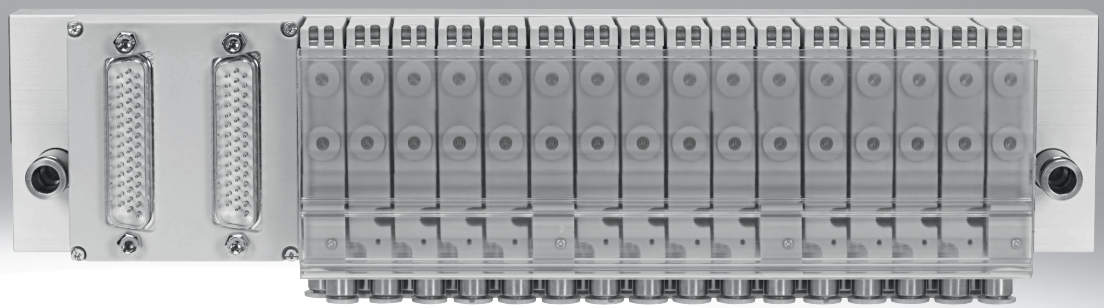
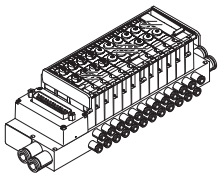
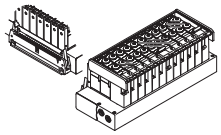
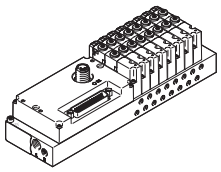
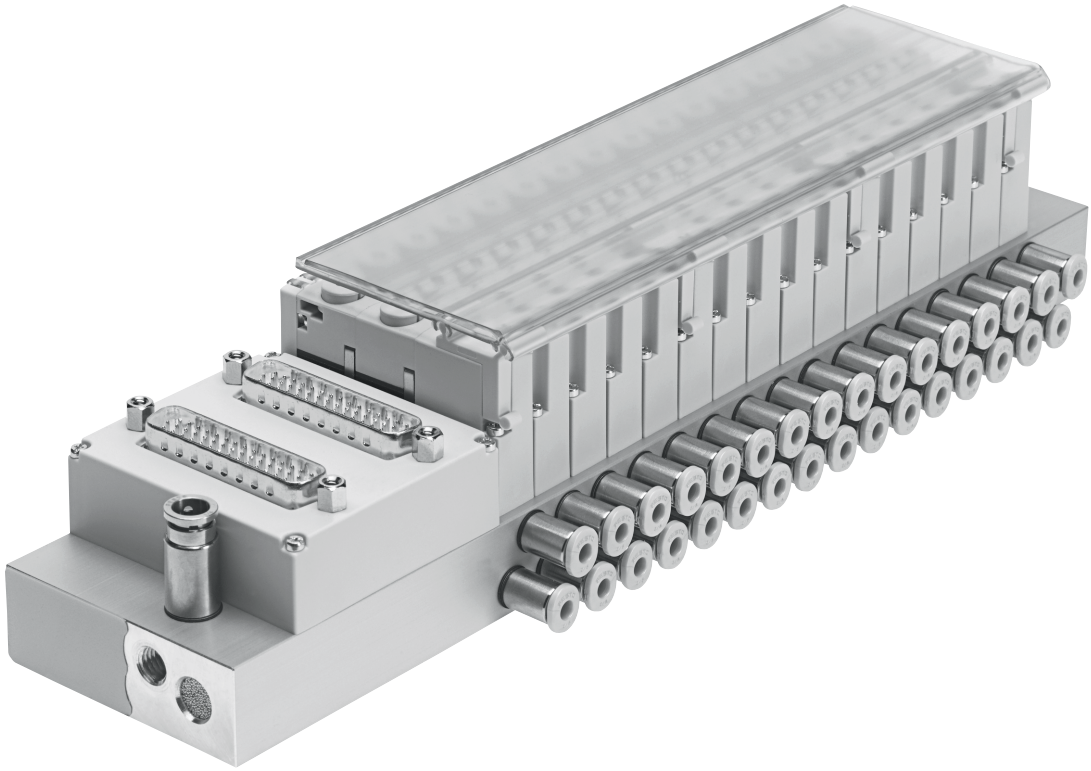
# Valve terminals VTOC



# Overview – Valve terminals

| Design | Type code | Description | → Page/ Internet |
|---|---|---|---|
| **Valve terminal VTOC with multi-pin plug connection, Sub-D** | | | |
|  | SD | • Sub-D 25-pin<br>• Sub-D 44-pin | 29 |
| **Valve terminal VTOC with multi-pin plug connection, ribbon cable** | | | |
|  | RC | • Flat cable 26-pin<br>• Flat cable 40-pin<br>• Flat cable 50-pin | 29 |
| **Valve terminal with I-Port interface, interlock/IO-Link®** | | | |
|  | LK/PT | • I-Port interface: plug M12, 5-pin<br>• Sub-D 44-pin<br>• IO-Link® | 31 |

# Key features



**Innovative**

- Valve terminal for a wide range of pneumatic applications
- Weight-optimised metal manifold rail
- Space-saving thanks to 2x3/2-way valves on one valve position
- Great flexibility during planning, assembly and operation
- Configurable manifold rails (pneumatic and electric connections)

**Flexible**

- Provides 2 ... 24 valve positions on one terminal
- Flexibility of the pneumatic working ports provides a practical solution to different requirements
- Wide range of electrical outlet directions
- Multi-pin plug connection with Sub-D plug or ribbon cable
- I-Port interface with interlock for fieldbus node (CTEU)
- IO-Link® mode for direct connection to a higher-level IO-Link master

**Reliable**

- Manual override – non-detenting, non-detenting/detenting, detenting
- Long service life
- Sturdy thanks to simple design

**Easy to install**

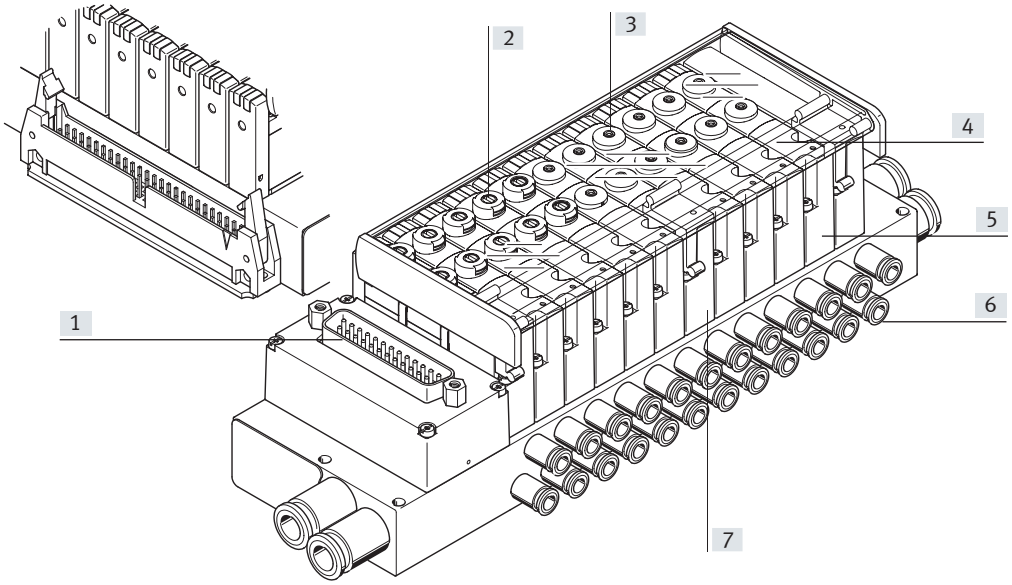
- Ready-to-install and tested unit
- Reduced ordering, assembly and commissioning costs
- Easy valve assembly

**Note**

Ordering system for valve terminal VTOC
→ Internet: vtoc

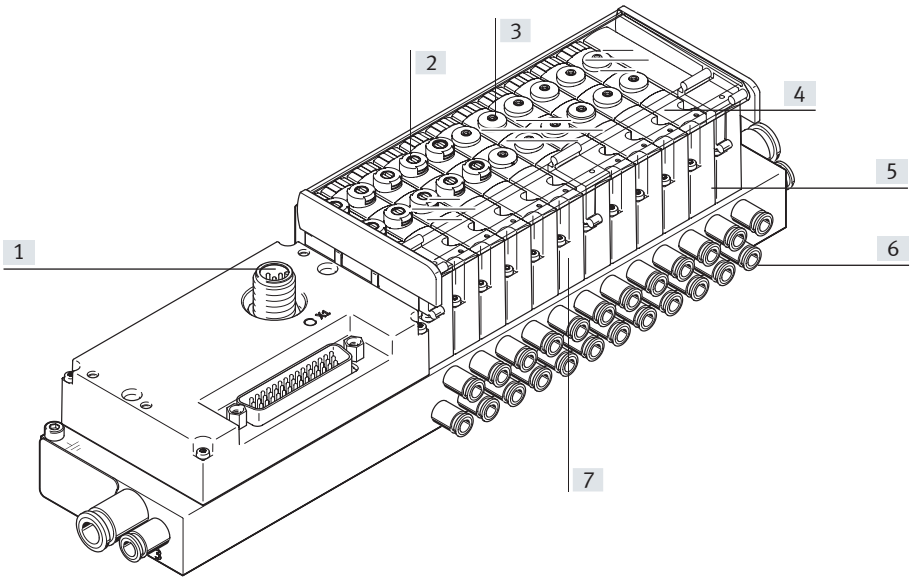
# Characteristics – Valve terminals

**Valve terminal with multi-pin plug connection:**




[1] Simple electrical connections: ribbon cable or Sub-D
[2] Valve with manual override, detenting, non-detenting
[3] Valve with manual override, non-detenting
[4] Valve with manual override, detenting
[5] Valve width 10 mm
[6] Choice of pneumatic outlets: straight or angled QS push-in connectors
[7] Space-saving thanks to 2x3/2-way valves

**Valve terminal with I-Port interface, interlock/IO-Link®**




[1] I-Port interface with interlock/IO-Link®
[2] Valve with manual override, detenting, non-detenting
[3] Valve with manual override, non-detenting
[4] Valve with manual override, detenting
[5] Valve width 10 mm
[6] Choice of pneumatic outlets: straight or angled QS push-in connectors
[7] Space-saving thanks to 2x3/2-way valves

**Equipment options**

Valve functions

- 2x3/2-way valve, single solenoid, normally closed
- Valve with manual override, non-detenting
- Valve with manual override, detenting, non-detenting
- Valve with manual override, detenting
- 2 ... 24 valve positions/max. 48 solenoid coils

Electrical connection options

- Variable multi-pin plug connection: Sub-D or ribbon cable
- I-Port interface with interlock for fieldbus node (CTEU)
- IO-Link® mode for direct connection to a higher-level IO-Link master

# Key features

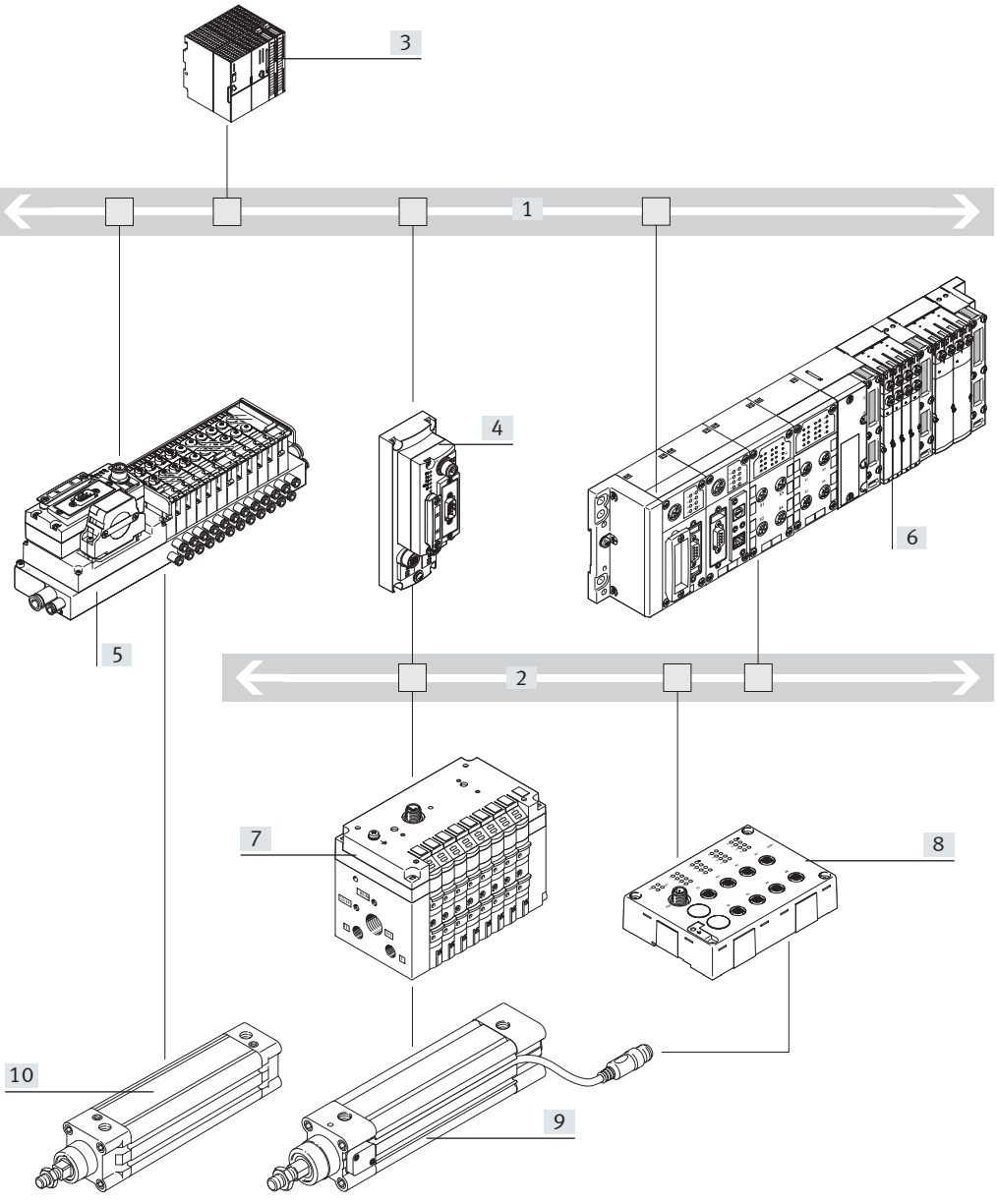
**Integration of the I-Port interface/IO-Link®**

Different bus nodes are used for integration into the control systems of various manufacturers.

The following protocols are supported with the compatible fieldbus node CTEU:
- CANopen
- DeviceNet®
- EtherCAT®
- CC-Link®
- PROFIBUS
- AS-Interface
- PROFINET
- EtherNet/IP
- VARAN

By using the electrical connection block CAPC, the bus nodes CTEU can be installed decentrally on an additional valve terminal or input modules with I-Port interfaces (➔ installation system CTEU/CTEL)

System overview, example




[1] Fieldbus
[2] IO-Link®/ I-Port
[3] PLC
[4] Bus node CTEU (I-Port master) on electrical connection block CAPC
[5] Valve terminal VTOC, I-Port interface with bus node CTEU
[6] CPX terminal with bus node and CTEL master
[7] Valve terminal CPV with I-Port interface/IO-Link®
[8] Input module CTSL
[9] Pneumatic drive with sensor
[10] Pneumatic drive

- Communication with the higher-order controller via fieldbus
- Use a fieldbus node CTEU compatible with the fieldbus protocol
- Up to 64 inputs/outputs (solenoid coils), depending on the valve terminal

# Peripherals overview

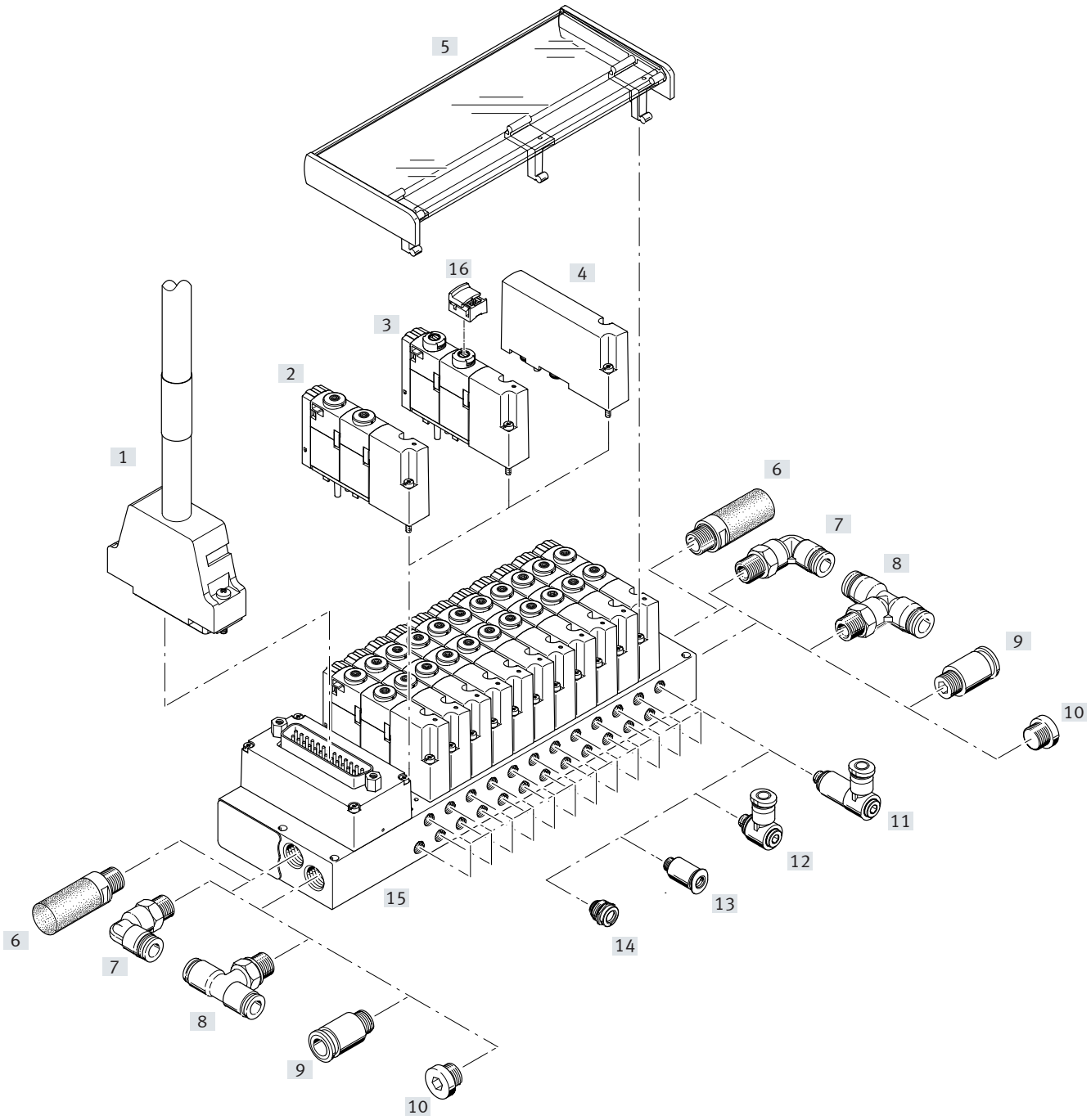
**Overview – Valve terminal VTOC with multi-pin plug connection, Sub-D**

- Up to 24 valve positions/48 solenoid coils
- Connection type: ribbon cable, code: RC
- Connection type: Sub-D plug, code: SD

Valve terminals with electrical multi-pin plug connection are available with 2 to max. 24 valve positions. Each valve position can either be equipped with a valve body or a blanking plate.

Only valve bodies containing two single solenoid 3/2-way valves are available.

A maximum of 48 solenoid coils can therefore be actuated via the electrical multi-pin plug connection.



# Peripherals overview

**Accessories**

| | | Type | Brief description | → Page/ Internet |
|---|---|---|---|---|
| [1] | Connecting cable | KMP6/ NEBV | For multi-pin plug connection, with Sub-D plug, 25-pin or 44-pin | 41 |
| [2] | Solenoid valve, single solenoid | VOVC | With manual override, non-detenting | 41 |
| [3] | Solenoid valve, single solenoid | VOVC | With manual override, detenting, non-detenting | 41 |
| [4] | Blanking plate | VABB | For vacant position | 41 |
| [5] | Inscription label holder | ASCF | For labelling the valves/covering the manual override | 42 |
| [6] | Silencer | U | For mounting in exhaust ports | 42 |
| [7] | Elbow connector | QSL | For connecting to the air supply or exhaust | 42 |
| [8] | T-fitting | QST | For connecting to the air supply or exhaust | 42 |
| [9] | Straight fitting | OS | For connecting to the air supply or exhaust | 42 |
| [10] | Blanking plug | B | For sealing the air supply or exhaust port | 41 |
| [11] | Push-in L-fitting, long | QSMLLV | Long elbow connector for working ports | 42 |
| [12] | Push-in L-fitting | QSMLV | Elbow connector for working ports | 42 |
| [13] | Push-in fitting | QS | Straight push-in fitting for working ports | 42 |
| [14] | Push-in fitting | QSIMG | Straight countersunk push-in fitting for working ports (compact) | – |
| [15] | Manifold rail | VABB | With multi-pin plug connection for max. 24 valve positions | – |
| [16] | Covering | VAMC | For manual override, detenting (without accessories) | 41 |

# Peripherals overview

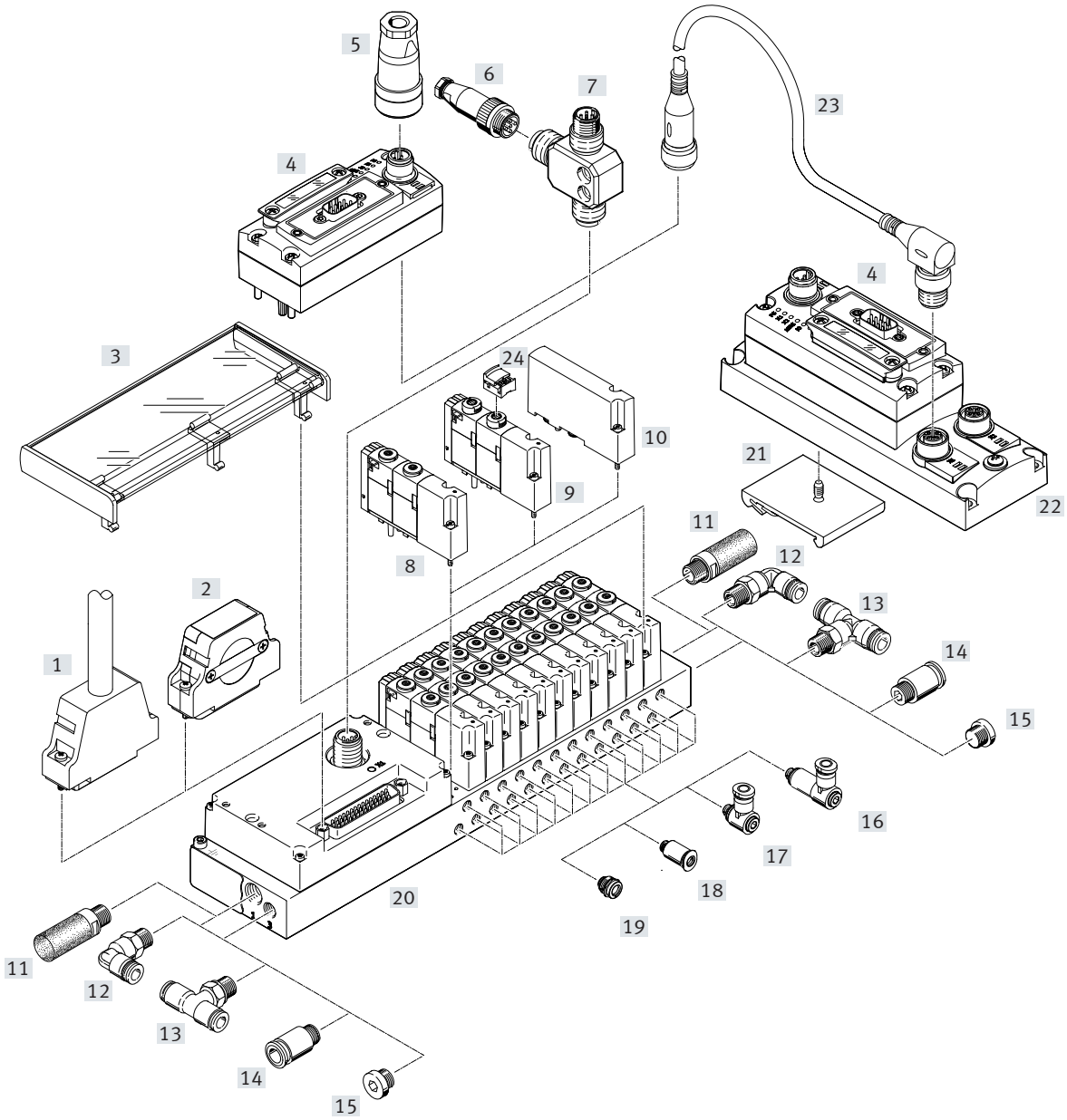
**Overview – Valve terminal VTOC with I-Port interface, interlock/IO-Link®**

- Up to 24 valve positions/48 solenoid coils
- Connection type: I-Port interface with interlock code: PT
- Code: LK

The electrical supply/ transmission of communication takes place via an M12 plug. The valve terminal can be equipped with 2 ... 24 valves. Only valve bodies containing two single solenoid 3/2-way valves are available.

The following protocols are supported in connection with the associated fieldbus node CTEU:

- CANopen
- DeviceNet®
- CC-Link®
- PROFIBUS
- EtherCAT®
- AS-Interface
- PROFINET
- EtherNet/IP
- VARAN



# Peripherals overview

**Accessories**

| | | Type | Brief description | → Page/ Internet |
|---|---|---|---|---|
| [1] | Connecting cable | KMP6/ NEBV | For multi-pin plug connection, with Sub-D plug, 44-pin | 41 |
| [2] | Plug socket | NEFF | For bypassing the interlock function | 44 |
| [3] | Inscription label holder | ASCF | For labelling the valves/covering the manual override | 42 |
| [4] | Fieldbus | CTEU | Bus node | 43 |
| [5] | Plug socket | NECB/ NTSD | For fieldbus node CTEU | 44 |
| [6] | Plug | NECB | Straight, for T-adapter FB-TA | 44 |
| [7] | T-adapter | FB-TA | For IO-Link® and load supply | 44 |
| [8] | Solenoid valve, single solenoid | VOVC | With manual override, non-detenting | 41 |
| [9] | Solenoid valve, single solenoid | VOVC | With manual override, detenting, non-detenting | 41 |
| [10] | Blanking plate | VABB | For vacant position | 41 |
| [11] | Silencer | U | For mounting in exhaust ports | 42 |
| [12] | Elbow connector | QSL | For connecting to the air supply or exhaust | 42 |
| [13] | T-fitting | QST | For connecting to the air supply or exhaust | 42 |
| [14] | Straight fitting | OS | For connecting to the air supply or exhaust | 42 |
| [15] | Blanking plug | B | For sealing the air supply or exhaust port | 41 |
| [16] | Push-in L-fitting, long | QSMLLV | Long elbow connector for working ports | 42 |
| [17] | Push-in L-fitting | QSMLV | Elbow connector for working ports | 42 |
| [18] | Push-in fitting | QS | Straight, for working ports | 42 |
| [19] | Push-in fitting | QSIMG | Straight countersunk push-in fitting for working ports (compact) | – |
| [20] | Manifold rail | VABB | With I-Port interface/IO-Link®, interlock | – |
| [21] | DIN rail mounting | CAFM | For electrical connection block CAPC | 44 |
| [22] | E-box | CAPC | For connecting a second device with I-Port interface | 44 |
| [23] | Connecting cable | NEBU | – | 44 |
| [24] | Covering | VAMC | For manual override, detenting (without accessories) | 41 |

# Peripherals overview

**Pin assignment variants**

| Ribbon cable | Number of valve positions | Top left (LT) | | | | Bottom left (LB) | | Top right (RT) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 26-pin Single | 26-pin Double | 50-pin Single | 50-pin Double | 26-pin Single | 26-pin Double | 40-pin Single | 40-pin Double | 50-pin Single | 50-pin Double |
| | 4–12 | V14 | – | – | – | V8 | – | – | – | – | – |
| | 8–12 | – | – | V11[1] | – | – | – | – | – | V10[1] | – |
| | 6–10 | – | – | – | – | – | – | V9[1][2] | – | – | – |
| | 13–24 | – | V15 | – | – | – | V17 | – | – | – | – |
| | 16–24 | – | – | – | V16[1] | – | – | – | – | – | – |
| | 16–20 | – | – | – | – | – | – | – | V18[1][2] | – | – |
| | 18–24 | – | – | – | – | – | – | – | – | – | V19[1] |

1) Separate earth
2) Not bi-directional

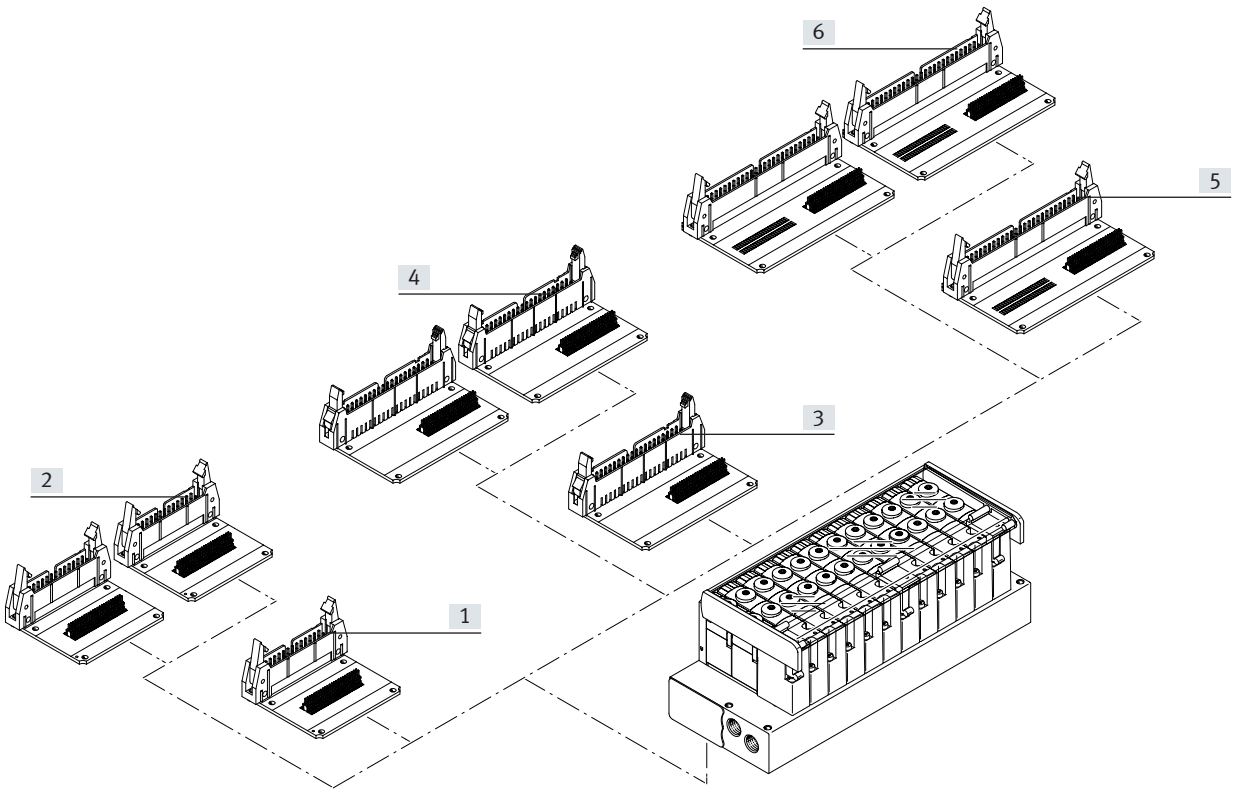
**Overview of electrical connections**

Valve terminal with ribbon cable connection on top

- Connection type: ribbon cable, code: RC
- Connection direction:
  – Top left (code LT)
  – Top right (code RT)

A total of 10 pin assignment variants are available.

Detailed pin assignment
➔ p. 21




**Accessories**

| | Code | Brief description | Number of valve positions | Variants |
|---|---|---|---|---|
| [1] Flat cable 26-pin | LT | Single, top left | 4–12 | V14 |
| [2] Flat cable 26-pin | | Double, top left | 13–24 | V15 |
| [3] Flat cable 40-pin | RT | Single, top right | 6–10 | V9 |
| [4] Flat cable 40-pin | | Double, top right | 16–20 | V18 |
| [5] Flat cable 50-pin | RT | Single, top right | 8–12 | V10 |
| [6] Flat cable 50-pin | | Double, top right | 18–24 | V19 |
| [5] Flat cable 50-pin | LT | Single, top left | 8–12 | V11 |
| [6] Flat cable 50-pin | | Double, top left | 16–24 | V16 |

# Peripherals overview

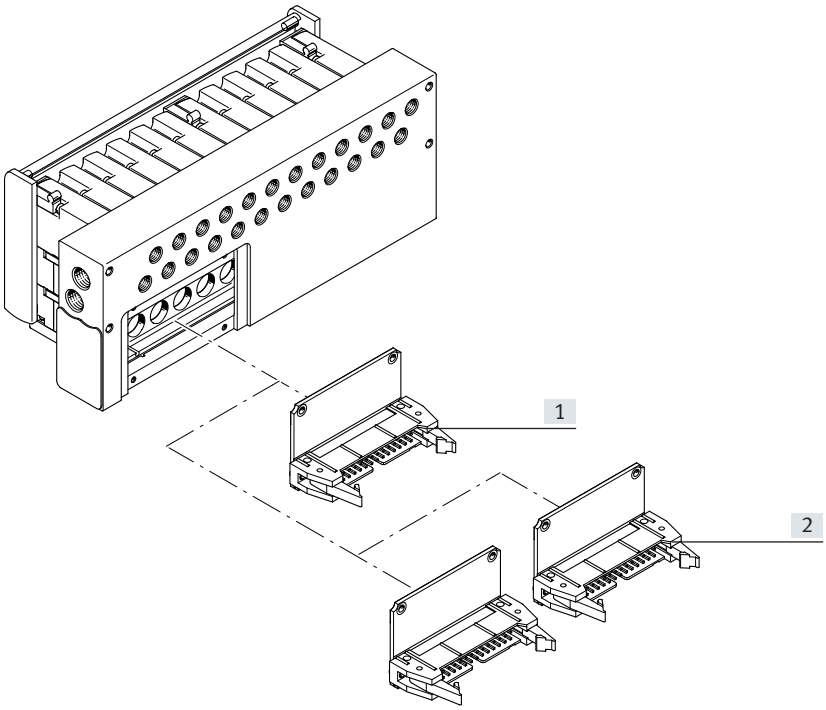
**Overview of electrical connections**

Valve terminal with ribbon cable connection underneath

- Connection type: ribbon cable, code: RC
- Connection direction:
  – Bottom left (code LB)

A total of 10 pin assignment variants are available.

Detailed pin assignment
➔ p. 21




**Accessories**

| | Code | Brief description | Number of valve positions | Variants |
|---|---|---|---|---|
| [1] Flat cable 26-pin | LB | Single, bottom left | 4–12 | V8 |
| [2] Flat cable 26-pin | | Double, bottom left | 13–24 | V17 |

# Peripherals overview

**Pin assignment variants**

| Sub-D | Number of valve positions | Top left (LT) | | | | | | | | Top right (RT) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 25-pin, single | | | 25-pin, double | 25-pin, double | 44-pin, single | 44-pin, double | | 44-pin, single |
| | 2–12 | V 2 | V3[2] | V1 | – | – | – | – | – | – |
| | 4–12 | – | – | – | – | V12[1] | – | – | – | – |
| | 13–21 | – | – | – | – | – | V5 | – | – | V13 |
| | 13–22 | – | – | – | – | – | – | V7[1] | V6[1][2] | – |
| | 13–24 | – | – | – | V4 | – | – | – | – | – |

1) Separate earth
2) Not bi-directional

**Overview of electrical connections**

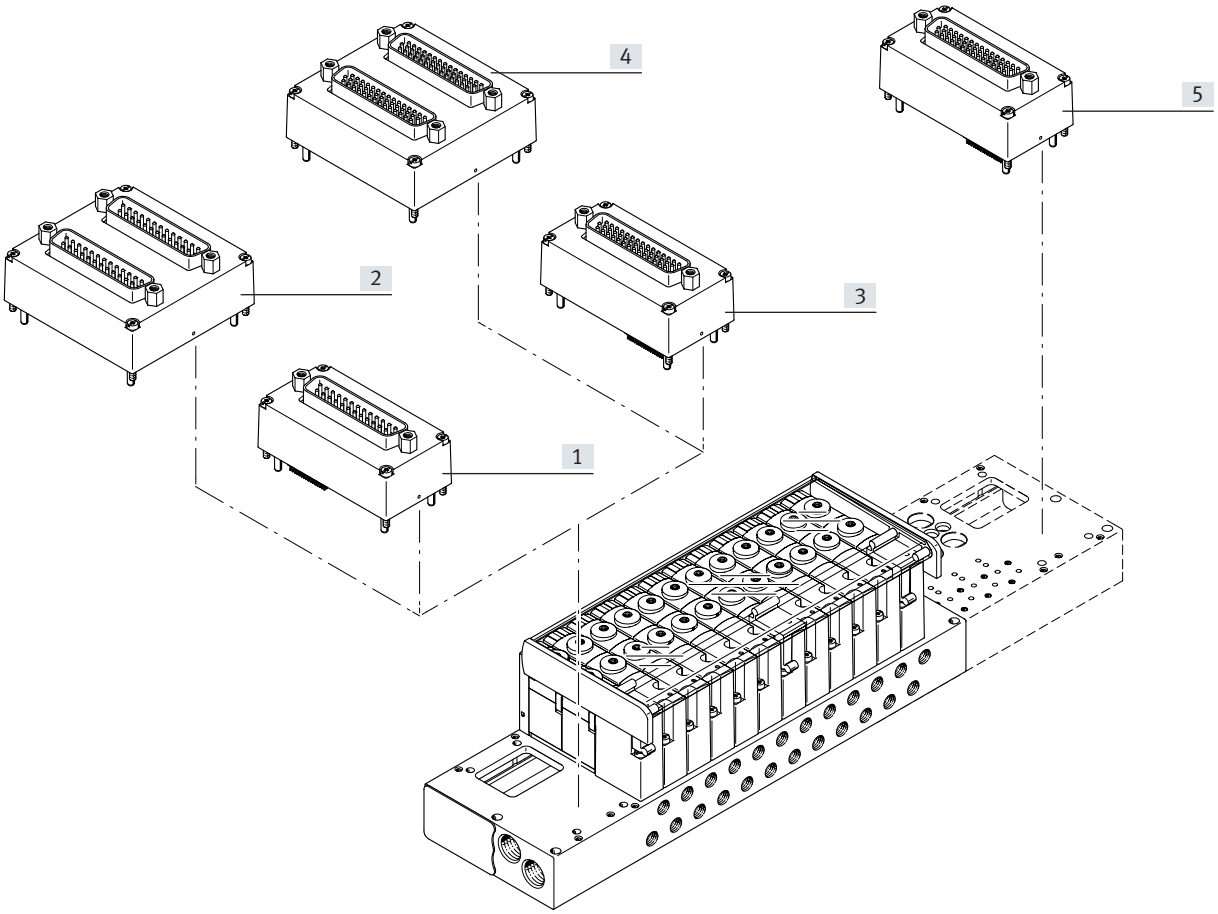
Valve terminal with Sub-D connection on top

- Connection type: Sub-D
  code: SD

Connection direction:
- Top left (code LT)
- Top right (code RT)

A total of 9 pin assignment variants are available.

Detailed pin assignment
→ p. 18




**Accessories**

| | | Code | Brief description | Number of valve positions | Variants |
|---|---|---|---|---|---|
| [1] | Sub-D 25-pin | LT | Single, top left | 2...12 | V1, V2, V3 |
| [2] | Sub-D 25-pin | | Double, top left | 13...24 | V4 |
| | | | | 4...12 | V12 |
| [3] | Sub-D 44-pin | LT | Single, top left | 13...21 | V5 |
| [4] | Sub-D 44-pin | | Double, top left | 13...22 | V6, V7 |
| [5] | Sub-D 44-pin | RT | Single, top right | 13...20 | V13 |

# Key features – Pneumatic components

## Design

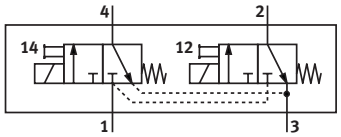
The valves are mounted on the metal manifold rail using two screws. The use of 2x3/2-way valves per valve position guarantees optimum use of space with maximum performance.

The valves differ only in the type of manual override. The assembled and tested units or individual components as modules enable a custom configuration.

Blanking plates can be replaced by valves at a later date.

The existing dimensions, mounting points and the pneumatic and electrical installation do not change.

**Valve function**

| Code | Circuit symbol | Width<br>10 mm | Description |
|---|---|---|---|
| K |  | ■ | 2x3/2-way valve, single solenoid<br>• Mechanical spring return<br>• Not reversible |

# Key features – Pneumatic components

**Fittings**

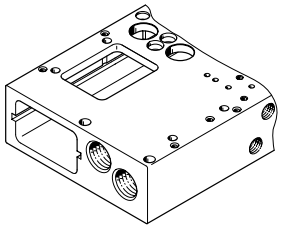
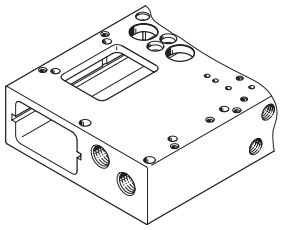
Ports 1/3

Wide range of connection sizes:
- Threaded connection M7, G1/8, 1/8 NPT
- Push-in connector QS6, QS8, QS3/8 or QS1/4 (compressed air supply)
- Push-in connector QS6, QS1/4 or silencer (exhaust air)

Choice of connection types for port 1, compressed air supply and port 3, exhaust air:
- Straight
- Elbow connector
- T-fitting

Flexible connection positions for the compressed air supply and exhaust:
- At both ends
- Left
- Right

**Ports 1/3**

| Connection direction: front | Code | Description |
|---|---|---|
|  | -G18 | Manifold block G1/8<br>(diagram shows example of Sub-D electrical connection on the left)<br>Basis for design:<br>• Push-in connector QS8<br>• Push-in connector QS3/8" |
|  | -M7 | Manifold block M7<br>(diagram shows example of Sub-D electrical connection on the left)<br>Basis for design:<br>• Push-in connector QS6<br>• Push-in connector QS1/4"<br>• Exhaust port via push-in fitting or silencer |

# Key features – Pneumatic components

**Fittings**

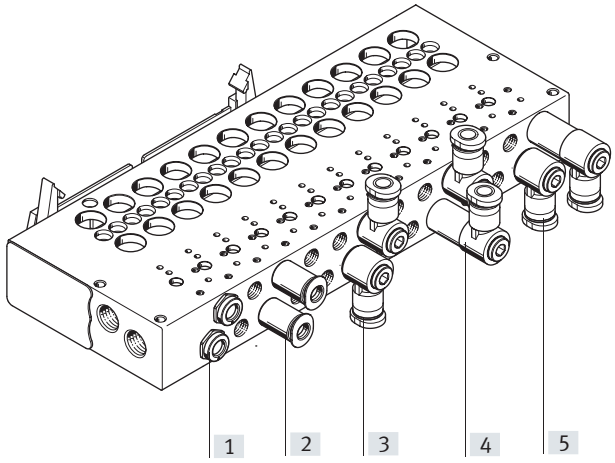
Ports 2/4

Wide range of connection sizes:
- Threaded connection M5
- 10-32 UNF
- Push-in connector QS3, QS4 or 1/8"

Outlet direction:
- Front
- Underneath

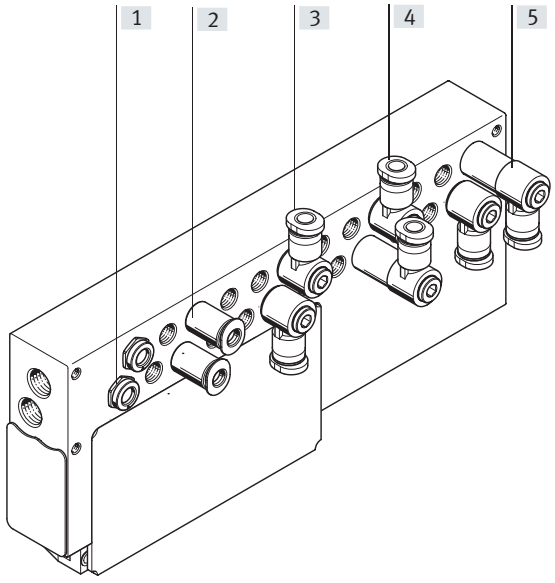
**Connection on the valve (port 2/4)**

Outlet direction at the front




| | Code | Description |
|---|---|---|
| [1] | X | Straight countersunk outlet (compact) |
| [2] | – | Straight outlet |
| [3] | FB | Angled outlet at top/underneath |
| [4] | FA | Angled outlet at top |
| [5] | FC | Angled outlet underneath |

Outlet orientation underneath

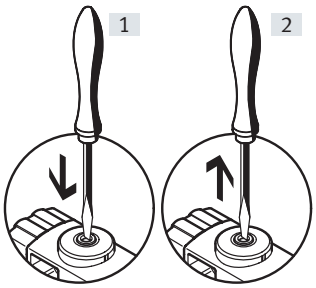



| | Code | Description |
|---|---|---|
| [1] | X | Straight countersunk outlet (compact) |
| [2] | U | Straight outlet |
| [3] | UB | Angled outlet, to the front/rear |
| [4] | UA | Angled outlet, to the front |
| [5] | UC | Angled outlet, to the rear |

# Key features – Display and operation

## Manual override (MO)

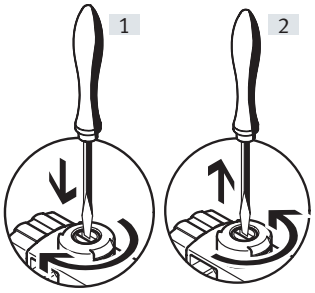
Manual override with automatic return (non-detenting)




[1] Press in the stem of the manual override with a pointed object or screwdriver. The valve switches.

[2] Remove the pointed object or screwdriver.
Spring force pushes the manual override back.
Valve returns to normal position.

Manual override with lock (non-detenting/detenting)



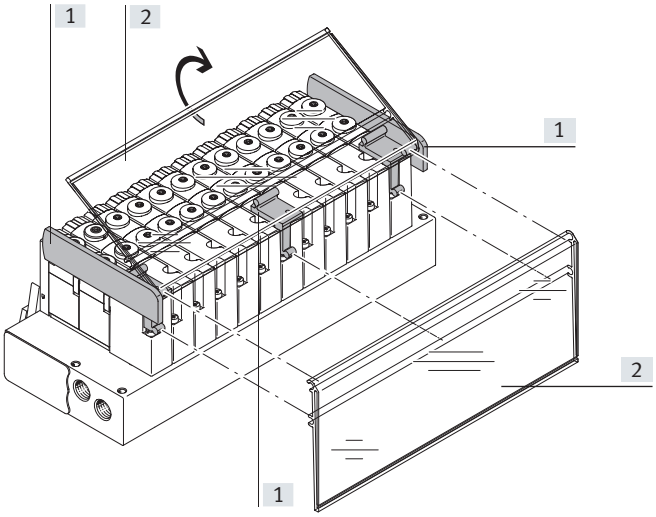

[1] Press in the stem of the manual override with a screwdriver until the valve switches and then turn the stem clockwise by 90° until the stop is reached.
The valve remains in the switching position.

[2] Turn the stem 90° anticlockwise until the stop is reached and then remove the screwdriver. Spring force pushes the manual override back.
Valve returns to normal position.

**Note**

VTOC provides two valves with the same valve function but different types of manual override. There is no provision for subsequent modification of the type of manual override (e.g. by attaching a cover).

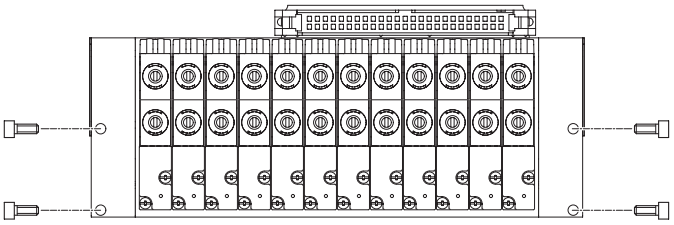
## Inscription system




[1] Retaining bracket for inscription label holder
The retaining bracket for the inscription label holder is mounted on the valves using a screw.
It enables the inscription label holder to be mounted in two different directions. The retainers at the side are flanged. to prevent the inscription label from sliding out.

[2] Inscription label holder
A transparent inscription label holder ASCF-H-L2 (code F/T in the order code) can be mounted for labelling the valves.
Inscription labels can be inserted in the holder for labelling purposes. Templates for printing the inscription label are available on request.

## Mounting – Valve terminal



Sturdy terminal mounting via:
- Four through-holes for wall mounting (hole diameter 3.3 mm)
- Four holes with thread on the reverse side:
  – Thread M3
  – Thread M4
  – Thread 8-32 UNC
  – Thread 10-32 UNC-2B

# Key features – Electric components

**Electrical connection**

Multi-pin plug

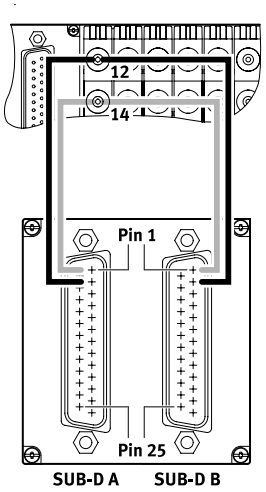
The following multi-pin plug connections are available for the valve terminal VTOC:
- Sub-D multi-pin plug connection (25-pin, single or double)
- Sub-D multi-pin plug connection (44-pin, single or double)
- Ribbon cable connector (26-pin, single or double)
- Ribbon cable connector (40-pin, single or double)
- Ribbon cable connector (50-pin, single or double)

The multi-pin plug connection is available with 19 different pin assignment variants.
Other variants on request.
Connection directions:
Sub-D connection (top left/right)
Ribbon cable (top/bottom left, top/bottom right)

Signals from the controller to the valve terminal are transmitted via the multi-core pre-assembled cable; this substantially reduces installation time.

The valves are switched using 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 24, this means that 48 solenoid coils can be addressed.

Explanation of pin assignment (V12)



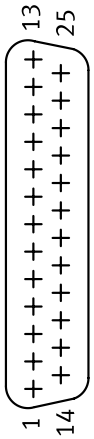

The example shows the pin assignment code V12. The solenoid coils are wired in ascending order of the valves so that solenoid coil 14 occupies the low-value pin and solenoid coil 12 the next pin of both Sub-D connections:
- Pin 1 of Sub-D A and Sub-D B at valve position 1, coil 14.
- Pin 2 of Sub-D A and Sub-D B at valve position 1, coil 12.

The following tables show the different pin assignments variants.

The circuitry may differ from the example depending on the multi-pin plug connection chosen.

# Key features – Electric components

**Pin assignment – Sub-D plug, 25-pin**




| Pin | -V1 | | -V2 | | -V3 | | -V4 | | | | -V12 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Sub-D A[1] | | Sub-D B[2] | | Sub-D A[1] | | Sub-D B[2] | |
| 1 | VP1 | 12 | VP1 | 14 | VP1 | 14- | VP1 | 14 | VP13 | 14 | VP1 | 14 | VP1 | 14 |
| 2 | VP1 | 14 | VP2 | 14 | VP2 | 14- | VP1 | 12 | VP13 | 12 | VP1 | 12 | VP1 | 12 |
| 3 | VP2 | 12 | VP3 | 14 | VP3 | 14- | VP2 | 14 | VP14 | 14 | VP2 | 14 | VP2 | 14 |
| 4 | VP2 | 14 | VP4 | 14 | VP4 | 14- | VP2 | 12 | VP14 | 12 | VP2 | 12 | VP2 | 12 |
| 5 | VP3 | 12 | VP5 | 14 | VP5 | 14- | VP3 | 14 | VP15 | 14 | VP3 | 14 | VP3 | 14 |
| 6 | VP3 | 14 | VP6 | 14 | VP6 | 14- | VP3 | 12 | VP15 | 12 | VP3 | 12 | VP3 | 12 |
| 7 | VP4 | 12 | VP7 | 14 | VP7 | 14- | VP4 | 14 | VP16 | 14 | VP4 | 14 | VP4 | 14 |
| 8 | VP4 | 14 | VP8 | 14 | VP8 | 14- | VP4 | 12 | VP16 | 12 | VP4 | 12 | VP4 | 12 |
| 9 | VP5 | 12 | VP9 | 14 | VP9 | 14- | VP5 | 14 | VP17 | 14 | VP5 | 14 | VP5 | 14 |
| 10 | VP5 | 14 | VP10 | 14 | VP10 | 14- | VP5 | 12 | VP17 | 12 | VP5 | 12 | VP5 | 12 |
| 11 | VP6 | 12 | VP11 | 14 | VP11 | 14- | VP6 | 14 | VP18 | 14 | VP6 | 14 | VP6 | 14 |
| 12 | VP6 | 14 | VP12 | 14 | VP12 | 14- | VP6 | 12 | VP18 | 12 | VP6 | 12 | VP6 | 12 |
| 13 | VP7 | 12 | Com | | Com+ | | VP7 | 14 | VP19 | 14 | VP7 | 14 | VP7 | 14 |
| 14 | VP7 | 14 | VP1 | 12 | VP1 | 12- | VP7 | 12 | VP19 | 12 | VP7 | 12 | VP7 | 12 |
| 15 | VP8 | 12 | VP2 | 12 | VP2 | 12- | VP8 | 14 | VP20 | 14 | VP8 | 14 | VP8 | 14 |
| 16 | VP8 | 14 | VP3 | 12 | VP3 | 12- | VP8 | 12 | VP20 | 12 | VP8 | 12 | VP8 | 12 |
| 17 | VP9 | 12 | VP4 | 12 | VP4 | 12- | VP9 | 14 | VP21 | 14 | VP9 | 14 | VP9 | 14 |
| 18 | VP9 | 14 | VP5 | 12 | VP5 | 12- | VP9 | 12 | VP21 | 12 | VP9 | 12 | VP9 | 12 |
| 19 | VP10 | 12 | VP6 | 12 | VP6 | 12- | VP10 | 14 | VP22 | 14 | VP10 | 14 | VP10 | 14 |
| 20 | VP10 | 14 | VP7 | 12 | VP7 | 12- | VP10 | 12 | VP22 | 12 | VP10 | 12 | VP10 | 12 |
| 21 | VP11 | 12 | VP8 | 12 | VP8 | 12- | VP11 | 14 | VP23 | 14 | VP11 | 14 | VP11 | 14 |
| 22 | VP11 | 14 | VP9 | 12 | VP9 | 12- | VP11 | 12 | VP23 | 12 | VP11 | 12 | VP11 | 12 |
| 23 | VP12 | 12 | VP10 | 12 | VP10 | 12- | VP12 | 14 | VP24 | 14 | VP12 | 14 | VP12 | 14 |
| 24 | VP12 | 14 | VP11 | 12 | VP11 | 12- | VP12 | 12 | VP24 | 12 | VP12 | 12 | VP12 | 12 |
| 25 | Com | | VP12 | 12 | VP12 | 12- | Com 1-12 | | Com 13-24 | | – | – | – | – |

**Note**

The drawing shows a plan view of the Sub-D plug on the valve terminal.

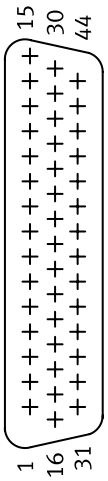
VP Valve position

[1] Sub-D A, first Sub-D plug

[2] Sub-D B, second Sub-D plug

# Key features – Electric components

**Pin assignment – Sub-D plug, 44-pin**




| Pin | -V5 | | -V6 | | | | -V7 | | | | -V13 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Sub-D A[1] | | Sub-D B[2] | | Sub-D A[1] | | Sub-D B[2] | | | |
| 1 | VP1 | 14 | VP1 | 14+ | VP1 | 14- | VP1 | 14 | VP1 | 14 | VP1 | 12 |
| 2 | VP1 | 12 | VP1 | 12+ | VP1 | 12- | VP1 | 12 | VP1 | 12 | VP1 | 14 |
| 3 | VP2 | 14 | VP2 | 14+ | VP2 | 14- | VP2 | 14 | VP2 | 14 | VP2 | 12 |
| 4 | VP2 | 12 | VP2 | 12+ | VP2 | 12- | VP2 | 12 | VP2 | 12 | VP2 | 14 |
| 5 | VP3 | 14 | VP3 | 14+ | VP3 | 14- | VP3 | 14 | VP3 | 14 | VP3 | 12 |
| 6 | VP3 | 12 | VP3 | 12+ | VP3 | 12- | VP3 | 12 | VP3 | 12 | VP3 | 14 |
| 7 | VP4 | 14 | VP4 | 14+ | VP4 | 14- | VP4 | 14 | VP4 | 14 | VP4 | 12 |
| 8 | VP4 | 12 | VP4 | 12+ | VP4 | 12- | VP4 | 12 | VP4 | 12 | VP4 | 14 |
| 9 | VP5 | 14 | VP5 | 14+ | VP5 | 14- | VP5 | 14 | VP5 | 14 | VP5 | 12 |
| 10 | VP5 | 12 | VP5 | 12+ | VP5 | 12- | VP5 | 12 | VP5 | 12 | VP5 | 14 |
| 11 | VP6 | 14 | VP6 | 14+ | VP6 | 14- | VP6 | 14 | VP6 | 14 | VP6 | 12 |
| 12 | VP6 | 12 | VP6 | 12+ | VP6 | 12- | VP6 | 12 | VP6 | 12 | VP6 | 14 |
| 13 | VP7 | 14 | VP7 | 14+ | VP7 | 14- | VP7 | 14 | VP7 | 14 | VP7 | 12 |
| 14 | VP7 | 12 | VP7 | 12+ | VP7 | 12- | VP7 | 12 | VP7 | 12 | VP7 | 14 |
| 15 | VP8 | 14 | VP8 | 14+ | VP8 | 14- | VP8 | 14 | VP8 | 14 | VP8 | 12 |
| 16 | VP8 | 12 | VP8 | 12+ | VP8 | 12- | VP8 | 12 | VP8 | 12 | VP8 | 14 |
| 17 | VP9 | 14 | VP9 | 14+ | VP9 | 14- | VP9 | 14 | VP9 | 14 | VP9 | 12 |
| 18 | VP9 | 12 | VP9 | 12+ | VP9 | 12- | VP9 | 12 | VP9 | 12 | VP9 | 14 |
| 19 | VP10 | 14 | VP10 | 14+ | VP10 | 14- | VP10 | 14 | VP10 | 14 | VP10 | 12 |
| 20 | VP10 | 12 | VP10 | 12+ | VP10 | 12- | VP10 | 12 | VP10 | 12 | VP10 | 14 |
| 21 | VP11 | 14 | VP11 | 14+ | VP11 | 14- | VP11 | 14 | VP11 | 14 | VP11 | 12 |
| 22 | VP11 | 12 | VP11 | 12+ | VP11 | 12- | VP11 | 12 | VP11 | 12 | VP11 | 14 |
| 23 | VP12 | 14 | VP12 | 14+ | VP12 | 14- | VP12 | 14 | VP12 | 14 | VP12 | 12 |
| 24 | VP12 | 12 | VP12 | 12+ | VP12 | 12- | VP12 | 12 | VP12 | 12 | VP12 | 14 |
| 25 | VP13 | 14 | VP13 | 14+ | VP13 | 14- | VP13 | 14 | VP13 | 14 | VP13 | 12 |
| 26 | VP13 | 12 | VP13 | 12+ | VP13 | 12- | VP13 | 12 | VP13 | 12 | VP13 | 14 |
| 27 | VP14 | 14 | VP14 | 14+ | VP14 | 14- | VP14 | 14 | VP14 | 14 | VP14 | 12 |
| 28 | VP14 | 12 | VP14 | 12+ | VP14 | 12- | VP14 | 12 | VP14 | 12 | VP14 | 14 |
| 29 | VP15 | 14 | VP15 | 14+ | VP15 | 14- | VP15 | 14 | VP15 | 14 | VP15 | 12 |
| 30 | VP15 | 12 | VP15 | 12+ | VP15 | 12- | VP15 | 12 | VP15 | 12 | VP15 | 14 |
| 31 | VP16 | 14 | VP16 | 14+ | VP16 | 14- | VP16 | 14 | VP16 | 14 | VP16 | 12 |
| 32 | VP16 | 12 | VP16 | 12+ | VP16 | 12- | VP16 | 12 | VP16 | 12 | VP16 | 14 |
| 33 | VP17 | 14 | VP17 | 14+ | VP17 | 14- | VP17 | 14 | VP17 | 14 | VP17 | 12 |
| 34 | VP17 | 12 | VP17 | 12+ | VP17 | 12- | VP17 | 12 | VP17 | 12 | VP17 | 14 |
| 35 | VP18 | 14 | VP18 | 14+ | VP18 | 14- | VP18 | 14 | VP18 | 14 | VP18 | 12 |
| 36 | VP18 | 12 | VP18 | 12+ | VP18 | 12- | VP18 | 12 | VP18 | 12 | VP18 | 14 |
| 37 | VP19 | 14 | VP19 | 14+ | VP19 | 14- | VP19 | 14 | VP19 | 14 | VP19 | 12 |
| 38 | VP19 | 12 | VP19 | 12+ | VP19 | 12- | VP19 | 12 | VP19 | 12 | VP19 | 14 |
| 39 | VP20 | 14 | VP20 | 14+ | VP20 | 14- | VP20 | 14 | VP20 | 14 | VP20 | 12 |
| 40 | VP20 | 12 | VP20 | 12+ | VP20 | 12- | VP20 | 12 | VP20 | 12 | VP20 | 14 |
| 41 | VP21 | 14 | VP21 | 14+ | VP21 | 14- | VP21 | 14 | VP21 | 14 | Com | |
| 42 | VP21 | 12 | VP21 | 12+ | VP21 | 12- | VP21 | 12 | VP21 | 12 | Com | |
| 43 | Com | | VP22 | 14+ | VP22 | 14- | VP22 | 14 | VP22 | 14 | Com | |
| 44 | Com | | VP22 | 12+ | VP22 | 12- | VP22 | 12 | VP22 | 12 | Com | |

**Note**

The drawing shows a plan view of the Sub-D plug on the valve terminal.

VP Valve position

1) Sub-D A, first Sub-D plug

2) Sub-D B, second Sub-D plug

# Key features – Electric components

## Electrical connection

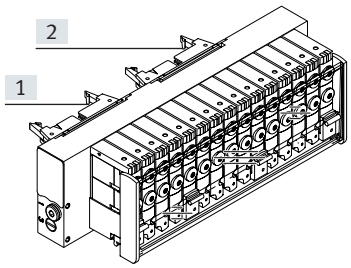
The solenoid coils are wired in ascending order of the valves so that solenoid coil 14 occupies the low-value pin and solenoid coil 12 the next pin:

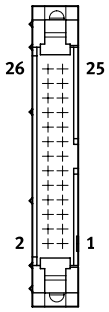
- Pin 1 of ribbon cable 1 valve position 1, coil 14.
- Pin 2 of ribbon cable 1 valve position 1, coil 12.

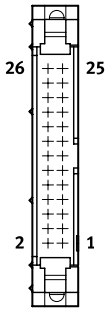
The valve positions are evenly divided between the two ribbon cable connectors.
If there is an odd number of valve positions, plug 2 controls one more valve position than plug 1.

The following table shows the pin assignment variants.

**Pin assignment – Ribbon cable, 26-pin**



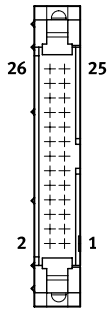

**Note**

The drawing shows a plan view of the flat cable connector on the valve terminal.

| valve positions | | -V15 | | -V17 | |
|---|---|---|---|---|---|
| Total | No. | Pin | | Pin | |
| | | [1] Plug 1 | [2] Plug 2 | [1] Plug 1 | [2] Plug 2 |
| 13 | 1 … 6 | 1 … 12 | – | 12 … 1 | – |
| | 7 … 13 | – | 1 … 14 | – | 14 … 1 |
| | Com | 25 … 26 | 25 … 26 | 25 … 26 | 25 … 26 |
| 14 | 1 … 7 | 1 … 14 | – | 14 … 1 | – |
| | 8 … 14 | – | 1 … 14 | – | 14 … 1 |
| | Com | 25 … 26 | 25 … 26 | 25 … 26 | 25 … 26 |
| 15 | 1 … 8 | 1 … 14 | – | 14 … 1 | – |
| | 8 … 15 | – | 1 … 16 | – | 16 … 1 |
| | Com | 25 … 26 | 25 … 26 | 25 … 26 | 25 … 26 |
| 16 | 1 … 8 | 1 … 16 | – | 16 … 1 | – |
| | 9 … 16 | – | 1 … 16 | – | 16 … 1 |
| | Com | 25 … 26 | 25 … 26 | 25 … 26 | 25 … 26 |
| 17 | 1 … 8 | 1 … 16 | – | 16 … 1 | – |
| | 9 … 17 | – | 1 … 18 | – | 18 … 1 |
| | Com | 25 … 26 | 25 … 26 | 25 … 26 | 25 … 26 |
| 18 | 1 … 9 | 1 … 18 | – | 18 … 1 | – |
| | 10 … 18 | – | 1 … 18 | – | 18 … 1 |
| | Com | 25 … 26 | 25 … 26 | 25 … 26 | 25 … 26 |
| 19 | 1 … 9 | 1 … 18 | – | 18 … 1 | – |
| | 10 … 19 | – | 1 … 20 | – | 20 … 1 |
| | Com | 25 … 26 | 25 … 26 | 25 … 26 | 25 … 26 |
| 20 | 1 … 10 | 1 … 20 | – | 20 … 1 | – |
| | 11 … 20 | – | 1 … 20 | – | 20 … 1 |
| | Com | 25 … 26 | 25 … 26 | 25 … 26 | 25 … 26 |
| 21 | 1 … 10 | 1 … 20 | – | 20 … 1 | – |
| | 11 … 21 | – | 1 … 22 | – | 22 … 1 |
| | Com | 25 … 26 | 25 … 26 | 25 … 26 | 25 … 26 |
| 22 | 1 … 11 | 1 … 22 | – | 22 … 1 | – |
| | 12 … 22 | – | 1 … 22 | – | 22 … 1 |
| | Com | 25 … 26 | 25 … 26 | 25 … 26 | 25 … 26 |
| 23 | 1 … 11 | 1 … 22 | – | 22 … 1 | – |
| | 12 … 23 | – | 1 … 24 | – | 24 … 1 |
| | Com | 25 … 26 | 25 … 26 | 25 … 26 | 25 … 26 |
| 24 | 1 … 12 | 1 … 24 | – | 24 … 1 | – |
| | 13 … 24 | – | 1 … 24 | – | 24 … 1 |
| | Com | 25 … 26 | 25 … 26 | 25 … 26 | 25 … 26 |

# Key features – Electric components

**Pin assignment – Ribbon cable, 26-pin**




| Pin | -V8 | | -V14 | |
|---|---|---|---|---|
| 1 | VP12 | 14 | VP1 | 14 |
| 2 | VP12 | 12 | VP1 | 12 |
| 3 | VP11 | 14 | VP2 | 14 |
| 4 | VP11 | 12 | VP2 | 12 |
| 5 | VP10 | 14 | VP3 | 14 |
| 6 | VP10 | 12 | VP3 | 12 |
| 7 | VP9 | 14 | VP4 | 14 |
| 8 | VP9 | 12 | VP4 | 12 |
| 9 | VP8 | 14 | VP5 | 14 |
| 10 | VP8 | 12 | VP5 | 12 |
| 11 | VP7 | 14 | VP6 | 14 |
| 12 | VP7 | 12 | VP6 | 12 |
| 13 | VP6 | 14 | VP7 | 14 |
| 14 | VP6 | 12 | VP7 | 12 |
| 15 | VP5 | 14 | VP8 | 14 |
| 16 | VP5 | 12 | VP8 | 12 |
| 17 | VP4 | 14 | VP9 | 14 |
| 18 | VP4 | 12 | VP9 | 12 |
| 19 | VP3 | 14 | VP10 | 14 |
| 20 | VP3 | 14 | VP10 | 14 |
| 21 | VP2 | 14 | VP11 | 14 |
| 22 | VP2 | 12 | VP11 | 12 |
| 23 | VP1 | 14 | VP12 | 14 |
| 24 | VP1 | 12 | VP12 | 12 |
| 25 | Com | | Com | |
| 26 | Com | | Com | |

**Note**

The drawing shows a plan view of the flat cable connector on the valve terminal.

VP Valve position

# Key features – Electric components

## Electrical connection

The solenoid coils are wired in ascending order of the valves so that solenoid coil 14 occupies the two higher-value pins and solenoid coil 12 the next two pins:

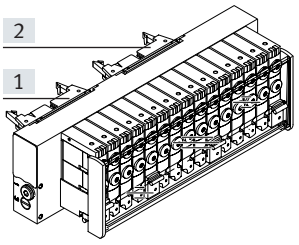
- Pin 40 and 39 of ribbon cable 1 valve position 1, coil 14.
- Pin 38 and 37 of ribbon cable 1 valve position 1, coil 12.

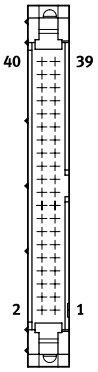
The valve positions are evenly divided between the two ribbon cable connectors.
If there is an odd number of valve positions, plug 2 controls one more valve position than plug 1.

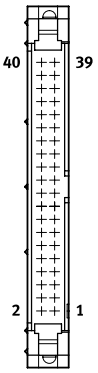
The following table shows the pin assignment variants.

**Pin assignment – Ribbon cable, 40-pin**

| Number of valve positions | Pin | -V18 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | [1] Plug 1 | | | | | [2] Plug 2 | | | | |
| | | 16 | 17 | 18 | 19 | 20 | 16 | 17 | 18 | 19 | 20 |
| 2 | 1 | VP8 | VP8 | VP9 | VP9 | VP10 | VP16 | VP17 | VP18 | VP19 | VP20 |
| | 2 | VP8 | VP8 | VP9 | VP9 | VP10 | VP16 | VP17 | VP18 | VP19 | VP20 |
| | 3 | VP8 | VP8 | VP9 | VP9 | VP10 | VP16 | VP17 | VP18 | VP19 | VP20 |
| | 4 | VP8 | VP8 | VP9 | VP9 | VP10 | VP16 | VP17 | VP18 | VP19 | VP20 |
| | 5 | VP7 | VP7 | VP8 | VP8 | VP9 | VP15 | VP16 | VP17 | VP18 | VP19 |
| | 6 | VP7 | VP7 | VP8 | VP8 | VP9 | VP15 | VP16 | VP17 | VP18 | VP19 |
| | 7 | VP7 | VP7 | VP8 | VP8 | VP9 | VP15 | VP16 | VP17 | VP18 | VP19 |
| | 8 | VP7 | VP7 | VP8 | VP8 | VP9 | VP15 | VP16 | VP17 | VP18 | VP19 |
| | 9 | VP6 | VP6 | VP7 | VP7 | VP8 | VP14 | VP15 | VP16 | VP17 | VP18 |
| | 10 | VP6 | VP6 | VP7 | VP7 | VP8 | VP14 | VP15 | VP16 | VP17 | VP18 |
| | 11 | VP6 | VP6 | VP7 | VP7 | VP8 | VP14 | VP15 | VP16 | VP17 | VP18 |
| | 12 | VP6 | VP6 | VP7 | VP7 | VP8 | VP14 | VP15 | VP16 | VP17 | VP18 |
| | 13 | VP5 | VP5 | VP6 | VP6 | VP7 | VP13 | VP14 | VP15 | VP16 | VP17 |
| | 14 | VP5 | VP5 | VP6 | VP6 | VP7 | VP13 | VP14 | VP15 | VP16 | VP17 |
| | 15 | VP5 | VP5 | VP6 | VP6 | VP7 | VP13 | VP14 | VP15 | VP16 | VP17 |
| | 16 | VP5 | VP5 | VP6 | VP6 | VP7 | VP13 | VP14 | VP15 | VP16 | VP17 |
| | 17 | VP4 | VP4 | VP5 | VP5 | VP6 | VP12 | VP13 | VP14 | VP15 | VP16 |
| | 18 | VP4 | VP4 | VP5 | VP5 | VP6 | VP12 | VP13 | VP14 | VP15 | VP16 |
| | 19 | VP4 | VP4 | VP5 | VP5 | VP6 | VP12 | VP13 | VP14 | VP15 | VP16 |
| | 20 | VP4 | VP4 | VP5 | VP5 | VP6 | VP12 | VP13 | VP14 | VP15 | VP16 |
| | 21 | VP3 | VP3 | VP4 | VP4 | VP5 | VP11 | VP12 | VP13 | VP14 | VP15 |
| | 22 | VP3 | VP3 | VP4 | VP4 | VP5 | VP11 | VP12 | VP13 | VP14 | VP15 |
| | 23 | VP3 | VP3 | VP4 | VP4 | VP5 | VP11 | VP12 | VP13 | VP14 | VP15 |
| | 24 | VP3 | VP3 | VP4 | VP4 | VP5 | VP11 | VP12 | VP13 | VP14 | VP15 |
| | 25 | VP2 | VP2 | VP3 | VP3 | VP4 | VP10 | VP11 | VP12 | VP13 | VP14 |
| | 26 | VP2 | VP2 | VP3 | VP3 | VP4 | VP10 | VP11 | VP12 | VP13 | VP14 |
| | 27 | VP2 | VP2 | VP3 | VP3 | VP4 | VP10 | VP11 | VP12 | VP13 | VP14 |
| | 28 | VP2 | VP2 | VP3 | VP3 | VP4 | VP10 | VP11 | VP12 | VP13 | VP14 |
| | 29 | VP1 | VP1 | VP2 | VP2 | VP3 | VP9 | VP10 | VP11 | VP12 | VP13 |
| | 30 | VP1 | VP1 | VP2 | VP2 | VP3 | VP9 | VP10 | VP11 | VP12 | VP13 |
| | 31 | VP1 | VP1 | VP2 | VP2 | VP3 | VP9 | VP10 | VP11 | VP12 | VP13 |
| | 32 | VP1 | VP1 | VP2 | VP2 | VP3 | VP9 | VP10 | VP11 | VP12 | VP13 |
| | 33 | – | – | VP1 | VP1 | VP2 | – | VP9 | VP10 | VP11 | VP12 |
| | 34 | – | – | VP1 | VP1 | VP2 | – | VP9 | VP10 | VP11 | VP12 |
| | 35 | – | – | VP1 | VP1 | VP2 | – | VP9 | VP10 | VP11 | VP12 |
| | 36 | – | – | VP1 | VP1 | VP2 | – | VP9 | VP10 | VP11 | VP12 |
| | 37 | – | – | – | – | VP1 | – | – | – | VP10 | VP11 |
| | 38 | – | – | – | – | VP1 | – | – | – | VP10 | VP11 |
| | 39 | – | – | – | – | VP1 | – | – | – | VP10 | VP11 |
| | 40 | – | – | – | – | VP1 | – | – | – | VP10 | VP11 |





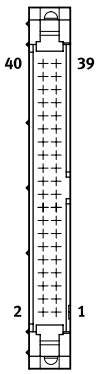

**Note**

The drawing shows a plan view of the flat cable connector on the valve terminal.

VP Valve position

# Key features – Electric components

**Pin assignment – Ribbon cable, 40-pin**




| Pin | -V9 | |
|---|---|---|
| 1 | VP10 | 12+ |
| 2 | VP10 | 12- |
| 3 | VP10 | 14+ |
| 4 | VP10 | 14- |
| 5 | VP9 | 12+ |
| 6 | VP9 | 12- |
| 7 | VP9 | 14+ |
| 8 | VP9 | 14- |
| 9 | VP8 | 12+ |
| 10 | VP8 | 12- |
| 11 | VP8 | 14+ |
| 12 | VP8 | 14- |
| 13 | VP7 | 12+ |
| 14 | VP7 | 12- |
| 15 | VP7 | 14+ |
| 16 | VP7 | 14- |
| 17 | VP6 | 12+ |
| 18 | VP6 | 12- |
| 19 | VP6 | 14+ |
| 20 | VP6 | 14- |
| 21 | VP5 | 12+ |
| 22 | VP5 | 12- |
| 23 | VP5 | 14+ |
| 24 | VP5 | 14- |
| 25 | VP4 | 12+ |
| 26 | VP4 | 12- |
| 27 | VP4 | 14+ |
| 28 | VP4 | 14- |
| 29 | VP3 | 12+ |
| 30 | VP3 | 12- |
| 31 | VP3 | 14+ |
| 32 | VP3 | 14- |
| 33 | VP2 | 12+ |
| 34 | VP2 | 12- |
| 35 | VP2 | 14+ |
| 36 | VP2 | 14- |
| 37 | VP1 | 12+ |
| 38 | VP1 | 12- |
| 39 | VP1 | 14+ |
| 40 | VP1 | 14- |

**Note**

The drawing shows a plan view of the flat cable connector on the valve terminal.

VP Valve position

# Characteristics – Electric components

## Electrical connection

The solenoid coils are wired in ascending order of the valves so that solenoid coil 14 occupies the two higher-value pins and solenoid coil 12 the two low-value pins:

Variant -V16:
- Pin 1 and 2 of ribbon cable 1 valve position 1, coil 12.
- Pin 3 and 4 of ribbon cable 1 valve position 1, coil 14.

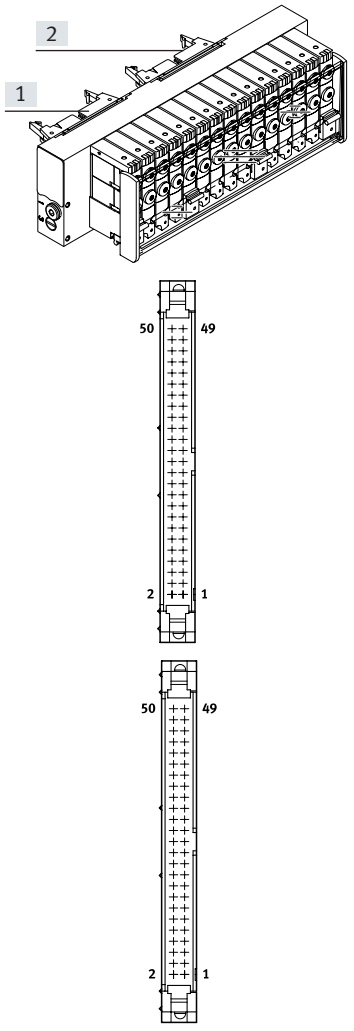
Variant -V19:
- Pin 48 and 47 of ribbon cable 1 valve position 1, coil 14.
- Pin 46 and 45 of ribbon cable 1 valve position 1, coil 12.

The valve positions are evenly divided between the two ribbon cable connectors.

If there is an odd number of valve positions, plug 2 controls one more valve position than plug 1.

The following table shows the pin assignment variants.

**Pin assignment – Ribbon cable, 50-pin**



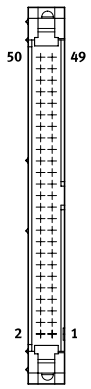

**Note**

The drawing shows a plan view of the flat cable connector on the valve terminal.

| valve positions | | -V16 | | -V19 | |
|---|---|---|---|---|---|
| Total | No. | Pin | | Pin | |
| | | [1] Plug 1 | [2] Plug 2 | [1] Plug 1 | [2] Plug 2 |
| 18 | 1 … 9 | 1 … 36 | – | 48 … 13 | – |
| | 10 … 18 | – | 1 … 36 | – | 48 … 13 |
| 19 | 1 … 9 | 1 … 36 | – | 48 … 13 | – |
| | 10 … 19 | – | 1 … 40 | – | 48 … 9 |
| 20 | 1 … 10 | 1 … 40 | – | 48 … 9 | – |
| | 11 … 20 | – | 1 … 40 | – | 48 … 9 |
| 21 | 1 … 10 | 1 … 40 | – | 48 … 9 | – |
| | 11 … 21 | – | 1 … 44 | – | 48 … 5 |
| 22 | 1 … 11 | 1 … 44 | – | 48 … 5 | – |
| | 12 … 22 | – | 1 … 44 | – | 48 … 5 |
| 23 | 1 … 11 | 1 … 44 | – | 48 … 5 | – |
| | 12 … 23 | – | 1 … 48 | – | 48 … 1 |
| 24 | 1 … 12 | 1 … 48 | – | 48 … 1 | – |
| | 13 … 24 | – | 1 … 48 | – | 48 … 1 |

# Key features – Electric components

**Pin assignment – Ribbon cable, 50-pin**




| Pin | -V11 | | -V10 | |
|---|---|---|---|---|
| 1 | VP1 | 12 | VP12 | 12 |
| 2 | VP1 | 12 | VP12 | 12 |
| 3 | VP1 | 14 | VP12 | 14 |
| 4 | VP1 | 14 | VP12 | 14 |
| 5 | VP2 | 12 | VP11 | 12 |
| 6 | VP2 | 12 | VP11 | 12 |
| 7 | VP2 | 14 | VP11 | 14 |
| 8 | VP2 | 14 | VP11 | 14 |
| 9 | VP3 | 12 | VP10 | 12 |
| 10 | VP3 | 12 | VP10 | 12 |
| 11 | VP3 | 14 | VP10 | 14 |
| 12 | VP3 | 14 | VP10 | 14 |
| 13 | VP4 | 12 | VP9 | 12 |
| 14 | VP4 | 12 | VP9 | 12 |
| 15 | VP4 | 14 | VP9 | 14 |
| 16 | VP4 | 14 | VP9 | 14 |
| 17 | VP5 | 12 | VP8 | 12 |
| 18 | VP5 | 12 | VP8 | 12 |
| 19 | VP5 | 14 | VP8 | 14 |
| 20 | VP5 | 14 | VP8 | 14 |
| 21 | VP6 | 12 | VP7 | 12 |
| 22 | VP6 | 12 | VP7 | 12 |
| 23 | VP6 | 14 | VP7 | 14 |
| 24 | VP6 | 14 | VP7 | 14 |
| 25 | VP7 | 12 | VP6 | 12 |
| 26 | VP7 | 12 | VP6 | 12 |
| 27 | VP7 | 14 | VP6 | 14 |
| 28 | VP7 | 14 | VP6 | 14 |
| 29 | VP8 | 12 | VP5 | 12 |
| 30 | VP8 | 12 | VP5 | 12 |
| 31 | VP8 | 14 | VP5 | 14 |
| 32 | VP8 | 14 | VP5 | 14 |
| 33 | VP9 | 12 | VP4 | 12 |
| 34 | VP9 | 12 | VP4 | 12 |
| 35 | VP9 | 14 | VP4 | 14 |
| 36 | VP9 | 14 | VP4 | 14 |
| 37 | VP10 | 12 | VP3 | 12 |
| 38 | VP10 | 12 | VP3 | 12 |
| 39 | VP10 | 14 | VP3 | 14 |
| 40 | VP10 | 14 | VP3 | 14 |
| 41 | VP11 | 12 | VP2 | 12 |
| 42 | VP11 | 12 | VP2 | 12 |
| 43 | VP11 | 14 | VP2 | 14 |
| 44 | VP11 | 14 | VP2 | 14 |
| 45 | VP12 | 12 | VP1 | 12 |
| 46 | VP12 | 12 | VP1 | 12 |
| 47 | VP12 | 14 | VP1 | 14 |
| 48 | VP12 | 14 | VP1 | 14 |
| 49 | | | | |
| 50 | | | | |

**Note**

The drawing shows a plan view of the flat cable connector on the valve terminal.

VP Valve position

# Characteristics – Electric components

**I-Port interface with interlock/IO-Link®**

IO-Link®

IO-Link® is an interface that supplies data for communication in addition to the power supply. An IO-Link® system consists of an IO-Link master and IO-Link® devices. The IO-Link master acts as the interface to the higher-order controller (PLC) and controls communication with the connected IO-Link® devices. One device with IO-Link® (e.g. an IO-Link® valve terminal from Festo) can be connected to each port on an IO-Link master.

I-Port

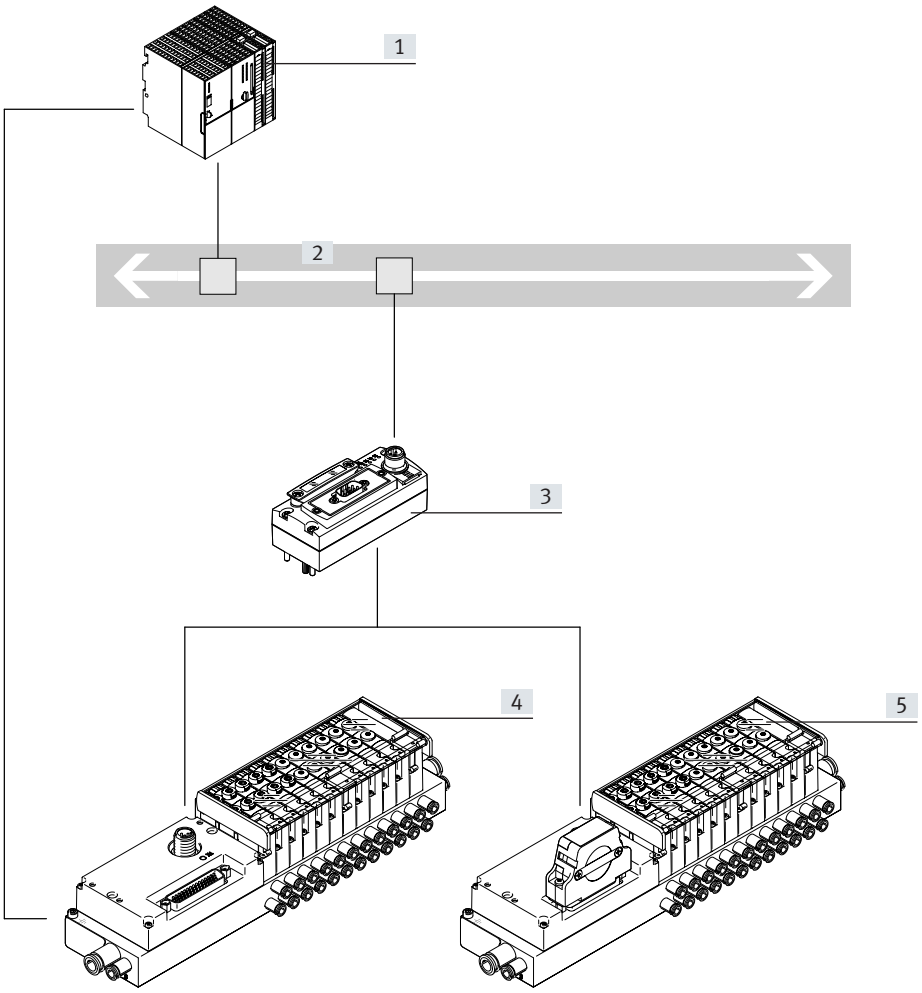
The Festo-specific I-Port interface based on IO-Link® offers the following connection options:
- Directly at the fieldbus, by mounting a bus node CTEU
- Connection to a higher-order I-Port master from Festo

Interlock

The interlock function enables the first 16 solenoid coils to be individually supplied externally. This ensures that these valves can be enabled in a safety-oriented way.
The interlock interface is established via external contacts for a single-pin connection or via safety output terminals for a double-pin connection.

For applications that do not need the solenoid coils to be actuated by interlock, the Sub-D connection can be bypassed using a special Sub-D socket (NEFF...).
The solenoid coils are then supplied with load voltage via the I-Port interface.

**Overview**




[1] PLC
[2] Fieldbus
[3] Bus node CTEU (I-Port master)
[4] Valve terminal VTOC, I-Port interface with interlock/IO-Link®
[5] Valve terminal VTOC, I-Port interface/IO-Link® with Sub-D socket NEFF

# Characteristics – Electric components

## Interlock interface

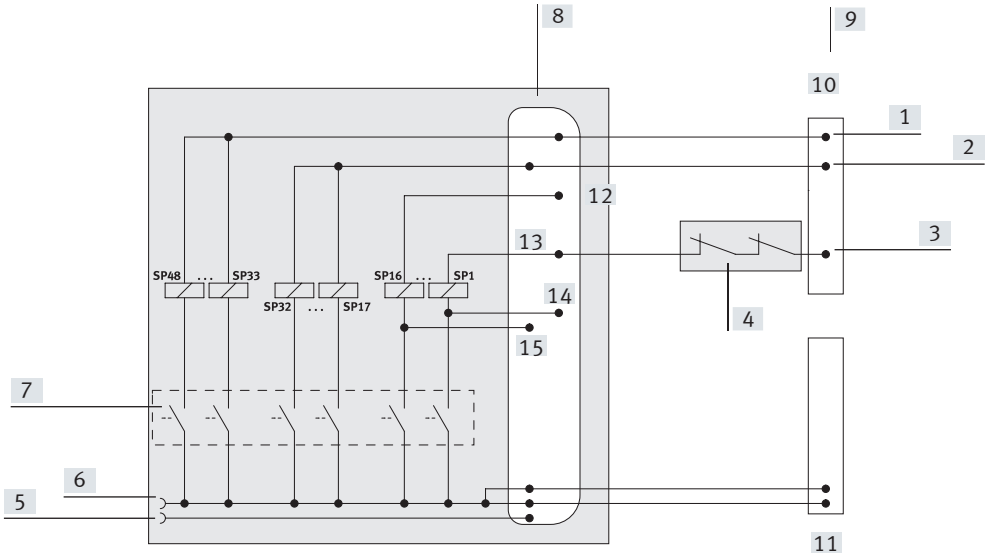
### Single-pin interlock interface

- The interlock interface is established via external positive switching contacts or single-pin switching safety terminals
- 16 solenoid coils can be actuated via the interlock (Vn+)
- Solenoid coils that do not need to be actuated by the interlock can be supplied directly with 24 V via pins 1 ... 3
- Application of the respective input voltage is fed back via the fieldbus as a process image

### Double-pin interlock interface

- The interlock interface is established via external positive-negative switching safety terminals
- The solenoid coils of the interlock valves are actuated via the corresponding pins in the sub-D plug (pins 7 ... 38)
- The solenoid coils that do not need to be actuated by the interlock can be supplied directly with 24 V (e.g. via pins 1 ... 3)
- Any difference in potential between Vn– and 0 V VAL/OUT must be below 5 V

## Sample circuit diagram for a single-pin interlock interface

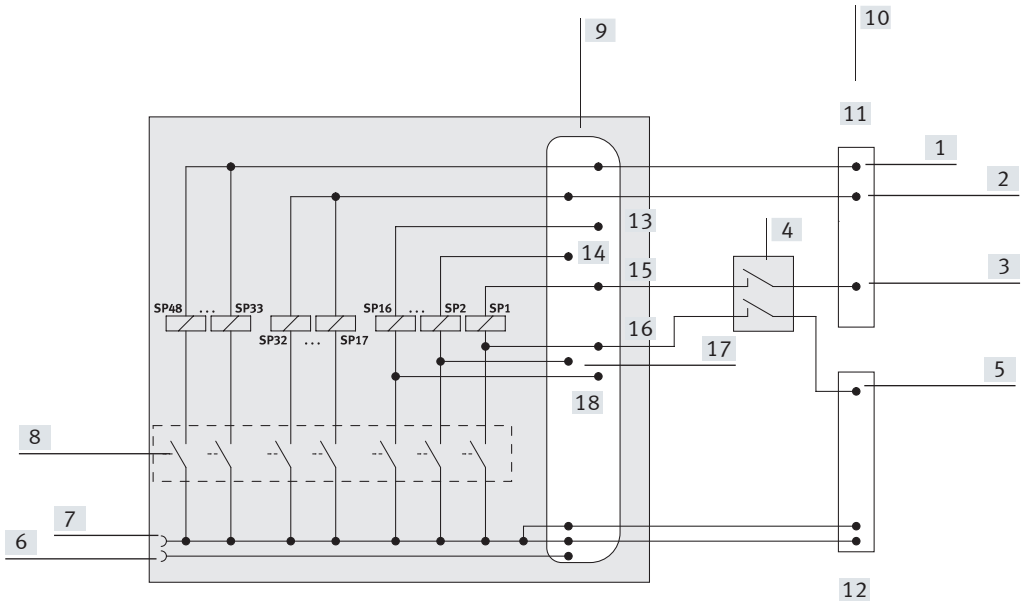



[1] Power supply V+; solenoid coil 33 ... 48 (no interlock)
[2] Power supply V+; solenoid coil 17 ... 32 (no interlock)
[3] Actuation Vn+ (via interlock)
[4] Interlock contacts of the output terminal
[5] I-Port connection pin 2, 24 V VAL/OUT (PL), load voltage supply
[6] I-Port connection pin 5, 0 V VAL/OUT (PL), load voltage supply
[7] Driver, actuated via fieldbus/ I-Port
[8] Interlock Sub-D connection
[9] Power supply (interlock)

[10] 24 $V_{VAL}$
[11] 0 $V_{VAL}$
[12] $V_{16+}$
[13] $V_{1+}$
[14] $V_{1-}$
[15] $V_{16-}$

# Characteristics – Electric components

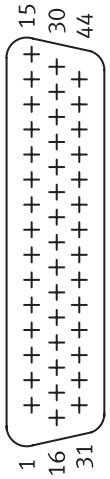
**Sample circuit diagram for a double-pin interlock interface**




[1] Power supply V+; solenoid coil 33 ... 48 (no interlock)
[2] Power supply V+; solenoid coil 17 ... 32 (no interlock)
[3] Actuation Vn+ (via interlock)
[4] Interlock contacts of the output terminal
[5] Actuation Vn– (via interlock)
[6] I-Port connection pin 2, 24 V VAL/OUT (PL), load voltage supply
[7] I-Port connection pin 5, 0 V VAL/OUT (PL), load voltage supply
[8] Driver, actuated via fieldbus/ I-Port
[9] Interlock Sub-D connection
[10] Power supply (interlock)

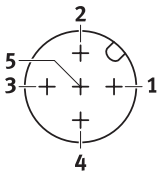
[11] 24 $V_{VAL}$
[12] 0 $V_{VAL}$
[13] $V_{16+}$
[14] $V_{2+}$
[15] $V_{1+}$
[16] $V_{1-}$
[17] $V_{2-}$
[18] $V_{16-}$

**Pin assignment – Interlock**




| Pin | Coil | Signal | Pin | Coil | Signal | Pin | Coil | Signal |
|---|---|---|---|---|---|---|---|---|
| 1 | – | 24 $V_{VAL/OUT}$ | 16 | 5 | V5- | 31 | 13 | V13+ |
| 2 | – | 24 $V_{VAL/OUT}$ | 17 | 6 | V6+ | 32 | 13 | V13- |
| 3 | – | 24 $V_{VAL/OUT}$ | 18 | 6 | V6- | 33 | 14 | V14+ |
| 4 | 1 ... 48 | 0 $V_{VAL/OUT}$ | 19 | 7 | V7+ | 34 | 14 | V14- |
| 5 | 1 ... 48 | 0 $V_{VAL/OUT}$ | 20 | 7 | V7- | 35 | 15 | V15+ |
| 6 | 1 ... 48 | 0 $V_{VAL/OUT}$ | 21 | 8 | V8+ | 36 | 15 | V15- |
| 7 | 1 | V1+ | 22 | 8 | V8- | 37 | 16 | V16+ |
| 8 | 1 | V1- | 23 | 9 | V9+ | 38 | 16 | V16- |
| 9 | 2 | V2+ | 24 | 9 | V9- | 39 | 17 ... 32 | V17...32+ |
| 10 | 2 | V2- | 25 | 10 | V10+ | 40 | 33 ... 48 | V33...48+ |
| 11 | 3 | V3+ | 26 | 10 | V10- | 41 | 1 ... 48 | 0 $V_{VAL/OUT}$ |
| 12 | 3 | V3- | 27 | 11 | V11+ | 42 | 1 ... 48 | 0 $V_{VAL/OUT}$ |
| 13 | 4 | V4+ | 28 | 11 | V11- | 43 | 1 ... 48 | 0 $V_{VAL/OUT}$ |
| 14 | 4 | V4- | 29 | 12 | V12+ | 44 | – | n.c. |
| 15 | 5 | V5+ | 30 | 12 | V12- | Housing | | FE |

**Pin assignment – I-Port interface/IO-Link®**



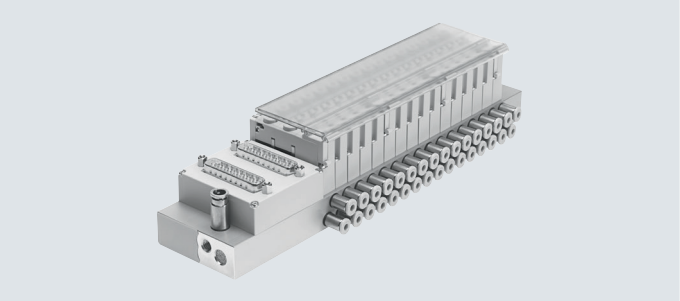

| Pin | Assignment | Function |
|---|---|---|
| 1 | 24$V_{EL/SEN}$ (PS) | Operating voltage supply (electronics, sensors/inputs) |
| 2 | 24$V_{VAL/OUT}$ (PL) | Load voltage supply (valves/outputs) |
| 3 | 0$V_{EL/SEN}$ (PS) | Operating voltage supply (electronics, sensors/inputs) |
| 4 | C/Q | Data communication |
| 5 | 0$V_{VAL/OUT}$ (PL) | Load voltage supply (valves/outputs) |
| Housing, FE | | Functional earth |

# Data sheet – Valve terminal VTOC with multi-pin plug connection

Voltage
24 V DC

Pressure
0 ... +0.8 MPa

Temperature range
–5 ... +50 °C



| General technical data | | | |
|---|---|---|---|
| Valve function | | | 2x3/2-way valve, closed, single solenoid |
| Design | | | Poppet valve with spring return |
| Overlap | | | Negative overlap |
| Sealing principle | | | Soft |
| Actuation type | | | Electrical |
| Reset method | | | Mechanical spring |
| Type of control | | | Direct |
| Flow direction | | | Not reversible |
| Exhaust air function | | | Cannot be throttled |
| Manual override | | | Non-detenting, detenting and non-detenting, detenting (without accessories) |
| Type of mounting | | | Via through-hole or thread |
| Mounting position | | | Any |
| Width | | [mm] | 10 |
| Nominal width | | [mm] | 0.65 |
| Max. no. of valve positions | | | 24 |
| Standard nominal flow rate | qnN | [l/min] | 10 |
| Product weight | Valve | | 30 |
| | Blanking plate for vacant position | | 20 |
| Corrosion resistance class[1)] | | | 1 |

1) More information www.festo.com/x/topic/crc

| Operating and environmental conditions | | |
|---|---|---|
| Operating medium | | Compressed air to ISO 8573-1:2010 [7:4:4] |
| Note on the operating/pilot medium | | Lubricated operation possible (in which case lubricated operation will always be required) |
| Operating pressure | [MPa] | 0 ... +0.8 |
| | [bar] | 0 ... +8 |
| | [psi] | 0 ... +116 |
| Ambient temperature | [°C] | –5 ... +50 |
| Temperature of medium | [°C] | –5 ... +50 |
| Housing material | | Reinforced PA |
| Sealing material | | NBR |
| | | PU |
| Note on materials | | RoHS-compliant |
| CE marking | | To EU EMC Directive |
| KC marking | | KC EMC |
| Certification | | c UL us - Recognized (OL) |

# Data sheet – Valve terminal VTOC with multi-pin plug connection

| **Electrical data** | | |
|---|---|---|
| Electrical control | | Multi-pin plug (Sub-D/ribbon cable) |
| Nominal operating voltage | [V DC] | 24 |
| Permissible voltage fluctuations | [%] | ±10 |
| Pickup time | [ms] | 100 |
| Nominal pick-up current per solenoid coil (current consumption per coil during the pick-up phase) | [mA] | 55 to 100 ms |
| Nominal current with current reduction (current consumption per coil during the holding phase) | [mA] | 13 after 100 ms |
| Degree of protection to EN 60529 | | IP40 |
| Signal status indication | | LED |

| **Valve switching times** | |
|---|---|
| | [ms] |
| On | 5.2 |
| Off | 4.7 |

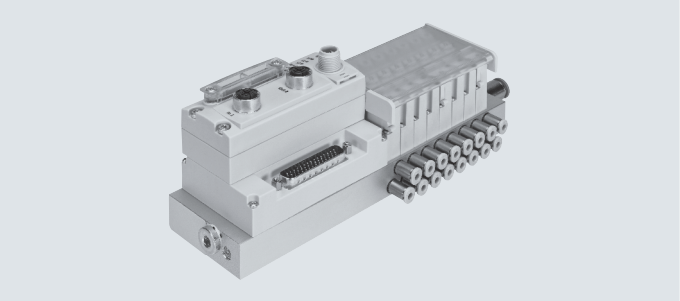
| **Safety characteristics** | | |
|---|---|---|
| Tried-and-tested component | | Yes |
| Max. positive test pulse with logic 0 | [µs] | 600 |
| Max. negative test pulse with logic 1 | [µs] | 800 |
| Shock resistance | | Shock test at severity level 2, to FN 942017-5 and EN 60068-2-27 |
| Vibration resistant | | Transport application test at severity level 2, to FN 942017-4 and EN 60068-2-6 |

# Data sheet – Valve terminal VTOC with I-Port interface, interlock/IO-Link®

Voltage
24 V DC

Pressure
0 ... +0.8 MPa

Temperature range
–5 ... +50 °C



| General technical data | | | |
|---|---|---|---|
| Valve | | | 2x3/2 normally closed, reset via mechanical spring |
| Design | | | Poppet valve with spring return |
| Overlap | | | Negative overlap |
| Reset method | | | Mechanical spring |
| Type of control | | | Direct |
| Flow direction | | | Not reversible |
| Exhaust air function | | | Cannot be throttled |
| Manual override | | | Non-detenting, detenting and non-detenting, detenting (without accessories) |
| Types of communication | | | I-Port/IO-Link® |
| Number of valve positions | | | 2 ... 24 |
| Max. number of solenoid coils | | | 48 |
| Number of interlock solenoid coils | | | 16 |
| Number of inputs for voltage feedback | | | 18 (16x interlock + 2 group supply) |
| Mounting position | | | Any |
| Nominal flow rate | | [l/min] | 10 |
| Residual ripple | | [$V_{SS}$] | 4 |
| Baud rate | COM3 | [kbps] | 230.4 |
| | COM2 | [kbps] | 38.4 |
| IO-Link® | Protocol | | V1.0 |
| | Connection technology | | M12, A-coded |
| | Port type | | Type B |
| | Number of ports | | 1 |
| | Process data length OUT | | 6 bytes |
| | Process data IN | | 4 bytes |
| | Minimum cycle time | | 11.5 ms (2.3 ms per frame = 2 bytes of user data) |
| Product weight | Valve | [g] | 30 |
| | Blanking plate for vacant position | [g] | 20 |
| Corrosion resistance class[1)] | | | 1 |

1) More information www.festo.com/x/topic/crc

| Operating and environmental conditions | | |
|---|---|---|
| Operating medium | | Compressed air to ISO 8573-1:2010 [7:4:4] |
| Note on the operating/pilot medium | | Lubricated operation possible (in which case lubricated operation will always be required) |
| Operating pressure | [MPa] | 0 ... +0.8 |
| | [bar] | 0 ... +8 |
| | [psi] | 0 ... +116 |
| Ambient temperature | [°C] | –5 ... +50 |
| Housing material | | Reinforced PA |
| Sealing material | | NBR |
| | | PU |
| Note on materials | | RoHS-compliant |
| CE marking | | To EU EMC Directive |
| KC marking | | KC EMC |
| Certification | | c UL us - Recognized (OL) |

# Data sheet – Valve terminal VTOC with I-Port interface, interlock/IO-Link®

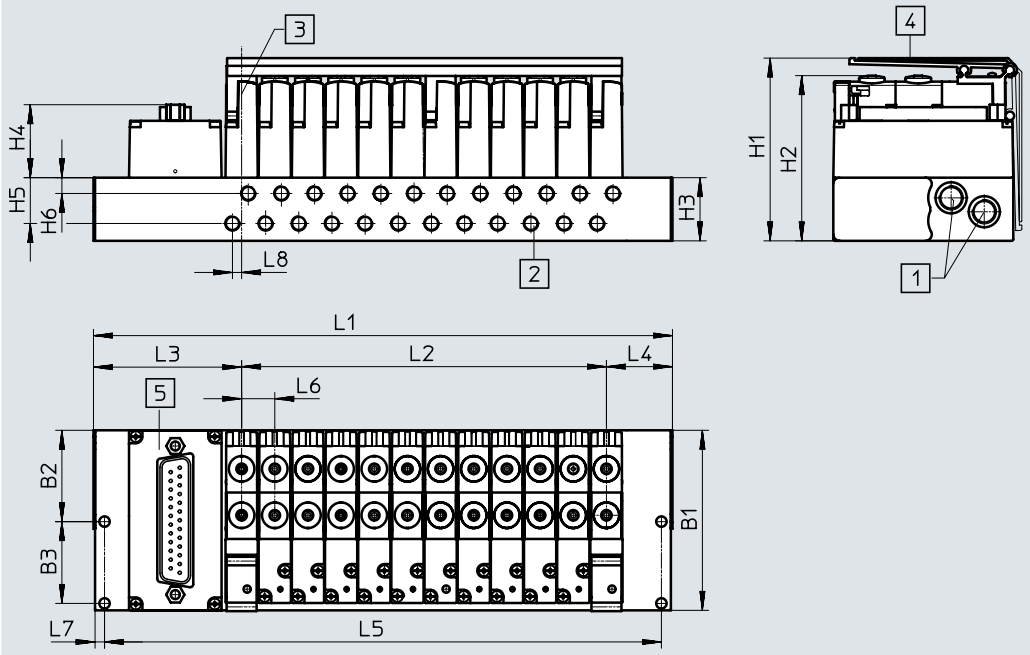
| Electrical data | | | |
|---|---|---|---|
| Power supply | Load voltage interlock (valves) | [V DC] | 24 (±10%) |
| | Load voltage (valves) | [V DC] | 24 (±10%) |
| | Operating voltage (electronics) | [V DC] | 24 (±25%) |
| Duration of pick-up phase | | [ms] | 100 |
| Current consumption per coil at 24 V during the pick-up phase (valves) | | [mA] | 55 |
| Current consumption per coil at 24 V during the holding phase (valves) | | [mA] | 13 |
| Intrinsic current consumption via I-Port (valves/electronics) | | [mA] | 4 0/30 |
| Degree of protection to EN 60529 | | | IP40 |

| Valve switching times | | |
|---|---|---|
| | | [ms] |
| On | | 5.2 |
| Off | | 4.7 |

| Safety characteristics | | |
|---|---|---|
| Tried-and-tested component | | Yes |
| Max. positive test pulse with logic 0 | [µs] | 600 |
| Max. negative test pulse with logic 1 | [µs] | 800 |
| Shock resistance | | Shock test at severity level 2, to FN 942017-5 and EN 60068-2-27 |
| Vibration resistant | | Transport application test at severity level 2, to FN 942017-4 and EN 60068-2-6 |

# Data sheet – Valve terminal VTOC

**Dimensions – Sub-D, single or double** Download CAD data ➔ www.festo.com



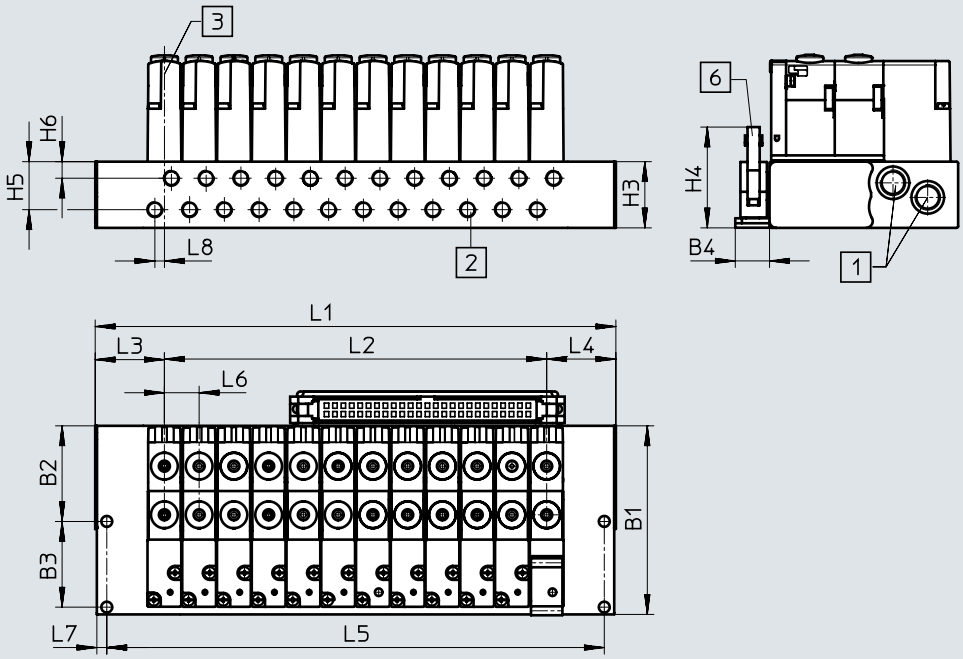

[1] Ports 1 and 3, left and right, M7 or G1/8
[2] Ports 2 and 4, front or underneath, M5 or 10-32 UNF
[3] Centre of first valve position
[4] Inscription label
[5] Electrical connection via Sub-D, single or double (left or right)

| | Comment | Electrical connection on top, single | | | Electrical connection on top, double | | |
|---|---|---|---|---|---|---|---|
| Pneumatic connection | – | M7 | G1/8 | G1/8 | M7 | G1/8 | G1/8 |
| Through-hole | – | ⌀ 3.3 | ⌀ 3.3 | M4 | ⌀ 3.3 | ⌀ 3.3 | M4 |
| L1 | – | L2+L3+L4 | L2+L3+L4 | L2+L3+L4 | L2+L3+L4 | L2+L3+L4 | L2+L3+L4 |
| L2 | – | (n-1)x10.5 | (n-1)x10.5 | (n-1)x10.5 | (n-1)x10.5 | (n-1)x10.5 | (n-1)x10.5 |
| L3 | Distance from the centre of the first valve position to the outer edge on the left-hand side | 41.4 | 46.4 | 36.9 | 66.4 | 71.4 | 66.4 |
| | Sub-D connection, 44-pin, top right, single:<br>Distance from the centre of the first valve position to the outer edge on the left-hand side | 14.4 | 20.4 | 20.4 | – | – | – |
| L4 | Distance from the centre of the last valve position to the outer edge on the right-hand side | 14.4 | 20.4 | 20.4 | – | – | – |
| | Sub-D connection, 44-pin, top right, single:<br>Distance from the centre of the last valve position to the outer edge on the right-hand side | 41.4 | 46.4 | 36.9 | – | – | – |
| L5 | – | (L1-6) | (L1-6) | (L1-6) | (L1-6) | (L1-6) | (L1-6) |

| B1 | B2<br>± 0.1 | B3<br>± 0.1 | H1 | H2 | H3 | H4 | H5 | H6 | L6 | L7<br>± 0.1 | L8 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 57 | 28.9 | 25.9 | 57.9 | 52.3 | 20 | 23.1 | 14.5 | 5 | 10.5 | 3 | 2.9 |

# Data sheet – Valve terminal VTOC

**Dimensions – Ribbon cable on top** Download CAD data ➔ www.festo.com



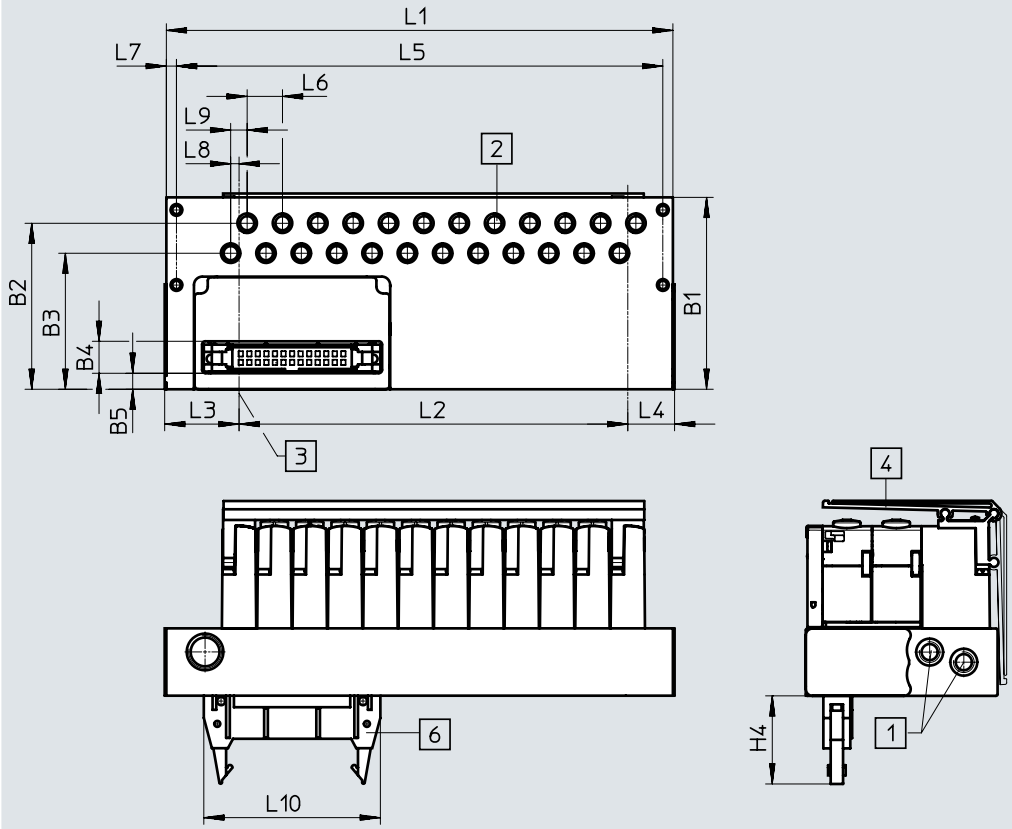

[1] Ports 1 and 3, left and right, M7 or G1/8
[2] Ports 2 and 4, front or underneath, M5 or 10-32 UNF
[3] Centre of first valve position
[6] Electrical connection via ribbon cable

| | Comment | Electrical connection via ribbon cable on top | | |
|---|---|---|---|---|
| Pneumatic connection | – | M7 | G1/8 | G1/8 |
| Through-hole | – | ⌀ 3.3 | ⌀ 3.3 | M4 |
| L1 | – | L2+L3+L4 | L2+L3+L4 | L2+L3+L4 |
| L2 | – | (n-1)x10.5 | (n-1)x10.5 | (n-1)x10.5 |
| L3 | Distance from the centre of the first valve position to the outer edge on the left-hand side | 14.4 | 46.4 | 36.9 |
| L4 | Distance from the centre of the last valve position to the outer edge on the right-hand side | 14.4 | 20.4 | 20.4 |
| L5 | – | (L1-6) | (L1-6) | (L1-6) |

| B1 | B2 ± 0.1 | B3 ± 0.1 | B4 | H3 | H4 | H5 | H6 | L6 | L7 ± 0.1 | L8 |
|---|---|---|---|---|---|---|---|---|---|---|
| 57 | 28.9 | 25.9 | 10.4 | 20 | 30.5 | 14.5 | 5 | 10.5 | 3 | 2.9 |

# Data sheet – Valve terminal VTOC

**Dimensions – Ribbon cable underneath** Download CAD data ➔ www.festo.com



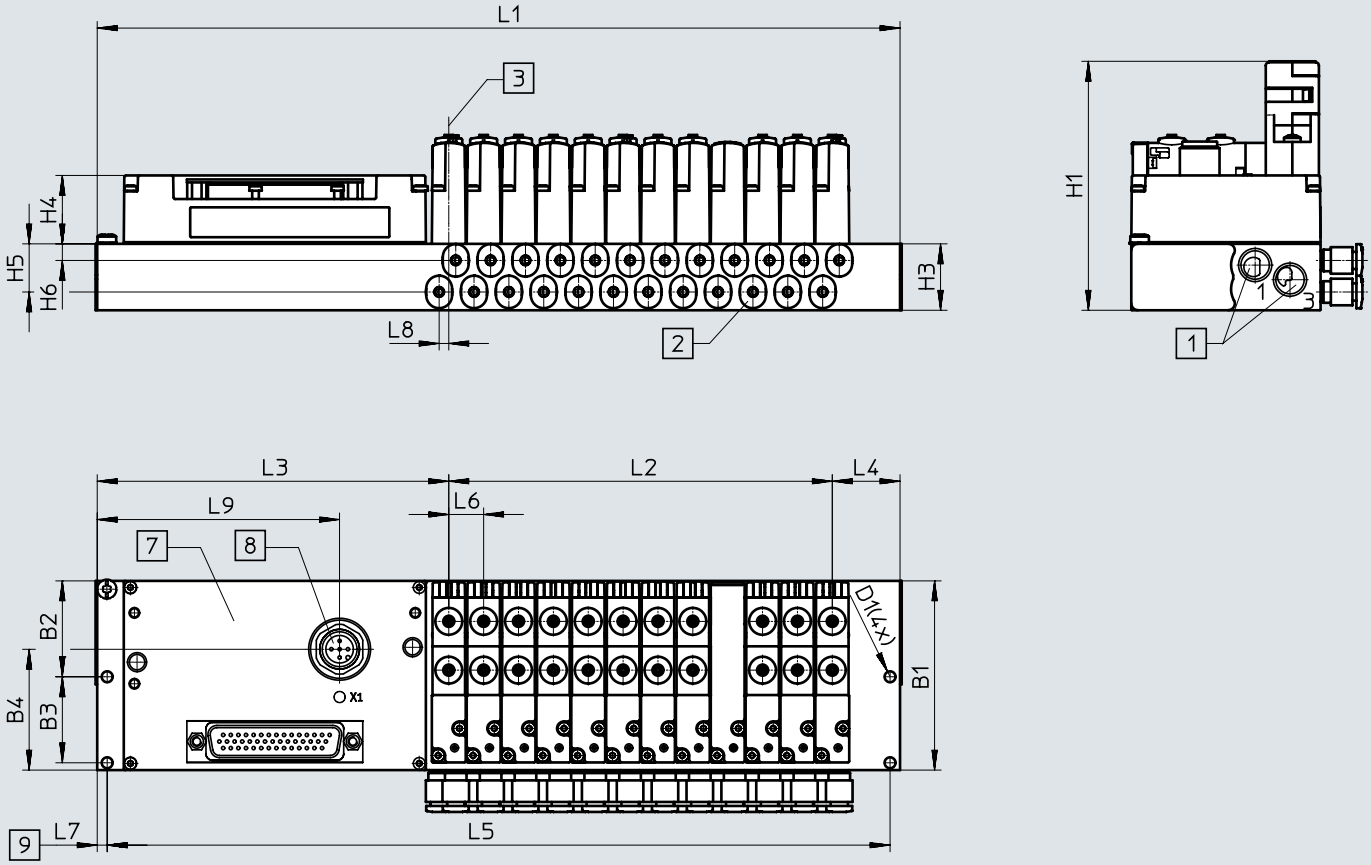

[1] Ports 1 and 3, left and right, M7 or G1/8
[2] Ports 2 and 4, front or underneath, M5 or 10-32 UNF
[3] Centre of first valve position
[4] Inscription label
[6] Electrical connection via ribbon cable underneath

| | Comment | Electrical connection via ribbon cable underneath | | | | |
|---|---|---|---|---|---|---|
| Pneumatic connection | – | M7 left | M7 front | G1/8 front | G1/8 left | G1/8 left |
| Through-hole | – | ⌀ 3.3 | ⌀ 3.3 | ⌀ 3.3 | ⌀ 3.3 | M4 |
| L1 | – | L2+L3+L4 | L2+L3+L4 | L2+L3+L4 | | |
| L2 | – | (n-1)x10.5 | (n-1)x10.5 | (n-1)x10.5 | | |
| L3 | Distance from the centre of the first valve position to the outer edge on the left-hand side | 14.4 | 25.55 | 21.6 | 20.4 | 20.4 |
| L4 | Distance from the centre of the last valve position to the outer edge on the right-hand side | 14.4 | 28.55 | 20.4 | 20.4 | 20.4 |
| L5 | – | (L1-6) | (L1-6) | (L1-6) | (L1-6) | (L1-6) |

| B1 | B2 ± 0.1 | B3 ± 0.1 | B4 | H3 | H4 | H5 | H6 | L6 | L7 ± 0.1 | L8 | L9 | L10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 57 | 28.9 | 25.9 | 10.4 | 20 | 30.5 | 14.5 | 5 | 10.5 | 3 | 2.5 | 4.9 | 52.5 |

# Data sheet – Valve terminal VTOC

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




[1] Ports 1 and 3: M7 or G1/8, position: left and right

[2] Ports 2 and 4: M5 or M8x0.5, position: front or underneath

[3] Centre of first valve position

[7] Electrical connection: I-Port interface

[8] M12 plug

[9] See dimensions for mounting holes

| | Comment | Electrical connection on top, single | | |
|---|---|---|---|---|
| Pneumatic connection | – | M7 | G1/8 | G1/8 |
| Through-hole | – | ⌀ 3.3 | ⌀ 3.3 | M4 |
| L1 | – | L2+L3+L4 | L2+L3+L4 | L2+L3+L4 |
| L2 | – | (n-1)x10.5 | (n-1)x10.5 | (n-1)x10.5 |
| L3 | Distance from the centre of the first valve position to the outer edge on the left-hand side | 105.9 | 105.9 | 105.9 |
| L4 | Distance from the centre of the first valve position to the outer edge on the right-hand side | 14.4 | 20.4 | 20.4 |
| L5 | – | (L1-2)xL7 | (L1-2)xL7 | (L1-2)xL7 |

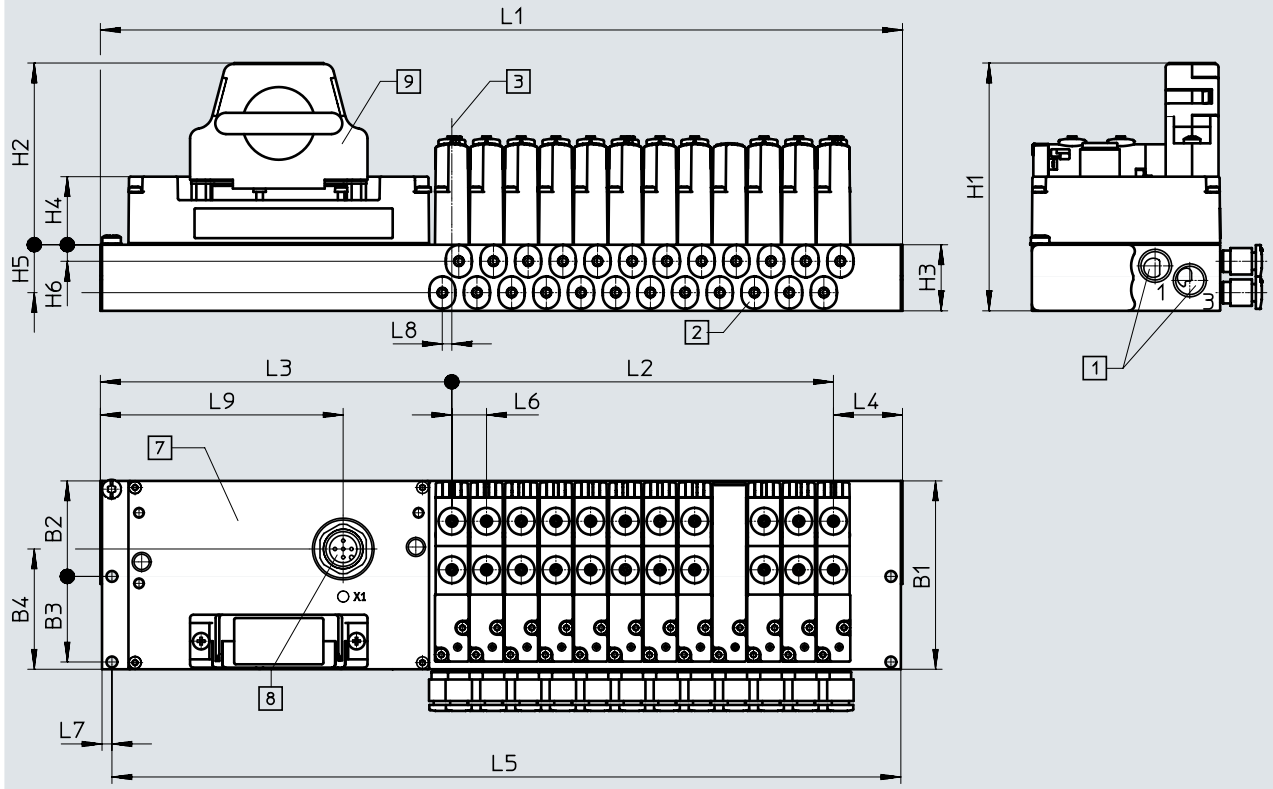
| B1 | B2 ± 0.1 | B3 ± 0.1 | B4 | H1 | H3 | H4 | H5 ± 0.1 | H6 ± 0.1 | L6 ± 0.05 | L7 ± 0.1 | L8 | L9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 57 | 28.9 | 25.9 | 36.4 | 74.7 | 20 | 20.6 | 14.5 | 5 | 10.5 | 3 | 2.9 | 73 |

**Note**

Deviating dimensions following assembly of the fieldbus node CTEU.
Specified dimensions for the fieldbus node CTEU ➔ installation system CTEU/CTEL

# Data sheet – Valve terminal VTOC

**Dimensions – I-Port interface with Sub-D socket NEFF** Download CAD data ➔ www.festo.com




[1] Ports 1 and 3: M7 or G1/8
[2] Ports 2 and 4: M5 or M8x0.5
[3] Centre of first valve position
[7] Electrical connection: I-Port interface
[8] M12 plug
[9] Sub-D socket for bypassing the interlock function

| B1 | B2 ± 0.1 | B3 ± 0.1 | B4 | H1 | H2 | H3 | H4 | H5 ± 0.1 | H6 ± 0.1 | L1 | L2 | L3 | L4 | L5 ± 0.2 | L6 ± 0.5 | L7 ± 0.1 | L8 | L9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 57 | 28.9 | 25.9 | 36.4 | 74.7 | 54.7 | 20 | 20.6 | 14.5 | 5 | L2+L3+L4 | (n-1)x10.5 | 105.9 | 14.4 | (L1-6) | 10.5 | 3 | 2.9 | 73 |

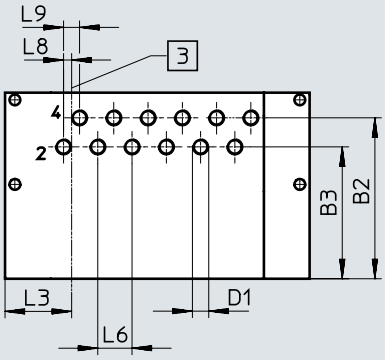
**Note**

Deviating dimensions following assembly of the fieldbus node CTEU. Specified dimensions for the bus node CTEU ➔ installation system CTEU/CTEL

# Data sheet – Valve terminal VTOC

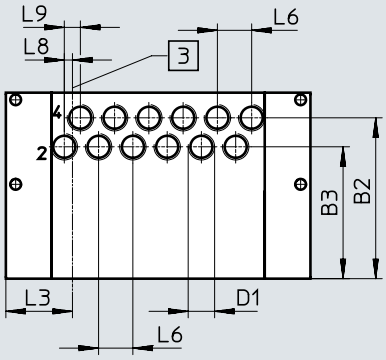
**Dimensions – Pneumatic connections** Download CAD data ➔ www.festo.com

Ports 2 and 4 underneath, M5 (10-32 UNF)



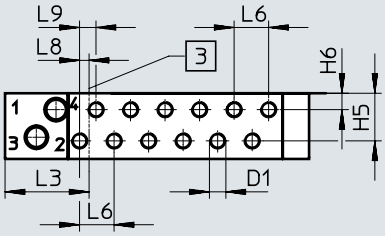

[3] Centre of first valve position

Ports 2 and 4 underneath, compact



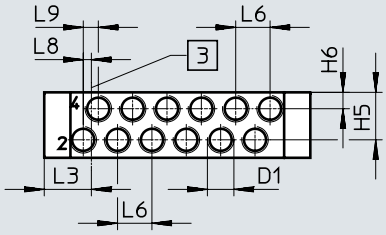

[3] Centre of first valve position

Ports 2 and 4 at the front, M5 (10-32 UNF)




[3] Centre of first valve position

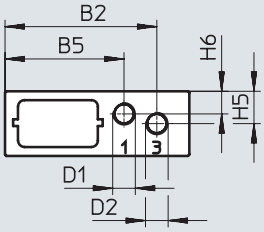
Ports 2 and 4 at the front, compact



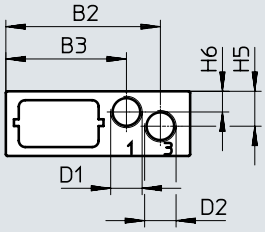

[3] Centre of first valve position

| Connection | B2 | B3 ± 0.1 | D1 | H5 | H6 | L6 | L8 | L9 |
|---|---|---|---|---|---|---|---|---|
| Underneath, M5 (10-32 UNF) | 49.3 | 40.4 | M5 | – | – | 10.5 | 2.5 | 4.9 |
| Underneath, compact | 49.3 | 40.4 | M8x0.5 | – | – | 10.5 | 2.5 | 4.9 |
| Front, M5 (10-32 UNF) | – | – | M5 | 14.5 | 5 | 10.5 | 2.9 | 5 |
| Front, compact | – | – | M8x0.5 | 14.5 | 5 | 10.5 | 2.5 | 4.6 |

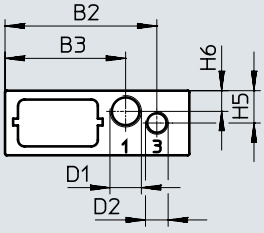
Ports 1 and 3, M7 left




Ports 1 and 3, G1/8 left




Ports 1 and 3, G1/8 left, with mounting hole M4

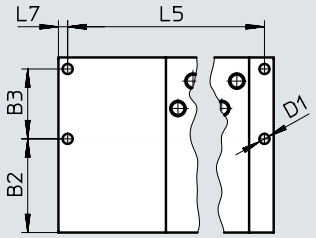



| Port 1 and 3 | B2 | B3 | D1 | D2 | H5 | H6 |
|---|---|---|---|---|---|---|
| M7 left | 47 | 36.8 | M7 | M7 | 10 | 7 |
| G1/8 left, with mounting hole M4 | 47 | 37.3 | G1/8 | M7 | 10 | 6.4 |

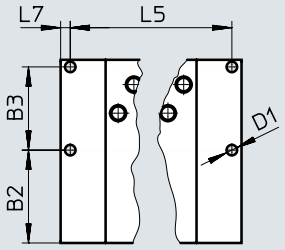
# Data sheet – Valve terminal VTOC

**Dimensions – Mounting hole** Download CAD data ➔ www.festo.com

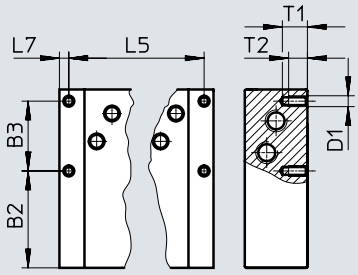
Ø 3.3 underneath, ports 1 and 3, M7



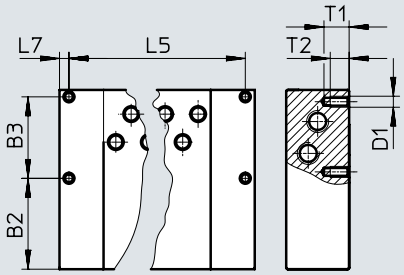

Ø 3.3 underneath, ports 1 and 3, G1/8



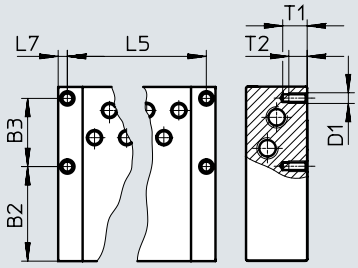

M3 underneath, ports 1 and 3, M7



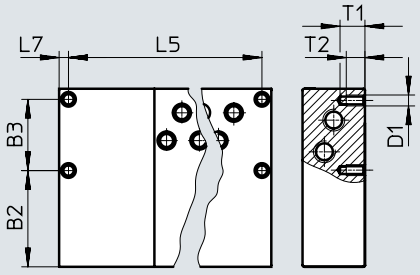

M3 underneath, ports 1 and 3, G1/8



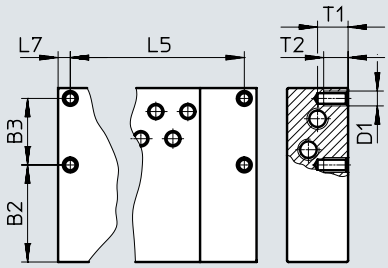

M4 underneath, ports 1 and 3, M7



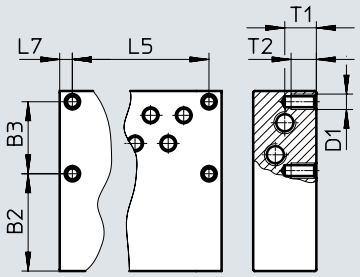

M4 or 8-32UNC underneath, ports 1 and 3, G1/8



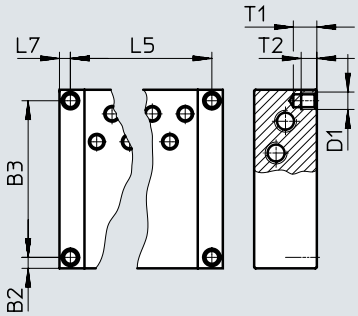

8-32UNC underneath, ports 1 and 3, M7




8-32UNC underneath, ports 1 and 3, G1/8



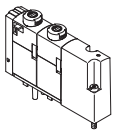
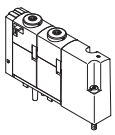
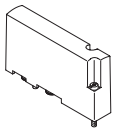
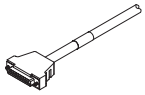
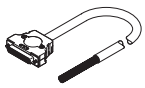

10-32UNF-2B underneath, ports 1 and 3, M7 or G1/8



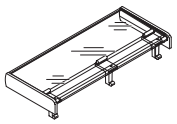
# Data sheet – Valve terminal VTOC

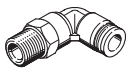
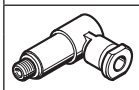
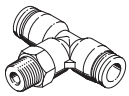
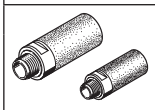
| | B2 | B3 | D1 | L5 | L7 | T1 | T2 |
|---|---|---|---|---|---|---|---|
| 3.3 underneath, ports 1 and 3, M7 | 30.5 | 22.8 | 3.3 | L1-2xL7 | 3 | – | – |
| 3.3 underneath, ports 1 and 3, G1/8 | 28.9 | 25.9 | 3.3 | | 3 | – | – |
| M3 underneath, ports 1 and 3 M7 | 31 | 22.3 | M3 | | 3 | 8 | 6 |
| M3 underneath, ports 1 and 3, G1/8 | 28.9 | 25.9 | M3 | | 3 | 8 | 6 |
| M4 underneath, ports 1 and 3 M7 | 31 | 22.3 | M4 | | 3 | 7.5 | 6 |
| M4 or 8-32UNC underneath, ports 1 and 3, G1/8 | 30.8 | 22.8 | M4/8-32UNC | | 3 | 7.5 | 6 |
| 8-32UNC underneath, ports 1 and 3 M7 | 31.8 | 21.8 | 8-32UNC | | 4 | 10 | 8 |
| 8-32UNC underneath, ports 1 and 3, G1/8 | 30.8 | 22.8 | 8-32UNC | | 4 | 10 | 8 |
| 10-32UNF-28 underneath, ports 1 and 3, M7 or G1/8 | 3.5 | 50 | 10-32UNF-28 | | 3.5 | 7.5 | 5 |

# Accessories

| Ordering data | Code | Valve function | | Part no. | Type |
|---|---|---|---|---|---|
| **Solenoid valves** | | | | | |
|  | K | 2x3/2-way valve, single solenoid, normally closed, manual override detenting, non-detenting/detenting | | **565450** | **VOVC-BT-T32C-MT-F-1T1** |
|  | K | 2x 3/2-way valve, single solenoid, normally closed, manual override, non-detenting | | **565449** | **VOVC-BT-T32C-MH-F-1T1** |
| **Blanking plate** | | | | | |
|  | L | Blanking plate for vacant position | | **565451** | **VABB-L2-P3** |
| **Cover cap for manual override** | | | | | |
|  | – | Detenting, without accessories | | **8002234** | **VAMC-L1-CD** |
| **Blanking plug** | | | | | |
|  | – | For sealing the air supply or exhaust port | | **3568** | **B-1/8** |
| | – | | | **174309** | **B-M7** |
| **Connecting cable for multi-pin plug** | | | | | |
|  | – | • Sub-D socket, 25-pin, IP40<br>• Open cable end, 15-core | 2.5 | **530049** | **KMP6-25P-12-2.5** |
| | | | 5 | **530050** | **KMP6-25P-12-5** |
| | | | 10 | **530051** | **KMP6-25P-12-10** |
| | – | • Sub-D socket, 25-pin, IP40<br>• Open cable end 25-core | 2.5 | **530046** | **KMP6-25P-20-2.5** |
| | | | 5 | **530047** | **KMP6-25P-20-5** |
| | | | 10 | **530048** | **KMP6-25P-20-10** |
|  | – | • Sub-D socket, straight, 44-pin, up to 35 coils, IP40<br>• Open cable end, 44-core | 2.5 | **575113** | **NEBV-S1G44-K-2.5-N-LE44-S6** |
| | | | 5 | **575114** | **NEBV-S1G44-K-5-N-LE44-S6** |
| | | | 10 | **575115** | **NEBV-S1G44-K-10-N-LE44-S6** |

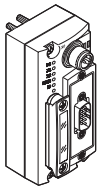
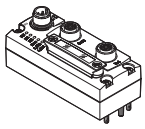
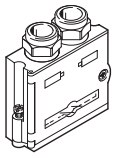
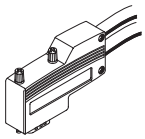
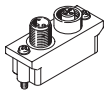
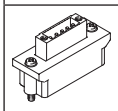
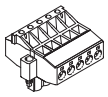
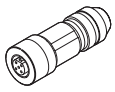
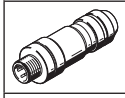
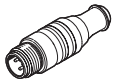
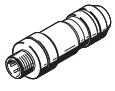
# Accessories

| Ordering data | | | | | | |
|---|---|---|---|---|---|---|
| | Code | Valve function | | | Part no. | Type |
| **Inscription label holder** | | | | | | |
|  | – | Inscription label holder for identifying the valves | 3 valve positions | 9.9 g | **565571** | **ASCF-H-L2-3V** |
| | | | 4 valve positions | 11.5 g | **565572** | **ASCF-H-L2-4V** |
| | | | 5 valve positions | 13.1 g | **565573** | **ASCF-H-L2-5V** |
| | | | 6 valve positions | 14.7 g | **565574** | **ASCF-H-L2-6V** |
| | | | 7 valve positions | 17.2 g | **565575** | **ASCF-H-L2-7V** |
| | | | 8 valve positions | 18.8 g | **565576** | **ASCF-H-L2-8V** |
| | | | 9 valve positions | 20.4 g | **565577** | **ASCF-H-L2-9V** |
| | | | 10 valve positions | 22 g | **565578** | **ASCF-H-L2-10V** |
| | | | 11 valve positions | 23.6 g | **565579** | **ASCF-H-L2-11V** |
| | | | 12 valve positions | 25.2 g | **565580** | **ASCF-H-L2-12V** |
| | | | 13 valve positions | 27.7 g | **565581** | **ASCF-H-L2-13V** |
| | | | 14 valve positions | 29.3 g | **565582** | **ASCF-H-L2-14V** |
| | | | 15 valve positions | 30.9 g | **565583** | **ASCF-H-L2-15V** |
| | | | 16 valve positions | 32.5 g | **565584** | **ASCF-H-L2-16V** |
| | | | 17 valve positions | 34.1 g | **565585** | **ASCF-H-L2-17V** |
| | | | 18 valve positions | 35.7 g | **565586** | **ASCF-H-L2-18V** |
| | | | 19 valve positions | 38.2 g | **565587** | **ASCF-H-L2-19V** |
| | | | 20 valve positions | 39.8 g | **565588** | **ASCF-H-L2-20V** |
| | | | 21 valve positions | 41.4 g | **565589** | **ASCF-H-L2-21V** |
| | | | 22 valve positions | 43 g | **565590** | **ASCF-H-L2-22V** |
| | | | 23 valve positions | 44.6 g | **565591** | **ASCF-H-L2-23V** |
| | | | 24 valve positions | 46.2 g | **565592** | **ASCF-H-L2-24V** |

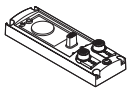
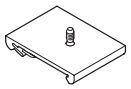
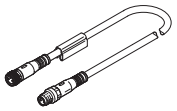
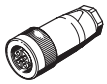
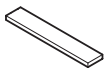
| Ordering data | | | | | | |
|---|---|---|---|---|---|---|
| | Code | Description | Tubing O.D. | Packaging unit quantity | Part no. | Type |
| **Push-in fittings** | | | | | | Datasheets → Internet: quick star |
|  | – | QS push-in fitting | 1/4" | 1 | **183741** | **QS-1/8-1/4-I-U-M** |
| | | | 8 mm | 10 | **153015** | **QS-1/8-8-I** |
| | | | 6 mm | 10 | **153321** | **QSM-M7-6-I** |
| | | | 1/4" | 1 | **183740** | **QSM-M7-1/4-I-U-M** |
| | | | 1/8" | 10 | **183749** | **QSM-M5-1/8-I-U-M** |
| | | | 5/32" | 1 | **130593** | **QSM-M5-5/32-I-U-M** |
| | | | 3 mm | 10 | **153313** | **QSM-M5-3-I** |
| | | | 4 mm | 10 | **153315** | **QSM-M5-4-I** |
|  | – | Push-in L-fitting | 1/4" | 1 | **533235** | **QBL-1/8-1/4-U-M** |
| | | | 3/8" | 1 | **562578** | **QBL-1/8-3/8-U-M** |
| | | | 3 mm | 10 | **130830** | **QSMLV-M5-3-I** |
| | | | 4 mm | 10 | **130831** | **QSMLV-M5-4-I** |
|  | – | Push-in L-fitting, long | 3 mm | 10 | **130834** | **QSMLLV-M5-3-I** |
| | | | 4 mm | 10 | **130835** | **QSMLLV-M5-4-I** |
|  | – | T-fitting | 1/4" | 1 | **533254** | **QBT-1/8-1/4-U-M** |
| | | | 3/8" | 1 | **562579** | **QBT-1/8-3/8-U-M** |
| | | | 8 mm | 1 | **153109** | **QST-1/8-8** |
| **Silencer** | | | | | | Datasheets → Internet: quick star |
|  | U | Silencer | – | 1 | **161418** | **UC-M7** |
| | | | | 50 | **534218** | **UC-M7-50** |

# Accessories

**Ordering data – CTEU**

| | | Part no. | Type |
|---|---|---|---|
| **Bus node** | | | |
|  | CANopen bus node | **570038** | **CTEU-CO** |
| | DeviceNet® bus node | **570039** | **CTEU-DN** |
| | CC-Link® bus node | **1544198** | **CTEU-CC** |
| | PROFIBUS bus node | **570040** | **CTEU-PB** |
| | PROFINET bus node | **2201471** | **CTEU-PN** |
| | EP bus node | **2798071** | **CTEU-EP** |
|  | EtherCAT® bus node | **572556** | **CTEU-EC** |
| | AS-Interface bus node | **572555** | **CTEU-AS** |
| | VARAN bus node | **8087559** | **CTEU-VN** |
| **Bus connection** | | | |
|  | Sub-D plug, straight, for DeviceNet®/CANopen | **532219** | **FBS-SUB-9-BU-2x5POL-B** |
| | Sub-D plug, straight, for CC-Link® | **532220** | **FBS-SUB-9-GS-2x4POL-B** |
| | Sub-D plug, straight, for PROFIBUS | **532216** | **FBS-SUB-9-GS-DP-B** |
|  | Sub-D plug, angled, for CANopen, 9-pin | **533783** | **FBS-SUB-9-WS-CO-K** |
| | Sub-D plug, angled, for PROFIBUS, 9-pin | **533780** | **FBS-SUB-9-WS-PB-K** |
|  | M12x1, 5-pin, A-coded, for DeviceNet®/CANopen | **525632** | **FBA-2-M12-5POL** |
| | M12x1, 5-pin, B-coded, for PROFIBUS | **533118** | **FBA-2-M12-5POL-RK** |
|  | For 5-pin terminal strip for DeviceNet®/CANopen | **525634** | **FBA-1-SL-5POL** |
|  | Terminal strip, 5-pin, for DeviceNet®/CANopen | **525635** | **FBSD-KL-2x5POL** |
|  | Fieldbus socket, M12x1, 5-pin, for DeviceNet®/CANopen | **8162291** | **NECB-M12G5-C2** |
| | Plug, M12x1, 5-pin, for DeviceNet®/CANopen | **–** | **FBS-M12-5GS-PG9** |
|  | Straight socket, M12x1, 5-pin, for assembling a connecting cable compatible with FBA-2-M12-5POL-RK for PROFIBUS | **1067905** | **NECU-M-B12G5-C2-PB** |
|  | Straight plug, M12x1, 5-pin, for assembling a connecting cable compatible with FBA-2-M12-5POL-RK for PROFIBUS | **1066354** | **NECU-M-S-B12G5-C2-PB** |
|  | Terminating resistor, M12, B-coded for PROFIBUS | **1072128** | **CACR-S-B12G5-220-PB** |
|  | Plug M12x1, 4-pin, D-coded for EtherCAT® | **543109** | **NECU-M-S-D12G4-C2-ET** |

# Accessories

| Ordering data – CTEU | | | | Part no. | Type |
|---|---|---|---|---|---|
| **E-box** | | | | | |
|  | – | For connecting a second device with I-Port interface | | **570042** | **CAPC-F1-E-M12** |
| **DIN rail mounting** | | | | | |
|  | – | For electrical connection block CAPC | | **570043** | **CAFM-F1-H** |
| **Connecting cable** | | | | | Datasheets → Internet: nebu |
|  | – | • Straight socket, M12x1, 5-pin,<br>• Straight plug, M12x1, 5-pin<br>• Nominal conductor cross section 1 mm² | 5 m | **574321** | **NEBU-M12G5-E-5-Q8N-M12G5** |
| | | | 7.5 m | **574322** | **NEBU-M12G5-E-7.5-Q8N-M12G5** |
| | | | 10 m | **574323** | **NEBU-M12G5-E-10-Q8N-M12G5** |
| | – | • Angled socket, M12x1, 5-pin,<br>• Angled plug, M12x1, 5-pin | 0.5 m | **570733** | **NEBU-M12W5-K-0.5-M12W5** |
| | | | 2 m | **570734** | **NEBU-M12W5-K-2-M12W5** |
| | – | • Straight socket, M12x1, 5-pin,<br>• Angled plug, M12x1, 5-pin | 0.5 m | **8003617** | **NEBU-M12G5-K-0.5-M12W5** |
| | | | 2 m | **8003618** | **NEBU-M12G5-K-2-M12W5** |
| **Plug socket** | | | | | |
|  | – | For power supply, M12x1, 5-pin, B-coded for CANopen/DeviceNet® | | **538999** | **NTSD-GD-9-M12-5POL-RK** |
| | – | For power supply, M12x1, 5-pin for CC-Link®, PROFIBUS, EtherCAT® | | **8162291** | **NECB-M12G5-C2** |
| **Connection technology for IO-Link®** | | | | | |
|  | XM | T-adapter M12, 5-pin for IO-Link® and load supply | | **171175** | **FB-TA-M12-5POL** |
| **Straight plug, for I-Port interface/IO-Link®** | | | | | |
|  | XN | M12, 5-pin, in combination with T-adapter for separate load voltage | | **8162296** | **NECB-S-M12G5-C2** |
| **Plug socket** | | | | | |
|  | – | For bypassing the interlock function | | **1589339** | **NEFF-S1G44LB** |
| **Inscription label** | | | | | |
|  | – | For bus node | | **565306** | **ASLR-C-E4** |