5.0 MPa Pneumatic Equipment Series

Regulator
Pressure switch
Solenoid valve (2/3 port)
Check valve
Silencer

For air-blowing, cylinder-driving, charging fluid into a tank, or discharging.

Pilot operated 2 port solenoid valve
VCH41 (Normally closed)

Pilot operated 3 port solenoid valve
VCH42 (Normally open)

Check valve VCHC40

Direct operated regulator (Relieving type)
VCHR30/40

Silencer
VCHN3/4
Applications include air-blowing, charging fluid into a vessel, or discharging (Blow-molding equipment, etc.)

Features:
- Silencer VCHN3/4
- Check valve VCHC40
- Pilot operated 2 port solenoid valve Normally open VCH42
- Direct operated regulator (Relieving type) VCHR30/40
- Pilot operated 2 port solenoid valve Normally closed VCH41
- Made to Order/Manifold Unit

5.0 MPa Pneumatic

Medium pressure
High pressure

IN
OUT

5.0 MPa
5.0 MPa

EXH
EXH

IN
IN

IN
IN

OUT
OUT

Features 1
## Equipment Variations

### Example of driving a cylinder

![Diagram of driving a cylinder]

### Pressure Sensor Made to Order

![Diagram of pressure sensor]

### Description and Related Equipment

<table>
<thead>
<tr>
<th>Description</th>
<th>Features</th>
<th>Maximum operating pressure (MPa)</th>
<th>Series</th>
<th>Port size</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot operated 2 port solenoid valve</td>
<td>Service life: 10 million cycles</td>
<td>5.0</td>
<td>VCH41(N.C.)</td>
<td>1/4</td>
<td>P.1</td>
</tr>
<tr>
<td>Check valve</td>
<td>A polyurethane elastomer poppet is adopted as a valve part. This improves durability under high pressure environment.</td>
<td>5.0</td>
<td>VCH42(N.O.)</td>
<td>1/2</td>
<td>P.5</td>
</tr>
<tr>
<td>Pilot operated 3 port solenoid valve</td>
<td></td>
<td>5.0</td>
<td>VCH410</td>
<td>3/4</td>
<td>P.7</td>
</tr>
<tr>
<td>Direct operated regulator (Relieving type)</td>
<td>Inlet pressure 6.0, Set pressure 0.5 to 5.0</td>
<td>5.0</td>
<td>VCHR30</td>
<td></td>
<td>P.15</td>
</tr>
<tr>
<td>Silencer</td>
<td>Noise reduction 35 dB(A) (At supply pressure 4.0 MPa, back pressure 2.0 MPa), Reduction of clogging with double-layer construction</td>
<td>5.0</td>
<td>VCHN3</td>
<td>1</td>
<td>P.21</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>VCHN4</td>
<td>1 1/4</td>
<td></td>
</tr>
</tbody>
</table>

### Related Equipment

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Description</th>
<th>Series</th>
<th>Port size</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure switch</td>
<td>2-colour display Metal body (Aluminum die-cast)</td>
<td>ISE75(H)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Made to Order

1. 6.0 MPa pilot operated regulator (Air operated type)
2. 22.0 MPa 2 port air operated valve
3. 5.0 MPa pressure sensor
5.0 MPa Pilot Operated 2 Port Solenoid Valve & Check Valve

**Series VCH40/VCHC40**

**For Air**

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**Series VCH40**

- **Stable responsiveness**
  - Response time variation within ±2 ms
  - Service life: 10 million cycles

**Collision-proof construction**
- Between the iron cores keeps equipment free of abrasion.
- Construction with reduced variation and improved responsiveness when switching off.
- Improved durability by applying a **special surface treatment** to the sliding parts.
- Unnecessary volume inside the pilot chamber is reduced.
- High speed response with reduced variance

**Use of shock absorbing rubber**, results in protection of the pilot valve and electric parts.

**Improved durability under a high pressure environment** is due to the **polyurethane elastomer poppet**.

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**Series VCHC40**

- **Uses NSF-H1-certified grease** on the guide ring (sliding part).
- Improved durability under a high pressure environment is due to the **polyurethane elastomer poppet**.
**How to Order**

**VCH4 1-5D-06 G -Q**

- **Valve type**
  - N.C.
  - N.O.

- **Voltage**
  - 5 24 VDC
  - 6 12 VDC

- **Thread type**
  - (G thread for hydraulics and pneumatics conforming to ISO1179-1)

- **Port size**
  - 06 3/4
  - 10 1

- **Electrical entry**
  - D DIN connector
  - DL DIN connector with light

\*Consult with SMC for other voltages, CE marking compliant products are only available with 50 VDC or less.

**Specifications**

- **Model**
  - VCH41 (N.C.)
  - VCH42 (N.O.)

- **Valve construction**
  - Pilot operated, diaphragm poppet

- **Fluid**
  - Air, Inert gas

- **Orifice**
  - ø16
  - ø17.5

- **C value (Effective area) (s-bar)**
  - 17 dm³/s/bar (85 mm²)
  - 22 dm³/s/bar (110 mm²)

- **b**
  - 0.08
  - 0.11

- **Cv**
  - 4.5
  - 5.8

- **Max. operating pressure**
  - 5.0 MPa

- **Operating pressure**
  - 0.5 to 5.0 MPa

- **Fluid temperature**
  - -5 to 80 °C

- **Ambient temperature**
  - -5 to 80 °C

- **Body material**
  - Brass

- **Main seal material**
  - Polyurethane elastomer

- **Enclosure**
  - Drip proof (Equivalent to IP65)

- **Port size**
  - G3/4, 1 (G thread for hydraulics and pneumatics conforming to ISO1179-1)

- **Impact/Vibration resistance (Note 1)**
  - 300/100 m/s²

- **Mounting orientation**
  - Unrestricted

- **Weight**
  - 1.67 kg
  - 1.9 kg

- **Rated voltage**
  - 12 VDC, 24 VDC

- **Allowable voltage fluctuation**
  - ±10 % of rated voltage

- **Electrical entry**
  - DIN connector

- **Coil insulation type**
  - Class B

- **Power consumption**
  - 5 W (DC)

**Response Time**

- **VCH42 ON response**
- **VCH42 OFF response**
- **VCH41 ON response**
- **VCH41 OFF response**

**Note 1)** DC solenoid without a light/surge voltage suppressor
**Note 2)** DC solenoid with an indicator light: It will cause delays around 20 to 30 msec in the OFF response time.

**Note 1)** Impact resistance: No malfunction resulted in an impact test using a drop impact tester. The test was performed one time each in the axial and right angle directions of the main valve and armature, for both energised and de-energised states. (Value in the initial stage)

**Vibration resistance**: No malfunction resulted in 8.3 to 2000 Hz, a one-sweep test performed in the axial and right angle directions of the main valve and armature for both energised and de-energised states. (Value in the initial stage)

**Note 2)** Vibration resistance is 50 m/s² when a light/surge voltage suppressor is attached.
Series VCH40

Construction

Normally closed (N.C.)

Normally open (N.O.)

Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Brass</td>
</tr>
<tr>
<td>2</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>3</td>
<td>Diaphragm assembly</td>
<td>Polyurethane elastomer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stainless steel</td>
</tr>
<tr>
<td>4</td>
<td>Main valve guide</td>
<td>Resin</td>
</tr>
<tr>
<td>5</td>
<td>Poppet spring</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>6</td>
<td>Hexagon socket head cap screw</td>
<td>Carbon steel</td>
</tr>
<tr>
<td>7</td>
<td>Bonnet</td>
<td>Brass</td>
</tr>
<tr>
<td>8</td>
<td>Hexagon socket head cap screw (with SW)</td>
<td>Carbon steel</td>
</tr>
<tr>
<td>9</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>10</td>
<td>Armature assembly</td>
<td>—</td>
</tr>
<tr>
<td>11</td>
<td>Return spring</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>12</td>
<td>Tube assembly</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>13</td>
<td>Nut</td>
<td>Brass</td>
</tr>
<tr>
<td>14</td>
<td>Rubber mount</td>
<td>NBR</td>
</tr>
<tr>
<td>15</td>
<td>DIN connector type solenoid coil</td>
<td>—</td>
</tr>
<tr>
<td>16</td>
<td>Clip</td>
<td>Carbon steel</td>
</tr>
<tr>
<td>17</td>
<td>DIN terminal gasket</td>
<td>CR</td>
</tr>
<tr>
<td>18</td>
<td>DIN connector</td>
<td>—</td>
</tr>
</tbody>
</table>

Component Parts

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<tr>
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<tr>
<td>2</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>3</td>
<td>Diaphragm assembly</td>
<td>Polyurethane elastomer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stainless steel</td>
</tr>
<tr>
<td>4</td>
<td>Main valve guide</td>
<td>Resin</td>
</tr>
<tr>
<td>5</td>
<td>Poppet spring</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>6</td>
<td>Bonnet plate</td>
<td>Brass</td>
</tr>
<tr>
<td>7</td>
<td>Hexagon socket head cap screw</td>
<td>Carbon steel</td>
</tr>
<tr>
<td>8</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>9</td>
<td>Valve spring</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>10</td>
<td>Poppet</td>
<td>H-NBR</td>
</tr>
<tr>
<td>11</td>
<td>Bonnet</td>
<td>Brass</td>
</tr>
<tr>
<td>12</td>
<td>Hexagon socket head cap screw (with SW)</td>
<td>Carbon steel</td>
</tr>
<tr>
<td>13</td>
<td>Armature assembly</td>
<td>—</td>
</tr>
<tr>
<td>14</td>
<td>Return spring</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>15</td>
<td>Tube assembly</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>16</td>
<td>Nut</td>
<td>Brass</td>
</tr>
<tr>
<td>17</td>
<td>Rubber mount</td>
<td>NBR</td>
</tr>
<tr>
<td>18</td>
<td>DIN connector type solenoid coil</td>
<td>—</td>
</tr>
<tr>
<td>19</td>
<td>Clip</td>
<td>Carbon steel</td>
</tr>
<tr>
<td>20</td>
<td>DIN terminal gasket</td>
<td>CR</td>
</tr>
<tr>
<td>21</td>
<td>DIN connector</td>
<td>—</td>
</tr>
</tbody>
</table>
Dimensions

VCH41 (N.C.)

VCH42 (N.O.)

5.0 MPa Pilot Operated
2 Port Solenoid Valve  Series VCH40
5.0 MPa Check Valve

**Series VCHC40**

**How to Order**

VCHC40 – 06 G

- **Thread type** (G thread for hydraulics and pneumatics conforming to ISO1179-1)
- **Port size**
  - 06 3/4
  - 10 1

**Specifications**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating pressure</td>
<td>0.05 to 5.0 MPa</td>
</tr>
<tr>
<td>Cracking pressure</td>
<td>0.05 MPa</td>
</tr>
<tr>
<td>Orifice diameter</td>
<td>ø16</td>
</tr>
<tr>
<td>C value (Effective area)</td>
<td>28 dm³/(s·bar) (140 mm²)</td>
</tr>
<tr>
<td>Cv</td>
<td>0.15</td>
</tr>
<tr>
<td>Fluid</td>
<td>Air, Inert gas</td>
</tr>
<tr>
<td>Fluid temperature</td>
<td>–5 to 80 °C</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>–5 to 80 °C</td>
</tr>
<tr>
<td>Body material</td>
<td>Brass</td>
</tr>
<tr>
<td>Seal material</td>
<td>Polyurethane elastomer</td>
</tr>
<tr>
<td>Port size</td>
<td>G3/4, 1 (G thread for hydraulics and pneumatics</td>
</tr>
<tr>
<td></td>
<td>conforming to ISO1179-1)</td>
</tr>
<tr>
<td>Mounting orientation</td>
<td>Unrestricted</td>
</tr>
<tr>
<td>Weight</td>
<td>1.02 kg</td>
</tr>
</tbody>
</table>
Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Brass</td>
</tr>
<tr>
<td>2</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>3</td>
<td>Piston</td>
<td>Aluminum + Hard anodized</td>
</tr>
<tr>
<td>4</td>
<td>Poppet</td>
<td>Polyurethane elastomer</td>
</tr>
<tr>
<td>5</td>
<td>Set screw</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>6</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>7</td>
<td>Nut</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>8</td>
<td>Guide ring</td>
<td>Resin</td>
</tr>
<tr>
<td>9</td>
<td>Spring</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>10</td>
<td>Plate</td>
<td>Steel + Electroless nickel plated</td>
</tr>
<tr>
<td>11</td>
<td>Hexagon socket head cap screw (with SW)</td>
<td>Carbon steel</td>
</tr>
</tbody>
</table>

Dimensions

VCHC40
# 5.0 MPa Pilot Operated 3 Port Solenoid Valve

## Series VCH400
**For Air**

### Stable responsiveness

- **Response time variation within ±2 ms**
- **Service life: 10 million cycles**

### Collision-proof construction

- Construction with reduced variation and improved responsiveness when switching off.

### Improved durability

- By applying a special surface treatment to the sliding parts.

### Unnecessary volume reduction

- Inside the pilot chamber.
- High speed response with reduced variance.

### Special treatment

- Uses NSF-H1-certified grease on the guide ring (sliding part).
- Special treatment containing fluoro-resin is applied to the body side sliding face.

### Shock absorption

- Use of shock absorbing rubber results in protection of the pilot valve and electric parts.

### A special fluoro-resin seal

- Adopted for the sliding part.

### Improved durability

- Under a high pressure environment is due to the polyurethane elastomer poppet.

### How to Order

**VCH410−** **D** **06 G−Q**

<table>
<thead>
<tr>
<th>Valve type</th>
<th>Voltage</th>
<th>Thread type</th>
<th>Port size</th>
<th>Electrical entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>(G thread for hydraulics and pneumatics conforming to ISO1179-1)</td>
<td>04 1/2</td>
<td>D DIN connector</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td></td>
<td>06 3/4</td>
<td>DL DIN connector with light</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td>10 1</td>
<td></td>
</tr>
</tbody>
</table>

- Consult with SMC for other voltages. CE marking compliant products are only available with 50 VDC or less.
- A surge voltage suppressor is integrated inside the coil as a standard feature.
### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>VCH410</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve construction</td>
<td>Pilot operated, diaphragm poppet</td>
</tr>
<tr>
<td>Fluid</td>
<td>Air, Inert gas</td>
</tr>
<tr>
<td>Orifice (Effective area)</td>
<td>G1/2: 20.22 dm³/(s·bar) (100 mm²), G3/4: 21.22 dm³/(s·bar) (110 mm²)</td>
</tr>
<tr>
<td>b</td>
<td>G1/2: 0.26, G3/4: 1.36</td>
</tr>
<tr>
<td>Cv</td>
<td>G1/2: 1<del>2: 5.3, 2</del>3: 5.8, G3/4: 1<del>2: 5.8, 2</del>3: 6.3</td>
</tr>
<tr>
<td>Max. operating pressure</td>
<td>5.0 MPa</td>
</tr>
<tr>
<td>Operating pressure</td>
<td>0.5 to 5.0 MPa</td>
</tr>
<tr>
<td>Fluid temperature</td>
<td>–5 to 80 °C</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>–5 to 80 °C</td>
</tr>
<tr>
<td>Body material</td>
<td>Aluminum + Hard anodized</td>
</tr>
<tr>
<td>Main seal material</td>
<td>Polyurethane elastomer</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Drip proof (Equivalent to IP65)</td>
</tr>
<tr>
<td>Port size</td>
<td>G1/2: 3/4, 1 (3 thread for hydraulics and pneumatics conforming to ISO1179-1)</td>
</tr>
<tr>
<td>Impact/Vibration resistance</td>
<td>300/100 m/s² (Note 3)</td>
</tr>
<tr>
<td>Mounting orientation</td>
<td>Unrestricted</td>
</tr>
<tr>
<td>Rated voltage</td>
<td>12 VDC, 24 VDC</td>
</tr>
<tr>
<td>Allowable voltage fluctuation</td>
<td>±10% of rated voltage</td>
</tr>
<tr>
<td>Electrical entry</td>
<td>DIN connector</td>
</tr>
<tr>
<td>Coil insulation type</td>
<td>Class B</td>
</tr>
<tr>
<td>Power consumption</td>
<td>5 W (DC), 13 VA (AC)</td>
</tr>
</tbody>
</table>

#### Note
- **Note 1)** When used as a selector valve (pressurising ports 1, 3), the pressure should be within the range of port 1 pressure ÷ port 3 pressure x 2 (2 times).
- **Note 2)** Impact resistance: No malfunction resulted in an impact test using a drop impact tester. The test was performed one time each in the axial and right angle directions of the main valve and armature, for both energised and de-energised states. (Value in the initial stage)
- **Vibration resistance** No malfunction resulted in 8.3 to 2000 Hz, a one-sweep test performed in the axial and right angle directions of the main valve and armature for both energised and de-energised states. (Value in the initial stage)
- **Note 3)** Vibration resistance is 50 m/s² when a light/surge voltage suppressor is attached.

### Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Aluminum + Hard anodized</td>
</tr>
<tr>
<td>2</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>3</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>4</td>
<td>Hexagon socket head cap screw</td>
<td>Carbon steel</td>
</tr>
<tr>
<td>5</td>
<td>Piston A</td>
<td>Aluminum + Hard anodized</td>
</tr>
<tr>
<td>6</td>
<td>Piston B</td>
<td>Aluminum + Hard anodized</td>
</tr>
<tr>
<td>7</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>8</td>
<td>Poppet</td>
<td>Polyurethane elastomer</td>
</tr>
<tr>
<td>9</td>
<td>Guide ring</td>
<td>Resin</td>
</tr>
<tr>
<td>10</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>11</td>
<td>Ring</td>
<td>Resin</td>
</tr>
<tr>
<td>12</td>
<td>Rod</td>
<td>Stainless steel</td>
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<tr>
<td>13</td>
<td>Hexagon nut</td>
<td>Brass</td>
</tr>
<tr>
<td>14</td>
<td>Hexagon nut class 3</td>
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<td>Poppet spring</td>
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<tr>
<td>16</td>
<td>Plate</td>
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</tr>
<tr>
<td>17</td>
<td>Hexagon socket head cap screw (with SW)</td>
<td>Carbon steel</td>
</tr>
<tr>
<td>18</td>
<td>Bonnet</td>
<td>Aluminum + Hard anodized</td>
</tr>
<tr>
<td>19</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>20</td>
<td>Return spring</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>21</td>
<td>Armature assembly</td>
<td>—</td>
</tr>
<tr>
<td>22</td>
<td>Tube assembly</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>23</td>
<td>Nut</td>
<td>Brass</td>
</tr>
<tr>
<td>24</td>
<td>Rubber mount</td>
<td>NBR</td>
</tr>
<tr>
<td>25</td>
<td>DIN connector type solenoid coil</td>
<td>—</td>
</tr>
<tr>
<td>26</td>
<td>Round S-type retaining ring</td>
<td>Carbon steel</td>
</tr>
<tr>
<td>27</td>
<td>DIN terminal gasket</td>
<td>CR</td>
</tr>
<tr>
<td>28</td>
<td>DIN connector</td>
<td>—</td>
</tr>
</tbody>
</table>
Series VCH400

Dimensions

VCH410

Applicable cable
O.D. ø6 to 12

2(OUT)

G1/2

42.5

50.5

17

G1/2, 3/4:
G1:

ø17.5

ø17.5

41

51.5

75

168

188

42

62

42

3(OUT)

3(OUT)

3(OUT)

3 x G1/2 x 15
3 x G3/4 x 16.3
3 x G1 x 19.1
1(IN)

G1/2, 3/4:
G1:

G1/4 x 7
Pilot EXH

2 x ø8.5
Mounting hole

106

70

80

2 x ø8.5
Mounting hole

G1/2, 3/4: 97
G1: 102

2 x ø8.5
Mounting hole

2 x ø8.5
Mounting hole

2(OUT)

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These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by labels of "Caution", "Warning" or "Danger". To ensure safety, be sure to observe ISO 4414 [Note 1], JIS B 8370 [Note 2] and other safety practices.

**Caution:** Operator error could result in injury or equipment damage.

**Warning:** Operator error could result in serious injury or loss of life.

**Danger:** In extreme conditions, there is a possible result of serious injury or loss of life.

---

**Warning**

1. **The compatibility of the equipment is the responsibility of the person who designs the system or decides its specifications.**
   
   Since the products specified here are used in various operating conditions, their compatibility with a specific system must be based on specifications or post analysis and/or tests to meet your specific requirements. The expected performance and safety assurance are the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified, referring to the latest catalogue information and taking into consideration the possibility of equipment failure when configuring a system. Be particularly careful in determining the compatibility with the fluid to be used.

2. **Only trained personnel should operate machinery and equipment.**
   
   The fluid (high pressure) can be dangerous if handled incorrectly. Assembly, handling or maintenance of the system should be performed by trained and experienced operators.

3. **Do not service machinery/equipment or attempt to remove components until the safety is confirmed.**
   
   1. Inspection and maintenance of machinery/equipment should only be performed once measures to prevent falling or runaway of the driven object have been confirmed. Measures to prevent danger from a fluid should also be confirmed.
   2. When equipment is removed, confirm that safety processes mentioned above, release the fluid pressure and be certain there is no danger from fluid leakage or fluid remaining in the system.
   3. Carefully restart the machinery, confirming that safety measures are being implemented.

4. **Contact SMC if the product will be used in any of the following conditions:**
   
   1. Conditions and environments beyond the given specifications, or if product is used outdoors.
   2. With fluids whose application causes concern due to the type of fluid or additives, etc.
   3. An application which has the possibility of having a negative effect on people, property, or animals, requiring special safety analysis.
   4. This product is not certified according to the High Pressure Gas Safety Law (in Japan).
### Warning

1. **Cannot be used as an emergency shutoff valve, etc.**
   
   The valves presented in this catalogue are not designed for safety applications such as an emergency shutoff valve. If the valves are used in this type of system, other reliable safety assurance measures should also be adopted.

2. **Extended periods of continuous energisation**
   
   The solenoid coil will generate heat when continuously energised. Avoid using in a tightly shut container. Install it in a well-ventilated area. Furthermore, do not touch it while it is being energised or right after it is energised.

3. **This solenoid valve cannot be used for explosion proof applications.**

4. **Maintenance space**
   
   The installation should allow sufficient space for maintenance activities.

5. **Actuator drive**
   
   When an actuator, such as a cylinder, is to be driven using a valve, take appropriate measures to prevent potential danger caused by actuator operation.

6. **Use caution regarding exhaust port freezing.**
   
   If a high pressure air (more than 1.0 MPa) is quickly exhausted, there may be an occurrence in which the valve will not switch properly or the service life will substantially decrease due to condensation or freezing caused by the substantial temperature change. When condensation or freezing occurs, take measures such as using a freeze-reducing silencer (VCHNF series), etc.

7. **Use caution regarding back pressure.**
   
   1) When port 3 (EXH) of a 3 port solenoid valve (VCH400 series) is excessively throttled or used as a selector valve (pressurising ports 1, 3), the pressure in the port should be within a range of half the pressure in port 1 (port 1 pressure ≥ twice as strong as port 3 pressure). Using a 3 port valve beyond its back pressure and/or supply pressure range may cause the valve switch to malfunction or result in unstable operation.
   
   2) In the case of a 3 port solenoid valve, when the valve is being switched, high pressure air will be introduced into the lower pressure side. Therefore, when using this product as a selector valve for switching between high and medium pressures, a relief type regulator (VCHR series) must be used for the medium pressure side.

### Selection

1. **Confirm the specifications.**
   
   Give careful consideration to the operating conditions such as the application, fluid and environment, and use within the operating ranges specified in this catalogue.

2. **Fluid**
   
   - Corrosive gas
     
     Cannot be used since it will lead to cracks by stress corrosion or result in other incidents.

3. **Air quality**
   
   1) **Use clean air.**
     
     Do not use compressed air which includes chemicals, synthetic oils containing organic solvents, salt or corrosive gases, etc., as it can cause damage or malfunction.
   
   2) **Install air filters.**
     
     Install air filters close to valves at their upstream side. A filtration degree of 5 μm or less should be selected.
   
   3) **Install an air dryer or after-cooler, etc.**
     
     Compressed air that includes excessive drainage may cause malfunction of valves and other pneumatic equipment. To prevent this, install an air dryer or after cooler, etc.
   
   4) **If excessive carbon powder is generated, eliminate it by installing mist separators at the upstream side of valves.**
     
     If excessive carbon powder is generated by the compressor, it may adhere to the inside of the valves and cause a malfunction. Refer to SMC’s Best Pneumatics 2004 catalogue for further details on compressed air quality.

4. **Ambient environment**
   
   Use within the operable ambient temperature range. Confirm the compatibility between the product’s composition materials and the ambient atmosphere. Be sure that the fluid used does not touch the external surface of the product.

5. **Supply source**
   
   If the primary side air is throttled, flow may be reduced resulting in the malfunction of the switch or instability in the response time because of the pilot operated solenoid valve. Conduct piping work suited for the secondary side piping (air consumption).
   
   Also, when a regulator is installed, the air supply will stop right after the solenoid valve is switched due to the response time of the regulator. Thus, when using it below the minimum operating pressure, adjust the pipe size, length or provide an air tank, etc.
5.0 MPa Pilot Operated 2/3 Port Solenoid Valve & Check Valve Precautions 2
Be sure to read this before handling.

## Selection

### Caution

1. **Leakage voltage**
   
   Particularly when using a resistor in parallel with a switching element and using a C-R element (surge voltage suppressor) to protect the switching element, take note that leakage current will flow through the resistor, C-R element, etc., creating a possible danger that the valve may not turn off.

### Piping

1. **Preparation before piping**
   
   Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe. Avoid pulling, compressing, or bending the valve body when piping.

2. **Wrapping of pipe tape**
   
   Pipe tape is not necessary since this product uses a pneumatic and hydraulic purpose G thread which conforms to ISO 1179-1.

   When an R (taper) thread is used, leave 1 to 2 threads at the tip exposed before winding the piping thread around it 4 to 5 times.

### Mounting

### Caution

1. **Do not apply external force to the coil section.**
   
   Be sure to apply the wrench to the external part of the piping connection. (Hexagonal parts or width across flats) Also, use caution when mounting a silencer or piping to the pilot exhaust port (G1/4) on top of the VCH410 series 3 port solenoid valve.

2. **Be sure not to position the coil downwards.**
   
   When mounting a valve with its coil positioned downwards, foreign objects in the fluid will adhere to the iron core leading to a malfunction.

3. **Avoid sources of vibration, or adjust the mounting arm from the body to the minimum length so that resonance will not occur.**

### Warning

1. **1. If air leakage increases or equipment does not operate properly, stop operation.**
   
   After mounting is completed, confirm that it has been done correctly by performing a suitable function test.

2. **2. Do not apply external force to the coil section.**
   
   Be sure to apply the wrench to the external part of the piping connection. (Hexagonal parts or width across flats) Also, use caution when mounting a silencer or piping to the pilot exhaust port (G1/4) on top of the VCH410 series 3 port solenoid valve.

3. **3. Be sure not to position the coil downwards.**
   
   When mounting a valve with its coil positioned downwards, foreign objects in the fluid will adhere to the iron core leading to a malfunction.

4. **4. Avoid sources of vibration, or adjust the mounting arm from the body to the minimum length so that resonance will not occur.**
Wiring

**Caution**

1. As a rule, use electrical wire with a cross-sectional area of 0.5 to 1.25 mm² for wiring. Furthermore, do not allow excessive force to be applied to the lines.

2. Use electrical circuits which do not generate chattering in their contacts.

3. Use voltage which is within ±10% of the rated voltage. In cases with a DC power supply where importance is placed on responsiveness, stay within ±5% of the rated value. The voltage drop is the value in the lead wire section connecting the coil.

4. When a surge from the solenoid affects the electrical circuitry, install a surge absorber, etc., in parallel with the solenoid. Or, adopt an option that comes with the surge voltage protection circuit. (However, a surge voltage occurs even if the surge voltage protection circuit is used. For details, please consult with SMC.)

Electrical Connections

**Caution**

**DIN connector**

Since internal connections are as shown below for the DIN connector, make connections to the power supply accordingly.

<table>
<thead>
<tr>
<th>Terminal no.</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN terminal</td>
<td>+ (-)</td>
<td>- (+)</td>
</tr>
</tbody>
</table>

- There is no polarity.
- Use the compatible heavy-duty cords with cable O.D. of ø6 to 12 mm.
- Use the tightening torques below for each section.

**Note**

For an outside cable diameter of ø9 to 12 mm, remove the internal parts of the rubber seal before using.

Electrical Circuits

**Caution**

**DIN connector**

DC circuit

```
1 (+) → ZNR → SOL → 2 (-)
```
5.0 MPa Pilot Operated 2/3 Port Solenoid Valve & Check Valve Precautions

Be sure to read this before handling.

Operating Environment

⚠️ Warning
1. Do not use the valves in an atmosphere having corrosive gases, chemicals, salt water, water, steam, or where there is direct contact with any of these.
2. Do not use in explosive atmospheres.
3. Do not use in locations subject to vibration or impact.
4. Do not use in locations where radiated heat will be received from nearby heat sources.
5. Employ suitable protective measures in locations where there is contact with water droplets, oil or welding spatter, etc.

Maintenance

⚠️ Warning
1. Removing the product
   1. Shut off the fluid supply and release the fluid pressure in the system.
   2. Shut off the power supply.
   3. Dismount the product.
2. Low frequency operation
   Switch valves at least once every 30 days to prevent malfunction.
   Also, in order to use it under the optimum state, conduct a regular inspection once every six months.

⚠️ Caution
1. Storage
   In the case of long term storage, thoroughly remove all moisture to prevent rust and deterioration of rubber materials, etc.
2. Exhaust the drain from an air filter periodically.
6.0 MPa Direct Operated Regulator (Relieving Type)

Series VCHR

How to Order

VCHR 30 06 G

- **Body size**: 30, 40
- **Thread type**: G thread for hydraulics and pneumatics conforming to ISO1179-1
- **Port size**:
  - 06: 3/4
  - 10: 1
  - 14: 1-1/2

Uses NSF-H1-certified grease on the guide ring (sliding) part.

Improved durability under a high pressure environment is due to the polyurethane elastomer poppet.

Adopting a metal-sealed relief valve improves the durability.

A special fluoro-resin seal is adopted for the sliding part.

Stable responsiveness after extended inactivity. Less likely to subject to a pressure changes.

Service life: 10 million cycles

Table:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port size</th>
<th>VCHR30</th>
<th>VCHR40</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>3/4</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>14</td>
<td>1-1/2</td>
<td>●</td>
<td></td>
</tr>
</tbody>
</table>
Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>VCHR30</th>
<th>VCHR40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve construction</td>
<td>Piston type</td>
<td></td>
</tr>
<tr>
<td>Valve material</td>
<td>Polyurethane elastomer</td>
<td></td>
</tr>
<tr>
<td>Relief mechanism</td>
<td>Relieving type</td>
<td></td>
</tr>
<tr>
<td>Port size</td>
<td>G3/4, G1</td>
<td>G1, G1-1/2</td>
</tr>
<tr>
<td>Thread type</td>
<td>G thread for hydraulics and pneumatics conforming to ISO1179-1</td>
<td></td>
</tr>
<tr>
<td>Fluid</td>
<td>Air</td>
<td></td>
</tr>
<tr>
<td>Max. operating pressure</td>
<td>6.0 MPa</td>
<td></td>
</tr>
<tr>
<td>Set pressure range</td>
<td>0.5 to 5.0 MPa</td>
<td></td>
</tr>
<tr>
<td>Fluid temperature</td>
<td>−5 to 60°C</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>−5 to 60°C</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>4.4 kg</td>
<td>6.2 kg</td>
</tr>
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</table>

Pressure Characteristics

**VCHR30**

<table>
<thead>
<tr>
<th>Inlet pressure (MPa)</th>
<th>Outlet pressure (MPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>2.0</td>
<td>1.5</td>
</tr>
<tr>
<td>3.0</td>
<td>1.3</td>
</tr>
<tr>
<td>4.0</td>
<td>1.1</td>
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</table>

**VCHR40**

<table>
<thead>
<tr>
<th>Inlet pressure (MPa)</th>
<th>Outlet pressure (MPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>2.0</td>
<td>1.5</td>
</tr>
<tr>
<td>3.0</td>
<td>1.3</td>
</tr>
<tr>
<td>4.0</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Flow Characteristics

**VCHR30**

<table>
<thead>
<tr>
<th>Flow rate (l/min)</th>
<th>Outlet pressure (MPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10,000</td>
<td>6.0</td>
</tr>
<tr>
<td>20,000</td>
<td>5.0</td>
</tr>
<tr>
<td>30,000</td>
<td>4.0</td>
</tr>
<tr>
<td>40,000</td>
<td>3.0</td>
</tr>
</tbody>
</table>

**VCHR40**

<table>
<thead>
<tr>
<th>Flow rate (l/min)</th>
<th>Outlet pressure (MPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10,000</td>
<td>6.0</td>
</tr>
<tr>
<td>20,000</td>
<td>5.0</td>
</tr>
<tr>
<td>30,000</td>
<td>4.0</td>
</tr>
<tr>
<td>40,000</td>
<td>3.0</td>
</tr>
</tbody>
</table>
### Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Aluminum + Hard anodized</td>
</tr>
<tr>
<td>2</td>
<td>Bonnet</td>
<td>Aluminum + Hard anodized</td>
</tr>
<tr>
<td>3</td>
<td>Valve</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>4</td>
<td>Valve spool</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>5</td>
<td>Piston</td>
<td>Steel + Electroless nickel plated</td>
</tr>
<tr>
<td>6</td>
<td>Spring guide</td>
<td>Steel + Electroless nickel plated</td>
</tr>
<tr>
<td>7</td>
<td>Spring seat</td>
<td>Steel + Electroless nickel plated</td>
</tr>
<tr>
<td>8</td>
<td>Spool guide</td>
<td>Aluminum + Hard anodized</td>
</tr>
<tr>
<td>9</td>
<td>Seal A</td>
<td>Resin</td>
</tr>
<tr>
<td>10</td>
<td>Seal B</td>
<td>Resin</td>
</tr>
<tr>
<td>11</td>
<td>Guide ring</td>
<td>Resin</td>
</tr>
<tr>
<td>12</td>
<td>Adjusting bolt</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>13</td>
<td>Return spring</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>14</td>
<td>Cushion</td>
<td>Polyurethane elastomer</td>
</tr>
<tr>
<td>15</td>
<td>Poppet</td>
<td>Polyurethane elastomer</td>
</tr>
<tr>
<td>16</td>
<td>Plate</td>
<td>Steel + Electroless nickel plated</td>
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<td>17</td>
<td>Spring</td>
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<td>18</td>
<td>Guide ring</td>
<td>Resin</td>
</tr>
<tr>
<td>19</td>
<td>Guide ring</td>
<td>Resin</td>
</tr>
<tr>
<td>20</td>
<td>Hexagon socket head cap screw</td>
<td>Carbon steel</td>
</tr>
<tr>
<td>21</td>
<td>Hexagon nut</td>
<td>Carbon steel</td>
</tr>
<tr>
<td>22</td>
<td>Hexagon bolt</td>
<td>Carbon steel</td>
</tr>
<tr>
<td>23</td>
<td>Spring washer</td>
<td>Carbon steel</td>
</tr>
<tr>
<td>24</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>25</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>26</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>27</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>28</td>
<td>Hexagon socket head plug</td>
<td>Carbon steel</td>
</tr>
</tbody>
</table>
6.0 MPa Direct Operated Regulator
(Relieving Type) Series VCHR

Dimensions

VCHR30

VCHR40
Regulator Precautions
Be sure to read this before handling.

<table>
<thead>
<tr>
<th>Caution on Design</th>
<th>Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Warning</strong> 1. Consult with SMC when leakage is never permitted because of the operating environment, or if fluids other than air will be used. 2. Be sure to install a safety device as output pressure exceeding the set pressure value could cause equipment damage or malfunctions on the outlet side.</td>
<td></td>
</tr>
</tbody>
</table>

| **Caution** 1. Using the product outside the specified range is not allowed. Consult with SMC when using the product outside the specified range of operating pressure, temperature, pressure, etc. |

| **Warning** 1. Adjust while confirming the pressure gauge value in the inlet and outlet sides. Overrotating the handle will damage the inner components. |

| **Caution** 1. Adjust after carefully confirming the inlet pressure. 2. Setting the pressure with the handle should be conducted in the upper direction. Setting the pressure in the lower direction may result in the pressure to the drop below the original set pressure. Turning the handle clockwise will increase the outlet side pressure. Meanwhile, turning counterclockwise will decrease the pressure. |

| **Warning** 1. Grease may leak into the outlet side because it has been applied to the inner sliding parts and seals. Contact SMC when such cases should be avoided. 2. Contact SMC as the set pressure of the outlet side may fluctuate when air has not been consumed for a long period of time, or when the product is used in a shut-off or balancing circuit on the outlet side. 3. The set outlet side pressure range should be less than 85% of the inlet side pressure. Setting a pressure exceeding 85% may be subject to fluctuation of flow or pressure in the inlet side, resulting in unstable operation. 4. The maximum value in catalogue set pressure range has a tolerance. Therefore, the pressure setting may exceed this value. 5. Confirm with SMC when the product will be used in circuits, requiring highly precise relief sensitivity or setting precision. |

| **Warning** 1. When tightening a screw on the piping material, use the recommended torque, holding the female side. Insufficient torque will cause looseness or inferior sealing. However, overtightening will cause damage to the thread. Also, tightening without holding the female side will put excessive direct stress on brackets, etc., resulting in damage, etc. 2. Use caution so twisting or bending other than the self-weight moment will not be applied to the product. Otherwise, it will result in damage. Support the external piping separately. 3. Inflexible piping such as steel piping is subject to excessive moment loads or transmission of vibrations from the piping side. Use flexible tubing, etc. between them to avoid it. |

| **Warning** 1. Confirm the “IN” and “OUT” showing the inlet/outlet of the air flow or arrow mark before connection. Reverse connections will result in malfunction. 2. Provide adequate space for maintenance or operation in the upper, lower and front of each product. Regarding this space, refer to the dimensions of each product. |

**Selection**

**Warning**

1. Confirm the “IN” and “OUT” showing the inlet/outlet of the air flow or arrow mark before connection. Reverse connections will result in malfunction.

**Caution**

1. Confirm the “IN” and “OUT” showing the inlet/outlet of the air flow or arrow mark before connection. Reverse connections will result in malfunction.
Adjustment

⚠️ Caution
1. When adjusting the outlet side pressure, moment is applied to the adjusting bolt. Support it separately so that any moment is not applied to the external pipings.

<table>
<thead>
<tr>
<th>Set pressure</th>
<th>1 MPa</th>
<th>2 MPa</th>
<th>3 MPa</th>
<th>4 MPa</th>
<th>5 MPa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td>15</td>
</tr>
</tbody>
</table>

2. When adjusting the outlet side pressure, the adjusting bolt (32 mm width across flats) can be rotated with a wrench. A screwdriver of approximately 20 to 30 mm can also be used for easy adjustments, using the (ø11) hole on the width across flats.

⚠️ Warning
1. When tightening a screw on the piping material, use the recommended torque, holding the female side. Insufficient torque will cause looseness or inferior sealing. However, overtightening will cause damage to the thread. Also, tightening without holding the female side will put excessive direct stress on brackets, etc., resulting in damage, etc.

<table>
<thead>
<tr>
<th>Connecting thread</th>
<th>3/4</th>
<th>1</th>
<th>1-1/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque</td>
<td>28 to 30</td>
<td>36 to 38</td>
<td>48 to 50</td>
</tr>
</tbody>
</table>

⚠️ Caution
1. This product cannot be disassembled since it is made of precision components with specific tolerances.
5.0 MPa Silencer
Series VCHN

35 dB(A) to noise reduction
(At supply pressure of 4.0 MPa, back pressure 2.0 MPa)
* 45 dB(A) noise reduction model can be "Made to Order".

1/10 M clogging reduction
(SMC comparison)
Double-layer sound absorbing material
with different filtration reduces clogging.

Standard integrated relief valve
The relief valve will activate when
the silencer's internal pressure
exceeds 1.8 MPa.
* The error indicator and the pressure switch, etc.
can be mounted as "Made to Order".

Improved maintenance
By removing the bolt, the sound
absorbing material can be replaced
without removing the silencer.

30-40% reduction in freezing
(SMC comparison) (Optional)
Freezing is reduced by a high pressure
sleeve and quick exhaust.

How to Order
VCHN 3 06

Body size
Option
Nil None
F With freeze reduction

Port size
Symbol Port size VCHN 3 VCHN 4
06 R3/4 ●
10 R1 ● ●
12 R1 1/4 ● ●
14 R1 1/2 ● ●
Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>VCHN3</th>
<th>VCHNF3</th>
<th>VCHN4</th>
<th>VCHNF4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. operating pressure (MPa)</td>
<td></td>
<td></td>
<td>5.0 (Solenoid valve inlet pressure)</td>
<td></td>
</tr>
<tr>
<td>Relief valve opening pressure (MPa)</td>
<td></td>
<td></td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>Port size</td>
<td>R3/4</td>
<td>R1</td>
<td>R3/4</td>
<td>R1</td>
</tr>
<tr>
<td>Effective area (mm²)</td>
<td>200</td>
<td>180</td>
<td>280</td>
<td>370</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sound absorbing material effective area (Single) (mm²)</td>
<td>420</td>
<td></td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Fluid temperature (°C)</td>
<td>5 to 80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature (°C)</td>
<td>5 to 80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise reduction dB(A)</td>
<td></td>
<td></td>
<td>35</td>
<td>(Supply pressure 4.0 MPa, Back pressure 2.0 MPa)</td>
</tr>
</tbody>
</table>

Construction/Dimensions

VCHN₃⁻⁰⁶ to ¹⁴

Freeze reduction type/Option

VCHNF₃⁻⁰⁶ to ¹⁴

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size (R)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCHN3-06</td>
<td>3/4</td>
<td>200</td>
<td>ø72</td>
<td>ø74</td>
<td>41</td>
<td>590</td>
</tr>
<tr>
<td>VCHNF3-06</td>
<td>3/4</td>
<td>200</td>
<td>ø72</td>
<td>ø74</td>
<td>41</td>
<td>710</td>
</tr>
<tr>
<td>VCHN3-10</td>
<td>1</td>
<td>200</td>
<td>ø72</td>
<td>ø74</td>
<td>41</td>
<td>605</td>
</tr>
<tr>
<td>VCHNF3-10</td>
<td>1</td>
<td>200</td>
<td>ø72</td>
<td>ø74</td>
<td>41</td>
<td>725</td>
</tr>
<tr>
<td>VCHN4-10</td>
<td>1</td>
<td>230</td>
<td>ø72</td>
<td>ø74</td>
<td>41</td>
<td>665</td>
</tr>
<tr>
<td>VCHNF4-10</td>
<td>1</td>
<td>230</td>
<td>ø72</td>
<td>ø74</td>
<td>41</td>
<td>810</td>
</tr>
<tr>
<td>VCHN4-12</td>
<td>1/1/4</td>
<td>240</td>
<td>ø72</td>
<td>ø74</td>
<td>54</td>
<td>765</td>
</tr>
<tr>
<td>VCHNF4-12</td>
<td>1/1/4</td>
<td>240</td>
<td>ø72</td>
<td>ø74</td>
<td>54</td>
<td>910</td>
</tr>
<tr>
<td>VCHN4-14</td>
<td>1/1/2</td>
<td>240</td>
<td>ø72</td>
<td>ø74</td>
<td>54</td>
<td>790</td>
</tr>
<tr>
<td>VCHNF4-14</td>
<td>1/1/2</td>
<td>240</td>
<td>ø72</td>
<td>ø74</td>
<td>54</td>
<td>935</td>
</tr>
</tbody>
</table>
1. The exhaust port can clog due to a clogged or frozen silencer. Consider design safety to avoid malfunctions of the entire system. Also, under conditions conducive to freezing, use a freeze reduction model. (VCHNF series)

**Caution**

1. A silencer reduces compressed air exhaust noise from the pneumatic equipment.
   Noise other than that generated by the exhaust assembly (noise generated inside piping, due to equipment vibration, solenoid valve switching, etc.) cannot be reduced. As for noise generated by sources other than the exhaust, locate the cause and take measures.

2. Silencer inlet side pressure shows the solenoid valve supply pressure (P1). (See below.)

3. Noise reduction may vary, depending on the pneumatic circuit or pressure, etc. exhausted from solenoid valves.

**Adjustment**

**Warning**

1. When exhaust speed begins to slow from clogging and system functionality begins to degrade, replace with a new silencer or sound-absorbent material.
   Also, be sure to confirm the actuator’s operation status once per day.

**Caution on Design**

1. When replacing the sound absorbing material, please follow the instructions below.

**Maintenance**

**Caution**

1. Select a silencer with a larger effective area (including the synthetic effective area) than the solenoid valve.

**Mounting**

**Caution**

1. Tighten the silencer, using an appropriate wrench on the width across flats, within the range of the recommended tightening torque as shown below.
   Do not use a pipe wrench. Otherwise, the silencer will be damaged.

<table>
<thead>
<tr>
<th>Recommended Tightening Torque (Unit: Nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connecting thread</td>
</tr>
<tr>
<td>Torque</td>
</tr>
</tbody>
</table>

2. Do not apply a lateral load on the main body during or after mounting.

3. When the silencer becomes loose due to vibrations from the mounted equipment, re-mount the silencer after applying an anti-loosening agent to the thread.

**Replacement Parts**

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Description</th>
<th>Applicable model</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCHN3-EL</td>
<td>Sound absorbing material</td>
<td>For VCHN(F)3</td>
</tr>
<tr>
<td>VCHN4-EL</td>
<td>Sound absorbing material</td>
<td>For VCHN(F)4</td>
</tr>
</tbody>
</table>
Remote control is possible with electro-pneumatic regulator series ITV.

**VCHRA 30-06**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port size</th>
<th>VCHRA30</th>
<th>VCHRA40</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>3/4</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>14</td>
<td>1+1/2</td>
<td>●</td>
<td></td>
</tr>
</tbody>
</table>

**Specifications**

- **Model**: VCHRA30, VCHRA40
- **Valve construction**: Piston type
- **Valve material**: Polyurethane elastomer
- **Relief mechanism**: Relieving type
- **Port size**: G3/4, G1, G1 1/2
- **Thread standard**: G thread for hydraulics and pneumatics conforming to ISO1179-1
- **Fluid**: Air
- **Max. operating pressure**: 6.0 MPa
- **Pilot pressure range**: Refer to the graph.
- **Set pressure range**: 0.5 to 4.5 MPa
- **Fluid temperature**: –5 to 60 °C
- **Ambient temperature**: –5 to 60 °C
- **Weight**: 2.9 kg, 4.1 kg

**Pilot pressure range**

- **VCHRA40**: PA = 0.2 x P2 + 0.02
- **VCHRA30**: PA = 0.22 x P2 + 0.01

**AXT836 A**

**Specifications**

- **Symbol**: A, B, C, D, E
- **Passage**: N.C., N.O.
- **Piping size**: Flange type, 3/4" fitting integrated type

**Integrated fitting type**

**Flange type**

**Specifications**

- **Fluid**: Air/Inert gas
- **Fluid temperature**: –10 to 60 °C (with no freezing)
- **Ambient temperature**: –10 to 60 °C (with no freezing)
- **Operating pressure range**: 0 to 22.0 MPa, 0 to 20.0 MPa
- **Proof pressure**: 35.0 MPa
- **Pilot pressure range**: 0.45 to 0.7 MPa, 0.3 to 0.5 MPa
- **Valve leakage**: 0.1 cm³/min or less
- **Orifice size**: 2.8 mm

**5.0 MPa pressure sensor**

**Specifications**

- **Model**: PSE550-XS12
- **Rated pressure range**: 0 to 5.0 MPa
- **Proof pressure**: 10.0 MPa

For detailed dimensions, specifications and delivery, please contact SMC.
## Related Equipment

2-colour display digital pressure switch  
**Series ISE75/75H**

### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>ISE75</th>
<th>ISE75H</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated pressure range</strong></td>
<td>0 to 10.0 MPa</td>
<td>0 to 15.0 MPa</td>
</tr>
<tr>
<td><strong>Set pressure range</strong></td>
<td>0.4 to 10.0 MPa</td>
<td>0.5 to 15.0 MPa</td>
</tr>
<tr>
<td><strong>Proof pressure</strong></td>
<td>30.0 MPa</td>
<td>45.0 MPa</td>
</tr>
<tr>
<td><strong>Set pressure resolution</strong></td>
<td>0.1 MPa</td>
<td></td>
</tr>
<tr>
<td><strong>Fluid</strong></td>
<td>Fluids that will not corrode stainless steel 430 and 630</td>
<td></td>
</tr>
<tr>
<td><strong>Power supply voltage</strong></td>
<td>12 to 24 VDC, Ripple (p-p) 10% or less (with power supply polarity protection)</td>
<td></td>
</tr>
<tr>
<td><strong>Current consumption</strong></td>
<td>55 mA or less (at no load)</td>
<td></td>
</tr>
</tbody>
</table>
| **Switch output**<sup>1</sup> | Output -43:  
1 setting; NPN open collector 1 output (Pin no. 4) + PNP open collector 1 output (Pin no. 2)<sup>Note</sup>  
Output -65:  
PNP open collector 1 output (Pin no. 4) |
| **Max. load current** | 80 mA |
| **Max. applied voltage** | 30 V (with NPN output) |
| **Residual voltage** | 1 V or less (with load current of 80 mA) |
| **Response time** | 2.5 ms (Response time selections with anti-chattering function: 20 ms, 160 ms, 640 ms, 1000 ms, 2000 ms) |
| **Short circuit protection** | With short circuit protection |

Note: The NPN and PNP outputs activate with a single set value.

---

<sup>1</sup> The NPN and PNP outputs activate with a single set value.
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Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.