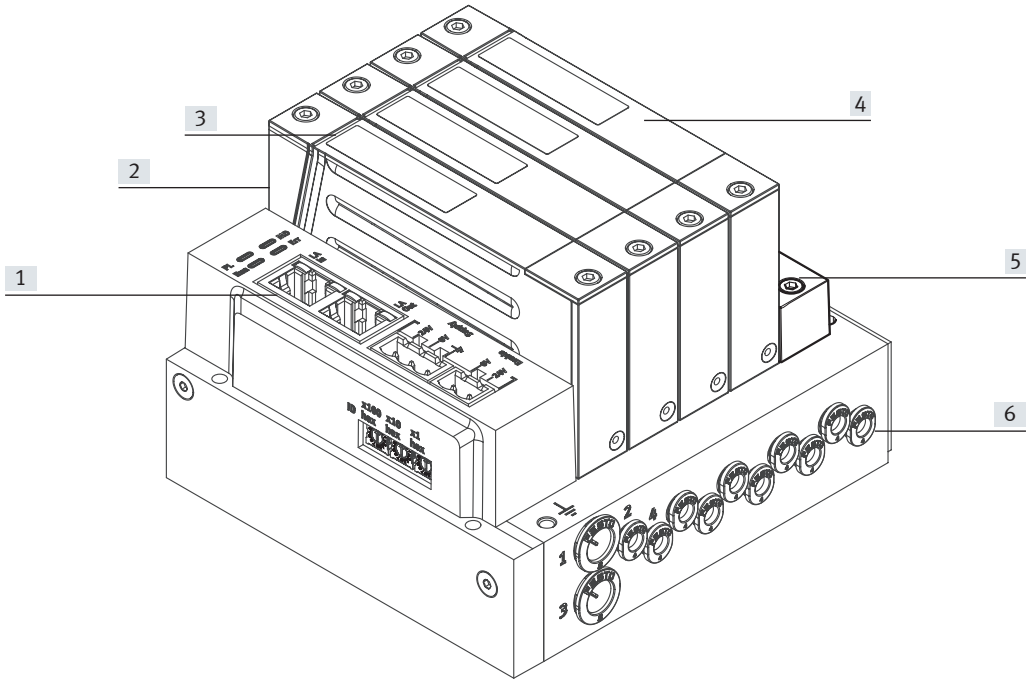
# Valve terminal VTEP

# Key features




[1] Simple electrical connections via EtherCAT®
[2] 16 mm grid dimension
[3] Simplified diagnostics thanks to LED status indication on the valve
[4] Two variants: VTEP-...-P- for pressure range 0 ... 0.6 MPa VTEP-...-PL- for pressure range -0.1 ... 0.1 MPa
[5] Flexible: 2 ... 10 ducts, 1 ... 5 valves
[6] Practical: Push-in tubing connectors integrated into the manifold sub-base

## Innovative

- Very compact: 10 ducts on an overall width of less than 120 mm width
- Highly dynamic and precise control
- Pressure and vacuum control can be combined
- Very flexible thanks to customisable control parameters
- LinkedPorts as an easy method of controlling the combined ducts to increase the maximum flow rate
- Energy-saving mode for efficient process monitoring and early detection of system changes

## Piezo technology

- No wear
- No tear
- No particle abrasion
- No heat generation
- Silent
- Low power consumption
- Low air consumption

## Reliable

- EtherCAT® communication interface
- Flow rate up to 42 l/min
- Fast troubleshooting with LEDs on the valves
- Easy to service thanks to replaceable valves
- Secure firmware updates via FoE ("Filetransfer over EtherCAT")
- With an internal setpoint profile generator, pressure profiles with increments in the ms range can be precisely realised, independent of the clock pulse of the higher-level control system

## Easy to install

- Push-in connectors securely integrated
- Supplied quickly and reliably as a ready-to-install, tested unit
- Reduced selection, ordering, installation and commissioning costs

## Ordering data – Product options

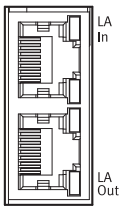
Configurable product
This product and all its product options can be ordered using the configurator.

The configurator can be found at
➔ **www.festo.com/catalogue/...**
Enter the part number or the type.

| Part no. | Type |
|---|---|
| 8176050 | VTEP |

# Key features – Electrical/mechanical

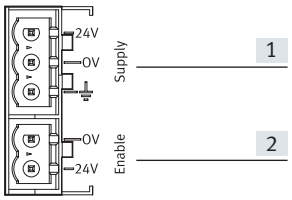
## EtherCAT® connection




Communication with a higher-order PLC takes place via the integrated EtherCAT® interface. The interfaces support crossover detection (auto MDI/MDI-X). This means either patch cables or crossover cables can be used.

The supported “distributed clocks” function, for precise synchronisation of participants in an EtherCAT® network, enables applications that require simultaneously coordinated actions.

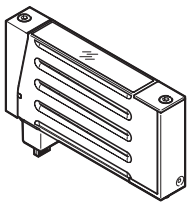
## Power supply




The valve terminal has a connection for supplying power to the electronics and valves [1].

Connection [2] enables the supply voltage for the valves to be switched on or off separately.

## Sub-base valve

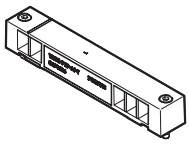


VTEP offers two different valves, one for high pressure and one for low pressure. The valves comprise four 2/2-way proportional valves connected to form a bridge circuit, two of which regulate the pressure in duct 2 and two of which regulate the pressure in duct 4.

Sensors monitor the degree of opening of the valves as well as the pressure in duct 2 and 4. The valves are attached to the sub-base using two screws. which means that they can be easily replaced. The sturdy mechanical structure of the sub-base ensures efficient, durable sealing.

Only valves of one pressure range/valve code (P, PL) can be combined on one valve terminal. The valve code (e.g. P, PL) is located on the front of the valve below the LED display.

## Cover plate

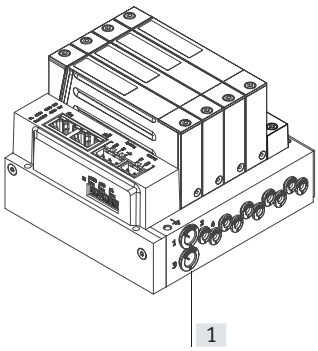


Cover plate (code B) without valve function, for reserving valve positions on a valve terminal.

The valve plate and blanking plate are connected to the sub-base using two screws.

Blanking plates can be replaced by valves at a later date. The dimensions, mounting points and existing pneumatic installations remain unchanged during this process.

## Compressed air supply and exhaust




The valve terminal VTEP is pressurised via the connections [1] in the manifold sub-base.

All pneumatic connections are integrated into the manifold sub-base.

# Key features – Display and operation

## Display and operation

### Status display, valve

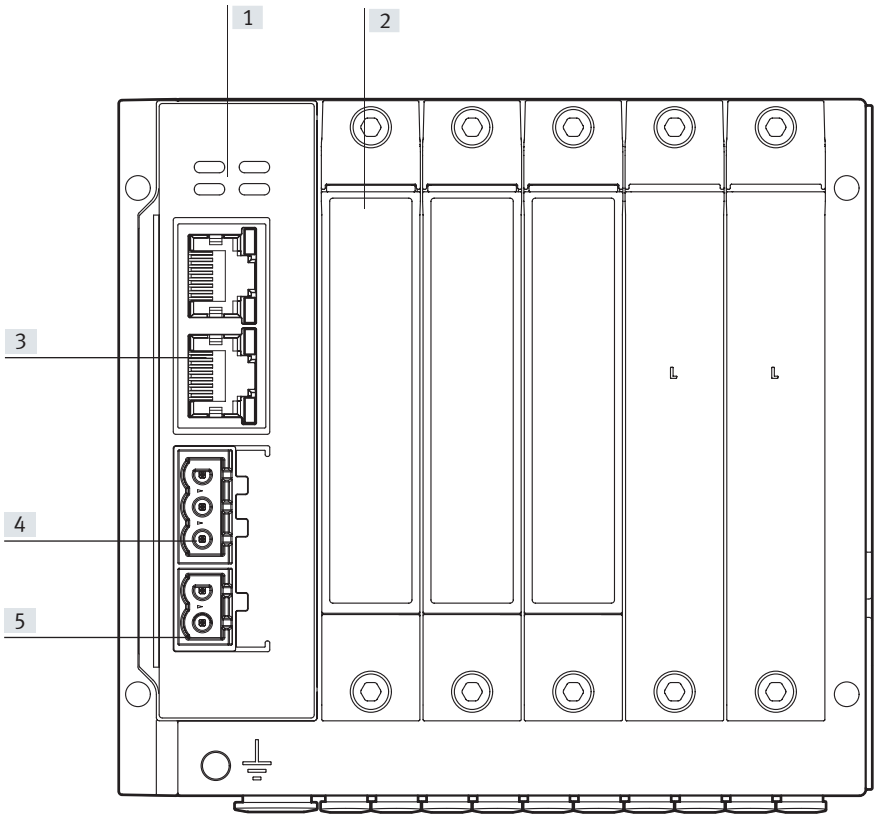
Each valve has an LED to indicate the valve status.

### Status display, valve terminal

The valve terminal has displays for:

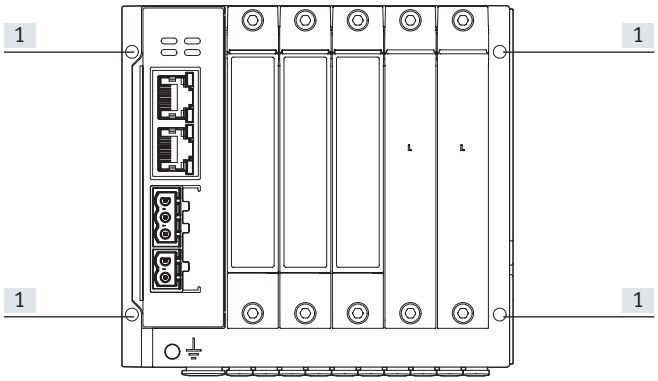
- Module diagnostics
- Load voltage
- EtherCAT® status
- Network status

### Display and operating components




[1] LED status indicators for the valve terminal
[2] LED indication on the valve
[3] Ethernet interface
[4] Power supply connection
[5] Switching input for valve supply

## Valve terminal mounting




The manifold sub-base has four through-holes [1] for mounting the valve terminal.

# Datasheet – Valve terminal VTEP

- Flow rate
  up to 42 l/min

- Valve width
  16 mm

- Voltage
  24 V DC

- Variant VTEP-...-P- for pressure range 0 ... 0.6 MPa
- Variant VTEP-...-PL- for pressure range -0.1 ... 0.1 MPa

## General technical data

| | VTEP-...-P- | VTEP-...-PL- |
|---|---|---|
| Application note | The product is suitable for industrial purposes only. In residential areas, measures for radio interference suppression may have to be taken.<br>For indoor use only | |
| Valve terminal design | Fixed grid | |
| Grid dimension | 16 mm | |
| Max. number of valve positions | 5 | |
| Max. no. of pressure zones | 1 | |
| Valve function | 3-way proportional-pressure regulator, closed | |
| Actuation type | Electrical | |
| Setpoint value input | Digital | |
| Sealing principle | Soft | |
| Standard flow rate (standardised to DIN 1343) | 42 l/min | 18 l/min |
| Flow direction | Not reversible | |
| Suitable for vacuum | Yes | |
| Display type | LED | |
| Linearity | 0.9% FS | 0.4% FS |
| Hysteresis | 0.4% FS | 0.5% FS |
| Reproducibility | 0.4% FS | 0.3% FS |
| Overall accuracy | 1.1% FS | 0.65% FS |
| Dimensions W x L x H | 119 mm x 110 mm x 82 mm<br>71 mm x 110 mm x 82 mm<br>87 mm x 110 mm x 82 mm | |

## Approx. product weight

| | |
|---|---|
| VTEP with 2 valve positions (without valves or cover plates) | 421 g |
| VTEP with 3 valve positions (without valves or cover plates) | 494 g |
| VTEP with 5 valve positions (without valves or cover plates) | 640 g |
| Valve VEVP | 86 g |
| Cover plate | 15 g |
| VTEP with 2 valve positions (including 2 valves) | 593 g |
| VTEP with 3 valve positions (including 2 valves) | 752 g |

# Datasheet – Valve terminal VTEP

| Technical data – Fieldbus interface | |
|---|---|
| Fieldbus interface, type of connection | 2 x socket |
| Fieldbus interface, connection technology | RJ45 |
| Fieldbus interface, protocol | EtherCAT® |

| Technical data – Electrical connection 1 | |
|---|---|
| Electrical connection 1, function | Power supply |
| Electrical connection 1, connection type | Socket |
| Electrical connection 1, connection technology | Terminal strip |
| Electrical connection 1, number of pins/ cores | 3 |
| Electrical connection 1, conductor cross section | 0.2 ... 1.5 mm² |

| Technical data – Electrical connection 2 | |
|---|---|
| Electrical connection 2, function | Digital input |
| Electrical connection 2, connection type | Socket |
| Electrical connection 2, connection technology | Terminal strip |
| Electrical connection 2, number of pins/ wires | 2 |
| Electrical connection 2, conductor cross section | 0.2 ... 1.5 mm² |

| Technical data – Electrics | |
|---|---|
| Nominal operating voltage DC | 24 V |
| Operating voltage range DC | 20.4 ... 27.6 V |
| Overvoltage category | II |
| Max. electrical power consumption | 6 W |
| Buffer time in case of voltage failure of logic supply | 10 ms |
| Residual ripple | ± 10% |
| Pollution degree | 2 |
| Reverse polarity protection | For all electrical connections |
| Protection against direct and indirect contact | PELV |

| Pneumatic connections | |
|---|---|
| Pneumatic connection 1 | For tubing O.D. 8 mm |
| Pneumatic connection 2 | For tubing O.D. 4 mm |
| Pneumatic connection 3 | For tubing O.D. 8 mm |
| Pneumatic connection 4 | For tubing O.D. 4 mm |

| Materials | |
|---|---|
| Sealing material | NBR |
| Note on materials | RoHs-compliant |
| LABS (PWIS) conformity | VDMA24364 zone III |
| Suitable for the production of Li-ion batteries | Metals with more than 5% by mass of copper, zinc or nickel are excluded from use. Exceptions are nickel in steel, chemically nickel-plated surfaces, printed circuit boards, cables, electrical plug connectors and coils |
| Cleanroom class | Class 3 to ISO 14644-1 |
| Material fire-tested | UL94 HB |

# Datasheet – Valve terminal VTEP

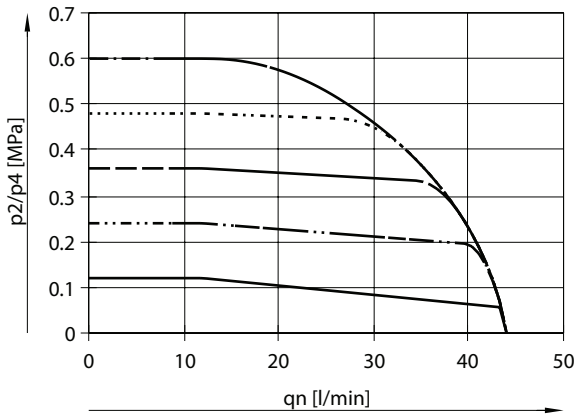
| Pressure specifications | | |
|---|---|---|
| | VTEP-...-P- | VTEP-...-PL- |
| Operating pressure | 0.7 MPa | 0.2 MPa |
| | 7 bar | 2 bar |
| | 101.5 psi | 29 psi |
| Input pressure 1 | 0 ... 0.7 MPa | 0 ... 0.2 MPa |
| | 0 ... 7 bar | 0 ... 2 bar |
| | 29 ... 101.5 psi | 29 ... 29 psi |
| Input pressure 3 | 0 MPa | -0.1 ... 0 MPa |
| | 0 bar | -1 ... 0 bar |
| | 0 psi | -14.5 ... 87 psi |
| Pressure regulation range | 0 ... 0.6 MPa | -0.1 ... 0.1 MPa |
| | 0 ... 6 bar | -1 ... 1 bar |
| | 0 ... 87 psi | -14.5 ... 14.5 psi |
| Burst pressure | 2.1 MPa | 2.1 MPa |
| | 21 bar | 21 bar |
| | 304.5 psi | 304.5 psi |

| Operating and environmental conditions | |
|---|---|
| Operating medium | Compressed air to ISO 8573-1:2010 [7:4:4], inert gases, oxygen |
| Ambient temperature | 5 ... 50 °C |
| Temperature of medium | 5 ... 50 °C |
| Storage temperature | -20 ... 60 °C |
| Relative humidity | 5 - 85%, non-condensing |
| Corrosion resistance class CRC [1] | 2 - Moderate corrosion stress |
| Nominal operating altitude | < 3000 m above sea level |
| Climatic category | 3K22 to EN 60721 |
| 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 |
| CE marking (see declaration of conformity) [2] | To EU EMC Directive<br>To EU RoHS Directive |
| UKCA marking (see declaration of conformity) [3] | To UK EMC regulations<br>To UK RoHS regulations |
| KC marking | KC EMC |
| Certification | RCM |
| Degree of protection | IP20 |

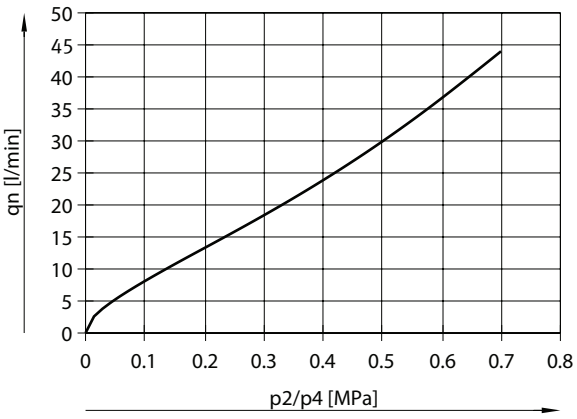
1) More information www.festo.com/x/topic/crc
2) More information www.festo.com/catalogue/... Support/downloads.
3) More information www.festo.com/catalogue/... Support/downloads.

# Datasheet – Valve terminal VTEP

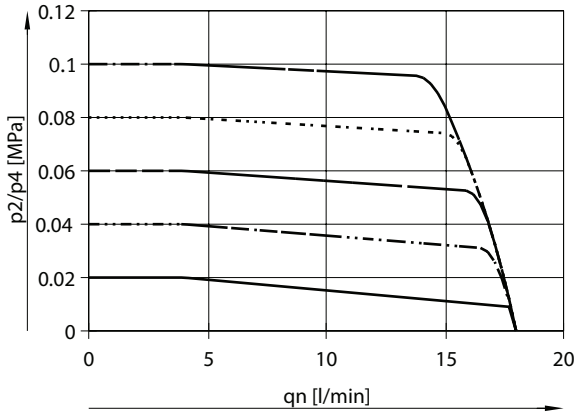
**Flow rate VTEP-...-P-, duct 1 (0.7 MPa) to 2/4**



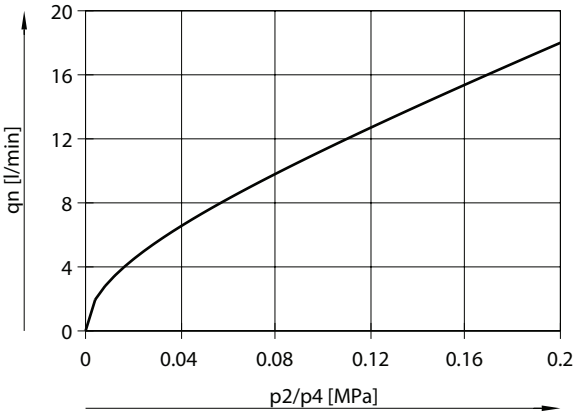

**Flow rate VTEP-...-P-, duct 2/4 to 3 (0 MPa)**




**Flow rate VTEP-...-PL-, duct 1 (0.2 MPa) to 2/4**



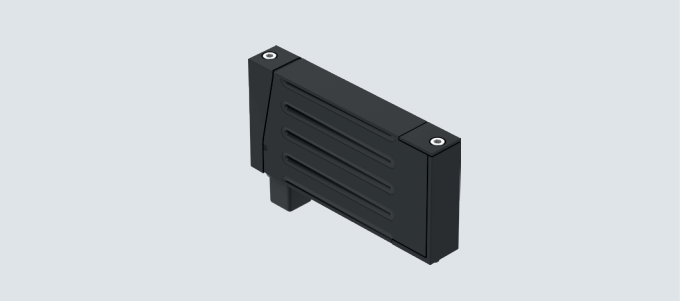

**Flow rate VTEP-...-PL-, duct 2/4 to 3 (0 MPa)**



# Datasheet – Valves VEVP

Grid dimension
16 mm

Voltage
24 V DC



| General technical data | |
|---|---|
| Grid dimension | 16 mm |
| Nominal width | 4 mm |
| Design | Sub-base valve |
| Valve function | 3-way proportional-pressure regulator, closed |
| Actuation type | Electrical |
| Sealing principle | Soft |
| Flow direction | Not reversible |
| Suitable for vacuum | Yes |
| Product weight | 85.5 g |

| Technical data – Electrics | |
|---|---|
| Nominal operating voltage DC | 24 V |

| Pneumatic connections | |
|---|---|
| Pneumatic connection 1 | Flange |
| Pneumatic connection 2 | Flange |
| Pneumatic connection 3 | Flange |
| Pneumatic connection 4 | Flange |

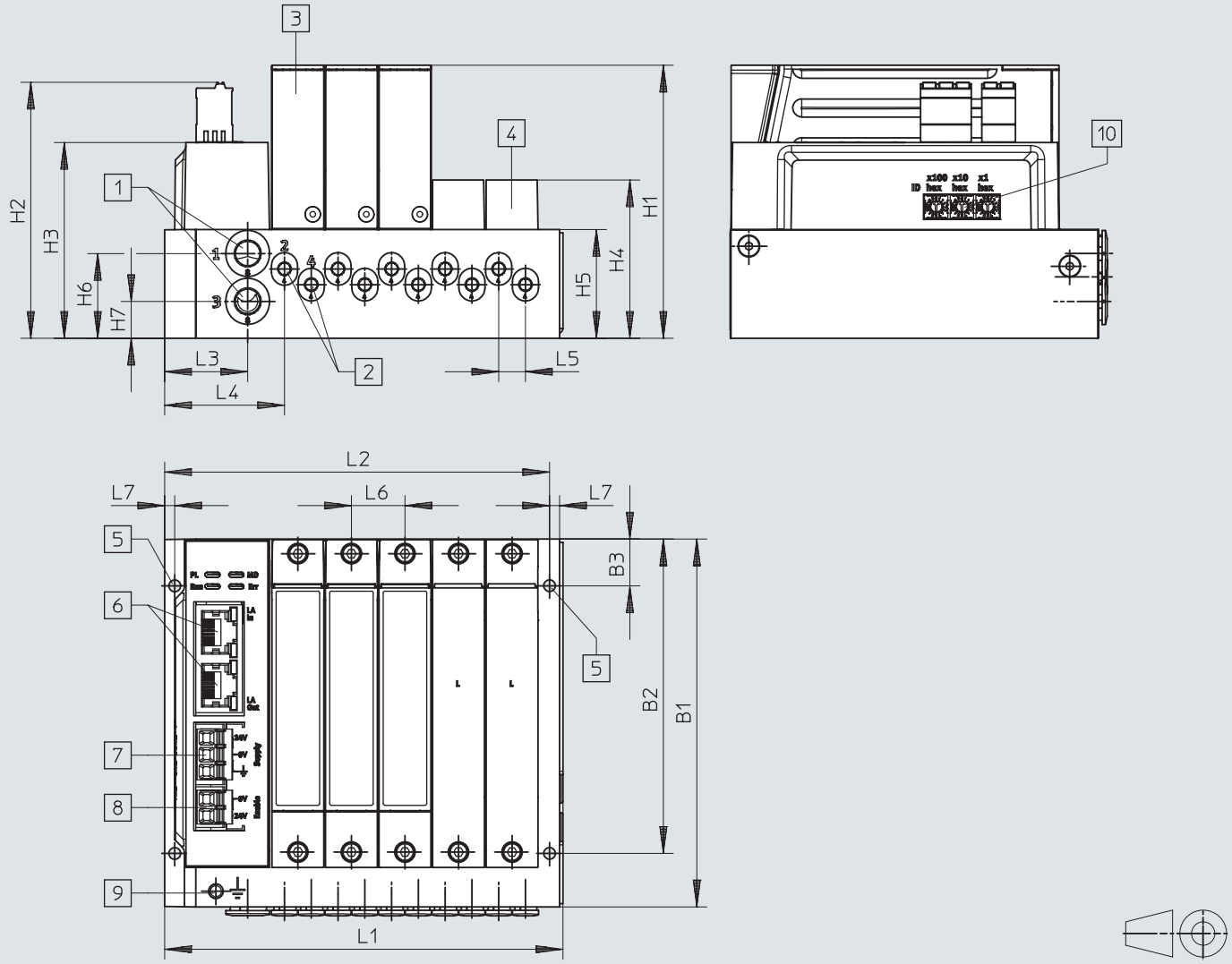
| Materials | |
|---|---|
| Housing material | PA66-GF30, TPE-U(PU) |
| Sealing material | NBR |
| Note on materials | RoHs-compliant |
| LABS (PWIS) conformity | VDMA24364 zone III |
| Suitable for the production of Li-ion batteries | Metals with more than 5% by mass of copper, zinc or nickel are excluded from use. Exceptions are nickel in steel, chemically nickel-plated surfaces, printed circuit boards, cables, electrical plug connectors and coils |
| Cleanroom class | Class 3 to ISO 14644-1 |

| Pressure specifications – Valves VEVP | | |
|---|---|---|
| Pressure range | 0 ... 3 bar | 0 ... 7 bar |
| Operating pressure | 0.2 MPa | 0.7 MPa |
| Operating pressure | 2 bar | 7 bar |
| Operating pressure | 29 psi | 101.5 psi |
| Standard flow rate (standardised to DIN 1343) | 16 l/min | 35 l/min |

| Operating and environmental conditions | |
|---|---|
| Ambient temperature | 5 ... 50 °C |
| Temperature of medium | 5 ... 50 °C |
| Storage temperature | -20 ... 70 °C |
| Relative humidity | 5 - 85%, non-condensing |
| Climatic category | 3K22 to EN 60721 |
| 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 |
| Degree of protection | IP65 |

# Datasheet

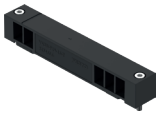
**Dimensions** Download CAD data ➔ www.festo.com




[1] Supply ports
[2] Working ports
[3] Solenoid valve VEVP
[4] Cover plate
[5] Mounting holes
[6] EtherCAT connection
[7] Power supply connection
[8] Switching input for valve supply
[9] Earth connection
[10] Addressing switch for EtherCAT

| Type | Number of valve positions | B1 | B2 | B3 | H1 | H2 | H3 | H4 | H5 | H6 | H7 | L1 | L2 | L3 | L4 | L5 | L6 | L7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VTEP | 2 | 110 | 94 | 14 | 81.6 | 76.5 | 58.5 | 47.3 | 32.5 | 25.3 | 11 | 71 | 67 | 24.8 | 35.8 | 8 | 16 | 3 |
| | 3 | | | | | | | | | | | 87 | 83 | | | | | |
| | 5 | | | | | | | | | | | 119 | 115 | | | | | |

# Accessories

| Ordering data | | | | | | |
|---|---|---|---|---|---|---|
| | Code | | | | Part no. | Type |
| **Piezo valve, individual** | | | | | | |
|  | Function P | Operating pressure 0.7 MPa | Standard flow rate 42 l/min | | **8184034** | **VEVP-XA-4-B-T32C-F-D31-2** |
| | Function: PL | Operating pressure 0.2 MPa | Standard flow rate 18 l/min | | **8184037** | **VEVP-XA-4-B-T32C-F-D22-2** |
| **Vacant position** | | | | | | |
|  | Valve type 1-5: B | Cover plate for one valve position | | | **8154656** | **VABB-P19-16-T** |
| **Control cabinet through-feed** | | | | | | |
|  | – | Straight socket, 4-pin, M12x1, D-coded | Straight socket, 4-pin, M12x1, D-coded | | **8040459** | **NEFU-D12G4-D12DG4** |
| | | | Angled socket, 8-pin, RJ45 | | **8040457** | **NEFU-D12G4-R3DW4** |
| **Plug** | | | | | | |
|  | – | Plug RJ45, 8-pin | Push-pull with locking mechanism against unintentional pulling | | **5195384** | **NECC-M-S-R3G8PP-HX-PN** |
| **Connecting cable** | | | | | | |
|  | – | Straight plug, RJ45, 8-pin | Straight plug, RJ45, 8-pin | 0.2 m | ★ **8082383** | **NEBC-R3G8-KS-0.2-N-S-R3G8-ET** |
| | | | | 1 m | **8040455** | **NEBC-R3G4-ES-1-S-R3G4-ET** |