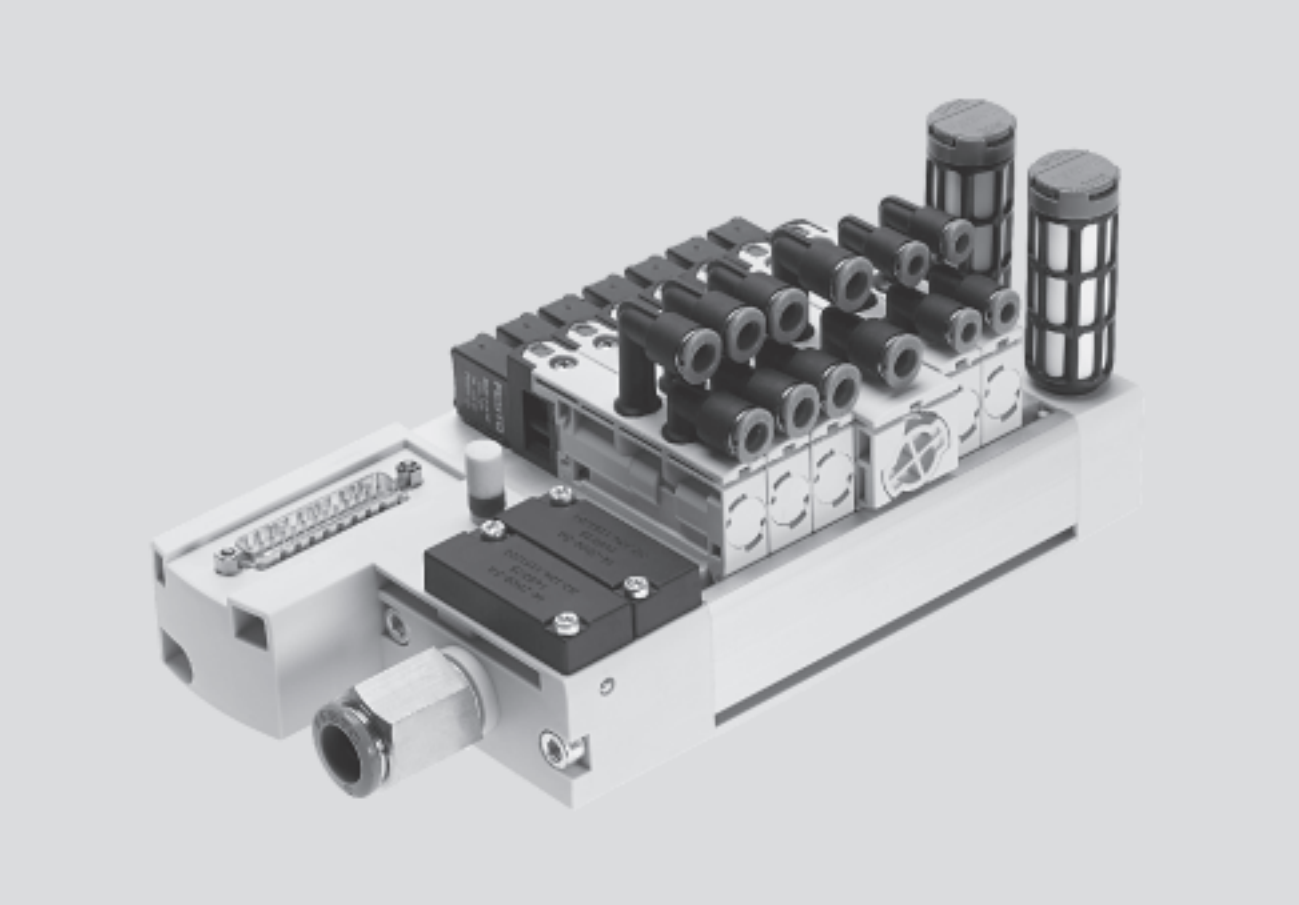
Valve terminals type 23 VTUB-12

FESTO

Valve terminals type 23 VTUB-12

Key features



Innovative

- Cost-effective I-Port interface for fieldbus nodes (CTEU)
- IO-Link mode for direct connection to a higher-level IO-Link master
- Lower installation costs thanks to multi-pin plug connection
- Valve terminal for a wide range of pneumatic applications
- 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 up to 35 valve positions on one valve terminal
- Flexibility of the pneumatic working lines provides a practical solution to different requirements
- Quick and easy replacement of fittings
- Optional manifold rail variant with LED signal status display

Reliable

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

Easy to mount

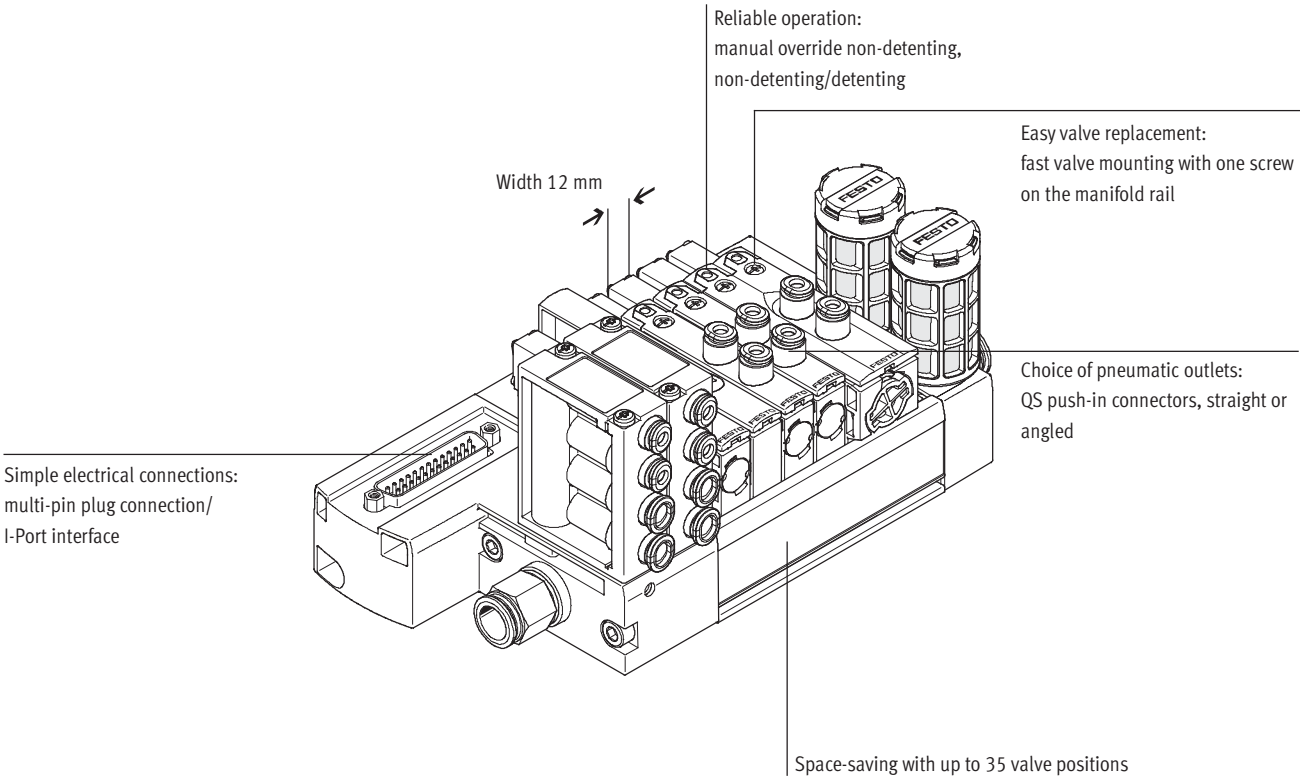
- Ready-to-install and tested unit
- Lower ordering, installation and commissioning costs
- Quick and secure installation thanks to integrated QS push-in connectors
- Easy valve assembly with just one screw

Note

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

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 created from a 5/2-way valve using blanking plugs

Electrical connection options

Multi-pin plug

- Sub-D, 25-pin
- Sub-D, 44-pin
- 2 ... 35 valve positions/ max. 35 solenoid coils

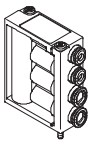
I-Port

- Fieldbus connection (CTEU)
- IO-Link mode
- 3 ... 35 valve positions/ max. 35 solenoid coils

Valve terminals type 23 VTUB-12

Key features

Pneumatic distributor



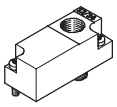
The pneumatic distributor supplies the operating pressure from port 1 to up to four other ports. The pneumatic distributor has integrated QS4 or QS6 connections.

Note

Number of pneumatic distributors that can be used

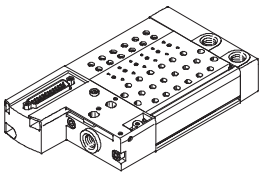
➔Page 7 Pilot air supply

Selector plate/pilot control with external pilot air (optional)



The VTUB-12 is intended for use with pilot air. It can be operated with external pilot air by mounting the selector plate VABF-C8-12-P6-...-Z instead of the blanking plate. The pilot air is then supplied via port 12/14 on the selector plate.

Manifold rail with multi-pin plug connection

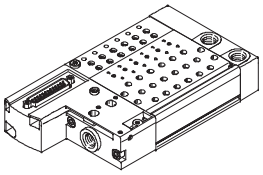


The manifold rail features a groove into which the semi in-line valves are latched and secured with just one screw.
The valve functions 5/2-way single solenoid and 5/2-way double solenoid are available.

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 mm.

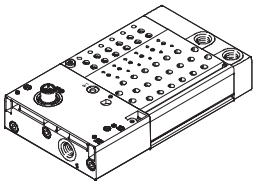
Manifold rail with optional LED signal status display



The manifold rail with multi-pin plug can optionally be ordered with LEDs (code L).

These indicate the signal states of the solenoid coils.

Manifold rail with I-Port interface



The manifold rail can be ordered with I-Port interface (code PT) and IO-Link (code LK) as a basis for fieldbus nodes (CTEU) or in IO-Link mode for direct connection to a higher-level IO-Link master.

Blanking plate

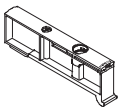


Plate without valve function for reserving valve positions on a valve terminal.

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

Blanking plug

For sealing the working lines (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 single solenoid 5/2-way valve.

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

Valve terminals type 23 VTUB-12

Peripherals overview

Overview – Valve terminal type 23 VTUB-12

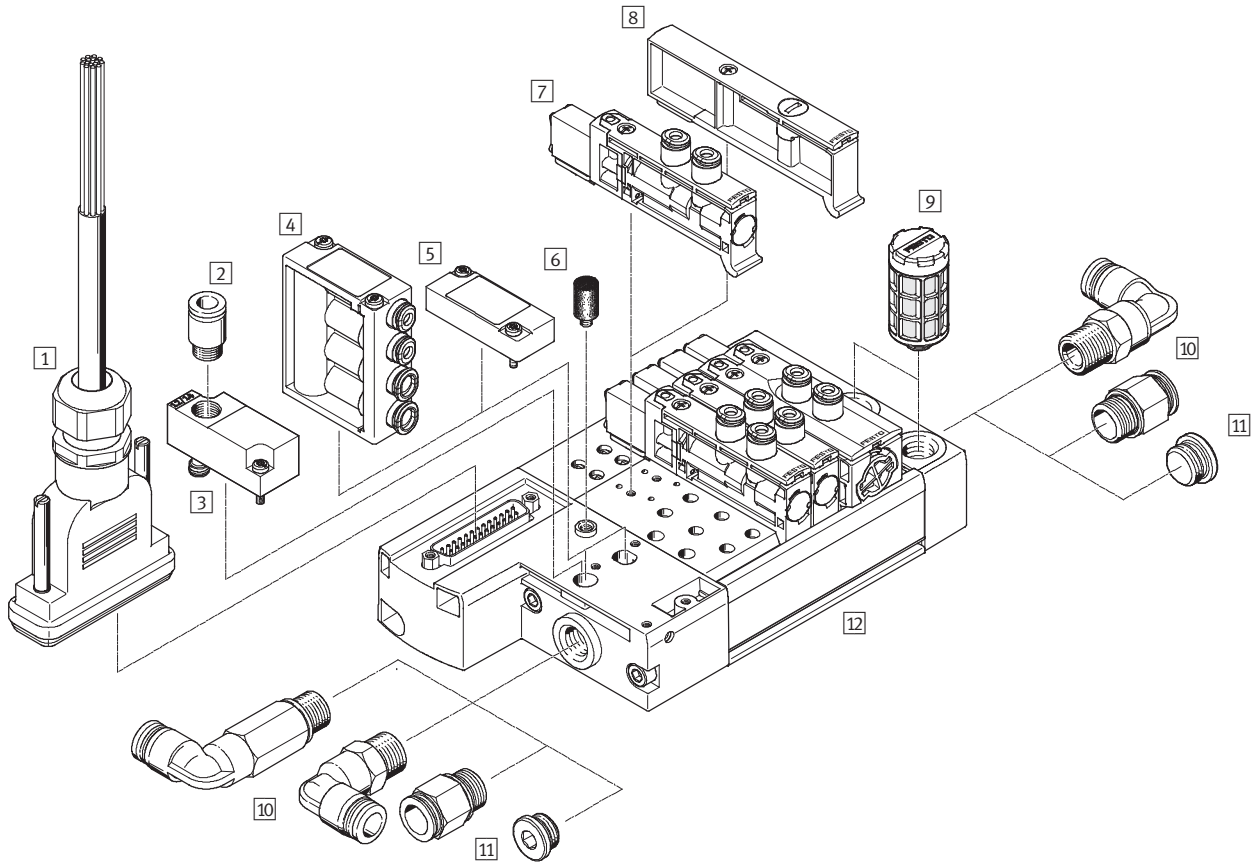
Valve terminal with electrical multi-pin plug connection

- 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 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	30
2	Push-in fitting	QS	For connecting compressed air tubing with standard O.D.	29
3	Selector plate	VABF	Pilot control with external pilot air (optional)	28
4	Pneumatic distributor	VABF	For connecting additional distributors to the air supply (port 1)	28
5	Blanking plate	VABB	Blanking plate for vacant position (pneumatic distributor)	28
6	Silencer	U	For venting hole	29
7	Single solenoid valve	VUVB-...-M	–	27
8	Blanking plate	VABB	Blanking plate for vacant position (solenoid valve)	28
9	Silencer	U	For fitting in exhaust ports	29
10	Fittings	QS	For connecting compressed air tubing with standard O.D.	29
11	Blanking plug	B	For sealing the air supply port	28
12	Manifold rail	VABM	With multi-pin plug connection, for connecting max. 35 valves	27

Valve terminals type 23 VTUB-12

Peripherals overview

FESTO

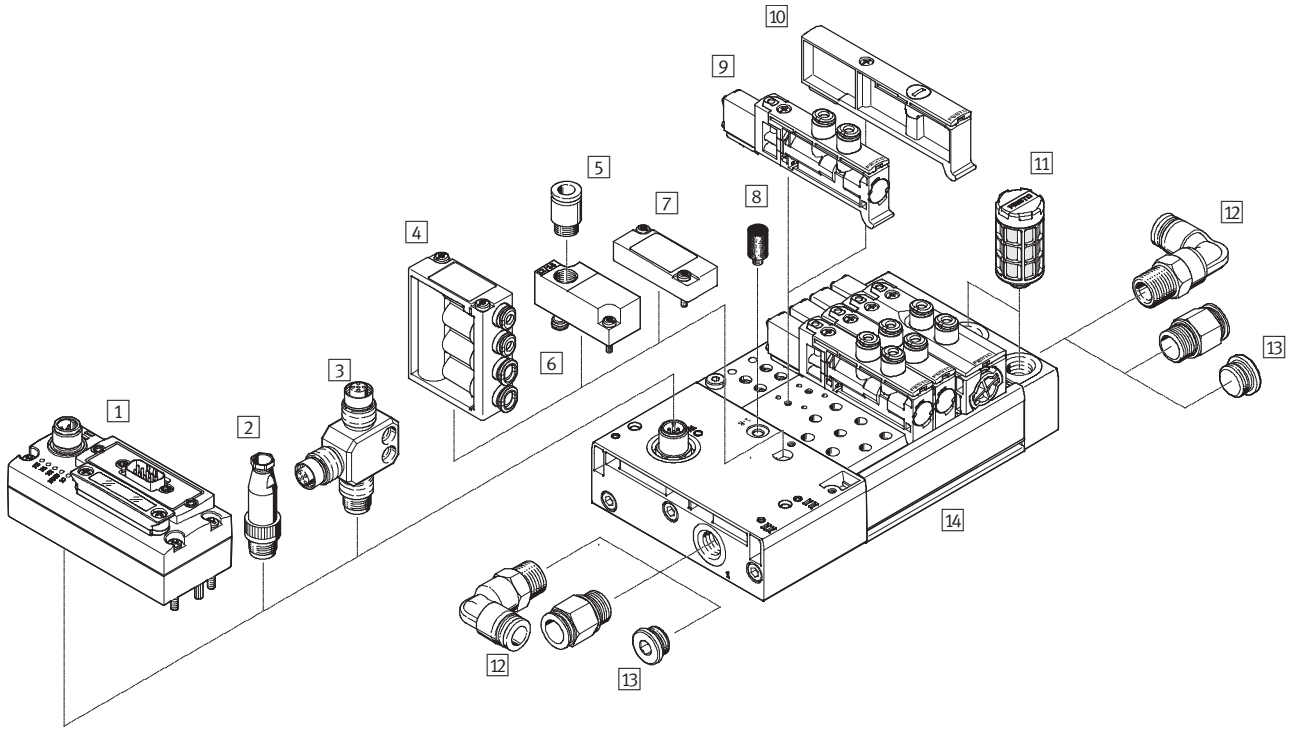
Overview – Valve terminal type 23 VTUB-12

Valve terminal with I-Port interface

Valve terminals with electrical supply and transmission of communication data via M12 plugs on the valve terminal (I-Port connection, code PT/LK) are available in gradations from 3 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.



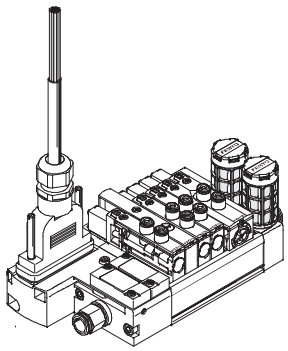
Accessories

			Brief description	➔ Page/Internet
1	Bus node	CTEU	–	cteu
2	Plug	SEA	For IO-Link and load supply	30
3	T-adapter	FB	For IO-Link and load supply (in combination with plug SEA for separate load supply)	30
4	Pneumatic distributor	VABF	For connecting additional distributors to the air supply (port 1)	28
5	Push-in fitting	QS	–	27
6	Selector plate	VABF	Pilot control with external pilot air (optional)	28
7	Blanking plate	VABB	Blanking plate for vacant position (pneumatic distributor)	28
8	Silencer	U	For venting hole	29
9	Single solenoid valve	VUVB-...-M	–	29
10	Blanking plate	VABB	Blanking plate for vacant position (solenoid valve)	28
11	Silencer	U	For fitting in exhaust ports	29
12	Fittings	QS	For connecting compressed air tubing with standard O.D.	29
13	Blanking plug	B	For sealing the air supply port	28
14	Manifold rail	VABM	With I-Port interface, for connecting max. 35 valves	27

Valve terminals type 23 VTUB-12

Key features

Multi-pin plug connection

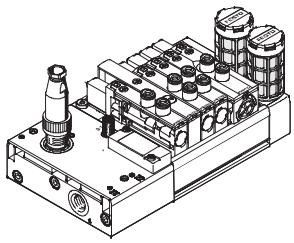


Control signals from the controller to the valve terminal are transmitted via a pre-assembled multi-core cable, which substantially reduces installation time.

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

Versions
- Sub-D connection

I-Port interface/IO-Link



The electrical supply/transmission of communication data takes place via an M12 plug on the valve terminal (I-Port interface).

This valve terminal can be equipped with 3 ... 35 valves.

Versions:
- I-Port interface for fieldbus nodes (CTEU)
- IO-Link mode for direct connection to a higher-level IO-Link master

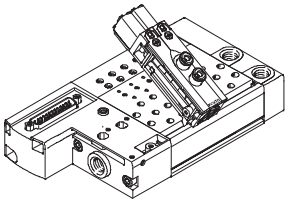
Pilot air supply

Internal		External	
The port for the pneumatic main supply is located on the left-hand sub-base (multi-pin plug connection/ I-Port interface). The internal pilot air (duct 12/14) is branched from duct 1 in the left-hand sub-base.	The air is branched using a pneumatic distributor or a blanking plate on the left-hand pneumatic distributor port. The multi-pin plug connection provides two pneumatic distributor ports and the I-Port provides one.	External pilot air is supplied via the selector plate on the left-hand pneumatic distributor port. It enables the pilot air and main supply to the valve terminal to be separated.	The multi-pin plug connection provides one pneumatic distributor port and the I-Port interface does not provide any.

Valve terminals type 23 VTUB-12

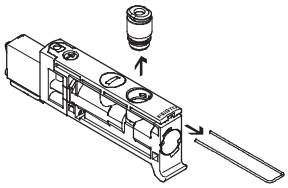
Key features – Pneumatic components

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 single components as modules for individual configurations.
- Flow rates from 230 ... 400 l/min depending on the valve used and appropriate QS connections.

Changing fittings on port 2/4

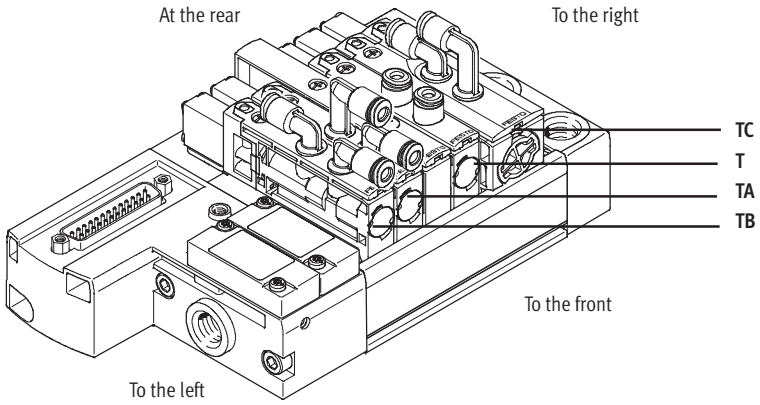


The cartridges (port 2/4) can be changed quickly and easily by removing the spring clip.
The ports can be sealed by inserting a blanking plug (➔ 28).

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 to the valve



Connection positions on the valve:
- T (on top, straight)
- TA (on top, angled outlet to the front)
- TB (on top, angled outlet to the front/rear)
- TC (on top, angled outlet to the rear)

Connection sizes:
- Push-in connector 4 mm (code P4)
- Push-in connector 6 mm (code P6)

Design

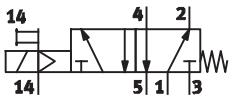
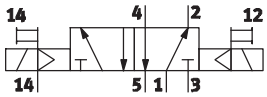
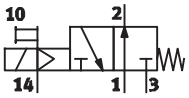
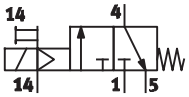
Valve replacement

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.

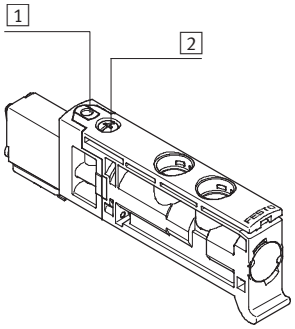
Expansion

Blanking plates can be replaced by valves at a later date. The dimensions, mounting points and the pneumatic installation already carried out do not change.

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 • Created 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 • Created from a 5/2-way single solenoid valve by sealing port 2

Display and operation

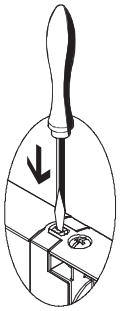


1 Manual override (non-detenting, non-detenting/detenting)
2 Screw for valve assembly

The manual override (MO) enables the valve to be activated without electronic control or power supply.

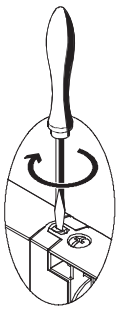
Manual override (MO)

MO with automatic return (non-detenting)



Press in the stem of the MO with a pointed object or screwdriver.
⇢ Valve is then actuated.
Remove the pointed object or screwdriver.
Spring force pushes the stem of the MO back.
⇢ Valve returns to normal position.

MO set via turning (non-detenting/detenting)

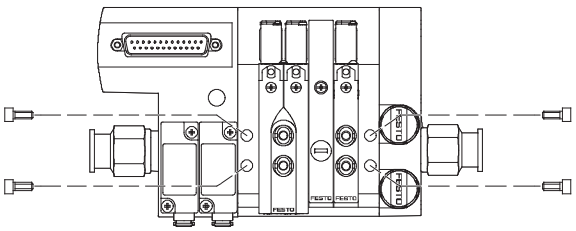


Press in the stem of the MO using a screwdriver until the valve switches and then turn the stem clockwise by 90° until the stop is reached.
⇢ Valve remains in switching position.
Turn the stem anti-clockwise by 90° until the stop is reached and then remove the screwdriver. Spring force pushes the stem 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.

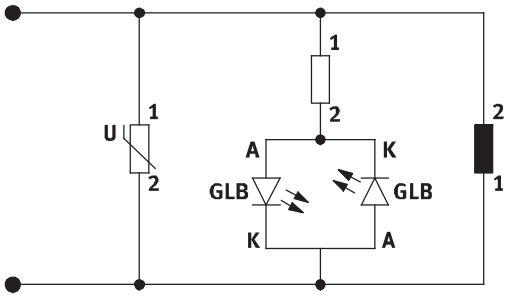
Mounting – Valve terminal



Sturdy terminal mounting thanks for four through-holes for wall mounting (M5 screws).

Protective circuit

Manifold rail with LED signal status display, multi-pin plug connection



- Note

The electrical protective circuit only relates to the optional LED variant with the multi-pin plug connection.

Electrical multi-pin plug connection

The following multi-pin plug connections are available 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).

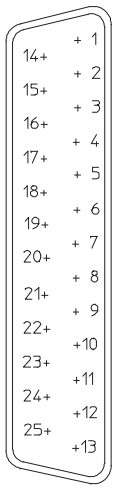
Mixed operation is not permitted. Each pin on the multi-pin plug can actuate exactly one solenoid coil. If the maximum configurable number of valve positions is 35, this means that 35 valves can be addressed with one solenoid coil (single solenoid).

- 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 decreases.

Pin allocation – Sub-D plug, 25-pin

Pin	Address/coil	Wire colour[1] of 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



- Note

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

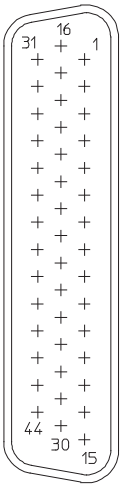
1) To IEC 757

Valve terminals type 23 VTUB-12

Key features – Electrical components

FESTO

Pin allocation – Sub-D plug, 44-pin

	NEBV-S1...44-K-...-LE39						
	Pin	Address/ coil	Wire colour[1] of connecting cable		Pin	Address/ coil	Wire colour[1] of connecting cable
	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	–	–
Note	19	18	WH PK		41	0 V	YE BK
	20	19	PK BN		42	0 V	GY BU
The drawing shows the view on the pins of the Sub-D plug.	21	20	WH BU		43	0 V	PK BU
	22	21	BN BU		44	0 V	GY RD

1) To IEC 757

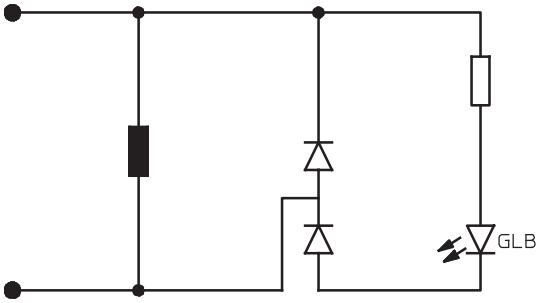
Valve terminals type 23 VTUB-12

Key features – Electrical components

FESTO

Protective circuit

Manifold rail with I-Port interface



I-Port interface

The valve terminal VTUB-12 can be connected as follows via the I-Port:

- Directly to the fieldbus by mounting the CTEU bus node on the valve terminal
- To an IO-Link master (in IO-Link mode) via a cable

Up to 35 solenoid coils can be actuated. A valve position always occupies one address. The following allocation applies in this case:

– Less significant valve position (address) for coil 14
– More significant valve position (address) for coil 12

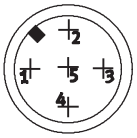
Addresses are allocated in ascending order without gaps, from left to right. The address allocation is independent of whether blanking plates or valves are used.

Note

More information on CTEU
➔ cteu

Additionally required IODD for IO-Link mode
➔ www.festo.com

Pin allocation of the I-Port/IO-Link cable[1)]

	Pin	Allocation
	1	24 V electronics (logic voltage)
	2	24 V valves (load voltage)
	3	0 V electronics (logic)
	4	COM I-Port communication signal
	5	0 V valves (load)

1) 5-pin socket, M12, A-coded

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 of 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.

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 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 to 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 data				
Valve function			Single solenoid	Double solenoid
Design			Poppet valve with spring return	Poppet valve with self-holding function
Sealing principle			Soft	
Actuation type			Electric	
Reset method			Mechanical spring	–
Type of control			Piloted	
Pilot air supply			Internal	
			External	
Direction of flow			Non-reversible	
Exhaust function			No flow control	
Manual override			Non-detenting, non-detenting/detenting	
Type of mounting			Via through-hole	
Width		[mm]	12	24
Nominal size		[mm]	4	
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	
		2, 4	QS-4 or QS-6	
		12, 14	G⅛	

Operating and environmental conditions			
Operating medium			Dried and filtered compressed air, lubricated or unlubricated, grade of filtration 40 µm
Operating pressure	Internal pilot air	[bar]	+2.8 ... +8
	External pilot air	[bar]	
Ambient temperature	Multi-pin plug connection	[°C]	–5 ... +60
	I-Port interface	[°C]	–5 ... +50
Temperature of medium	Multi-pin plug connection	[°C]	–5 ... +60
	I-Port interface	[°C]	–5 ... +50
Note on materials			RoHS-compliant
CE marking			To EU EMC Directive

Note

The CE marking for the valve terminal with I-Port interface applies up to a maximum length of the connecting cable of 30 m.

Valve terminals type 23 VTUB-12

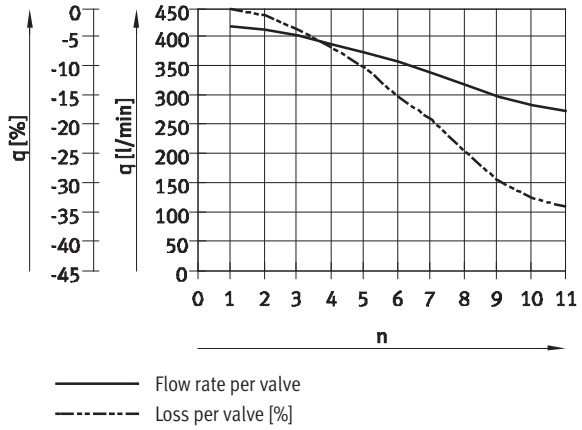
Technical data

Product weight		
Approx. weight		[g]
Valves		
• Single solenoid (code M), ducted solenoid exhaust		27.8
• Double solenoid (code J), ducted solenoid exhaust		57.4
• Single solenoid (code M), unducted solenoid exhaust		27.5
• Double solenoid (code J), unducted solenoid exhaust		57.1
Blanking plate for vacant position		13.8
Manifold rail		
• Multi-pin plug with Sub-D plug, 25-pin	2 valve positions	382
	4 valve positions	484
	6 valve positions	585
	8 valve positions	687
	10 valve positions	788
	12 valve positions	890
	14 valve positions	992
	16 valve positions	1,093
	18 valve positions	1,195
• Multi-pin plug with Sub-D plug, 44-pin	20 valve positions	1,296
	24 valve positions	1,500
	28 valve positions	1,704
	32 valve positions	1,907
	35 valve positions	2,060
• I-Port interface with M12 plug	4 valve positions	521
	6 valve positions	627
	8 valve positions	727
	10 valve positions	834
	12 valve positions	940
	14 valve positions	1,040
	16 valve positions	1,145
	18 valve positions	1,251
	20 valve positions	1,358
	24 valve positions	1,562
	28 valve positions	1,775
	32 valve positions	1,982
	35 valve positions	2,138

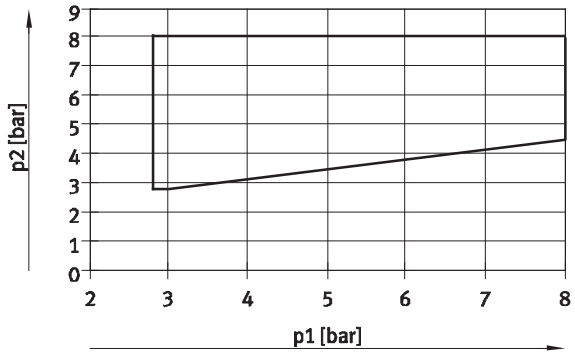
Electrical data				
			Multi-pin plug	I-Port interface
Nominal operating voltage		[V DC]	24, reverse polarity protected	
Permissible voltage fluctuations			±10%	
Electrical power consumption per solenoid coil		[W]	1	
Protection class to EN 60529			IP65	
Duty cycle		[%]	100	
Intrinsic current consumption, logic supply		[mA]	–	30
Intrinsic current consumption, valve supply		[mA]	–	30
Max. cable length		[m]	–	20
Min. cable cross section		[mm^2]	–	1
Baud rate	COM3	[kbps]	–	230.4
	COM2	[kbps]	–	38.4

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

Flow rate q per valve with multiple (n) valves switched simultaneously (tolerance ± 20%)

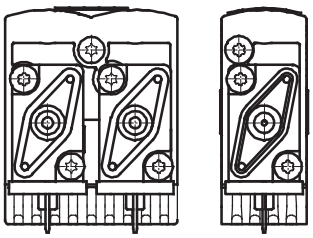


Pilot pressure as a function of operating pressure



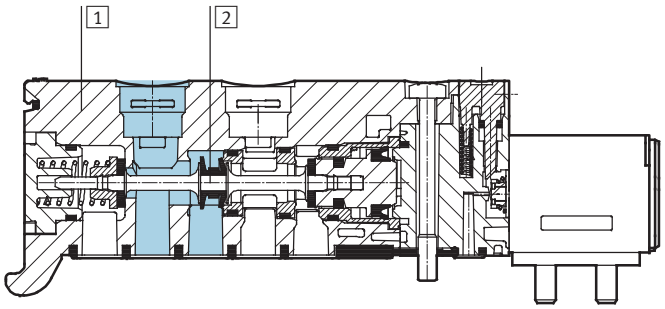
Materials

Sectional view – Valves



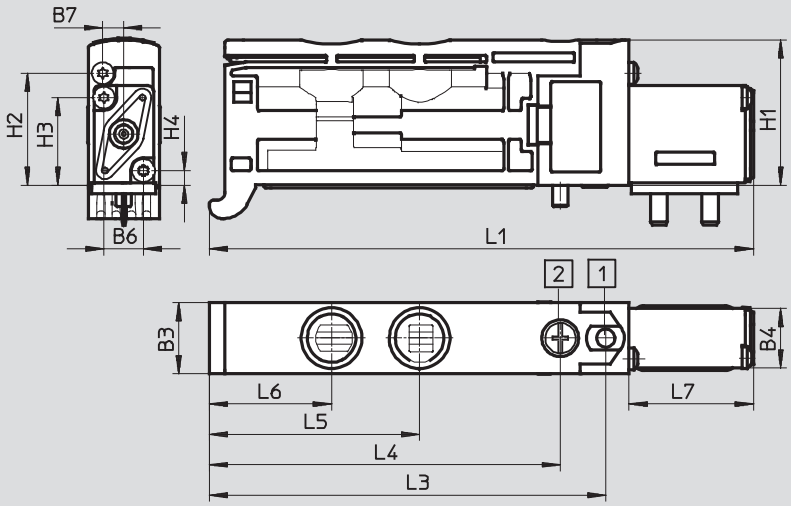
Double solenoid

Single solenoid



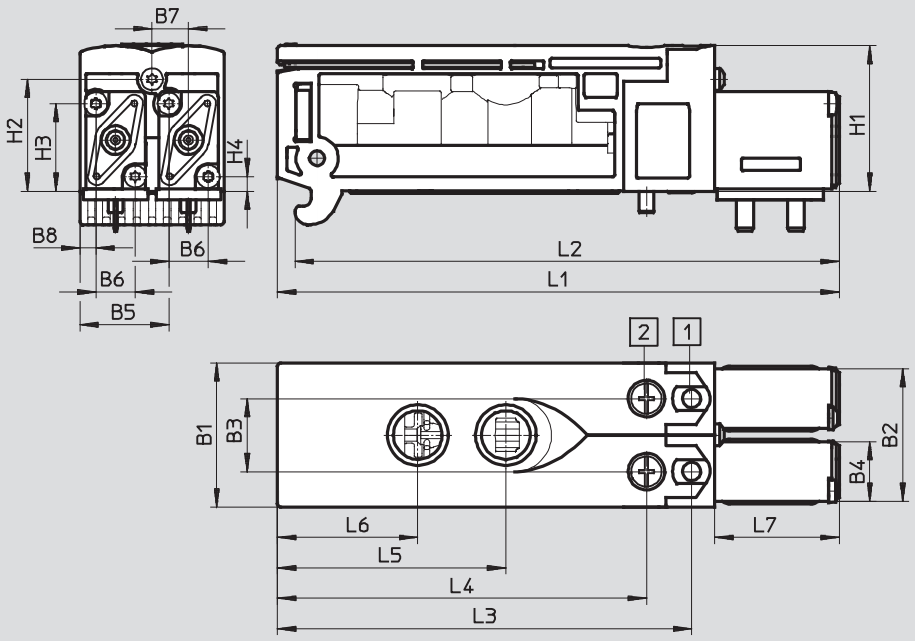
1	Housing	PA, reinforced
2	Piston spool	Wrought aluminium alloy
–	Seals	NBR, PUR
–	Manifold rail with multi-pin plug	Wrought aluminium alloy
–	Power supply module	PA, reinforced
–	Blanking plate for vacant position	PA, reinforced
–	Selector plate	Wrought aluminium alloy

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



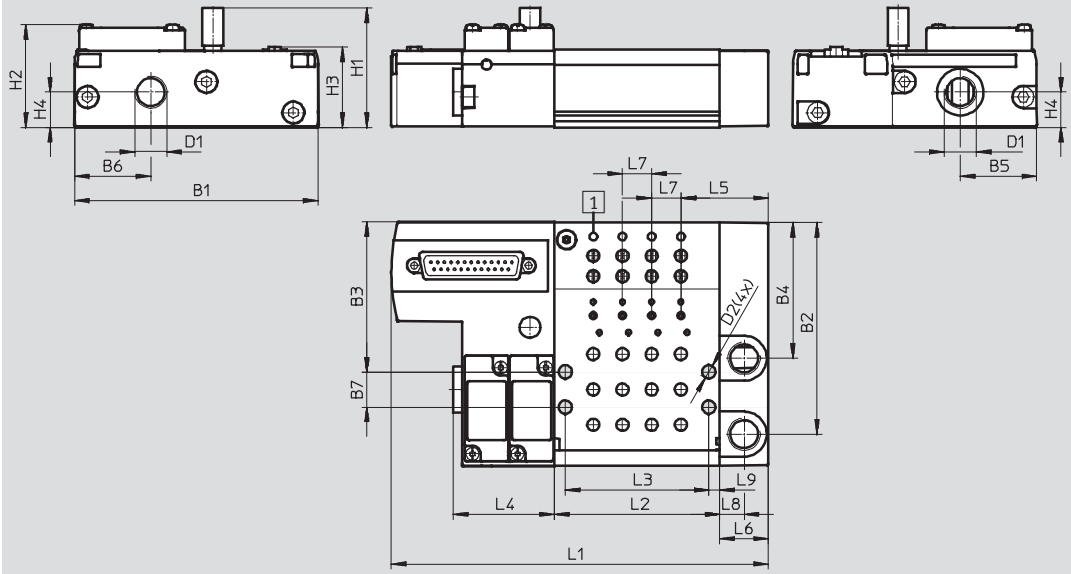
Type	B1	B2	B3	B4	B5	B6	B7	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7
VUVB-ST12-M52-MZH-QX-1T1	–	–	12	9.8	–	6.5	3.5	24	18.5	14.5	2.5	89.6	–	65.3	57.8	34.7	20.2	20.5
VUVB-ST12-M52-MZH-QX-D-1T1												89.9						20.8

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



Type	B1	B2	B3	B4	B5	B6	B7	H1	H2	H3	H4	L1	L2	L3	L4	L5	L6	L7
VUVB-ST12-B52-ZH-QX-1T1	23.7	21.8	12	9.8	14.6	6.5	6	24	18.5	14.5	2.5	92.4	89.5	68.1	60.7	37.6	23.1	20.5
VUVB-ST12-B52-ZH-QX-D-1T1												92.7	89.8					20.8

Dimensions – Manifold rail with multi-pin plug Download CAD data ➔ **www.festo.com**



1 LED signal status display (optional)

n Number of valve positions (2 ... 35)

Type	B1	B2	B3	B4	B5	B6	B7	D1	D2	H1	H2	H3	H4
VABM-C8-12E	100	87	61.4	55.9	31.5	31.3	14.5	G¼	5.5	49	42.2	33	14.5

Type	L1	L2	L3	L4	L5	L6	L7	L8	L9
VABM-C8-12E	(n x 12) + 107	(n x 12) + 20	(n x 12) + 11	41.5	36	20	12	10	4.5

Valve terminals type 23 VTUB-12

Technical data

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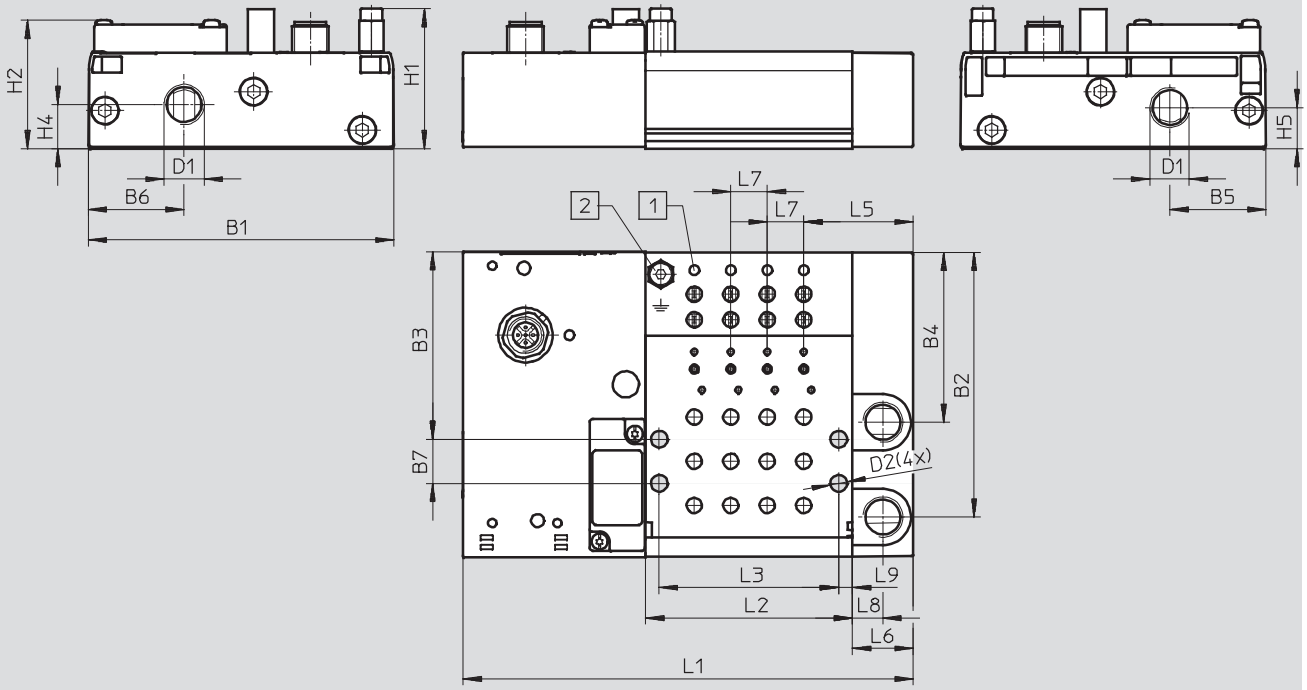
Dimensions – Manifold rail with I-Port interface Download CAD data ➔ **www.festo.com**



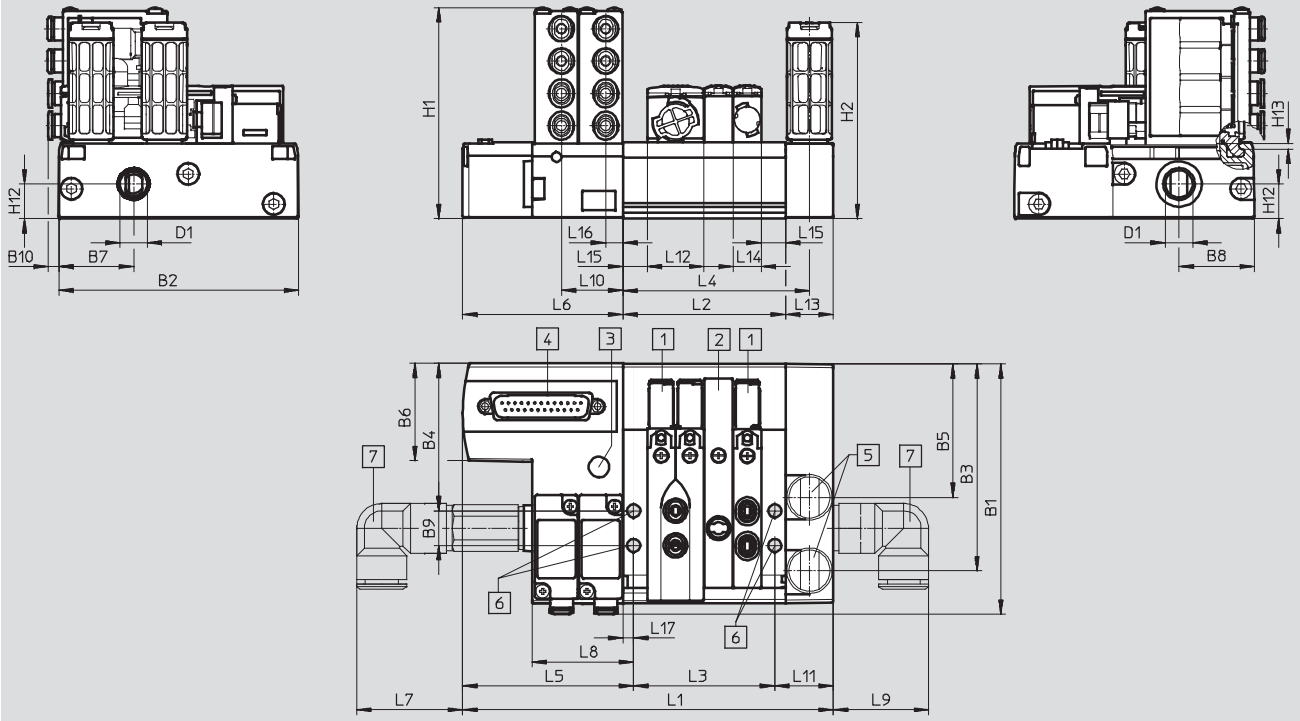
1 LED signal status display
2 Earthing screw M4
n Number of valve positions (3 … 35)

Type	B1	B2	B3	B4	B5	B6	B7	D1	D2 Ø	H1	H2	H4	H5
VTUB-12	100	87	61.5	55.9	31.5	31.3	14.5	G¼	5.5	48	42.2	14.5	13.5

Type	L1	L2	L3	L5	L6	L7	L8	L9
VTUB-12	(nx12)+100	(nx12)+20	(nx12)+11	36	20	12	10	4.5

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 connection M5
4 Sub-D plug, 25-pin or 44-pin with 21 or more solenoid coils
5 Silencer/threaded connection G¼
6 Hole for wall mounting, ∅ 5.5 mm
7 Fittings for air supply port
n Number of valve positions (2 ... 35)

Type	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16	L17
VTUB-12	(n x 12) + 107	(n x 12) + 20	(n x 12) + 11	78	71.5	67	44.3	42.5	40	25.7	24.5	23.7	20	11.7	10.2	7.2	4.5

Type	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	D1	H2	H12	H13
VTUB-12	103	100	86.5	61.5	55.9	40.5	31.3	31.5	14.5	3	G¼	82	14.5	2.5

New

CTEU-CO

Technical data – Bus node CTEU-CO

FESTO

CANopen

The bus node handles communication between the valve terminal and a higher-level CANopen® master.

The module has basic diagnostic functions. It has 5 integrated LEDs for on-site display. Up to 8 byte inputs and 8 byte outputs are typically transmitted in the cyclic process image.

Application

Fieldbus connection

The bus connection is established via a 9-pin Sub-D plug (pin) as per the CAN in Automation (CiA) specification DS 102 with additional 24 V CAN transceiver supply (option as per DS 102).

The bus connector plug (with protection class IP65/IP67 from Festo or IP20 from other manufacturers) facilitates the connection of an incoming and an outgoing bus cable.

There are 4 contacts each available for the conductors (CAN_L/CAN_H and 24 V/0 V) of the incoming and outgoing bus cables.

The fieldbus parameters and the basic device parameter settings are set on the bus node via DIL switches.

Implementation

Protocol chip used:
- CAN transceiver 82C251

Baud rates supported:
- 125 kB
- 250 kB
- 500 kB
- 1 MB

Max. CANopen line length (trunk cable):
- 40 m at 1 Mbps
- 100 m at 500 kbps
- 250 m at 250 kbps
- 500 m at 125 kbps

Max. branch line length (drop cable):
- 0.30 m at 1 Mbps
- 0.75 m at 500 kbps
- 2 m at 250 kbps
- 3.75 m at 125 kbps

The following variants can be realised using an adapter:
- 2 x micro style M12, protection class IP65, 5-pin, socket and pin
- Open Style plug, protection class IP20, 5-pin, pin

Valve terminals type 23 VTUB-12

Technical data – Bus node CTEU-CO

FESTO

General technical data			
Fieldbus interface			• Sub-D socket, 9-pin • Sub-D plug, for self-assembly • 2x M12x1, 5-pin • 5-pin terminal strip
Protocol			CANopen
Baud rate		[kbps]	125, 250, 500 and 1,000
Internal cycle time			1 ms per 1 byte of user data
Operating voltage	Nominal value	[V DC]	24
	Permissible range	[V DC]	18 ... 30
Intrinsic current consumption at nominal operating voltage		[mA]	Typically 120
Max. power supply		[A]	4
Parameterisation			Diagnostic behaviour Fail state
Max. address capacity, inputs			8 byte
Max. address capacity, outputs			8 byte
Additional functions			• Emergency message • Acyclic data access via "SDO"
Operating elements			DIL switch
Configuration support			EDS files
Device-specific diagnostics			• System diagnostics • Undervoltage • Communication errors
LED display	Fieldbus-specific		• MNS: Network status • IO: I/O status
	Product-specific		• PS: Operating voltage for electronics and load supply • X1: System status of module at I-Port 1 • X2: System status of module at I-Port 2
Protection class to EN 60529			IP 65/67
CE marking			To EU EMC Directive
Note on materials			RoHS-compliant
Housing materials			• PC • PA, reinforced
Product weight		[g]	90
Temperature range	Ambient temperature	[°C]	–5 ... +50
	Storage	[°C]	–20 ... +70
Dimensions W x L x H		[mm]	40 x 91 x 50

Valve terminals type 23 VTUB-12

Technical data – Bus node CTEU-CO

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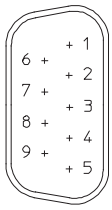
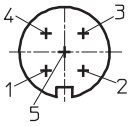
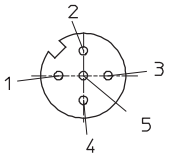
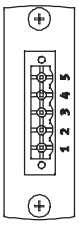
Pin allocation of the CANopen interface			
Pin allocation	Pin	Signal	Designation
Sub-D plug			
	1	n.c.	Not connected
	2	CAN_L	Received/transmitted data low
	3	CAN_GND	0 V CAN interface
	4	n.c.	Not connected
	5	CAN_Shld	Optional screened connection
	6	GND	Ground[1]
	7	CAN_H	Received/transmitted data high
	8	n.c.	Not connected
	9	CAN_V+	24 V DC supply CAN interface
	Housing	Screen	Connection to FE (functional earth)
Bus connection Micro Style (M12)			
Incoming 	1	Screen	Connection to FE (functional earth)
	2	CAN_V+	24 V DC supply CAN interface
	3	CAN_GND	0 V CAN interface
	4	CAN_H	Received/transmitted data high
	5	CAN_L	Received/transmitted data low
Outgoing 	1	Screen	Connection to FE (functional earth)
	2	CAN_V+	24 V DC supply CAN interface
	3	CAN_GND	0 V CAN interface
	4	CAN_H	Received/transmitted data high
	5	CAN_L	Received/transmitted data low
Bus connection Open Style			
	1	CAN_GND	0 V CAN interface
	2	CAN_L	Received/transmitted data low
	3	Screen	Connection to FE (functional earth)
	4	CAN_H	Received/transmitted data high
	5	CAN_V+	24 V DC supply CAN interface

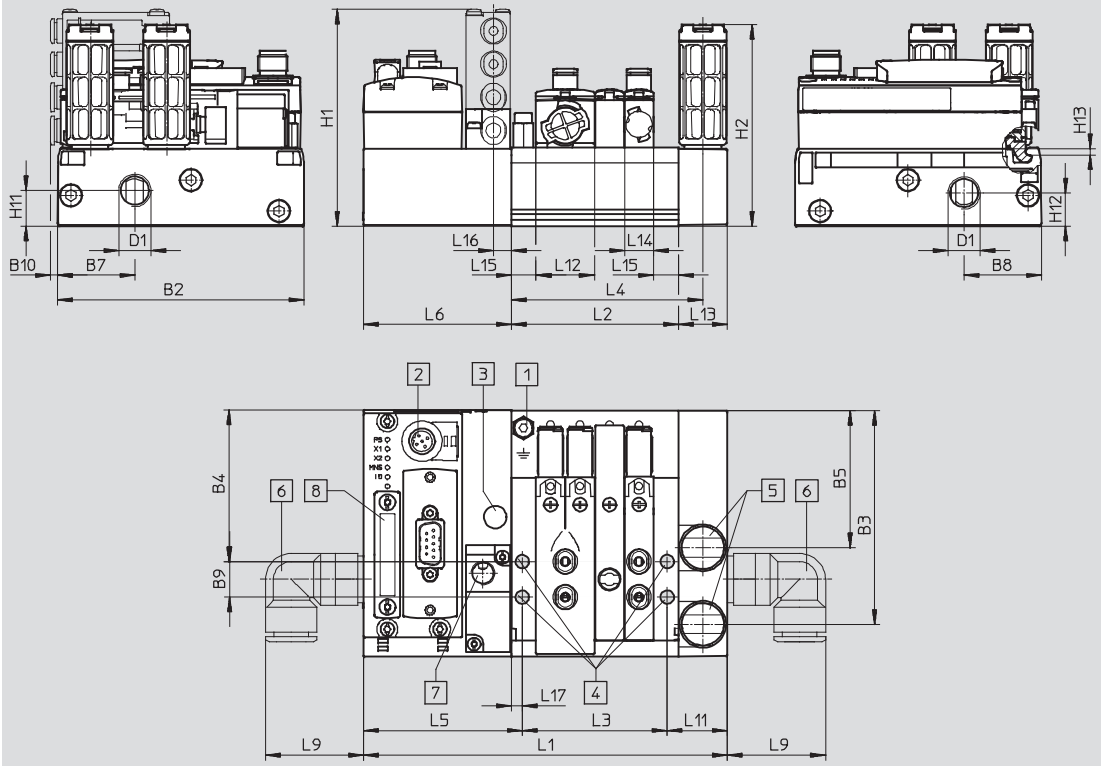
1) Connected internally via Pin 3

Valve terminals type 23 VTUB-12

Technical data – Bus node CTEU-CO

FESTO

Dimensions – Valve terminal with CTEU-CO Download CAD data ➔ **www.festo.com**



1 Earthing screw M4
2 M12 plug, 5-pin
3 Silencer, threaded connection M5
4 Holes for mounting ∅ 5.5
5 Silencer, threaded connection G¼
6 Fittings for air supply port
7 External pilot air 12/14, G⅛
8 CTEU bus node
n Number of valve positions (3 ... 35)

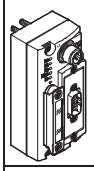
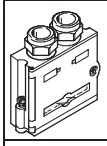
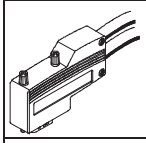
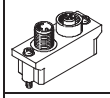
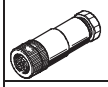
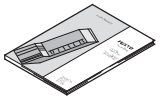
Type	B2	B3	B4	B5	B7	B8	B9	B10	D1	H1	H2	H11	H12	H13
VTUB-12	100	87	61.5	55.9	31.3	31.5	14.5	3	G¼	88.2	82	14.5	13.5	2.5

Type	L1	L2	L3	L4	L5	L6	L9	L11	L12	L13	L14	L15	L16	L17
VTUB-12	(nx12)+100	(nx12)+20	(nx12)+11	78	64.5	60	40	24.5	23.7	20	11.7	10.2	7.2	4.5

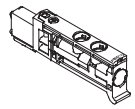
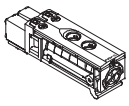
Valve terminals type 23 VTUB-12

Accessories – CTEU-CO

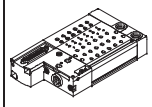
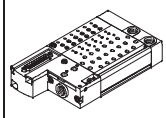
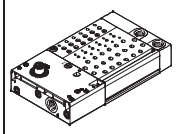
FESTO

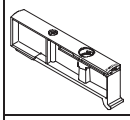
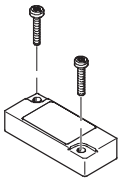
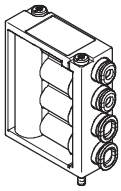
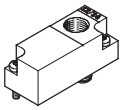
Ordering data				
Designation			Part No.	Type
Bus node				
	CANopen bus node		**570038**	**CTEU-CO**
Bus connection				
	Sub-D plug		**532219**	**FBS-SUB-9-BU-2x5POL-B**
	Sub-D plug, angled		**533783**	**FBS-SUB-9-WS-CO-K**
	Micro Style bus connection, 2xM12, 5-pin		**525632**	**FBA-2-M12-5POL**
	Fieldbus socket for Micro Style connection, M12, 5-pin		**18324**	**FBSD-GD-9-5POL**
	Plug for Micro Style connection, M12, 5-pin		**175380**	**FBS-M12-5GS-PG9**
	Open Style bus connection		**525634**	**FBA-1-SL-5POL**
	Terminal strip for Open Style connection, 5-pin		**525635**	**FBSD-KL-2x5POL**
Plug socket				
	For voltage supply		**538999**	**NTSD-GD-9-M12-5POL-RK**
Manual				
	Manual – Bus node CTEU-CO	German	**573767**	**P.BE-CTEU-CO-FUNCT+MAINT**
		English	**573768**	**P.BE-CTEU-CO-FUNCT+MAINT**
		Spanish	**573769**	**P.BE-CTEU-CO-FUNCT+MAINT**
		French	**573770**	**P.BE-CTEU-CO-FUNCT+MAINT**
		Italian	**573771**	**P.BE-CTEU-CO-FUNCT+MAINT**
		Chinese	**573774**	**P.BE-CTEU-CO-FUNCT+MAINT**

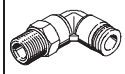
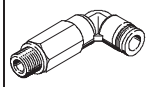
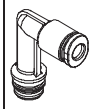
Ordering data – Solenoid valves

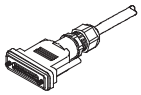
	Code	Valve function	Solenoid exhaust air	Part No.	Type
	M	5/2-way valve, single solenoid, manual override non-detenting	Unducted	**557649**	**VUVB-ST12-M52-MZH-QX-1T1**
			Ducted	**558369**	**VUVB-ST12-M52-MZH-QX-D-1T1**
		5/2-way valve, single solenoid, manual override non-detenting/detenting	Unducted	**570908**	**VUVB-ST12-M52-MZD-QX-1T1**
			Ducted	**570909**	**VUVB-ST12-M52-MZD-QX-D-1T1**
	J	5/2-way valve, double solenoid, manual override non-detenting	Unducted	**557650**	**VUVB-ST12-B52-ZH-QX-1T1**
			Ducted	**558370**	**VUVB-ST12-B52-ZH-QX-D-1T1**
		5/2-way valve, double solenoid, manual override non-detenting/detenting	Unducted	**570910**	**VUVB-ST12-B52-ZD-QX-1T1**
			Ducted	**570911**	**VUVB-ST12-B52-ZD-QX-D-1T1**

Ordering data – Manifold rail

	Code	Description	Valve positions	Part No.	Type
	–	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**
	L	Multi-pin plug with Sub-D plug, 25-pin, LED signal status display	2	**1361863**	**VABM-C8-12E-G14-2-M1-L**
			4	**1361865**	**VABM-C8-12E-G14-4-M1-L**
			6	**1361867**	**VABM-C8-12E-G14-6-M1-L**
			8	**1361868**	**VABM-C8-12E-G14-8-M1-L**
			10	**1361869**	**VABM-C8-12E-G14-10-M1-L**
			12	**1361870**	**VABM-C8-12E-G14-12-M1-L**
			14	**1361871**	**VABM-C8-12E-G14-14-M1-L**
			16	**1361873**	**VABM-C8-12E-G14-16-M1-L**
			18	**1361874**	**VABM-C8-12E-G14-18-M1-L**
			20	**1361875**	**VABM-C8-12E-G14-20-M1-L**
		Multi-pin plug with Sub-D plug, 44-pin, LED signal status display	24	**1361876**	**VABM-C8-12E-G14-24-M1-L**
			28	**1361877**	**VABM-C8-12E-G14-28-M1-L**
			32	**1361878**	**VABM-C8-12E-G14-32-M1-L**
			35	**1361879**	**VABM-C8-12E-G14-35-M1-L**
	PT/LK	Manifold rail with I-Port interface	4	**1247975**	**VABM-C8-12E-G14-4-PT-L**
			6	**1247976**	**VABM-C8-12E-G14-6-PT-L**
			8	**1247977**	**VABM-C8-12E-G14-8-PT-L**
			10	**1247978**	**VABM-C8-12E-G14-10-PT-L**
			12	**1247979**	**VABM-C8-12E-G14-12-PT-L**
			14	**1247980**	**VABM-C8-12E-G14-14-PT-L**
			16	**1247981**	**VABM-C8-12E-G14-16-PT-L**
			18	**1247982**	**VABM-C8-12E-G14-18-PT-L**
			20	**1247983**	**VABM-C8-12E-G14-20-PT-L**
			24	**1247984**	**VABM-C8-12E-G14-24-PT-L**
			28	**1247985**	**VABM-C8-12E-G14-28-PT-L**
			32	**1247986**	**VABM-C8-12E-G14-32-PT-L**
			35	**1247987**	**VABM-C8-12E-G14-35-PT-L**

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**
Pneumatic distributor				
	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**
Selector plate				
	SL	Pneumatic connection G1/8	**1210305**	**VABF-C8-12-P6-G18-Z**
Blanking plug				
		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 with push-in connector						
	–	Straight connection ∅ 10 mm	4 mm	10 pieces	**172972**	**QSP10-4**
	–		6 mm	10 pieces	**172973**	**QSP10-6**
	–	L-shaped connection ∅ 10 mm	4 mm	10 pieces	**132601**	**QSPLK10-4**
	–		6 mm	10 pieces	**132602**	**QSPLK10-6**
	–	Extra-long L-shaped 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					
	Code	Description	Cable length [m]	Part No.	Type
Connecting cable for multi-pin plug					
	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**
Connection technology for IO-Link					
	XM	T-adapter M12, 5-pin	2.5	**171175**	**FB-TA-M12-5POL**
	XN	Straight plug, M12, 5-pin (in combination with adapter for separate load supply)	2.5	**175487**	**SEA-M12-5GS-PG7**