

## Valve terminal VTUX

**FESTO**



## Key features

**Innovative**

- Compact design with low overall height and width
- Manifold sub-bases with different widths for different flow rate with the same valves
- Flow rate up to 670 l/min
- Flexibly configurable push-in fittings as a cartridge, easy to exchange in just a few simple steps
- Wide range of electrical connection options for multi-pin plug: Sub-D, ribbon cable or spring-loaded terminal
- Connection to the automation system CPX-AP-I
- Connection to the automation system CPX-AP-A
- IO-Link® interface

**Versatile**

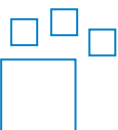
- Modular system offering a range of configuration options
- Manifold sub-bases for 4 valves or an individual valve, can be combined as required
- System can be extended as needed with individual manifold sub-bases and modular tie rods
- Up to 32 solenoid coils
- Can be converted and extended at a later date
- Air supply can be extended via additional pressure zones using supply modules
- Can be assembled using individually ordered components

**Reliable**

- High output reserves thanks to large pneumatic cross sections and exhausting with high flow rates
- Resilient thanks to high mechanical rigidity
- Lightweight polymer components
- Fast troubleshooting with LEDs on the valves
- Easy to service with replaceable valves and manifold sub-bases
- Manual override either non-detenting, detenting or secured against unauthorised activation (concealed)

**Easy to install**

- Fast and reliable delivery as a ready-to-install and tested unit or for self-assembly from individual components
- Reduced selection, ordering, installation and commissioning costs
- Secure wall mounting or H-rail mounting

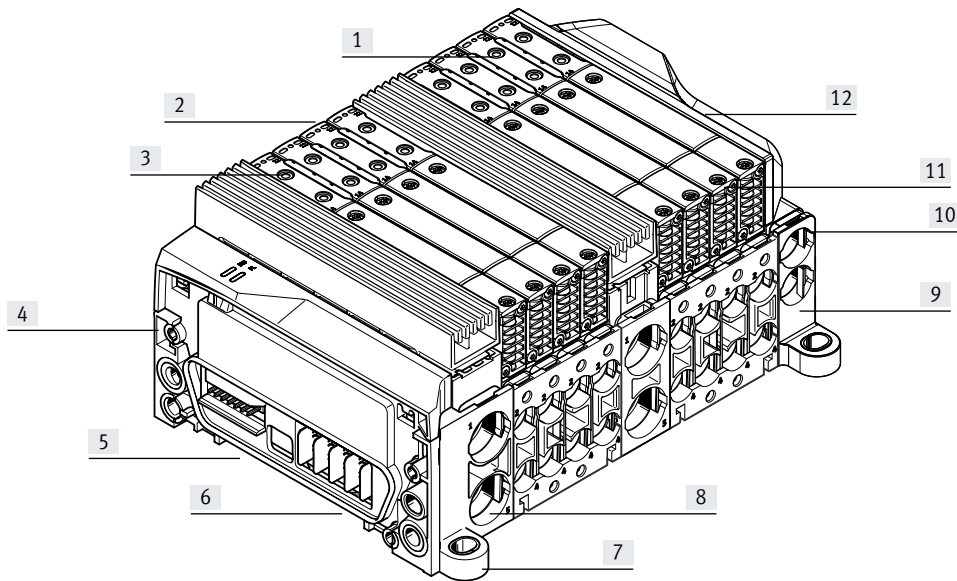
**Ordering data – Product options**

Configurable product  
This product and all its product options can be ordered using the configurator.

The configurator can be found at  
→ [www.festo.com/catalogue/...](http://www.festo.com/catalogue/...)  
Enter the part number or the type.

| Part no. | Type         |
|----------|--------------|
| 8000800  | VTUX-A-P     |
| 8000810  | VTUX-A-P-APA |
| 8000850  | VUX          |

## Key features



- |   |   |   |   |
|---|---|---|---|
| <p>[1] Valves in width 10 mm and manifold sub-bases in widths of 10 mm and 12 mm</p> <p>[2] Reduced downtime: LED signal status indicator</p> <p>[3] Safe operation: Manual override, non-detenting/detenting or concealed</p> <p>[4] Pneumatic interface to CPX-AP-A</p> | <p>[5] Simple electrical connection<br/>– Multi-pin plug connection<br/>– Fieldbus interface CPX-AP-A<br/>– Interface CPX-AP-I<br/>– IO-Link®</p> <p>[6] Reliable: Operating voltage connection, outputs and valves can be disconnected separately</p> <p>[7] Quick to mount: Directly using screws or on an H-rail</p> | <p>[8] Practical: Pre-assembled cartridges can be exchanged in just a few steps</p> <p>[9] Adaptable: The pilot air supply (internal or external) is selected using a separator in the end plate</p> <p>[10] Variable: 32 valve positions/32 solenoid coils</p> | <p>[11] Space-saving: Flat valves and flat plate silencer</p> <p>[12] Modular: Pressure zone creation, additional exhaust and supply ports possible using supply module</p> |
|---|---|---|---|

**Equipment options**

## Valve functions

- 5/2-way valve, single solenoid
- 5/2-way valve, double solenoid
- 2x 3/2-way valve, normally open
- 2x 3/2-way valve, normally closed
- 5/3-way valve, mid-position closed

## Special features

- Max. 32 valve positions/  
max. 32 solenoid coils
- Parallel, modular valve links
- Any compressed air supply
- Creation of pressure zones possible
- Modular, individually extendable tie rods
- Single valves or combinations of four valves
- Freely selectable tubing size at each port

## Key features

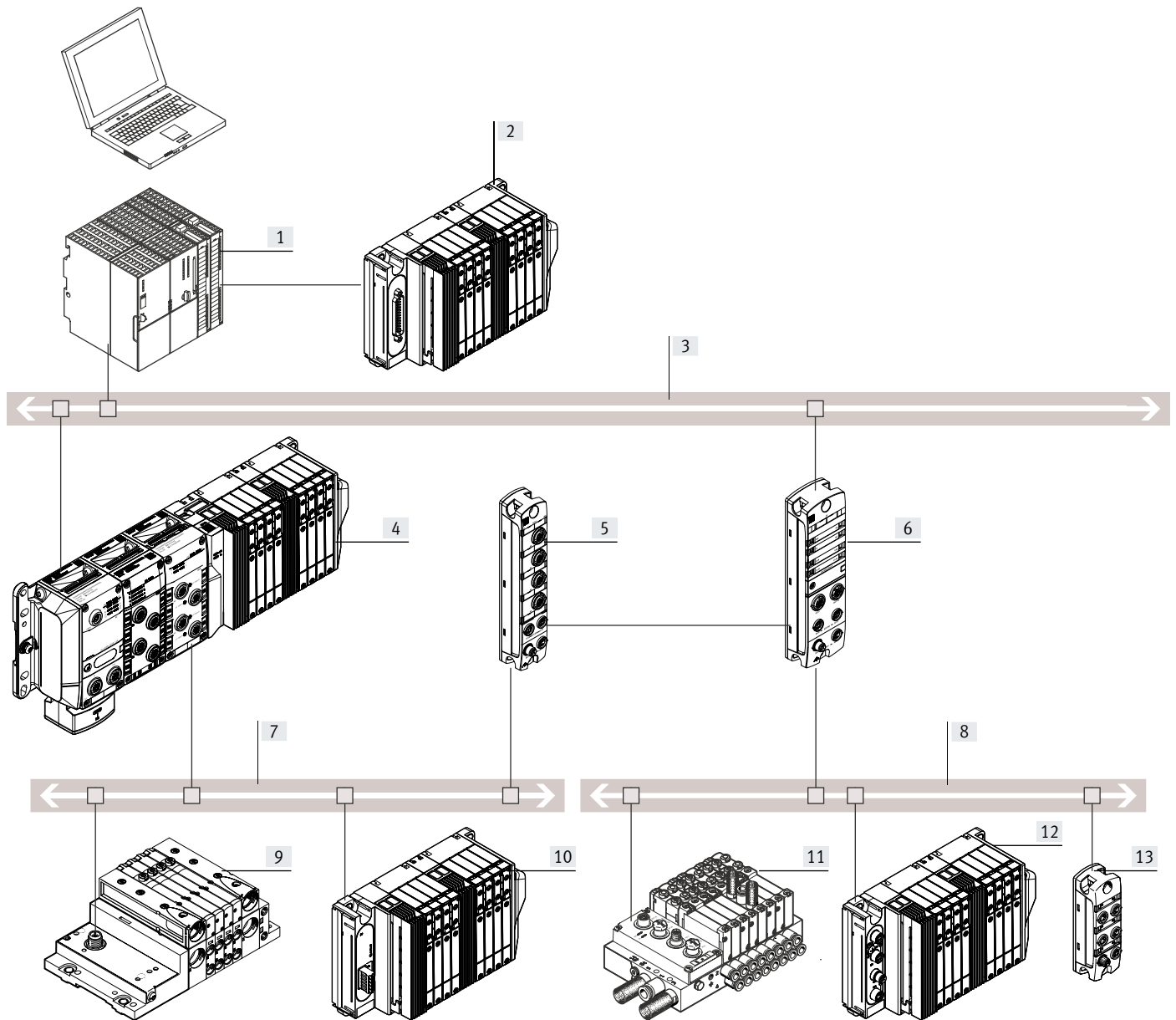
### Control variants of the valve terminal VTUX

The VTUX can be integrated in control systems in a variety of ways. There are a range of designs available for actuation via electrical multi-pin connection. Likewise, valve terminals can be connected via IO-Link® using round plugs with a high degree of protection or using terminal connections.

The valve terminals are particularly versatile and high-performing thanks to the perfect integration into the Festo AP Automation Platform. In combination with the automation system CPX-AP-A, valve terminals with various peripheral modules can be readily configured and assembled.

Integration into the automation system CPX-AP-I offers numerous options, especially for decentralised solutions. It is thus possible to have particularly space-saving solutions close to the pneumatic drives, enabling rapid movements and short cycle times.

Being able to combine the valve terminal with the automation system CPX-AP-A as well as CPX-AP-I creates a unique solution for central and decentralised machine functions. This modularity makes the VTUX perfectly adaptable to any application.



- [1] Higher-order controller (PLC)
- [2] VTUX with multi-pin plug connection
- [3] Fieldbus
- [4] VTUX with automation system CPX-AP-A with fieldbus interface
- [5] IO-Link master of the automation system CPX-AP-I
- [6] Bus node of the automation system CPX-AP-I
- [7] IO-Link
- [8] AP bus
- [9] Components from Festo with IO-Link interface (e.g. valve terminal MPA-S)
- [10] VTUX with IO-Link node
- [11] Components from Festo with AP bus interface (e.g. valve terminal MPA-S)
- [12] VTUX with pneumatic interface for automation system CPX-AP-I
- [13] Input/output module with AP bus



## Key features

## Valve terminal selection

## Valve terminal configurator

The appropriate valve terminal VTUX can be selected quickly and easily using the online catalogue. This includes a convenient valve terminal configurator, making it much easier to order the right product.

The valve terminals are assembled according to your order specification and are individually checked. This reduces assembly and installation time to a minimum.

Order a valve terminal VTUX using the order code.

Ordering system for VTUX

→ Internet: vtux

Ordering system for CPX-AP-I

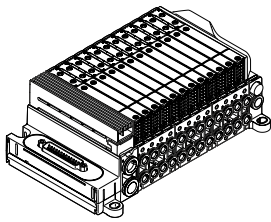
→ Internet: cpx-ap-i

Online at: → [www.festo.com](http://www.festo.com)

2D/3D CAD data

You can request the CAD data for a valve terminal you have configured. To do so, start the product search as described above. Click on the CAD/EPLAN symbol. On the next page, you can generate a 3D preview or request a data format of your choice via e-mail.

## Multi-pin plug connection



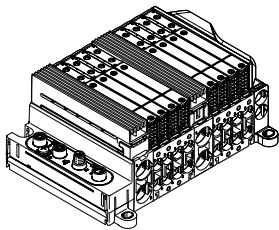
The signals are transmitted from the controller to the valve terminal via a pre-assembled or self-assembled multi-core cable to the multi-pin plug connection. This substantially reduces installation time.

The valve terminal can be equipped with max. 32 solenoid coils. This corresponds to 2 to 32 valves.

Versions:

- Sub-D connection
  - Pre-assembled multi-pin cable
  - Multi-pin cable for self-assembly
- Ribbon cable connection
- Terminal strip connection

## Fieldbus interface via the automation system CPX-AP-I



CPX-AP-I is a flexible, decentralised, compact and lightweight automation system with high degree of protection IP65/IP67.

An automation system CPX-AP-I consists of a bus interface and at least one other module. System communication between the modules takes place via connecting cables.

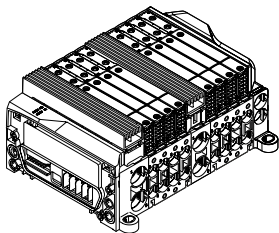
The process data is exchanged cyclically. The following module types are available:

- Bus interface
- Input modules
- Input/output modules
- Interface for valve terminal

Fieldbus protocols in combination with VTUX:

- PROFINET
- EtherNet/IP
- EtherCAT®

## Fieldbus interface via the automation system CPX-AP-A



CPX-AP-A is a flexible, central, compact and lightweight automation system with high degree of protection IP65/IP67.

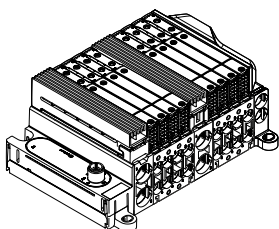
A bus node directly mounted on the valve terminal VTUX manages communication with a higher-order PLC.

A compact unit, combining pneumatics, sensors and a bus interface, can be designed using directly linked input and output modules.

Fieldbus protocols:

- PROFINET
- EtherNet/IP
- EtherCAT®

## IO-Link®



IO-Link® consists of a central master and the IO-Link® devices connected via special connecting cables. This permits a decentralised layout of the devices.

The connection type corresponds to a star topology.

As well as transmitting the communication data, the IO-Link® interfaces also handle the power supply for the connected devices.

The maximum length of a string is 20 m.

## Peripherals overview

### Modular pneumatic components

The modular design of the valve terminal VTUX enables outstanding flexibility right from the planning stage and offers maximum ease of service in operation.

The system consists of manifold sub-bases and valves.

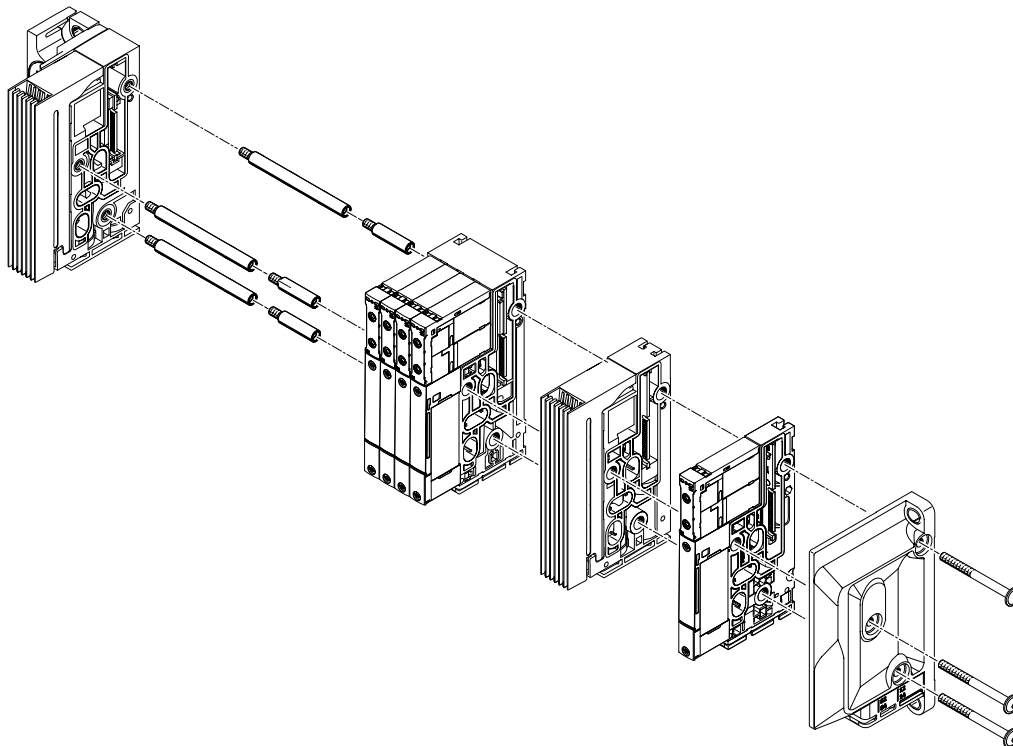
The manifold sub-bases form the support system for the valves.

They contain the electrical links, the ducts for supplying compressed air to and exhausting the valve terminal as well as the working ports for the pneumatic drives for each valve.

The manifold sub-bases are connected by a tie rod system. This comprises a tie rods and a screw set. The combination of tie rods and screw set is selected according to the chosen number of individual sub-bases.

A valve terminal can be easily extended by adding individual manifold sub-bases or supply modules. This is done simply by inserting suitable tie rod extenders.

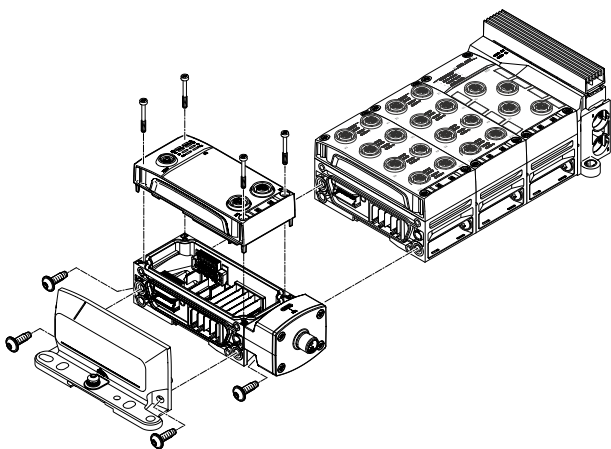
This ensures that the valve terminal can be rapidly and reliably extended.



#### Note

The tie rod system for the valve terminal VTUX consists of at least two manifold sub-bases or one manifold sub-base and one supply module.

### Modular electrical peripherals



The mechanical connection between the CPX-AP-A modules is created using angled fittings.

The automation system CPX-AP-A can be flexibly expanded at any time. The advantages of polymer (low weight) and metal (sturdy, high EMC compatibility) are perfectly combined by using high-quality polymer materials.

The input/output modules, manifold blocks and bus node of the automation system CPX-AP-A are fastened to the interlinking blocks using 4 screws and can be exchanged or modified in nearly any way.

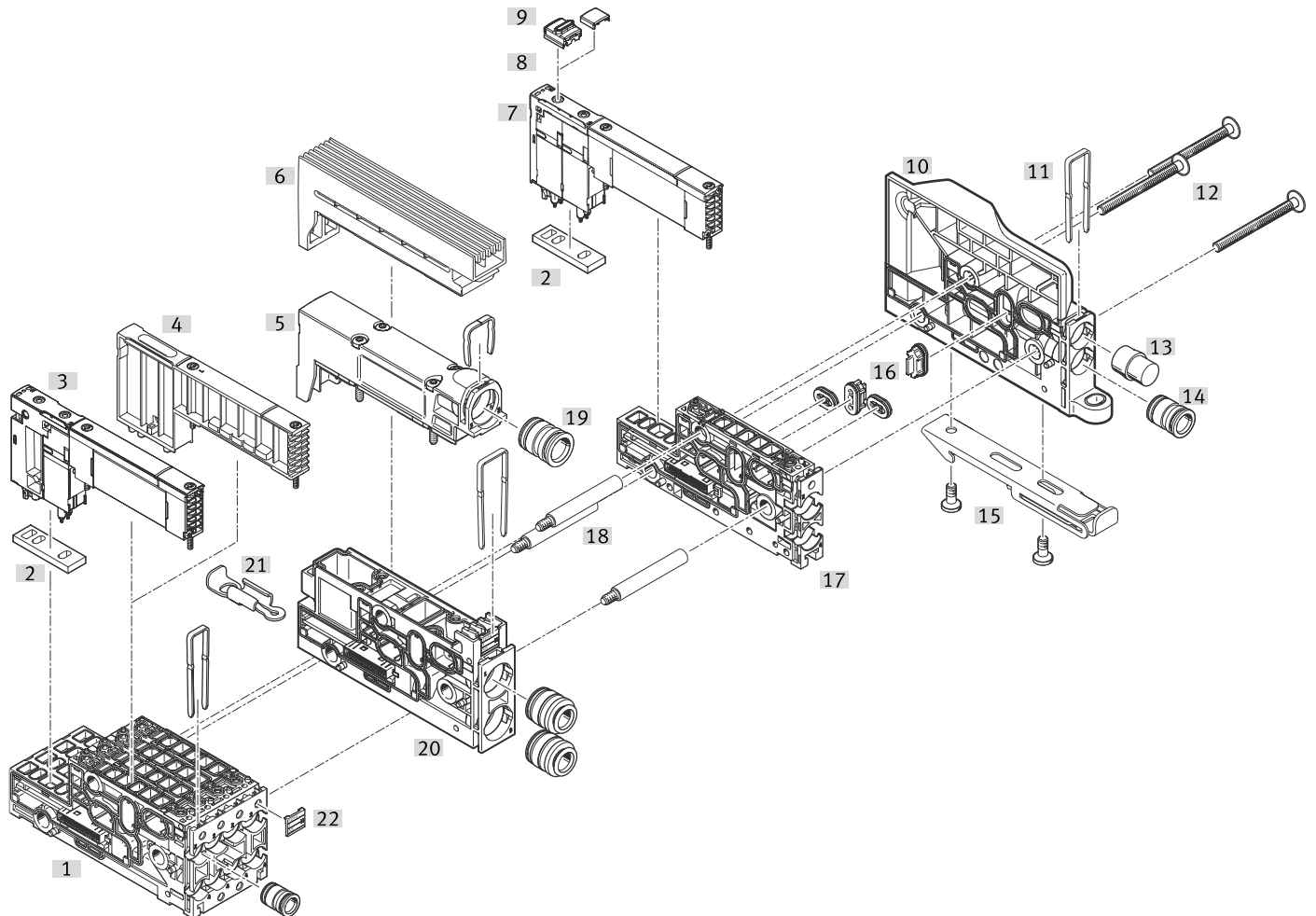
## Peripherals overview

### Pneumatic components of the valve terminal

The manifold sub-bases are available individually with one valve position or with a grid of four valve positions.

The manifold sub-bases include the electrical links for:

- Single solenoid valves or
- Double solenoid valves
- Double solenoid valve positions occupy two addresses and can be equipped with any valve or a cover plate.
- Single solenoid valve positions occupy a single address and can only be equipped with single solenoid valves or a cover plate.



## Peripherals overview

| Pneumatic components of the valve terminal |                               |  |    |
|--|-------------------------------|--|----|
| Designation                                | Brief description             | → Page/Internet  |    |
| [1]  | Manifold sub-base             | Manifold sub-base with four valve positions                        | 36 |
| [2]  | Seal                          | –  | –  |
| [3]  | Solenoid valve                | Valve size 10 mm   | 36 |
| [4]  | Vacant position               | Cover plate for one valve position                                 | 36 |
| [5]  | Plate                         | Exhaust plate for ducted exhaust air                               | 36 |
| [6]  | Plate                         | Exhaust plate as flat plate silencer                               | 36 |
| [7]  | Solenoid valve                | Valve size 10 mm   | 36 |
| [8]  | Cover cap for manual override | Conversion from non-detenting to detenting                         | 37 |
| [9]  | Cover cap for manual override | Conversion from non-detenting to concealed                         | 37 |
| [10]                                       | Right end plate               | - End plate with ports 12/14, 82/84                                | 38 |
| [11]                                       | Clamping clip for cartridge   | –  | –  |
| [12]                                       | Screw                         | Tie rod system, connects the manifold sub-bases                    | 37 |
| [13]                                       | Silencer                      | with cartridge connection  | 39 |
| [14]                                       | Cartridge                     | For air supply and exhaust ports                                   | 39 |
| [15]                                       | Mounting                      | Clamping kit for H-rail mounting                                   | 37 |
| [16]                                       | Separator                     | Separator for pressure zone separation in duct 1 and duct 3, 5     | 37 |
| [17]                                       | Manifold sub-base, individual | Manifold sub-base with one valve position                          | 36 |
| [18]                                       | Tie rod                       | Threaded rod, clamps the manifold sub-bases between the end plates | 37 |
| [19]                                       | Cartridge                     | For air supply and exhaust ports                                   | 39 |
| [20]                                       | Supply module                 | For compressed air supply/exhaust air                              | 36 |
| [21]                                       | Mounting                      | Mounting bracket for wall mounting                                 | 37 |
| [22]                                       | Inscription labels            | For identifying the pressure zone separation                       | 37 |

## Peripherals overview

## Valve terminal with multi-pin plug connection:

Order code:

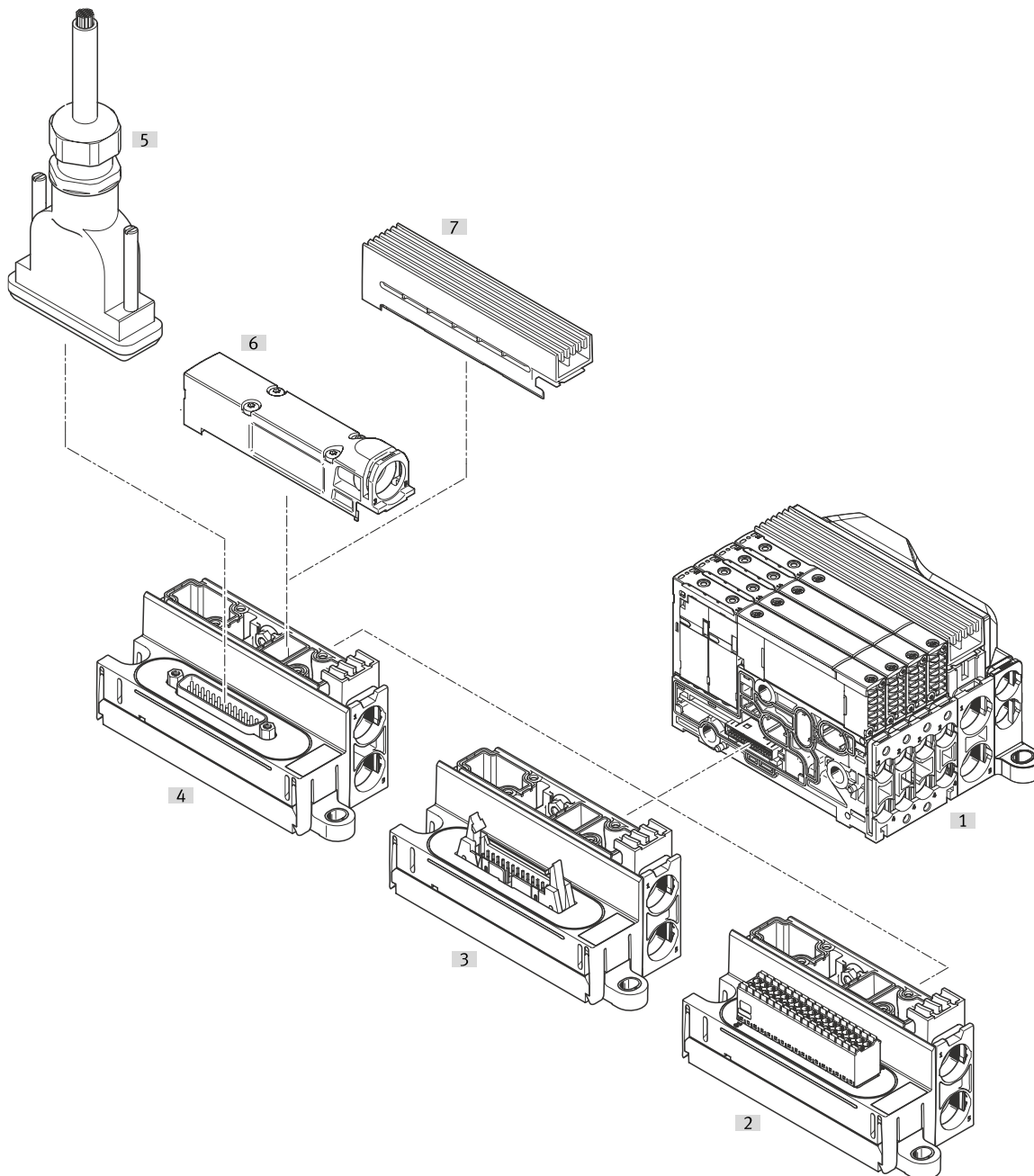
- VTUX-A-P-M...

Valve terminals VTUX with multi-pin plug connection can be expanded by up to 32 solenoid coils/valve positions.

The multi-pin plug connection can be ordered as a Sub-D connection (25- or 44-pin) or as a terminal strip (34-pin) or as a ribbon cable connection (26-pin).

The Sub-D multi-pin plug connection (25- and 44-pin) is available with degree of protection IP40 and IP65; the terminal strip and ribbon cable connection with IP40.

Pre-assembled cables of different lengths with degree of protection IP40 or IP65/67 are available as accessories for the Sub-D multi-pin plug connection (25- and 44-pin).



| Designation                   | Brief description                           | → Page/Internet |
|-------------------------------|---|-----------------|
| [1] Valve terminal VTUX       | Pneumatic part                              | 7               |
| [2] Multi-pin plug connection | Terminal strip                              | 38              |
| [3] Multi-pin plug connection | For ribbon cable, 40-pin, IP40              | 38              |
| [4] Multi-pin plug connection | Sub-D, 25-pin                               | 38              |
| [5] Connecting cable          | Socket 25-pin, Sub-D, open cable end 25-pin | 39              |
| [6] Plate                     | Exhaust plate for ducted exhaust air        | 36              |
| [7] Plate                     | Exhaust plate as flat plate silencer        | 36              |

## Peripherals overview

### Valve terminal with fieldbus interface, automation system CPX-AP-A

Order code:

- VTUX-A-P-APA-... for the pneumatics
- CPX-AP-A-... for the electrical peripherals

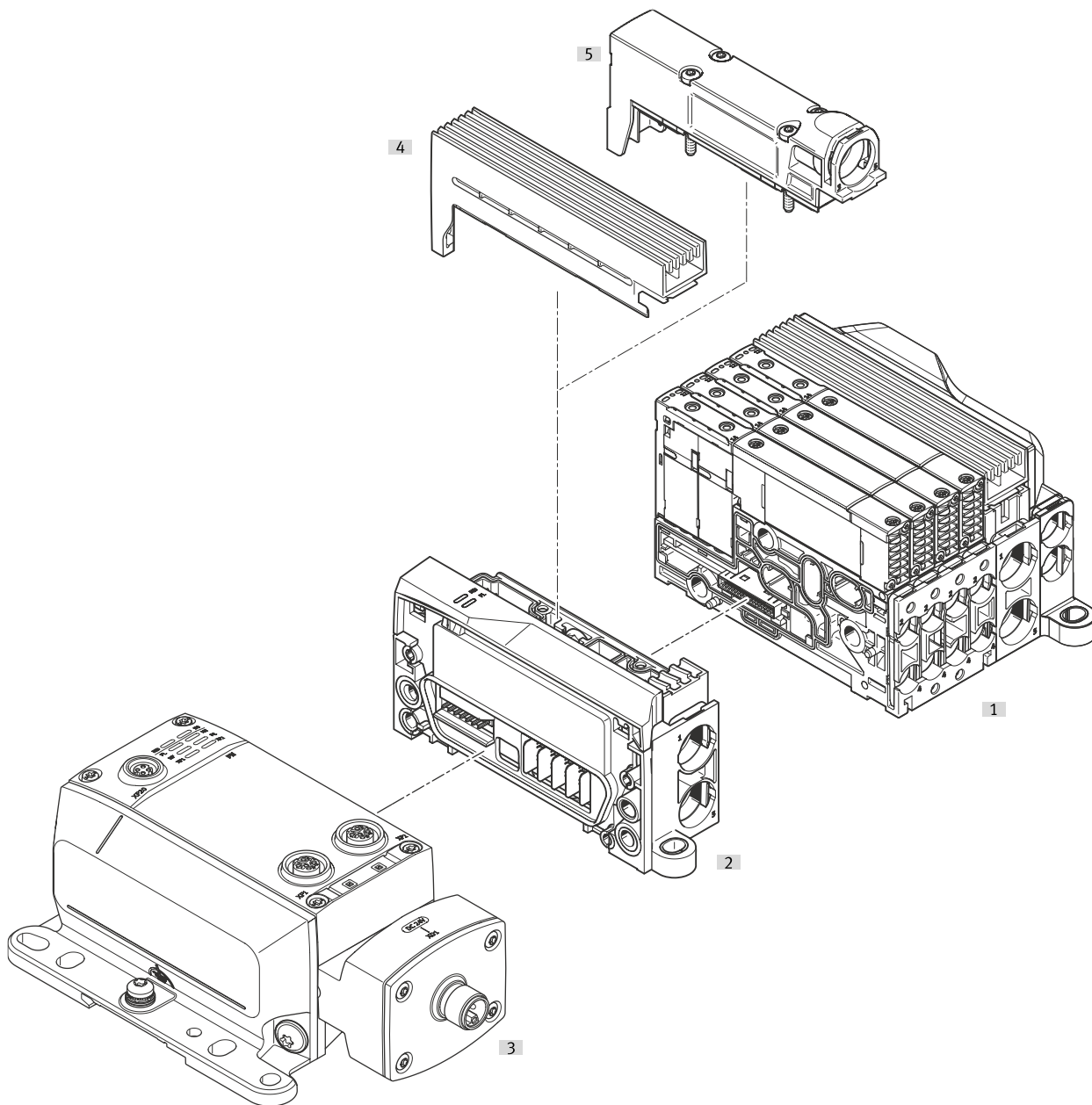
Valve terminals with CPX-AP-A interface can be expanded by up to 32 solenoid coils/valve positions.

Up to 32 valve positions can be equipped with single solenoid valves. The maximum number of valve positions is reduced to 16 if only valves with two solenoid coils are used (double solenoid valves, 5/3-way valves, 2x 3/2-way valves).

Each valve position can be equipped with any valve or a cover plate. The rules for CPX-AP-A apply to the equipment that can be used with the electrical peripherals CPX-AP-A.

In general:

- Digital inputs/outputs
- Parameterisation of inputs and outputs
- Integrated, convenient diagnostics
- Preventive maintenance concepts



| Designation                    | Brief description                                  | → Page/Internet |
|--------------------------------|--|-----------------|
| [1] Valve terminal VTUX        | Pneumatic part                                     | 7               |
| [2] Left end plate             | Pneumatic interface for automation system CPX-AP-A | 38              |
| [3] Automation system CPX-AP-A | Electrical part of the automation system CPX-AP-A  | cpx-ap-a        |
| [4] Plate                      | Exhaust plate as flat plate silencer               | 36              |
| [5] Plate                      | Exhaust plate for ducted exhaust air               | 36              |



## Peripherals overview

## Valve terminal with interface to automation system CPX-AP-I

Order code:

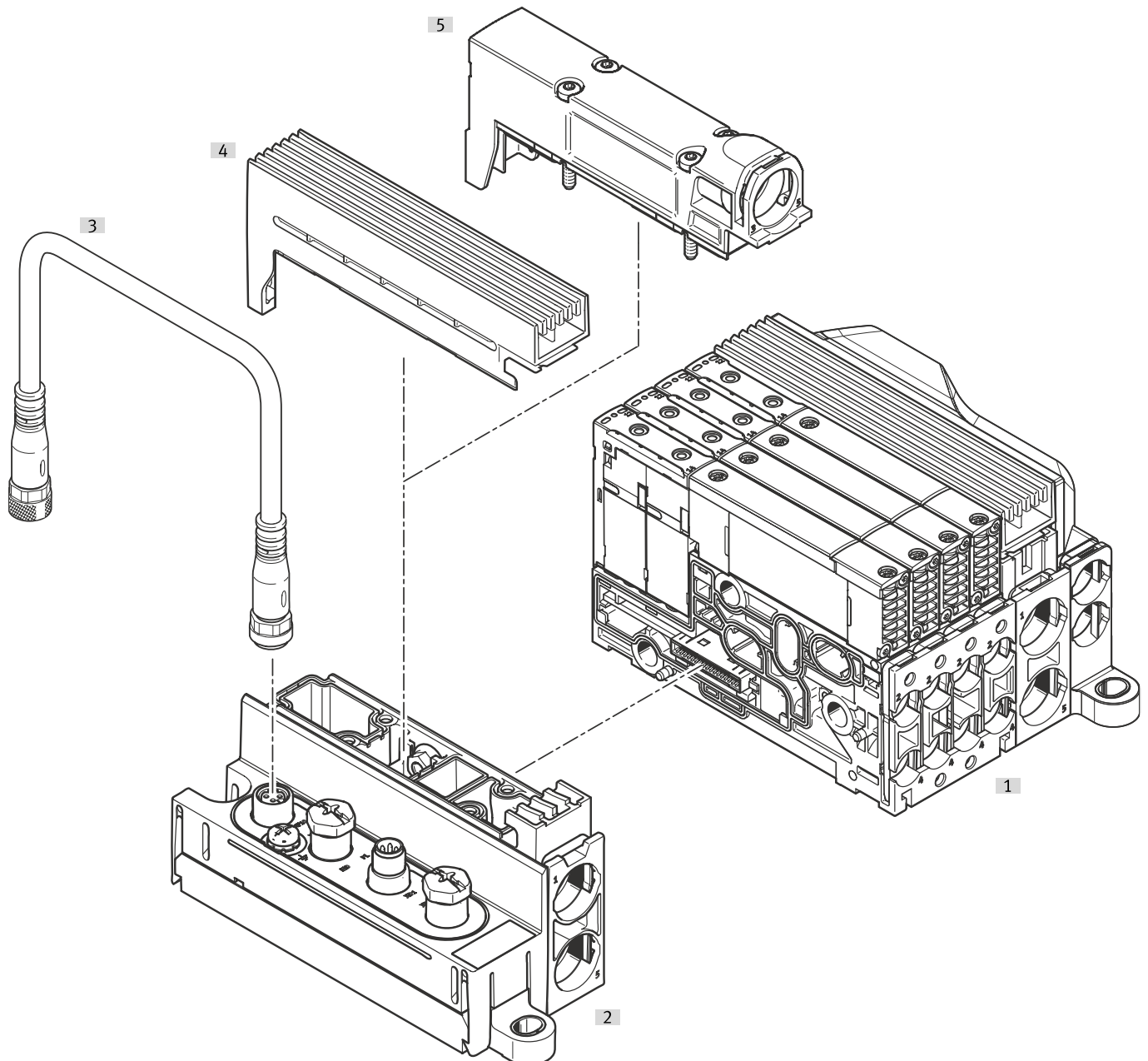
- VTUX-A-P-API... for the pneumatic components
- CPX-AP-I components are to be ordered individually

Valve terminals with CPX-AP-I interface can be expanded by up to 32 solenoid coils/valve positions.

Up to 32 valve positions can be equipped with single solenoid valves.

The maximum number of valve positions is reduced to 16 if only valves with two solenoid coils are used (double solenoid valves, 5/3-way valves, 2x 3/2-way valves).

Each valve position can be equipped with any valve or a cover plate.



| Designation             | Brief description  | → Page/Internet |
|-------------------------|--|-----------------|
| [1] Valve terminal VTUX | Pneumatic part   | 7               |
| [2] Left end plate      | End plate with interface to the automation system CPX-AP-I and with interface for power supply | 38              |
| [3] Connecting cable    | Between two CPX-AP-I modules   | cpx-ap-i        |
| [4] Plate               | Exhaust plate as flat plate silencer   | 36              |
| [5] Plate               | Exhaust plate for ducted exhaust air   | 36              |

## Peripherals overview

### Valve terminal with IO-Link® interface (and bus node)

Order code:

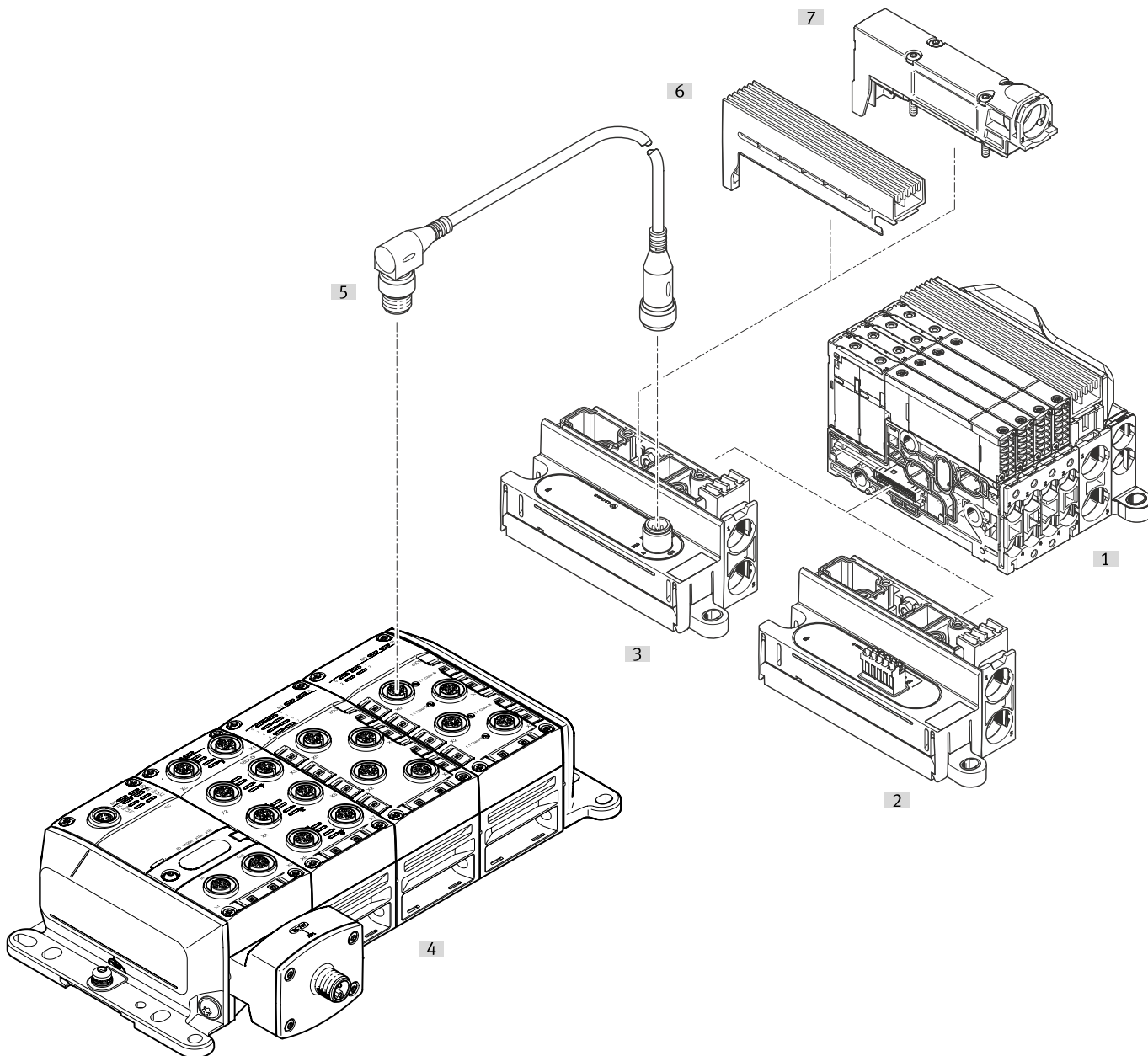
- VTUX-A-P-IO... for the pneumatic components
- CTEU... for the bus node

Valve terminals with IO-Link® interface can be expanded by up to 32 solenoid coils/valve positions.

Up to 32 valve positions can be equipped with single solenoid valves.

The maximum number of valve positions is reduced to 16 if only valves with two solenoid coils are used (double solenoid valves, 5/3-way valves, 2x 3/2-way valves).

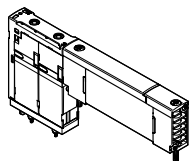
Each valve position can be equipped with any valve or a cover plate.



| Designation                    | Brief description  | → Page/Internet |
|--------------------------------|--|-----------------|
| [1] Valve terminal VTUX        | Pneumatic part   | 7               |
| [2] Left end plate             | End plate with IO-Link® interface, push-in electrical connection                                     | 38              |
| [3] Left end plate             | End plate with IO-Link® interface, M12 electrical connection   | 38              |
| [4] Automation system CPX-AP-A | With bus node, input/output modules and IO-Link master for connecting devices with IO-Link interface | cpx-ap-a        |
| [5] Connecting cable           | Between two IO-Link® interfaces  | nebu            |
| [6] Plate                      | Exhaust plate as flat plate silencer   | 36              |
| [7] Plate                      | Exhaust plate for ducted exhaust air   | 36              |

## Key features – Pneumatic components

### Sub-base valve



VTUX offers a comprehensive range of valve functions. The spool valves VTUX of width 10 mm offer a particularly high flow rate. They are used on manifold sub-bases of width 10 mm and 12 mm with a tubing connection up to 8 mm.

Valves of size 10 mm are the a particularly effective option for compact valve terminals that also enable applications with outstanding flow rate performance when using 8 mm tubing connections.

This eliminates having to select and decide between different valve sizes and reduces the complexity for planned applications.

Mounting valves on manifold sub-bases offers a range of advantages. The valves are secured using two screws and can be easily replaced.

In terms of valve engineering, 5/2-way and 3/2-way valves have negative overlap. This thus enables the working ports to be exhausted in the de-energised state.

Pilot air (duct 12/14) is supplied via the manifold sub-bases, allowing it to be interrupted and exhausted.

All valves have pneumatic pilot control for optimising performance.

Irrespective of the valve function, there are sub-base valves with one solenoid coil (single solenoid) or with two solenoid coils (double solenoid or two single solenoid valves in one housing).

### Design

#### Replacing valves

The valves are attached to the sub-base using two screws. The tubing remains on the manifold sub-base, which prevents mix-ups during servicing.

As a result, the valves can be easily replaced. The sturdy mechanical structure of the sub-base ensures efficient, durable sealing.

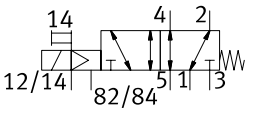
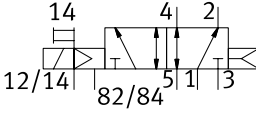
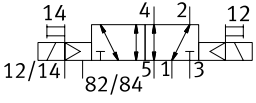
#### Extension

Cover plates for reserve positions can be replaced by valves at a later date.

The dimensions, mounting points as well as the existing pneumatic installation do not change.

#### Note

A filter must be installed upstream of valves operated in vacuum mode. This prevents any foreign matter in the intake air getting into the valve (e.g. when operating a suction cup).

| 5/2-way valve   | Code                      | Assigned addresses | Description  |
|---|---------------------------|--------------------|--|
| Circuit symbol<br> | Position function 1-32: A | 1                  | <ul style="list-style-type: none"> <li>• Single solenoid</li> <li>• Mechanical spring return</li> <li>• Reversible</li> <li>• Operating pressure –0.09 ... +0.7 MPa</li> </ul> |
|                    | Position function 1-32: M | 1                  | <ul style="list-style-type: none"> <li>• Single solenoid</li> <li>• Pneumatic spring return</li> <li>• Operating pressure +0.2 ... +0.7 MPa</li> </ul>                         |
|                    | Position function 1-32: J | 2                  | <ul style="list-style-type: none"> <li>• Double solenoid</li> <li>• Limited reversibility</li> <li>• Operating pressure –0.09 ... +0.7 MPa</li> </ul>                          |

Key features – Pneumatic components

| 2x 3/2-way valve |                            |                    |  |
|------------------|----------------------------|--------------------|--|
| Circuit symbol   | Code                       | Assigned addresses | Description  |
|                  | Position function 1-32: NS | 2                  | <ul style="list-style-type: none"> <li>• Single solenoid</li> <li>• Normally open</li> <li>• Mechanical spring return</li> <li>• Reversible</li> <li>• Operating pressure 0 ... 0.7 MPa</li> </ul>   |
|                  | Position function 1-32: K  | 2                  | <ul style="list-style-type: none"> <li>• Single solenoid</li> <li>• Normally closed</li> <li>• Mechanical spring return</li> <li>• Reversible</li> <li>• Operating pressure 0 ... 0.7 MPa</li> </ul> |
|                  | Position function 1-32: KC | 2                  | <ul style="list-style-type: none"> <li>• Single solenoid</li> <li>• Normally closed</li> <li>• Pneumatic spring return</li> <li>• Operating pressure 0.15 ... 0.7 MPa</li> </ul>                     |
| 5/3-way valve    |                            |                    |  |
| Circuit symbol   | Code                       | Assigned addresses | Description  |
|                  | Position function 1-32: G  | 2                  | <ul style="list-style-type: none"> <li>• Mid-position closed</li> <li>• Mechanical spring return</li> <li>• Reversible</li> <li>• Operating pressure -0.09 ... +0.7 MPa</li> </ul>                   |

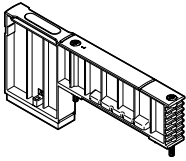
**Note**

The valve functions of an exhausted and pressurised 5/3-way valve can be realised using the 3/2-way valves "normally closed" and "normally open", respectively, with mechanical spring return.

The negative overlap makes it possible to exhaust the working ports in the de-energised state.

## Key features – Pneumatic components

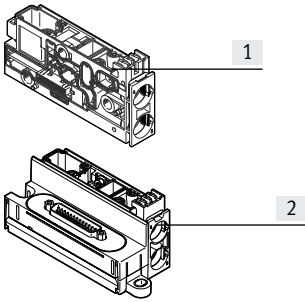
## Cover plate



Cover plate (code L) without valve function, for reserving valve positions on a valve terminal.

Valves and cover plates are attached to the manifold sub-base using two screws.

## Compressed air supply and exhaust



- [1] Supply module  
[2] Left end plate

The valve terminal VTUX can be supplied with compressed air at one or more points via the left end plate and/or via supply modules. The generously sized pneumatic system ensure that all components will offer good performance, even with large-scale extensions.

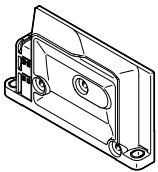
Exhausting (ducts 3 and 5) takes place either via silencers or ports for ducted exhaust air, via the supply modules or the left end plate.

There are two variants for exhausting:

- Exhaust air 3/5 via flat plate silencer
- Exhaust air 3/5 ducted

Ducts 3 and 5 are separate in the terminal and are only joined together in the supply module/left end plate. The pilot exhaust air (duct 82/84) is completely separate from ducts 3 and 5.

## Pilot air supply



The valve terminal VTUX is supplied with pilot air only via the right end plate.

The type of pilot air supply can be selected using a separator in duct 1 of the end plate:

- Internal (from duct 1) or
- External (from duct 12/14)


The actual required pilot pressure depends on the valves used on the valve terminal.

With a sufficiently high supply pressure on the valve terminal, internal pilot air supply can be chosen.

In this case, the pilot air supply is diverted through an internal connection from duct 1 in the right end plate.

The operating pressure in the right pressure zone must be at least equal to the highest required pilot pressure of the entire valve terminal.

Port 12/14 on the right end plate is sealed using a blanking plug.

 **Note**

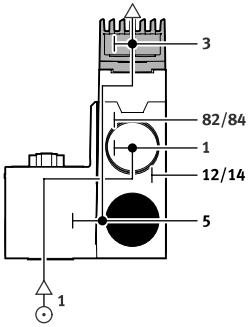
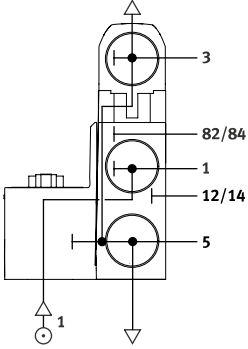
If a gradual pressure build-up in the system using a soft-start valve is chosen, an external pilot air supply should be connected so that the pilot pressure applied during switch-on is already very high.

Key features – Pneumatic components

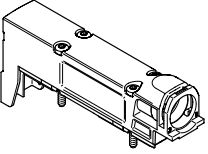
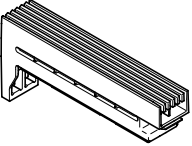
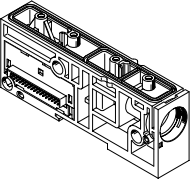
| Compressed air supply and pilot air supply |  |  |
|--|--|--|
| Illustration                               | Code   | Information  |
| <b>Right end plate, with supply ports</b>  |  |  |
|  | Pilot air supply, via right end plate:<br>-                    | <p>Internal pilot air supply</p> <ul style="list-style-type: none"> <li>• Pilot air is branched internally from port 1 in the right end plate</li> <li>• Port 12/14 in the right end plate is sealed using a blanking plug</li> <li>• Pilot exhaust air 82/84 via right end plate</li> <li>• For operating pressure in the range 0.25 ... 0.7 MPa</li> </ul>                                   |
|  | Pilot air supply, via right end plate:<br>Z                    | <p>External pilot air supply</p> <ul style="list-style-type: none"> <li>• Pilot air supply (0.25 ... 0.7 MPa) is connected at port 12/14 on the right end plate</li> <li>• Port 1 in the right end plate is sealed using a separator</li> <li>• Pilot exhaust air 82/84 via right end plate</li> <li>• For operating pressure in the range -0.09 ... +0.7 MPa (suitable for vacuum)</li> </ul> |
| <b>Supply module, flat plate silencer</b>  |  |  |
|  | Connection position type 1-64: U<br>Position function 1-64: US | <ul style="list-style-type: none"> <li>• Exhaust air 3/5 via flat plate silencer</li> <li>• Pilot exhaust air 82/84 via right end plate</li> <li>• For operating pressure in the range -0.09 ... +0.7 MPa (suitable for vacuum)</li> </ul>   |
| <b>Supply module, ducted exhaust air</b>   |  |  |
|  | Connection position type 1-64: U<br>Position function 1-64: UD | <ul style="list-style-type: none"> <li>• Exhaust air 3/5 via supply module</li> <li>• Pilot exhaust air 82/84 via right end plate</li> <li>• For operating pressure in the range -0.09 ... +0.7 MPa (suitable for vacuum)</li> </ul>   |

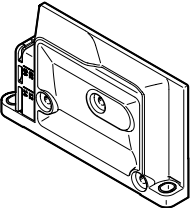


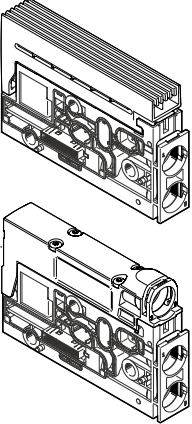
## Key features – Pneumatic components

| Compressed air supply and pilot air supply   |      |   |
|--|------|---|
| Illustration   | Code | Information   |
| <b>Left end plate, flat plate silencer</b>   |      |   |
|   | –    | <ul style="list-style-type: none"> <li>• Exhaust air 3/5 via flat plate silencer</li> <li>• Pilot exhaust air 82/84 via right end plate</li> <li>• For operating pressure in the range <math>-0.09 \dots +0.7</math> MPa (suitable for vacuum)</li> </ul> |
| <b>Left end plate, ducted exhaust air</b>  |      |   |
|  | –    | <ul style="list-style-type: none"> <li>• Exhaust air 3/5 via supply module</li> <li>• Pilot exhaust air 82/84 via right end plate</li> <li>• For operating pressure in the range <math>-0.09 \dots +0.7</math> MPa (suitable for vacuum)</li> </ul>       |

Key features – Pneumatic components

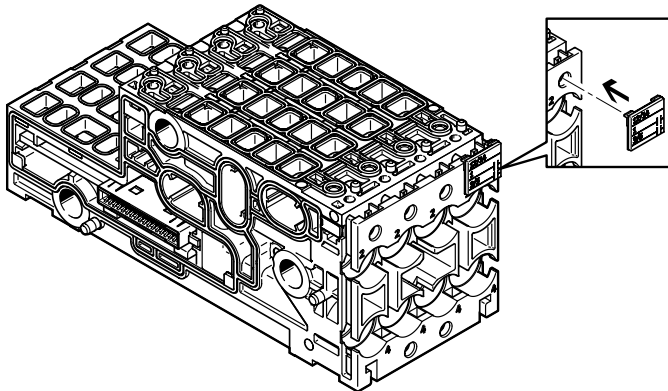
| Supply module  | Code                             | Type          | Designation                          | Information  |
|--|----------------------------------|---------------|--------------------------------------|--|
|  | Position function 1-64: UD       | VABF-XA-12-M2 | Exhaust plate for ducted exhaust air | Additional supply modules can be used for larger terminals or to create pressure zones. Supply modules can be configured at any point upstream or downstream from the manifold sub-bases or also next to one another. Supply modules contain the following ports: <ul style="list-style-type: none"> <li>• Compressed air supply (duct 1)</li> <li>• Exhaust air (duct 3/5)</li> </ul> Depending on your order, the exhaust ducts are either ducted or exhausted via the flat plate silencer. The flat plate silencer is fixed on the manifold sub-base with a latching lug and can be removed without the need for tools. |
|  | Position function 1-64: US       | VABF-XA-12-M1 | Flat plate silencer                  |  |
|  | Connection position type 1-64: U | VABX-A-P-BU   | Supply module without cartridge      |  |

| Supply and exhaust ports  | Code | Connection | Push-in fitting/cartridge |           |                     |
|---|------|------------|---------------------------|-----------|---------------------|
| <b>Right end plate with supply ports 12/14, 82/84</b>                             |      |            |                           |           |                     |
|  |      | 12/14      | Pilot air supply          | Cartridge | Cartridge, straight |
|   |      | 82/84      | Pilot exhaust air         | Cartridge |                     |

| Supply module  | Connection position type 1-64: U |     |                           |                     |                     |
|--|----------------------------------|-----|---------------------------|---------------------|---------------------|
|  |                                  | 1   | Working air/vacuum supply | Cartridge           | Cartridge, straight |
|  |                                  | 3/5 | Exhaust air               | Flat plate silencer | –                   |
|  |                                  |     |                           | Cartridge           | Cartridge, straight |

### Key features – Pneumatic components

#### Creating pressure zones and separating exhaust air



VTUX offers a number of options for creating pressure zones if different working pressures are required. Pressure zones are created by isolating the internal supply ducts between two adjacent manifold sub-bases. Every pressure zone must have its own compressed air supply. Compressed air can be supplied and exhausted via the left end plate and/or the supply modules.

The position of the supply modules and the pressure zone separation can be freely chosen with the valve terminal VTUX.

The separators for pressure zone separation are integrated into the terminal at the factory as specified in your order.

Their position is marked using corresponding inscription labels. Duct separation takes place between two manifold sub-bases.

#### Creating pressure zones

Manifold sub-bases with separator for pressure zone separation  
Illustrated examples

| Illustrated examples | Coding  | Code  | Information |     |                            |   |
|----------------------|---|-------|-------------|-----|----------------------------|---|
|                      | <table border="1"> <tr><td>12/14</td></tr> <tr><td>1</td></tr> <tr><td>3/5</td></tr> </table> | 12/14 | 1           | 3/5 | Duct separation 1 - 64: TT | <ul style="list-style-type: none"> <li>[1] Duct 82/84</li> <li>[2] Duct 3</li> <li>[3] Duct 1, separated</li> <li>[4] Duct 12/14</li> <li>[5] Duct 5</li> </ul>                       |
| 12/14                |   |       |             |     |                            |   |
| 1                    |   |       |             |     |                            |   |
| 3/5                  |   |       |             |     |                            |   |
|                      | <table border="1"> <tr><td>12/14</td></tr> <tr><td>1</td></tr> <tr><td>3/5</td></tr> </table> | 12/14 | 1           | 3/5 | Duct separation 1 - 64: TR | <ul style="list-style-type: none"> <li>[1] Duct 82/84</li> <li>[2] Duct 3, separated</li> <li>[3] Duct 1</li> <li>[4] Duct 12/14</li> <li>[5] Duct 5, separated</li> </ul>            |
| 12/14                |   |       |             |     |                            |   |
| 1                    |   |       |             |     |                            |   |
| 3/5                  |   |       |             |     |                            |   |
|                      | <table border="1"> <tr><td>12/14</td></tr> <tr><td>1</td></tr> <tr><td>3/5</td></tr> </table> | 12/14 | 1           | 3/5 | Duct separation 1 - 64: TS | <ul style="list-style-type: none"> <li>[1] Duct 82/84</li> <li>[2] Duct 3, separated</li> <li>[3] Duct 1, separated</li> <li>[4] Duct 12/14</li> <li>[5] Duct 5, separated</li> </ul> |
| 12/14                |   |       |             |     |                            |   |
| 1                    |   |       |             |     |                            |   |
| 3/5                  |   |       |             |     |                            |   |

### Key features – Pneumatic components

**Examples: compressed air supply and pilot air supply**

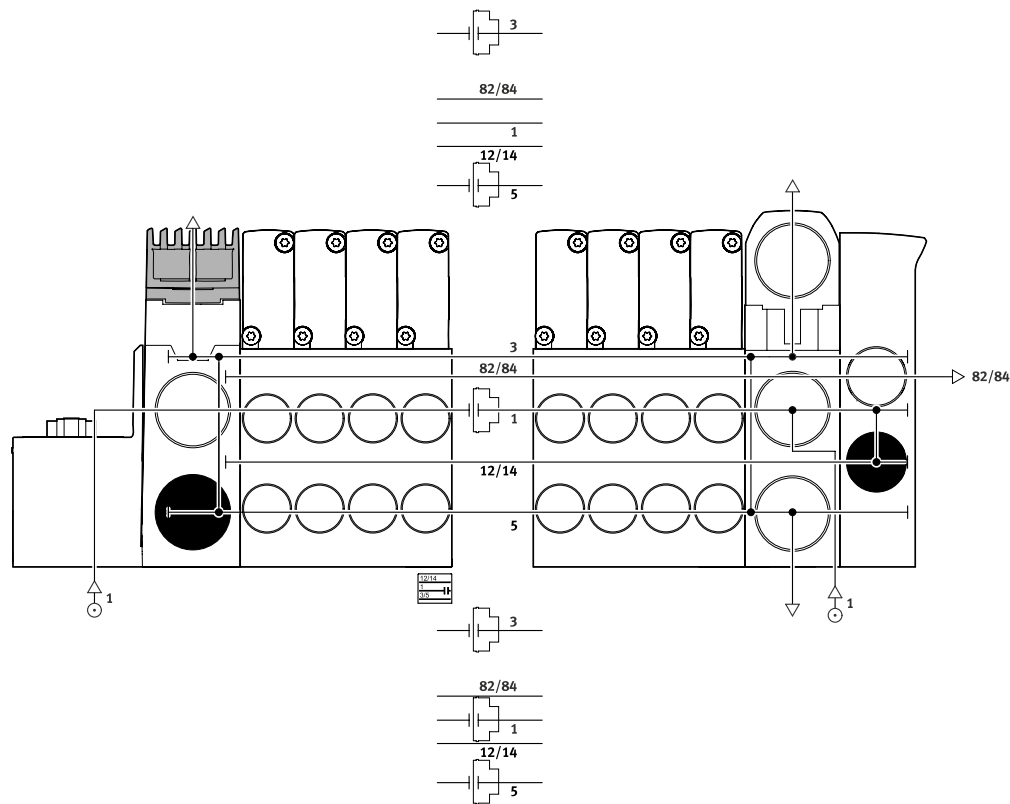
Internal pilot air supply

The diagram on the right shows an example of the configuration and connection of the air supply with internal pilot air supply.

The exhaust air (duct 3/5) is exhausted via supply modules.

The pilot exhaust air (duct 82/84) is discharged via the right end plate.

Special separators are used to create pressure zones.



**Examples: compressed air supply and pilot air supply**

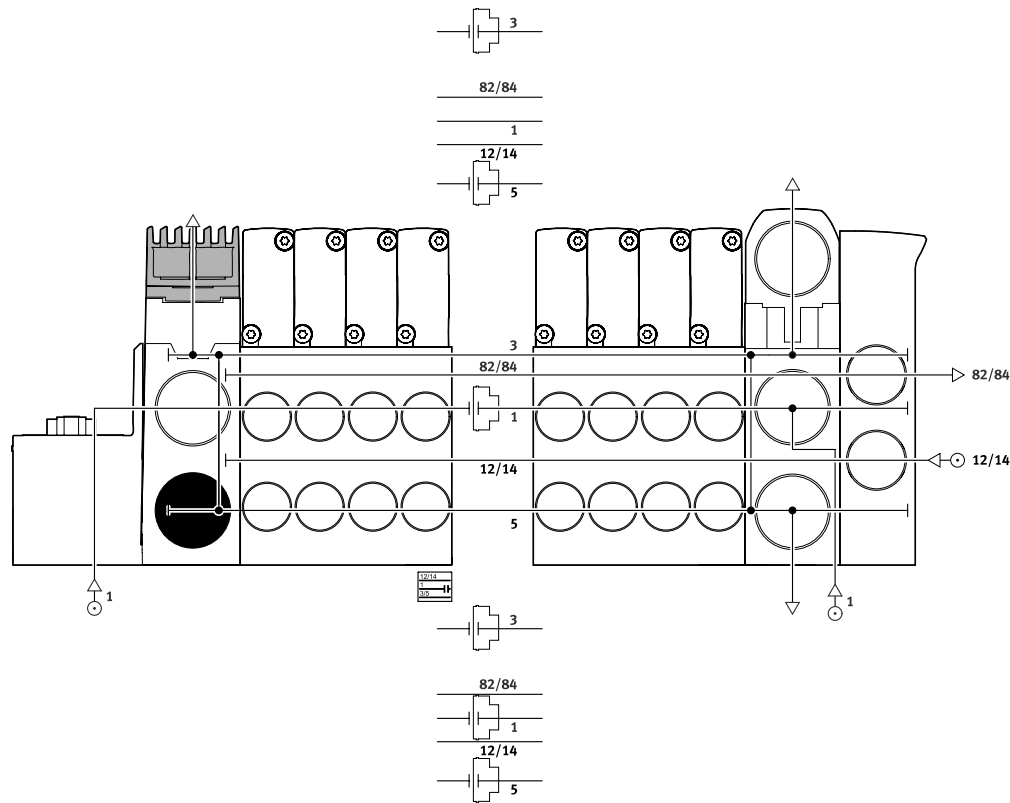
External pilot air supply

The diagram on the right shows an example of the configuration and connection of the compressed air supply with external pilot air supply. Port 12/14 on the right end plate is equipped with a fitting for this.

The exhaust air (duct 3/5) is exhausted via supply modules.

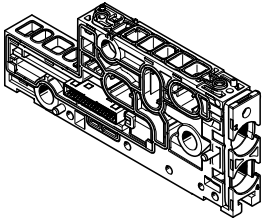
The pilot exhaust air (duct 82/84) is discharged via the right end plate.

Special separators are used to create pressure zones.



## Key features – Pneumatic components

### Manifold sub-base



VTUX is based on a modular system which consists of manifold sub-bases and valves. The manifold sub-bases are joined together using tie rods and thus form the support system for the valves.

They contain the ducts for supplying compressed air to and exhausting from the valve terminal as well as the working ports for the pneumatic drives for each valve.

The tie rod used to join the manifold sub-bases together consists of a threaded rod and screw.

The manifold sub-bases are available in variants for one or for four valves. The threaded rod/screw combination is selected according to the number and width of the individual manifold sub-bases.

To add further manifold sub-bases, simply loosen the tie rod and adapt using extenders.

There are no restrictions on how extensions. A tie rod could be constructed almost entirely using extenders.

### Manifold sub-base variants

|  | Code | Type  | Information   |
|--|------|---|---|
|  | -    | VABX-A-P-BV-AH-F<br>VABX-A-P-BV-AH-A            | <ul style="list-style-type: none"> <li>• One valve position</li> <li>• Without cartridge</li> <li>• Width 10.55 mm</li> </ul>   |
|  |      | VABX-A-P-BV-BH-G<br>VABX-A-P-BV-BH-B            | <ul style="list-style-type: none"> <li>• One valve position</li> <li>• Without cartridge</li> <li>• Width 12.55 mm</li> </ul>   |
|  | -    | VABX-A-P-BV-AH-RVFFFF<br>VABX-A-P-BV-AH-RVAAAA  | <ul style="list-style-type: none"> <li>• Four valve positions</li> <li>• Without cartridge</li> <li>• Width 42.05 mm</li> </ul> |
|  |      | VABX-A-P-BV-BH-RVGGGG<br>VABX-A-P-BV-BH-RVB BBB | <ul style="list-style-type: none"> <li>• Four valve positions</li> <li>• Without cartridge</li> <li>• Width 50.05 mm</li> </ul> |

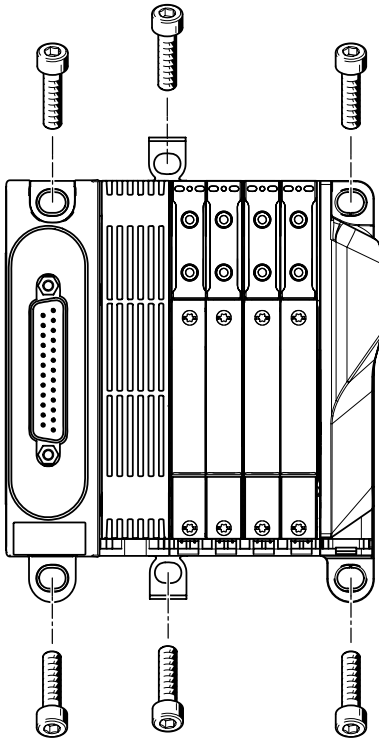
## Key features – Mounting

## Valve terminal mounting

Sturdy terminal mounting via:

- Four through-holes for wall mounting
- Additional mounting brackets
- H-rail mounting

## Wall mounting

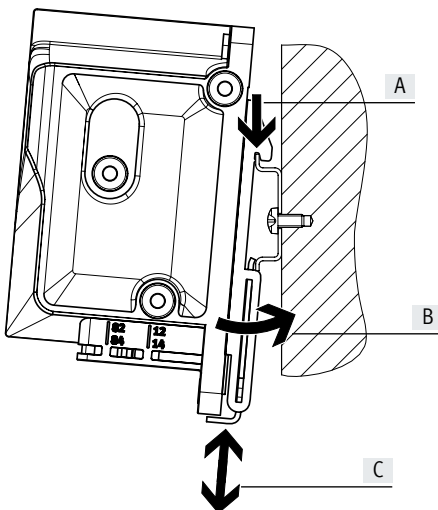


The valve terminal VTUX is screwed onto the mounting surface using four M4 or M6 screws. The mounting holes are on the multi-pin plug connection and on the right end plate. Optional mounting brackets are also available.

**Note**

For wall mounting, in addition to the mounting holes, mounting brackets must be attached to the end plates every 20 cm.

## H-rail mounting



The valve terminal VTUX is attached to the H-rail (see arrow A). The valve terminal VTUX is then swivelled onto the H-rail (see arrow B). As a third step, the valve terminal VTUX is fixed on the H-rail by moving the slide on the H-rail mounting (see arrow C).

The clamping kit for H-rail mounting enables the valve terminal to be mounted on H-rails to EN 60715.

**Note**

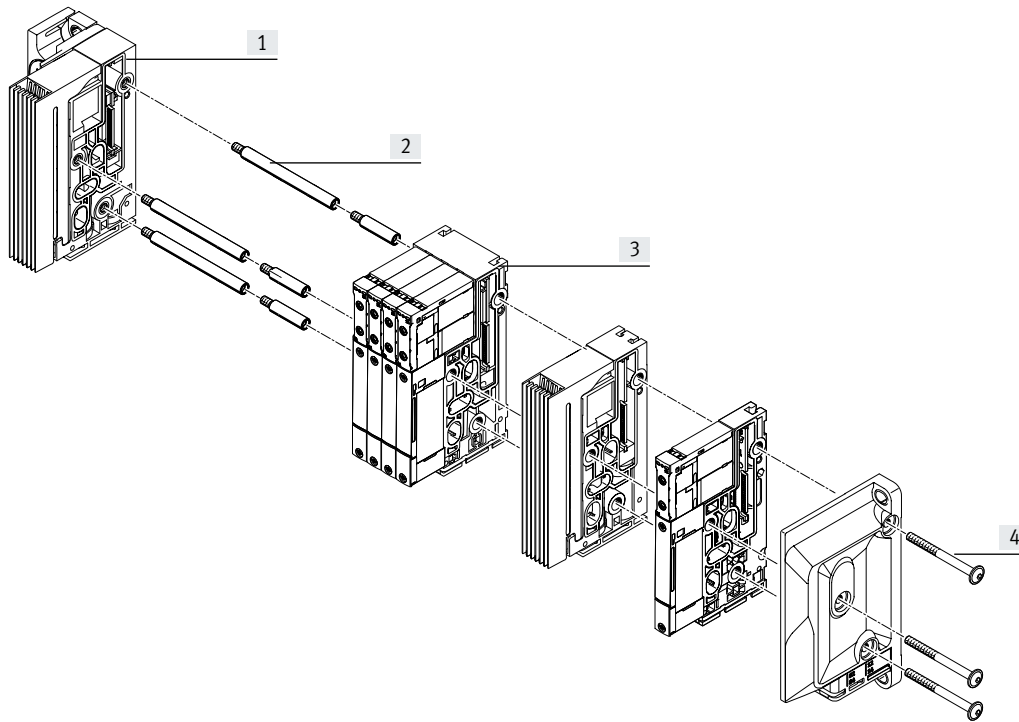
The clamping kit locks the valve terminal in a horizontal mounting position.



## Key features – Mounting

## Tie rod

## Configuration



- [1] Left end plate
- [2] Tie rod sections
- [3] Manifold sub-bases
- [4] Tie rod screws

## Operating mode

The tie rod on the VTUX is made up of two parts:

- Threaded rods
- Screw

This enables valve terminals of any length to be created. It takes just four steps to assemble the tie rod and the valve terminal:

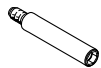
- Screw the threaded rods into the left end plate
- Push the sub-bases and supply modules onto the threaded rods
- Push on the right end plate and secure using the screws

The tie rod enables the valve terminal to be extended at a later date. This is done by loosening the tie rod screws and disassembling the relevant components. The additional sub-base or the additional supply module is inserted at the required location. The previously disassembled components are then re-assembled.

To compensate for the change in length, the tie rod must be extended by the increase in length. To do this, threaded rods of a suitable length are screwed in place. To determine which components are required, the online spare parts catalogue includes information on how to use the spare parts and a conversion guide.

## Tie rod – Components and design

## Tie rod (threaded rod)



The threaded rod is used to create a cost-optimised fixed-grid tie rod. The combination of a threaded rod and screw offers the optimum compensation of tolerances (by compressing the seals between the manifold sub-bases).

The valve terminal can be extended almost infinitely at any time using additional threaded rod sections. The threaded rod sections are inserted between the existing threaded rod and are available in different lengths, in each case matched to the manifold sub-bases and supply modules.

## Screw



The entire valve terminal is clamped via the tie rod using the screw.

Tolerances that occur, for example when the seals are compressed between the manifold sub-bases during assembly, are compensated by the interaction of the screw and the threaded rod.

## Key features – Mounting

| Ordering data – Tie rods  |                |               |              |                 |
|---|----------------|---------------|--------------|-----------------|
| Reference length<br>[mm]  | Part no.       | Type          | Part no.     | Type            |
| <b>L = sum of the widths of the manifold sub-bases and supply modules</b> | <b>Tie rod</b> |               | <b>Screw</b> |                 |
| 21.00 ... 23.00   | –              | –             | 8191748      | VAME-XA-S-M4-45 |
| 25.00 ... 29.60   | 8191756        | VAME-XA-Z-19  | 8191747      | VAME-XA-S-M4-30 |
| 31.50 ... 38.80   | 8191757        | VAME-XA-Z-29  | 8191747      | VAME-XA-S-M4-30 |
| 40.00 ... 63.30   | 8191758        | VAME-XA-Z-38  | 8191748      | VAME-XA-S-M4-45 |
| 63.40 ... 86.20   | 8191761        | VAME-XA-Z-61  | 8191748      | VAME-XA-S-M4-45 |
| 86.30 ... 109.10  | 8191762        | VAME-XA-Z-84  | 8191748      | VAME-XA-S-M4-45 |
| 109.20 ... 131.80   | 8191763        | VAME-XA-Z-107 | 8191748      | VAME-XA-S-M4-45 |
| 131.90 ... 154.30   | 8191764        | VAME-XA-Z-130 | 8191748      | VAME-XA-S-M4-45 |
| 154.40 ... 173.70   | 8191765        | VAME-XA-Z-150 | 8191748      | VAME-XA-S-M4-45 |
| 173.80 ... 193.20   | 8191766        | VAME-XA-Z-170 | 8191748      | VAME-XA-S-M4-45 |
| 193.30 ... 212.70   | 8191767        | VAME-XA-Z-190 | 8191748      | VAME-XA-S-M4-45 |

## Key features – Display and operation

## Display and operation

## Signal status indication

Every solenoid coil is allocated an LED that indicates its signal status.

- Indicator 12 shows the signal status of the coil for duct 2
- Indicator 14 shows the signal status of the coil for duct 4

## Manual override

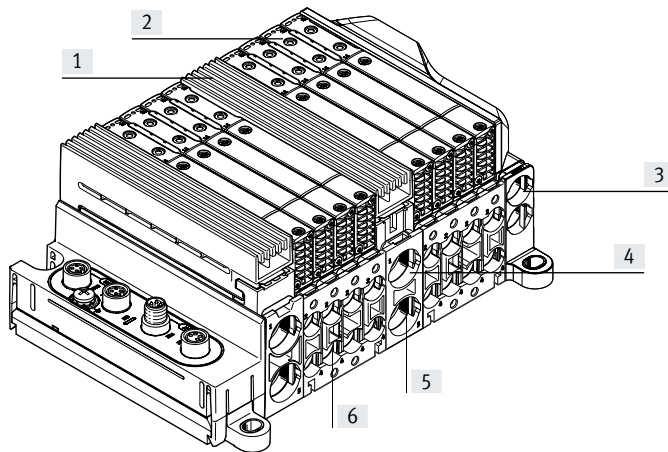
The manual override (MO) enables the valve to be switched when not electrically actuated or energised.

The valve is switched by pushing the manual override.

Alternatives:

- A cover cap (code HR or as an accessory) can be used to operate the manual override in detenting mode.
- A cover cap (code HV or as an accessory) can prevent the manual override from being accidentally activated.

## Pneumatic connection and control elements



- [1] Flat plate silencer, duct 3/5
- [2] Manual override (for each pilot solenoid, non-detenting or non-detenting/detenting)
- [3] Ports 12/14 for external pilot air supply and 82/84 for pilot exhaust air in the right end plate
- [4] Supply port, duct 1
- [5] Ducted exhaust air, duct 3/5
- [6] Working ports, ducts 2 and 4, for each valve position

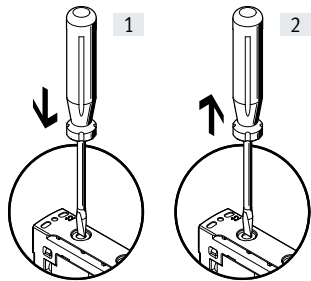
 **Note**

A manually actuated valve (using the manual override) cannot be reset electrically.

Conversely, an electrically actuated valve cannot be reset using the manual override.

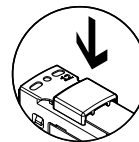
## Manual override

## Manual override with automatic return (non-detenting)



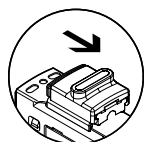
- [1] Press in the plunger of the manual override with a pointed object or screwdriver. The pilot valve switches and actuates the main valve.
- [2] Remove the pointed object or screwdriver. The spring force pushes the plunger of the manual override back. The pilot valve returns to the normal position as does the single solenoid main valve (this is not the case with a double solenoid valve).

## Cover cap for manual override, mounting

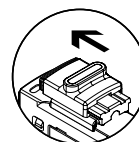


Clip the covering onto the pilot valve.

## Manual override with cover cap, detenting without accessories, actuation



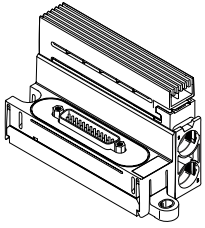
- Moving the slide on the cover cap in the direction of the arrow results in:
- The slide locks into the end position
  - The pilot valve switches and actuates the main valve



- Moving the slide on the cover cap in the direction of the arrow results in:
- The slide locks into the end position
  - The spring force pushes the plunger of the manual override back.
  - The pilot valve returns to the normal position as does the single solenoid main valve (this is not the case with a double solenoid valve).

## Key features – Electrical components

## Electrical connection – Left end plate



The electrical connection from the valves to a higher-order controller is in the left end plate of the VTUX.

Switching between the various connection options is easy: simply swap the left end plate. The pneumatic connections remain unaffected.

The valves are switched by positive or negative logic (PNP or NPN). Mixed operation is not permitted.

## Guidelines on addressing for valves/solenoid coils

The addresses are numbered from left to right in ascending order. The following applies for individual valve positions: address  $x$  for coil 14 and address  $x+1$  for coil 12.

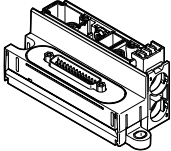
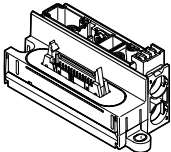
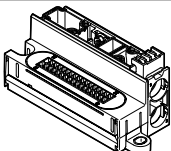
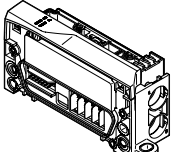
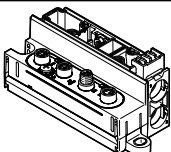
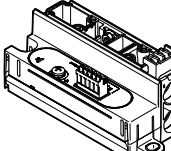
Every manifold sub-base occupies a specific number of addresses/pins:

- Manifold sub-base for a single-solenoid valve: 1
- Manifold sub-base for a double-solenoid valve: 2
- Manifold sub-base for four single solenoid valves: 4
- Manifold sub-base for four double solenoid valves: 8

**Note**

If a single solenoid valve is mounted on a double solenoid valve position, the second address (for coil 12) is also occupied and cannot be used.

## Key features – Electrical components

| Variants of the left end plate  |                            |                     |                          |                      |  |
|---|----------------------------|---------------------|--------------------------|----------------------|--|
|   | Code                       | Type                | Max. number of addresses | Degree of protection | Information  |
| <b>Electrical multi-pin plug connection</b>   |                            |                     |                          |                      |  |
|    | Electrical connection: MS1 | VABX-A-P-EL-E12-MS1 | 24                       | IP40                 | Electrical connection: Sub-D, 25-pin   |
|   | Electrical connection: MS3 | VABX-A-P-EL-E12-MS3 | 32                       | IP40                 | Electrical connection: Sub-D, 44-pin   |
|   | Electrical connection: MS6 | VABX-A-P-EL-E12-MS6 | 24                       | IP65                 | Electrical connection: Sub-D, 25-pin   |
|   | Electrical connection: MS8 | VABX-A-P-EL-E12-MS8 | 32                       | IP65                 | Electrical connection: Sub-D, 44-pin   |
|    | Electrical connection: MF1 | VABX-A-P-EL-E12-MF1 | 24                       | IP40                 | Electrical connection: ribbon cable, 26-pin  |
|    | Electrical connection: MC  | VABX-A-P-EL-E12-MC  | 32                       | IP40                 | Electrical connection: terminal strip, 34-pin  |
| <b>Fieldbus interface/automation system CPX-AP-A</b>                                |                            |                     |                          |                      |  |
|   | Electrical connection: APA | VABX-A-P-EL-E12-APA | 32                       | IP65                 | Electrical connection: CPX-AP-A link   |
| <b>Interface to automation system CPX-AP-I</b>                                      |                            |                     |                          |                      |  |
|  | Electrical connection: API | VABX-A-P-EL-E12-API | 32                       | IP65                 | Electrical connection <ul style="list-style-type: none"> <li>• 2x socket, M8x1, D-coded, 4-pin, AP-COM</li> <li>• M8x1, A-coded, 4-pin for power supply</li> </ul> |
| <b>IO-Link® interface</b>   |                            |                     |                          |                      |  |
|  | Electrical connection: IOL | VABX-A-P-EL-E12-IOL | 32                       | IP40                 | Electrical connection: Push-in, IO-Link®   |
|   | Electrical connection: IOS | VABX-A-P-EL-E12-IOS | 32                       | IP65                 | Electrical connection: M12, IO-Link®   |

## Key features – Electrical components

## Fieldbus interface/automation system CPX-AP-A

The pneumatic interface (left end plate) serves as an adapter between the two current feeds.

All functions and features of the automation system CPX-AP-A are valid in combination with the CPX-AP-A interface.

This means that:

- The valves and outputs are supplied via the system supply for the automation system CPX-AP-A
- The valves can optionally be actuated or switched off separately from the outputs

**Note**

More information can be found at:

→ Internet: cpx-ap-a

## Automation system CPX-AP-I

All functions and features of the CPX-AP-I are valid in combination with the automation system CPX-AP-I:

- Power supply via the connection in the left end plate of the VTUX
- Power supply together with other modules or individually for the valve terminal
- Valves actuated via the communication cable from the preceding module
- Cable length of up to 50 m between the modules
- Up to 80 individual modules/valve terminals per bus interface

**Note**

More information can be found at:

→ Internet: cpx-ap-i

## IO-Link®

The IO-Link® interface enables the valve terminal VTUX to be connected to the following systems:

- Automation systems CPX-AP-A, CPX-AP-I and CPX-E from Festo
- CPX terminal
- Control system CECC
- Bus node CTEU from Festo
- IO-Link® master

The maximum distance between the IO-Link® master and valve terminal with IO-Link® interface is 20 m.

The 5-pin connecting cables transmit the power supply for the valves; the power supply for the internal valve terminal electronics and the control signals are separate from this.

**Note**

More information can be found at:

→ Internet: cteu

## Instructions for use

## Operating materials

Operate your system with unlubricated compressed air, if possible. Festo valves and cylinders are designed so that, if used as intended, they will not require additional lubrication and will still achieve a long service life.

The quality of compressed air downstream of the compressor must correspond to that of unlubricated compressed air. If possible, do not operate the entire system with lubricated compressed air. The lubricators should, where possible, always be installed directly upstream of the actuator requiring them.

Incorrect additional oil and too high an oil content in the compressed air reduce the service life of the valve terminal.

Use Festo special oil OFSW-32 or the alternatives listed in the Festo catalogue (as specified in DIN 51524 HLP32; basic oil viscosity 32 CST at 40°C).

## Bio-oils

When using bio-oils (oils which are based on synthetic or native esters, e.g. rapeseed oil methyl ester), the maximum residual oil content of 0.1 mg/m<sup>3</sup> must not be exceeded (see ISO 8573-1 Class 2).




## Mineral oils

When using mineral oils (e.g. HLP oils to DIN 51524, parts 1 to 3) or similar oils based on poly-alpha-olefins (PAO), the maximum residual oil content of 5 mg/m<sup>3</sup> must not be exceeded (see ISO 8573-1 Class 4).

A higher residual oil content is not permitted, regardless of the compressor oil, because the permanent lubrication would otherwise be flushed out over a period of time.



## Datasheet – Valve terminal VTUX

-  - Flow rate  
to 670 l/min
-  - Valve width  
10 mm
-  - Voltage  
24 V DC

**General technical data**

|                                  |                                    |                 |
|----------------------------------|------------------------------------|-----------------|
| Valve terminal design            | Modular and expandable             |                 |
| Actuation type                   | Electrical                         |                 |
| Nominal operating voltage        | [V DC]                             | 24              |
| Permissible voltage fluctuations | [%]                                | ±10             |
| Max. no. of valve positions      | 32                                 |                 |
| Max. no. of pressure zones       | 32                                 |                 |
| Valve size                       | [mm]                               | 10              |
| Type of control                  | Piloted                            |                 |
| Valve function                   | 2x3/2-way, single solenoid, closed |                 |
|                                  | 2x3/2-way, single solenoid, open   |                 |
|                                  | 5/2-way, single solenoid           |                 |
|                                  | 5/2-way, double solenoid           |                 |
|                                  | 5/3-way, closed                    |                 |
| Design                           | Piston spool                       |                 |
| Sealing principle                | Soft                               |                 |
| Type of mounting, sub-base       | Via through-hole                   |                 |
| Type of mounting                 | Tie rod                            |                 |
| Pilot air supply                 | Internal or external               |                 |
| Suitable for vacuum              | Yes                                |                 |
| Exhaust air function             | Can be throttled                   |                 |
| Standard nominal flow rate       | [l/min]                            | 470 ... 670     |
| Grid dimension                   | [mm]                               | 10.55 ... 12.55 |

**Pneumatic connections**

|                      |       |      |      |      |       |       |        |         |        |         |        |          |
|----------------------|-------|------|------|------|-------|-------|--------|---------|--------|---------|--------|----------|
| Pneumatic connection | 1     | -    | -    | QS-8 | QS-10 | QS-12 | -      | -       | -      | QS-5/16 | QS-3/8 | -        |
|                      | 3     | -    | -    | QS-8 | QS-10 | QS-12 | -      | -       | -      | QS-5/16 | QS-3/8 | Silencer |
|                      | 5     | -    | -    | QS-8 | QS-10 | QS-12 | -      | -       | -      | QS-5/16 | QS-3/8 | Silencer |
|                      | 12/14 | QS-4 | QS-6 | QS-8 | -     | -     | -      | -       | QS-1/4 | QS-5/16 | -      | Silencer |
|                      | 82/84 | QS-4 | QS-6 | -    | -     | -     | -      | -       | QS-1/4 | QS-5/16 | -      | Silencer |
|                      | 2     | -    | QS-6 | QS-8 | -     | -     | QS-1/8 | QS-5/32 | QS-1/4 | QS-5/16 | -      | -        |
|                      | 4     | -    | QS-6 | QS-8 | -     | -     | QS-1/8 | QS-5/32 | QS-1/4 | QS-5/16 | -      | -        |

## Datasheet – Valve terminal VTUX

| Operating and environmental conditions                               |       |  |
|--|-------|--|
| Operating medium   |       | Compressed air to ISO 8573-1:2010 [7:4:4] → 37                                   |
| Pilot medium   |       | Compressed air to ISO 8573-1:2010 [7:4:4] → 37                                   |
| Operating pressure   | [MPa] | -0.1 ... +0.7  |
|  | [bar] | -1 ... +7  |
|  | [psi] | -14.5 ... +101.5   |
| Operating pressure for valve terminal with internal pilot air supply | [MPa] | 0.15 ... 0.7   |
|  | [bar] | 1.5 ... 7  |
|  | [psi] | 21.75 ... 101.5  |
| Pilot pressure   | [MPa] | 0.15 ... 0.7   |
|  | [bar] | 1.5 ... 7  |
|  | [psi] | 21.75 ... 101.5  |
| Ambient temperature  | [°C]  | -5 ... +50   |
| Storage temperature  | [°C]  | -20 ... +70  |
| Maximum setup altitude   | [m]   | 3500   |
| Corrosion resistance class CRC <sup>1)</sup>                         |       | 1  |
| CE marking (see declaration of conformity)                           |       | To EU EMC Directive <sup>2)</sup>  |
|  |       | To EU RoHS Directive <sup>2)</sup>   |
| UKCA marking (see declaration of conformity)                         |       | To UK EMC regulations <sup>2)</sup>  |
|  |       | To UK RoHS regulations <sup>2)</sup>   |
| KC marking   |       | KC EMC   |
| Certification  |       | RCM  |
| Vibration resistant  |       | Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6 |
| Shock resistance   |       | Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27                |
| Continuous shock resistance to DIN/IEC 68, Part 2 - 82               |       | Tested to severity level 1   |
| Degree of protection   |       | IP65, IP6X   |




1) More information [www.festo.com/x/topic/crc](http://www.festo.com/x/topic/crc)

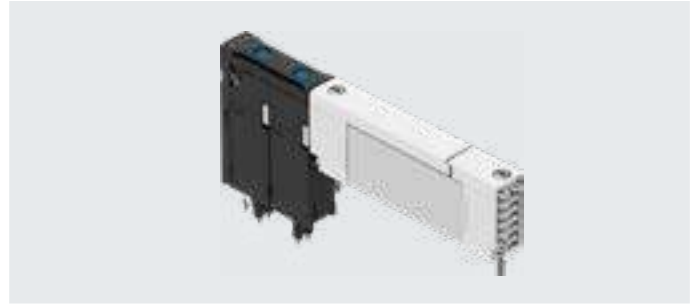
2) For information about the area of use, see the EC declaration of conformity at: [www.festo.com/catalogue/...](http://www.festo.com/catalogue/...) → Support/Downloads.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

| Materials              |                |
|------------------------|----------------|
| Manifold sub-base      | PA             |
| Seals                  | NBR            |
|                        | HNBR           |
| Note on materials      | RoHS-compliant |
| LABS (PWIS) conformity | VDMA24364-C1-L |

## Datasheet – Valves of size 10 mm

-  Flow rate  
to 730 l/min
-  Valve size  
10 mm
-  Voltage  
24 V DC

**General technical data**

|                          |                                |
|--------------------------|--------------------------------|
| Valve size               | 10 mm                          |
| Design                   | Piston slide with sealing ring |
| Actuation type           | Electrical                     |
| Type of control          | Piloted                        |
| Duty cycle [%]           | 100                            |
| Electrical connection    | Plug-in                        |
| Pilot air supply         | External                       |
| Sealing principle        | Soft                           |
| Exhaust air function     | Can be throttled               |
| Manual override          | Non-detenting                  |
| Signal status indication | Yes                            |
| Mounting position        | Any                            |
| Type of mounting         | On sub-base                    |
| Width [mm]               | 10.35                          |

**Pneumatic connections**

|                      |    |          |
|----------------------|----|----------|
| Pneumatic connection | 1  | Sub-base |
|                      | 3  | Sub-base |
|                      | 5  | Sub-base |
|                      | 12 | Sub-base |
|                      | 82 | Sub-base |
|                      | 2  | Sub-base |
|                      | 4  | Sub-base |

**Technical data – Valves**

| Code for position function 1-64   | A                        | M                | J                            | NS                               | K                                  | KC               | G                 |                |
|---|--------------------------|------------------|------------------------------|----------------------------------|------------------------------------|------------------|-------------------|----------------|
| Valve function  | 5/2-way, single solenoid |                  | 5/2-way, double solenoid     | 2x3/2-way, single solenoid, open | 2x3/2-way, single solenoid, closed |                  | 5/3-way, closed   |                |
| Reset method  | Mechanical spring        | Pneumatic spring | –                            | Mechanical spring                | Mechanical spring                  | Pneumatic spring | Mechanical spring |                |
| Overlap   | Negative overlap         |                  |                              |                                  |                                    |                  | Positive overlap  |                |
| Flow direction  | Reversible               | Not reversible   | Reversible with restrictions | Reversible                       | Reversible                         | Not reversible   | Reversible        |                |
| Switching times [ms]  | ≤34.5                    | ≤18.4            | ≤10.4                        | ≤17.3                            | ≤17.3                              | ≤21.9            | ≤48.3             |                |
| Nominal flow rate standardised according to ISO 8778 [l/min]              | 730                      | 730              | 730                          | 555                              | 600                                | 600              | 510               |                |
| Nominal flow rate standardised according to ISO 8778, exhaust 2→3 [l/min] | 700                      | 700              | 700                          | 545                              | 650                                | 650              | 465               |                |
| Operating pressure  | [MPa]                    | –0.09 ... +0.7   | 0.2 ... 0.7                  | –0.09 ... +0.7                   | 0.0 ... 0.7                        | 0.0 ... 0.7      | 0.15 ... 0.7      | –0.09 ... +0.7 |
|   | [bar]                    | –0.9 ... +7      | 2 ... 7                      | –0.9 ... +7                      | 0 ... 7                            | 0 ... 7          | 1.5 ... 7         | –0.9 ... +7    |
| Pilot pressure  | [MPa]                    | 0.25 ... 0.7     | 0.2 ... 0.7                  | 0.15 ... 0.7                     | 0.15 ... 0.7                       | 0.15 ... 0.7     | 0.15 ... 0.7      | 0.15 ... 0.7   |
|   | [bar]                    | 2.5 ... 7        | 2 ... 7                      | 1.5 ... 7                        | 1.5 ... 7                          | 1.5 ... 7        | 1.5 ... 7         | 1.5 ... 7      |
| Product weight [g]  | 41.5                     | 41.3             | 49.7                         | 50.7                             | 50.7                               | 49.9             | 51.1              |                |

## Datasheet – Valves of size 10 mm

| Operating and environmental conditions       |  |       |
|--|--|-------|
| Operating medium                             | Compressed air to ISO 8573-1:2010 [7:4:4] → 37   |       |
| Pilot medium                                 | Compressed air to ISO 8573-1:2010 [7:4:4] → 37   |       |
| Note on the operating/pilot medium           | Lubricated operation possible (in which case lubricated operation will always be required) |       |
| Ambient temperature [°C]                     | -5 ... +50   |       |
| Temperature of medium [°C]                   | -5 ... +50   |       |
| Storage temperature [°C]                     | -20 ... +70  |       |
| Burst pressure                               | [MPa]  | 3.5   |
|  | [bar]  | 35    |
|  | [psi]  | 507.5 |
| Overload pressure                            | [MPa]  | 1     |
|  | [bar]  | 10    |
|  | [psi]  | 145   |
| Corrosion resistance class CRC <sup>1)</sup> | 1  |       |
| Vibration resistant                          | Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6           |       |
| Shock resistance                             | Shock test with severity level 1 to FN 942017-5 and EN 60068-2-27                          |       |
| Degree of protection                         | IP65, IP67, with plug socket, to IEC 60529   |       |

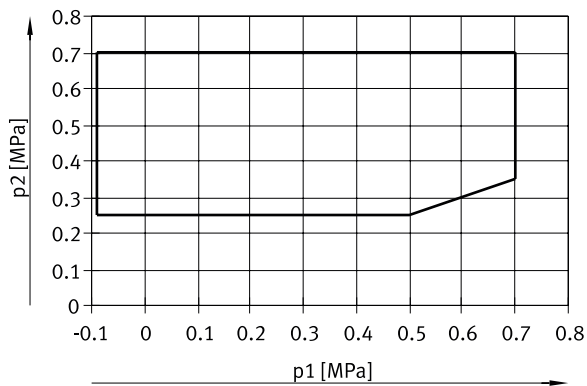
1) More information [www.festo.com/x/topic/crc](http://www.festo.com/x/topic/crc)

| Materials              |                                  |
|------------------------|----------------------------------|
| Housing                | Anodised wrought aluminium alloy |
| Spring                 | High-alloy stainless steel       |
| Piston spool           | POM                              |
| Screws                 | Stainless steel                  |
| Seals                  | HNBR                             |
| Dynamic seals          | HNBR                             |
| Note on materials      | RoHS-compliant                   |
| LABS (PWIS) conformity | VDMA24364-C1-L                   |

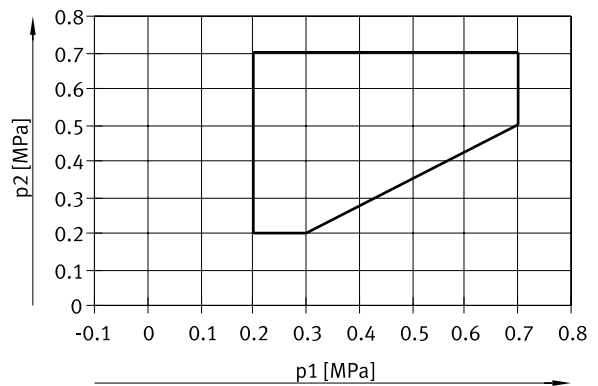
Datasheet – Valves of size 10 mm

Pilot pressure p2 as a function of working pressure p1

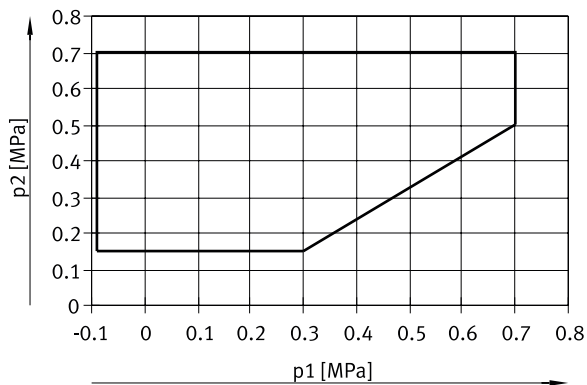
For 5/2-way valve, single solenoid, mechanical spring return



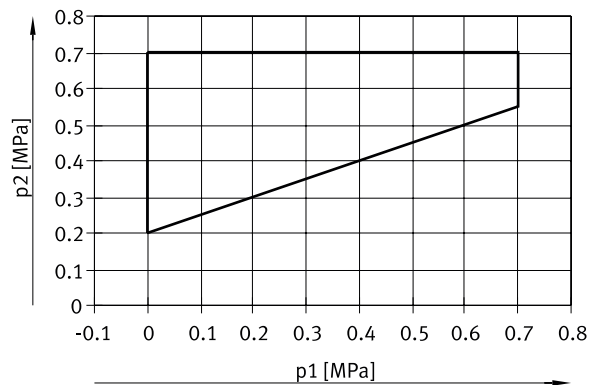
For 5/2-way valve, single solenoid, pneumatic spring return



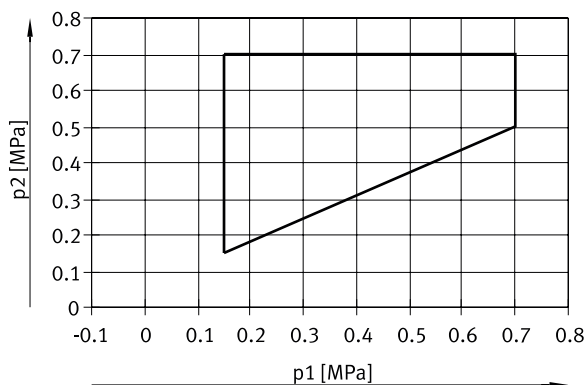
For 5/2-way valve, double solenoid



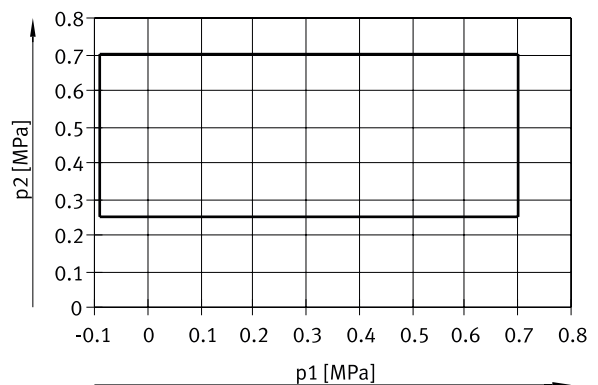
For 2x3/2-way valve, mechanical spring return



For 2x3/2-way valve, pneumatic spring return

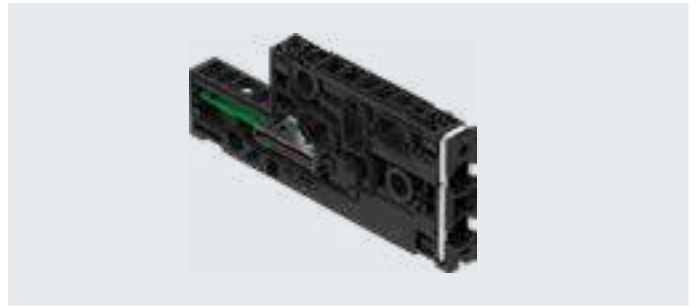


For 5/3-way valve, normally closed



## Datasheet – Manifold sub-bases

–  – Valve size  
10 mm



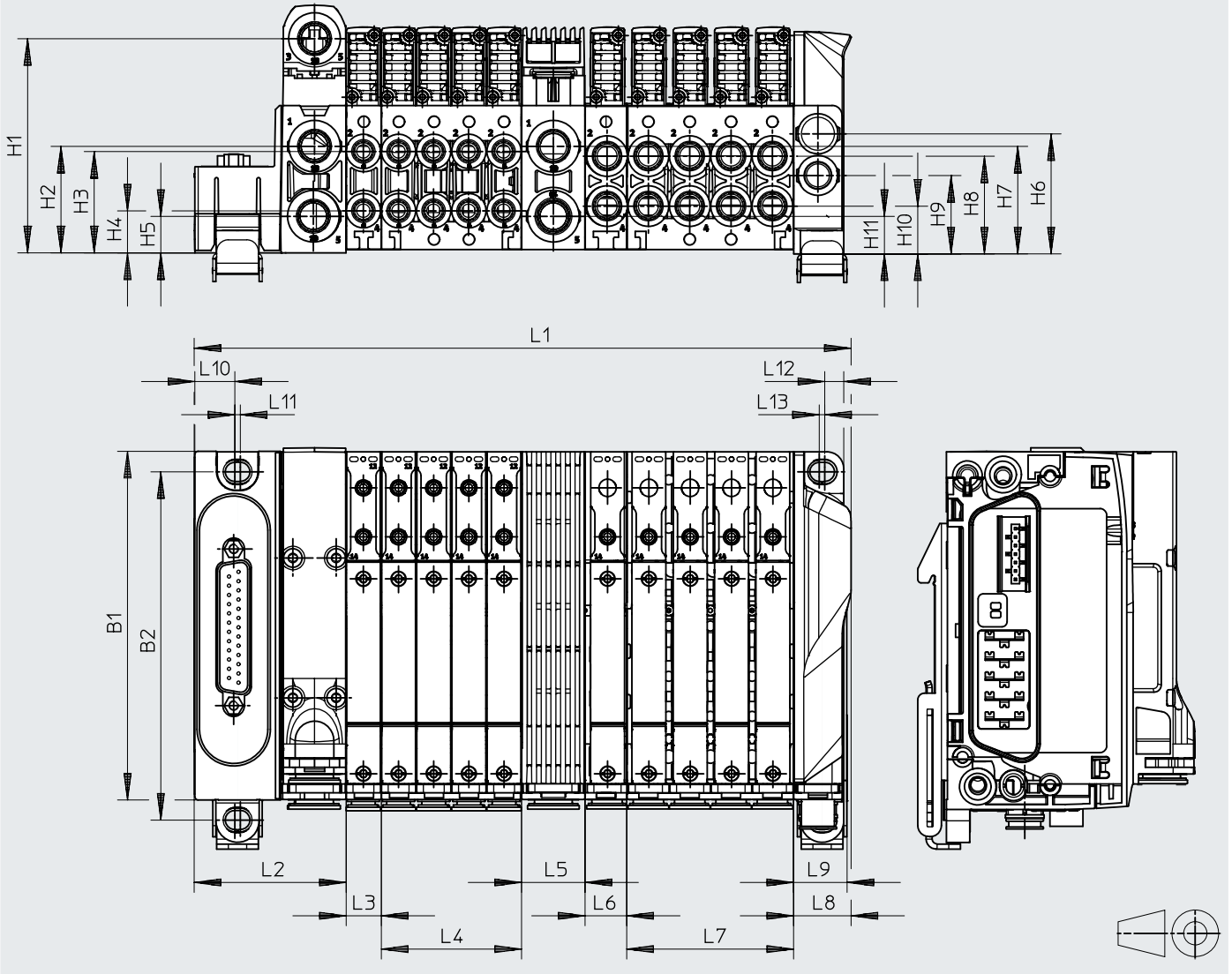
| General technical data            |                      |                      |                      |                      |
|-----------------------------------|----------------------|----------------------|----------------------|----------------------|
| Type                              | VABX-A-P-BV-AH       | VABX-A-P-BV-BH       | VABX-A-P-BV-AH-R     | VABX-A-P-BV-BH-R     |
| Maximum number of valve positions | 1                    | 1                    | 2                    | 2                    |
| Dimensions W x L x H [mm]         | 10.55 x 104.3 x 43.1 | 12.55 x 104.3 x 43.1 | 42.05 x 104.3 x 43.1 | 50.05 x 104.3 x 43.1 |
| Product weight [g]                | 31.2                 | 36.2                 | 115.7                | 136.2                |

| Materials              |                            |                            |
|------------------------|----------------------------|----------------------------|
|                        | For one valve              | For four valves            |
| Sub-base               | Reinforced PA              | Reinforced PA              |
| Seals                  | NBR                        | NBR                        |
| Retainer               | –                          | POM                        |
| Clamp                  | High-alloy stainless steel | High-alloy stainless steel |
| Nut                    | High-alloy stainless steel | High-alloy stainless steel |
| Note on materials      | RoHS-compliant             | RoHS-compliant             |
| LABS (PWIS) conformity | VDMA24364-B1/B2-L          | VDMA24364-B1/B2-L          |

Datasheet

Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

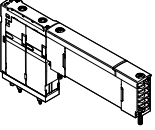
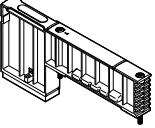
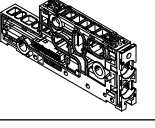
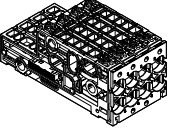
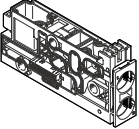
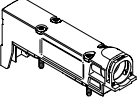
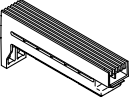


| Type | B1    | B2    | H1   | H2 | H3   | H4   | H5 | H6 | H7   | H8   | H9   | H10  | H11  |
|------|-------|-------|------|----|------|------|----|----|------|------|------|------|------|
| VTUX | 104.6 | 104.5 | 64.3 | 32 | 30.4 | 12.6 | 11 | 36 | 32.3 | 29.3 | 23.5 | 14.3 | 11.3 |

| Type | L1  | L2   | L3   | L4 | L5   | L6   | L7 | L8   | L9   | L10 | L11 | L12 | L13 |
|------|---|------|------|----|------|------|----|------|------|-----|-----|-----|-----|
| VTUX | $L2 + L8 + m \times L3 + n \times L4 + o \times L5 + p \times L6 + q \times L7$ | 45.7 | 10.5 | 42 | 19.1 | 12.5 | 50 | 17.2 | 16.1 | 12  | 1.7 | 5.7 | 1.7 |

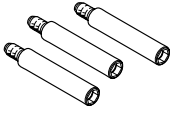
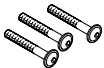



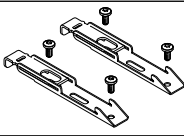


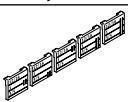
1) m, n, o, p, q = number of manifold sub-bases/valve positions

## Accessories

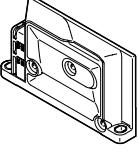
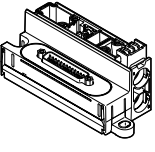
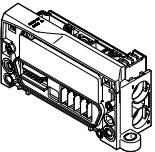
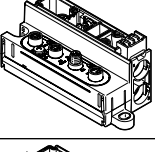
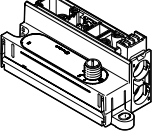
| Ordering data  |                                  | Code   | Valve function | Part no.                  | Type                       |                        |
|--|----------------------------------|--|----------------|---------------------------|----------------------------|------------------------|
| <b>Individual solenoid valve – Valve size 10 mm</b>                                |                                  |  |                |                           |                            |                        |
|    | <b>5/2-way valve</b>             |  |                |                           |                            |                        |
|  | Position function 1-64: A        | Single solenoid, mechanical spring return                                      |                | <b>8187057</b>            | VUVX-BK10-M52-MZH-F-1T1L   |                        |
|  | Position function 1-64: M        | Single solenoid, pneumatic spring return                                       |                | <b>8187056</b>            | VUVX-BK10-M52-A1ZH-F-1T1L  |                        |
|  | Position function 1-64: J        | Double solenoid  |                | <b>8187059</b>            | VUVX-BK10-B52-ZH-F-1T1L    |                        |
|  | <b>2x 3/2-way valve</b>          |  |                |                           |                            |                        |
|  | Position function 1-64: NS       | Normally open, mechanical spring return  |                | <b>8187063</b>            | VUVX-BK10-T32U-MZH-F-1T1L  |                        |
|  | Position function 1-64: K        | Normally closed, mechanical spring return                                      |                | <b>8187061</b>            | VUVX-BK10-T32C-MZH-F-1T1L  |                        |
|  | Position function 1-64: KC       | Normally closed, pneumatic spring return                                       |                | <b>8187060</b>            | VUVX-BK10-T32C-A1ZH-F-1T1L |                        |
|  | <b>5/3-way valve</b>             |  |                |                           |                            |                        |
| Position function 1-64: G  | Mid-position closed              |  | <b>8187066</b> | VUVX-BK10-P53C-MZH-F-1T1L |                            |                        |
| <b>Vacant position – Valve size 10 mm</b>  |                                  |  |                |                           |                            |                        |
|    | Position function 1-64: L        | Cover plate for one valve position   |                | <b>8163948</b>            | VABB-XA-10-T               |                        |
| <b>Manifold sub-base – For one valve</b>   |                                  |  |                |                           |                            |                        |
|   | –                                | Single solenoid (for 1 solenoid coil)  | Cartridge      | 10 mm                     | <b>8188458</b>             | VABX-A-P-BV-AH-F       |
|  |                                  |  |                | 12 mm                     | <b>8188462</b>             | VABX-A-P-BV-BH-G       |
|  |                                  | Double solenoid (for 2 solenoid coils)   | Cartridge      | 10 mm                     | <b>8188459</b>             | VABX-A-P-BV-AH-A       |
|  |                                  |  |                | 12 mm                     | <b>8188463</b>             | VABX-A-P-BV-BH-B       |
| <b>Manifold sub-base – For four valves</b>   |                                  |  |                |                           |                            |                        |
|  | –                                | Single solenoid (for 1 solenoid coil)  | Cartridge      | 10 mm                     | <b>8188460</b>             | VABX-A-P-BV-AH-RVFFFF  |
|  |                                  |  |                | 12 mm                     | <b>8188464</b>             | VABX-A-P-BV-BH-RVGGGG  |
|  |                                  | Double solenoid (for 2 solenoid coils)   | Cartridge      | 10 mm                     | <b>8188461</b>             | VABX-A-P-BV-AH-RVAAAA  |
|  |                                  |  |                | 12 mm                     | <b>8188465</b>             | VABX-A-P-BV-BH-RVB BBB |
| <b>Supply module</b>   |                                  |  |                |                           |                            |                        |
|  | Connection position type 1-64: U | Manifold sub-base with ports for ducts 1 and 3/5, no plate, no cartridge       |                | <b>8191788</b>            | VABX-A-P-BU-E12-SHUH       |                        |
| <b>Plate</b>   |                                  |  |                |                           |                            |                        |
|  | Position function 1-64: UD       | Plate for ducted exhaust air, without cartridge, for mounting on supply module |                | <b>8191794</b>            | VABF-XA-12-M2-QX           |                        |
|  | Position function 1-64: US       | Exhaust plate, for mounting on supply module                                   |                | <b>8191741</b>            | VABF-XA-12-M1-C            |                        |



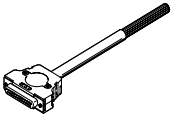
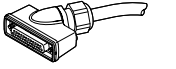
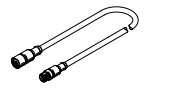
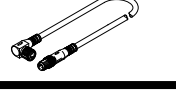



## Accessories

| Ordering data   |                         | Code  | Description           | Part no. | Type            |
|---|-------------------------|---|-----------------------|----------|-----------------|
| <b>Tie rods</b>   |                         |   |                       |          |                 |
|    | Tie rod: –              | Threaded rod for tie rod, internal hex, spanner size 4<br>The threaded rod/screw combination is selected based on the number and width of the individual sub-bases. | 10 mm                 | 8191752  | VAME-XA-Z-10    |
|   |                         |   | 12 mm                 | 8191753  | VAME-XA-Z-12    |
|   |                         |   | 15 mm                 | 8191754  | VAME-XA-Z-15    |
|   |                         |   | 17 mm                 | 8191755  | VAME-XA-Z-17    |
|   |                         |   | 19 mm                 | 8191756  | VAME-XA-Z-19    |
|   |                         |   | 29 mm                 | 8191757  | VAME-XA-Z-29    |
|   |                         |   | 38 mm                 | 8191758  | VAME-XA-Z-38    |
|   |                         |   | 42 mm                 | 8191759  | VAME-XA-Z-42    |
|   |                         |   | 50 mm                 | 8191760  | VAME-XA-Z-50    |
|   |                         |   | 61 mm                 | 8191761  | VAME-XA-Z-61    |
|   |                         |   | 84 mm                 | 8191762  | VAME-XA-Z-84    |
|   |                         |   | 107 mm                | 8191763  | VAME-XA-Z-107   |
|   |                         |   | 130 mm                | 8191764  | VAME-XA-Z-130   |
|   |                         |   | 150 mm                | 8191765  | VAME-XA-Z-150   |
|   |                         |   | 170 mm                | 8191766  | VAME-XA-Z-170   |
|    | –                       | M4 screw with internal hex, spanner size 2.5, for tie rod   | 30 mm                 | 8191747  | VAME-XA-S-M4-30 |
|   |                         |   | 45 mm                 | 8191748  | VAME-XA-S-M4-45 |
| <b>Separator</b>  |                         |   |                       |          |                 |
|   | –                       | Separator for pressure zone separation in duct 1  |                       | 8191736  | VABD-XA-12-P1   |
|  | –                       | Separator for pressure zone separation in duct 3/5  |                       | 8191737  | VABD-XA-12-P2   |
| <b>Wall mounting</b>  |                         |   |                       |          |                 |
|  | –                       | Mounting bracket<br>Wall brackets should be mounted on the valve terminal every 20 cm.  |                       | 8191739  | VAME-XA-W       |
| <b>H-rail mounting</b>  |                         |   |                       |          |                 |
|  | Mounting accessories: H | Clamping kit for H-rail mounting  |                       | 8191782  | VAME-XA-H       |
| <b>Cover cap</b>  |                         |   |                       |          |                 |
|  | Manual override: HV     | Cover cap for manual override, concealed  |                       | 8198864  | VAMC-XA-CS      |
|  | Manual override: HR     | Cover cap for manual override, detenting  |                       | 8198865  | VAMC-XA-CD      |
| <b>Inscription labels</b>   |                         |   |                       |          |                 |
|  | –                       | Inscription label for marking pressure zone separation  | Duct 1 separated      | 8191742  | ASLR-C-XA-TT    |
|   |                         |   | Duct 3/5 separated    | 8191743  | ASLR-C-XA-TR    |
|   |                         |   | Duct 1, 3/5 separated | 8191745  | ASLR-C-XA-TS    |

## Accessories

| Ordering data  |                            | Code   | Description                          | Part no.       | Type                            |
|--|----------------------------|--|--------------------------------------|----------------|---------------------------------|
| <b>Right end plate</b>   |                            |  |                                      |                |                                 |
|    | -                          | With fastening holes for wall mounting                   |                                      | <b>8191781</b> | <b>VABX-A-ER-E12-JHTR-XR</b>    |
| <b>Left end plate</b>  |                            |  |                                      |                |                                 |
|    | Electrical connection: MS1 | Electrical interface for multi-pin plug connection, IP40 | Sub-D, 25-pin, 24 addresses          | <b>8188447</b> | <b>VABX-A-P-EL-E12-MS1-SHUH</b> |
|  | Electrical connection: MS3 |  | Sub-D, 44-pin, 32 addresses          | <b>8188449</b> | <b>VABX-A-P-EL-E12-MS3-SHUH</b> |
|  | Electrical connection: MF1 |  | Ribbon cable, 26-pin, 24 addresses   | <b>8188451</b> | <b>VABX-A-P-EL-E12-MF1-SHUH</b> |
|  | Electrical connection: MC  |  | Terminal strip, 34-pin, 32 addresses | <b>8188452</b> | <b>VABX-A-P-EL-E12-MC-SHUH</b>  |
|  | Electrical connection: MS6 | Electrical interface for multi-pin plug connection, IP65 | Sub-D, 25-pin, 24 addresses          | <b>8188448</b> | <b>VABX-A-P-EL-E12-MS6-SHUH</b> |
|  | Electrical connection: MF8 |  | Sub-D, 44-pin, 32 addresses          | <b>8188450</b> | <b>VABX-A-P-EL-E12-MS8-SHUH</b> |
|   | Electrical connection: APA | Pneumatic interface for automation system CPX-AP-A, IP65 | 32 addresses                         | <b>8189594</b> | <b>VABX-A-P-EL-E12-APA-SHUH</b> |
|  | Electrical connection: API | Pneumatic interface for automation system CPX-AP-I, IP65 | 32 addresses                         | <b>8189592</b> | <b>VABX-A-P-EL-E12-API-SHUH</b> |
|  | Electrical connection: IOL | Node with IO-Link®, IP40                                 | Push-in, 32 addresses                | <b>8189591</b> | <b>VABX-A-P-EL-E12-IOL-SHUH</b> |
|  | Electrical connection: IOS | Node with IO-Link®, IP65                                 | M12, 32 addresses                    | <b>8189590</b> | <b>VABX-A-P-EL-E12-IOS-SHUH</b> |

## Accessories

| Ordering data   |      | Code  | Description  | Part no.   | Type                        |                             |             |                      |
|---|------|---|--------------|------------|-----------------------------|-----------------------------|-------------|----------------------|
| <b>Connecting cable for multi-pin plug connection, Sub-D</b>                        |      |   |              |            |                             |                             |             |                      |
|    | -    | Socket, 25-pin, straight, open cable end 25-pin | IP65/IP67    | 2.5 m      | 538225                      | NEBV-S1G25-K-2.5-N-LE25     |             |                      |
|   |      |   |              | 5 m        | 538226                      | NEBV-S1G25-K-5-N-LE25       |             |                      |
|   |      |   |              | 10 m       | 538227                      | NEBV-S1G25-K-10-N-LE25      |             |                      |
|   |      |   | IP40         | 2.5 m      | 575417                      | NEBV-S1G25-K-2.5-N-LE25-S6  |             |                      |
|   |      |   |              | 5 m        | 575418                      | NEBV-S1G25-K-5-N-LE25-S6    |             |                      |
|   |      |   |              | 10 m       | 575419                      | NEBV-S1G25-K-10-N-LE25-S6   |             |                      |
|    | -    | Socket, 25-pin, angled, open cable end, 25-pin  | IP65/IP67    | 2.5 m      | 575423                      | NEBV-S1WA25-K-2.5-N-LE25-S9 |             |                      |
|   |      |   |              | 5 m        | 575424                      | NEBV-S1WA25-K-5-N-LE25-S9   |             |                      |
|   |      |   |              | 10 m       | 575425                      | NEBV-S1WA25-K-10-N-LE25-S9  |             |                      |
|   |      | Socket, 44-pin, angled, open cable end, 44-pin  | 2.5 m        | 575420     | NEBV-S1WA44-K-2.5-N-LE44-S9 |                             |             |                      |
|   |      |   | 5 m          | 575421     | NEBV-S1WA44-K-5-N-LE44-S9   |                             |             |                      |
|   |      |   | 10 m         | 575422     | NEBV-S1WA44-K-10-N-LE44-S9  |                             |             |                      |
| <b>Connecting cable – Round plug</b>  |      |   |              |            |                             |                             |             |                      |
|    | -    | Socket M12x1, 8-pin, plug M12x1, 4-pin          | IP67         | 2 m        | 553575                      | NEBV-M12G8-K-2-M12G4        |             |                      |
|   |      |   |              | 5 m        | 553576                      | NEBV-M12G8-K-5-M12G4        |             |                      |
|    | -    | Socket M8x1, 4-pin, plug M8x1, 3-pin            | IP65<br>IP67 | 2.5        | 562468                      | NEBV-M8W4L-E-2.5-M8G3       |             |                      |
|   |      |   |              | 5          | 562469                      | NEBV-M8W4L-E-5-M8G3         |             |                      |
|   |      |   |              | 10         | 562470                      | NEBV-M8W4L-E-10-M8G3        |             |                      |
| <b>Ordering data</b>  |      |   |              |            |                             |                             |             |                      |
|   |      | Code  | Description  | Weight [g] | Pack size                   | Part no.                    | Type        |                      |
| <b>Cartridge</b>  |      |   |              |            |                             |                             |             |                      |
|  | -    | Cartridge 10 mm, connection for tubing O.D.     |              | 4 mm       | 0.9                         | 10                          | 8174164     | NPQX-D-PC10-Q4-P10   |
|   |      |   |              | 6 mm       | 0.72                        | 10                          | 8174165     | NPQX-D-PC10-Q6-P10   |
|   |      |   |              | 1/8"       | 2                           | 10                          | 8184511     | NPQX-D-PC10-T18-P10  |
|   |      |   |              | 5/32"      | 0.9                         | 10                          | 8184509     | NPQX-D-PC10-T532-P10 |
|   |      |   |              | 1/4"       | 2.15                        | 10                          | 8184510     | NPQX-D-PC10-T14-P10  |
|   |      | Cartridge 12 mm, connection for tubing O.D.     |              | 4 mm       | 1.24                        | 10                          | 8174166     | NPQX-D-PC12-Q4-P10   |
|   |      |   |              | 6 mm       | 1.2                         | 10                          | 8174167     | NPQX-D-PC12-Q6-P10   |
|   |      |   |              | 8 mm       | 0.92                        | 10                          | 8174168     | NPQX-D-PC12-Q8-P10   |
|   |      |   |              | 5/32"      | 1.24                        | 10                          | 8184512     | NPQX-D-PC12-T532-P10 |
|   |      |   |              | 1/4"       | 2.6                         | 10                          | 8184514     | NPQX-D-PC12-T14-P10  |
|   |      | Cartridge 15 mm, connection for tubing O.D.     |              | 5/16"      | 0.92                        | 10                          | 8184513     | NPQX-D-PC12-T516-P10 |
|   |      |   |              | 8 mm       | 1.9                         | 10                          | 8174169     | NPQX-D-PC15-Q8-P10   |
|   |      |   |              | 10 mm      | 1.64                        | 10                          | 8174170     | NPQX-D-PC15-Q10-P10  |
|   |      |   |              | 12 mm      | 7.6                         | 10                          | 8174171     | NPQX-D-PC19-Q12-P10  |
|   |      |   |              | 5/16"      | 1.9                         | 10                          | 8184515     | NPQX-D-PC15-T516-P10 |
|   | 3/8" | 10  | 10           | 8189810    | NPQX-D-PC10-T38-P10         |                             |             |                      |
| <b>Silencer</b>   |      |   |              |            |                             |                             |             |                      |
|  | -    | Silencer  |              | 0.7        | -                           | 8191740                     | AMTX-P-PC12 |                      |
| <b>Blanking plug</b>  |      |   |              |            |                             |                             |             |                      |
|  | -    | Cartridge                                       |              | 1          | -                           | 8191749                     | NPQX-P-PC10 |                      |
|   |      |   |              | 0.8        | -                           | 8191750                     | NPQX-P-PC12 |                      |
|   |      |   |              | 1.6        | -                           | 8191751                     | NPQX-P-PC15 |                      |

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