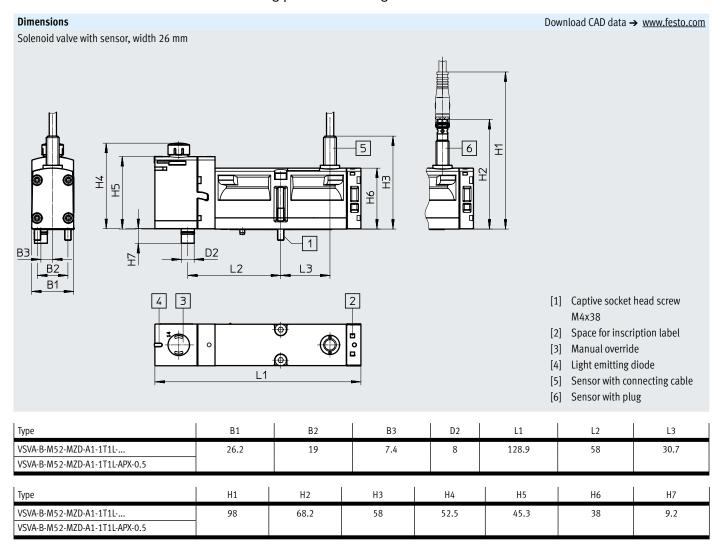
<sup>1)</sup> For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... 

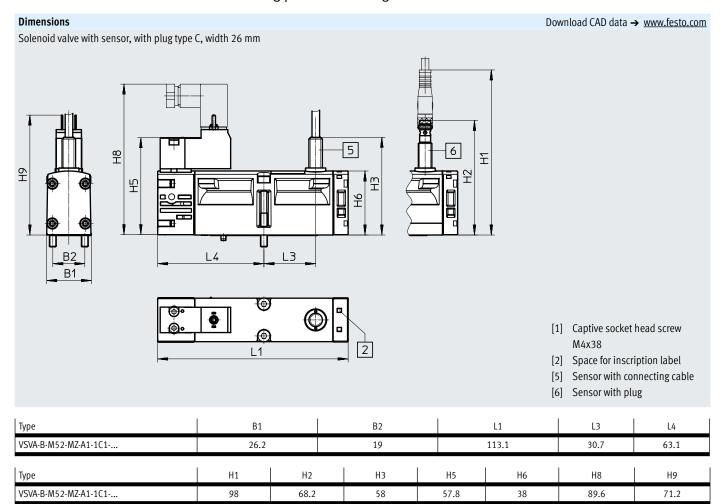
Support/Downloads.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Materials			
Sub-base/manifold sub-base	Die-cast aluminium		
Valve	Die-cast aluminium, PA		
Seals	FPM, NBR		
Screws	Galvanised steel		
Sensor housing	High-alloy stainless steel		
Sensor cable sheath	TPE-U(PUR)		

Product weight					
Width	18 mm	26 mm			
5/2-way solenoid valve type	5/2-way solenoid valve type				
VSVA-B-M52-MZD-A2-1T1L-APX-0.5	157 g	-			
VSVA-B-M52-MZD-A2-1T1L-APP	140 g	-			
VSVA-B-M52-MZD-A2-1T1L-ANP	140 g	-			
VSVA-B-M52-MZD-A1-1T1L-APC	-	307 g			
VSVA-B-M52-MZD-A1-1T1L-APP	-	264 g			
VSVA-B-M52-MZ-A1-1C1-APC	-	332 g			
VSVA-B-M52-MZ-A1-1C1-APP	-	289 g			
VSVA-B-M52-MZD-A1-1T1L-ANC	-	307 g			
VSVA-B-M52-MZD-A1-1T1L-ANP	-	264 g			
VSVA-B-M52-MZ-A1-1C1-ANC	-	332 g			
VSVA-B-M52-MZ-A1-1C1-ANP	-	289 g			
VSVA-B-M52-MZD-A1-1T1L-APX-0.5	-	281 g			
Individual connection					
Individual sub-base	192	302 g			





## Ordering data – Solenoid valve with switching position sensing

	Code	Valve function	Width	Part no.	Туре	
5/2-way solenoid valve, 24 V DC, plug-in design for valve terminal VTSA/VTSA-F with proximity switch						
	-	5/2-way valve, single solenoid, mechanical spring return, inductive sensor with PNP output and cable, 3-core, 2.5 m	26 mm	560723	VSVA-B-M52-MZD-A1-1T1L-APC	
	-	5/2-way valve, single solenoid, mechanical spring return, inductive sensor with NPN output and cable, 3-core, 2.5 m	26 mm	560742	VSVA-B-M52-MZD-A1-1T1L-ANC	
	SS	5/2-way valve, single solenoid, mechanical spring return, inductive	18 mm	573201	VSVA-B-M52-MZD-A2-1T1L-APX-0.5	
		sensor with PNP output with 0.5 m connecting cable and 4-pin sensor push-in connector M12x1	26 mm	570850	VSVA-B-M52-MZD-A1-1T1L-APX-0.5	
	SO SO	5/2-way valve, single solenoid, mechanical spring return, inductive	18 mm	573202	VSVA-B-M52-MZD-A2-1T1L-APP	
		sensor with PNP output and 3-pin sensor push-in connector M8x1	26 mm	560724	VSVA-B-M52-MZD-A1-1T1L-APP	
	SQ	5/2-way valve, single solenoid, mechanical spring return, inductive	18 mm	573203	VSVA-B-M52-MZD-A2-1T1L-ANP	
		sensor with NPN output and 3-pin sensor push-in connector M8x1	26 mm	560743	VSVA-B-M52-MZD-A1-1T1L-ANP	

Ordering data – Solenoi	d valve VS\ Code	/A with cover cap for manual override non-detenting/heavy duty, deter Valve function	sory (TR) Part no.	Туре		
5/2-way solenoid valve, 24 V DC, plug-in design for valve terminal VTSA/VTSA-F with proximity switch						
	-	5/2-way valve, single solenoid, mechanical spring return, inductive sensor with PNP output and cable, 3-core, 2.5 m	26 mm	8033026	VSVA-B-M52-MZTR-A1-1T1L-APC	
	-	5/2-way valve, single solenoid, mechanical spring return, inductive sensor with NPN output and cable, 3-core, 2.5 m	26 mm	8033030	VSVA-B-M52-MZTR-A1-1T1L-ANC	
	SS	5/2-way valve, single solenoid, mechanical spring return, inductive sensor with PNP output with 0.5 m connecting cable and 4-pin sensor push-in connector M12x1	18 mm	8033459	VSVA-B-M52-MZTR-A2-1T1L-APX-0.5	
			26 mm	8033034	VSVA-B-M52-MZTR-A1-1T1L-APX-0.5	
	SO 5/2-way valve, single solenoid, mechanical spring return, inductive sensor with PNP output and 3-pin sensor push-in connector M8x1  SQ 5/2-way valve, single solenoid, mechanical spring return, inductive sensor with NPN output and 3-pin sensor push-in connector M8x1		18 mm	8033460	VSVA-B-M52-MZTR-A2-1T1L-APP	
			26 mm	8033027	VSVA-B-M52-MZTR-A1-1T1L-APP	
		18 mm	8033461	VSVA-B-M52-MZTR-A2-1T1L-ANP		
		sensor with NPN output and 3-pin sensor push-in connector M8x1	26 mm	8033031	VSVA-B-M52-MZTR-A1-1T1L-ANP	

# Ordering data – Solenoid valve with switching position sensing

	Code	Valve function	Width	Part no.	Туре
2-way solenoid valve	, 24 V DC, p	lug-in design for valve terminal VTSA/VTSA-F with proximity switch			
	-	5/2-way valve, single solenoid, mechanical spring return, inductive sensor with PNP output and cable, 3-core, 2.5 m	26 mm	8033049	VSVA-B-M52-MZH-A1-1T1L-APC
	_	5/2-way valve, single solenoid, mechanical spring return, inductive sensor with NPN output and cable, 3-core, 2.5 m	26 mm	8033053	VSVA-B-M52-MZH-A1-1T1L-ANC
<u> </u>	SS	5/2-way valve, single solenoid, mechanical spring return, inductive	18 mm	8033477	VSVA-B-M52-MZH-A2-1T1L-APX-0.5
		sensor with PNP output with 0.5 m connecting cable and 4-pin sensor push-in connector M12x1	26 mm	8033057	VSVA-B-M52-MZH-A1-1T1L-APX-0.5
	S0	5/2-way valve, single solenoid, mechanical spring return, inductive	18 mm	8033478	VSVA-B-M52-MZH-A2-1T1L-APP
		sensor with PNP output and 3-pin sensor push-in connector M8x1	26 mm	8033050	VSVA-B-M52-MZH-A1-1T1L-APP
	SQ	5/2-way valve, single solenoid, mechanical spring return, inductive	18 mm	8033479	VSVA-B-M52-MZH-A2-1T1L-ANP
		sensor with NPN output and 3-pin sensor push-in connector M8x1	26 mm	8033054	VSVA-B-M52-MZH-A1-1T1L-ANP

Ordering data - Solenoi	d valve VS\	/A with cover cap for manual override, concealed							
	Code	Valve function	Width	Part no.	Туре				
5/2-way solenoid valve, 24 V DC, plug-in design for valve terminal VTSA/VTSA-F with proximity switch									
	_	5/2-way valve, single solenoid, mechanical spring return, inductive sensor with PNP output and cable, 3-core, 2.5 m	26 mm	8033072	VSVA-B-M52-MZ-A1-1T1L-APC				
	_	5/2-way valve, single solenoid, mechanical spring return, inductive sensor with NPN output and cable, 3-core, 2.5 m	26 mm	8033076	VSVA-B-M52-MZ-A1-1T1L-ANC				
(P)	SS	5/2-way valve, single solenoid, mechanical spring return, inductive	18 mm	8033495	VSVA-B-M52-MZ-A2-1T1L-APX-0.5				
		sensor with PNP output with 0.5 m connecting cable and 4-pin sensor push-in connector M12x1	26 mm	8033080	VSVA-B-M52-MZ-A1-1T1L-APX-0.5				
	S0	5/2-way valve, single solenoid, mechanical spring return, inductive	18 mm	8033496	VSVA-B-M52-MZ-A2-1T1L-APP				
		sensor with PNP output and 3-pin sensor push-in connector M8x1	26 mm	8033073	VSVA-B-M52-MZ-A1-1T1L-APP				
	SQ	5/2-way valve, single solenoid, mechanical spring return, inductive	18 mm	8033497	VSVA-B-M52-MZ-A2-1T1L-ANP				
		sensor with NPN output and 3-pin sensor push-in connector M8x1	26 mm	8033077	VSVA-B-M52-MZ-A1-1T1L-ANP				

## Valve terminal VTSA/VTSA-F, NPT

# Ordering data – Solenoid valve with switching position sensing

Ordering data					
	Code	Valve function	Width	Part no.	Туре
Solenoid valves, 24 V DC	, with pne	umatic interface to ISO 15218 for individual sub-base			
	-	5/2-way valve, single solenoid, mechanical spring return, inductive sensor with PNP output and cable, 3-core, 2.5 m, electrical connection to EN 175301-803, type C	26 mm	560725	VSVA-B-M52-MZ-A1-1C1-APC
	-	5/2-way valve, single solenoid, mechanical spring return, inductive sensor with NPN output and cable, 3-core, 2.5 m, electrical connection to EN 175301-803, type C	26 mm	560744	VSVA-B-M52-MZ-A1-1C1-ANC
	_	5/2-way valve, single solenoid, mechanical spring return, inductive sensor with PNP output and 3-pin sensor push-in connector M8x1, electrical connection to EN 175301-803, type C	26 mm	560726	VSVA-B-M52-MZ-A1-1C1-APP
	-	5/2-way valve, single solenoid, mechanical spring return, inductive sensor with NPN output and 3-pin sensor push-in connector M8x1, electrical connection to EN 175301-803, type C	26 mm	560745	VSVA-B-M52-MZ-A1-1C1-ANP



## - Note

- The sensors integrated in the valves must not be replaced by the customer. Incorrect assembly can result in malfunctions or damage to the valve. Return the module to Festo for repair in the event of a fault.
- Valves with switching position sensing from the VSVA-B-M52-... series can only be ordered individually. If these are used on a valve terminal, appropriate vacant positions must be provided for them. Exceptions are the valves with ident. code SS, SO and SQ.

# Accessories – Solenoid valve with switching position sensing

	Code	Description		Part no.	Туре
dual sub-base,	port patteri	to ISO 15407-2, electrical connection via cable terminals			
	<u> </u>	Threaded connection, internal pilot air supply, lateral connections	18 mm	541068	VABS-S4-2S-N18-B-K2
e die			26 mm	541066	VABS-S4-1S-N14-B-K2
	٦ [-	Threaded connection, external pilot air supply, lateral connections	18 mm	539724	VABS-S4-2S-N18-K2
	<b> </b>		26 mm	539726	VABS-S4-1S-N14-K2
ocket for the e	lectrical con	nection of individual valves, type C			
	-	Angled socket, type C, 3-pin     Strict taken PG7		151687	MSSD-EB
		<ul><li>Straight plug, PG7</li><li>230 V AC</li></ul>			
J		Angled socket, type C, 3-pin		539712	MSSD-EB-M12
		Aligled Socket, type C, 3-pill     Straight plug, M12x1		539/12	MISSU-ED-MI12
	-1			Detect out on 1	atamat mak III
nating seal for	plug patteri	to EN 175301-803, type C		Datasheets → I	
	-	For plug socket MSSD, 12 24 V DC		151717	MEB-LD-12-24DC
cting cable for	electrical co	onnection of individual valves, type C			
	GG	Angled socket, type C, 3-pin, with LED	151688	KMEB-1-24-2.5-LED	
A)	GH	Open end, 3-core	5 m	151689	KMEB-1-24-5-LED
	GJ	• 24 V DC, PVC	10 m	193457	KMEB-1-24-10-LED
ecting cable for	the electric	al connection of sensors for switching position sensing			
ecting cable for			2.5 m	193457 541333	NEBU-M8G3-K-2.5-LE3
ecting cable for	the electric	Straight socket, M8x1, 3-pin     Open end, 3-core     Straight socket, M8x1, 3-pin			
ecting cable for	the electric	al connection of sensors for switching position sensing  • Straight socket, M8x1, 3-pin • Open end, 3-core  • Straight socket, M8x1, 3-pin • Open end, 3-core  • Angled socket, M8x1, 3-pin	2.5 m	541333	NEBU-M8G3-K-2.5-LE3
ecting cable for	GM GO	al connection of sensors for switching position sensing  • Straight socket, M8x1, 3-pin • Open end, 3-core  • Straight socket, M8x1, 3-pin • Open end, 3-core  • Angled socket, M8x1, 3-pin • Open end, 3-core	2.5 m 5 m 2.5 m	541333 541334 541338	NEBU-M8G3-K-2.5-LE3 NEBU-M8G3-K-5-LE3 NEBU-M8W3-K-2.5-LE3
ecting cable for	the electric  GM  GN	al connection of sensors for switching position sensing  • Straight socket, M8x1, 3-pin • Open end, 3-core  • Straight socket, M8x1, 3-pin • Open end, 3-core  • Angled socket, M8x1, 3-pin • Open end, 3-core  • Angled socket, M8x1, 3-pin • Open end, 3-core  • Angled socket, M8x1, 3-pin	2.5 m	541333 541334	NEBU-M8G3-K-2.5-LE3 NEBU-M8G3-K-5-LE3
ecting cable for	GM GO	al connection of sensors for switching position sensing  • Straight socket, M8x1, 3-pin • Open end, 3-core  • Straight socket, M8x1, 3-pin • Open end, 3-core  • Angled socket, M8x1, 3-pin • Open end, 3-core  • Angled socket, M8x1, 3-pin • Open end, 3-core  • Angled socket, M8x1, 3-pin • Open end, 3-core	2.5 m 5 m 2.5 m 5 m	541333 541334 541338 541341	NEBU-M8G3-K-2.5-LE3 NEBU-M8G3-K-5-LE3 NEBU-M8W3-K-2.5-LE3 NEBU-M8W3-K-5-LE3
ecting cable for	GM GO	al connection of sensors for switching position sensing  Straight socket, M8x1, 3-pin Open end, 3-core Straight socket, M8x1, 3-pin Open end, 3-core Angled socket, rotatable, M8x1, 3-pin	2.5 m 5 m 2.5 m	541333 541334 541338	NEBU-M8G3-K-2.5-LE3 NEBU-M8G3-K-5-LE3 NEBU-M8W3-K-2.5-LE3
ecting cable for	GM GO	al connection of sensors for switching position sensing  • Straight socket, M8x1, 3-pin • Open end, 3-core  • Straight socket, M8x1, 3-pin • Open end, 3-core  • Angled socket, M8x1, 3-pin • Open end, 3-core  • Angled socket, M8x1, 3-pin • Open end, 3-core  • Angled socket, M8x1, 3-pin • Open end, 3-core  • Angled socket, rotatable, M8x1, 3-pin • Open end, 3-core	2.5 m 5 m 2.5 m 5 m 2.5 m	541333 541334 541338 541341 8001660	NEBU-M8G3-K-2.5-LE3 NEBU-M8G3-K-5-LE3 NEBU-M8W3-K-2.5-LE3 NEBU-M8W3-K-5-LE3
ecting cable for	GM GO	al connection of sensors for switching position sensing  Straight socket, M8x1, 3-pin Open end, 3-core Straight socket, M8x1, 3-pin Open end, 3-core Angled socket, rotatable, M8x1, 3-pin	2.5 m 5 m 2.5 m 5 m	541333 541334 541338 541341	NEBU-M8G3-K-2.5-LE3 NEBU-M8G3-K-5-LE3 NEBU-M8W3-K-2.5-LE3 NEBU-M8W3-K-5-LE3
ecting cable for	GM GO	al connection of sensors for switching position sensing  Straight socket, M8x1, 3-pin Open end, 3-core Straight socket, M8x1, 3-pin Open end, 3-core Angled socket, rotatable, M8x1, 3-pin Open end, 3-core Angled socket, rotatable, M8x1, 3-pin Open end, 3-core Angled socket, rotatable, M8x1, 3-pin	2.5 m 5 m 2.5 m 5 m 2.5 m	541333 541334 541338 541341 8001660	NEBU-M8G3-K-2.5-LE3 NEBU-M8G3-K-5-LE3 NEBU-M8W3-K-2.5-LE3 NEBU-M8R3-K-2.5-LE3 NEBU-M8R3-K-5-LE3
ecting cable for	GM GO GP -	al connection of sensors for switching position sensing  Straight socket, M8x1, 3-pin Open end, 3-core Straight socket, M8x1, 3-pin Open end, 3-core Angled socket, rotatable, M8x1, 3-pin Open end, 3-core Angled socket, rotatable, M8x1, 3-pin Open end, 3-core Angled socket, rotatable, M8x1, 3-pin Open end, 3-core	2.5 m 5 m 2.5 m 5 m 2.5 m 5 m 5 m	541333 541334 541338 541341 8001660 8001661	NEBU-M8G3-K-2.5-LE3 NEBU-M8G3-K-5-LE3 NEBU-M8W3-K-2.5-LE3 NEBU-M8W3-K-5-LE3
	GM GO GP -	al connection of sensors for switching position sensing  Straight socket, M8x1, 3-pin Open end, 3-core Straight socket, M8x1, 3-pin Open end, 3-core Angled socket, M8x1, 3-pin Open end, 3-core Angled socket, M8x1, 3-pin Open end, 3-core Angled socket, rotatable, M8x1, 3-pin Open end, 3-core Angled socket, rotatable, M8x1, 3-pin Open end, 3-core Angled socket, rotatable, M8x1, 3-pin Open end, 3-core Straight socket, M8x1, 3-pin	2.5 m 5 m 2.5 m 5 m 2.5 m 5 m 5 m	541333 541334 541338 541341 8001660 8001661	NEBU-M8G3-K-2.5-LE3 NEBU-M8G3-K-5-LE3 NEBU-M8W3-K-2.5-LE3 NEBU-M8R3-K-2.5-LE3 NEBU-M8R3-K-5-LE3

Pneumatic connection accessories

A selection of possible fittings, blanking plugs, silencers and other pneumatic accessories can be found in the chapter "Accessories" > page: 209 or on the website using the individual search terms:

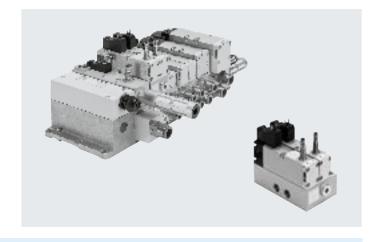
 $\textbf{Internet} \rightarrow \text{connection technology, silencer, blanking plug}$ 

- N - Flow rate on valve terminal: 830 l/min

Solenoid valve width 26 mm

- **\** - Voltage 24 V DC

Operating pressure
0.3 ... 1 MPa
3 ... 10 bar

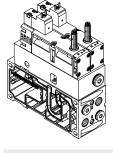


#### Description

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

- Protection against unexpected start-up (EN 1037)
- Reversing hazardous movements, provided the reversing motion will not result in further hazards

Version for valve terminal VTSA/VTSA-F



The control attributes of the control block enable Performance Level e to be achieved for the protective measures. 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 valves with integrated switching position sensing on manifold sub-base for valve terminal VTSA/VTSA-F need to be supplied with power regardless of the type of electrical actuation (individual, multi-pin plug or fieldbus/control block connection).

The requirements of EN ISO 13849-1 and EN ISO 13849-2 (e.g. CCF, DC) must be taken into consideration when installing and operating the component and when using it 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 electrical connection for the solenoid valves is established separately via a standardised square plug to EN 175301-803, type C.

The switching position sensing of the inductive PNP or NPN proximity switch is via a push-in connector size M8x1 to EN 61076-2-104.

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.

More information and technical data

→ Internet: User documentation



#### Note

The appropriate manifold sub-base VABV-S4-..., which is required for integration into the valve terminal, is not part of the control block. It is automatically allocated by the configurator when the control block is selected.

- 🖣 - Note

The control block with safety function (VOFA) is also available as a decentralised individual connection variant with electrical and pneumatic individual connection.

For information see:

→ Internet: vofa

#### Pneumatic/electrical links

Function

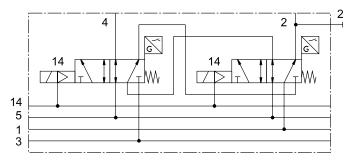
The safety function is achieved by pneumatically linking two ducts for two 5/2-way single solenoid valves within the control block: port 4 is only pressurised if both solenoid valves are switched to switching position 14.

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

The switching operation of the solenoid valves can be sensed using the proximity switches on the solenoid valves (switching position sensing). By connecting the control signal and the switching signal of the proximity switch it is possible to check if the piston spool of the solenoid valve has reached or left the normal position (expectations). The piston spools of the solenoid valves are designed so that pneumatic short circuits between ports 2 and 4 are prevented (positive overlap).

The two solenoid valves must be actuated via two separate ducts to achieve the required category 4 (Performance Level e, to EN ISO 13849-1).

#### Circuit symbol<sup>1)</sup>



For the control block with safety function VOFA-B26-T52-... for the valve terminal, two 5/2-way solenoid valves of width 26 mm are pneumatically linked via two ducts, using an intermediate plate as vertical stacking element (output 2 is switched in parallel, output 4 is switched in series).

1) The circuit diagram represents a valve with a proximity switch with a N/O switching output signal.

In accordance with ISO 1219-1, this symbol applies to both N/O and N/C contacts. The switching element function of the sensors used here is designed as an N/C contact.

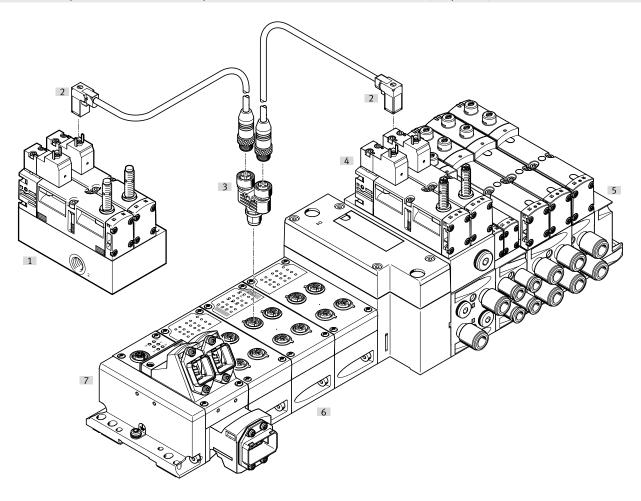
Safety data						
Conforms to	EN 13849-1					
Safety function	Protection against manipulation, prevention of unexpected start-up					
	Reversing a movement					
Performance Level (PL)	Protection against manipulation, prevention of unexpected start-up/up to category 4, Performance Level e					
	Reversing a movement/up to category 4, Performance Level e					
Note on forced checking procedure	Switching frequency min. 1/week					
Certificate-issuing authority	IFA 1001179					
CE marking (see declaration of conformity)	To EU EMC Directive <sup>1)</sup>					
	To EU Machinery Directive					
Max. positive test pulse [μs] with logic 0	1000					
Max. negative test pulse [μs] with logic 1	800					
Shock resistance	Shock test with severity level 2, to EN 60068-2-27					
Vibration resistant	Transport application test with severity level 2, to EN 60068-2-6					

<sup>1)</sup> For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... -> Support/Downloads.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

## Peripherals overview

Electrical connection option for control block with safety function via PROFIsafe shut-off module CPX-FVDA-P2 (safety module)



Perip	Peripherals overview								
		Description	→ Page/Internet						
[1]	Control block with safety function	Away from the valve terminal as a decentralised individual connection variant	vofa						
[2]	Connecting cable KMEB	For electrical connection of the control block with safety function via PROFIsafe shut-off module CPX-FVDA-P2 (safety module)	kmeb						
[3]	Push-in T-connector NEDU	For simultaneously actuating two valves, e.g. control block with safety function	nedu						
[4]	Control block with safety function	Integrated in the pneumatic section of the valve terminal VTSA/VTSA-F	-						
[5]	Pneumatic section of the valve terminal VTSA/VTSA-F	Pneumatic components of the valve terminal VTSA/VTSA-F	-						
[6]	CPX-FVDA-P2 (safety module)	PROFIsafe shut-off module integrated in the CPX terminal of the valve terminal VTSA/VTSA-F	срх						
[7]	CPX terminal of the valve terminal VTSA/VTSA-F	Electrical components of the valve terminal VTSA/VTSA-F	-						

General technical data		
Design		Piston spool valve
Standard nominal flow rate [l/min]		830
Reset method		Mechanical spring
Sealing principle		Soft
Exhaust air function		Can be throttled
Actuation type		Electrical
Overlap		Positive overlap
Type of control		Piloted
Flow direction		Not reversible
Exhaust air function		Can be throttled
Suitable for vacuum		-
Nominal width	[mm]	9
Pilot air supply		Via valve terminal
Type of mounting		Via through-hole, on manifold sub-base
Mounting position		Any
Manual override		-
Signal status display, valve		Via accessories
Pneumatic connections		
Supply	1	Via the manifold sub-base of the valve terminal
Exhausting	3/5	
Working ports	2/4	
Pilot air supply	14	
Pressure gauge		61/4

Operating and environmental co	nditions					
Operating medium		mpressed air to ISO 8573-1:2010 [7:4:4]				
Pilot medium		Compressed air to ISO 8573-1:2010 [7:4:4]				
Notes on operating/		Lubricated operation possible (in which case lubrication will always be required)				
pilot medium						
Operating pressure	[bar]	010				
	[MPa]	01				
Operating pressure for valve ter-	[bar]	310				
minal with internal pilot air sup-	[MPa]	0.3 1				
ply						
Pilot pressure	[bar]	310				
	[MPa]	0.3 1				
Noise level LpA	[dB(A)]	85				
Ambient temperature	[°C]	_5 +50				
Temperature of medium	[°C]	-5 +50				
CE marking (see declaration of cor	nformity)	To EU EMC Directive <sup>1)</sup>				
		To EU Machinery Directive				

<sup>1)</sup> For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... 

Support/Downloads.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Electrical data for con	trol block							
Electrical connection	Electrical connection		ug to EN 175301-803, type C, without PE conductor					
Nominal operating volt	tage	[V DC]	24					
Permissible voltage flu	ctuations	[%]	<b>-15/+10</b>					
Surge resistance		[kV]	2.5					
Pollution degree			3					
Power consumption		[W]	1.8					
Max. magnetic disrupt	Max. magnetic disruption field [mT]		60					
Switching position sen	ising		Normal position via sensor					
Duty cycle		[%]	100					
Degree of protection to	EN 60529	)	IP65, NEMA 4 (for all types of signal transmission when mounted)					
Protection against dire	ct and in-		PELV					
direct contact			Protection class to EN 60950/IEC 950					
Valve switching time	On	[ms]	22					
Off [n		[ms]	59					
Valve sensor switch-	On	[ms]	60					
ing time <sup>1)</sup>	Off	[ms]	11					

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



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

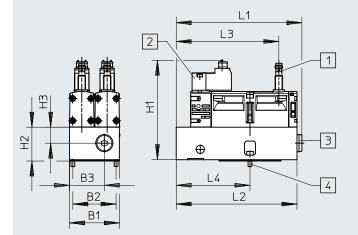
Electrical data – Sensor (to EN -	60947-5-2)					
Electrical connection		le, 3-core				
		Plug M8x1, 3-pin				
Cable length	[m]	2.5				
Switching output		PNP or NPN				
Switching element function		N/C				
Signal status indication		Yellow LED				
Operating voltage range	[V DC]	10 30				
Residual ripple	[%]	±10				
Sensor no-load current	[mA]	Max. 10				
Max. output current	[mA]	200				
Voltage drop	[V]	Max. 2				
Max. switching frequency	[Hz]	5000				
Short circuit current rating		Clocked				
Reverse polarity protection for se	ensor	For all electrical connections				
Measuring principle		Inductive				

Materials						
Sub-base/manifold sub-base	Wrought aluminium alloy					
Valve	Die-cast aluminium, PA					
Seals	FPM, NBR, HNBR					
Screws	Galvanised steel					
Sensor housing	High-alloy stainless steel					
Sensor cable sheath	PUR					
Note on materials	RoHS-compliant					

#### **Dimensions**

Version for valve terminal VTSA/VTSA-F

Download CAD data → www.festo.com





- [1] Proximity switch PNP or NPN, size M8x1, plug connection to EN 61076-2-104
- [2] Electrical connection to EN 175301-803, type C
- [3] Pneumatic connection G1/4 sealed with blanking plug
- [4] 2x screw with internal hexagon (width across flats 2.5), M4x12 (included in the scope of delivery)

Туре	B1	B2	В3	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										

Ordering	Ordering data							
Code	Valve function		Switching output	Weight	Part no.	Туре		
				[g]				
Control b	olock, version for valve term	ninal VTSA/VTSA-F						
SP 2)		2x 5/2-way valve, single solenoid, mechanical spring re-	PNP	1112	_ 1)	VOFA-B26-T52-M-1C1-APP		
SN <sup>2)</sup>		turn, with switching position sensing via inductive sensor and 3-pin sensor push-in connector M8, mounted on in- termediate plate for pneumatic linking	NPN	1112	_ 1)	VOFA-B26-T52-M-1C1-ANP		

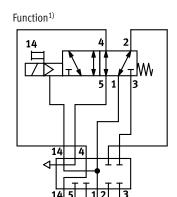
- 1) The control block with safety function can only be ordered via the valve terminal configurator and therefore does not have a separate part number. The appropriate manifold sub-required base for the valve terminal VTSA/VTSA-F is automatically allocated to the control block by the configurator.
- 2) Code letter within the order code for a valve terminal configuration

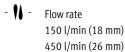


The sensors integrated in the valves must not be replaced by the customer. Incorrect assembly can result in malfunctions or damage to the valve. Please contact Festo in the event of a malfunction.

# Accessories – Control block with safety function

Ordering data	اما	la		l	1-
	Code	Description		Part no.	Туре
Plug socket for the el	ectrical conn	ection of individual valves			[
	-	<ul><li>Angled socket, type C, 3-pin</li><li>PG7</li></ul>	151687	MSSD-EB	
	-	<ul><li>Angled socket, type C, 3-pin</li><li>M12x1</li></ul>		539712	MSSD-EB-M12
Illuminating seal for p	olug pattern	to EN 175301-803		Datasheets →	Internet: meb-ld
	-	For plug socket MSSD		151717	MEB-LD-12-24DC
Connecting cable for	electrical con	nnection of individual valves			
	GG	Angled socket, type C, 3-pin, with LED	2.5 m	151688	KMEB-1-24-2.5-LED
A STATE OF THE STA	GH	o Open end, 3-core 5		151689	KMEB-1-24-5-LED
	GJ		10 m	193457	KMEB-1-24-10-LED
<u> </u>					
Connecting cable for	the electrical	l connection of sensors for switching position sensing			
	GM	Straight socket, M8x1, 3-pin     Open end, 3-core	2.5 m	541333	NEBU-M8G3-K-2.5-LE3
	GN		5 m	541334	NEBU-M8G3-K-5-LE3
	-	<ul><li>Angled socket, rotatable, M8x1, 3-pin</li><li>Open end, 3-core</li></ul>	2.5 m	8001660	NEBU-M8R3-K-2.5-LE3
	-		5 m	8001661	NEBU-M8R3-K-5-LE3
	GQ • Straight socket, M8x1, 3-pin • Straight plug M8x1, 4-pin		2.5 m	554037	NEBU-M8G3-K-2.5-M8G4
	-	Modular system for a choice of connecting cables –		-	NEBU → Internet: nebu
Connecting cable for	the electrical	l connection of PROFIsafe shut-off module CPX-FVDA-P2 to the control bloc	 k		
	For the electrical connection of PROFisare snut-off module CPX-FVDA-P2 to the control block  For the easy connection of one control block valve (power supply via PROFIsare shut-off module CPX-FVDA-P2)  Angled socket, type C, 3-pin, with LED  Straight plug M12x1, 5-pin				KMEB-2-24-M12-0.5-LED
Push-in T-connector f	or dual electi	rical connection of PROFIsafe shut-off module CPX-FVDA-P2 to the control b	olock		
	-	For dual connection of two control block valves (power supply via PROFIsafe shut-off module CPX-FVDA-P2)  • Straight plug, M12x1, 5-pin (A-coded)  • 2x straight socket, M12x1, 5-pin (A-coded)		2839867	NEDU-L2R1-V10-M12G5-M12G5
Pneumatic connection	accessories				
A selection of possible	e fittings, blar ssories can be	nking plugs, silencers and e found in the chapter "Accessories" → page: 209 search terms:			
		, silencer, blanking plug			





Valve width
18 mm
26 mm

- **\** - Voltage 24 V DC

Operating pressure
-0.9 ... 10 bar

#### Description

The pilot air switching valve is essentially a combination of a 5/2-way sole-noid valve with switching position sensing and the intermediate plate VA-BF-S4-...-S..

It enables the pilot air supply to be verifiably switched on and off (sensor

function) from duct 1 to 14 for the entire pressure zone or valve terminal. This valve is not a safety device in accordance with the Machinery Directive 2006/42/EC. When used in higher categories, the sensor signal from the

valve must be evaluated by the control system.

This valve is suitable for use in safety-related parts of control systems to EN ISO 13849-1.

This valve is designed for installation in machines and automation systems

and must only be used in industrial applications (high-demand mode).

#### Alternative switching position sensing with pressure switch

As an alternative to the sensing function in the solenoid valve, a pressure switch can be mounted (in place of the blanking plug) in the intermediate

plate VABF-S4-...-S. With this pressure switch, the switching on and off (sensing function) of the pilot air supply can be verified.

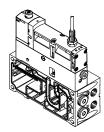
An ISO solenoid valve without a sensor can therefore be mounted on the intermediate plate to give the same function.

→ Internet: spba



The pilot air switching valve can only be operated on the valve terminal VTSA/VTSA-F in combination with a right end plate for external pilot air type VABE-S6-1RZ-.... Port 14 on the right end plate must then be sealed.

Vertical stacking variant for valve terminal VTSA/VTSA-F, width 18 mm, 26 mm



The valves with integrated switching position sensing in plug-in design for valve terminal VTSA/VTSA-F can be used regardless of the type of electrical actuation (individual, multi-pin plug or fieldbus/control block connection).

This module is supplied pre-assembled together with the valve terminal VTSA/VTSA-F. No other assembly steps are required before installation.

Switching position sensing is carried out using an inductive PNP proximity switch with cable and M12x1 push-in connector to EN 61076-2-104.

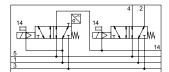
Alternatively, combinations with a pressure switch in the intermediate plate and ISO solenoid valves are possible.

- 🖣 - Note

All solenoid valves VSVA to ISO 15407-1 can be used.

- → Internet: vsva
- 1) The circuit diagram represents a valve with a proximity switch with a N/O switching output signal. In accordance with ISO 1219-1, this symbol applies to both N/O and N/C contacts. The switching element function of the sensors used here is designed as an N/C contact.

## Function of pneumatic/electrical links



The function for switching off the pilot air is essentially achieved by combining the intermediate plate type VABF-S4-...-S with the 5/2-way single sole-noid valve type VSVA-B-M52-MZD-...-1T1L-APX-0.5. The valve terminal is not supplied with any pilot air via the right end plate type VABE-S6-1 (ident. code XS, external pilot air). Port 14 on the end plate is sealed.

The pilot air for the valve is branched from duct 1 in the intermediate plate and redirected to the pilot air duct 14 of the valve terminal when the valve is in the switching position. Ports 2 and 4 of the manifold sub-base are sealed with blanking plugs. The switching operation of the solenoid valve can be monitored by sensing using the proximity switch in the solenoid valve (or pressure sensor in the intermediate plate VABF...).

By connecting the control signal and the switching signal of the proximity switch it is possible to check if the piston spool of the solenoid valve has reached or left the normal position (expectations).

The piston spool of the solenoid valve is designed so that pneumatic short circuits between ports 2 and 4 are prevented (overlap).

Alternatively, combinations with a pressure switch in the intermediate plate and ISO solenoid valves are possible.



A valve from the modular system VTSA/VTSA-F can be provided or configured to the right of the valve with switching position sensing on the intermediate plate of the pilot air switching valve.

Pilot air switching valve with integrated switching position sensing

The pilot air switching valve can be ordered as a combination of a 5/2-way solenoid valve with switching position sensing and the intermediate plate VA-BF-S4-...-S.

## Alternative switching position sensing with pressure switch

As an alternative to the pilot air switching valve with integrated switching position sensing, it is possible to combine an ISO solenoid valve and a pressure switch in the intermediate plate.

To do this, various 5/2-way solenoid valves in combination with a pressure switch SPBA-... are available.

Safety data				
Conforms to	EN 13849-1/2			
CE marking (see declaration of conformity)	To EU EMC Directive 1)			
Shock resistance	Shock test with severity level 2, to EN 60068-2-27			
Vibration resistant	Transport application test with severity level 2, to EN 60068-2-6			

<sup>1)</sup> For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp → Certificates.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

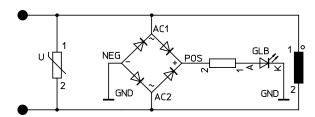
Safety data			
Valve function 5/2-way, single solenoid		Test pulses	
		Max. positive test pulse with 0 signal	Max. negative test pulse with 1 signal
VSVA-B-M52-MZA1-1T1L	[µs]	1200	1100
VSVA-B-M52-MZA2-1T1L	[µs]	1500	800
VSVA-B-M52-MZ-A1-1C1	[µs]	1800	800

General technical data				
		Intermediate plate type VABF-S4-2-S and solenoid valve type VSVA-B-M52-MZD-A2-1T1L-APX-0.5 mounted on valve terminal VTSA/VTSA-F	Intermediate plate type VABF-S4-1-S and solenoid valve type VSVA-B-M52-MZD-A1-1T1L-APX-0.5 mounted on valve terminal VTSA/VTSA-F	
Width		18 mm	26 mm	
Design		Piston spool valve		
Sealing principle		Soft		
Overlap		Positive overlap		
Actuation type		Electrical system		
Type of control		Piloted		
Type of mounting:				
Solenoid valve on intermediate plate		M3	M4	
Intermediate plate on manifold sub-base		M3x12 (captive)	M4x12 (captive)	
Mounting position		Any		
Pneumatic connections				
Supply 1		Via the manifold sub-base of the valve terminal		
Exhausting	3/5	Via the manifold sub-base of the valve terminal		
Working ports	2/4	Sealed with blanking plug type B-1/4		
Pilot air supply	14	Via the manifold sub-base of the valve terminal		
Pressure gauge/pressure switch		G1/8		

Switching times [ms]						
Width		18 mm	26 mm			
Valve type		5/2	5/2			
Identifier		MZD-A2	MZD-A1	MZ-A1		
Valve switching time	On	12	20	21		
	Off	38	54	41		
Valve sensor switching time <sup>1)</sup>	On	32	60	60		
	Off	9	11	11		

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

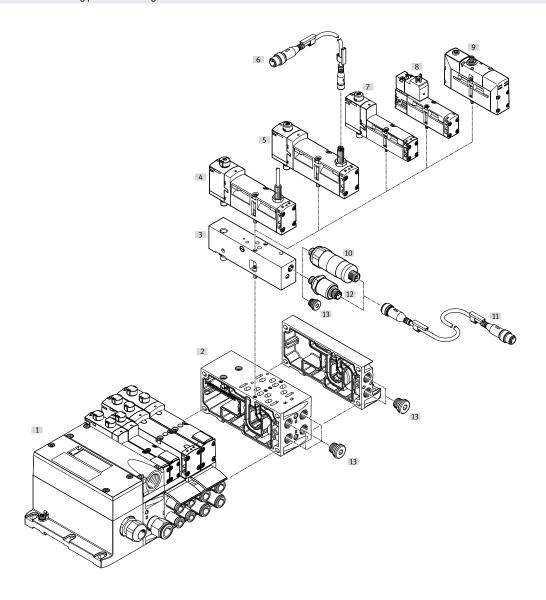
## Protective circuit



Each solenoid coil VSVA is protected with a spark arresting protective circuit as well as against polarity reversal.

## Peripherals overview

Pilot air switching valve with switching position sensing



Perip	Peripherals overview – Pilot air switching valve					
		Description	→ Page/Internet			
[1]	Valve terminal VTSA/VTSA-F	Valve terminal with multi-pin plug interface	vtsa			
[2]	Manifold sub-base VABF	Width 18 mm or 26 mm	128			
[3]	Intermediate plate VABF-S4	For pilot air switching valve	161			
[4]	Solenoid valve VSVA-B-M52	Width 18 mm or 26 mm, with sensor and integrated cable 0.5 m	161			
[5]	Solenoid valve VSVA-B-M52	Width 18 mm or 26 mm, with sensor for external connecting cable	161			
[6]	Connecting cable NEBU-M8	For connection to sensor	162			
[7]	Solenoid valve VSVA-B-M52	Width 18 mm or 26 mm <sup>1)</sup>	161			
[8]	Solenoid valve VSVA-B-M52	Width 18 mm or 26 mm, with plug to EN 175301, type C <sup>1)</sup>	161			
[9]	Solenoid valve VSVA-B-M52	Width 18 mm or 26 mm, with round plug <sup>1)</sup>	vsva			
[10]	Pressure switch SPBA	Mechanically actuated	162			
[11]	Connecting cable NEBU-M12G5	For connection to pressure switch	162			
[12]	Pressure switch SPBA	Electrically actuated	162			
[13]	Blanking plug	-	210			

The switching position is sensed by pressure switches when the solenoid valves used have no integrated sensor.
 The pressure switch is screwed into the intermediate plate in place of the blanking plug.

Electrical data for pilot air switch	Electrical data for pilot air switching valve					
Nominal operating voltage	[V DC]	24				
Permissible voltage fluctuations	[%]	±10				
Surge resistance	[kV]	2.5				
Pollution degree		3				
Power consumption	[W]	1.6 (M52-MZD), 1.8 (M52-MZ)				
Max. magnetic disruption field	[mT]	60				
Switching position sensing		Normal position via sensor				
Duty cycle	[%]	100				
Degree of protection		IP65, NEMA 4 (for all types of signal transmission when mounted)				

Electrical data for sensor						
Sensor identifier		APP	ANP	APC	ANC	APX
Switching output		PNP	NPN	PNP	NPN	PNP
Sensor connection		Plug M8x1, 3-pi	1	With fixed cable	e and open end	With fixed cable and plug M12x1, 4-pin
Cable length	[m]	0.5 (with socket	M8x1, plug M12x1)	2.5		0.5
Switching element function		N/C				
Signal status indication		Yellow LED (on se	ensor)			
Operating voltage range	[V DC]	10 30				
Residual ripple	[%]	±10				
Rated operating voltage	[V DC]	24				
Max. no-load supply current	[mA]	10				
Max. output current	[mA]	200				
Max. voltage drop	[V]	2				
Max. switching frequency	[Hz]	5000				
Short circuit current rating		Clocked				
Reverse polarity protection		For all electrical connections				
Measuring principle		Inductive				
Switching position sensing		Valve normal pos	sition via sensor			

Operating and environmenta	Operating and environmental conditions					
Valve		VSVA-B-M521T1L	VSVA-B-M521C1	Without sensor		
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4	]			
Notes on operating/ pilot medium		Lubricated operation possible (in which ca	Lubricated operation possible (in which case lubrication will always be required)			
Operating pressure	[bar]	-0.9 10	-0.9 16	-0.9 10		
	[MPa]	-0.09 1	-0.09 1	-0.09 1		
Noise level LpA	[dB(A)]	85	85	-		
Ambient temperature	[°C]	−5 +50	-5 +50	-5 +50		
Temperature of medium	[°C]	−5 +50	-5 +50	-		
Note on materials		RoHS-compliant	RoHS-compliant	RoHS-compliant		
KC marking		KC EMC	KC EMC	-		
UKCA marking		To UK EMC regulations	To UK EMC regulations	-		
Certification		C-Tick	C-Tick	-		
		c UL us Recognized (OL)	-	c UL us Recognized (OL)		

Materials	
Sub-base/manifold sub-base	Die-cast aluminium
Valve	Die-cast aluminium, PA
Seals	FPM, NBR
Screws	Galvanised steel
Sensor housing	High-alloy stainless steel
Sensor cable sheath	TPE-U(PUR)

Product weight					
Width	18 mm	26 mm			
Solenoid valve					
VSVA-B-M52-MZD-A1-1T1L-APC	-	307 g			
VSVA-B-M52-MZD-A1-1T1L-APP	-	264 g			
VSVA-B-M52-MZ-A1-1C1-APC	-	332 g			
VSVA-B-M52-MZ-A1-1C1-APP	-	289 g			
VSVA-B-M52-MZD-A1-1T1L-ANC	-	307 g			
VSVA-B-M52-MZD-A1-1T1L-ANP	-	264 g			
VSVA-B-M52-MZ-A1-1C1-ANC	-	332 g			
VSVA-B-M52-MZ-A1-1C1-ANP	-	289 g			
VSVA-B-M52-MZD-A1-1T1L-APX-0.5	-	281 g			
VSVA-B-M52-MZD-A2-1T1L-APX-0.5	157 g	-			
VSVA-B-M52-MZD-A2-1T1L-APP	140 g	-			
VSVA-B-M52-MZD-A2-1T1L-ANP	140 g	-			
VSVA-B-M52-MZD-A1-1T1L	-	293 g			
VSVA-B-M52-MZD-A2-1T1L	163 g	-			
Intermediate plate	Intermediate plate				
VABF-S4-2-S	203.5 g	-			
VABF-S4-1-S	-	295 g			

# Ordering data – Pilot air switching valve

Ordering data									
	Code	Valve function			Part no.	Туре			
5/2-way solenoid valve, 24 V DC, plug-in design with proximity switch									
<b>è</b> > n	SS	5/2-way valve, single solenoid, mechanical spring return,	PNP	18 mm	573201	VSVA-B-M52-MZD-A2-1T1L-APX-0.5			
		with 0.5 m connecting cable and 4-pin sensor push-in connector M12x1		26 mm	570850	VSVA-B-M52-MZD-A1-1T1L-APX-0.5			
	-	5/2-way valve, single solenoid, mechanical spring return,	PNP	26 mm	560723	VSVA-B-M52-MZD-A1-1T1L-APC			
		with 2.5 m connecting cable	NPN	26 mm	560742	VSVA-B-M52-MZD-A1-1T1L-ANC			
<b>19</b>	S0	5/2-way valve, single solenoid, mechanical spring return,	PNP	18 mm	573202	VSVA-B-M52-MZD-A2-1T1L-APP			
		with 3-pin sensor push-in connector M8x1		26 mm	560724	VSVA-B-M52-MZD-A1-1T1L-APP			
	SQ		NPN	18 mm	573203	VSVA-B-M52-MZD-A2-1T1L-ANP			
				26 mm	560743	VSVA-B-M52-MZD-A1-1T1L-ANP			
	-	5/2-way valve, single solenoid, mechanical spring return,	PNP	26 mm	560725	VSVA-B-M52-MZ-A1-1C1-APC			
		with plug to EN 175301, type C, with 2.5 m connecting cable	NPN	26 mm	560745	VSVA-B-M52-MZ-A1-1C1-ANP			
	-	5/2-way valve, single solenoid, mechanical spring return,	PNP	26 mm	560726	VSVA-B-M52-MZ-A1-1C1-APP			
		with plug to EN 175301, type C, with 3-pin sensor push-in connector M8x1	NPN	26 mm	560744	VSVA-B-M52-MZ-A1-1C1-ANC			
5/2-way solenoid valve,	24 V DC, pl	ug-in design			1				
A.	<u> </u> -	5/2-way valve, single solenoid, mechanical spring return		26 mm	539159	VSVA-B-M52-MZD-A1-1T1L			
			1		539185	VSVA-B-M52-MZD-A2-1T1L			
Intermediate plate for pil	lot air switc	ching valve							
	ZO	For switching the pilot air from duct 1 to duct 14		18 mm	573200	VABF-S4-2-S			
				26 mm	570851	VABF-S4-1-S			



Further solenoid valves with switching position sensing can be ordered as distinct types. These are preconfigured with the desired manual override cover caps.

ightarrow Solenoid valve with switching position sensing, page 138



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

# Valve terminal VTSA/VTSA-F, NPT

# Ordering data – Pilot air switching valve

	Code	Description	Part no.	Туре	
ssure switch fo	r intermediate pl	late for pilot air switching valve			
	WL	Mechanical pressure switch (only in combination with interme plug M12x1, 4-pin	diate plate ZO), with	8000033	SPBA-P2R-G18-W-M12-0.25X
	WH	Electrical pressure switch, switching output 2xPNP (only in cormediate plate ZO), with plug M12x1, 4-pin	nbination with inter-	8000210	SPBA-P2R-G18-2P-M12-0.25X
necting cable f	or connection of	pressure switches			
T. M. T. M.	GE	Straight socket, M12x1, 5-pin     Straight plug M12x1, 4-pin	0.5 m	8000208	NEBU-M12G5-K-0.5-M12G4
nnecting cable f	or the electrical	connection of sensors for switching position sensing			
	,) -	<ul><li>Straight socket, M8x1, 3-pin</li><li>Straight plug M12x1, 3-pin</li></ul>	0.5 m	8000209	NEBU-M8G3-K-0.5-M12G3
	GM	• Straight socket, M8x1, 3-pin • Open end, 3-core	2.5 m	541333	NEBU-M8G3-K-2.5-LE3
	GN		5 m	541334	NEBU-M8G3-K-5-LE3
	GO	Angled socket, M8x1, 3-pin	2.5 m	541338	NEBU-M8W3-K-2.5-LE3
	GP	Open end, 3-core	5 m	541341	NEBU-M8W3-K-5-LE3
	-	Angled socket, rotatable, M8x1, 3-pin	2.5 m	8001660	NEBU-M8R3-K-2.5-LE3
	-	Open end, 3-core	5 m	8001661	NEBU-M8R3-K-5-LE3
	GQ	<ul><li>Straight socket, M8x1, 3-pin</li><li>Straight plug M8x1, 4-pin</li></ul>	2.5 m	554037	NEBU-M8G3-K-2.5-M8G4
	)  -	Modular system for a choice of connecting cables	-	-	NEBU → Internet: nebu

# Ordering data – Pilot air switching valve

	Code	Description	Part no.	Туре	
Covering					71.
	N	Cover cap for manual override, non-detenting	Pack of 10	541010	VAMC-S6-CH
	V	Cover cap for manual override, concealed	Pack of 10	541011	VAMC-S6-CS
	A	Cover cap, heavy duty, for manual override, non-detenting heavy duty, detenting via accessory (key) (The cover cap is provided for one-off mounting only)	Pack of 10	4105147	VAMC-B-S6-CTR
Accessories for manual (	override, h	eavy duty			
	-	Coded key (accessory) for actuating cover cap, heavy duty, for detenting position	Pack of 1	1662543	АНВ-МЕВ-В

A selection of possible fittings, blanking plugs, silencers and other pneumatic accessories can be found in the chapter "Accessories" → page: 209 or on the website via the individual search terms:

Internet → connection technology, silencer, blanking plug

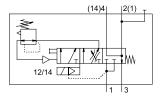


Note

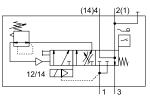
There is a wide range of preconfigured solenoid valves with cover cap for manual override and correct valve type code available to order in the sections on solenoid valves.

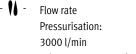
## Datasheet - Soft-start valve for VTSA/VTSA-F

# Function without sensor



#### With sensor

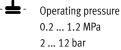




Exhausting: 3300 l/min

- Module width 43 mm







## Description

Function

The purpose of the soft-start valve is to slowly and safely build up the supply pressure in duct 1 of the valve terminal or to quickly exhaust it via duct 1.

Switch-on takes place in two stages:

- First the working pressure for duct 1 gradually increases (the speed can be adjusted using a flow control screw).
- Once the working pressure in duct 1 reaches a previously set value, the soft-start valve switches to full operating pressure at duct 1 of the valve terminal.

The switching point for full operating pressure is set to 4 bar at the factory, but can be changed using an adjusting screw.

The full operating pressure is applied at duct 14 (pilot air) at all times. This pressure causes the valves on the valve terminal to immediately move to the required switching position, so an unspecified position is not possible.

Duct 1 of the valve terminal is exhausted via the soft-start valve's exhaust port only in the normal position, when the valve is not switched. The exhaust air can optionally be ducted with a fitting or using a silencer.

A detenting manual override with self-reset via an electrical control signal is available for maintenance and service purposes.



When using "Protection against unexpected start-up": Protection against unexpected activation of the manual override (MO) must be guaranteed in all operating modes.

## Diagnostics

The piston position of the soft-start valve can be monitored by a sensor with integrated LED display. This sensor registers whether the valve has switched and thus whether the valve terminal is being supplied with working air.

Pressure sensing via a pressure gauge (optional) is also possible.

The soft-start valve can also be ordered with a sensor. A sensor cannot be retrofitted at a later date because of the calibration that is required. Connecting cables with integrated LED display are provided for displaying the signal status.

#### Pilot air supply

The valve terminal can either be supplied with internal pilot air via the soft-start valve or with internal or external pilot air via the various end plate variants.

The pilot air supply for the valve terminal (internal/external) is determined by the seal between the manifold subbase and the soft-start valve.

The scope of delivery of the soft-start valve includes both the seal for internal pilot air supply (with drilled hole) and the seal for external pilot air supply (no drilled hole).

The soft-start valve itself is always supplied with internal pilot air.

## Datasheet - Soft-start valve for VTSA/VTSA-F

## Creating pressure zones with a soft-start valve

The soft-start valve can be used for the pneumatic compressed air supply of the valve terminal or of a pressure zone. The soft-start valve can only be used as the sole compressed air supply component on valve terminals with one pressure zone or within a pressure zone.

If a soft-start valve in combination with a right end plate (code XP3) is chosen for a pressure zone, a supply plate with a blanking plug in duct 1 (code W) is required in this pressure zone. When using a soft-start valve, a supply plate (with blanking plug in duct 1) is generally also required for this pressure zone to discharge the exhaust air (duct 3/5).

A supply plate is not required if the exhaust air (duct 3/5) in a pressure zone with soft-start valve can be expelled via the right end plate.

#### **Constraints**

Compressed air supply

There must be no other elements supplying compressed air in the pressure zone in which the soft-start valve is being used. Exhaust air

Exhaust air cannot be expelled via the soft-start valve. If it is being used in a pressure zone with duct 3/5 separate, an exhaust plate is required.

Pilot air supply

If the soft-start valve is used for internal pilot air supply (duct 14), there must be no other pilot air supply within the valve terminal.

Reverse operation

The soft-start valve is not approved for reverse operation.



Setting options as well as drawings with descriptions of the components for the soft-start valve can be found in the user documentation.

The adjusting screws are freely accessible once they are fitted.

Safety data

Conforms to		ISO 5599-2
Note on forced checking procedure		Switching frequency min. once a month
Max. positive test pulse [µ	ıs]	2500 <sup>1)</sup>
with logic 0		
Max. negative test pulse [µ	ıs]	1400 <sup>1)</sup>
with logic 1		
Shock resistance		Shock test with severity level 2, to EN 60068-2-27
Vibration resistant		Transport application test with severity level 2, to EN 60068-2-6

<sup>1)</sup> Values apply only to types with direct voltage 24 V DC

General	technical	data

Design	Piston spool
Actuation type	Electrical
Sealing principle	Soft
Type of mounting	On sub-base, ISO size 1 to ISO 5599-2
Mounting position	Any
Valve function	Soft-start function
Manual override	Detenting, self-resetting via electrical control signal, normal position on top, → page 171
Reset method	Mechanical spring
Type of control	Piloted
Pilot air supply	Internal, external
Flow direction	Not reversible
Switching position sensing	Switching position with sensor

#### Standard nominal flow rate [l/min]

Pressurisation	3000
Exhausting	3300

# Datasheet – Soft-start valve for VTSA/VTSA-F

Operating and environmental conditions				
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]		
Notes on operating/ pilot medium		Lubricated operation possible (in which case lubrication will always be required)		
Operating pressure	[bar]	212		
	[MPa]	0.2 1.2		
Switchover pressure presetting	[bar]	4		
	[MPa]	0.4		
Ambient temperature	[°C]	-5 +50		
Note on materials		RoHS-compliant		

Valve switching times [ms]				
Valve switching time	On	17		
	Off	50		

Electrical data for soft-start valve	Electrical data for soft-start valve				
Electrical connection		Plug, type C to EN 175301-803, square design			
Nominal operating voltage	[V]	24 DC			
Operating voltage range	[V]	24 DC ±10%			
Characteristic coil data		24 V DC: 2.5 W			
Degree of protection to EN 60529		IP65, NEMA 4 (for all types of signal transmission when mounted)			

Electrical data for sensor				
Туре		SIEN-M12B-PS-S-L	SIEN-M12B-NS-S-L	
Electrical connection		Plug M12x1 to EN 60947-5-2, 4-pin		
Switching output		PNP	NPN	
Switching element function		N/O contact		
Signal status indication		Yellow LED		
Operating voltage range	[V DC]	10 30		
Residual ripple	[%]	±10		
Rated operating voltage	[V DC]	24		
Max. no-load current for sensor	[mA]	10		
Max. output current	[mA]	200		
Max. voltage drop	[V]	2		
Max. switching frequency	[Hz]	3000		
Short circuit current rating		Clocked		
Reverse polarity protection for sensor		For all electrical connections		
Measuring principle		Inductive		
Switching position sensing	·	Switching position with sensor		

Materials – Soft-start valve		
	Soft-start valve	Manifold sub-base
Housing	Wrought aluminium alloy	Die-cast aluminium
Seals	NBR, HNBR	_
Screws	Galvanised steel	-

## Datasheet - Soft-start valve for VTSA/VTSA-F

## Example 1: Pressure zone with soft-start valve and pilot air supply

Internal, external pilot air supply

#### Requirements

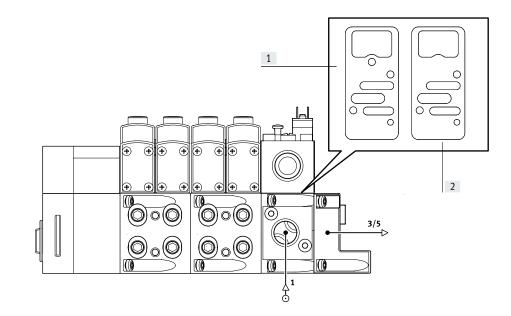
- Compressed air supply via soft-start valve
- Right end plate<sup>1)</sup>:
   Blanking plug in duct 1

#### For internal pilot air supply:

- Seal (soft-start valve manifold subbase) with pilot air supply bore "open" and
- Right end plate: Blanking plug in duct 14

## For external pilot air supply:

- Seal (soft-start valve manifold subbase) with pilot air supply bore "closed" and
- Pilot air supply via duct 14 in the right end plate



- [1] Seal for internal pilot air supply
- [2] Seal for external pilot air supply
- 1) A right end plate with pilot air selector cannot be used with this configuration, as it doesn't allow the exhaust air to be discharged

## Example 2: Pressure zone with soft-start valve, supply plate and pilot air supply

Internal, external pilot air supply

## Requirements

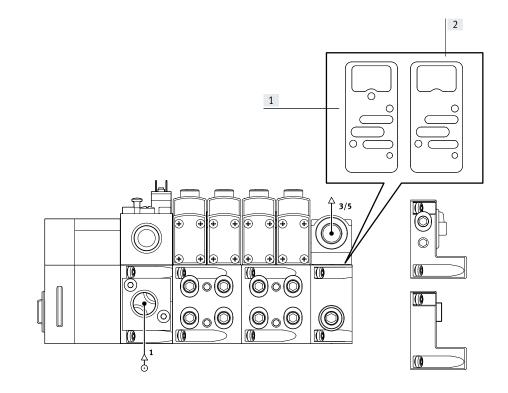
- Compressed air supply via soft-start valve
- Supply plate: Blanking plug in duct 1
- Right end plate: blanking plug in duct 1, 3, 5 or
- Right end plate with pilot air selector

#### For internal pilot air supply:

- Seal (soft-start valve manifold subbase) with pilot air supply bore "open" and
- Right end plate: blanking plug in duct 14 or
- End plate with coding (position 2, internal pilot air supply)

#### For external pilot air supply:

- Seal (soft-start valve manifold subbase) with pilot air supply bore "closed" and
- Pilot air supply via duct 14 in the right end plate or
- End plate with coding (position 1, external pilot air supply)



- [1] Seal for internal pilot air supply
- [2] Seal for external pilot air supply

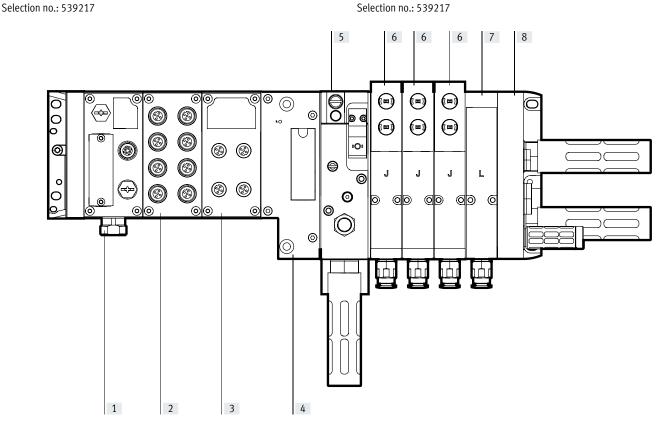
## Datasheet - Soft-start valve for VTSA/VTSA-F

## Practical example 1: Valve terminal VTSA with CPX terminal (metal design) and soft-start valve

With internal pilot air (PP and XP2):

With external pilot air (PM and XP1):

Selection no.: 539217



- [1] Bus node for EtherNet/IP or Modbus TCP
- [2] Input module (16 digital inputs)
- [3] Output module (8 digital outputs)
- [4] CPX pneumatic interface
- Soft-start valve (PP - internal pilot air)
- [5] Soft-start valve (PM - external pilot air)
- [6] 5/2-way valve, double solenoid (J)
- [7] Vacant position (L)
- Right end plate (XP2) with supply air/exhaust air, external pilot air supply, blanking plug in duct 1 and 14
- [8] Right end plate (XP1) with supply air/exhaust air, external pilot air supply, blanking plug in duct 1

## Selection with internal pilot air (PP and XP2):

Selection no. in online catalogue: 539217

Electrical part: 51E-F36GCQPNMKBLX-S+GSBA Pneumatic part: 44P-N-XP2-SMPP-BB-3JL+UGBP1

## Selection with external pilot air (PM and XP1):

Selection no. in online catalogue: 539217

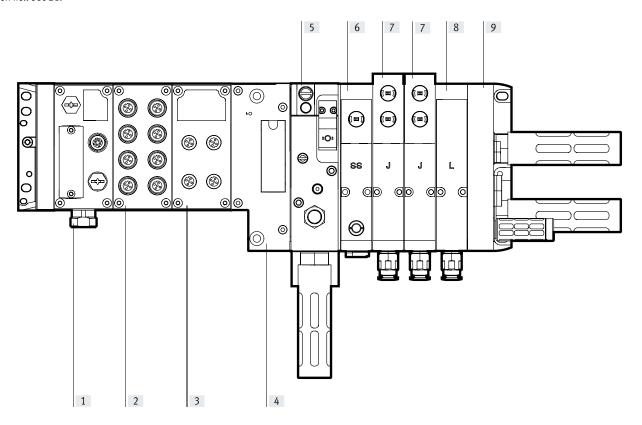
Electrical part: 51E-F36GCQPNMKBLX-S+GSBA Pneumatic part: 44P-N-XP1-SMPM-BB-3JL+UGBP1

## Datasheet - Soft-start valve for VTSA/VTSA-F, width 43 mm

## Practical example 2: Valve terminal VTSA with CPX terminal (metal design), soft-start valve and switching position sensing

With external pilot air (PM and XP2):

Selection no.: 539217



- [1] Bus node for EtherNet/IP or Modbus TCP
- [2] Input module (16 digital inputs)
- [3] Output module (8 digital outputs)
- [4] CPX pneumatic interface
- [5] Soft-start valve (PM external pilot air)
- [6] 5/2-way single solenoid valve, spring return, switching status indication with PNP sensor with 0.5 m connecting cable and pushin connector M12x1 (SS), and intermediate plate for switchable pilot air supply (ZO)
- [7] 5/2-way double solenoid valve (J), width 26 mm
- [8] Vacant position (L)
- 9] Right end plate (XP2) with supply air/exhaust air, external pilot air supply, blanking plug in duct 1 and 14

Selection with external pilot air (PM and XP2), solenoid valve with switching position sensing (SS) and intermediate plate for switchable pilot air supply (ZO)

Selection no. in online catalogue: 539217

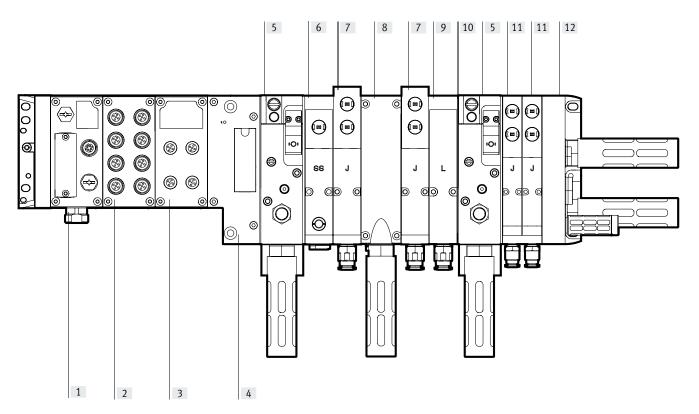
Electrical part: 51E-F36GCQPNMKBLX-S+GSBA
Pneumatic part: 44P-N-XP2-SMPM-BB-SSZOJJL+UGCGBP1

## Datasheet - Soft-start valve for VTSA/VTSA-F

## Practical example 3: Valve terminal VTSA with CPX terminal (metal design), switching position sensing, soft-start valve and 2 pressure zones

With external pilot air (PM and XP2)

Selection no.: 539217



- [1] Bus node for EtherNet/IP or Modbus TCP
- [2] Input module (16 digital inputs)
- [3] Output module (8 digital outputs)
- [4] CPX pneumatic interface
- [5] Soft-start valve for one pressure zone (PM external pilot air)
- [6] 5/2-way single solenoid valve, spring return, switching status indication with PNP sensor with 0.5 m connecting cable and pushin connector M12x1 (SS), and intermediate plate for switchable auxiliary pilot air supply (ZO)
- [7] 5/2-way double solenoid valve (J), width 26 mm
- [8] Exhaust plate (W) for ducts 3/5
- [9] Vacant position (L)
- [10] Duct separation (S) 1, 3, 5
- [11] 5/2-way double solenoid valve (J), width 18 mm
- [12] Right end plate (XP2) with supply air/exhaust air, external pilot air supply, blanking plug in duct 1 and 14

Selection with external pilot air (PM and XP2), solenoid valve with switching position sensing (SS) and intermediate plate for switchable pilot air supply and 2 pressure zones

Selection no. in online catalogue: 539217

Electrical part: 51E-F36GCQPNMKBLX-S+GSBA

Pneumatic part: 44P-N-XP2-LSMPM-BWBSPMA-SSZOJJLJJ+UGCGBP1

## Electrical connection of pneumatic components

The solenoid valve with switching position sensing (SS), with sensor connection M12 is connected to the CPX input module using an appropriate connecting cable in order to link the sensor signal into the CPX system.

The soft-start valve (PM – with sensor PNP) is connected to the CPX input module using an appropriate connecting cable (GC) in order to integrate the sensor signal into the CPX system.

A connecting cable (GBP1) to/from the CPX output module is used to control the soft-start valve (PM). (Control signal)

## Datasheet - Soft-start valve for VTSA/VTSA-F

#### **Dimensions** Download CAD data → www.festo.com Soft-start valve 1 6 TTP 4 5 ¥ 2 L1 L2 L4 B3 B1 B1 L6 [3] Soft-start valve optionally with [2] Manifold sub-base with Manual override, switching po-[1] Soft-start valve, (port pattern to ISO 5599-2) connecting adapter (ducts 2 sensor or protective cap sition (actuated) and 4), pneumatic connection [4] Manual override, normal posi-[6] Seal for internal or external pilot G1/2 tion (unactuated) air supply of the valve terminal В1 Туре B2 ВЗ B4 В5 D1 L1 L2 L3 L7 VABF-S6-1-P5A4-G12-4-.. M12x1 142 30 29.3 20.8 43 36.5 28 11.2 12.6 67.3 41 27

Seal 1) between soft-start valve and manifold sub-base

H1

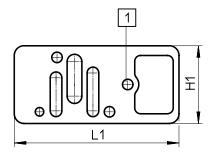
78.9

H2

65.5

Н3

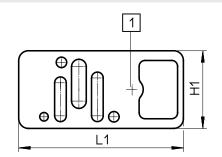
56.4



Type

VABF-S6-1-P5A4-G12-4- ...

[1] With drilled hole, internal pilot air supply



Н6

44

Н7

41.2

Н8

3.5

Н9

68.3

H10

39.5

H11

[1] Without drilled hole, external pilot air supply

Туре	H1	L1
VABD-S6	40	84.8

Н4

55.9

Н5

51.5

<sup>1)</sup> Seals are included with the soft-start valve

# Valve terminal VTSA/VTSA-F, NPT

# Datasheet – Soft-start valve for VTSA/VTSA-F

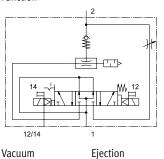
Ordering data					
	Terminal code	Description	Weight [g]	Part no.	Туре
Soft-start valve					
	-	Without sensor output (with seals for internal and external pilot air)	590	558231	VABF-S6-1-P5A4-N12-4-1
	PN	Seal for external pilot air (without drilled hole)			
	PQ	Seal for internal pilot air (with drilled hole)			
	-	With sensor output PNP (with seals for internal and external pilot air)	605	558232	VABF-S6-1-P5A4-N12-4-1-P
	PM	Seal for external pilot air (without drilled hole)			
	PP	Seal for internal pilot air (with drilled hole)			
	-	With sensor output NPN (with seals for internal and external pilot air)	605	558234	VABF-S6-1-P5A4-N12-4-1-N
	PK	Seal for external pilot air (without drilled hole)			
	PO	Seal for internal pilot air (with drilled hole)			
Manifold sub-base		1			•
	-	Suitable for a soft-start valve (ports for ducts 2 and 4 combined)	570	556988	VABV-S6-1Q-N12

# Accessories – Soft-start valve for VTSA/VTSA-F

esignation	Code	Description		Part no.	Туре
ver cap					
	-	M12, for sealing the sensor opening	Pack of 10	165592	ISK-M12
ectrical connectio	n for soft-start v	valve	'		
	P1	<ul> <li>Angled socket, type C, 2-pin, with LED</li> <li>Straight plug M12x1, 2-pin</li> </ul>		188024	MSSD-EB-M12-MONO
	GB	<ul><li>Straight socket, M12x1, 5-pin</li><li>Open end, 4-core</li></ul>	5 m	541328	NEBU-M12G5-K-5-LE4
	-	<ul> <li>Angled socket, M12x1, 5-pin</li> <li>Open end, 4-core</li> </ul>	5 m	541329	NEBU-M12W5-K-5-LE4
<u>-</u>	GG	Angled socket, type C, 3-pin, with LED	2.5 m	151688	KMEB-1-24-2,5-LED
	GH	Open end, 3-core	5 m	151689	KMEB-1-24-5-LED
	GJ		10 m	193457	KMEB-1-24-10-LED
	GK	Angled socket, type C, 3-pin	2.5 m	151690	KMEB-1-230AC-2.5
<b>≫</b>	GL	• Open end, 3-core	5 m	151691	KMEB-1-230AC-5
onnocting cable fo	r alactrical con	nection of the proximity switch			
onnecting capte to		Straight socket, M12x1, 5-pin	5 m	541328	NEBU-M12G5-K-5-LE4
		• Open end, 4-core	3.11	341320	NESO MIZOS R S EE4
	GC	<ul><li>Angled socket, M12x1, 5-pin</li><li>Open end, 4-core</li></ul>	5 m	541329	NEBU-M12W5-K-5-LE4
	) -	Modular system for a choice of connecting cables		-	NEBU → Internet: nebu
Silencer					
	U	Standard version (pack of 1)	1/2 NPT	12741	U-1/2-B-NPT
~	A	Sintered design	1/2 NPT	1206992	AMTE-M-LH-N12

## Datasheet - Vacuum block for VTSA/VTSA-F

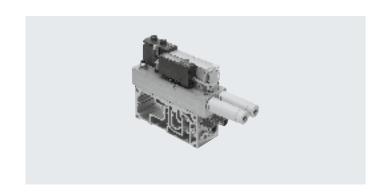
#### Function



Vacuum block width



Operating pressure
0.4 ... 0.8 MPa
4 ... 8 bar



## Description

The vacuum block can be integrated into the existing valve terminal VTSA/VTSA-F. To do this, the vacuum block is screwed to a manifold sub-base for 2 valve positions, width 26 mm.

The vacuum block is used in conjunction with a suction gripper to pick up, hold and place components. The suction gripper uses vacuum for picking up and holding.

Once the component has been positioned, it is released by an ejector pulse. This ejector pulse is created by pressurising the vacuum system so that the vacuum briefly collapses. The ejector pulse can be set.



Note

The vacuum block can be operated in combination with the vertical stacking for pilot air switch-off (intermediate plate VABF-S4-1-S plus 5/2-way valve) on the valve terminal VTSA/VTSA-F.

#### Function

The vacuum block VABF-S4-1-V2B1... is used to generate a vacuum. The generated vacuum and a suction gripper produce a force which is used to grip and transport a workpiece. The supply of compressed air for vacuum generation is controlled by a solenoid valve.

The vacuum is generated by actuating the solenoid coil 12. The setpoint value set at duct B for the generated vacuum is monitored via a vacuum sensor (with switching output). Vacuum generation reverts to a self-holding phase after reaching the setpoint value. The vacuum block controls the vacuum generation process independently within the range of the set switching points (air saving function).

The integrated solenoid valve is used to generate an ejector pulse by activating coil 14. The workpiece is thus safely released from the suction cup with connector and the vacuum is rapidly reduced. The length of the ejector pulse can be influenced by the duration of the electrical pulse. The strength of the ejector pulse is influenced by the adjustable flow control.

- 🏻 -

Note

If the electrical or pneumatic supply fails while the valve is in the "generate vacuum" or "air saving" state, the valve moves to the "generate vacuum" position.

#### Operating mode of the air saving function (LS)

If the desired threshold value (1) (turn off suction) is reached for the vacuum, vacuum generation is automatically switched off.

Check valves prevent the reduction of the vacuum. However, leakages (e.g. due to rough workpiece surfaces) will slowly reduce the vacuum. If the vacuum drops below the set threshold value (turn on suction), vacuum generation is switched on automatically. Vacuum is generated until the set threshold value (turn off suction) is reached again.

Threshold value to turn off suction (air saving function) (1):

The vacuum generator is switched off simultaneously when the output Out A is set.

The preset value is -700 mbar.

Threshold value to turn on suction (2):

The threshold value (2) should always be above the switching point of duct B (3) "vacuum sensing".

The gap between (2) and (3) should be at least 50 mbar.

## - 🖣 - Note

Setting options and further instructions are described in the operating instructions and/or documentation VABF-S4-1-V2B1....

→ Internet

# Datasheet – Vacuum block for VTSA/VTSA-F

General technical data				
Valve function		5/3-way, pressurised		
Design		Non-modular		
Mounting position		Any		
Nominal width of Laval nozzle	[mm]	2.0		
(vacuum generation)				
Ejector characteristics		High vacuum, standard		
Integrated functions		Ejector pulse valve, electric		
		Flow control valve		
		On/offvalve, electric		
		Air-saving circuit, electric		
		Check valve		
		• Open silencer		
		Vacuum switch		
Silencer design		Open		
Measured variable		Relative pressure		
Measuring principle		Piezoresistive		
Switching function		Threshold value comparator		
Short circuit current rating		Yes		
Reverse polarity protection		For all electrical connections		
Inductive protective circuit		Adapted to MZ, MY, ME coils		
Switching element function		N/O contact		
Threshold-value setting range	[bar]	-0.999 0 (recommended operating range: -0.950.05)		
0 0	[MPa]	-0.0999 0 (recommended operating range: -0.0950.005)		
Hysteresis setting range	[bar]	-0.9 0		
	[MPa]	-0.09 0		
Power supply, vacuum block	[ 41]	Via own M12 plug		
Pneumatic supply for vacuum		Via valve terminal VTSA/VTSA-F		
block				
Ejector pulse		Strength adjustable via flow control screw		
Actuation type				
Solenoid valve		Electrically actuated		
Vacuum block		Vacuum generation via Venturi nozzle		
Type of actuation for solenoid		Piloted		
valve				
Flow direction		Not reversible		
Exhaust air function		Can be throttled (duct 3 and 5)		
Type of mounting		Via through-hole, screwed onto manifold sub-base, width 26 mm		
Manual override		Detenting, non-detenting, concealed		
For vacuum generation		Yes, solenoid coil 12 (holding)		
For ejector pulse		Yes, solenoid coil 14 (spring return), (only effective when power supply is switched off)		
Signal status display, valve		LED		
Pneumatic connections				
Supply	1, 3	Via the manifold sub-base of the valve terminal, width 26 mm		
Exhausting	3/5	Via the modular silencer for vacuum block		
Working port	2	Via the manifold sub-base of the valve terminal (QS push-in fitting – vacuum), G1/4		
(vacuum port)				
Connection	4	Via the manifold sub-base of the valve terminal (sealed with blanking plug type B-1/4)		
	•	G Fire of the control		

Technical data for pressur	e switch of vacuum	block (delivery status)
Duct A: air saving function		
Switching behaviour		Threshold value comparator
Switching point	[mbar]	<b>-</b> 700
	[MPa]	-0.07
Hysteresis	[mbar]	200
	[MPa]	0.02
Switching characteristic		NO (normally open contact)
Duct B: vacuum sensing		
Switching behaviour		Threshold value comparator
Switching point	[mbar]	-400
	[MPa]	-0.04
Hysteresis	[mbar]	5
	[MPa]	0.0005
Switching characteristic		NO (normally open contact)



Setting options for duct A and duct B and further instructions are described in the operating manual and/or documentation VABF-S4-1-V2B1....

Electrical data		
Electrical connection	-	4-pin plug to ISO 15407-2 (vacuum block supplied with power separately, not via valve terminal)
Nominal operating voltage	[V DC]	24
Operating voltage range	[V DC]	21.6 26.4
Duty cycle	[%]	100
Max. output current	[mA]	50
Voltage drop	[V]	š1.5
No-load current	[mA]	50 150 (dependent on the switching status of the solenoid coils)
Characteristic coil data	[V DC]	24
Power consumption	[W]	1.3
(Characteristic coil data)		
Overload protection		Available
Accuracy (full scale)	[% FS]	±3
Degree of protection to EN 60529		IP65, NEMA 4 (for all types of signal transmission when mounted)

Electrical connection <sup>1)</sup>			
2 + + + 4	1xM12 plug, 4-pin to EN 61076-2-101	Pin1 + 24 V DC (brown (BN)) Pin2 Out B (white (WH)) Pin3 0 V DC (blue (BU)) Pin4 Out A (black (BK))	Supply voltage Switching output B (duct B) 0 V DC Switching output A (duct A)

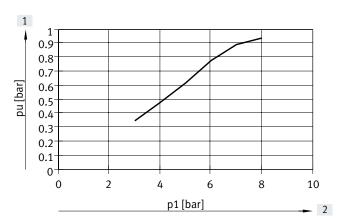
<sup>1)</sup> Max. permissible signal cable length: 5 m

Operating and environmental co	nditions	
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Notes on the operating medium		Unlubricated operation
Operating pressure	[bar]	48
	[MPa]	0.4 0.8
Nominal operating pressure	[bar]	6
	[MPa]	0.6
Pressure measuring range	[bar]	-10
	[MPa]	-0.1 0
Negative pressure	[bar]	Up to approx. 0.9 (as a function of operating pressure)
	[MPa]	Up to approx. 0.09 (as a function of operating pressure)
Ambient temperature	[°C]	050
Temperature of medium	[°C]	050
Noise level LpA (at nominal oper-	[dB(A)]	78
ating pressure)		

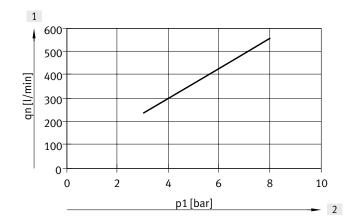
Materials	
Housing, jet nozzle	Wrought aluminium alloy
Screws	Galvanised steel
Seals	NBR
Plug housing	Nickel-plated die-cast zinc
Plug contacts	Gold-plated brass
Inspection window on pressure	PA PA
sensor	
Pressure sensor keypad	TPE-U
Note on materials	RoHS-compliant

## Pressure ratios, air consumption and volumetric flow rate

Vacuum as a function of operating pressure

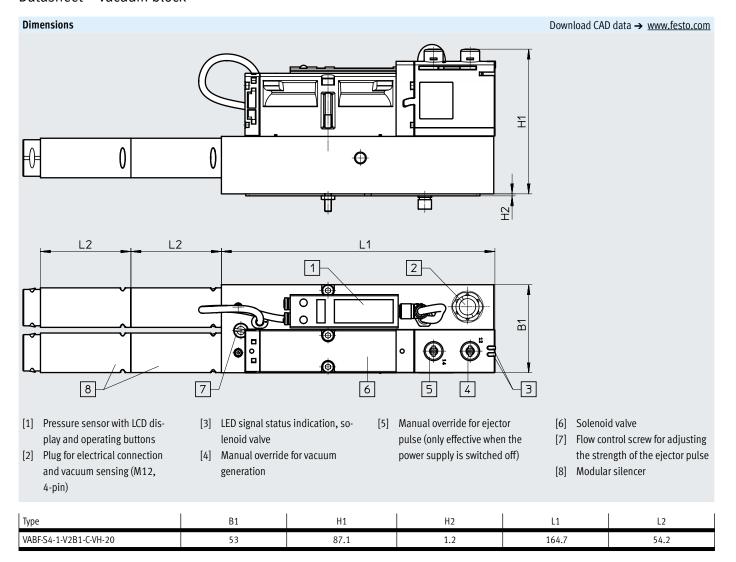


Air consumption as a function of operating pressure



[1] Vacuum

- [2] Operating pressure
- [1] Air consumption
- [2] Operating pressure



Ordering data					
	Code	Description		Part no.	Туре
/acuum block					
	VB	Vacuum block for valve terminal VTSA/VTSA-F with air-saving function and adjustable ejector pulse	1120 g	571425	VABF-S4-1-V2B1-C-VH-20
Manifold sub-base					
	L <sup>2)</sup>	For vacuum block 2 valve positions, 4 addresses, with 2 blanking plugs in port 4	26 mm	_ 1)	VABV-S4
o o o	LK <sup>2)</sup>	For vacuum block 2 valve positions, 4 addresses, with 2 blanking plugs in port 4, with small QS fitting	26 mm	_ 1)	VABV-S4
Connecting cable					
	_	<ul><li>Straight socket, M12x1, 5-pin</li><li>Open end, 4-core</li></ul>	2.5 m	550326	NEBU-M12G5-K-2.5-LE4
			5 m	541328	NEBU-M12G5-K-5-LE4
	GC	<ul> <li>Angled socket, M12x1, 5-pin</li> <li>Open end, 4-core</li> </ul>	5 m	541329	NEBU-M12W5-K-5-LE4
	-	Modular system for a choice of connecting cables		-	NEBU → Internet: nebu
	fittings, bla	nking plugs, silencers and			
orner pneumatic acces or on the website via t		e found in the chapter "Accessories" → page: 209 I search terms:			
nternet → connection	n technology	, silencer, blanking plug			

<sup>1)</sup> The manifold sub-base for use with the vacuum block can only be ordered via the valve terminal configurator and therefore doesn't have a separate part number.

<sup>2)</sup> Code letter within the order code for a valve terminal configuration

## Adaptation to width 65 mm

- **[]** - Valve width 65 mm ISO size 3

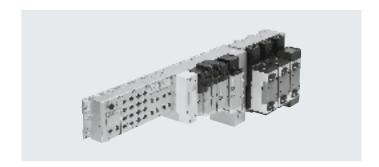
Voltage 24 V DC

Flow rate up to 4000 l/min

Temperature range −5 ... +50°C

-0.09 ... 1

Operating pressure -0.09 ... 1 MPa -0.9 ... 10 bar



#### Description

Function

By adapting valves, regulator plates and throttle plates for width 65 mm, ISO size 3, the scope of application of the valve terminal VTSA/VTSA-F can be further expanded:

 5 valve sizes with pneumatic function integration on a valve terminal VTSA/VTSA-F. • Max. flow rate up to 4000 l/min

- Max. 26 solenoid coils of width 65 mm, ISO size 3 can be adapted to the valve terminal VTSA/VTSA-F.
- The total number of solenoid coils of all widths must not exceed 32.

#### **Constraints**

End plate with pilot air selector

If components of ISO size 3 are used, the end plate with pilot air selector is not available for selection.

Pilot air supply via adapter plate

If no pneumatic components are installed on the left side of the adapter plate (electrical components only), ducts 12 and 14 of the adapter plate must be sealed with blanking plugs.

Pressure zones

Max. 2 pressure zones are possible with ISO size 3.

### Key features - Adaptation to width 65 mm

### **Equipment options**

Valve functions for width 65 mm, ISO size 3

5/2-way valve

- Single solenoid, pneumatic spring/mechanical spring
- Double solenoid
- Double solenoid with dominant signal

5/3-way valve

- Mid-position pressurised
- Mid-position closed
- Mid-position exhausted

### Special features

Fieldbus interface/CPX terminal

- Max. 32 valve positions/max. 32 solenoid coils
- · Any compressed air supply
- Any number of pressure zones

Multi-pin plug connection

- Max. 32 valve positions/max. 32 solenoid coils
- Parallel, modular valve links
- Any compressed air supply
- Any number of pressure zones

AS-Interface

 1 to 8 valve positions/max. 8 solenoid coils. Auxiliary power supply is required. Can be combined

- Width 65 mm Flow rate up to 4000 l/min
- Widths 18 mm, 26 mm, 42 mm and 52 mm can be combined on a single valve terminal. Width 65 mm is mounted at the end of the VTSA/ VTSA-F configuration using adapter VABA ...



The total number of solenoid coils of all widths must not exceed 32.

### Valve terminal configurator

Note

A valve terminal configurator is available to help you select a suitable valve terminal VTSA/VTSA-F, making it much easier to order the right product.

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

Order a valve terminal VTSA using the order code:

Ordering system for VTSA

→ Internet: vtsa

Ordering system for CPX

→ Internet: cpx

→ Internet: www.festo.com

Order a valve terminal VTSA-F using the order code:

Ordering system for VTSA-F

→ Internet: vtsa-f

Ordering system for CPX

→ Internet: cpx

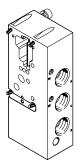


Please note that despite the basic configuration for ISO size 3 valves

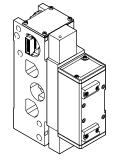
- the manual override is always non-detenting.
- exhaust air 3/5 of the adapter plate for ISO size 3 is always routed separately.
- there is no option for a 90°-connection plate, outlet at bottom.
- there is no option for sintered silencers.
- there is no option for pneumatic accessories.

### Peripherals – Adaptation to width 65 mm

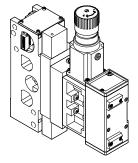
### Overview of modules for width 65 mm, ISO size 3



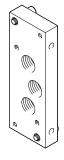




Valve with manifold sub-base



Vertical stacking



End plate

### **Pneumatics**

### Pneumatic modules

- Manifold sub-base for ISO valves
- Size 3: 4000 l/min

### Adapter plate

rated)

- · Compressed air supply port, duct 1
- Exhaust connection duct 3/5 (sepa-
- External pilot air supply connection (optional) for pneumatic components on the left side

### Pneumatic modules

- Manifold sub-base for an ISO valve
- Pilot control via intermediate solenoid plate
- ISO size 3

### Vertical stacking

- Valves
- Throttle plates
- Intermediate pressure regulator plates
- Pressure gauge
- Creating pressure zones with 10 bar or vacuum (with external pilot air supply only)

# Information on valve activation for ISO size 3

- All intermediate solenoid plates have a non-detenting manual override
- Valve terminals with internal pilot air supply: restricted pressure range
- Valve terminals with external pilot air supply: pressure zones up to 10 bar or vacuum operation possible. In this case, the pilot air supply must be regulated and supplied externally.

### Additional modules

- Throttle plates: one-way flow control valves can be mounted between the manifold block and the valve so that the speed of travel can be set separately for single and double-acting cylinders
- Pressure regulators: intermediate pressure regulator plates for setting the contact pressure of a cylinder, either separately on duct 1, 2 or 4, or shared by 2 and 4.
- Pressure gauge on pressure regulator

### Flexible compressed air supply

- Compressed air supply via the adapter plate or the right end plate
- With large valve terminals, compressed air can be supplied at both sides

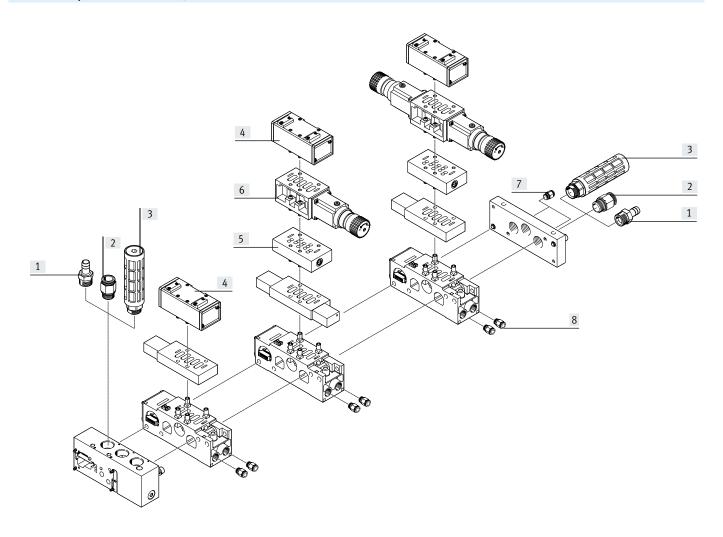
- Creating pressure zones: maximum of 2 pressure zones, up to 10 bar as well as for vacuum, are possible for all valve sizes. Compressed air supply at both sides is essential in this case
- Regulated external pilot air supply should be used for pressures
   3 bar.

### Options

- Vacant positions for subsequent extensions
- All pneumatic connections can also be supplied with a G thread

# Peripherals – Adaptation to width 65 mm

# Pneumatic components of width 65 mm, ISO size 3



		Description	→ Page/Internet
[1]	Barbed hose fitting	-	209
[2]	Fitting	For compressed air supply	209
[3]	Silencer	For exhaust air	210
[4]	Valve	Pneumatically actuated standards-based valve	198
[5]	Throttle plate	For exhaust air flow control	199
[6]	Intermediate pressure regulator plate	-	199
[7]	Fitting	For pilot air	209
[8]	Fitting	For working air	209

### Key features - Pneumatic components

Adapter plate VABA ...



The adapter plate VABA-... is used for adapting valves of width 65 mm ISO size 3 to valve terminal VTSA/VTSA-F. Ports for supply/exhaust air and pilot air supply are available.

The external pilot air used here supplies the valve terminal with valve widths 18 ... 52 mm, to the left of the adapter.

The external pilot air supply for the valves with a width of 65 mm, ISO size 3, is provided via the end plate IEPR ....

### Blanking plates



Blanking plates are used to seal off vacant valve positions.

No intermediate solenoid plate is mounted underneath the blanking plate.

This depends on the valve used and must be ordered with the valve if the terminal is expanded at a later date.

### Valves and pilot control



The valves used are pneumatically actuated standards-based valves that are controlled via an intermediate solenoid plate.

### Compressed air supply

The pilot air supply is selected at the intermediate solenoid plate by configuring two plungers.

Air can be taken from the working air, or from a separate air supply.

A separate pilot air supply is required in principle if the supply pressure is less than 3 bar (including vacuum).

In this case, it is advisable to restrict the pilot air supply to max. 10 bar with a suitable regulator.

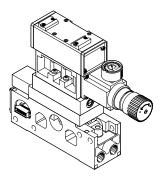
The following circuit diagrams are shown as solenoid valves and are combinations (sets) consisting of a pneumatic valve with an appropriate solenoid intermediate plate. The symbols printed on the components can therefore vary.

Valve fund Terminal code	ction Circuit symbol	Description
0	14 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5/2-way valve, single solenoid  • With intermediate solenoid plate  • Mechanical spring
-	14 4 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5/2-way valve, single solenoid  • With intermediate solenoid plate  • Pneumatic spring
М	14 4 2 12 12 14 5 1 3	5/2-way valve, single solenoid  • With intermediate solenoid plate  • Pneumatic spring, air spring supplied by external pilot air
J	14 4 2 12 12 14 5 1 3 12	5/2-way valve, double solenoid  • With intermediate solenoid plate
D	14 4 2 12 12 14 5 1 3 12	5/2-way valve, double solenoid  • With intermediate solenoid plate  • with dominant signal
G	14 W 4 2 W 12 14 5 1 3 12	5/3-way valve  • With intermediate solenoid plate  • Mid-position closed
E	14 W 4 2 W 12 T T T T T T T T T T T T T T T T T T	5/3-way valve  • With intermediate solenoid plate  • Mid-position exhausted
В	14 W 4 2 W 12 14 14 5 1 1 3 12	5/3-way valve  • With intermediate solenoid plate  • Mid-position pressurised
L		Blanking plate



A filter must be installed upstream of valves operated in vacuum mode. This prevents any foreign matter in the intake air getting into the valve (e.g. when operating a suction cup).

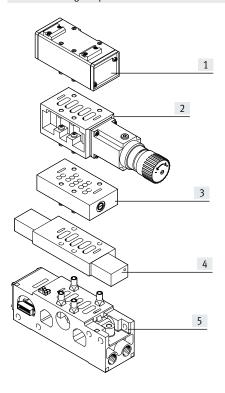
### Vertical stacking



Additional components can be added to each valve position of width 65 mm, between the base plate (manifold sub-base) and the valve.

These functions are known as vertical stacking modules and enable special functions or control of an individual valve position.

### Vertical stacking components



- [1] Valve
- [2] Intermediate pressure regulator plate
- [3] Throttle plate
- [4] Intermediate solenoid plate
- [5] Manifold sub-base with port pattern to DIN ISO 5599-2

### - Note

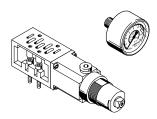
Certain combinations are not possible due to the design of the individual vertical stacking components.

### Throttle plate



Intermediate plate with integrated exhaust air flow controls at ports 3 and 5 for regulating cylinder speed

### Intermediate pressure regulator plate and pressure gauge



Intermediate plate with integrated pressure regulator for regulating pressure at

- Ports 2 and 4 (B, A)
- Port 4 (A)
- Port 2 (B)
- Port 1 (P)

### Easy pressure setting

Pressure gauges can be screwed directly into the intermediate pressure regulator plate for setting the pressure.

Function	unctions									
Code	Circuit symbol	Width 65 mm	Description							
X	-	•	Throttle plate (with two one-way flow control valves for exhaust air flow control)							
ZA	14  12  11  3  12	-	Intermediate pressure regulator plate, port 1							
ZB	14 5   1   3   12	•	Intermediate pressure regulator plate, port 4							
ZC	14 5 1 3 12	•	Intermediate pressure regulator plate, port 2							
ZD	14/5/1/3/12	•	Intermediate pressure regulator plate, ports 2 and 4							
S T R		•	Isolating disc for creating pressure zones Duct separation 1, 3, 5 Duct separation 1 Duct separation 3, 5							
T		-	Pressure gauge for regulator, max. 10 bar							
-		_	Pressure gauge for regulator, max. 16 bar							

### Manifold sub-base for valves

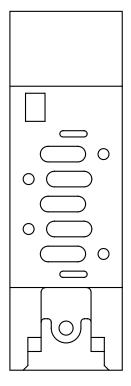
Adaptation to size 65 mm is based on a modular system which consists of manifold sub-bases and valves. The manifold sub-bases contain a duct seal and an electrical link, are screwed together and thus form the support system for the valves.

Inside the manifold sub-bases are the connection ducts for supplying compressed air to and exhausting the valve terminal as well as the working ports for the pneumatic cylinders for each valve.

Each manifold sub-base is connected to the next using two screws.

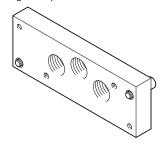
Individual valve terminal sections can be isolated and further manifold sub-bases can be inserted by loosening these screws. This ensures that the valve terminal can be rapidly and reliably extended, even for width 65 mm, ISO size 3.

Port pattern to ISO 5599-2 of the manifold sub-base for valves with width 65 mm



### Compressed air supply and exhausting

Right end plate



With the adaptation to width 65 mm, compressed air is supplied via the right end plate and/or the adapter plate VABA ...

Exhausting is either via silencers or ports for ducted exhaust air on the adapter plate VABA ... and/or on the right end plate.

The external pilot air supply for the valves of width 65 mm is provided via the end plate IEPR ...

### Pilot air supply

When using valves with a width of 65 mm, the internal/external pilot air supply for the valves with a width of 18 ... 52 mm is provided via the adapter plate VABA-....

The external pilot air supply for valves with a width of 65 mm is provided via the right end plate IEPR ....

### Internal pilot air supply

If the working pressure is between 3 ... 10 bar, internal pilot air supply can be selected.

The pilot air supply is then branched from the compressed air supply 1 using an internal connection. Ports 12 and 14 on the right end plate should be sealed with a blanking plug.

### External pilot air supply

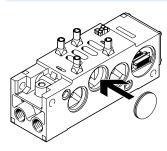
If the working pressure is not in the range from 3 ... 10 bar, you must operate the valves with a width of 65 mm using external pilot air supply. The pilot air supply is then supplied via ports 12 and 14 on the right end plate.



### Note

If a gradual pressure build-up is required in the system by using an external soft-start valve, then external pilot air should be selected so that the pilot pressure is already applied in full at the point of switch-on.

### **Creating pressure zones**

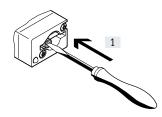


It is possible to have different supply pressures in the area containing valves with a width of 65 mm by installing isolating discs between two manifold blocks. Please note that the isolating disc is inserted into the manifold subbase from the right.

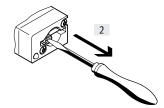
The air is supplied and exhausted via the left side via the adapter plate VABA ... and via the right end plate. Normally only duct 1 has to be isolated. In special cases, isolating discs can also be inserted into exhaust ducts 3 and 5.

### Manual override (MO)

Manual override with automatic return (non-detenting)



[1] Press in the plunger of the manual override using a pointed object or screwdriver. The valve is in the switching position.



[2] Remove the pointed object or screwdriver.

The spring force pushes the plunger of the manual override back.

The valve returns to its initial position (not with double solenoid valve, code J, D).

### **Electrical connection concept**

Replacing the solenoid coil fuse

Each solenoid coil is protected with a (fast-blowing) 0.315 A fuse.

These fuses are located behind the covering of the manifold sub-base on the printed circuit board.

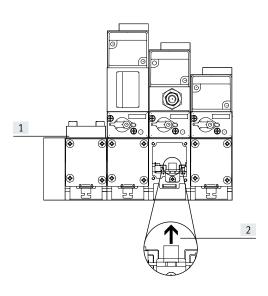
Each single solenoid manifold subbase has one fuse, while each double solenoid manifold sub-base has two fuses.



Note

Make sure that there is sufficient clearance for maintenance purposes.

### Changing the solenoid coil fuse

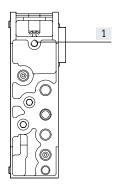


- [1] Loosen the retaining screws in the
- [2] Carefully remove the fuse from its base.

Right fuse for valve solenoid 14 Left fuse for valve solenoid 12

# Key features – Mounting, adaptation to width 65 mm

### Mounting at the rear

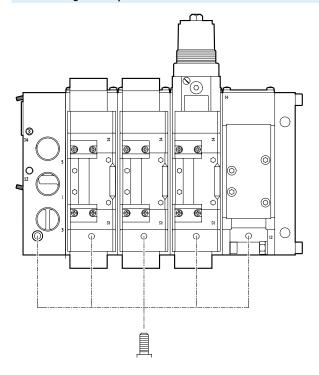


[1] Blind hole for mounting at the rear

The rear side of the manifold sub-bases has drilled holes (blind holes) for mounting the valve terminal on machines or metal racks (rear side mounting).

M8 threads need to be cut for this purpose.

### Wall mounting with adaptation to width 65 mm



- With M8 screws on the adapter plate and the manifold sub-bases
- Drilled holes (blind holes) on the underside of the manifold sub-bases
- Drilled hole (through-hole) in the adapter plate



### Note

The mounting holes of every second manifold sub-base must be used for the wall mounting of a valve terminal VTSA-ASI of width 65 mm.

# Datasheet – General technical data, adaptation to width 65 mm

General technical data for valve fun	nctions					
Design						
Valves		Piston spool valve				
Intermediate pressure regulator p	late	Pressure regulator with secondary exhausting				
Width [1	mm]	65				
Nominal width [1	mm]	14.5				
Type of mounting						
Valves		With through-holes on the manifold sub-base				
Throttle plate		With through-holes on the manifold sub-base				
Intermediate pressure regulator p	late	With through-holes on the manifold sub-base				
Mounting position		Any				
Manual override		Non-detenting				
Pneumatic connections – Threaded c	connection					
Working air 1		1 1/2 NPT				
Exhaust air 3	3/5	1 1/2 NPT				
Working ports 2/4 1/2 NPT						
Pilot air supply 1	1 2/14	1/8 NPT				

Technical data Valve function	Termi- nal code	Valve switching times in [ms]			Flow direction		Reset method		Standard nominal flow rate in [I/min]
		On	Off	Change- over	Reversible	Not reversible	Pneumatic spring	Mechanical spring	
5/2-way, double solenoid	J	-	-	8	•	_	-	-	4500
5/2-way, double solenoid with dominant signal	D	29	36	_	•	-	-	-	4500
5-2-way single solenoid, pneumatic spring supplied by external pilot air	М	29	36	-		-	•	-	4500
5/2-way single solenoid	-	29	36	-	-	•	•	-	4500
5/2-way single solenoid	0	17	61	-	•	_	_	•	4500
5/3-way, closed <sup>1)</sup>	G	17	61	_	•	_	-	-	3600
5/3-way, exhausted <sup>1)</sup>	E	18	63	-	•	-	-	-	3800
5/3-way, pressurised <sup>1)</sup>	В	16	60	-		_	-	•	3800
Intermediate plate									
For single solenoid valves (MUH-ZP-D-3-24G)	-	-	-	_	-	•	-	-	-
For double solenoid, 5/3-way and valves with dominant signal (MUHX2-ZP-D-3-24G)	-	-	-	-	-	•	-	-	-
For single solenoid valves, pneumatic spring supplied by external pilot air (MUH-ZP-D-3-L-24G)	-	-	-	-	-	•	-	•	-
Intermediate pressure regulator plate									
LR-ZP-A-D-	ZB	-	-	-	-	-	-	-	2300
LR-ZP-B-D-	ZC	-	-	-	-	-	-	-	2300
LR-ZP-P-D-	ZA	-	-	_	-	-	-	-	1800
LR-ZP-A/B-D-	ZD	-	_	-	-	-	_	-	-

If neither solenoid coil is energised, the valve is moved to its mid-position by spring force.
 If both solenoid coils are energised at the same time, the valve remains in the previously assumed switching position.

# Datasheet – General technical data, adaptation to width 65 mm

Operating and environmental co Valve functions, adapter plate	nditions							
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]						
Notes on operating/ pilot medium		Lubricated operation possible (in which case lubrication will always be required)						
Operating pressure for valve terminal								
With ext. pilot air supply	[bar]	-0.9 +10						
	[MPa]	-0.09 +1						
With int. pilot air supply	[bar]	310						
	[MPa]	0.3 1						
Pilot pressure for valve terminal	[bar]	310						
	[MPa]	0.3 1						
Operating pressure for valves								
With ext. pilot air supply	[bar]	−0.9 +10 (for reversible valves, for non-reversible valves 2 10)						
	[MPa]	−0.09 +1 (for reversible valves, for non-reversible valves 0.2 1)						
With int. pilot air supply	[bar]	3 10 (for mechanically reset valves, for pneumatically reset valves 2 10)						
	[MPa]	0.3 1 (for mechanically reset valves, for pneumatically reset valves 0.2 1)						
Pilot pressure for valves	[bar]	3 10 (for mechanically reset valves, for pneumatically reset valves 2 10)						
	[MPa]	0.3 1 (for mechanically reset valves, for pneumatically reset valves 0.2 1)						
Pressure regulation range	[bar]	0 12 (for intermediate pressure regulator plate)						
	[MPa]	0 1.2 (for intermediate pressure regulator plate)						
Ambient temperature	[°C]	-5 +50						
Temperature of medium	[°C]	-5 +50						
Mounting position		Any						
Certification		c UL us – Recognized (OL) - (does not apply to valve J-5/2-D-3-C with part no. 151865)						
CE marking (see declaration of conformity)		To EU EMC Directive <sup>1)</sup> (for intermediate plate MUH )						
Relative humidity	[%]	90						

<sup>1)</sup> For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... 

Support/Downloads.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Electrical data for solenoid coil							
Protection against electric shock (protection against direct and indirect contact to EN 60204-1/IEC 204)		Through PELV power supply unit					
Operating voltage [V]		24 DC ±10%					
Power consumption per coil	[W]	3.1 (130 mA at 24 V DC)					
Duty cycle		100% (50% concurrence)					
Degree of protection to EN 60529		IP65 (when mounted)					
Relative humidity	[%]	90% at 40°C, non-condensing					

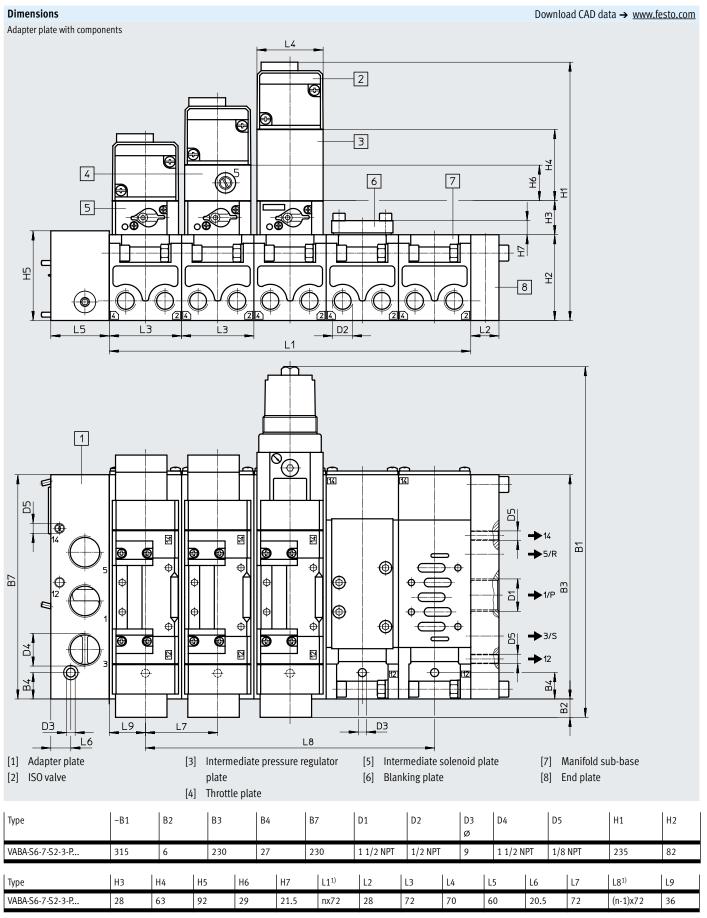
Electrical data – Adapter plate							
Operating voltage	[V]	24 DC ±10%					
Max. current rating per signal	[mA]	500					
Duty cycle		100%					
Degree of protection		IP65, NEMA 4 (for all types of signal transmission when mounted)					

# Datasheet – General technical data, adaptation to width 65 mm

Materials	
Valves	Die-cast aluminium, steel
Adapter plate	Wrought aluminium alloy
Seals	NBR
Throttle plate	Anodised aluminium, brass
Intermediate pressure regulator plate	Die-cast aluminium, steel
Screws	Galvanised steel
Note on materials	RoHS-compliant

Product weight	
Approx. weight [g]	
Adapter plate	2600
Manifold sub-base	1120
Right end plate	1120
Intermediate solenoid plate	500
Valves	
Single solenoid, double solenoid	760
Mid-position	840
Blanking plate	180
Throttle plate	850
Intermediate pressure regulator plate	
• P, B, A	1120
• A/B	1770

# Datasheet - Adaptation to width 65 mm



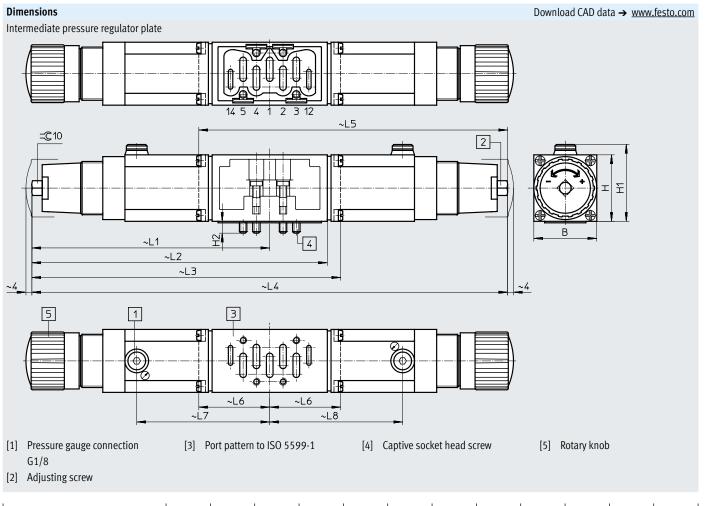
<sup>1)</sup> n = number of valves

# Datasheet - Dimensions, adaptation to width 65 m

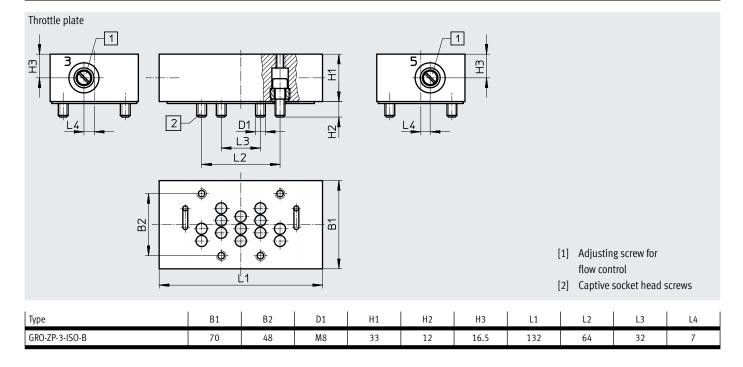
### **Dimensions** Download CAD data → www.festo.com Manifold sub-bases for valves L10\_ 2 **B**2 L5 囟 3 [1] Adapter plate [3] Retaining screws [2] Right end plate Туре ~B1 В2 В3 В4 D1 D2 D3 D4 D5 D6 Н1 H2 VIGI/VIGM-04-D-3-NPT 1 1/2 NPT 1/2 NPT 1 1/2 NPT 1/8 NPT 1/8 NPT max. 237 230 max. 64 27 9.0 92 82 L5<sup>1)</sup> H4 L11) L2 L4 Туре НЗ L3 L6 L7 L8 L9 L10 VIGI/VIGM-04-D-3-NPT 20 5 nx72 72 60 36 (n-1)x72 20.5 36 18 18 10

<sup>1)</sup> n = number of valves

# Datasheet – Dimensions, adaptation to width 65 m



Туре	В	Н	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
LR-ZP-A-D-3	70	63	65	14	201.5	-	274	-	-	-	119	-
LR-ZP-B-D-3	70	63	65	14	201.5	-	-	-	274	72.5	-	119
LR-ZP-A/B-D-3	70	63	65	14	201.5	-	-	403	-	-	119	119
LR-ZP-P-D-3	70	63	65	14	201.5	260	-	-	-	-	119	-



# Valve terminal VTSA/VTSA-F, NPT

# Ordering data – Adaptation to width 65 mm

Ordering data				
Designation	Code	Description	Part no.	Туре
Pneumatic valve				
	-	5/2-way valve, monostable, mechanical spring return	151863	VL-5/2-D-3-FR-C
	-	5/2-way valve, monostable, pneumatic spring return	151864	VL-5/2-D-3-C
	-	5/2-way valve, bistable	151865	J-5/2-D-3-C
	-	5/2-way valve, bistable, with dominant signal	151866	JD-5/2-D-3-C
	_	5/3-way valve, mid-position closed	151867	VL-5/3G-D-3-C
	-	5/3-way valve, mid-position exhausted	151868	VL-5/3E-D-3-C
	-	5/3-way valve, mid-position pressurised	151869	VL-5/3B-D-3-C

# Accessories – Adaptation to width 65 mm

Ordering data - Access	ories			
Designation	Code	Description	Part no.	Туре
Throttle plate				
	X	Throttle plate (with two one-way flow control valves for exhaust air flow control)	119674	GRO-ZP-3-ISO-B
Intermediate pressure r	egulator	plate		
	ZA	Duct 1, pressure regulation range: 0.012 bar	35968	LR-ZP-P-D-3
	ZB	Duct 4, pressure regulation range: 0.512 bar	35971	LR-ZP-A-D-3
	ZC	Duct 2, pressure regulation range: 0.512 bar	35426	LR-ZP-B-D-3
	ZD	Duct 2 and 4, pressure regulation range: 0.512 bar	35429	LR-ZP-A/B-D-3
Pressure gauge		'		
	T	For regulator, max. 10 bar	162835	MA-40-10-1/8-EN
	-	For regulator, max. 16 bar	529046	MA-40-16-1/8-EN-DPA

# Datasheet – Valves on individual sub-base

- 🔰 - Valve width

to ISO 15407-2

- 18 mm
- 26 mm to ISO 5599-2
- 42 mm (ISO 1)
- 52 mm (ISO 2)



Voltage 24 V DC 110 V AC



Flow rate
Width 18 mm:
up to 600 l/min
Width 26 mm:
up to 1200 l/min
Width 42 mm:
up to 1500 l/min
Width 52 mm:
up to 3400 l/min

110 V AC

General technical da

General technical data															
Design		Piston spool valve													
Sealing principle		Soft													
Actuation type		Electrical	Electrical												
Type of control		Piloted													
Exhaust function, can be throttle	d	Via individual sub-base													
Lubrication		Lifetime lubrication													
Type of mounting															
Valve		Screwed onto sub-base													
<ul> <li>Individual sub-base</li> </ul>		Screwed via through-ho	le												
Mounting position		Any	Any												
Manual override		Detenting, non-detenting	ig, concealed												
Pneumatic connections – NPT thr	read														
Width		18 mm	26 mm	42 mm	52 mm										
Pneumatic connection		Via sub-base			·										
Supply port	1	1/8 NPT	1/4 NPT	3/8 NPT	1/2 NPT										
Exhaust port	3/5	1/8 NPT	1/4 NPT	3/8 NPT	1/2 NPT										
Working ports	2/4	1/8 NPT	1/4 NPT	3/8 NPT	1/2 NPT										
External pilot air supply port	14	10-32UNF-2B	1/8 NPT	1/8 NPT	1/8 NPT										
Pilot exhaust air port	12	10-32UNF-2B	1/8 NPT	1/8 NPT	1/8 NPT										

Operating and environmental co	onditions	
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Notes on operating/ pilot medium		Lubricated operation possible (in which case lubrication will always be required)
Operating pressure	[bar]	-0.9 +10
	[MPa]	-0.09 +1
Ambient temperature	[°C]	-5 +50
Certification		c UL us - Recognized (OL)
CE marking (see declaration of		In accordance with EU Low Voltage Directive (not for VABS-S4R3 and variants of width 52, VABS-S2-2S)
conformity)		
Degree of protection		IP65, NEMA 4 (for all types of signal transmission when mounted)

# Datasheet – Valves on individual sub-base

## $\Big|\ Standard\ nominal\ flow\ rate\ of\ valve/individual\ sub-base\ [l/min]$

Valve function (with valve code)	Width 18 mm		Width 26 mm	
	Valve	Valve on individual sub-base	Valve	Valve on individual sub-base
5/2-way double solenoid (B52)	750	600	1400	1200
5/2-way double solenoid with dominant signal (D52)	750	600	1400	1200
5/2-way single solenoid, pneumatic spring (M52A)	750	600	1400	1200
5/2-way single solenoid, mechanical spring (M52M)	750	600	1400	1200
5/3-way closed (P53C)	700	550	1400 <sup>1)</sup> 700 <sup>2)</sup>	1200 <sup>1)</sup> 700 <sup>2)</sup>
5/3-way exhausted (P53E)	7001)	500 <sup>1)</sup>	14001)	1200 <sup>1)</sup>
	330 <sup>2)</sup>	330 <sup>2)</sup>	700 <sup>2)</sup>	700 <sup>2)</sup>
5/3-way pressurised (P53U)	7001)	5001)	14001)	12001)
	330 <sup>2)</sup>	330 <sup>2)</sup>	700 <sup>2)</sup>	700 <sup>2)</sup>
5/3-way exhausted, switching position 14 detenting (P53ED)	_	390 <sup>1)</sup> 310 <sup>2)</sup>	1400 <sup>1)</sup> 700 <sup>2)</sup>	1200 <sup>1)</sup> 700 <sup>2)</sup>
5/3-way exhausted, switching position 12 detenting	_	3901)	14001)	12001)
(P53EP)		320 <sup>2)</sup>	700 <sup>2)</sup>	700 <sup>2)</sup>
5/3-way, port 2 pressurised, 4 exhausted, switching posi-	-	380 <sup>1)</sup>	700 <sup>1)</sup>	700 <sup>1)</sup>
tion 14 detenting (P5 3AD)		360 <sup>2)</sup>	700 <sup>2)</sup>	700 <sup>2)</sup>
5/3-way, port 4 pressurised, 2 exhausted, switching posi-	-	400	-	9001)
tion 14 detenting (P53BD)				8402)
2x3/2-way single solenoid, closed (T32C)	600	500	1250	1100
2x3/2-way single solenoid, open (T32U)	600	500	1250	1100
2x3/2-way single solenoid, open/closed (T32H)	600	500	1250	1100
2x3/2-way single solenoid, closed (T32N)	600	500	1250	1100
2x3/2-way single solenoid, open (T32F)	600	500	1250	1100
2x3/2-way single solenoid, open/closed (T32W)	600	500	1250	1100
2x2/2-way single solenoid, closed (T22C)	700	500	1350	1100
2x2/2-way single solenoid, closed (T22CV)	700	500	1350	1100

Switching position
 Mid-position

### Datasheet - Valves on individual sub-base

### Standard nominal flow rate of valve/individual sub-base [l/min] Valve function (with valve code) Width 42 mm Width 52 mm Valve Valve on individual sub-base Valve Valve on individual sub-base 5/2-way double solenoid (B52) 2000 1500 4000 3400 5/2-way double solenoid with dominant signal (D52) 2000 1500 4000 3400 5/2-way single solenoid, pneumatic spring (M52A) 2000 1500 4000 3400 5/2-way single solenoid, mechanical spring (M52M) 2000 1500 4000 3400 5/3-way closed (P53C) 1900<sup>1)</sup> 1400<sup>1)</sup> 3600<sup>1)</sup> 3200<sup>1)</sup> 950<sup>2)</sup> 8002) 17002) 1700<sup>2)</sup> 3200<sup>1)</sup> 5/3-way exhausted (P53E) 1900<sup>1)</sup> 1400<sup>1)</sup> 3600<sup>1)</sup> $1700^{2)}$ 1700<sup>2)</sup> 950<sup>2)</sup> 800<sup>2)</sup> 5/3-way pressurised (P53U) 19001 14001 3600<sup>1)</sup> 3200<sup>1)</sup> 1700<sup>2)</sup> 1700<sup>2)</sup> 950<sup>2)</sup> 800<sup>2)</sup> 5/3-way, pressurised 1 to 2, 4 to 5 closed (P53F)3) 1700<sup>1)</sup> 1400<sup>1)</sup> 3000<sup>1)</sup> 2600<sup>1)</sup> 700<sup>2)</sup> $700^{2)}$ 9002) 9002) 2x3/2-way single solenoid, closed (T32C) 1600 1200 3000 2600 2x3/2-way single solenoid, open (T32U) 1600 1200 3000 2600 2x3/2-way single solenoid, open/closed (T32H) 1600 1200 3000 2600 2x3/2-way single solenoid, closed (T32N) 1600 1200 3000 2600 3000 2x3/2-way single solenoid, open (T32F) 1600 1200 2600 2x3/2-way single solenoid, open/closed (T32W) 1600 1200 3000 2600

1400

1400

4000

3400

2x2/2-way single solenoid, closed ( $\overline{T22C}$ )

2x2/2-way single solenoid, closed (T22CV)

1600

1600

Electrical data, individual sub	-base							
Current rating at 40°C	[A]	2 (1 A per coil)						
Degree of protection to EN 60529 IP65, NEMA 4 (for all types of signal transmission when mounted)								
Variants with cable connector								
Operating voltage range	[V DC]	24 ±10% (for variants with cable terminal VABSK1/C1,K2)						
	[V AC]	110 ±10% (50 60Hz) (for variants with cable and spring-loaded terminal VABSK1/C1,K2)						
Surge resistance	[kV]	4						
Pollution degree		3						
Duty cycle	[ED]	100%						



A cable connector is needed to ensure the IP degree of protection and to protect against tensile load, twisting and bending.

<sup>1)</sup> Switching position

<sup>2)</sup> Mid-position

<sup>3)</sup> The valve function P53F is only available in the 24 V DC version. Values only apply to 24 V DC.

# Datasheet – Valves on individual sub-base

Materials				
Width	18 mm	26 mm	42 mm	52 mm
Connecting plate	Die-cast aluminium			Gravity die-cast aluminium
Valve	Die-cast aluminium, PA			
Seals	FPM, NBR			
Note on materials	RoHS-compliant			

Product weight [g]				
Width	18 mm	26 mm	42 mm	52 mm
Valves				
5/2-way solenoid valve, Double solenoid	172	276	439	732
5/2-way valve, single solenoid	163	293	426	702
5/3-way solenoid valve (P53C, P53E, P53U)	191	320	456	780
5/3-way solenoid valve (P53BD)	172	301	-	-
5/3-way solenoid valve (P53ED, P53EP)	170	291	-	-
5/3-way solenoid valve (P53AD)	172	301	-	-
5/3-way solenoid valve (P53F)	-	-	456	780
2x 3/2-way solenoid valve	190	335	442	740
2x 2/2-way solenoid valve	190	335	442	740
Individual connection				
Individual sub-base	192	302	386	815

# Datasheet - Valves on individual sub-base

# Dimensions Individual sub-base with cable terminals, width 18 mm B1 B2 H1 H2 H3 B4 B5 B5 B3 B5 B3

Туре	B1	B2	В3	B5	D1	D2	D3	D4	D5 Ø	H1	H2	Н3	H4	H5	H6	H7
VABS-S4-2S-N18-K2 1)	32.4	30	18	6	1/8 NPT	10-32UNF-2B	10-32UNF-2B	M20x1.5	5.5	31	53.4	14.5	13	13.7	8.8	4
VABS-S4-2S-N18-B-K2 <sup>2)</sup>							_									

Туре	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
VABS-S4-2S-N18-K2 <sup>1)</sup>	133.5	124.5	38.6	22.2	32.4	33.2	16.6	25.3	16.2	4.5
VABS-S4-2S-N18-B-K2 <sup>2)</sup>										

<sup>1)</sup> External pilot air supply

Internal pilot air supply

Note: This product conforms to ISO 1179-1 and ISO 228-1.

# Datasheet – Valves on individual sub-base

# 

Туре	B1	В3	B5	D1	D2	D3	D4	D5 Ø	H1	H2	H3	H4	H5	H6	H7
VABS-S4-1S-G14-K2 <sup>1)</sup>	43	26	8.5	1/4 NPT	1/8 NPT	1/8 NPT	M20x1.5	5.5	36.5	53.5	26.5	13	13	12.5	4
VABS-S4-1S-G14-B-K2 <sup>2)</sup>						-									

Туре	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
VABS-S4-1S-G14-K2 <sup>1)</sup>	150.6	141.5	53.6	23.2	41.4	37.9	24.2	29.3	20.7	4.5
VABS-S4-1S-G14-B-K2 <sup>2)</sup>										

<sup>1)</sup> External pilot air supply

<sup>2)</sup> Internal pilot air supply

# Datasheet - Valves on individual sub-base

# 

Туре	B1	В3	B5	B6	D1	D2	D3	D4	D5 Ø	H1	H2	Н3	H4	H5	Н6	H7	Н8
VABS-S2-1S-N38-K1 <sup>1)</sup>	50	42	4	2.2	3/8 NPT	1/8 NPT	1/8 NPT	M20x1.5	5.5	42.5	55.3	29	13.6	17.1	16.3	4	47.5
VABS-S2-1S-N38-C1 1)																	
VABS-S2-1S-N38-B-K1 <sup>2)</sup>							_										
VABS-S2-1S-N38-B-C1 <sup>2)</sup>																	

Туре	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
VABS-S2-1S-N38-K1 <sup>1)</sup>	150.6	141.5	53.6	23.2	44	37	26	28	22	4.5
VABS-S2-1S-N38-C1 1)										
VABS-S2-1S-N38-B-K1 <sup>2)</sup>	]									
VABS-S2-1S-N38-B-C1 <sup>2)</sup>	]									

<sup>1)</sup> External pilot air supply

Internal pilot air supply

 $<sup>| \</sup>label{eq:Note:This product conforms to ISO 1179-1 and ISO 228-1.}$ 

# Datasheet – Valves on individual sub-base

# Dimensions Download CAD data → www.festo.com Individual sub-base with M12 plug, width 52 mm Н8 В4 В1 H1 H2 Ф Ð 8 $\oplus$ 7 L9 $\oplus$ $\oplus$ 9 Н6 H5 H4 ш <u>B5</u> [1] Plug to EN 61076-2-101

Туре	B1	В3	B5	B6	D1	D2	D3	D4	D5 Ø	H1	H2	Н3	H4	H5	Н6	H7	H8
VABS-S2-2S-N12-K1 <sup>1)</sup>	67	52	7.5	2.2	1/2 NPT	1/8 NPT	1/8 NPT	M20x1.5	6.5	60	60	43.5	17	26.5	23.5	10	65
VABS-S2-2S-N12-C1 <sup>1)</sup>																	
VABS-S2-2S-N12-B-K1 <sup>2)</sup>							-										
VABS-S2-2S-N12-B-C1 <sup>2)</sup>																	

Туре	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
VABS-S2-2S-N12-K1 <sup>1)</sup>	185	172	17.5	17.5	55.4	99.5	33	88.3	27.7	6.5
VABS-S2-2S-N12-C1 <sup>1)</sup>										
VABS-S2-2S-N12-B-K1 <sup>2)</sup>										
VABS-S2-2S-N12-B-C1 <sup>2)</sup>										

<sup>1)</sup> External pilot air supply

<sup>2)</sup> Internal pilot air supply

<sup>•</sup> Note: This product conforms to ISO 1179-1 and ISO 228-1.

# Valve terminal VTSA/VTSA-F, NPT

# Accessories – Individual connection

	Description		Width	Part no.	Туре	
al sub-base,	electrical connection via cable terminals					
	Internal pilot air supply	1/8 NPT connections	18 mm	541068	VABS-S4-2S-N18-B-K2	
15000		1/4 NPT connections	26 mm	541066	VABS-S4-1S-N14-B-K	
	External pilot air supply	1/8 NPT connections	18 mm	539724	VABS-S4-2S-N18-K2	
		1/4 NPT connections	26 mm	539726	VABS-S4-1S-N14-K2	
ıal sub-base,	electrical connection via spring-loaded ten	minal				
<u> </u>	Internal pilot air supply	3/8 NPT connections	42 mm	546763	VABS-S2-1S-N38-B-C	
10000		1/2 NPT connections	52 mm	555644	VABS-S2-2S-N12-B-C	
	External pilot air supply	3/8 NPT connections	42 mm	546761	VABS-S2-1S-N38-C1	
		1/2 NPT connections	52 mm	555639	VABS-S2-2S-N12-C1	
ıal sub-base,	electrical connection via cable (open end)					
	Internal pilot air supply	3/8 NPT connections	42 mm	546103	VABS-S2-1S-N38-B-K	
1500		1/2 NPT connections	52 mm	555642	VABS-S2-2S-N12-B-K	
	External pilot air supply	3/8 NPT connections	42 mm	546100	VABS-S2-1S-N38-K1	
		1/2 NPT connections	52 mm	555637	VABS-S2-2S-N12-K1	
ting cable for	electrical connection of individual valves a	t the individual electrical connection	I			
	Modular system for a choice of connecting	g cables		-	NEBU → Internet: nebu	

# Accessories

Ordering data	Description		Part no.	Туре	PU <sup>1)</sup>
Multi-pin plug dist	· ·		Ture no.	1960	1.0
wutti-pin piug dist	15-pin Sub-D socket/8x 3-pin M8 plugs		177669	MPV-E/A08-M8	1
	15-pin Sub-D socket/12x 3-pin M8 plugs		177670	MPV-E/A12-M8	1
ush-in fitting					'
	Connecting thread 1/4 NPT for tubing O.D.	1/2"	567771	QB-1/4-1/2-U	10
		3/8"	533278	QB-1/4-3/8-U	10
		5/16"	533277	QB-1/4-5/16-U	10
	Connecting thread 1/8 NPT for tubing O.D.	3/8"	567773	QB-1/8-3/8-U	10
		1/4"	533273	QB-1/8-1/4-U	10
		5/16"	533274	QB-1/8-5/16-U	10
	Connecting thread 3/8 NPT for tubing O.D.	1/2"	533282	QB-3/8-1/2-U	5
	C II I I I I I I I I I I I I I I I I I	3/8"	533281	QB-3/8-3/8-U	5
	Connecting thread 1/2 NPT for tubing O.D.	5/8"	190682	QS-1/2-5/8-U	1
		1/2"	533284	QB-1/2-1/2-U	5
Barbed hose fitting	3			·	'
~^	For right end plate (connecting thread NPT)	3/4"	564848	N-3/4-P-19-NPT	1
		R1	572243	N-1-P-19-NPT	1
	For adapter plate (connecting thread NPT)	R1	572243	N-1-P-19-NPT	1

<sup>1)</sup> Packaging unit

# Valve terminal VTSA/VTSA-F, NPT

# Accessories

Ordering data						
	Code	Description		Part no.	Type	PU <sup>1)</sup>
Silencer						
	U	Standard design, connecting thread NPT	1/8"	12638	U-1/8-B-NPT	1
			1/4"	12639	U-1/4B-NPT	1
<b>9</b>			1/2"	12741	U-1/2-B-NPT	1
			3/4"	566823	U-3/4-B-NPT	1
			1"	571280	U-1-B-NPT	1
	A Sintered design, connecting thread NPT	Sintered design, connecting thread NPT	1/8"	1206989	AMTE-M-LH-N18	20
		1/4"	1206990	AMTE-M-LH-N14	20	
		1/2"	1206992	AMTE-M-LH-N12	10	
Blanking plug						
	-	Connecting thread NPT	1/8"	173985	B-1/8-NPT	1
			1/4"	174165	B-1/4-NPT	1
			1/2"	31785	B-1/2-NPT	1
			3/4"	31786	B-3/4-NPT	1
			1"	31787	B-1-NPT	1
Other pneumatic c	onnection acc	eccuriec				
· · · · · · · · · · · · · · · · · · ·		planking plugs and silencers can be found				
on the website via	•	0. 0				
		ogy, silencer, blanking plug				

<sup>1)</sup> Packaging unit