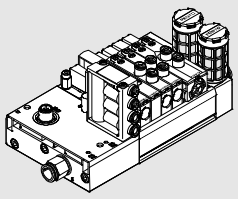
VTUB-12-V



Brief description
(Original instructions)

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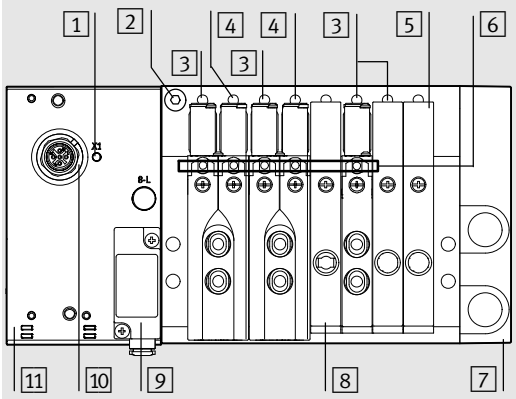


Fig. 1

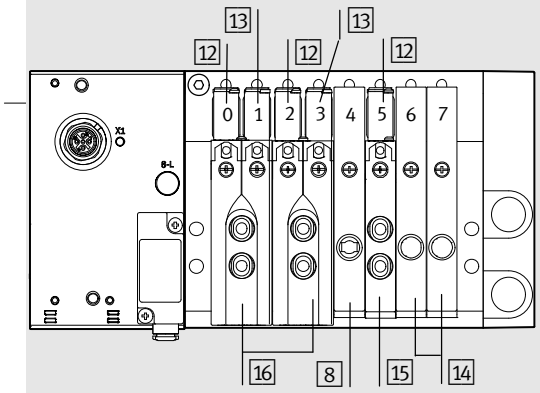


Fig. 2

Pilot pressure p2 as a function of the operating pressure p1 with auxiliary pilot air supply for valve type 3/2C



Fig. 3

Pilot pressure p2 as a function of the operating pressure p1 with auxiliary pilot air supply for valve type 5/2 and 3/2U

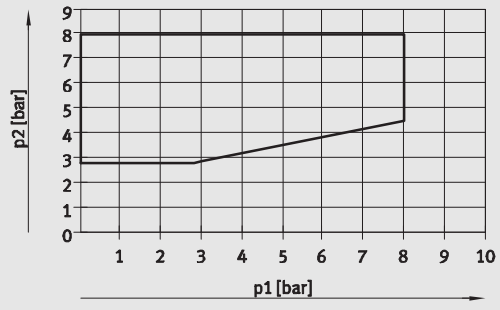


Fig. 4

Valve terminal type VTUB-12-V ..... **en**

1 General instructions

For all available product documentation
➔ www.festo.com/pk

The valve terminal VTUB-12-V has been designed exclusively for controlling pneumatic actuators. The limit values specified in the technical data section must be observed here.
The valve terminal is intended for use in an industrial environment. Measures for interference suppression may need to be implemented in residential areas.
The target group of this description consists of trained specialists in control and automation technology who have experience with the installation of valve terminals.
IO-Link is a registered trademark of the trademark holder in certain countries.

Warning

Danger of injury through uncontrolled movements of connected devices.
Make sure that electrical and pneumatic equipment are in a de-energised and pressureless status.

Before working on the pneumatics:
- Switch off the compressed air supply
- Vent the valve terminal

Before work on electrical equipment, e.g. before plugging together or disconnecting plug connectors:
- Switch off the power supply

In this way, you can avoid:
– uncontrolled movements of loose tubing
– accidental and uncontrolled movements of the connected actuators
– undefined switching states of the electronics
– functional damage

Note

- Use protective caps or blanking plugs to seal unused connections. You will then achieve degree of protection IP65.
- Commission a valve terminal only if it has been completely mounted and wired!

2 I-port connection

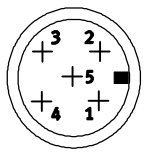
The VTUB-12-V can be connected as follows via the I-Port connection:
– directly to the fieldbus (mounting the CTEU bus node on the valve terminal VTUB-12-V)
– decentralised at an external I-Port
– decentralised at an IO-Link master (IO-Link mode)

Warning

- Only use PELV circuits in accordance with IEC/EN 60204-1 (protective extra-low voltage, PELV) for the electrical power supply.
- Observe also the general requirements for PELV power circuits in accordance with IEC/EN 60204-1.
- Only use voltage sources which guarantee reliable electrical isolation of the operating voltage in accordance with IEC/EN 60204-1.
- Always connect both circuits for operating and load voltage supply.

Through the use of PELV circuits, protection against electric shock (protection against direct and indirect contact) is ensured in accordance with IEC/EN 60204-1.

2.1 Pin allocation of the I-port/IO-Link cable

Plug[1)]	Pin	Allocation	Function
	1	24 $V_{EL/SEN}$ (PS)	Operating voltage supply
	2	24 $V_{VAL/OUT}$ (PL)	Load voltage supply
	3	0 $V_{EL/SEN}$ (PS)	Operating voltage supply
	4	C/$Q_{I\text{-}PORT}$	Communication C/Q
	5	0 $V_{VAL/OUT}$ (PL)	Load voltage supply
	Housing	FE	Functional earth

1) 5-pin M12x1 plug, A-coded

3 Connection, display and control elements (Fig. 1)

1 LED X1 (status)
2 Earthing screw
3 LED/coil 14
4 LED/coil 12 (for bistable valves)
5 Blanking plates on vacant positions
6 Manual override non-detenting/detenting while turning
7 End plate with pneumatic connections
8 Supply module with pneumatic port (1)
9 P-distributor or selector plate
10 M12 plug (I-Port connection)
11 Sub-base with electr. and pneum. ports

3.1 LED display X1 1

LED status	Significance
Flashing green (900 ms LED on, 100 ms LED off)	Normal operating status
Illuminated green	Data communication is not satisfactory
Illuminated red	24 V load voltage supply not satisfactory (no voltage, undervoltage or short circuit; in addition, data communication cannot be satisfactory)
Flashing red	Device errors

4 Address assignment of the (Fig. 2)

With the VTUB-12-V you can actuate up to 35 solenoid coils. Fig. 2 shows as an example the address assignment of the valve terminal with 8 valve positions (top view):
– 12 assigned addresses of the coils 14
– 13 assigned addresses of coils 12
– The address assignment does not depend on whether blanking plates 14, valves 15 or 16 or supply module 8 are fitted.
– Address assignment is in ascending order without gaps, from left to right (➔ Fig. 2).
– A valve position always occupies one address.
– Bistable valves 16 occupy 2 valve positions. The following allocation applies here:
  – Less significant valve position (address) for coil 14
  – High-order valve position (address) for coil 12.

5 Earth terminal

Connect the VTUB-12-V to the functional earth via the earth terminal 2 (➔ Fig. 1). In this way, you will avoid malfunctions from electromagnetic interference.

6 P-distributor (optional, with NPT thread not available)

The valve terminal VTUB-12-V can be equipped optionally with a P distributor 9 type VABF-C8-12-V1P4-.... Through this distributor, you can pass on the operating pressure of the valve terminal for external pneumatic components. Mounting of the P-distributor is described in the mounting instructions VABF/VABB-C8-12.

7 Power supply module

For supplemental supply of the valve terminal VTUB-12-V with operating pressure, there is a power supply module 8. The power supply module is mounted onto a valve position instead of a valve.

8 Pressure zone separation

With the valve terminal VTUB-12-V, the channel (1) can be divided into pressure zones. Pressure zones are formed with the separator VABD-C8-P1. Pressure zones must be supplied with operating pressure via a separate power supply module if they are not limited by the following components:
– left of the sub-base 11 or
– right of the end plate 7.
The left pressure zone must be supplied with operating pressure by the sub-base, the right pressure zone by the end plate.
Mounting of the separator is described in the mounting instructions VABF/VABB-C8-12.
For supply with internal pilot air, the pressure zone must lie with the highest pressure on the sub-base.

9 Pilot control with external pilot air supply (optional)

The VTUB-12-V is intended for use with internal pilot air supply. Through mounting of the selector plate VABF-C8-12-P6-...-Z instead of the P distributor 9, the VTUB-12-V can be operated using external pilot air supply. The pilot air is then supplied via port 12/14 on the selector plate. Mounting of the selector plate is described in the mounting instructions VABF/VABB-C8-12.

10 IO-Link mode

The VTUB-12-V can also be operated as an IO-Link device. Here, the I-Port connection is used in an IO-Link mode. You can download the IODD configuration file required for this from the Festo Internet page (➔ www.festo.com/sp).

11 Technical data

Type VTUB-12-V	
Number of valve positions min.	3
Number of valve positions max. – G thread/NPT thread	 35/32
Mounting position	any
Ambient/media temperature	–5 ... +50 °C
Storage temperature	–25 ... +60 °C
Operating/pilot medium:	Compressed air in accordance with ISO 8573-1:2010 [7:4:4]
Instructions on the operating/pilot medium:	Operation with lubricated medium possible (in which case lubricated operation will always be required, oil: VG32)
Operation with internal pilot air supply: Operating pressure – 3/2C-way valve (normal position closed) – 3/2U-way valve (normally open) and all 5/2-way valves	 0 ... 8 bar 2.8 ... 8 bar
Operation with external pilot air: – 3/2C-way valve – 3/2U-way valve and all 5/2-way valves	 ➔ Fig. 3 ➔ Fig. 4 in the diagrams, the following mean: p1: operating pressure p2: pilot pressure
Power supply (protected against incorrect polarity): – electronics – valves	 Nominal value (tolerance) DC 24 V (±25 %) DC 24 V (±10 %)
Power consumption (load and logic, per coil) at 24 V DC	1.0 W
Max. current consumption: – Valves	 2 A
Intrinsic current consumption: – Valves / electronics	 30 mA / 30 mA
Mains buffering time	10 ms
I-port/IO-Link line: – Wire cross section – Max. length	 min. 1 mm² 20 m (unshielded)
IO-Link properties: – Operating mode – Revision – Data Out	 COM 3 (230.4 kBit) COM 2 (38.4 kBit) 1.1 (1.0 compatible) 1 byte (3 ... 8 valves) 2 bytes (9 ... 16 valves) 4 bytes (17 ... 24 valves) 6 bytes (25 ... 35 valves)
Protection against electric shock:	By the use of PELV current circuits (protection against direct and indirect contact in accordance with IEC/DIN EN 60204-1)
Electromagnetic compatibility – Resistance to interference and emitted interference	 ➔ Declaration of conformity (www.festo.com)
Degree of protection for completely mounted valve terminal with cable	in accordance with EN 60529: IP65
Vibration and shock [1)] – Vibration – Shock – Continuous shock	 Severity level 2 Severity level 2 Severity level 1
Materials	AL, PA, POM, NBR, PU, PC
Tightening torque: – Bus node on VTUB-12-V – Valve on terminal strip – P distributor, selector – Wall mounting – Earthing screw	 1.0 Nm (±10 %) 0.6 Nm (±20 %) 0.6 Nm (±20 %) 5.0 Nm 1.0 Nm (±20 %)

1) Explanation of the severity levels ➔ subsequent table

Explanation on vibration and shock – severity level	
Severity level 1	Vibration: 0.15 mm path at 10 ... 58 Hz; 2 g acceleration at 58 ... 150 Hz
	Shock: ±15 g with 11 ms duration; 5 shocks per direction
	Continuous shock: ±15 g with 6 ms duration, 1000 shocks per direction
Severity level 2	Vibration: 0.35 mm path at 10 ... 60 Hz; 5 g acceleration at 60 ... 150 Hz
	Shock: ±30 g with 11 ms duration; 5 shocks per direction
	Continuous shock: n. a.

Code MSB	Code LSB	Malfunction and error handling	Type
50h	00h	Device errors • Switch device off and back on. If the error is still present, the device is defective and needs to be replaced.	Faults
51h	12h	Error in the load voltage supply • Check the load voltage supply	Warning
77h	10h	Short circuit • Check mounting of the valve and replace, if necessary	Faults