

Proportional-pressure regulators VPPE

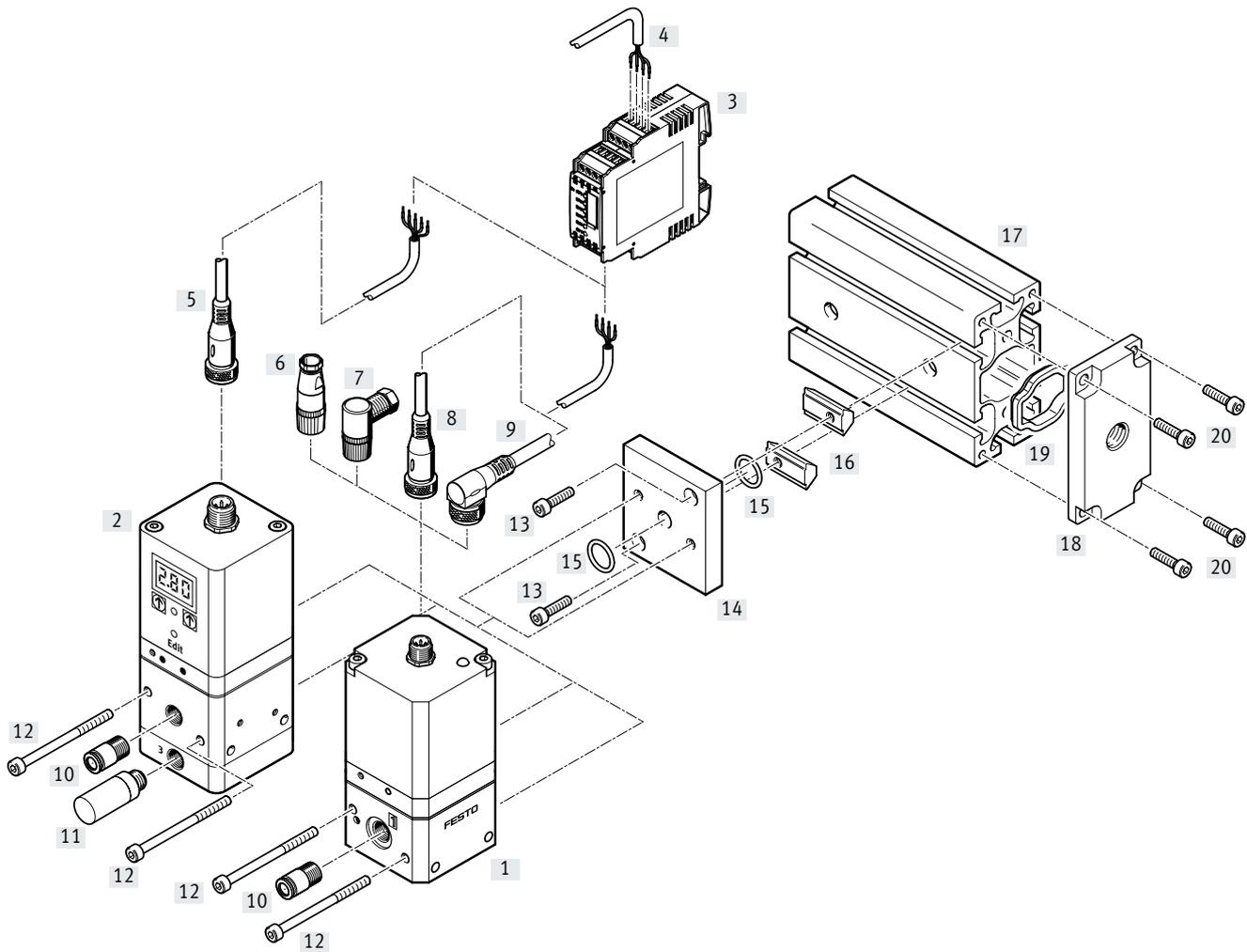
FESTO



Product range overview

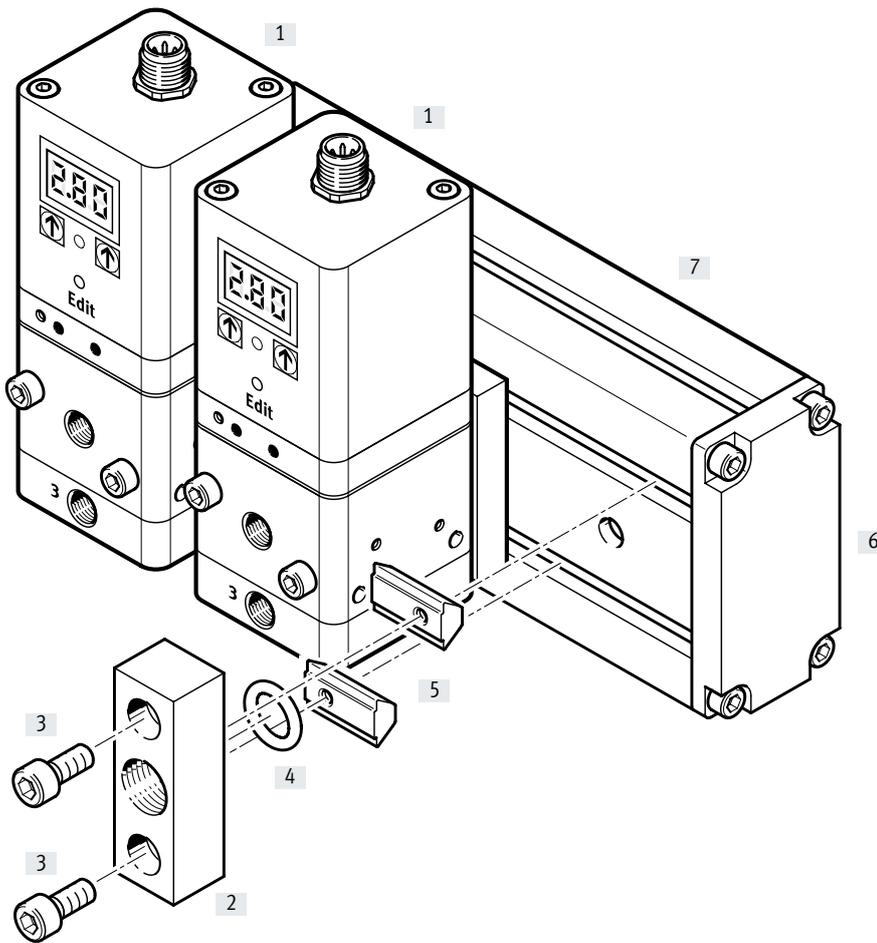
| Function | Design | Pneumatic connection | Nominal width pressurisation/exhaust [mm] | Pressure regulation range | | Setpoint input | | → Page/ Internet |
|-------------------------------------|---|----------------------|---|---------------------------|------------|----------------------------|-----------------------------|---------------------|
| | | | | [MPa] | [bar] | Voltage type 0 ... 10 V | Current type 4 ... 20 mA | |
| Proportional- pressure regulator | Without display | | | | | | | |
| |  | G1/8 | 5/2.5 | 0.015 ... 0.6 | 0.15 ... 6 | ■ | – | 6 |
| Proportional- pressure regulator | With display | | | | | | | |
| |  | G1/8 | 5/2.5 | 0.002 ... 0.2 | 0.02 ... 2 | ■ | ■ | 11 |
| | | | | 0.006 ... 0.6 | 0.06 ... 6 | | | |
| 0.01 ... 1 | | | | 0.1 ... 10 | | | | |

Peripherals overview



| Accessories | | Type | Description | → Page/Internet |
|-------------|---------------------------------------|--------------------|---|-----------------|
| [1] | Prop.-pressure regulator | VPPE... | – | 9 |
| [2] | Prop.-pressure regulator with display | VPPE ... E1 | – | 15 |
| [3] | Setpoint module | MPZ | For generating 6+1 analogue voltage signals | 9, 15 |
| [4] | Digital input/output | – | For actuating the setpoint module | – |
| [5] | Connecting cable | SIM-M12-5GD-...-PU | With straight plug socket for actuating the VPPE...E1 | 1 |
| [6] | Connection socket | SIE-GD | Straight plug socket for actuating the VPPE | 15 |
| [7] | Connection socket | SIE-WD-TR | Angled plug socket for actuating the VPPE | 9 |
| [8] | Connecting cable | SIM-M12-4GD-5PU | With straight plug socket for actuating the VPPE | 9 |
| [9] | Connecting cable | SIM-M12-4WD-5PU | With angled plug socket for actuating the VPPE | 9 |
| [10] | Push-in fitting | QS | For connecting compressed air tubing with standard O.D. | quick star |
| [11] | Silencer | U | For mounting in exhaust ports | u |
| [12] | Socket head screw M4x55 | – | For screwing the VPPE to the mounting plate | 17 |
| [13] | Socket head screw M4x16 | – | For screwing the mounting plate to the slot nut | 17 |
| [14] | Mounting plate (set) | VAME-P5-MK | For attaching the VPPE to the profile strip (consists of mounting plate, slot nuts, screws and seals) | 17 |
| [15] | O-ring | – | For sealing | 17 |
| [16] | Slot nuts | – | For clamp fastening on the profile strip | 17 |
| [17] | Profile strip | – | Standard profile strip as central air supply | 17 |
| [18] | Compressed air supply plate (set) | VABF-P5-P3A3... | For supplying compressed air (consists of compressed air supply plate, screws and seal) | 17 |
| [19] | Seal | – | – | 17 |
| [20] | Socket head screw M5x12 | – | For screwing the compressed air supply plate to the profile strip | 17 |

Peripherals overview – Additional supply



| Accessories | | | | |
|-------------|---------------------------------------|-----------------|---|-----------------|
| | | Type | Description | → Page/Internet |
| [1] | Prop.-pressure regulator with display | VPPE ... E1 | – | 15 |
| [2] | Additional supply (set) | VABF-P5-P1A3... | For supplying compressed air (consists of compressed air supply plate, screws and seal) | 17 |
| [3] | Socket head screw M6x20 | – | For screwing the compressed air supply plate to the slot nut | 17 |
| [4] | O-ring | – | For sealing | 17 |
| [5] | Slot nuts | – | For clamp fastening on the profile strip | 17 |
| [6] | End plate (set) | VABE-P5-C | For sealing the profile strip (consists of an end plate, screws and seal) | 17 |
| [7] | Profile strip | – | Standard profile strip as central air supply | 17 |

Type codes

| | |
|-------------|---------------------------------|
| 001 | Series |
| VPPE | Proportional pressure regulator |

| | |
|----------|---|
| 002 | Valve function |
| 3 | 3-way proportional-pressure regulator, closed |

| | |
|------------|----------------------|
| 003 | Pneumatic connection |
| 1/8 | Female thread G1/8 |

| | |
|----------|---------------------------|
| 004 | Pressure regulation range |
| 6 | 0.15 ... 6 bar |

| | |
|------------|--------------------------------------|
| 005 | Setpoint input for individual valves |
| 010 | 0 ... 10 V |

Proportional-pressure regulators VPPE without display

Data sheet

-  Flow rate
850 l/min
-  Voltage
21.6 ... 26.4 V DC
-  Pressure regulation range
0.015 ... 0.6 MPa

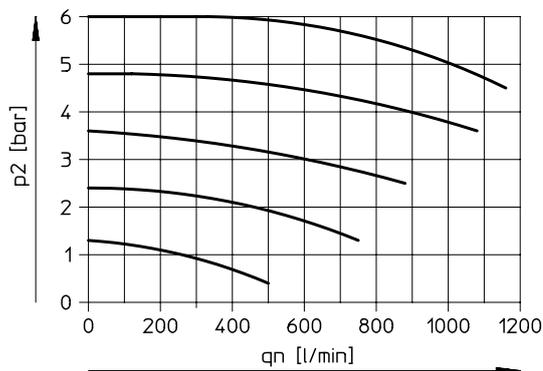
- Variants
- Setpoint input as analogue voltage signal 0 ... 10 V



General technical data

| | | | |
|------------------------------|--|---------|---------|
| Pneumatic connection 1 and 2 | G1/8 | | |
| Design, valve function | Piloted piston regulator, 3-way prop.-pressure regulator, closed | | |
| Safety remark | Safety position VPPE | | |
| Sealing principle | Soft | | |
| Actuation type | Electrical | | |
| Type of control | Piloted via 2/2-way valves | | |
| Type of mounting | Via through-hole | | |
| Mounting position | Any, preferably vertical | | |
| Nominal width | Pressurisation | [mm] | 5 |
| | Exhaust | [mm] | 2.5 |
| Standard nominal flow rate | | [l/min] | → graph |
| Product weight | | [g] | 445 |

Flow rate qn as a function of output pressure p2

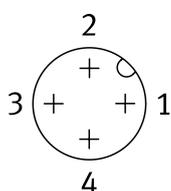


 **Note**
Output pressure remains unregulated if the power supply cable is interrupted.

Electrical data

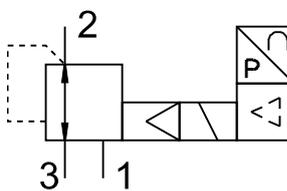
| | | | |
|--|----------------------------------|---------------|--|
| Electrical connection | Plug, round design, 4-pin, M12x1 | | |
| Operating voltage range | [V DC] | 21.6 ... 26.4 | |
| Operating voltage indicator | LED | | |
| Residual ripple | [%] | 10 | |
| Max. electrical power consumption | [W] | 3.6 | |
| Max. current consumption | [mA] | 150 | |
| Setpoint input signal | [V DC] | 0 ... 10 | |
| Switching time on/off | [ms] | 55 0/1300 | |
| Short circuit current rating/reverse polarity protection | For all electrical connections | | |
| Degree of protection | IP65 | | |

M12x1 – Pin allocation for VPPE



- 1 Supply
21.6 ... 26.4 V DC
- 2 Setpoint value (-)
- 3 GND (-)
- 4 Setpoint value (+) 0 ... 10 V DC

Circuit symbol



Data sheet

| Operating and environmental conditions | | |
|--|-------|---|
| Operating medium | | Compressed air to ISO 8573-1:2010 [7:4:4] |
| | | Inert gases |
| Note on the operating/pilot medium | | Lubricated operation not possible |
| Operating pressure | [MPa] | 0.8 |
| | [bar] | ≤ 8 |
| Input pressure 1 | [MPa] | 0.6 ... 0.8 |
| | [bar] | 6 ... 8 |
| Pressure regulation range | [MPa] | 0.015 ... 0.6 |
| | [bar] | 0.15 ... 6 |
| Max. pressure hysteresis | [MPa] | 0.015 |
| | [bar] | 0.15 |
| Hysteresis FS (full scale) | [%] | 2.5 |
| Linearity error FS (full scale) | [%] | 1 |
| Repetition accuracy FS (full scale) | [%] | 0.5 |
| Overall accuracy FS (full scale) | [%] | 2.25 |
| Temperature coefficient | [%/K] | 0.04 |
| Ambient temperature | [°C] | 10 ... 50 |
| Temperature of medium | [°C] | 10 ... 50 |
| Corrosion resistance class CRC ¹⁾ | | 2 |
| CE marking (see declaration of conformity) | | To EU EMC Directive ²⁾ |
| Certification | | RCM |
| | | cUL us listed (OL) |

1) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

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

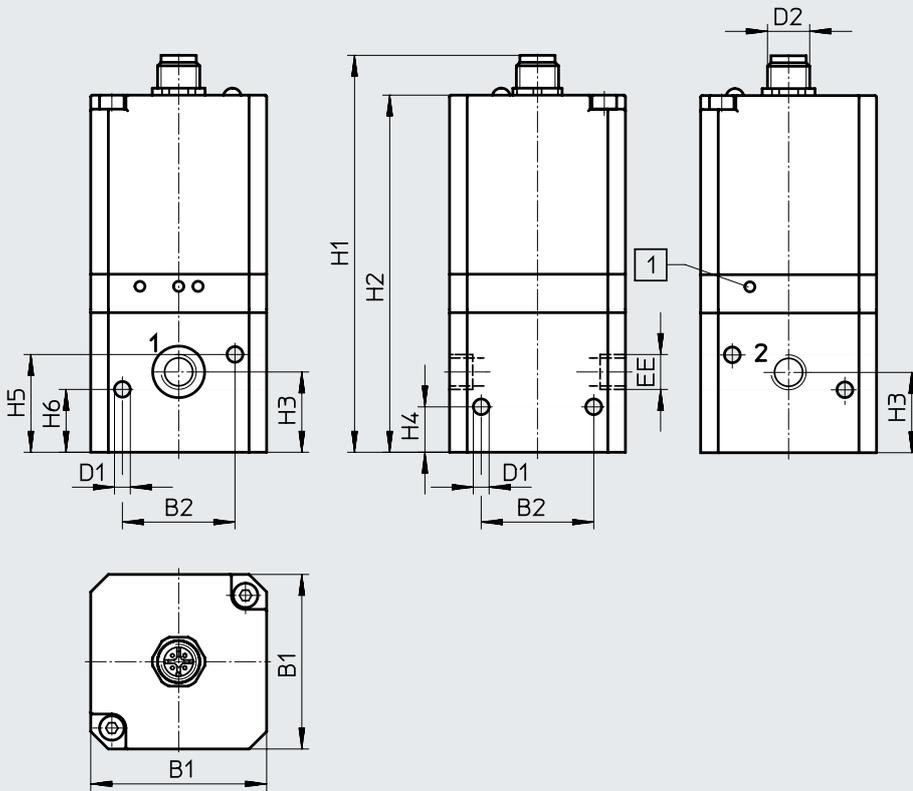
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

| Materials | |
|-------------------|-------------------------|
| Housing | Wrought aluminium alloy |
| Diaphragm | NBR |
| Note on materials | RoHS-compliant |
| PWIS conformity | VDMA24364-B2-L |

Data sheet

Dimensions

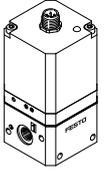
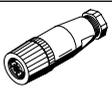
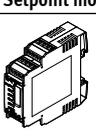
Download CAD data → www.festo.com



[1] Earthing hole

| Type | B1 | B2 | D1 ∅ | D2 | EE | H1 | H2 | H3 | H4 | H5 | H6 |
|------------------|----|----|---------|-------|------|-----|-----|----|----|----|----|
| VPPE-3-1/8-6-010 | 50 | 32 | 4.5 | M12x1 | G1/8 | 114 | 102 | 23 | 13 | 28 | 18 |

Ordering data

| Ordering data | Description | Part no. | Type |
|---|--|----------|---------------------|
| Proportional-pressure regulator VPPE without display | | | |
|  | <ul style="list-style-type: none"> • Pressure regulation range: 0.015 ... 0.6 MPa • Pneumatic connection: G1/8 | 539639 | VPPE-3-1/8-6-010 |
| Connecting cable | | | |
|  | <ul style="list-style-type: none"> • Straight socket, M12x1, 5-pin • Open end, 4-wire, cable length 5 m | 164259 | SIM-M12-4GD-5-PU |
|  | <ul style="list-style-type: none"> • Angled socket, M12x1, 5-pin • Open end, 4-wire, cable length 5 m | 164258 | SIM-M12-4WD-5-PU |
| Connection socket | | | |
|  | Straight socket, M12x1, 4-pin | 18494 | SIE-GD |
|  | Angled socket, M12x1, 4-pin | 12956 | SIE-WD-TR |
| Setpoint module | | | |
|  | Setpoint module for generating 6 + 1 analogue voltage signals | 546224 | MPZ-1-24DC-SGH-6-SW |

Type codes

| 001 | Series |
|-------------|---------------------------------|
| VPPE | Proportional pressure regulator |
| 002 | Valve function |
| | None |
| 3 | 3-way valve |
| 003 | Valve function |
| 1 | Normally closed |
| 004 | Pneumatic connection |
| 1/8 | Female thread G1/8 |

| 005 | Pressure regulation range |
|------------|---|
| 2 | 0.02 ... 2 bar |
| 6 | 0.06 ... 6 bar |
| 10 | 0.1 ... 10 bar |
| 006 | Setpoint input for individual valves |
| 010 | 0 ... 10 V |
| 420 | 4 ... 20 mA |
| 007 | Operator unit/interface |
| | None |
| E1 | LED display, 7-segment |
| 008 | Mounting |
| | In-line valve |
| T | Common supply manifold mounting (mounting rail) |

Data sheet

-  Flow rate
310 ... 1250 l/min
-  Voltage
21.6 ... 26.4 V DC
-  Pressure regulation ranges
0.002 ... 0.2 MPa
0.006 ... 0.6 MPa
0.01 ... 1 MPa

- Variants
- Setpoint input as analogue voltage signal 0 ... 10 V
 - Setpoint input as analogue current signal 4 ... 20 mA
 - Assembly as in-line valve or on profile strip
 - 3-digit LED display



General technical data

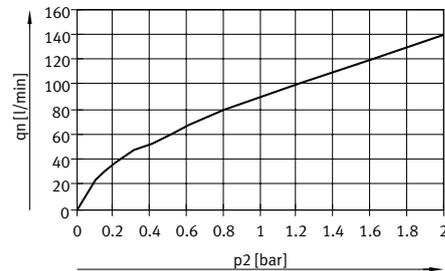
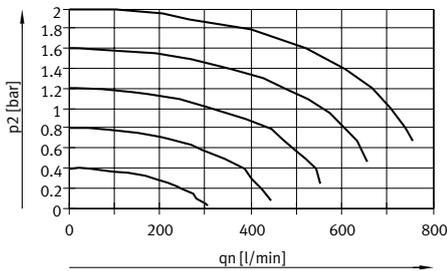
| | | | |
|------------------------------|---|---------|----------|
| Pneumatic connection 1, 2, 3 | G1/8 | | |
| Design, valve function | Piloted diaphragm regulator, 3-way prop.-pressure regulator | | |
| Safety remark | Safety position VPPE | | |
| Sealing principle | Soft | | |
| Actuation type | Electrical | | |
| Reset method | Mechanical spring | | |
| Type of control | Piloted via 2/2-way valves | | |
| Type of mounting | Via through-hole | | |
| Mounting position | Any, preferably upright | | |
| Nominal width | Pressurisation | [mm] | 5 |
| | Exhaust | [mm] | 2.5 |
| Standard nominal flow rate | | [l/min] | → graphs |
| Product weight | | [g] | 390 |

Flow rate qn as a function of output pressure p2

VPPE- ... -2- ...

qn 1 → 2

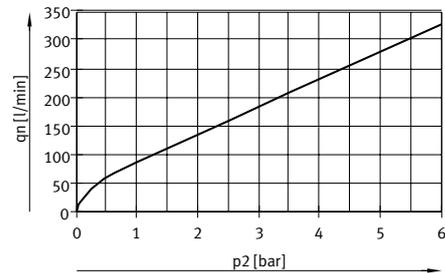
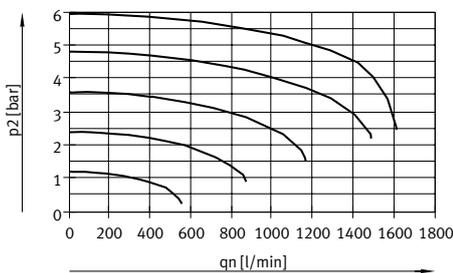
qn 2 → 3



VPPE- ... -6- ...

qn 1 → 2

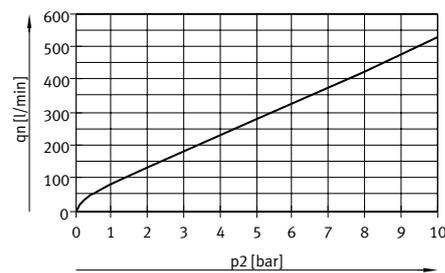
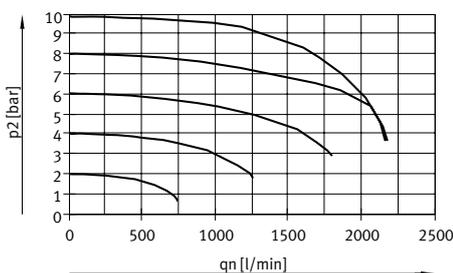
qn 2 → 3



VPPE- ... -10- ...

qn 1 → 2

qn 2 → 3



Data sheet

| Electrical data | | | | |
|--|--|-----------------|---------------|-------------|
| Electrical connection | Plug, round design, 5-pin, M12x1 | | | |
| Operating voltage range | [V DC] | 21.6 ... 26.4 | | |
| Operating voltage indicator | LED | | | |
| Residual ripple | [%] | 10 | | |
| Max. electrical power consumption | [W] | 4.2 | | |
| Max. current consumption | [mA] | 160 | | |
| Signal range for analogue output/input | Voltage | [V DC] | 0 ... 10 | |
| | Current | [mA] | 4 ... 20 | |
| Short circuit current rating | For all electrical connections | | | |
| Switching output | PNP | | | |
| Reverse-polarity protection | For all electrical connections | | | |
| Degree of protection | IP65 | | | |
| Operating and environmental conditions | | | | |
| Pressure regulation range | [MPa] | 0.002 ... 0.2 | 0.006 ... 0.6 | 0.01 ... 1 |
| | [bar] | 0.02 ... 2 | 0.06 ... 6 | 0.1 ... 10 |
| Operating medium | Compressed air to ISO 8573-1:2010 [7:4:4] Inert gases | | | |
| Note on the operating/pilot medium | Lubricated operation not possible | | | |
| Input pressure 1 ¹⁾ | [MPa] | 0.3 ... 0.4 | 0.6 ... 0.8 | 0.6 ... 1.1 |
| | [bar] | 3 ... 4 | 6 ... 8 | 6 ... 11 |
| Max. pressure hysteresis | [MPa] | 0.002 | 0.003 | 0.005 |
| | [bar] | 0.02 | 0.03 | 0.05 |
| Hysteresis FS (full scale) | [%] | 1 | 0.5 | |
| Linearity error FS (full scale) | [%] | 1 | | |
| Repetition accuracy FS (full scale) | [%] | 0.5 | | |
| Overall accuracy FS (full scale) | [%] | 1.5 | 1.25 | |
| Temperature coefficient | [%/K] | 0.04 | | |
| Duty cycle | [%] | 100 | | |
| Ambient temperature | [°C] | 0 ... 60 | | |
| Temperature of medium | [°C] | 10 ... 50 | | |
| Corrosion resistance class | [CRC] | 2 ²⁾ | | |
| CE marking (see declaration of conformity) | To EU EMC Directive ³⁾ | | | |
| Certification | RCM | | | |
| | c UL us listed (OL) | | | |

1) Input pressure 1 should always be 1 bar greater than the maximum regulated output pressure.

2) Corrosion resistance class CRC 2 to Festo standard FN 940070

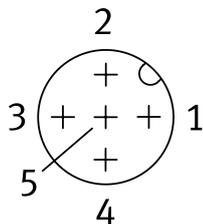
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

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

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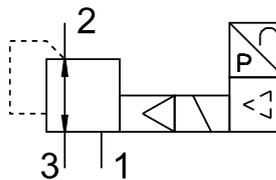
Data sheet

Pin allocation for VPPE with display, M12x1



- 1 Supply
21.6 ... 26.4 V DC
- 2 Setpoint value (-)
- 3 GND (-)
- 4 Setpoint value (+) 0 ... 10 V DC /
4 ... 20 mA
- 5 Actual value output or switching
output (can be selected on the
operator panel)

Circuit symbol



Materials

| | |
|-------------------|---|
| Housing | Anodised wrought aluminium alloy |
| Note on materials | RoHS-compliant Free of copper and PTFE |
| PWIS conformity | VDMA24364-B2-L |

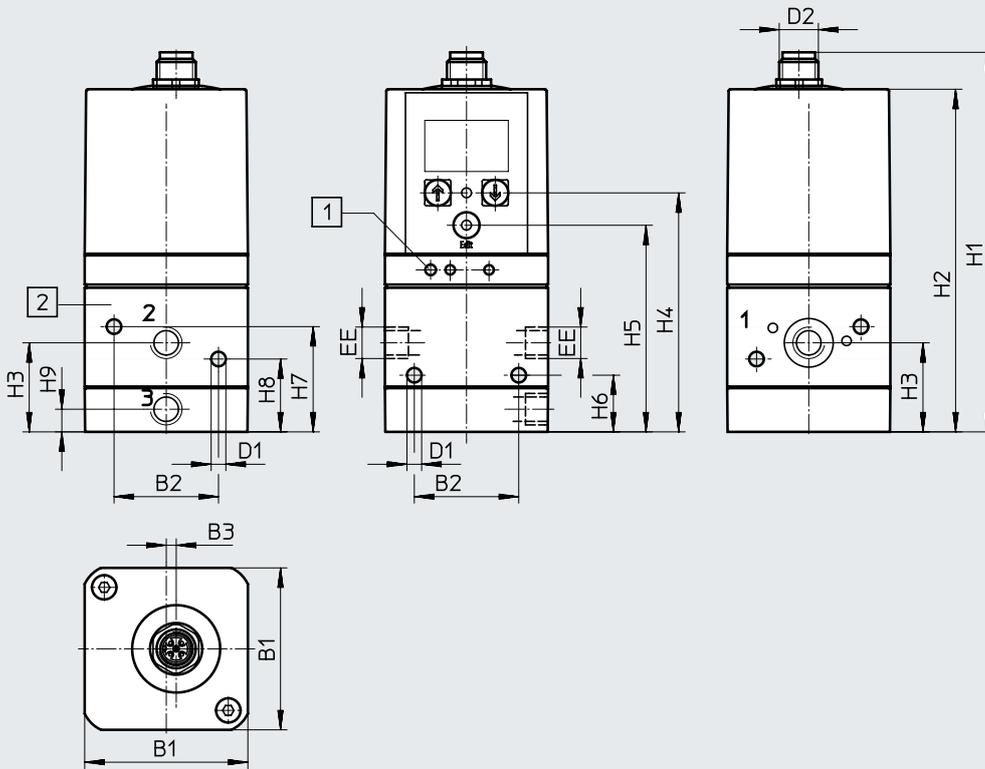
- - Note

Output pressure remains unregulated if the supply cable is interrupted.

Data sheet

Dimensions

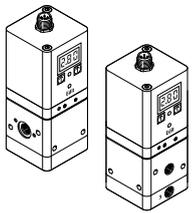
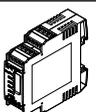
Download CAD data → www.festo.com



- [1] Earthing hole
- [2] Booster turned by 90°
with variant VPPE-...-E1T

| Type | B1 | B2 | B3 | @ D1 | D2 | EE | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 |
|------------------------|----|----|-----|------|-------|------|-------|-------|------|------|------|------|------|------|----|
| VPPE-3-1/8- ... E1 ... | 50 | 32 | 3.1 | 4.5 | M12x1 | G1/8 | 117.2 | 105.8 | 27.5 | 73.8 | 63.8 | 17.5 | 32.5 | 22.5 | 7 |

Ordering data

| Ordering data | Description | Part no. | Type | |
|---|---|-------------------------|-------------------------|--------------------|
| Proportional-pressure regulator VPPE with display | | | | |
|  | Voltage type 0 ... 10 V | | | |
| | Pressure regulation range 0.002 ... 0.2 MPa | 557771 | VPPE-3-1-1/8-2-010-E1 | |
| | | 557777 | VPPE-3-1-1/8-2-010-E1T | |
| | Pressure regulation range 0.006 ... 0.6 MPa | 557772 | VPPE-3-1-1/8-6-010-E1 | |
| | | 567539 | VPPE-3-1-1/8-6-010-E1T | |
| | Pressure regulation range 0.01 ... 1 MPa | 557773 | VPPE-3-1-1/8-10-010-E1 | |
| | | 557778 | VPPE-3-1-1/8-10-010-E1T | |
| | Current type 4 ... 20 mA | | | |
| | Pressure regulation range 0.002 ... 0.2 MPa | 557774 | VPPE-3-1-1/8-2-420-E1 | |
| | | 557779 | VPPE-3-1-1/8-2-420-E1T | |
| | Pressure regulation range 0.006 ... 0.6 MPa | 557775 | VPPE-3-1-1/8-6-420-E1 | |
| | | 567540 | VPPE-3-1-1/8-6-420-E1T | |
| Pressure regulation range 0.01 ... 1 MPa | 557776 | VPPE-3-1-1/8-10-420-E1 | | |
| | 557780 | VPPE-3-1-1/8-10-420-E1T | | |
| Connecting cable Data sheets → Internet: nebu | | | | |
|  | • Straight socket, M12x1, 5-pin | 2.5 m | 175715 | SIM-M12-5GD-2.5-PU |
| | • Open end, 5-wire | 5 m | 175716 | SIM-M12-5GD-5-PU |
| Setpoint module Data sheets → Internet: mpz | | | | |
|  | Setpoint module for generating 6 + 1 analogue voltage signals | 546224 | MPZ-1-24DC-SGH-6-SW | |

Data sheet

General information

Design

Some selected types of the pressure regulator VPPE can be screwed to a profile strip. This has the advantage that the profile strip can be used to create a central compressed air supply.

The air can be fed into the profile strip:

- at one end or
- at both ends through end plates,
- using an intermediate air supply module (in applications where an increased air rate is required).

The holes for the profile strip must be drilled according to the assembly instructions. The pressure regulators VPPE are screwed to the profile strip using the mounting plate. The end plates are screwed to the left and right end faces of the profile strip. See the

assembly instructions for further information:

→ Internet: vppe

Compressed air supply on the profile strip

When using the profile strip as a central compressed air supply, make sure that the required compressed air supply is guaranteed. Bear in mind that an intermediate air supply module needs

a valve position. The intermediate air supply module takes up one VPPE valve position.

Recommendation for compressed air supply

For example, with tubing diameter \varnothing 16 mm with simultaneous max. flow rate for all valves, the following applies:

Compressed air supply – number of valves:

- At one end – max. 5 valves
- At both ends – max. 10 valves
- With intermediate air supply module – max. 5 valves each

Note

- Intermediate air supply modules must always be centred on the profile strip.
- Multiple intermediate air supply modules must be evenly distributed.

Note

Only the following types of proportional-pressure regulators VPPE can be mounted on profile strips using a mounting plate:

- Valve VPPE with LED display, VPPE-3-1/8-6-010
- Valve VPPE with display and top part rotated by 90° VPPE- ... –E1T

Further information on mounting proportional-pressure regulators VPPE as well as intermediate air supply modules on profile strips can be found in the assembly instructions:

→ Internet: vppe

Mounting plate (set) materials

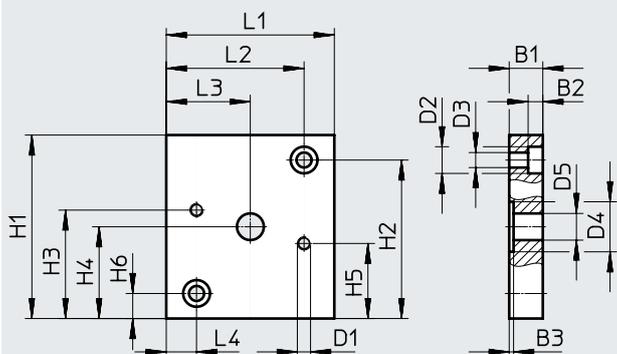
| | |
|----------------------------|-------------------------|
| Plate | Wrought aluminium alloy |
| Seals | NBR |
| Screws | Steel |
| Note on materials | RoHS-compliant |
| Corrosion resistance class | [CRC] 2 ¹⁾ |

1) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

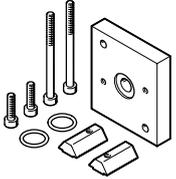
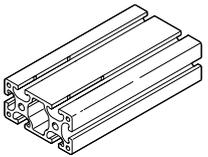
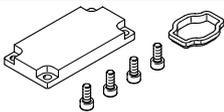
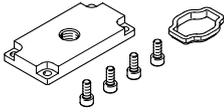
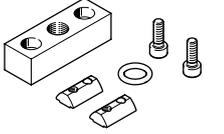
Mounting plate dimensions

Download CAD data → www.festo.com



| Type | B1 | B2 | B3 | D1 | @ D2 | @ D3 | @ D4 | @ D5 | H1 | H2 | H3 | H4 | H5 | H6 | L1 | L2 | L3 | L4 |
|------------|----|-----|-----|----|------|------|------|------|----|------|------|------|------|-----|----|----|----|----|
| VAME-P5-MK | 10 | 4.6 | 1.3 | M4 | 8 | 4.5 | 15 | 8 | 55 | 47.5 | 32.5 | 27.5 | 22.5 | 7.5 | 50 | 41 | 25 | 9 |

Ordering data

| Ordering data | Description | Part no. | Type |
|---|--|----------|------------------|
| Mounting plate set | | | |
|  | Set comprising: <ul style="list-style-type: none"> • 1x mounting plate, weight: 110 g • 2x socket head screws M4X55 • 2x socket head screws M4X16 • 2x slot nuts • 2x O-rings | 570966 | VAME-P5-MK |
| Profile column (profile strip) | | | |
|  | Made from aluminium, as central air supply, length: individually adaptable | 175964 | HMBS-8 0/40- - |
| End plate set (closed) | | | |
|  | For sealing the profile strip, consisting of: <ul style="list-style-type: none"> • 1x plate • 1x seal • 4x socket head screws M5x12 | 8021858 | VABE-P5-C |
| Compressed air supply plate set | | | |
|  | With connecting thread G1/4, consisting of: <ul style="list-style-type: none"> • 1x plate with connecting thread G1/4 • 1x seal • 4x socket head screws M5x12 | 8021859 | VABF-P5-P3A3-G14 |
|  | With connecting thread G3/8, consisting of: <ul style="list-style-type: none"> • 1x plate with connecting thread G3/8 • 1x seal • 4x socket head screws M5x12 | 8021860 | VABF-P5-P3A3-G38 |
|  | With connecting thread G1/2, consisting of: <ul style="list-style-type: none"> • 1x plate with connecting thread G1/2 • 1x seal • 4x socket head screws M5x12 | 8021861 | VABF-P5-P3A3-G12 |
| Additional supply set | | | |
|  | Connection G1/4, consisting of: <ul style="list-style-type: none"> • 1x plate with connecting thread G1/4 • 1x O-ring • 2x slot nuts • 2x socket head screws M6x20 | 8021862 | VABF-P5-P1A3-G14 |
|  | Connection G3/8, consisting of: <ul style="list-style-type: none"> • 1x plate with connecting thread G3/8 • 1x O-ring • 2x slot nuts • 2x socket head screws M6x20 | 8021863 | VABF-P5-P1A3-G38 |