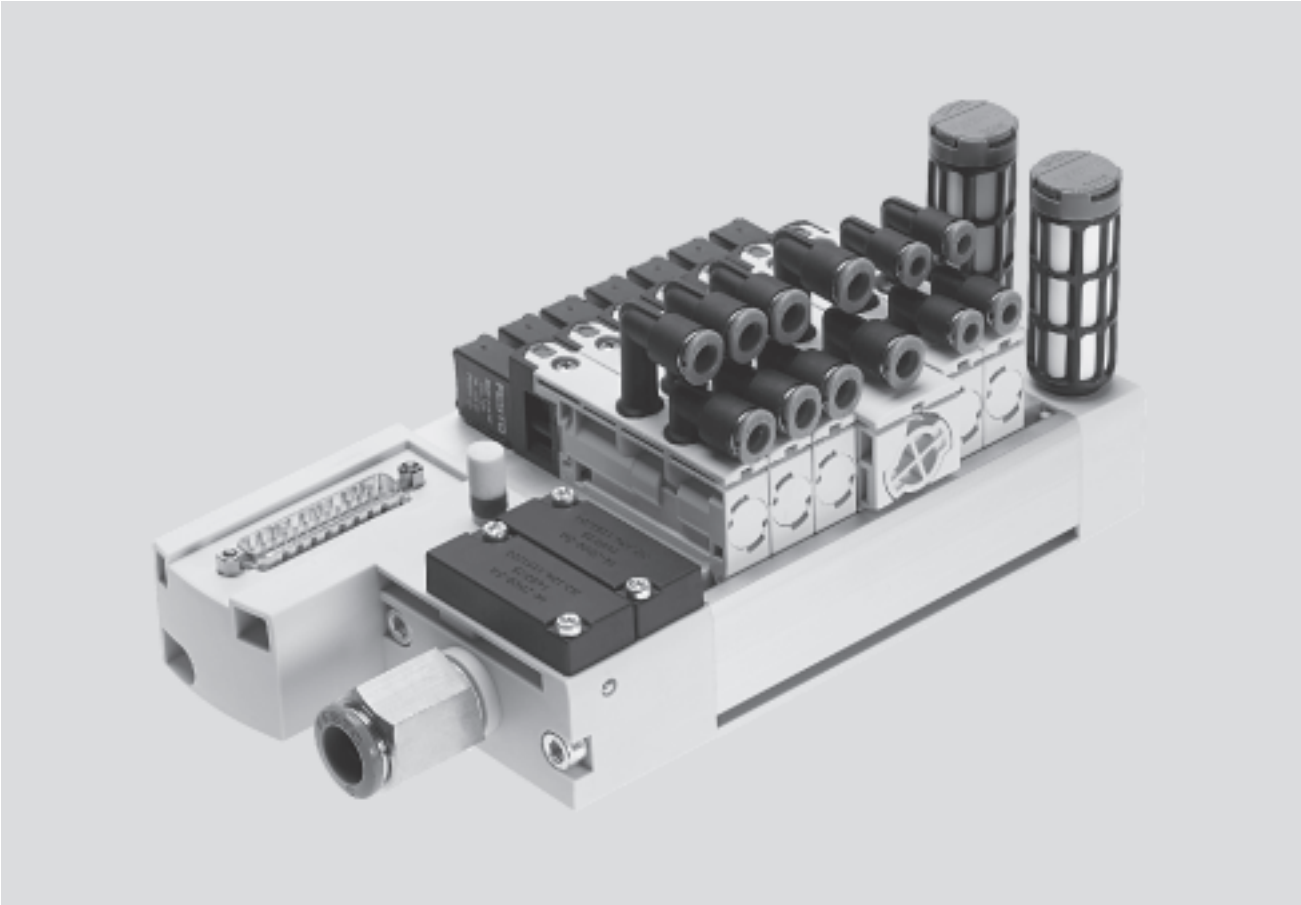
Valve terminals type 23 VTUB-12

FESTO

Valve terminals type 23 VTUB-12

Key features



Innovative

- Valve terminal for a wide range of pneumatic applications
- Weight-optimised metal manifold rail
- Minimal space requirement
- Great flexibility during planning, assembly and operation
- Pneumatic distributor integrated on the valve terminal
- Use in dusty environments

Versatile

- Room for expansion with 2 ... 35 valve positions on one valve terminal
- The flexibility of the pneumatic working ports provides a practical solution to different requirements
- Fast and easy replacement of fittings

Reliable

- Manual override
- Durable
- Sturdy thanks to the polymer housing and metal manifold rail

Easy to mount

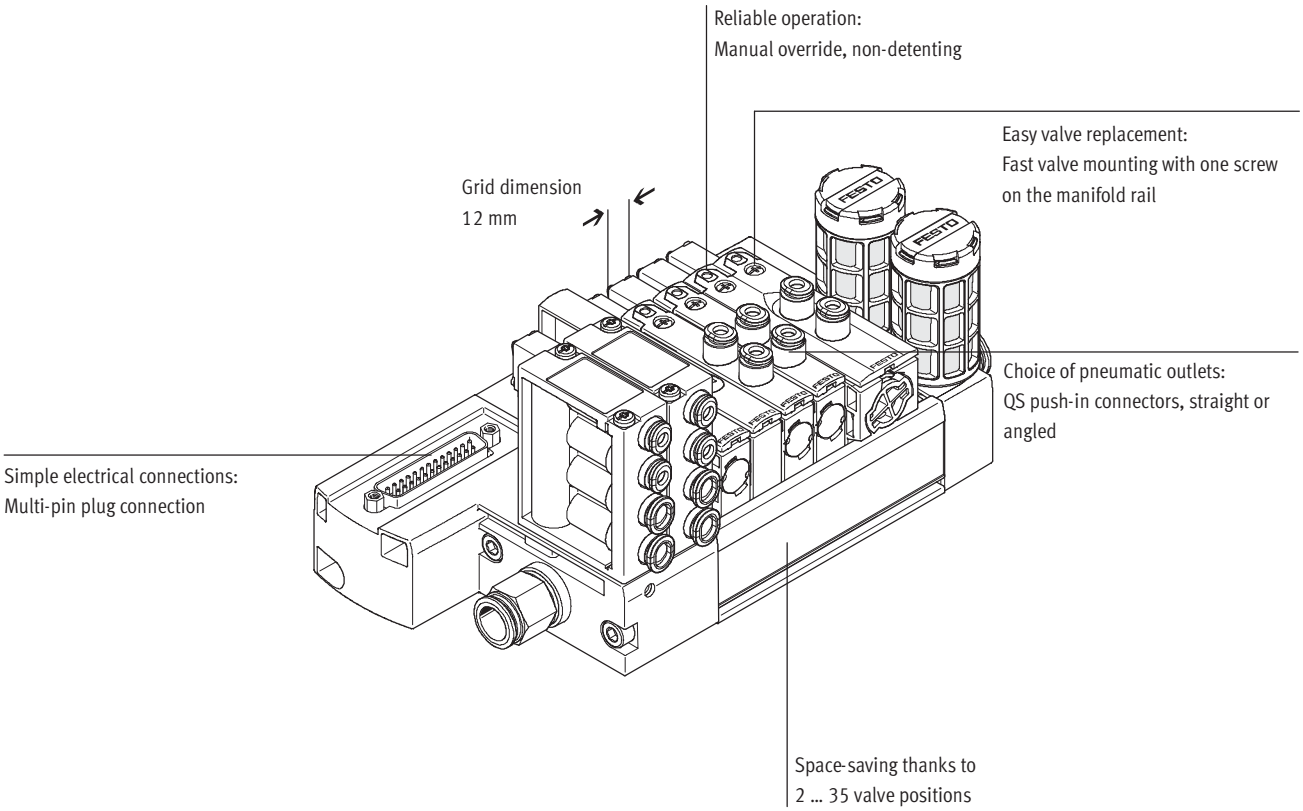
- Tested and ready to install unit
- Reduced time and effort when ordering, installing and commissioning
- Quick and secure installation thanks to integrated QS fittings
- Easy valve assembly with just one screw

- - Note

Ordering system for valve terminal type 23 VTUB
➔ Internet: vtub-12

Valve terminals type 23 VTUB-12

Key features



Equipment options

Valve functions

- 5/2-way valve, single solenoid
- 5/2-way valve, double solenoid
- 3/2-way valve can be formed from a 5/2-way valve using blanking plugs

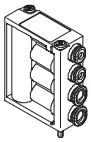
Electrical connection options

- Multiple connector plate
- 2 ... 35 valve positions/ max. 35 solenoid coils
- Sub-D

Valve terminals type 23 VTUB-12

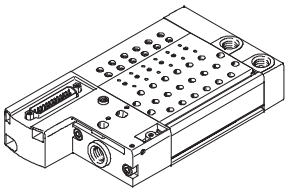
Key features

Pneumatic distributor



The pneumatic distributor supplies the operating pressure from port 1 to up to four other ports. Two pneumatic distributors of this type can be connected to valve terminal type 23 VTUB-12. The pneumatic distributor has integrated QS4 or QS6 connections.

Manifold rail



The manifold rail features a groove into which the semi in-line valves are latched and secured with just one screw.

The valve functions 5/2-way single solenoid and 5/2-way double solenoid are available. The valve functions 3/2-way normally closed and 3/2-way normally open can be created using blanking plugs. The valves can be supplied as semi in-line valves with cartridges QSP for tubing diameters 4 and 6.

Blanking plate

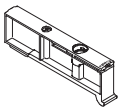


Plate without valve function for reserving valve positions on a valve terminal.

Valves and blanking plates are attached to the manifold rail using one screw.

Blanking plug

Blanking plug for sealing working ports (port 2 or 4) on the valve.

The valve function of a 3/2-way valve, normally open, can be created by sealing port 4 of a 5/2-way single solenoid valve.

The valve function of a 3/2-way valve, normally open, can be created by sealing port 2 of a 5/2-way single solenoid valve.

Valve terminals type 23 VTUB-12

Peripherals overview

Overview – Valve terminals type 23 VTUB-12

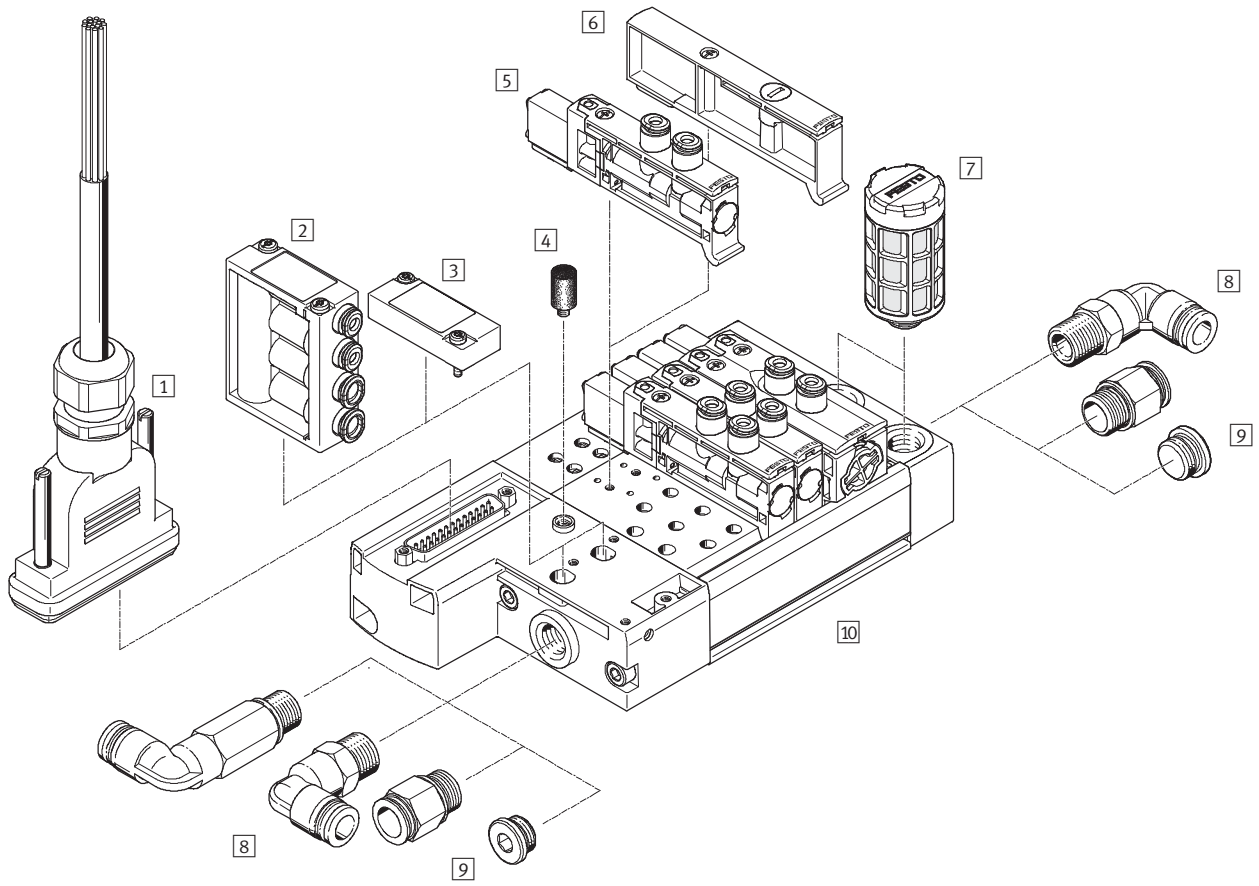
Valve terminal with electrical multi-pin plug connection

- Up to 20 valve positions/solenoid coils, 25-pin Sub-D multi-pin plug connection, code: M
- From 21 valve positions/solenoid coils, 44-pin Sub-D multi-pin plug connection, code: M

Valve terminals with electrical multi-pin plug connection are available in gradations from 2 to max. 35 valve positions.

Each valve position can either be equipped with a valve or a blanking plate. Double solenoid valves occupy two valve positions.

A maximum of 35 valve solenoid coils can be actuated via the electrical multi-pin plug connection.



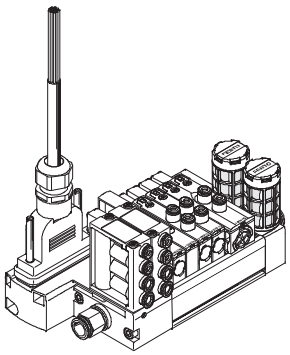
Accessories

			Brief description	➔ Page/Internet
1	Connecting cable	NEBV	Connecting cable for multi-pin plug connection, with Sub-D plug	19
2	Pneumatic distributor	VABF	For connecting additional distributors to the air supply (port 1)	17
3	Blanking plate	VABB	Blanking plate for vacant position (pneumatic distributor)	17
4	Silencer	U	For venting hole	18
5	Single solenoid valve	VUVB-...-M	–	17
6	Blanking plate	VABB	Blanking plate for vacant position (solenoid valve)	17
7	Silencer	U	For fitting on exhaust ports	18
8	Fittings	QS	For connecting compressed air tubing with standard outside diameter	18
9	Blanking plug	B	For adapting valve functions	17
10	Manifold rail	VABM	With multi-pin plug connection, for connecting max. 35 valves	17

Valve terminals type 23 VTUB-12

Key features

Multi-pin plug connection

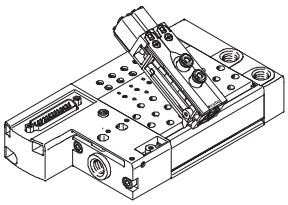


Control signals from the controller to the valve terminal are transmitted via a pre-assembled multi-core cable, which substantially reduces installation time.

This valve terminal can be fitted with 2 ... 35 valves.

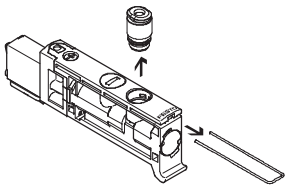
Versions
- Sub-D connection

Wide range of pneumatic components



- The use of the same basic valves for the 3/2-way and 5/2-way valve function permits fast and flexible conversion and multiple use of parts.
- Flexible construction thanks to assembled and tested units or individual components as modules for individual configurations.
- Flow rates from 230 ... 400 l/min depending on the valve used and appropriate QS connections.

Changing of fittings on port 2/4

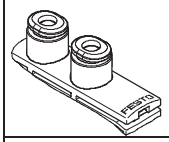
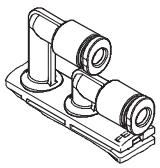


The cartridges (port 2/4) can be changed quickly and easily by removing the spring clip.
The ports can be sealed by screwing in a blanking plug (➔ 17).

3/2-way function

- The function of a 3/2-way valve, normally closed, can be created by sealing port 2 of the 5/2-way single solenoid valve.
- The function of a 3/2-way valve, normally open, can be created by sealing port 4 of the 5/2-way single solenoid valve.

Connection on the valve

	Code	Description
Code for valve connection position: T		
	P4	Push-in connector 4 mm Connection position on top, straight
	P6	Push-in connector 6 mm Connection position on top, straight
Code for valve connection position: TB, TA, TC		
	P4	Push-in connector 4 mm Connection position on top, angled outlet to the front/rear, front, rear
	P6	Push-in connector 6 mm Connection position on top, angled outlet to the front/rear, front, rear

Valve terminals type 23 VTUB-12

Key features – Pneumatic components

FESTO

Constructional design

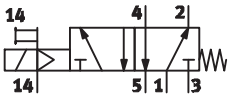
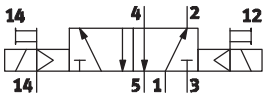
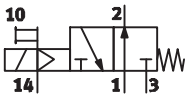
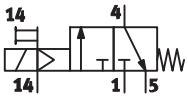
Valve replacement

The valves are attached to the aluminium manifold rail using one screw, which means that they can be easily replaced. Use of high-quality plastics guarantees minimum weight and maximum performance.

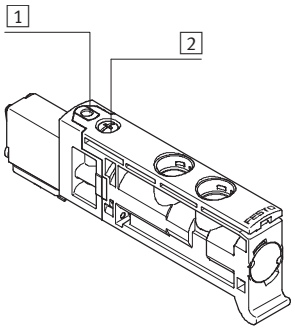
Extension

Blanking plates can be replaced by valves at a later date. The dimensions, mounting points and existing pneumatic installations remain unchanged during this process.

Valve function

Code	Circuit symbol	Width 12 mm	Width 24 mm	Description
M		■	–	5/2-way valve, single solenoid • Mechanical spring return • Non-reversible • Not suitable for vacuum
J		–	■	5/2-way valve, double solenoid • Non-reversible • Not suitable for vacuum
N		■	–	3/2-way valve, single solenoid • Normally open • Mechanical spring return • Non-reversible • Not suitable for vacuum • Formed from a 5/2-way single solenoid valve by sealing port 4
K		■	–	3/2-way valve, single solenoid • Normally closed • Mechanical spring return • Non-reversible • Not suitable for vacuum • Formed from a 5/2-way single solenoid valve by sealing port 2

Display and operation

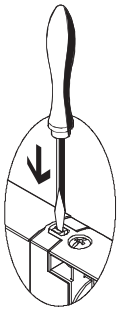


1 Manual override (non-detenting)
2 Screw for valve assembly

The manual override (MO) enables the valve to be activated without electronic control or power supply. The valve is activated by pushing the manual override. The set switching status cannot be locked.

Manual override (MO)

MO with automatic return (non-detenting)

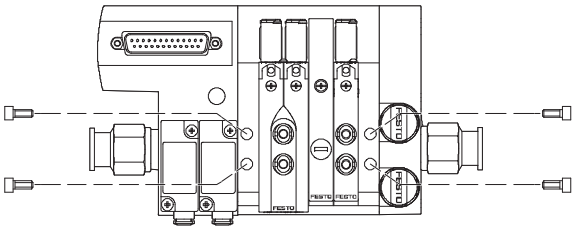


Press in the stem of the MO with a pin or screwdriver.
⇢ Valve is in switching position.
Remove the pin or screwdriver.
Spring force pushes the stem of the MO back.
⇢ Valve returns to normal position.

Note

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

Mounting – Valve terminal



Sturdy terminal mounting thanks to:
- Four through-holes for wall mounting (M5 screws)

Electrical multi-pin plug connection

The following multi-pin plug connections are offered for the valve terminal VTUB-12:

- Sub-D multi-pin plug connection (25-pin)
- Sub-D multi-pin plug connection (44-pin)

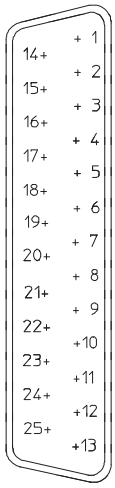
Pins 1 ... 44 are used for addresses 0 ... 43 in order.
If fewer than 44 addresses are used for the valve terminal, the remaining pins are left free. Pins 22 ... 25 or 41 ... 44 are reserved for the neutral conductor or 24 V.
The valves are switched by means of positive or negative logic (positive switching or negative switching).

Mixed operation is not permitted. Each pin on the multi-pin plug can actuate exactly one valve solenoid coil. If the maximum configurable number of valve positions is 35, this means that 35 valves can be addressed with one solenoid coil (single solenoid).

- - Note

A double solenoid valve occupies two valve positions. With 17 or more valve positions, the number of available valve positions for double solenoid valves.

Pin allocation – Sub-D plug, 25-pin



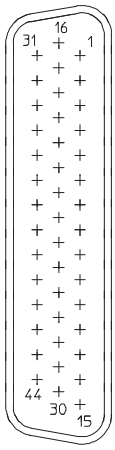
- - Note

The drawing shows the view on the pins of the Sub-D plug.

Pin	Address/coil	Wire colour[1] connecting cable	
		15-wire, NEBV-S1...25-K-...-LE15	25-wire, NEBV-S1...25-K-...-LE25
1	0	WH	WH
2	1	BN	BN
3	2	GN	GN
4	3	YE	YE
5	4	GY	GY
6	5	PK	PK
7	6	BU	BU
8	7	RD	RD
9	8	BK	BK
10	9	VT	VT
11	10	GY PK	GY PK
12	11	RD BU	RD BU
13	12	–	GN WH
14	13	–	BN GN
15	14	–	YE WH
16	15	–	BN YE
17	16	–	GY WH
18	17	–	BN GY
19	18	–	WH PK
20	19	–	BN PK
21	–	–	BU WH
22	0 V/24 V	–	BN BU
23	0 V/24 V	GN WH	RD WH
24	0 V/24 V	BN GN	BN RD
25	0 V/24 V	YE WH	BK WH

1) To IEC 757

Pin allocation – Sub-D plug, 44-pin



- Note

The drawing shows the view on the pins of the Sub-D plug.

Pin	Address/coil	Wire colour[1] connecting cable NEBV-S1...44-K...	Pin	Address/coil	Wire colour[1] connecting cable NEBV-S1...44-K...
1	0	WH	23	22	WH RD
2	1	BN	24	23	BN RD
3	2	GN	25	24	WH BK
4	3	YE	26	25	BN BK
5	4	GY	27	26	GY GN
6	5	PK	28	27	YE GY
7	6	BU	29	28	PK GN
8	7	RD	30	29	YE PK
9	8	BK	31	30	GN BU
10	9	VT	32	31	YE BU
11	10	GY PK	33	32	GN RD
12	11	RD BU	34	33	YE RD
13	12	WH GN	35	34	GN BK
14	13	BN GN	36	–	–
15	14	WH YE	37	–	–
16	15	YE BN	38	–	–
17	16	WH GY	39	–	–
18	17	GY BN	40	–	–
19	18	WH PK	41	0 V/24 V	YE BK
20	19	PK BN	42	0 V/24 V	GY BU
21	20	WH BU	43	0 V/24 V	PK BU
22	21	BN BU	44	0 V/24 V	GY RD

1) To IEC 757

System equipment

Operate system equipment with unlubricated compressed air if possible. Festo valves and cylinders are designed so that, if used as designated, they will not require additional lubrication and will still achieve a long service life.
The quality of compressed air downstream from the compressor must correspond to that of unlubricated compressed air. If possible, do not operate all of your system equipment with lubricated compressed air. The lubricators should, where possible, always be installed directly upstream of the actuator used.

Unsuitable additional oil and an excessive 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 ester, e.g. rapeseed oil methyl ester), the maximum residual oil content of 0.1 mg/m^3 must not be exceeded (see ISO 8573-1 Class 2).

Mineral oils
When using mineral oils (e.g. HLP oils to DIN 51524, parts 1 through 3) or similar oils based on poly-alpha-olefins (PAO), the maximum residual oil content of 5 mg/m^3 must not be exceeded (see ISO 8573-1 Class 4).
A higher residual oil content irrespective of the compressor oil cannot be permitted, as the basic lubricant would be flushed out over time.

Valve terminals type 23 VTUB-12

Technical data

FESTO

Voltage
24 V DC

Pressure
+2.8 ... +8 bar

Temperature range
–5 ... +60 °C

General technical dats				
Valve function			Single solenoid	Double solenoid
Constructional design			Poppet valve	
Sealing principle			Soft	
Actuation type			Electric	
Reset method			Mechanical spring	
Control type			Piloted	
Pilot air supply			Internal	
Direction of flow			Non-reversible	
Exhaust function			No flow control	
Manual override			Non-detenting (pushing)	
Type of mounting			Via through-holes	
Grid dimension		[mm]	12	24
Nominal size		[mm]	3	
Max. number of valve positions			35	17
Max. number of pressure zones			1	
Standard nominal flow rate	qnN	[l/min]	400	
Pneumatic connection		1; 3	G¼	
Pneumatic working line		2; 4	QS-4 or QS-6	

Operating and environmental conditions		
Operating medium		Dried and filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm
Operating pressure	[bar]	+2.8 ... +8
Ambient temperature	[°C]	–5 ... +60
Temperature of medium	[°C]	+5 ... +50
Note on materials		Conforms to RoHS

Valve terminals type 23 VTUB-12

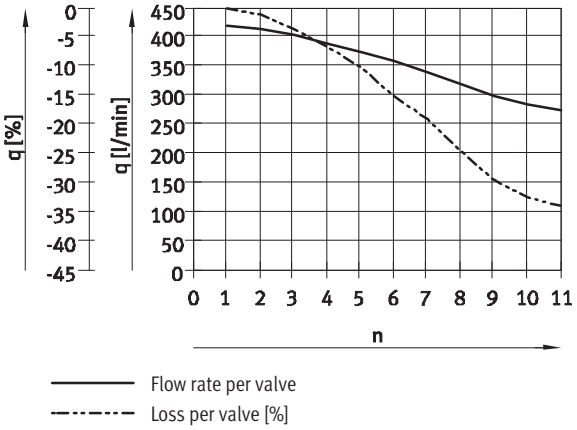
Technical data

Product weight		
Approx. weights		[g]
Valves		
• Single solenoid (code M), ducted solenoid exhaust		27.8
• Double solenoid (code J), ducted solenoid exhaust		57.4
• Single solenoid (code M), not ducted solenoid exhaust		27.5
• Double solenoid (code J), not ducted solenoid exhaust		57.1
Blanking plate for vacant position		13.8
Manifold rail		
• Multiple connector with Sub-D plug, 25 pin	2 valve positions	381.9
	4 valve positions	483.5
	6 valve positions	585.1
	8 valve positions	686.7
	10 valve positions	788.3
	12 valve positions	889.9
	14 valve positions	991.5
	16 valve positions	1093.1
	18 valve positions	1194.7
• Multiple connector with Sub-D plug, 44 pin	20 valve positions	1296.3
	24 valve positions	1397.9
	28 valve positions	1499.5
	32 valve positions	1601.1
	35 valve positions	1702.7

Electrical data			
Valve function		Single solenoid	Double solenoid
Electrical actuation		Multi-pin plug	
Nominal operating voltage	[V DC]	24	
Permissible voltage fluctuations		±10%	
Electrical power consumption	[W]	1	
Protection class to EN 60529		IP65	
Duty cycle	[%]	100	

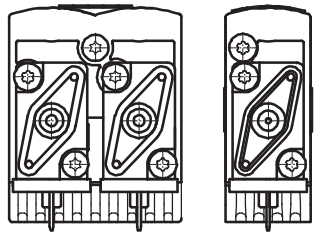
Valve switching times [ms]			
Valve function	3/2	5/2-way, single solenoid	5/2-way, double solenoid
On	6	6	–
Off	14	14	–
Changeover	–	–	10

Flow rate per valve with multiple (n) valves switched simultaneously



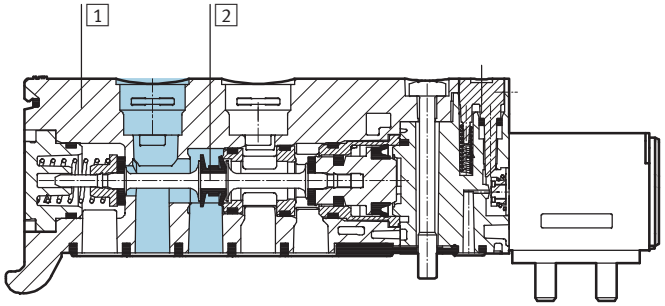
Materials

Sectional view – Valves



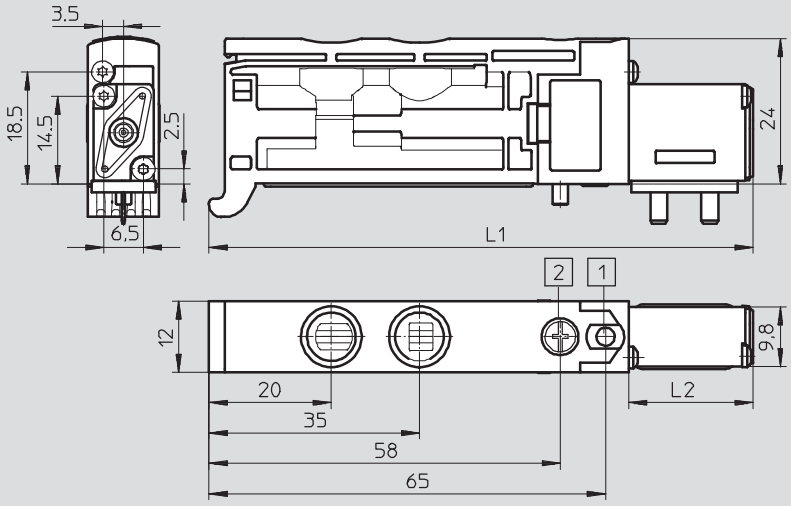
Double solenoid

Single solenoid



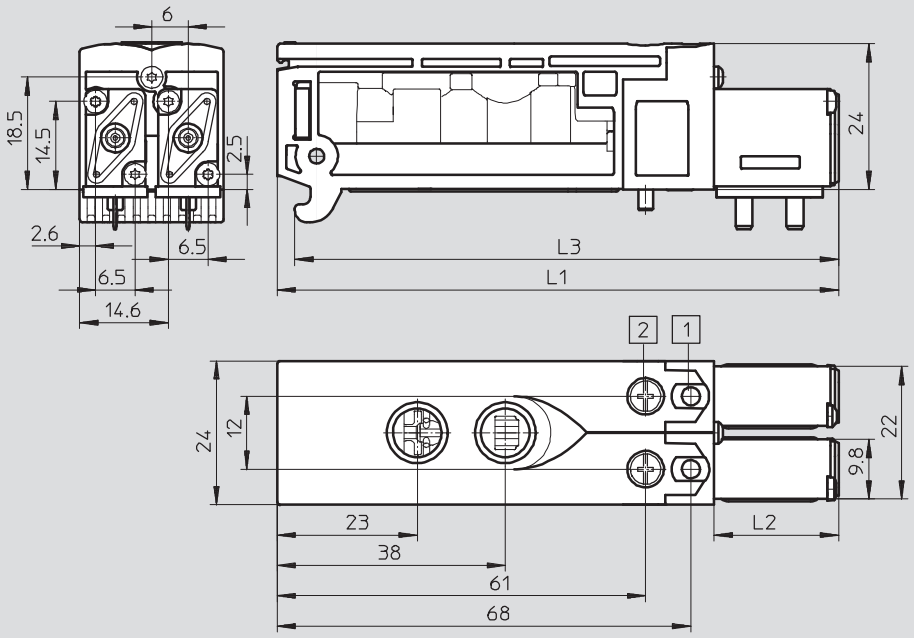
1	Housing	Reinforced polyamide
2	Piston spool	Wrought aluminium alloy
–	Seals	Nitrile rubber, thermoplastic polyurethane
–	Manifold rail with multi-pin plug	Wrought aluminium alloy
–	Power supply module	Reinforced polyamide
–	Blanking plate for vacant position	Reinforced polyamide

Dimensions – 5/2-way valve, single solenoid Download CAD data ➔ **www.festo.com**



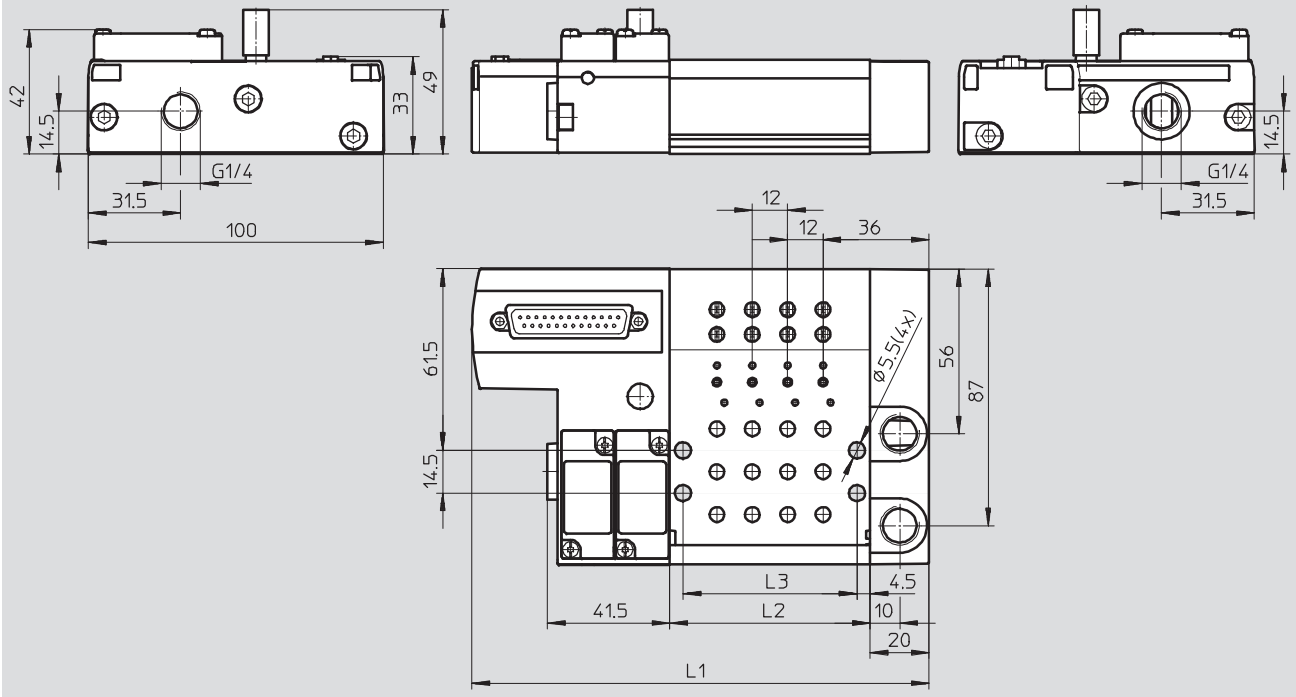
Type	L1	L2
VUVB-ST12-M52-MZH-QX-1T1	89.6	20.5
VUVB-ST12-M52-MZH-QX-D-1T1	89.6	20.8

Dimensions – 5/2-way valve, double solenoid Download CAD data ➔ **www.festo.com**



Type	L1	L2	L3
VUVB-ST12-B52-ZH-QX-1T1	92.4	20.5	89.5
VUVB-ST12-B52-ZH-QX-D-1T1	92.7	20.8	89.9

Dimensions – Manifold rail Download CAD data ➔ **www.festo.com**

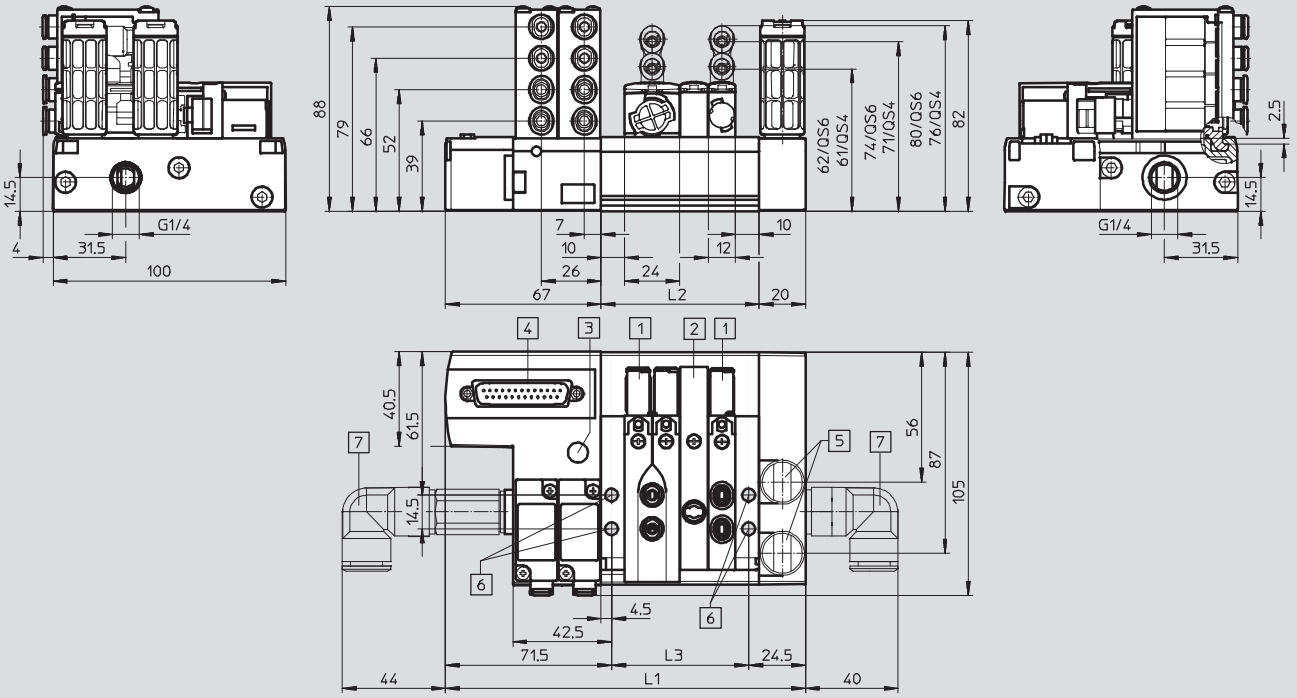


1 5/2-way valve
2 Blanking plate for vacant position
3 Silencer/threaded port M5
4 SUB-D plug, 25-pin or 44-pin with 21 or more solenoid coils
5 Silencer/threaded port G¼
6 Hole for wall mounting, ∅ 5.5 mm
7 Fittings for air supply port

n	L1	L2	L3
Number of single solenoid valves	L2 + 87	L3 + 9	(n x 12) + 11

Dimensions – Valve terminal Download CAD data ➔ **www.festo.com**

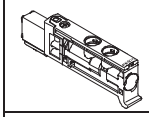
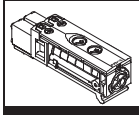
With electrical multi-pin plug



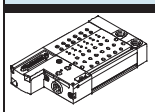
1 5/2-way valve
2 Blanking plate for vacant position
3 Silencer/threaded port M5
4 SUB-D plug, 25-pin or 44-pin with 21 or more solenoid coils
5 Silencer/threaded port G¼
6 Hole for wall mounting, ∅ 5.5 mm
7 Fittings for air supply port

n	L1	L2	L3
Number of single solenoid valves	L2 + 87	L3 + 9	(n x 12) + 11

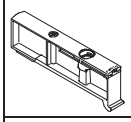
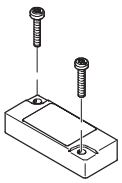
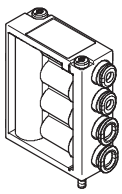
Ordering data – Solenoid valves

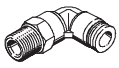
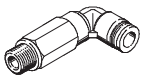
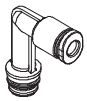
	Code	Valve function	Solenoid exhaust air	Part No.	Type
	M	5/2-way valve, single solenoid	None/not ducted	**557649**	**VUVB-ST12-M52-MZH-QX-1T1**
			Ducted	**558369**	**VUVB-ST12-M52-MZH-QX-D-1T1**
	J	5/2-way valve, double solenoid	None/nor ducted	**557650**	**VUVB-ST12-B52-ZH-QX-1T1**
			Ducted	**558370**	**VUVB-ST12-B52-ZH-QX-D-1T1**

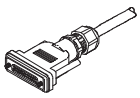
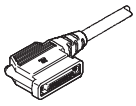
Ordering data – Manifold rail

	Code	Description	Valve posi-tions	Part No.	Type
	M	Multi-pin plug with Sub-D plug, 25-pin	2	**557651**	**VABM-C8-12E-G14-2-M1**
			4	**557653**	**VABM-C8-12E-G14-4-M1**
			6	**557655**	**VABM-C8-12E-G14-6-M1**
			8	**557657**	**VABM-C8-12E-G14-8-M1**
			10	**557659**	**VABM-C8-12E-G14-10-M1**
			12	**557661**	**VABM-C8-12E-G14-12-M1**
			14	**557663**	**VABM-C8-12E-G14-14-M1**
			16	**557665**	**VABM-C8-12E-G14-16-M1**
			18	**557667**	**VABM-C8-12E-G14-18-M1**
			20	**557669**	**VABM-C8-12E-G14-20-M1**
		Multi-pin plug with Sub-D plug, 44-pin	24	**557673**	**VABM-C8-12E-G14-24-M1**
			28	**557677**	**VABM-C8-12E-G14-28-M1**
			32	**557681**	**VABM-C8-12E-G14-32-M1**
			35	**557684**	**VABM-C8-12E-G14-35-M1**

Ordering data

	Code	Description	Part No.	Type
Blanking plate				
	L	Blanking plate for vacant valve position	**562461**	**VABB-C8-12-ET**
	–	Blanking plate for pneumatic distributor position	**562460**	**VABB-C8-12-A**
Distributors				
	AL	Push-in connector 4 mm	**562457**	**VABF-C8-12-V1P4-Q4**
	BL	Push-in connector 6 mm	**562458**	**VABF-C8-12-V1P4-Q6**
	CL	Push-in connector 4 and 6 mm	**562459**	**VABF-C8-12-V1P4-Q4-Q6**
Blanking plugs				
		Connection ∅ 10 mm	**562243**	**QSPC10**
	–	For thread G¼, 10 pieces	**3569**	**B-¼**

Ordering data	Code	Description	Tubing O.D.	Packaging unit	Part No.	Type
Push-in fitting						Technical data ➔ Internet: quick star
	–	With sealing ring Connection G¼	8 mm	10 pieces	**186099**	**QS-G¼-8**
	–		10 mm	10 pieces	**186101**	**QS-G¼-10**
	–		12 mm	10 pieces	**186350**	**QS-G¼-12**
Push-in L-fitting						Technical data ➔ Internet: quick star
	–	With sealing ring Connection G¼	8 mm	10 pieces	**186120**	**QSL-G¼-8**
	–		10 mm	10 pieces	**186122**	**QSL-G¼-10**
	–		12 mm	10 pieces	**186351**	**QSL-G¼-12**
Push-in L-fitting (long)						Technical data ➔ Internet: quick star
	–	With sealing ring Connection G¼	8 mm	10 pieces	**186131**	**QSLL-G¼-8**
	–		10 mm	10 pieces	**186133**	**QSLL-G¼-10**
	–		12 mm	10 pieces	**132596**	**QSLL-G¼-12**
Cartridge fitting with push-in connector						
	–	Straight Connection ∅ 10 mm	4 mm	10 pieces	**172972**	**QSP10-4**
	–		6 mm	10 pieces	**172973**	**QSP10-6**
	–	L-shape Connection ∅ 10 mm	4 mm	10 pieces	**132601**	**QSPLK10-4**
	–		6 mm	10 pieces	**132602**	**QSPLK10-6**
	–	L-shape, long Connection ∅ 10 mm	4 mm	10 pieces	**132603**	**QSPLLK10-4**
	–		6 mm	10 pieces	**132604**	**QSPLLK10-6**
Silencer						Technical data ➔ Internet: u
	–	For thread M5		1 piece	**4645**	**U-M5**
	–	For thread G¼		1 piece	**2316**	**U-¼**

Ordering data – Connecting cable for multi-pin plug					
	Code	Description	Cable length [m]	Part No.	Type
	M1	Sub-D, 25-pin, straight socket, up to 12 coils, IP65	2.5	**538222**	**NEBV-S1G25-K-2,5-N-LE15**
	M2		5	**538223**	**NEBV-S1G25-K-5-N-LE15**
	M3		10	**538224**	**NEBV-S1G25-K-10-N-LE15**
	M1	Sub-D, 25-pin, straight socket, up to 20 coils, IP65	2.5	**538225**	**NEBV-S1G25-K-2,5-N-LE25**
	M2		5	**538226**	**NEBV-S1G25-K-5-N-LE25**
	M3		10	**538227**	**NEBV-S1G25-K-10-N-LE25**
	M1	Sub-D, 44-pin, straight socket, up to 35 coils, IP65	2.5	**565289**	**NEBV-S1G44-K-2.5-N-LE39**
	M2		5	**565290**	**NEBV-S1G44-K-5-N-LE39**
	M3		10	**565291**	**NEBV-S1G44-K-10-N-LE39**
	W1	Sub-D, 25-pin, angled socket, up to 12 coils, IP65	2.5	**565280**	**NEBV-S1W25-K-2.5-N-LE15**
	W2		5	**565281**	**NEBV-S1W25-K-5-N-LE15**
	W3		10	**565282**	**NEBV-S1W25-K-10-N-LE15**
	W1	Sub-D, 25-pin, angled socket, up to 20 coils, IP65	2.5	**565283**	**NEBV-S1W25-K-2.5-N-LE25**
	W2		5	**565284**	**NEBV-S1W25-K-5-N-LE25**
	W3		10	**565285**	**NEBV-S1W25-K-10-N-LE25**
	W1	Sub-D, 44-pin, angled socket, up to 35 coils, IP65	2.5	**565286**	**NEBV-S1W44-K-2.5-N-LE39**
	W2		5	**565287**	**NEBV-S1W44-K-5-N-LE39**
	W3		10	**565288**	**NEBV-S1W44-K-10-N-LE39**