This hybrid regulator combines a regulator and a solenoid valve.

Stepless control through electric signals
Port sizes M5 to 2 inches can be covered by combining an ultra-compact electro-pneumatic pilot valve and a 3 port high-capacity exhaust main regulator.

Simple circuit configuration

Application example
Capable of performing multistage pressure control and stepless pressure control by varying the electrical signals.

Ease of handling
Having the amplifier built into the electro-pneumatic pilot valve, only an external power supply and signal (voltage, current) need to be connected.

Manifold capable
Using the VVEXB/2/4 series, a maximum 10 station manifold is possible.

Drive and Thrust Control
Cylinder behavior and pressurization control for peening and stamping
Example
Welding pressure control of spot welding gun cylinder
Loading cylinder control

Flow Control of Various Fluids
For remote control of another air operated valve

Pressure Control of Tank
Automatic adjustments

Note) Use for the sonic flow.
### E-P HYREG® VY1 Series

#### How to Order

<table>
<thead>
<tr>
<th>E-P HYREG</th>
<th>Maximum operating pressure: 0.9 MPa</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pilot type</strong></td>
<td>0 Internal pilot 1 External pilot (Note 1)</td>
</tr>
<tr>
<td><strong>Thread type</strong></td>
<td>Nil Rc F G N PT</td>
</tr>
<tr>
<td><strong>Power source/Command signal</strong></td>
<td>Symbol Power source voltage DC Command signal DC Input impedance</td>
</tr>
<tr>
<td></td>
<td>Symbol</td>
</tr>
<tr>
<td>Nil</td>
<td>24 V</td>
</tr>
<tr>
<td>1</td>
<td>0 to 20 mA</td>
</tr>
<tr>
<td>2</td>
<td>4 to 20 mA</td>
</tr>
<tr>
<td>5</td>
<td>1 to 5 V</td>
</tr>
<tr>
<td>8</td>
<td>0 to 20 mA</td>
</tr>
<tr>
<td>7</td>
<td>0 to 10 V</td>
</tr>
<tr>
<td>6</td>
<td>4 to 20 mA</td>
</tr>
<tr>
<td>3</td>
<td>0 to 20 mA</td>
</tr>
</tbody>
</table>

#### Body size

<table>
<thead>
<tr>
<th>Mounting</th>
<th>Symbol</th>
<th>Port size Rc</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>2(A) 24 V</td>
<td>4 to 20 mA</td>
<td>120 Ω</td>
</tr>
<tr>
<td>B</td>
<td>00 Without sub-plate M5 01 Without sub-plate M5 02 Without sub-plate M5 03 Without sub-plate M5 04 Without sub-plate M5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>01 Without sub-plate M5 02 Without sub-plate M5 03 Without sub-plate M5 04 Without sub-plate M5 05 Without sub-plate M5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Port size Rc

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Power source/Command signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Symbol B (Bracket)</td>
</tr>
<tr>
<td>F</td>
<td>Symbol F (Foot)</td>
</tr>
<tr>
<td>G</td>
<td>Symbol G (Pressure gauge)</td>
</tr>
<tr>
<td>N</td>
<td>Symbol N (Silencer)</td>
</tr>
</tbody>
</table>

#### Option

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Power source/Command signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>Power source/Command signal</td>
</tr>
</tbody>
</table>

#### Note 1)
Except body size D

#### Note 2)
Not conforming to ISO1179-1.

#### Note 3)
Only bracket or foot may be mounted.

#### Note 4)
When replacing the pilot valve, it may not satisfy characteristics such as accuracy, etc. Confirm the product works under the operating conditions before using. If SMC is requested to repair the product, SMC confirms whether characteristics are satisfied.

#### Note 5)
\( \square \) in the applicable pilot valve part number is designated for the power source/command signal.

#### Note 6)
Cut off the command signal when the pressure control on the outlet side is not required, such as when the line is temporarily halted, etc. Refer to Specific Product Precautions on page 1006.
Standard Specifications

<table>
<thead>
<tr>
<th>Port</th>
<th>M5</th>
<th>M5</th>
<th>M5</th>
<th>01</th>
<th>01</th>
<th>02</th>
<th>02</th>
<th>02</th>
<th>03</th>
<th>04</th>
<th>04</th>
<th>06</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(P)</td>
<td>M5</td>
<td>M5</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>1</td>
<td>1</td>
<td>½</td>
</tr>
<tr>
<td>2(A)</td>
<td>M5</td>
<td>M5</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>½</td>
<td>1</td>
<td>1</td>
<td>½</td>
</tr>
</tbody>
</table>

Weight (kg) (1)
- 0.11
- 0.16
- 0.19
- 0.25
- 0.35
- 0.55
- 0.75
- 1.5
- 2
- 4

Hysteresis (2)
- 0.009 MPa
- 0.023 MPa
- 0.027 MPa
- 0.045 MPa

Sensitivity (2)
- 0.005 MPa
- 0.009 MPa
- 0.014 MPa
- 0.018 MPa

Repeatability (2)
- ± 0.005 MPa
- ± 0.009 MPa
- ± 0.009 MPa
- ± 0.018 MPa

Response time (2)
- 10 ms
- 30 ms

Fluid
- Air

Ambient and fluid temperature
- 0 to 50°C (No condensation)

Maximum operating pressure
- 0.9 MPa

Regulating pressure range
- 0.05 to 0.84 MPa (Supply pressure 0.9 MPa)
- Set pressure + 0.04 to 0.9 MPa (VY1□01)

Command signal (3)
- 1 to 5 VDC, 0 to 10 VDC, 4 to 20 mA DC, 0 to 20 mA DC

Power supply
- 12 VDC±10%, 24 VDC±10%, 1.8 W or less

Electrical entry
- DIN terminal

Applicable cable
- Cable O.D. ø4 to 6.5

Bled air flow (Pilot EXH port)
- When not operating: Zero, When operating: 10 L/min (ANR) (Supply pressure 0.9 MPa)

Installation
- Universal

Lubrication
- Not required (4)

Note 1) The mass of the base mounting type (D/B/2/4 size) with sub-plate is indicated.
Note 2) All property values indicate maximum values.
Note 3) Cut off the command signal when the pressure control on the outlet side is not required, such as when the line is temporarily halted, etc.
Note 4) To lubricate the outlet side of "VY", use "VY" as an external pilot. Avoid lubrication to the pilot air.
Note 5) To lubricate the outlet side of "VY", use "VY" as an external pilot. Avoid lubrication to the pilot air.

Option

<table>
<thead>
<tr>
<th>Description</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bracket (With bolt, washer)</td>
<td>B — VEXA-18-2A — VEX1-18-1A — VEX3-32A — VEX5-32A — VEX7-32A — VEX9-32A</td>
</tr>
<tr>
<td>Pressure gauge</td>
<td>F — VEXA-18-3A — VEX1-18-2A — — — — — —</td>
</tr>
<tr>
<td>Pilot EXH port silencer</td>
<td>N AN120-MS — — AN120-MS AN101-01 AN120-MS AN210-02</td>
</tr>
</tbody>
</table>

Sub-plate and Base Gasket Part No.

<table>
<thead>
<tr>
<th>Valve size</th>
<th>D</th>
<th>B</th>
<th>P</th>
<th>Thread type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-plate</td>
<td>VEXD-5</td>
<td>VEXB-2-2</td>
<td>Symbol Port size</td>
<td>Symbol Port size</td>
</tr>
<tr>
<td>Port size</td>
<td>Port size</td>
<td>Port size</td>
<td>Port size</td>
<td>Port size</td>
</tr>
<tr>
<td>A</td>
<td>M5</td>
<td>½</td>
<td>A</td>
<td>Rc</td>
</tr>
<tr>
<td>B</td>
<td>½</td>
<td>½</td>
<td>F</td>
<td>Rc</td>
</tr>
<tr>
<td>N</td>
<td>NPT</td>
<td>N</td>
<td>NPT</td>
<td>NPTF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Valve size</th>
<th>D</th>
<th>B</th>
<th>P</th>
<th>Thread type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-plate</td>
<td>VEX1-9-1</td>
<td>VEX4-2A</td>
<td>Symbol Port size</td>
<td>Symbol Port size</td>
</tr>
<tr>
<td>Port size</td>
<td>Port size</td>
<td>Port size</td>
<td>Port size</td>
<td>Port size</td>
</tr>
<tr>
<td>A</td>
<td>½</td>
<td>½</td>
<td>A</td>
<td>Rc</td>
</tr>
<tr>
<td>F</td>
<td>½</td>
<td>½</td>
<td>F</td>
<td>Rc</td>
</tr>
<tr>
<td>N</td>
<td>NPT</td>
<td>NPT</td>
<td>N</td>
<td>NPTF</td>
</tr>
</tbody>
</table>

| Base gasket | VEX1-11-2 | VEX4-4 |

Note 7) Not conforming to ISO1179-1.
**VY1 Series**

**Characteristics**

**Command Signal — Outlet Pressure Characteristics (Characteristics of pressure setting)**

Port 1 (P) Pressure 0.9 MPa (-X39: 0.7 MPa)

- **VY1D00**
- **VY1A00/1A01, VY1B00/1B01**
- **VY1100/1101, VY1200/1201**
- **VY1300/1301**
- **VY1400/1401**
- **VY1500/1501**
- **VY1700/1701**
- **VY1900/1901**

Command signal voltage (current) for starting the operation of a pilot valve VY1D00 (-X39) (direct operated)
(There is dispersion in the following range)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Input Signal</th>
<th>Operation Start Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil, 5</td>
<td>1 to 5 VDC</td>
<td>0.93 to 1.07 VDC</td>
</tr>
<tr>
<td>1, 6</td>
<td>0 to 10 VDC</td>
<td>0.01 to 0.1 VDC</td>
</tr>
<tr>
<td>2, 7</td>
<td>4 to 20 mA DC</td>
<td>3.7 to 4.3 mA DC</td>
</tr>
<tr>
<td>3, 8</td>
<td>0 to 20 mA DC</td>
<td>0.02 to 0.2 mA DC</td>
</tr>
</tbody>
</table>

Note 1) Enter symbols above in VY1D00-**. □ indicates power supply and a command signal.

Note 2) Other body sizes add the dispersion on the above data when the main valve activates.

For the command signal range of the low wattage specification (X39), refer to the specifications on page 1003.
Pressure Characteristics

**VY1D00**

![Graph showing pressure characteristics for VY1D00](image1)

**VY1A0 /1B0**

![Graph showing pressure characteristics for VY1A0 /1B0](image2)

**VY110 /120**

![Graph showing pressure characteristics for VY110 /120](image3)

**VY130**

![Graph showing pressure characteristics for VY130](image4)

**VY140**

![Graph showing pressure characteristics for VY140](image5)

**VY150**

![Graph showing pressure characteristics for VY150](image6)

**VY170**

![Graph showing pressure characteristics for VY170](image7)

**VY190**

![Graph showing pressure characteristics for VY190](image8)

* For the low wattage specification (X39), the maximum pressure of port 1 (P) is 0.7 MPa.
Characteristics

Flow Rate Characteristics

VY1 Series

VY1D00

Port 2 (A) pressure (MPa)
Port 1 (P) pressure 0.9 MPa

VY110 /120

Port 2 (A) pressure (MPa)
Port 1 (P) pressure 0.9 MPa

VY130 /140

Port 2 (A) pressure (MPa)
Port 1 (P) pressure 0.9 MPa

VY150

Port 2 (A) pressure (MPa)
Port 1 (P) pressure 0.9 MPa

VY170

Port 2 (A) pressure (MPa)
Port 1 (P) pressure 0.9 MPa

Exhaust Flow rate Reduced pressure supply

VY1A0 /1B0

Port 2 (A) pressure (MPa)
Port 1 (P) pressure 0.9 MPa

VY1 Series

(L/min(ANR))

VY1 Series

(L/min(ANR))

VY1 Series

(L/min(ANR))

VY1 Series

(L/min(ANR))
**Exhaust Time**

1. **Exhaust Time from 0.5 MPa to 0.1 MPa**

2. **Exhaust Time from 10 L Tank**

3. **Exhaust time from optional pressure point**

Ex. Using VY1500, lower the 500 L tank pressure from 0.4 to 0.1.

   a) If describing the above graph in accordance with graphs, the exhaust time is read, 27 – 3 = 24 s.

   b) Then, to convert the time into one from a 500 L tank.

   Initial pressure

   Tank capacity

   Numerical target of pressure lowering

   Read exhaust time

   Then, the result is 12 s.
### VY1 Series

#### Dimensions

**VY1D00**

- **Mounting hole:** 2 x ø4.4
- **Port 1 (P), 2 (A), 3 (R):**
- **3 x M5**
- **Applicable cable O.D.:** ø4 to ø6.5
- **Connection mark:**
  - All types are the same in terms of connection.
  - (VY1A01 only)
  - M5 external pilot port
  - Foot (Option)
  - Bracket (Option)

**VY1A01**

- **Mounting hole:** 2 x ø4.5
- **M5 thread depth 6.5** (For bracket and foot mounting)
- **Applicable cable O.D.:** ø4 to ø6.5
- **Connection mark:**
  - All types are the same in terms of connection.
  - (VY1A01 only)
  - M5 external pilot port
  - Foot (Option)
  - Bracket (Option)
**E-P HYREG® VY1 Series**

### VY1B0 \(^0\)

- **Pressure gauge (Option)**
  - G27-10-R1-X207

- **Applicable cable O.D.**
  - ø4 to ø6.5

- **Port 1 (P), 3 (R)**
  - M5, 1/8

- **Port 2 (A)**
  - M5, 1/8

- **Connection mark**
  - All types are the same in terms of connection.

- **Mounting hole**
  - 2 x ø4.5

### VY110 \(^0\)

- **M5 external pilot port**
  - (VY2B01 only)

- **Pressure gauge (Option)**
  - G27-10-01

- **Applicable cable O.D.**
  - ø4 to ø6.5

- **Port 1 (P), 3 (R)**
  - 1/8, 1/4

- **Port 2 (A)**
  - 1/8, 1/4

- **Connection mark**
  - All types are the same in terms of connection.

- **Mounting hole**
  - 4 x ø4.5

- **Foot (Option)**
  - VEX1-1B-2
    - Hexagon socket head cap screw M3 L = 8 (2 pcs.)
    - (With spring washer)

- **Bracket (Option)**
  - VEX1-1B-1A
    - Hexagon socket head cap screw M3 L = 8 (2 pcs.)
    - (With spring washer)

- **Silencer (Option)**
  - AN120-M5

- **M5 Pilot EXH port**

- **2 x M3 thread depth 6.5**
  - (For bracket and foot mounting)
  - 4 x ø4.5 Mounting hole
VY1 Series

Dimensions

VY120

- 1/8 Gauge port
- 2 x ø4.5 Mounting hole (VY1201 only)
- M5 external pilot port

Connection mark: All types are the same in terms of connection.

View A

Pressure gauge (Option) G27-10-01

Port 1 (P), 2 (A), 3 (R)

3 x 1/8, 1/4

Silencer (Option) AN120-M5

VY130

- 1/8 Gauge port
- 1/4, 3/8, 1/2 Port 1 (P)
- 1/4, 3/8, 1/2 Port 3 (R)

Connection mark: All types are the same in terms of connection.

Pressure gauge (Option) G36-10-01

Port 1 (P)

Bracket (Option) VEX3-32A

Hexagon socket head cap screw M5 L = 10 (4 pcs.)
(With spring washer)

VY1 Series Dimensions

Port 1 (P)

1/4, 3/8, 1/2

Port 3 (R)

1/8 Pilot EXH port

(AN1301 only)

1/8 external pilot port

Silencer (Option) AN101-01

Mounting hole elongated

4 x M5 thread depth 8
(For bracket mounting)

Applicable cable O.D. ø4 to ø6.5

Port 1 (P), 2 (A), 3 (R)

998
VY140

Port 1 (P), 3 (R)
1/4, 3/8, 1/2
All types are the same in terms of connection.

Connection mark

Port 2 (A)
1/4, 3/8, 1/2
(VY1401 only)
1/8 external pilot port

Applicable cable O.D.
ø4 to ø6.5

Silencer (Option)
AN120-M5

Bracket (Option)
VEX5-32A
Hexagon socket head cap screw
M5 L = 10 (2 pcs.)
(With spring washer)

2 x M6 thread depth 9
(For bracket mounting)

VY150

Port 1 (P), 2 (A)
2 x 1/2, 3/4, 1
Port 3 (R)

1/2, 3/4, 1

Connection mark
All types are the same in terms of connection.

Pressure gauge (Option)
G46-10-01

Silencer (Option)
AN210-02

Bracket (Option)
VEX5-32A
Hexagon socket head cap screw
M5 L = 10 (2 pcs.)
(With spring washer)

2 x M6 thread depth 9
(For bracket mounting)
All types are the same in terms of connection.

Connection mark

Pressure gauge (Option)
G46-10-01

Applicable cable O.D.
ø4 to ø6.5

Port 3 (R)

1/8 Gauge port

Port 1 (P), 2 (A)

1/4 external pilot port

(VY1701 only)

AN210-02

Silencer (Option)

1/4 Pilot EXH port

Bracket (Option)

VEX7-32A
Hexagon socket head cap screw M6
L = 10 (4 pcs.) (With spring washer)

Dimensions

(VY1701 only)

1/4 external pilot port

(VY1901 only)

1/4 Pilot EXH port

Bracket (Option)

VEX9-32A
Hexagon socket head cap screw M6
L = 15 (4 pcs.) (With spring washer)
**Construction/Component Parts/Working Principle**

**Working principle**
- When the command signal is below 1 VDC, the solenoid valve is inactive, and the port 2(A) pressure is zero.
- When a command signal between 1 and 5 VDC is provided, the solenoid is activated.
- The port 2(A) pressure is fed back to the control circuit by the pressure sensor.
- The control circuit compares the feedback signal with the size of the command signal that was provided, and:
  1) If the feedback signal is smaller, current is supplied to the solenoid valve to raise the port 2(A) pressure [from 1(P) to 2(A)].
  2) If the feedback signal is greater, current is not supplied to valve to reduce the port 2(A) pressure [from 2(A) to 3(R)].
- The above processes 1) and 2) are repeated at high speeds to set the port 2(A) pressure.

**Component Parts**

<table>
<thead>
<tr>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Body</td>
<td>Zinc alloy die-casted</td>
</tr>
<tr>
<td>2 Pilot valve assembly</td>
<td>Aluminum alloy</td>
</tr>
<tr>
<td>3 Adjusting piston</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>4 Spring</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>5 Valve guide</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>6 Valve</td>
<td>Aluminum alloy/Rubber</td>
</tr>
<tr>
<td>7 Retainer</td>
<td>Aluminum alloy</td>
</tr>
<tr>
<td>8 Rod</td>
<td>Stainless steel/Rubber</td>
</tr>
</tbody>
</table>

**VY1D00, VY1B00** (Pilot valve: VY1D00-□□□□)

The VY1D00, which is the smallest direct drive, consists of a solenoid, pressure sensor, control circuit, body cover, and a sub-plate. The type with sub-plate can be used alone, and the type without sub-plate can also be used as a pilot valve.
Working principle

- The pair of poppet valves close due to the balance between actuating forces F1 and F2. Actuating force F1 is applied to the top surface of pressure regulation piston by the pilot pressure (pilot valve assembly VY1D00-□00), and actuating force F2 is applied to the bottom surface of the piston by the port 2(A) pressure that passes through the feedback passage. Thus, the port 2(A) pressure that corresponds to the pilot pressure is established. The poppet valve, which maintains a pressure balance with the port 2(A) pressure, is backed up by spring (refer to the diagram on the left).

- When the port 2(A) pressure becomes higher than the pilot pressure, F2 becomes higher than F1. This causes the pressure regulation piston to move upward, and the top poppet valve to open, allowing the air to be discharged from port 2(A) to port 3(R). When the port 2(A) pressure drops to reach a balance, the regulator returns to the state shown in the diagram to the left.

- Conversely, if the port 2(A) pressure is lower than the pilot pressure, F2 becomes less than F1. This causes the pressure regulation piston to move downward, and the lower poppet valve to open, allowing the air to be supplied from port 1(P) to port 2(A). When the port 2(A) pressure rises to reach a balance, the regulator returns to the state shown in the diagram to the left.

Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pilot valve assembly</td>
<td>—</td>
</tr>
<tr>
<td>2</td>
<td>Body</td>
<td>Aluminum alloy</td>
</tr>
<tr>
<td>3</td>
<td>Cover</td>
<td>Aluminum alloy</td>
</tr>
<tr>
<td>4</td>
<td>Adjusting piston</td>
<td>Aluminum alloy</td>
</tr>
<tr>
<td>5</td>
<td>Spring</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>6</td>
<td>Valve guide</td>
<td>Aluminum alloy</td>
</tr>
<tr>
<td>7</td>
<td>Poppet valve</td>
<td>Aluminum alloy/Rubber</td>
</tr>
<tr>
<td>8</td>
<td>Shaft</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>9</td>
<td>Valve guide</td>
<td>Aluminum alloy</td>
</tr>
</tbody>
</table>
VY1 Series
Made to Order Specifications

Please contact SMC for detailed dimensions, specifications and lead times.

1 Low Wattage Specification: 0.8 W or less

Under operating conditions that the ON time, such as charging to the tank is long, the service life may be shortened due to the heat generation of the product. When the operating pressure is 0.7 MPa or less, it is recommended to use the special product “-X39” (Service life: Approx. 7000 operating hours) that is a type of low wattage and suppresses heat generation. Please note that the product characteristics are those with 0.7 MPa or less of the standard specifications.

How to Order

Power source/Command signal

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Power source voltage DC</th>
<th>Command signal DC</th>
<th>Input impedance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>24 V</td>
<td>1 to 4 V</td>
<td>67 kΩ</td>
</tr>
<tr>
<td>2</td>
<td>0 to 7.5 V</td>
<td>4 to 16 mA</td>
<td>120 Ω</td>
</tr>
<tr>
<td>3</td>
<td>0 to 15 mA</td>
<td>120 Ω</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1 to 4 V</td>
<td>67 kΩ</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0 to 7.5 V</td>
<td>10 kΩ</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>0 to 15 mA</td>
<td>120 Ω</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>4 to 16 mA</td>
<td>120 Ω</td>
<td></td>
</tr>
</tbody>
</table>

Thread type

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Rc</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>T</td>
</tr>
<tr>
<td>N</td>
<td>NPT</td>
</tr>
<tr>
<td>T</td>
<td>NPTF</td>
</tr>
</tbody>
</table>

Note 1) Except body size D

Note 2) Not conforming to ISO1179-1.

Specifications (Specifications other than those below are the same as the standard type.)

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. operating pressure</td>
<td>0.7 MPa</td>
</tr>
<tr>
<td>Regulating pressure range</td>
<td>0.05 to 0.66 MPa (Supply pressure 0.7 MPa)</td>
</tr>
<tr>
<td>External pilot pressure</td>
<td>Set pressure +0.04 MPa to 0.7 MPa</td>
</tr>
<tr>
<td>Command signal</td>
<td>1 to 4 VDC, 0 to 7.5 VDC, 4 to 16 mA DC, 0 to 15 mA DC</td>
</tr>
<tr>
<td>Power supply</td>
<td>12 VDC ±10%, 24 VDC ±10%, 0.8 W or less</td>
</tr>
<tr>
<td>Bleed air flow (Pilot EXH port)</td>
<td>When not operating: Zero. When operating: 7 L/min (ARJ) (Supply pressure 0.7 MPa)</td>
</tr>
</tbody>
</table>

Note 6) The supply pressure must be under the maximum operating pressure.

Note 7) Cut off the command signal when the pressure control on the outlet side is not required, such as when the line is temporarily halted, etc. Refer to Specific Product Precautions on page 1006.
Using the VVEXB/2/4 series, a maximum of 10 stations manifold is possible.

### Specifications

<table>
<thead>
<tr>
<th>Applicable valve</th>
<th>VY1B0&lt;sup&gt;1&lt;/sup&gt;</th>
<th>VY120&lt;sup&gt;2&lt;/sup&gt;</th>
<th>VY140&lt;sup&gt;2&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve stations&lt;sup&gt;(1)&lt;/sup&gt;</td>
<td>2 to 10 stations</td>
<td>2 to 8 stations</td>
<td>2 to 6 stations</td>
</tr>
<tr>
<td>Passage</td>
<td>Common supply/exhaust</td>
<td>Common supply/exhaust</td>
<td>Common supply/exhaust</td>
</tr>
<tr>
<td>Pilot type</td>
<td>Internal pilot, Common external pilot&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>Internal pilot, Common external pilot&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>Internal pilot, Common external pilot&lt;sup&gt;(2)&lt;/sup&gt;</td>
</tr>
<tr>
<td>Pilot port size</td>
<td>M5</td>
<td>M5</td>
<td>M5</td>
</tr>
<tr>
<td>Port size port 1(P), 2(A), 3(R)</td>
<td>1/8</td>
<td>1/4</td>
<td>1/4, 3/8, 1/2</td>
</tr>
<tr>
<td>Blanking plate assembly&lt;sup&gt;(3)&lt;/sup&gt;</td>
<td>VEXB-6</td>
<td>VEX1-17</td>
<td>VEX4-5</td>
</tr>
</tbody>
</table>

Note 1) VY1B0<sup>1</sup> 6 stations or more, VY120<sup>2</sup> 5 stations or more, VY140<sup>2</sup> 4 stations or more supply pressure to the ports 1(P) on both sides of the manifold and exhaust pressure from the port 3(R) on the both sides.

Note 2) When used as a common external pilot, select the internal pilot specification as an applicable valve.

Note 3) Gasket and mounting bolts are equipped.

### How to Order

#### VVEX

- **Body size**: B
- **Valve stations**: 1
- **Port size**: 5
- **01**:

<table>
<thead>
<tr>
<th>Body size</th>
<th>Valve stations</th>
<th>Port size</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

- **Piping thread type**
  - Nil
  - Rc
  - F
  - N
  - P
  - T

Note 1) In the case of VVEXB, the “2” in the first digit of the valve station number is a dummy part number.

Note 2) Not conforming to ISO 1179-1.

### Dimensions

#### VVEXB

- Connection mark: All types are the same in terms of connection.
- Individual external pilot port: P1
  - M5 (VY1B0<sup>1</sup>-C00 only)
  - 2 x ø5.5 (For mounting)
- Port 3(R): 2 x 1/8
  - Exhaust from the both sides for 6 stations or more.
- Common external pilot port: See “Note for P1”.
  - 2 x M5 (VVEXB-2n-01 only)

**Note for P1**
- Confirm internal pilot or common external pilot by checking whether P1 has a M5 screw or not.
- Internal pilot:.................P1 has no M5 screw.
- Common external pilot:........P1 has an M5 screw.
### Dimensions

**VVEX2**

- Connection mark: All types are the same in terms of connection.
- Individual external pilot port: P1
- Mounting hole: 2 x ø6.5

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>91  122  153  184  215  246  277</td>
</tr>
<tr>
<td>L2</td>
<td>76  107  138  169  200  231  262</td>
</tr>
</tbody>
</table>

- Port 2(A): n x 1/4
- Blanking plate: 2 x ø8.5
- Port 1(P): 2 x 1/4
- Pressurize from both sides for 5 stations or more.
- Common external pilot port: See "Note for P1": 2 x M5 (VVEX2-2-n-02 only)

### VVEX4

- Connection mark: All types are the same in terms of connection.
- Pilot EXH port: P2
- Mounting hole: 2 x ø8.5

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>123  169  215  261  307</td>
</tr>
<tr>
<td>L2</td>
<td>107  153  199  245  291</td>
</tr>
</tbody>
</table>

- Port 2(A): n x 1/4, 3/8
- Blanking plate: 45
- Port 1(P): 2 x 3/8, 1/2
- Pressurize from both sides for 4 stations or more.
- Common external pilot port: See "Note for P1": 2 x M6 (VVEX4-2-n-02 only)

### Note for P1

- Confirm internal pilot or common external pilot by checking whether P1 has a M5 screw or not.
- Internal pilot: P1 has no M5 screw.
- Common external pilot: P1 has an M5 screw.

---

### Connection Mark

All types are the same in terms of connection.

### Ports

- **Port 1(P):** 2 x 1/4
- **Port 2(A):** n x 1/4
- **Port 3(R):** 2 x 3/8
- **Pilot EXH port:** P2
- **Blanking plate:** 2 x ø8.5
- **Common external pilot port:** See "Note for P1": 2 x M5 (VVEX2-2-n-02 only)

### Note for P1

- Confirm internal pilot or common external pilot by checking whether P1 has a M5 screw or not.
- Internal pilot: P1 has no M5 screw.
- Common external pilot: P1 has an M5 screw.
Piping

**Caution**

**Tightening the fittings and their torque**

When screwing fittings into the valves, make sure to tighten them to the proper torque values given below.

- **Connection thread:** M5
  - First, tighten by hand, then use a wrench appropriate for the hexagon flats of the body to tighten an additional 1/6 to 1/4 turn.
  - A reference value for the tightening torque is 1 to 1.5 N·m.
- For the fitting with sealant R or NPT, first, tighten it by hand, then use a wrench appropriate for the hexagon flats of the body to tighten it a further two or three turns. For a tightening torque guide, refer to the table below.

<table>
<thead>
<tr>
<th>Connection thread size (R, NPT)</th>
<th>Proper tightening torque (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8</td>
<td>3 to 5</td>
</tr>
<tr>
<td>1/4</td>
<td>6 to 12</td>
</tr>
<tr>
<td>3/8</td>
<td>15 to 20</td>
</tr>
<tr>
<td>1/2</td>
<td>20 to 25</td>
</tr>
<tr>
<td>5/8</td>
<td>25 to 30</td>
</tr>
<tr>
<td>1</td>
<td>36 to 38</td>
</tr>
<tr>
<td>1 1/4</td>
<td>40 to 42</td>
</tr>
<tr>
<td>1 1/2</td>
<td>48 to 50</td>
</tr>
<tr>
<td>2</td>
<td>48 to 50</td>
</tr>
</tbody>
</table>

**Operating Fluid**

**Caution**

1. If drainage or debris is present in the supply pressure line, the sliding resistance of the main valve or piston, etc. increases, resulting in a malfunction. Therefore, in addition to the air filter (SMC’s AF series), make sure to use a mist separator (SMC’s AM, AFM series). Concerning the quality of the operating air, refer to SMC’s air preparation equipment selection guide (pages 2 and 3).

2. Make sure to perform a maintenance periodically on air filter and mist separator (by discharging the drain and cleaning a filter element or replacing with new one).

**Pressure Gauge**

**Caution**

For products with pressure gauge, use caution about the durability of a pressure gauge, since it may be affected by the sudden pressure changes during operation.

**Wires to be Used**

**Caution**

Use 3 core shielded wires measuring 0.5 (mm²) line. The length of the power supply and signal lines must be kept as short as possible.

- **Shielded wire**
  - c.f. 0.5 mm² 3 core wire (JIS C 3306 equivalent)

### How to Use DIN Terminal

**Caution**

**Wiring procedures**

1. Loosen the retaining screw and pull the connector from the solenoid valve terminal block.
2. Remove the retaining screw, insert a flat head screwdriver into the groove below the terminal block and pry it up to separate the terminal block from the housing.
3. Loosen the terminal screws (slot head screws) on the terminal block.
4. In accordance with the wiring procedure, insert the cord of the lead wires into the terminals and tighten the terminal screws to secure in place.
5. Tighten the ground nut to secure the cord.

- **Outlet changing procedure**
  - After the terminal block has been separated from its housing, reassemble the housing in the desired direction (in four 90° increments) to change the direction of the cord outlet.

- **Precautions**
  - Kindly insert the connector straight in without tilting it, and pull it out straight.
  - **Applicable wire**
    - Cord external diameter: ø4 to ø6.5
    - c.f. 0.5 mm² 3 core wire (JIS C 3306 equivalent)
  - **Connector part no.:** VK300-82-1

**Input Signal**

**Caution**

- **Input signal when out of operation**
  - There is dispersion in operation start voltage (current) for the input signal. (Refer to page 992.)
  - If the command signal when out of operation exceeds the lower limit of the operation start voltage (current), the solenoid valve inside the pilot valve starts to activate and may be in the operation state. The service life of this product varies depending on the operating time of the solenoid valve inside the pilot valve. Be sure to cut off the command signal when the pressure control on the outlet side is not required, such as when the line is temporarily halted, etc. (Refer to “Service Life” below.)

**Service Life**

**Caution**

The pilot valve service life is approximately 4000 to 5000 operating hours. (When using AF + AFM) This may be approximately 3000 hours with ultra-dry air (dew point −40°C or equivalent). For the low wattage specification (X39), the service life is approximately 7000 operating hours. (When using AF and AFM)

**Bleed**

**Caution**

Since the pilot solenoid valve enters the normally operating status and the air is discharged continuously from the pilot EXH port (port 3 (R) for VY1D00, VY1A0 and VY1B0) in the pressure setting status, the bleed sound is produced. However, this is not an abnormal phenomenon.

### Related Products:

- **Silencer (AN series)**
  - Noise reducing effect: 30 dB or more.
  - Large effective area
  - Refer to Best Pneumatics No. 7 for details.

- **Exhaust cleaner (AMC series)**
  - Provides noise reduction and oil mist collecting functions.
  - Can also be used in a common piping system.
  - Oil mist recovering efficiency 99.9%.
  - Noise reduction efficiency 35 dB or more.
  - Refer to Best Pneumatics No. 7 for details.