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**
- Piping labor reduced
- A flexible system has been adopted.

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

**Drive and Thrust Control**
- Cylinder behavior and pressurization control for peening and stamping

**Cylinder Thrust Control**
- Tension control balancer

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

**Pressure Control of Tank**
- Automatic adjustments

**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.

**Air Flow Control of Nozzle**
- Use for the sonic flow.
E-P HYREG®

VY1 Series

Maximum operating pressure: 0.9 MPa

How to Order

<table>
<thead>
<tr>
<th>Pilot type</th>
<th>0</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal pilot</td>
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<td></td>
</tr>
<tr>
<td>External pilot (Note 1)</td>
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</tbody>
</table>

Note 1: Except body size D

Note 2: Not conforming to ISO1179-1.

Power source/Command signal

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Power source/Command signal</th>
<th>Input impedance</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>24 V 1/2.5 V 0 to 10V 0 to 20mA</td>
<td>67 kΩ 120 kΩ</td>
</tr>
<tr>
<td>2</td>
<td>12 V 0 to 5V 0 to 20mA</td>
<td>120 Ω</td>
</tr>
<tr>
<td>3</td>
<td>24 V 1/2.5 V 0 to 10V 0 to 20mA</td>
<td>67 kΩ</td>
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<td>4</td>
<td>12 V 0 to 5V 0 to 20mA</td>
<td>120 Ω</td>
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<tr>
<td>5</td>
<td>24 V 1/2.5 V 0 to 10V 0 to 20mA</td>
<td>67 kΩ</td>
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<tr>
<td>6</td>
<td>12 V 0 to 5V 0 to 20mA</td>
<td>120 Ω</td>
</tr>
<tr>
<td>7</td>
<td>24 V 1/2.5 V 0 to 10V 0 to 20mA</td>
<td>67 kΩ</td>
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<tr>
<td>8</td>
<td>12 V 0 to 5V 0 to 20mA</td>
<td>120 Ω</td>
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Thread type

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<th>Rc</th>
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<tbody>
<tr>
<td>NPTF</td>
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Option

<table>
<thead>
<tr>
<th>Body size Port size Rc (Note 3)</th>
<th>Made to Order</th>
<th>E-P HYREG Low wattage specification</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>P.1003</td>
<td>X39</td>
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</table>

<table>
<thead>
<tr>
<th>Power source/Command signal</th>
<th>Symbol</th>
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<td>8</td>
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<td>120 Ω</td>
</tr>
</tbody>
</table>

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: 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.

Note 7: Face seal type One-touch fittings cannot be used.

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

Pilot type

Internal pilot

External pilot

Symbol

Power source/Command signal

Input impedance

Table

<table>
<thead>
<tr>
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Note 7: Face seal type One-touch fittings cannot be used.
### Standard Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>Weight (kg)</th>
<th>Hysteresis</th>
<th>Sensitivity</th>
<th>Repeatability</th>
<th>Response time</th>
<th>Fluid</th>
<th>Ambient and fluid temperature</th>
<th>Maximum operating pressure</th>
<th>Regulating pressure range</th>
<th>External pilot pressure</th>
<th>Command signal</th>
<th>Power supply</th>
<th>Electrical entry</th>
<th>Applicable cable</th>
<th>Bled air flow (Pilot EXH port)</th>
<th>Installation</th>
<th>Lubrication</th>
<th>Note 1</th>
<th>Note 2</th>
<th>Note 3</th>
<th>Note 4</th>
<th>Note 5</th>
<th>Note 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>VY1D00</td>
<td>M5</td>
<td>0.11</td>
<td>0.009 MPa</td>
<td>0.023 MPa</td>
<td>±0.005 MPa</td>
<td>10 ms</td>
<td>Air</td>
<td>0 to 50°C (No condensation)</td>
<td>0.9 MPa</td>
<td>0.05 to 0.84 MPa (Supply pressure 0.9 MPa)</td>
<td>Set pressure + 0.04 to 0.9 MPa (VY101)</td>
<td>1 to 5 VDC, 0 to 10 VDC, 4 to 20 mA DC, 0 to 20 mA DC</td>
<td>12 VDC ±10%, 24 VDC ±10%, 1.8 W or less</td>
<td>DIN terminal</td>
<td>Cable O.D. ø4 to 6.5</td>
<td>When not operating: Zero, When operating: 10 L/min (ANR) (Supply pressure 0.9 MPa)</td>
<td>Universal</td>
<td>Not required</td>
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<tr>
<td>VY1A0</td>
<td>M5</td>
<td>0.16</td>
<td>0.027 MPa</td>
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<tr>
<td>VY1B0</td>
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<td>0.19</td>
<td>0.005 MPa</td>
<td>0.014 MPa</td>
<td>±0.009 MPa</td>
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<tr>
<td>VY110</td>
<td>M5</td>
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<td>0.018 MPa</td>
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<tr>
<td>VY120</td>
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<tr>
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<td>0.018 MPa</td>
<td>±0.009 MPa</td>
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<tr>
<td>VY140</td>
<td>M5</td>
<td>0.75</td>
<td>0.014 MPa</td>
<td>0.018 MPa</td>
<td>±0.009 MPa</td>
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</tr>
<tr>
<td>VY150</td>
<td>M5</td>
<td>1.5</td>
<td>0.009 MPa</td>
<td>0.018 MPa</td>
<td>±0.009 MPa</td>
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<tr>
<td>VY170</td>
<td>M5</td>
<td>2</td>
<td>0.005 MPa</td>
<td>0.018 MPa</td>
<td>±0.009 MPa</td>
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<tr>
<td>VY190</td>
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<td>2.2</td>
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</tbody>
</table>

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. Refer to Specific Product Precautions on page 1006.
Note 4) To lubricate the outlet side of “VY”, use “VY” as an external pilot. Avoid lubrication to the pilot air.
Note 5) The non-lubricated specification is not applicable to these models.
Note 6) The 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).

### Option

<table>
<thead>
<tr>
<th>Description</th>
<th>Part no.</th>
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</thead>
<tbody>
<tr>
<td>Bracket (With bolt, washer)</td>
<td>VEX1-18-2A, VEX1-18-1A, VEX3-32A, VEX5-32A, VEX5-32A, VEX9-32A</td>
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<tr>
<td>Pressure gauge</td>
<td>G27-10-01, G36-10-01</td>
</tr>
<tr>
<td>Pilot EXH port silencer</td>
<td>AN120-MS, AN120-MS, AN120-MS, AN120-MS, AN120-MS</td>
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</tbody>
</table>

### Sub-plate and Base Gasket Part No.

<table>
<thead>
<tr>
<th>Valve size</th>
<th>D</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-plate</td>
<td>VEXD-5</td>
<td>VEXB-2-2</td>
</tr>
<tr>
<td>Symbol Port size</td>
<td>Symbol Port size</td>
<td>Symbol Thread type</td>
</tr>
<tr>
<td>A</td>
<td>B</td>
<td>M5</td>
</tr>
<tr>
<td>N</td>
<td>F</td>
<td>Rc</td>
</tr>
<tr>
<td>T</td>
<td>NPT</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>NPTF</td>
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</tr>
<tr>
<td>Base gasket</td>
<td>VYD-7</td>
<td>VEXB-4-1</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Valve size</th>
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<th>4</th>
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</thead>
<tbody>
<tr>
<td>Sub-plate</td>
<td>VEX1-9-1</td>
<td>VEX4-2A</td>
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<td>Symbol Port size</td>
<td>Symbol Port size</td>
<td>Symbol Thread type</td>
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<td>A</td>
<td>B</td>
<td>¼</td>
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<tr>
<td>N</td>
<td>F</td>
<td>G (7)</td>
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<tr>
<td>T</td>
<td>NPT</td>
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<td>T</td>
<td>NPTF</td>
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</tr>
<tr>
<td>Base gasket</td>
<td>VEX1-11-2</td>
<td>VEX4-4</td>
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</tbody>
</table>

Note 7) Not conforming to ISO1179-1.
Command Signal — Outlet Pressure Characteristics (Characteristics of pressure setting)

VY1 Series

Characteristics

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

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

Note 1) Enter symbols above \( \star \) in VY1D00-\( \star \). Indicates power supply and a command signal.

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

Port 2 (A) Pressure (MPa)

VY1D00

VY1A00/1A01, VY1B00/1B01

VY1100/1101, VY1200/1201

VY1300/1301

VY1400/1401

VY1500/1501

VY1700/1701

VY1900/1901

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

**VY1D00**

![Graph showing Port 2 (A) pressure vs Port 1 (P) pressure for VY1D00](#)

**VY1A0 1/IB0**

![Graph showing Port 2 (A) pressure vs Port 1 (P) pressure for VY1A0 1/IB0](#)

**VY110 1/120**

![Graph showing Port 2 (A) pressure vs Port 1 (P) pressure for VY110 1/120](#)

**VY130**

![Graph showing Port 2 (A) pressure vs Port 1 (P) pressure for VY130](#)

**VY140**

![Graph showing Port 2 (A) pressure vs Port 1 (P) pressure for VY140](#)

**VY150**

![Graph showing Port 2 (A) pressure vs Port 1 (P) pressure for VY150](#)

**VY170**

![Graph showing Port 2 (A) pressure vs Port 1 (P) pressure for VY170](#)

**VY190**

![Graph showing Port 2 (A) pressure vs Port 1 (P) pressure for VY190](#)

* For the low wattage specification (X39), the maximum pressure of port 1 (P) is 0.7 MPa.
**VY1 Series**

**Characteristics**

**Flow Rate Characteristics**

<table>
<thead>
<tr>
<th>VY1D00</th>
<th>Port 2 (A) pressure (MPa) Port 1 (P) pressure 0.9 MPa</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

| VY1A0  
/VY1B0 | Port 2 (A) pressure (MPa) Port 1 (P) pressure 0.9 MPa |
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
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</tbody>
</table>

| VY110    
/VY120 | Port 2 (A) pressure (MPa) Port 1 (P) pressure 0.9 MPa |
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
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</table>

| VY130    
/VY140 | Port 2 (A) pressure (MPa) Port 1 (P) pressure 0.9 MPa |
<table>
<thead>
<tr>
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<tbody>
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<table>
<thead>
<tr>
<th>VY150</th>
<th>Port 2 (A) pressure (MPa) Port 1 (P) pressure 0.9 MPa</th>
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<table>
<thead>
<tr>
<th>VY170</th>
<th>Port 2 (A) pressure (MPa) Port 1 (P) pressure 0.9 MPa</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
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.

\[ t = \frac{\text{Tank capacity}}{\text{Read exhaust time}} \]

\[ = \frac{500}{24} \]

\[ = 12 \]

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

**Dimensions**

**VY1D00**

- 2 x Ø4.4
  - Mounting hole
- 3 x M5
  - Port 1 (P), 2 (A), 3 (R)
- Applicable cable O.D.
  - All types are the same in terms of connection.
- Silencer (Option)
  - Ø4 to Ø6.5
- Connection mark
  - All types are the same in terms of connection.
- M5 external pilot port
  - (VY1A01 only)
- Foot (Option)
  - 4 x Ø4.5
  - Mounting hole
  - 2 x M3 thread depth 6.5
    - (For bracket and foot mounting)
- Bracket (Option)
  - VEXA-18-2A
    - Hexagon socket head cap screw M3 L = 8 (2 pcs.)
    - (With spring washer)

**VY1A01**

- 2 x Ø4.5
  - Mounting hole
- 3 x M5
  - Port 1 (P), 2 (A), 3 (R)
- Applicable cable O.D.
  - Ø4 to Ø6.5
- Connection mark
  - All types are the same in terms of connection.
- M5 external pilot port
  - (VY1A01 only)
- Foot (Option)
  - VEXA-18-3A
    - Hexagon socket head cap screw M3 L = 8 (2 pcs.)
    - (With spring washer)
**VY1B0^9\_**

- **M5 external pilot port (VY2B01 only)**
- **Connection mark**
- **All types are the same in terms of connection.**
- **Port 1 (P), 3 (R)**
- **Applicable cable O.D.** ø4 to ø6.5
- **M5, 1/8**
- **Mounting hole** 2 x ø4.5

---

**VY110^0\_**

- **M5 Pilot EXH port**
- **Pressure gauge (Option)**
  - G27-10-01
- **Silencer (Option)**
  - AN120-M5
- **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)
- **Connection mark**
- **All types are the same in terms of connection.**
- **Port 2 (A)**
- **Applicable cable O.D.** ø4 to ø6.5
- **M5 external pilot port (VY1101 only)**
- **Mounting hole** 2 x ø4.5
- **Thread depth** 6.5
- **Foot (Option)**
- **VY1**
- **Foot (Option)**
- **VY1**
**VY1 Series**

**Dimensions**

**VY120**

- 1/8 Gauge port
- 2 x ø4.5 Mounting hole (VY1201 only)
- M5 external pilot port
- All types are the same in terms of connection.

**Connection mark**

- Pressure gauge (Option) G27-10-01
- Pilot EXH port AN120-M5
- Silencer (Option) AN101-01
- Bracket (Option) VEX3-32A
- Hexagon socket head cap screw M5 L = 10 (4 pcs.) (With spring washer)
- Applicable cable O.D. ø4 to ø6.5

**Applicable cable O.D.**

- ø4 to ø6.5

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

- 3 x 1/8, 1/4 Port 1 (P), 2 (A), 3 (R)

**Bracket (Option)**

- VEX3-32A
- Hexagon socket head cap screw M5 L = 10 (4 pcs.) (With spring washer)
- Applicable cable O.D. ø4 to ø6.5

**Pressure gauge (Option)**

- G27-10-01

**Silencer (Option)**

- AN101-01

**Mounting hole elongated**

- For bracket mounting

**Connection mark**

- All types are the same in terms of connection.

**View A**

- 1/8 Gauge port
- 1/4, 3/8, 1/2 Port 1 (P)
- 1/4, 3/8, 1/2 Port 3 (R)
- 1/8 Pilot EXH port (VY1301 only)
- 1/8 external pilot port (VY1301 only)
VY1 Series

Dimensions

VY170

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

Pressure gauge (Option)
G46-10-01

Applicable cable O.D.
ø4 to ø6.5

Port 3 (R)
1, 1/4

1/8 Gauge port

VY190

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

Pressure gauge (Option)
G46-10-01

Applicable cable O.D.
ø4 to ø6.5

Port 3 (R)
2 x 1 1/2, 2

2 x ø9
Mounting hole

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

Silencer (Option)
AN210-02
1/4 Pilot EXH port

4 x M6 thread depth 12
(For bracket mounting)

4 x ø7
Mounting hole

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

**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.

**VY1A09, VY1B09 (Pilot valve: VY1D00-□00)**

Working principle
- The supply [1(P) to 2(A)] valve of valve and the exhaust [2(A) to 3(R)] valve close due to the balance between actuating forces F1 and F2. Actuating force F1 is applied to the right surface of pressure regulation piston by the pilot pressure (pilot valve assembly ②: VY1D00-□00), and actuating force F2 is applied to the left surface of the pressure regulation piston by the port and pressure that passes through the feedback passage. Thus, the port 2(A) pressure that coprresponds to the pilot pressure is established.
- When the port 2(A) pressure becomes higher than the pilot pressure, F2 becomes greater than F1. This causes only the pressure regulation piston to move to the right, and the exhaust valve seat 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 set state.
- Conversely, if the port 2(A) pressure is lower than the pilot pressure, F2 becomes lower than F1. This causes the pressure regulating piston to move the valve to the left, and the supply valve seat to open, allowing the air to be supplied from port 1(P) to port 2(A). When the port 2(A) pressure balances, the regulator returns to the set state.

**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></td>
</tr>
<tr>
<td>3 Adjusting piston</td>
<td>Aluminum alloy</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>
**Construction/Component Parts/Working Principle**

**Working principle**
- The pair of poppet valves close due to the balance between actuating forces $F_1$ and $F_2$. Actuating force $F_1$ is applied to the top surface of pressure regulation piston by the pilot pressure (pilot valve assembly $VY_{1D}00_0$), and actuating force $F_2$ 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, $F_2$ becomes higher than $F_1$. 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, $F_2$ becomes less than $F_1$. 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.

## 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

- **E-P HYREG**
  - Maximum operating pressure: 0.7 MPa

- **VY1**
  - **1**
  - **0**
  - **0**
  - **0**
  - **01**
  - **-X39**

- **Power source/Command signal**
  - Symbol
  - Nil
  - 24 V
  - 12 V

- **Thread type**
  - Nil
  - Rc
  - F
  - G
  - N
  - NPT
  - T
  - NPTF

- **Body size**
  - Base mounted
  - D 00
  - M5 00
  - M5 01
  - 1/6
  - 2 00
  - 1/6
  - 02 1/6
  - 4 00
  - 1/6
  - 02 1/6
  - 04 1/6
  - A 03
  - ¾
  - B 03
  - M5
  - 1/6
  - 02 1/6
  - 04 1/6
  - 05
  - 1/4
  - 03
  - ¾
  - 04
  - 1/4
  - 06
  - ¾
  - 10
  - 1
  - 7
  - 10
  - 2
  - 1/4
  - 1 1/4
  - 12
  - 1/4
  - 14
  - 1 1/2
  - 2
  - 20
  - 2
  - **-X39**

### Specifications

- **Max. operating pressure:** 0.7 MPa
- **Regulating pressure range:** 0.05 to 0.66 MPa (Supply pressure 0.7 MPa)
- **External pilot pressure:** Set pressure +0.04 MPa to 0.7 MPa
- **Command signal:** 1 to 4 VDC, 0 to 7.5 VDC, 4 to 16 mA DC, 0 to 15 mA DC
- **Bleed air flow (Pilot EXH port):** When not operating: Zero, When operating: 7 L/min (AIR) (Supply pressure 0.7 MPa)

Note 7) The supply pressure must be under the maximum operating pressure.

If the supply pressure exceeds the maximum operating pressure, this may cause abnormal leakage from the pilot valve or abnormal set pressure to occur.

Note 8) 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</th>
<th>VY120</th>
<th>VY140</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve stations</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></td>
<td></td>
</tr>
<tr>
<td>Pilot type</td>
<td>Internal pilot, Common external pilot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pilot port size</td>
<td>M5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port size port 1(P), 2(A), 3(R)</td>
<td>(\frac{1}{4}), (\frac{1}{8}), (\frac{1}{4}), (\frac{1}{8})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blanking plate assembly</td>
<td>VEXB-6, VEX1-17, VEX4-5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note**
1) VY1B0|6 stations or more, VY120|5 stations or more, VY140|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.
2) When used as a common external pilot, select the internal pilot specification as an applicable valve.
3) Gasket and mounting bolts are equipped.

**How to Order**

Enter the valves and the blank plates to be placed on a manifold in order, starting at the left side of the manifold base (with port 2(A) facing you).

Ex.) VVEX2-2-5-02
- VY1200-00-G  4 pcs.
- VEX1-17  1 pc.

**Piping thread type**

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

**Note**
1) In the case of VVEXB, the “2” in the first digit of the valve station number is a dummy part number.
2) Not conforming to ISO 1179-1.

**Dimensions**

**VVEXB**

All types are the same in terms of connection.

Individual external pilot port: P1
- M5 (VY1B0|1-C00 only)
- 2 x ø5.5 (For mounting)

Port 3(R): 2 x 1/8
- Exhaust from both sides for 6 stations or more.

Common external pilot port: See "Note for P1".
- 2 x M5 (VVEXB-2n-01 only)

Port 1(P): 2 x 1/8
- Pressure to both sides for 6 stations or more.

**Note for P1**
- Confirm internal pilot or common external pilot by checking whether P1 has a M5 screw or not.
- Internal pilot: P1 has a M5 screw.
- Common external pilot: P1 has an M5 screw.
**Manifold Specifications VY1 Series**

### Dimensions

**VVEX2**

Connection mark

All types are the same in terms of connection.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Stations</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td></td>
<td>91</td>
<td>122</td>
<td>153</td>
<td>184</td>
<td>215</td>
<td>246</td>
<td>277</td>
</tr>
<tr>
<td>L2</td>
<td></td>
<td>76</td>
<td>107</td>
<td>138</td>
<td>169</td>
<td>200</td>
<td>231</td>
<td>262</td>
</tr>
</tbody>
</table>

**VVEX4**

Connection mark

All types are the same in terms of connection.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Stations</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td></td>
<td>123</td>
<td>169</td>
<td>215</td>
<td>261</td>
<td>307</td>
</tr>
<tr>
<td>L2</td>
<td></td>
<td>107</td>
<td>153</td>
<td>199</td>
<td>245</td>
<td>291</td>
</tr>
</tbody>
</table>

**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

\[ \text{Caution} \]

**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>3/16</td>
<td>15 to 20</td>
</tr>
<tr>
<td>1/2</td>
<td>20 to 25</td>
</tr>
<tr>
<td>5/32</td>
<td>28 to 30</td>
</tr>
<tr>
<td>1/4</td>
<td>36 to 38</td>
</tr>
<tr>
<td>1/2</td>
<td>40 to 42</td>
</tr>
<tr>
<td>1/2</td>
<td>48 to 50</td>
</tr>
<tr>
<td>1/2</td>
<td>48 to 50</td>
</tr>
</tbody>
</table>

Operating Fluid

\[ \text{Caution} \]

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).

Pressure Gauge

\[ \text{Caution} \]

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

\[ \text{Caution} \]

Use 3 core shielded wires measuring 0.5 (mm²) for the power supply and signal lines according to the respective number of conductors. When connecting the shielded braided wire, connect it to the ground of the signal generator. As a rule, the electro-pneumatic hybrid regulator should be installed in a location that is free of noise or is shielded. If it must be installed in an environment with poor noise conditions, eliminate the power supply noise according to the respective number of conductors. When connecting the shielded braided wire, connect it to the ground of the signal generator. As a rule, the electro-pneumatic hybrid regulator should be installed in a location that is free of noise or is shielded. If it must be installed in an environment with poor noise conditions, eliminate the power supply noise according to the respective number of conductors.

<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>3/16</td>
<td>15 to 20</td>
</tr>
<tr>
<td>1/2</td>
<td>20 to 25</td>
</tr>
<tr>
<td>5/32</td>
<td>28 to 30</td>
</tr>
<tr>
<td>1/4</td>
<td>36 to 38</td>
</tr>
<tr>
<td>1/2</td>
<td>40 to 42</td>
</tr>
<tr>
<td>1/2</td>
<td>48 to 50</td>
</tr>
<tr>
<td>1/2</td>
<td>48 to 50</td>
</tr>
</tbody>
</table>

How to Use DIN Terminal

\[ \text{Caution} \]

**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. Then, 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)

Pressure Gauge

\[ \text{Caution} \]

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

\[ \text{Caution} \]

Use 3 core shielded wires measuring 0.5 (mm²) for the power supply and signal lines according to the respective number of conductors. When connecting the shielded braided wire, connect it to the ground of the signal generator. As a rule, the electro-pneumatic hybrid regulator should be installed in a location that is free of noise or is shielded. If it must be installed in an environment with poor noise conditions, eliminate the power supply noise using a line filter, Z-wrap, or a spark killer on the 100 V power supply or signal source. 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).

Service Life

\[ \text{Caution} \]

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**

\[ \text{Caution} \]

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, VY1A00 and VY1B00) 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.