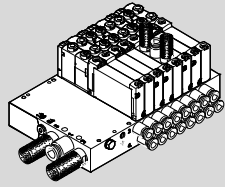


Valve terminal VTUG-...-M/VTUG-...-V



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Brief description

8043715
1502c
[8043722]

Original: de



Valve terminal VTUG-...-M (multi-pin node) English
Valve terminal VTUG-...-V (I-Port)

1 Safety

1.1 Intended use

The valve terminal VTUG... has been designed exclusively for controlling pneumatic actuators.

The valve terminal VTUG... is intended for use in an industrial environment. Outside of industrial environments, e.g. in commercial and mixed-residential areas, actions to suppress interference may have to be taken.

1.2 Safety instructions

- The valve terminal may only be used in its original status without unauthorised modifications.
- Use the valve terminal only if it is in an excellent technical status.
- Comply with all applicable national and international regulations.
- Observe the specified limit values (→ Chapter 12, technical data).
- Take into consideration the ambient conditions at the location of use.

1.3 Qualified specialists

Only qualified personnel may perform installation, commissioning, maintenance and disassembly of the valve terminal. The qualified personnel must be familiar with installation and operation of electrical and pneumatic control systems.



Warning

If inappropriate voltage sources are used, the housing can conduct dangerous voltage if there is a fault.

- For the electrical power supply, use only PELV voltage sources in accordance with IEC 60204-1 (Protective Extra-Low Voltage, PELV).
- Observe the requirements of IEC 60204-1 for PELV circuits.



Note

Avoid damage to and malfunctions of the valve terminal.

- Switch off voltage before plugging together or disconnecting plug connectors.



Note

The valve terminal can be destroyed through electrical overvoltage.

- Keep voltage within the specified technical data (→ Section 12).
- Operate valve terminal only with an overvoltage limiter.

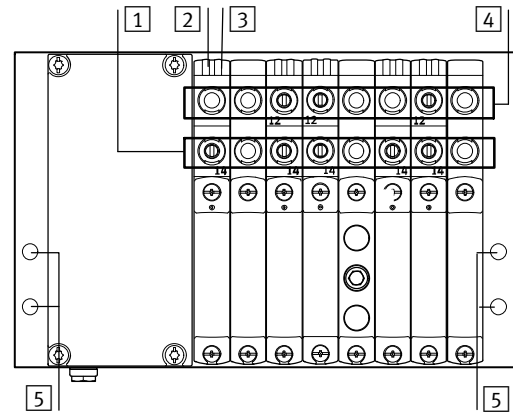


Note

- Commission a valve terminal only if it has been completely mounted and wired.

2 Design

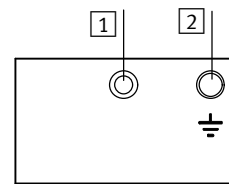
The valve terminal VTUG... has the following connection, display and control elements.



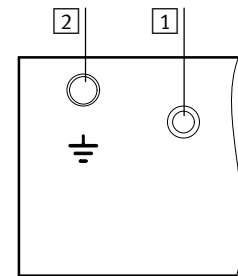
- | | |
|---|---|
| 1 Manual override 14
(non-detenting/turning with detent) | 4 Manual override 12
(non-detenting/turning with detent) |
| 2 LED for solenoid coil 12 | 5 Mounting holes |
| 3 LED for solenoid coil 14 | |

Fig. 1

Widths 10 mm and 18 mm



Width 14 mm

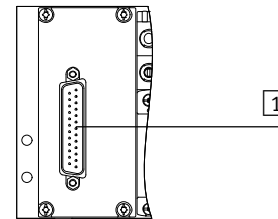


- | | |
|--|--|
| 1 Position of the pilot air supply selector or the blanking plug | 2 Earth terminal (hole for the earthing screw) |
|--|--|

Fig. 2

2.1 Valve terminal VTUG-...-M

The valve terminal VTUG-...-M (multi-pin node) has the following additional connecting component.

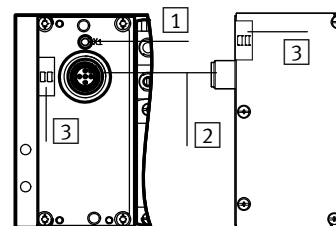


- | |
|---|
| 1 Electrical multi-pin plug connection
(Sub-D or ribbon cable) |
|---|

Fig. 3

2.2 Valve terminal VTUG-...-V

The valve terminal VTUG-...-V (I-Port) has the following additional connection and display components.



- | | |
|---|---------------------------------|
| 1 LED X1 (status) | 3 Fixture for inscription field |
| 2 M12 plug connector
(I-Port connection) | |

Fig. 4

3 Multi-pin plug connection

The valve terminal VTUG-...-M can actuate up to 48 solenoid coils, depending on the alternative connection. Each solenoid coil of the valve terminal VTUG-...-M must be assigned to a specific pin of the multi-pin plug.



Note

No valves with 2 coils may be mounted on the valve positions that are not shown with a grey background in the following table (Fig. 7 ... Fig. 14). Coil 12 cannot be controlled on these valve positions.

3.1 Sub-D multi-pin plug

Recommendation:

Use the following sockets with cables from the Festo range of accessories for connecting the valve terminal VTUG with multi-pin plug connection.

Sockets with cables

Maximum number of controllable coils	24	42
Protection class	IP40 or IP67	IP40 or IP67
Sub-D socket with cable	NEBV-S1...25-...LE25	NEBV-S1...44-...LE44

Fig. 5

3.2 Pin allocation of the multi-pin plug connections

Instructions on the tables:

- Addr. = address, VP = valve position, Coil = solenoid coil
- Valve positions, which support actuation of 2 coils each, are shown with a grey background.

i Information on the above listed cables from Festo, e.g. the assignment of the pins to the wire colour, can be found in the leaflet accompanying the cable.

25-pin Sub-D connection on the valve terminal

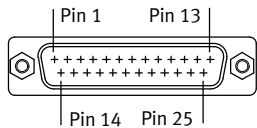


Fig. 6

Pin assignment of the variants V20:

Pin	Addr.	Maximum number of valve positions			
		4, 5 ... 10, 12	16	20	24
Valve position no./coil designation					
1	0	0/14	0/14	0/14	0/14
2	1	0/12	0/12	0/12	23/14
3	2	1/14	1/14	1/14	1/14
4	3	1/12	1/12	1/12	22/14
5	4	2/14	2/14	2/14	2/14
6	5	2/12	2/12	2/12	21/14
7	6	3/14	3/14	3/14	3/14
8	7	3/12	3/12	3/12	20/14
9	8	4/14	4/14	4/14	4/14
10	9	4/12	4/12	19/14	19/14
11	10	5/14	5/14	5/14	5/14
12	11	5/12	5/12	18/14	18/14
13	12	6/14	6/14	6/14	6/14
14	13	6/12	6/12	17/14	17/14
15	14	7/14	7/14	7/14	7/14
16	15	7/12	7/12	16/14	16/14
17	16	8/14	8/14	8/14	8/14
18	17	8/12	15/14	15/14	15/14
19	18	9/14	9/14	9/14	9/14
20	19	9/12	14/14	14/14	14/14
21	20	10/14	10/14	10/14	10/14
22	21	10/12	13/14	13/14	13/14
23	22	11/14	11/14	11/14	11/14
24	23	11/12	12/14	12/14	12/14
25	-	Com ¹⁾			

1) Connect 0 V with positive-switching control signals, 24 V with negative-switching control signals.

Fig. 7

Pin assignment of the variants V22 ... V25:

Pin	Addr.	Maximum number of valve positions (variant)			
		4, 5 ... 10 (V22)	12 (V23)	16 (V24)	20 (V25)
Valve position no./coil designation					
1	0	0/14	0/14	0/14	0/14
2	1	0/12	0/12	0/12	1/14
3	2	1/14	1/14	1/14	2/14
4	3	1/12	1/12	1/12	3/14
5	4	2/14	2/14	2/14	4/14
6	5	2/12	2/12	2/12	5/14
7	6	3/14	3/14	3/14	6/14
8	7	3/12	3/12	3/12	7/14
9	8	4/14	4/14	4/14	8/14
10	9	4/12	4/12	5/14	9/14
11	10	5/14	5/14	6/14	10/14
12	11	5/12	5/12	7/14	11/14
13	12	6/14	6/14	8/14	12/14
14	13	6/12	6/12	9/14	13/14
15	14	7/14	7/14	10/14	14/14
16	15	7/12	7/12	11/14	15/14
17	16	8/14	8/14	12/14	16/14
18	17	8/12	9/14	13/14	17/14
19	18	9/14	10/14	14/14	18/14
20	19	9/12	14/14	15/14	19/14
21	-	Com for coil 16 ... 19 ¹⁾			
22	-	Com for coil 12 ... 15 ¹⁾			
23	-	Com for coil 8 ... 11 ¹⁾			
24	-	Com for coil 4 ... 7 ¹⁾			
25	-	Com for coil 0 ... 3 ¹⁾			

1) Connect 0 V with positive-switching control signals, 24 V with negative-switching control signals.

Fig. 8

44-pin HD-Sub-D connection on the valve terminal

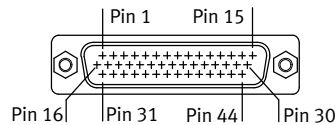


Fig. 9

Pin assignment of the variant V21:

Pin	Addr.	VP. no./coil	Pin	Addr.	VP. no./coil
1	0	0/14	23	22	11/14
2	1	0/12	24	23	11/12
3	2	1/14	25	24	12/14
4	3	1/12	26	25	12/12
5	4	2/14	27	26	13/14
6	5	2/12	28	27	13/12
7	6	3/14	29	28	14/14
8	7	3/12	30	29	14/12
9	8	4/14	31	30	15/14
10	9	4/12	32	31	15/12
11	10	5/14	33	32	16/14
12	11	5/12	34	33	16/12
13	12	6/14	35	34	17/14
14	13	6/12	36	35	17/12
15	14	7/14	37	36	18/14
16	15	7/12	38	37	19/14
17	16	8/14	39	38	20/14
18	17	8/12	40	39	21/14
19	18	9/14	41	40	22/14
20	19	9/12	42	41	23/14
21	20	10/14	43	Com for coil 0 ... 41 ¹⁾	
22	21	10/12	44	Com for coil 0 ... 41 ¹⁾	

1) Connect 0 V with positive-switching control signals, 24 V with negative-switching control signals.

Fig. 10

26-pin connection for ribbon cable on the valve terminal

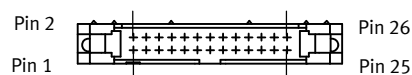


Fig. 11

Pin allocation of the variants V20:

Pin	Addr.	Maximum number of valve positions			
		12	16	20	24
Valve position no./coil designation					
1	0	0/14	0/14	0/14	0/14
2	1	0/12	0/12	0/12	23/14
3	2	1/14	1/14	1/14	1/14
4	3	1/12	1/12	1/12	22/14
5	4	2/14	2/14	2/14	2/14
6	5	2/12	2/12	2/12	21/14
7	6	3/14	3/14	3/14	3/14
8	7	3/12	3/12	3/12	20/14
9	8	4/14	4/14	4/14	4/14
10	9	4/12	4/12	19/14	19/14
11	10	5/14	5/14	5/14	5/14
12	11	5/12	5/12	18/14	18/14
13	12	6/14	6/14	6/14	6/14
14	13	6/12	6/12	17/14	17/14
15	14	7/14	7/14	7/14	7/14
16	15	7/12	7/12	16/14	16/14
17	16	8/14	8/14	8/14	8/14
18	17	8/12	15/14	15/14	15/14
19	18	9/14	9/14	9/14	9/14
20	19	9/12	14/14	14/14	14/14
21	20	10/14	10/14	10/14	10/14
22	21	10/12	13/14	13/14	13/14
23	22	11/14	11/14	11/14	11/14
24	23	11/12	12/14	12/14	12/14
25	-	Com ¹⁾			
26	-	Com ¹⁾			

1) Connect 0 V with positive-switching control signals, 24 V with negative-switching control signals.

Fig. 12

50-pin connection for flat cable on the valve terminal

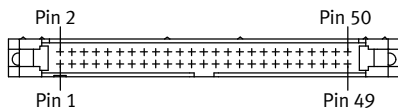


Fig. 13

Pin allocation of the variant V26

Pin	Addr.	VP. no./coil	Pin	Addr.	VP. no./coil
1	0	0/14	26	25	12/12
2	1	0/12	27	26	13/14
3	2	1/14	28	27	13/12
4	3	1/12	29	28	14/14
5	4	2/14	30	29	14/12
6	5	2/12	31	30	15/14
7	6	3/14	32	31	15/12
8	7	3/12	33	32	16/14
9	8	4/14	34	33	16/12
10	9	4/12	35	34	17/14
11	10	5/14	36	35	17/12
12	11	5/12	37	36	18/14
13	12	6/14	38	37	18/12
14	13	6/12	39	38	19/14
15	14	7/14	40	39	19/12
16	15	7/12	41	40	20/14
17	16	8/14	42	41	20/12
18	17	8/12	43	42	21/14
19	18	9/14	44	43	21/12
20	19	9/12	45	44	22/14
21	20	10/14	46	45	22/12
22	21	10/12	47	46	23/14
23	22	11/14	48	47	23/12
24	23	11/12	49	Com ¹⁾	
25	24	12/14	50	Com ¹⁾	

1) Connect 0 V with positive-switching control signals, 24 V with negative-switching control signals.

Fig. 14

4 I-port connection

Up to 48 solenoid coils can be actuated with the VTUG-...-V.

The VTUG-...-V can be connected as follows via the I-Port connection:

- directly to the fieldbus by mounting a CTEU bus node on the VTUG-...-V
- decentralised at an external I-Port
- to an IO-Link master in the IO-Link mode.

4.1 Pin allocation of the plug of the I-Port/IO-Link cable

Plug connector, 5-pin, M12x1, A-coded	Pin	Allocation
	1	24 V _{EL/SEN} (PS), operating voltage
	2	24 V _{VAL/OUT} (PL), load voltage
	3	0 V _{EL/SEN} (PS), operating voltage
	4	C/Q _{I-PORT} , data communication
	5	0 V _{VAL/OUT} (PL), load voltage
Housing		FE, functional earth (optional)

Fig. 15

4.2 Fieldbus connection

Information on the CTEU-... bus node can be found in the Internet ([→ www.festo.com/sp](http://www.festo.com/sp)).

4.3 LED display X1

The LED display X1 ([→ Fig. 4](#)) displays the following statuses.

LED X1	Status and significance
	LED illuminated green: - normal operating status
	LED flashing green: - data communication not satisfactory
	LED flashing red - device error
	LED flashes alternately green/red - 24 V load voltage not satisfactory (no voltage, undervoltage or short circuit)
	LED illuminated red - data communication and 24 V load voltage not satisfactory (no voltage, undervoltage or short circuit)

Fig. 16

4.4 IO-Link mode

The valve terminal VTUG-...-V can also be operated as an IO-Link device. Here, the I-Port connection is used in an IO-Link mode. The IODD configuration file required for this can be downloaded at www.festo.com/sp.

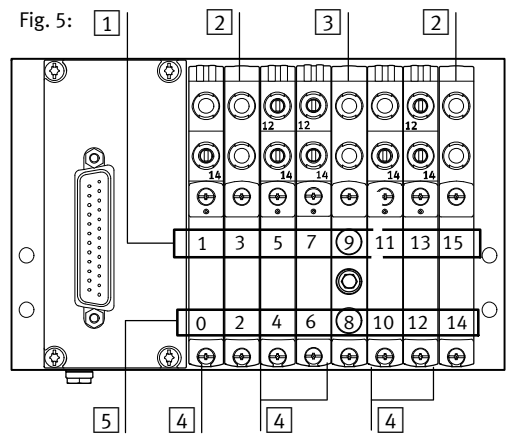
5 Earthing the valve terminal VTUG-...



Note

- Earth valve terminal VTUG-... in order to avoid malfunctions due to electro-magnetic influences.
- To earth the valve terminal, use the earth terminal ([→ Fig. 2](#)). To create a conducting connection, the anodised coating on the earth terminal of the sub-base must be penetrated.
- Shim the mounting screw, e.g. with a toothed disc that penetrates the anodised coating of the sub-base.

6 Address assignment of the valves



- 1 Higher-value address
- 2 Blanking plate
- 3 Auxiliary power supply
- 4 Valve
- 5 Less-significant address

Fig. 17

Fig. 17 shows as an example the address assignment of the valve terminal VTUG-... with 8 valve positions (top view).

- Address assignment is in ascending order without gaps, from left to right ([→ Fig. 17](#)).
- Address assignment does not depend on whether vacant positions are equipped with blanking plates [2] on vacant positions, auxiliary power supplies [3] or valves [4].

- A valve position occupies either 1 or 2 addresses.
- The following assignment applies with valve positions for 2 coils:
 - Less significant address [5] for solenoid coil 14
 - Higher-value address [1] for solenoid coil 12.

7 Pilot control with external pilot air supply (optional)

The valve terminal VTUG... is supplied as standard with internal pilot pressure branched off from channel 1. Optionally, the VTUG... can be provided with external pilot air with the help of the pilot air selector. The pilot air is then supplied via port 14 of the VTUG....

i Mounting of the pilot air supply selector is described in the mounting instructions VABM-L1-...G....

8 Pressure zones

Using separators, the valve terminal VTUG... can be divided into pressure zones.

i Mounting of these separators is described in the mounting instructions VABD-... B.

→ Note

Damage to the supply plate
The supply plate VABF-L1-14-P3A4-G18-T1 must not be equipped with fittings with an R-thread!
• Only use fittings with a G-thread for the supply plate VABF-L1-14-P3A4-G18-T1.

9 Inscription labels

The valves of the VTUG... can be equipped with an inscription label holder (→ Mounting instructions ASCF-H-L1) or with identification plate holders (→ Mounting instructions ASLR-D). The I-port sub-base can be equipped with the identification plate ASLR-C-E4.

10 Manual override (MO)

Actuation of the MO under the holders of the inscription label holder ASCF-H-L1 or under the identification plate holders ASLR-D, is only possible in a non-detenting manner.

→ Note

Destruction of the MO
• Observe the maximum permissible actuating force of 20 N.

11 H-rail mounting

The valve terminal VTUG... is designed for mounting on an H-rail.

i The H-rail mounting is described in the mounting instructions VAME-T-M4 and VAME-T-M5.

12 Technical data

VTUG-...		Valve width [mm]		
		10	14	18
Number of valve positions		4 ... 24		
Mounting position		any		
- Wall mounting		horizontal		
- H-rail mounting		horizontal		
Ambient temperature		-5 ... +60 °C		
- VTUG-...-M		-5 ... +50 °C		
- VTUG-...-V		-5 ... +50 °C		
Storage temperature		-20 ... +60 °C		-10 ... +60 °C
Protection class in accordance with EN 60529 (Valve terminal completely mounted, plug connector plugged in).		IP40/IP65/IP67		
Operation with external pilot air (IC = ident. code)				
Operating pressure		-0.9 ... 10 bar		
- 5/3-; 5/2-; 2x 3/2-; 3/2-way valves (IC: B, E, G; J, A, M, P; VH, VK, VN, VX, VW)		-0.9 ... 10 bar		
- 2x 3/2-way valves (IC: H, K, N)		1.5 ... 10 bar		
Pilot pressure ¹⁾		3 ... 8 bar		
- 5/3-, 5/2-way valves (IC: B, E, G, A)		3 ... 8 bar		
- 5/2-way valve (impulse) (IC: J)		1.5 ... 8 bar		
- 5/2-; 3/2-way valve (IC: M, P, VX, VW)		2.5 ... 8 bar		3.5 ... 8 bar
- 2x 3/2-way valve (IC: VH, VK, VN)		2 ... 8 bar		
- 2x 3/2-way valve with pneumatic spring (IC: H, K, N)		1.5 ... 8 bar		
Operation with internal pilot air supply (IC = ident. code)				
Operating and control pressure ¹⁾²⁾		3 ... 8 bar		
- 5/3-, 5/2-way valves (IC: B, E, G, A)		3 ... 8 bar		
- 5/2-way valves (impulse) (IC: J)		1.5 ... 8 bar		
- 5/2-; 3/2-way valves (IC: M, P, VX, VW)		2.5 ... 8 bar		3.5 ... 8 bar
- 2x 3/2-way valve (IC: VH, VK, VN)		2 ... 8 bar		
- 2x 3/2-way valve with pneumatic spring (IC: H, K, D)		1.5 ... 8 bar		
Control voltage		24 V DC		
- Nominal value (protected against incorrect polarity)		24 V DC		
- Tolerance		±10 %		
Current consumption per solenoid coil at 24 V DC				
- Pull current (duration 20 ms)		47 mA		-
- Holding current		15.5 mA		-
Maximum current consumption				
- Valves (general)/electronics (I-Port)		2 mA/0.1 mA		
Materials		AL, PA, POM, NBR, PU, PC		
Tightening torque				
- Electrical interface		0.7 Nm (±20 %)		
- Bus node CTEU-... on VTUG-...-V		0.7 Nm (±0.1 Nm)		
- Valve on manifold rail		0.3 Nm (+50 %)	0.55 Nm (±20 %)	0.7 Nm (±20 %)
- Selector		1.5 Nm (-20 %)		5 Nm (±20 %)
- Earthing screw		1.0 Nm (±20 %)		
Operating and pilot medium		Compressed air in accordance with ISO 8573-1:2010 [7:4:4]		
Exhaust		If there are more than 6 simultaneously switched valves, exhausting on both sides is required.		
Electromagnetic compatibility (EMC) ³⁾		→ Declaration of conformity (www.festo.com)		
Protection against electric shock (protection against direct and indirect contact to IEC/EN 60204-1)		through the use of PELV circuits		

- 1) If the VTUG... is operated with external pilot air, the pressure of the pilot air must be at least 50 % of the operating pressure.
- 2) Reduce pilot pressure to max. 6 bar if there are more than 12 simultaneously switched valves.
- 3) The valve terminal is intended for use in an industrial environment. Outside of industrial environments, e.g. in commercial and mixed-residential areas, actions to suppress interference may have to be taken.

Fig. 18

13 Valve terminal VTUG-...-V, error diagnostics

Code		Malfunction and error handling	Type
MSB	LSB		
50h	00h	Device error • Switch device off and restart; if the error continues to occur, the device is defective.	Warning
51h	12h	Error in the load voltage supply • Check the load voltage supply	Warning

Fig. 19