## 5 Port Pilot Operated Solenoid Valve

**Series Variations**

<table>
<thead>
<tr>
<th>Series</th>
<th>Sonic conductance C ((\text{dm}^3/\text{s} \cdot \text{bar}))</th>
<th>Type of actuation</th>
<th>Voltage</th>
<th>Electrical entry</th>
<th>With light/surge voltage suppressor (Option)</th>
<th>Manual override</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS1000 (P.1114)</td>
<td>1.8 1.8</td>
<td>Single 3 position</td>
<td>(Standard) 100 VAC, 50/60 Hz</td>
<td>Conduit terminal (T)</td>
<td>Grommet terminal (G)</td>
<td>Non-locking push type (Flush)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Double 2 position</td>
<td>200 VAC, 50/60 Hz</td>
<td>DIN terminal (D)</td>
<td>Grommet terminal (E)</td>
<td>Non-locking push type (Extended)</td>
</tr>
<tr>
<td>VFS2000 (P.1122)</td>
<td>3.4 3.4</td>
<td>2 position single</td>
<td>110 to 125 VAC, 50/60 Hz</td>
<td>Conduit terminal (T)</td>
<td>Grommet terminal (G)</td>
<td>Locking type (Tool required)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 position double</td>
<td>240 VAC, 50/60 Hz</td>
<td>DIN terminal (D)</td>
<td>Grommet terminal (E)</td>
<td>Locking type (Lever)</td>
</tr>
<tr>
<td>VFS3000 (P.1130)</td>
<td>6.8 6.5</td>
<td>3 position closed center</td>
<td>12 VDC 100 VDC</td>
<td>DIN terminal (D)</td>
<td>Grommet terminal (E)</td>
<td>Non-locking push type (Flush)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 position exhaust center</td>
<td>(Standard) 100 VAC, 50/60 Hz</td>
<td>Conduit terminal (T)</td>
<td>Grommet terminal (G)</td>
<td>Non-locking push type (Extended)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 position pressure center</td>
<td>240 VAC, 50/60 Hz</td>
<td>DIN terminal (D)</td>
<td>Grommet terminal (E)</td>
<td>Locking type (Tool required)</td>
</tr>
</tbody>
</table>

- Locking type (levers) is not available for body ported Series VFS2000/3000.

- DC: There is polarity. (Lead wire Red: +, Black: –)

### Body Mounted

- VFS2000 Plug-in type Non plug-in type (P.1138)
- VFS3000 Plug-in type Non plug-in type (P.1162)
- VFS4000 Plug-in type Non plug-in type (P.1182)
- VFS5000 Plug-in type Non plug-in type (P.1202)
- VFS6000 Plug-in type Non plug-in type (P.1218)

### Base Mounted

- VFS2000 Plug-in type Non plug-in type (P.1138)
- VFS3000 Plug-in type Non plug-in type (P.1162)
- VFS4000 Plug-in type Non plug-in type (P.1182)
- VFS5000 Plug-in type Non plug-in type (P.1202)
- VFS6000 Plug-in type Non plug-in type (P.1218)
## Series VFS

### Manifold Variations

<table>
<thead>
<tr>
<th>Manifold</th>
<th>Bar base</th>
<th>Stacking base</th>
<th>With attachment plug lead wire</th>
<th>With terminal block</th>
<th>With multi-connector</th>
<th>With D-sub connector</th>
<th>Non plug-in (Connection to each valve)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS1000</td>
<td>● (P.1119)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>VFS2000</td>
<td>● (P.1127)</td>
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<tr>
<td>VFS3000</td>
<td>● (P.1136)</td>
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<td></td>
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<tr>
<td>VFS2000</td>
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<tr>
<td>VFS3000</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>VFS4000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>VFS5000</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Bar Base** (Series VFS1000/2000)
  - Pilot Individual EXH
  - Pilot common EXH

- **Stacking base** (Series VFS3000)
  - Pilot common EXH

- **Plug-in**
  - With terminal block
    - With attachment plug lead wire
  - With multi-connector
  - With D-sub connector

- **Non Plug-in**
  - Grommet terminal
  - DIN terminal

* Bottom piping is available as an option.
### Manifold Option

<table>
<thead>
<tr>
<th>With exhaust cleaner</th>
<th>With control unit</th>
<th>Driproof manifold (Equivalent to IP65)</th>
<th>Serial transmission kit manifold (EX123/4-type compatible)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Manifold Option Parts

<table>
<thead>
<tr>
<th>Individual SUP spacer</th>
<th>Individual EXH spacer</th>
<th>SUP block disk</th>
<th>EXH block disk</th>
<th>Throttle valve spacer</th>
<th>Interface regulator</th>
<th>Air shutoff valve spacer</th>
<th>Air release valve spacer</th>
<th>Double check spacer</th>
<th>Blanking plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>(P.1113)</td>
<td>(P.1114)</td>
<td>(P.1114)</td>
<td>(P.1114)</td>
<td>(P.1114)</td>
<td>(P.1114)</td>
<td>(P.1114)</td>
<td>(P.1114)</td>
<td>(P.1114)</td>
<td>(P.1114)</td>
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<td>(P.1115)</td>
<td>(P.1116)</td>
<td>(P.1116)</td>
<td>(P.1116)</td>
<td>(P.1116)</td>
<td>(P.1116)</td>
<td>(P.1116)</td>
<td>(P.1116)</td>
<td>(P.1116)</td>
<td>(P.1116)</td>
</tr>
<tr>
<td>(P.1117)</td>
<td>(P.1118)</td>
<td>(P.1118)</td>
<td>(P.1118)</td>
<td>(P.1118)</td>
<td>(P.1118)</td>
<td>(P.1118)</td>
<td>(P.1118)</td>
<td>(P.1118)</td>
<td>(P.1118)</td>
</tr>
<tr>
<td>(P.1119)</td>
<td>(P.1120)</td>
<td>(P.1120)</td>
<td>(P.1120)</td>
<td>(P.1120)</td>
<td>(P.1120)</td>
<td>(P.1120)</td>
<td>(P.1120)</td>
<td>(P.1120)</td>
<td>(P.1120)</td>
</tr>
</tbody>
</table>

Note: Made to Order Specifications

1. Dripproof Manifold (Equivalent to IP65) With serial transmission kit
2. Individual SUP spacer
3. Individual EXH spacer
4. SUP/EXH block disk
5. Throttle valve spacer
6. Interface regulator
7. Air shutoff valve spacer
8. Air release valve spacer
9. Double check spacer
10. Blanking plate
## Model Specifications

### Flow Characteristics

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>b</th>
<th>Cv</th>
<th>C</th>
<th>1 - 4/2 (P -&gt; A/B)</th>
<th>4/2 - 5/3 (A/B -&gt; R1/R2)</th>
<th>Max. operating cycle (rpm)</th>
<th>Response time (ms)</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS1120</td>
<td>1/4</td>
<td>1.7</td>
<td>0.22</td>
<td>0.38</td>
<td>1.8</td>
<td>2.0</td>
<td>0.38</td>
<td>0.19</td>
<td>0.40</td>
</tr>
<tr>
<td>VFS1220</td>
<td>1/4</td>
<td>1.7</td>
<td>0.22</td>
<td>0.38</td>
<td>1.8</td>
<td>2.0</td>
<td>0.38</td>
<td>0.19</td>
<td>0.40</td>
</tr>
<tr>
<td>VFS1320</td>
<td>1/4</td>
<td>1.6</td>
<td>0.20</td>
<td>0.37</td>
<td>1.8</td>
<td>2.0</td>
<td>0.41</td>
<td>0.20</td>
<td>0.41</td>
</tr>
<tr>
<td>VFS1420</td>
<td>1/4</td>
<td>1.7</td>
<td>0.18</td>
<td>0.38</td>
<td>1.9</td>
<td>2.0</td>
<td>0.44</td>
<td>0.19</td>
<td>0.44</td>
</tr>
<tr>
<td>VFS1520</td>
<td>1/4</td>
<td>1.7</td>
<td>0.24</td>
<td>0.40</td>
<td>1.6</td>
<td>0.18</td>
<td>0.37</td>
<td>0.18</td>
<td>0.37</td>
</tr>
</tbody>
</table>

### Standard Specifications

- **Fluid**: Air/Inert gas
- **Maximum operating pressure**: 1.0 MPa
- **Min. operating pressure**: 0.1 MPa
- **Proof pressure**: 1.5 MPa
- **Ambient and fluid temperature**: -10 to 60°C
- **Lubrication**: Non-lube
- **Coil rated voltage**: 12, 100 VDC
- **Coil insulation type**: Class B or equivalent (130°C)
- **Electrical entry**: Grommet, Grommet terminal, Conduit terminal, DIN terminal

### Option Specifications

- **Pilot valve manual override**: Non-locking push type (PS)
- **Apparent power (Power consumption)**: 1.8 W (2.04 W: With light/surge voltage suppressor)

### Note

1. Use dry air at low temperatures.
2. Use turbine oil Class 1 (ISO VG32), if lubricated.
3. Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)
4. Based on JIS C 0920.
5. Based on JIS C 4003.
5 Port Pilot Operated Solenoid Valve
Metal Seal, Body Ported

Series VFS1000

How to Order

VFS1 [1] [20] [1] [G] [ ] [01] [ ] [ ]

Option

CE-compliant

Symbol

2 position single

2 position double

3 position closed center

3 position exhaust center

3 position pressure center

Body (Pilot exhaust)

Individual EXH

Common EXH

Electrical entry

G: Grommet

E: Grommet terminal

T: Conduit terminal

D: DIN terminal

Y: Conforming to DIN43650B standard

F: Conduit terminal with light/surge voltage suppressor

G: Grommet terminal with light/surge voltage suppressor

Type

Option

Thread type

F: With foot bracket

Option

Port size

01: Rc 1/8

Manual override

A: Non-locking push type (Flush)

B: Locking type (Lever)

With surge voltage suppressor

Non-locking push type

Locking type

G: Grommet

DIN connector is not attached.

Nil

With surge voltage suppressor

How to Order Pilot Valve Assembly

SF4 [1] [DZ] [ ] [21]

Applicable model

For VFS1:20

Individual pilot exhaust

For VFS1:30

Common pilot exhaust

Coil rated voltage

1: 100 VAC (50/60 Hz)

2: 200 VAC (50/60 Hz)

3: 110 to 120 VAC (50/60 Hz)

4: 220 VAC (50/60 Hz)

5: 24 VDC

6: 12 VDC

7: 240 VAC (50/60 Hz)

8: Other

Electrical entry, Light/Surge voltage suppressor

G: Grommet

D: DIN terminal

T: Conduit terminal

Y: Conforming to DIN43650B standard

F: DIN terminal with light/surge voltage suppressor

G: Grommet terminal with light/surge voltage suppressor

Y: Conforming to DIN43650B standard

D: DIN connector is not attached.

Option

Manual override

A: Non-locking push type (Flush)

B: Locking type (Tool required)

C: Locking type (Lever)

Option

Other

Drawing

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com
Series **VFS1000**

**Cylinder Speed Chart**

**Body Ported**

<table>
<thead>
<tr>
<th>Series</th>
<th>Average speed (mm/s)</th>
<th>Bore size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ø6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø32</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø63</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø100</td>
</tr>
</tbody>
</table>

**Conditions**

<table>
<thead>
<tr>
<th>Body ported</th>
<th>Series CJ2</th>
<th>Series CM2</th>
<th>Series MB, CA2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tube bore x Length</td>
<td>T0604 x 1 m</td>
<td>T0806 x 1 m</td>
<td>AN101-01</td>
</tr>
<tr>
<td>Speed controller</td>
<td>AS3001F-06</td>
<td>AS3001F-08</td>
<td>AN101-01</td>
</tr>
</tbody>
</table>

**Construction**

2 position single  
2 position double  
3 position closed center/exhaust center/pressure center

**Component Parts**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Aluminum die-casted</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>2</td>
<td>Spool/Sleeve</td>
<td>Stainless steel</td>
<td>—</td>
</tr>
<tr>
<td>3</td>
<td>End plate</td>
<td>Resin</td>
<td>—</td>
</tr>
<tr>
<td>4</td>
<td>Piston</td>
<td>Resin</td>
<td>—</td>
</tr>
<tr>
<td>5</td>
<td>Return spring</td>
<td>Stainless steel</td>
<td>—</td>
</tr>
<tr>
<td>6</td>
<td>Pilot valve assembly</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>7</td>
<td>Detent assembly</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

* Refer to “How to Order Pilot Valve Assembly” on page 1115.

* It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.

* The average velocity of the cylinder is the value that the stroke is divided by the total stroke time.

* Load factor: (Load weight x 9.8)/Theoretical force x 100%

---

**Series VFS1000**

**Cylinder Speed Chart**

**Body Ported**

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<tr>
<th>Series</th>
<th>Average speed (mm/s)</th>
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<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>ø16</td>
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<td>ø63</td>
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<td></td>
<td>ø80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø100</td>
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</tbody>
</table>

**Conditions**

<table>
<thead>
<tr>
<th>Body ported</th>
<th>Series CJ2</th>
<th>Series CM2</th>
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<tr>
<td>Tube bore x Length</td>
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<td>AS3001F-06</td>
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**Construction**

2 position single  
2 position double  
3 position closed center/exhaust center/pressure center

**Component Parts**

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<td>Stainless steel</td>
<td>—</td>
</tr>
<tr>
<td>3</td>
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<td>Resin</td>
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<td>Piston</td>
<td>Resin</td>
<td>—</td>
</tr>
<tr>
<td>5</td>
<td>Return spring</td>
<td>Stainless steel</td>
<td>—</td>
</tr>
<tr>
<td>6</td>
<td>Pilot valve assembly</td>
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<td>—</td>
</tr>
<tr>
<td>7</td>
<td>Detent assembly</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

* Refer to “How to Order Pilot Valve Assembly” on page 1115.
5 Port Pilot Operated Solenoid Valve
Metal Seal, Body Ported  Series VFS1000

2 Position Single — Grommet, Grommet terminal, Conduit terminal, DIN terminal

Grommet : VFS1120-□G
Foot bracket (F)
Part no. : AXT626-10A

2 x ø4.5 mounting hole

Grommet terminal: VFS1120-□E/EZ

Conduit terminal: VFS1120-□T/TZ

DIN terminal: VFS1120-□D/DZ/Y/YZ

Foot bracket (F)
Part no. : AXT626-10A

2 x ø4.5 mounting hole

Pilot EXH
(No VFS1□36)

Manual override
Non-locking push type

2 x ø3.5 mounting hole

Manual override
(Locking type)

2 x ø4.5 mounting hole

Solenoid valve

M3 x 0.5 x 14L
Countersunk head screw
Tightening torque: 0.6 N·m

With light/surge voltage suppressor (EZ)

With light/surge voltage suppressor (DZ)

Applicable heavy-duty code
O.D. ø6 to ø8
(Y: ø4.7 to ø7)

Applicable heavy-duty code
O.D. ø6 to ø8

With light/surge voltage suppressor (TZ)

With light/surge voltage suppressor (Y)

( ): Y, YZ

VFS
VFR
VQ4
VQ5
VQC
VQZ
VQ7

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com
2 Position Double, 3 Position — Grommet, Grommet terminal, Conduit terminal, DIN terminal

Grommet: VFS1220-□G, VFS1320-□G, VFS1420-□G, VFS1520-□G

DIN terminal: VFS1220-□D/DZ/Y/YZ
VFS1320-□D/DZ/Y/YZ
VFS1420-□D/DZ/Y/YZ
VFS1520-□D/DZ/Y/YZ

Conduit terminal: VFS1220-□T/TZ
VFS1320-□T/TZ
VFS1420-□T/TZ
VFS1520-□T/TZ

Pilot EXH
(No VFS1/30)

Applicable heavy-duty cord
O.D. ø6 to ø8
188 (3 position: 192.5)

With light/surge voltage suppressor (TZ)

Manual override
(Locking type)
### Specifications

<table>
<thead>
<tr>
<th>Manifold base type</th>
<th>Bar manifold, Body ported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stations</td>
<td>Max. 15 stations</td>
</tr>
</tbody>
</table>

#### Port Specifications

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Passage</th>
<th>Porting specifications: Rc (Connecting port size)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>Base: 1(P), 5(R1), 3(R2)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Valve: 4(A), 2(B)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Common: Side Rc: 1/8, Top Rc: 1/8</td>
</tr>
</tbody>
</table>

#### Option

- Blanking plate: VVFS1000-10A-1
- With gasket, screw

### How to Order Manifold Base

**VVFS1**

**VFS1-20**

**VFS1-30**

Part no. for mounting bolt and gasket: BG-VFS1030

### How to Order Manifold Assembly [Example]

Add the valve and option part numbers in order starting from the first station on the D side.

**<Example>**

<table>
<thead>
<tr>
<th>Manifold base</th>
<th>Pilot exhaust</th>
<th>Applicable valve model</th>
</tr>
</thead>
<tbody>
<tr>
<td>VVFS1-20</td>
<td>Pilot individual EXH</td>
<td>VFS1220-1D-01</td>
</tr>
<tr>
<td>VVFS1000-10A-1</td>
<td>Pilot common EXH</td>
<td>VFS1220-1D-01 mountable</td>
</tr>
</tbody>
</table>

The asterisk denotes the symbol for assembly. Prefix it to the part numbers of the solenoid valve.

### Series VFS1000 Manifold Specifications

- Single Base Type
- Compact and lightweight: Compact due to manifolding on a single base for mounting in small spaces.
- Keeps environmental air clean from pilot exhaust: Use of the VVFS1-30 manifold can exhaust intensively the pilot exhaust gas to the base side, and can prevent environmental aggravation due to noise and oil mist.

### Compact and Lightweight

- Suitable for compact and lightweight applications due to manifolding on a single base.

### Keeps Environmental Air Clean from Pilot Exhaust

- Effective in preventing environmental aggravation due to noise and oil mist by exhaust gas from the pilot exhaust.
**Series VFS1000**

**Type 20 Manifold — Pilot individual exhaust: VV5FS1-20-**

**Grommet terminal: E/EZ**

**Conduit terminal: T/TZ**

**DIN terminal: D/DZ/Y/YZ**

---

**Formula for manifold weight M = 0.049n + 0.059 (kg)**

n: Station

---

**Grommet: G**

**Lead wire O.D.**

Max. ø3.5

---

**Applicable heavy-duty cord**

O.D. ø6 to ø8

---

**Applicable heavy-duty cord**

O.D. ø6 to ø8
(Y: ø4.7 to ø7)

---

**Blanking plate**

---

**Manual override**

≈ 300

---

**Leak wire length**

---

**Symbol**

**L1**

59  83  107  131  155  179  203  227  251

**L2**

77  101  125  149  173  197  221  245  269

---

**Formula**

L1 = 24 x n + 11

L2 = 24 x n + 29

---

**Notes:**

1. Grommet: G
2. Type 20 Manifold — Pilot individual exhaust: VV5FS1-20-
3. Lead wire O.D.: Max. ø3.5
4. Applicable heavy-duty cord: O.D. ø6 to ø8
5. Blanking plate
7. Leak wire length

---

**1120**

Courtesy of Steven Engineering, Inc. - 230 Ryan Way, South San Francisco, CA 94080-6370 - Main Office: (650) 588-9200 - Outside Local Area: (800) 258-9200 - www.stevenengineering.com
## 5 Port Pilot Operated Solenoid Valve
### Series VFS1000

#### Type 30 Manifold — Pilot common exhaust: VV5FS1-30-

<table>
<thead>
<tr>
<th>Station</th>
<th>Grommet: G</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-01</td>
<td></td>
</tr>
</tbody>
</table>

**Grommet terminal: E/EZ**

**Conduit terminal: T/TZ**

**DIN terminal: D/DZ/Y/YZ**

### Formula for manifold weight

\[ M = 0.079n + 0.093 \text{ (kg)} \]

- \( n \): Station

### Symbol

<table>
<thead>
<tr>
<th>Symbol</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>
<th>9</th>
<th>10</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>( L_1 )</td>
<td></td>
<td>59</td>
<td>83</td>
<td>107</td>
<td>131</td>
<td>155</td>
<td>179</td>
<td>203</td>
<td>227</td>
<td>251</td>
<td>( L_1 = 24 \times n + 11 )</td>
</tr>
<tr>
<td>( L_2 )</td>
<td></td>
<td>77</td>
<td>101</td>
<td>125</td>
<td>149</td>
<td>173</td>
<td>197</td>
<td>221</td>
<td>245</td>
<td>269</td>
<td>( L_2 = 24 \times n + 29 )</td>
</tr>
</tbody>
</table>

---

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com
5 Port Pilot Operated Solenoid Valve
Metal Seal, Body Ported
Series VFS2000

Model

<table>
<thead>
<tr>
<th>Type of actuation</th>
<th>Model</th>
<th>Port size Rc</th>
<th>Flow characteristics</th>
<th>Max operating pressure (cycle per min)</th>
<th>Response time (ms)</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>VFS2120</td>
<td>1/8</td>
<td>3.2</td>
<td>0.24</td>
<td>0.78</td>
<td>0.28</td>
</tr>
<tr>
<td></td>
<td>VFS2130</td>
<td>1/8</td>
<td>4.0</td>
<td>0.20</td>
<td>0.90</td>
<td>0.32</td>
</tr>
<tr>
<td>Double</td>
<td>VFS2220</td>
<td>1/8</td>
<td>3.2</td>
<td>0.24</td>
<td>0.78</td>
<td>0.32</td>
</tr>
<tr>
<td></td>
<td>VFS2230</td>
<td>1/8</td>
<td>4.0</td>
<td>0.20</td>
<td>0.90</td>
<td>0.32</td>
</tr>
<tr>
<td>Closed center</td>
<td>VFS2240</td>
<td>1/8</td>
<td>3.2</td>
<td>0.24</td>
<td>0.78</td>
<td>0.32</td>
</tr>
<tr>
<td>Pressure center</td>
<td>VFS2520</td>
<td>1/8</td>
<td>3.1</td>
<td>0.23</td>
<td>0.75</td>
<td>0.32</td>
</tr>
</tbody>
</table>

Standard Specifications

Fluid: Air/min gas
Maximum operating pressure: 1.0 MPa
Minimum operating pressure: 0.7 MPa
Proof pressure: 1.5 MPa
Ambient and fluid temperature: –10 to 60°C
Lubrication: Non-lube
Pilot valve manual override: Non-locking push type (Flush)
Shock/Vibration resistance: Dustproof (degrees of protection IP65)
Enclosure: IP65 (IP67 in Type C)
Coil rated voltage: 100, 200 VAC, 50/60 Hz, 24 VDC
Allowable voltage fluctuation: –15 to +10% of rated voltage
Coil insulation type: Class B or equivalent (130°C)
Apparent power (Power consumption) AC: Holding 5.6 VA (50 Hz), 5.0 VA (60 Hz)
Power consumption: 1.8 W (2.04 W: With light/surge voltage suppressor)
Electrical entry: Grommet, Grommet terminal, Conduit terminal, DIN terminal

Option Specifications

Pilot type: External pilot
Pilot valve manual override: Non-locking push type (Flush), Locking type (Tool required)
Coil rated voltage: 110 to 120, 220, 240 VAC (50/60 Hz)
Option: With light/surge voltage suppressor
Foot bracket (With screw): Part no.: VFN200-17A, VFS2120 (single) only

Manifold

Body type: Applicable manifold base (Pilot EXH)
VFS2-20: Bar manifold (Individual EXH)
VFS2-30: Bar manifold (Common EXH base side)

Note 1) Based on JIS B 6375 (once per 30 days) for the minimum operating frequency.
Note 2) According to JIS B 8375 (2001). (The value at supply pressure 0.5 MPa.)
Note 3) Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)
Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz.

1) Use turbine oil Class 1 (ISO VG32), if lubricated.
2) Use oil in Class 1 (ISO VG32), if lubricated.

Note 2) Use turbine oil Class 1 (ISO VG32), if lubricated.
5 Port Pilot Operated Solenoid Valve
Metal Seal, Body Ported

Series VFS2000

How to Order

<table>
<thead>
<tr>
<th>Symbol</th>
<th>1</th>
<th>20</th>
<th>1</th>
<th>G</th>
<th>01</th>
<th>Option</th>
<th>CE-compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port size</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Nil</td>
<td>Rc</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rc</td>
<td>Rc</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NPT</td>
<td>NPT</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>T</td>
<td>T</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
<td>G</td>
</tr>
</tbody>
</table>

Manual override

| Nil | Non-locking push type (Flush) |
| A | Non-locking push type (Extended) |
| B | Locking type (Tool required) |

Light/Surge voltage suppressor

| Nil | None |
| A | With light/surge voltage suppressor |
| B | With surge voltage suppressor |

Electrical entry

| Nil | Conduit terminal |
| D | DIN terminal |
| Y | DIN terminal with light/surge voltage suppressor |
| T | DIN terminal with light/surge voltage suppressor |
| E | Grommet terminal |

How to Order Pilot Valve Assembly

<table>
<thead>
<tr>
<th>Series SF4</th>
<th>1</th>
<th>DZ</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coil rated voltage</td>
<td>1</td>
<td>100 VAC (50/60 Hz)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>200 VAC (50/60 Hz)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>110 to 120 VAC (50/60 Hz)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>220 VAC, 50/60 Hz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>24 VDC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>12 VDC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>240 VAC, 50/60 Hz</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

| Nil | Internal pilot |
| R | External pilot |

| Coil rated voltage | 1 | 100 VAC (50/60 Hz) |
| | 2 | 200 VAC (50/60 Hz) |
| | 3 | 110 to 120 VAC (50/60 Hz) |
| | 4 | 220 VAC (50/60 Hz) |
| | 5 | 24 VDC |
| | 6 | 12 VDC |
| | 7 | 240 VAC (50/60 Hz) |
| | 9 | Other |

Applicable model

| 12 | For VFS2120 | Individual pilot exhaust |
| 13 | For VFS2130 | Common pilot exhaust |

Manual override

| Nil | Non-locking push type (Flush) |
| A | Non-locking push type (Extended) |
| B | Locking type (Tool required) |

Approved

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**Series VFS2000**

**Cylinder Speed Chart**

Use as a guide for selection. Please confirm the actual conditions with SMC Sizing Program.

### Body Ported

<table>
<thead>
<tr>
<th>Series</th>
<th>Average speed (mm/s)</th>
<th>Bore size</th>
<th>800</th>
<th>700</th>
<th>600</th>
<th>500</th>
<th>400</th>
<th>300</th>
<th>200</th>
<th>100</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS2120-02</td>
<td>Series CJ2</td>
<td>Pressure 0.5 MPa</td>
<td>Load factor 50%</td>
<td>Stroke 60 mm</td>
<td>ø6</td>
<td>ø10</td>
<td>ø16</td>
<td>ø20</td>
<td>ø25</td>
<td>ø32</td>
<td>ø40</td>
</tr>
<tr>
<td></td>
<td>Series CM2</td>
<td>Pressure 0.5 MPa</td>
<td>Load factor 50%</td>
<td>Stroke 300 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Series MB, CA2</td>
<td>Pressure 0.5 MPa</td>
<td>Load factor 50%</td>
<td>Stroke 500 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Conditions

<table>
<thead>
<tr>
<th>Body ported</th>
<th>Series CJ2</th>
<th>Series CM2</th>
<th>Series MB, CA2</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS2120-02</td>
<td>Tube bore x Length</td>
<td>T0604 x 1 m</td>
<td>T1075 x 1 m</td>
</tr>
<tr>
<td>Speed controller</td>
<td>AS3001F-06</td>
<td>AS4001F-10</td>
<td></td>
</tr>
<tr>
<td>Silencer</td>
<td>AN110-01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Construction**

- 2 position single
- 2 position double
- 3 position closed center/exhaust center/pressure center

**Component Parts**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body/Sleeve</td>
<td>Aluminum die-casted</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>2</td>
<td>Spool/Sleeve</td>
<td>Stainless steel</td>
<td>—</td>
</tr>
<tr>
<td>3</td>
<td>End plate</td>
<td>Resin</td>
<td>—</td>
</tr>
<tr>
<td>4</td>
<td>Piston</td>
<td>Resin</td>
<td>—</td>
</tr>
<tr>
<td>5</td>
<td>Return spring</td>
<td>Stainless steel</td>
<td>—</td>
</tr>
<tr>
<td>6</td>
<td>Pilot valve assembly</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>7</td>
<td>Detent assembly</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

* Refer to "How to Order Pilot Valve Assembly" on page 1123.

* It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
* The average velocity of the cylinder is the value that the stroke is divided by the total stroke time.
* Load factor: ((Load weight x 9.8)/Theoretical force) x 100%
# 2 Position Single — Grommet, Grommet terminal, Conduit terminal, DIN terminal

## Grommet: VFS2120-□G

- Manual override (Non-locking)
- Lead wire O.D. Max. ø3.5
- Light

## Foot bracket (F)

- Part no.: VFN200-17A
- 2 x ø3.5 mounting hole

## Grommet terminal: VFS2120-□E/EZ

- With light/surge voltage suppressor (EZ)

## DIN terminal: VFS2120-□D/DZ/Y/YZ

- Applicable heavy-duty code O.D. ø6 to ø8 (Y: ø4.7 to ø7)
- With light/surge voltage suppressor (DZ)

## Conduit terminal: VFS2120-□T/TZ

- Applicable heavy-duty code O.D. ø6 to ø8
- With light/surge voltage suppressor (TZ)
Series VFS2000

2 Position Double, 3 Position — Grommet, Grommet terminal, Conduit terminal, DIN terminal

Grommet: VFS2220-G, VFS2320-G, VFS2420-G, VFS2520-G

Grommet terminal: VFS2220-□G, VFS2320-□G, VFS2420-□G, VFS2520-□G

DIN terminal: VFS2220-D/DZ/Y/YZ, VFS2320-D/DZ/Y/YZ, VFS2420-D/DZ/Y/YZ, VFS2520-D/DZ/Y/YZ

Conduit terminal: VFS2220-T/TZ, VFS2320-T/TZ, VFS2420-T/TZ, VFS2520-T/TZ

Applicable heavy-duty code O.D. ø6 to ø8
With light/surge voltage suppressor (TZ) 219 (3 position: 229)

With light/surge voltage suppressor (EZ) 182 (3 position: 192.5)

With light/surge voltage suppressor (DZ) 219 (3 position: 229)

Applicable heavy-duty code O.D. ø4.7 to ø7

Manual override (Non-locking) 2 x ø3.5 mounting hole

(M5: External pilot port Only for external pilot model)

Lead wire O.D. Max. ø3.5

With light/surge voltage suppressor (EZ) 182 (3 position: 192.5)
Series VFS2000 Manifold Specifications
Single Base Type

Specifications

<table>
<thead>
<tr>
<th>Manifold base type</th>
<th>Bar manifold, Body ported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stations</td>
<td>Max. 15 stations</td>
</tr>
</tbody>
</table>

Port Specifications

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Passage</th>
<th>Porting specifications: Rc</th>
<th>Base</th>
<th>Valve</th>
<th>Base</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1(P), 2(R1), 3(R2)</td>
<td>1(P) 2(B), 4(A) 3(R2), 5(R1)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Option

Blanking plate VVFS2000-10A-1 With gasket, screw

How to Order Manifold Base

VV5FS2-20 05 1-03

Stations

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Passage</th>
<th>P. EA, EB port size</th>
<th>Station</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1(P), 2(R1), 3(R2)</td>
<td>Rc 3/8</td>
<td>2 stations</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Base model

<table>
<thead>
<tr>
<th>Model</th>
<th>Pilot exhaust</th>
<th>Applicable valve model</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Pilot individual EXH</td>
<td>VFS2120-□□□□</td>
</tr>
<tr>
<td>30</td>
<td>Pilot common EXH</td>
<td>VFS21230-□□□□</td>
</tr>
</tbody>
</table>

How to Order Manifold Assembly

[Example]

Add the valve and option part numbers in order starting from the first station on the D side.

<Example>

(Manifold base) VV5FS2-20-051-03 1
(2 position single) VFS2120-1D-02 3
(2 position double) VFS2220-1D-02 2
(Blanking plate) VVFS2000-10A-1

The asterisk denotes the symbol for assembly. Prefix it to the part numbers of the solenoid valve.

Keeps environmental air clean from pilot exhaust

Use of the VV5FS2-30 manifold can exhaust intensively the pilot exhaust gas to the base side, and can prevent environmental aggravation due to noise and oil mist.

Part no. for mounting bolt and gasket

BS-VFS2030

Part no. for mounting bolt and gasket

BG-VFS2030

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**Series VFS2000**

**Type 20 Manifold — Pilot individual exhaust: VV5FS2-20- [Station]1-03**

**Grommet terminal: E/EZ**

**Conduit terminal: T/TZ**

**DIN terminal: D/DZ/Y/YZ**

---

<table>
<thead>
<tr>
<th>Stations</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>58</td>
<td>83</td>
<td>108</td>
<td>133</td>
<td>158</td>
<td>183</td>
<td>208</td>
<td>233</td>
<td>258</td>
<td>L1 = 25 x n + 8</td>
</tr>
<tr>
<td>L2</td>
<td>68</td>
<td>93</td>
<td>118</td>
<td>143</td>
<td>168</td>
<td>193</td>
<td>218</td>
<td>243</td>
<td>268</td>
<td>L2 = 25 x n + 18</td>
</tr>
</tbody>
</table>

---

Formula for manifold weight M = 0.108n + 0.068 (kg)  n: Station

---

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5 Port Pilot Operated Solenoid Valve
Metal Seal, Body Ported Series VFS2000

Type 30 Manifold — Pilot common exhaust: VV5FS2-30-Station 1-03

Grommet: G

Formula for manifold weight \( M = 0.12n + 0.21 \) (kg)  
\( n \): Station

<table>
<thead>
<tr>
<th>Stations</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>( L_1 )</td>
<td>62</td>
<td>87</td>
<td>112</td>
<td>137</td>
<td>162</td>
<td>187</td>
<td>212</td>
<td>237</td>
<td>262</td>
</tr>
<tr>
<td>( L_1 )</td>
<td>92</td>
<td>117</td>
<td>142</td>
<td>167</td>
<td>192</td>
<td>217</td>
<td>242</td>
<td>267</td>
<td>292</td>
</tr>
</tbody>
</table>

Formula: \( L_1 = 25 \times n + 12 \)

Congratulations on your purchase of the SMC 5 port pilot operated solenoid valve equipped with metal seals, body mounted series VFS2000. This document provides an overview of the product and its specifications. The Type 30 Manifold — Pilot common exhaust: VV5FS2-30-Station 1-03 is illustrated, along with various terminal configurations.

Grommet terminal: E/EZ
Conduit terminal: T/TZ
DIN terminal: D/DZ/Y/YZ

Additional details include:

- **Lead wire O.D.**
  - Max. ø3.5
  - With light/surge voltage suppressor: ø4.7 to ø7
  - With light/surge voltage suppressor: 98
  - With light/surge voltage suppressor: 107.5

<table>
<thead>
<tr>
<th>Stations</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<th>7</th>
<th>8</th>
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<td>( L_1 )</td>
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<td>192</td>
<td>217</td>
<td>242</td>
<td>267</td>
<td>292</td>
</tr>
</tbody>
</table>

**Stations**

- **P1111-P1228-E.qxd 08.9.2 2:53 PM Page 1129**

Courtesy of Steven Engineering, Inc. - 230 Ryan Way, South San Francisco, CA 94080-6370 - Main Office: (650) 588-9200 - Outside Local Area: (800) 258-9200 - www.stevenengineering.com
## 5 Port Pilot Operated Solenoid Valve Metal Seal, Body Ported

### Series VFS3000

- **Model**
  - Type of actuation: Single, Double
  - Port size: Rc 1/4, 3/8
  - Model: VFS3120, VFS3130, VFS3220, VFS3230, VFS3320, VFS3330, VFS3420, VFS3430, VFS3520, VFS3530

- **Flow characteristics**
  - Flow equations: \(Q = C \cdot \sqrt{P} \cdot (B/1000) \)
  - Parameters: \(C\), \(b\), \(Cv\)
  - Pressure: 0.1 MPa

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size Rc</th>
<th>Flow characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS3120</td>
<td>1/4</td>
<td>(C = 0.20) (b = 1.1) (Cv = 6.8)</td>
</tr>
<tr>
<td>VFS3130</td>
<td>3/8</td>
<td>(C = 0.20) (b = 1.1) (Cv = 6.8)</td>
</tr>
<tr>
<td>VFS3220</td>
<td>1/4</td>
<td>(C = 0.14) (b = 1.4) (Cv = 7.3)</td>
</tr>
<tr>
<td>VFS3230</td>
<td>3/8</td>
<td>(C = 0.14) (b = 1.4) (Cv = 7.3)</td>
</tr>
<tr>
<td>VFS3320</td>
<td>1/4</td>
<td>(C = 0.20) (b = 1.1) (Cv = 6.8)</td>
</tr>
<tr>
<td>VFS3330</td>
<td>3/8</td>
<td>(C = 0.20) (b = 1.1) (Cv = 6.8)</td>
</tr>
<tr>
<td>VFS3420</td>
<td>1/4</td>
<td>(C = 0.24) (b = 1.1) (Cv = 6.5)</td>
</tr>
<tr>
<td>VFS3430</td>
<td>3/8</td>
<td>(C = 0.24) (b = 1.1) (Cv = 6.5)</td>
</tr>
<tr>
<td>VFS3520</td>
<td>1/4</td>
<td>(C = 0.15) (b = 1.4) (Cv = 7.0)</td>
</tr>
<tr>
<td>VFS3530</td>
<td>3/8</td>
<td>(C = 0.15) (b = 1.4) (Cv = 7.0)</td>
</tr>
</tbody>
</table>

- **Max. operating frequency**
  - 1200 Hz

- **Response time**
  - 1200 Hz

- **Mass**
  - 0.33 kg

### Standard Specifications

- **Fluid**
  - Air/Inert gas
- **Maximum operating pressure**
  - 1.0 MPa
- **Minimum operating pressure**
  - 0.1 MPa
- **Ambient and fluid temperature**
  - –1 to 60°C (Note 1)
- **Lubrication**
  - Non-lube
- **Pilot valve manual override**
  - Non-locking push type (Flush)
- **Shock/Vibration resistance**
  - 150/50 m/s²
- **Enclosure**
  - Dustproof (Degrees of protection 0) (Note 2)
- **Coil rated voltage**
  - 100, 200 VAC, 50/60 Hz; 24 VDC
- **Coil insulation type**
  - Class B or equivalent (130°C) (Note 3)
- **Apparent power (Power consumption) AC**
  - 3.4 VA (2.1 W) at 50 Hz, 2.3 VA (1.5 W) at 60 Hz
- **Power consumption**
  - 1.8 W (2.04 W: With light/surge voltage suppressor)
- **Electrical entry**
  - Grommet, Grommet terminal, Conduit terminal, DIN terminal

### Option Specifications

- **Pilot type**
  - External pilot (Note 4)
- **Pilot valve manual override**
  - Non-locking push type (Extended), Locking type (Tool required)
- **Coil rated voltage**
  - 110 to 120, 220, 240 VAC (50/60 Hz)
- **Option**
  - With light/surge voltage suppressor (Note 2)
- **Foot bracket (With screw)**
  - Part no.: VFS3000-52A, VFS3120 (single only)

### Manifold

- **Body type**
  - VFS3120, VFS3130
- **Applicable manifold base**
  - Individual EXH (Valve side)
- **Pilot EXH**
  - Stacking manifold
- **Common EXH (Manifold base side)**

Note 1: Based on JIS B 8375-1981. (The value at supply pressure 0.5 MPa.)
Note 2: Factors of “Note1)” and “Note 2)” are achieved in controlled clean air.
Note 3: Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)
Note 4: Based on JIS B 8375-1981. (The value at supply pressure 0.5 MPa.)
Note 4: Based on JIS B 8375-1981. (The value at supply pressure 0.5 MPa.)
Note 5: Based on JIS C 4003.
How to Order Pilot Valve Assembly

5 Port Pilot Operated Solenoid Valve
Metal Seal, Body Ported
Series VFS3000

How to Order

Symbol

1: 2 position single
2: position double
3: position closed center
4: position pressure center
5: position exhaust center
8: symbol
9: symbol

Body (Pilot exhaust)

20: Individual EXH
30: Common EXH

Thread size

N1 N2 N3 N4 N5

Option
F: With foot bracket

Manual override

N: Non-locking push type
F: Non-locking push type (Flush)
B: Locking type (Tool required)

Light/Surge voltage suppressor

Z: With light/surge voltage suppressor
S: With surge voltage suppressor

Electrical entry

Q: Grommet
E: Grommet terminal
T: Conduit terminal
O: Y: DIN terminal

Coil rated voltage

1: 100 VAC (50/60 Hz)
2: 200 VAC (50/60 Hz)
3: 110 to 120 VAC (50/60 Hz)
4: 220 VAC (50/60 Hz)
5: 24 VDC
6: 12 VDC
7: 240 VAC (50/60 Hz)
9: Other

Option

Other: CE-compliant

Applicable model

1: A side pilot operator for VFS3 20
2: Individual pilot exhaust
3: A side pilot operator for VFS320
4: B side pilot operator for VFS3 120
5: Common pilot exhaust

Other: Conforming to DIN43650B standard
**DIN connector is not attached.

—or-

How to Order Pilot Valve Assembly

SF4 – DZ – 21

Coil rated voltage

1: 100 VAC (50/60 Hz)
2: 200 VAC (50/60 Hz)
3: 110 to 120 VAC (50/60 Hz)
4: 220 VAC (50/60 Hz)
5: 24 VDC
6: 12 VDC
7: 240 VAC (50/60 Hz)
9: Other

Option

M: VFS3000 Series
1: 2-16 VFS1000.qxd 10.3.29 5:46 PM Page 3

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## Series VFS3000

### Cylinder Speed Chart

Use as a guide for selection. Please confirm the actual conditions with SMC Sizing Program.

<table>
<thead>
<tr>
<th>Body Ported</th>
<th>Bore size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series CJ2</td>
<td>Pressure 0.5 MPa, Load factor 50% Stroke 60 mm</td>
</tr>
<tr>
<td>Series CM2</td>
<td>Pressure 0.5 MPa, Load factor 50% Stroke 300 mm</td>
</tr>
<tr>
<td>Series MB, CA2</td>
<td>Pressure 0.5 MPa, Load factor 50% Stroke 500 mm</td>
</tr>
<tr>
<td>Series CS1/CS2</td>
<td>Pressure 0.5 MPa, Load factor 50% Cylinder stroke 1000 mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Series Average speed (mm/s)</th>
<th>ø6</th>
<th>ø10</th>
<th>ø16</th>
<th>ø20</th>
<th>ø25</th>
<th>ø32</th>
<th>ø40</th>
<th>ø50</th>
<th>ø63</th>
<th>ø80</th>
<th>ø100</th>
<th>ø125</th>
<th>ø140</th>
<th>ø160</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS3120-03</td>
<td>900</td>
<td>800</td>
<td>700</td>
<td>600</td>
<td>500</td>
<td>400</td>
<td>300</td>
<td>200</td>
<td>100</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
- The average velocity of the cylinder is the value that the stroke is divided by the total stroke time.
- Load factor: ((Load weight x 9.8)/Theoretical force) x 100%

### Conditions

<table>
<thead>
<tr>
<th>Body ported</th>
<th>Series CJ2</th>
<th>Series CM2</th>
<th>Series MB, CA2</th>
<th>Series CS1/CS2</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS3120-03</td>
<td>Tube bore x Length: T0604 x 1 m</td>
<td>T1075 x 1 m</td>
<td>T1209 x 1 m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Speed controller: AS3001F-06</td>
<td>AS6001F-10</td>
<td>AS4001F-12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Silencer: AN200-02</td>
<td>AN200-02</td>
<td>AN200-02</td>
<td></td>
</tr>
</tbody>
</table>

Perpendicular, Upward actuation, Horizontal actuation
5 Port Pilot Operated Solenoid Valve
Metal Seal, Body Ported

**Series VFS3000**

### Construction

#### 2 position single

#### 2 position double

#### 3 position closed center/exhaust center/pressure center

<table>
<thead>
<tr>
<th>Component Parts</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Body</td>
<td>Aluminum die-cast</td>
<td>Platinum silver</td>
<td></td>
</tr>
<tr>
<td>2 Spool/Sleeve</td>
<td>Stainless steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 End plate</td>
<td>Resin</td>
<td>Black</td>
<td></td>
</tr>
<tr>
<td>4 Piston</td>
<td>Resin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Return spring</td>
<td>Stainless steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Pilot valve assembly</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Detent assembly</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Refer to "How to Order Pilot Valve Assembly" on page 1131.
Series **VFS3000**

2 Position Single — Grommet, Grommet terminal, Conduit terminal, DIN terminal

**Grommet terminal: VFS3120-G**

- Manual override (Non-locking)
- 2 x ø4.3 mounting hole
- M6: External pilot port (For external pilot model)
- 2 x ø4.3 mounting hole
- Lead wire length
- With light/surge voltage suppressor (EZ)

**Conduit terminal: VFS3120-T/TZ**

- With light/surge voltage suppressor (TZ)
- 2 x ø4.3 mounting hole
- Applicable heavy-duty cord O.D. ø6 to ø8

**DIN terminal: VFS3120-D/DZ/Y/YZ**

- With light/surge voltage suppressor (DZ)
- 2 x ø4.3 mounting hole
- Applicable heavy-duty cord O.D. ø6 to ø8

**Foot bracket (F)**

- Part no.: VFS3000-52A
- 2 Position Single — Grommet, Grommet terminal, Conduit terminal, DIN terminal

- Lead wire O.D.
  - Max. ø3.5
  - Max. ø3.5
  - Max. ø3.5

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- Max. ø3.5

- Max. ø3.5
5 Port Pilot Operated Solenoid Valve
Metal Seal, Body Ported Series VFS3000

2 Position Double, 3 Position — Grommet, Grommet terminal, Conduit terminal, DIN terminal

Grommet: VFS3220-G, VFS3320-G, VFS3420-G, VFS3520-G

Conduit terminal: VFS3220-T/TZ VFS3320-T/TZ VFS3420-T/TZ VFS3520-T/TZ

DIN terminal: VFS3220-D/DZ/Y/YZ VFS3320-D/DZ/Y/YZ VFS3420-D/DZ/Y/YZ VFS3520-D/DZ/Y/YZ

Applicable heavy-duty cord
O.D. ø6 to ø8 (Y: ø4.7 to ø7)
With light/surge voltage suppressor (DZ)

Applicable heavy-duty cord
Max. ø3.5

63.5 (ø8.5)

2 x ø4.3 mounting hole

2 x ø4.3 mounting hole

194 (3 position: 204)

Manual override
(Non-locking)

2 x ø4.3 mounting hole

3 xR:f/½

2 x ø4.3 mounting hole

2 x ø4.3 mounting hole

231 (3 position: 241)

With light/surge voltage suppressor (EZ)

With light/surge voltage suppressor (TZ)

With light/surge voltage suppressor (EZ)

Approx. 300

(Lead wire length)
Series VFS3000
Manifold Specifications
Stacking Type

Specifications

<table>
<thead>
<tr>
<th>Manifold base type</th>
<th>Stacking type</th>
</tr>
</thead>
</table>

| Stations | Max. 15 stations |

Port Specifications

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Passage</th>
<th>Porting specifications: Rc</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Base</td>
<td>Valve</td>
</tr>
<tr>
<td>(1)P</td>
<td>3(R2), 5(R1)</td>
<td>1(TP)</td>
</tr>
</tbody>
</table>

Option

- Blanking plate: VV5FS3000-10A-1
- SUP block plate: AX1636-10A
- EXH block plate: AX1636-11A

Note: Individual SUP or EXH is possible with bottom porting of SUP or EXH. For your order, please indicate it in the manifold specification sheet.

How to Order Manifold Base

**Example**

- VV5FS3-31-05-03
- VFS3130-1D-02
- VFS3230-1D-02

Add the valve and option part numbers in order starting from the first station on the D side.

<Example>

(VV5FS3-31-061-03)
- VFS3130-1D-02
- VFS3230-1D-02
- VFS3300-10A-1

The asterisk denotes the symbol for assembly. Prefix it to the part numbers of the solenoid valve.

Exploded View of Manifold

Manifold block assembly VVFS3000-1A-30

- Hexagon socket head cap screw: M4 x 53
  (AXT335-37-1)

Note: Individual SUP or EXH is possible with bottom porting of SUP or EXH. For your order, please indicate it in the manifold specification sheet.

For increasing the manifold bases, please prepare the manifold block assembly no.

How to Order Manifold Assembly [Example]

Add the valve and option part numbers in order starting from the first station on the D side.

<Example>

- VV5FS3-31-061-03
- VFS3130-1D-02
- VFS3230-1D-02
- VFS3300-10A-1

The asterisk denotes the symbol for assembly. Prefix it to the part numbers of the solenoid valve.

For increasing the manifold bases, please prepare the manifold block assembly no.

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5 Port Pilot Operated Solenoid Valve
Metal Seal, Body Ported  Series VFS3000

Type 31 Manifold — Pilot common exhaust: VV5FS3-31 Station 1-03

Grommet: G

Formula for manifold weight \( M = 0.184n + 0.16 \) (kg)  \( n: \) Station

<table>
<thead>
<tr>
<th>Stations</th>
<th>( L_1 )</th>
<th>( L_2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>77</td>
<td>92</td>
</tr>
<tr>
<td>3</td>
<td>108</td>
<td>123</td>
</tr>
<tr>
<td>4</td>
<td>139</td>
<td>154</td>
</tr>
<tr>
<td>5</td>
<td>170</td>
<td>185</td>
</tr>
<tr>
<td>6</td>
<td>201</td>
<td>216</td>
</tr>
<tr>
<td>7</td>
<td>232</td>
<td>247</td>
</tr>
<tr>
<td>8</td>
<td>263</td>
<td>278</td>
</tr>
<tr>
<td>9</td>
<td>294</td>
<td>309</td>
</tr>
<tr>
<td>10</td>
<td>325</td>
<td>340</td>
</tr>
</tbody>
</table>

Formula: \( L_1 = 31x + 15 \)  \( L_2 = 31x + 30 \)

Grommet terminal: E/EZ
Conduit terminal: T/TZ
DIN terminal: D/DZY/YYZ

---

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370
Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com
5 Port Pilot Operated Solenoid Valve
Metal Seal, Body Ported
Series VFS2000

How to Order

Conforming to CSA standard

Symbol

1: 2 position single
2: 2 position double
3: 3 position closed center
4: 3 position exhaust center
5: 3 position pressure center

Body (Pilot exhaust)

20: Individual EXH
30: Common EXH

Reverse pressure: Can be used by external pilot specifications.

Pilot type

- Nil: Internal pilot
- R: External pilot
- Option: Individual external pilot (External pilot port: Body side)

Light/Surge voltage suppressor

- Nil: None
- Z: With light/surge voltage suppressor

Electrical entry

- D: DIN terminal

Mountable only for VFS2120.

Thread type

- Rc
- NPT
- NPTF
- G

- Option

Option

- F: With tool bracket

Port size

- 01: Rc 1/4
- 02: Rc 1/4

Manual override

- Nil: Non-locking push type
- A: Non-locking push type (Extended)
- B: Locking type (Tool required)

Refer to standard products for specifications and dimensions.
# 5 Port Pilot Operated Solenoid Valve
## Metal Seal, Body Ported
### Series VFS3000

**How to Order**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: 2 position single</td>
<td></td>
</tr>
<tr>
<td>2: 2 position double</td>
<td></td>
</tr>
<tr>
<td>3: 3 position closed center</td>
<td></td>
</tr>
<tr>
<td>4: 3 position exhaust center</td>
<td></td>
</tr>
<tr>
<td>5: 3 position pressure center</td>
<td></td>
</tr>
</tbody>
</table>

**Thread type**

- Nil
- Rc
- Rp
- NPT
- NPTF
- G

**Port size**

- Nil: Non-locking push type (Flush)
- A*: Non-locking push type (Extended)
- B*: Locking type (Tool required)

**Manual override**

- Option

**Light/Surge voltage suppressor**

- Nil: None
- Z: With light/surge voltage suppressor

**Body (Pilot exhaust)**

- 20: Individual EXH
- 30: Common EXH

**Coil rated voltage**

- 1: 100 VAC (50/60 Hz)
- 2: 200 VAC (50/60 Hz)
- 3: 110 to 120 VAC (50/60 Hz)
- 4: 220 VAC (50/60 Hz)
- 5: 24 VDC
- 6: 12 VDC
- 7: 240 VAC (50/60 Hz)
- Option

**Electrical entry**

- D: DIN terminal

**VFS.qxd 10.11.25 9:49 AM Page 5**

Refer to standard products for specifications and dimensions.

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## 5 Port Pilot Operated Solenoid Valve
### Metal Seal, Plug-in/Non Plug-in
#### Series VFS2000

<table>
<thead>
<tr>
<th>Model</th>
<th>Type of actuation</th>
<th>Plug-in</th>
<th>Non plug-in</th>
<th>Port size</th>
<th>Flow characteristics</th>
<th>Max (^{1,2,3,4}) operating cycle (cycle/min)</th>
<th>Max (^{1,2,3,4}) operating cycle (cycle/min)</th>
<th>Response time (ms)</th>
<th>Max (^{1,2,3,4}) operating cycle (cycle/min)</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS2100</td>
<td>Single</td>
<td></td>
<td></td>
<td>1/2</td>
<td>2.4, 0.16</td>
<td>0.65, 2.8</td>
<td>0.20, 0.65</td>
<td>15 or less</td>
<td>0.34</td>
<td></td>
</tr>
<tr>
<td>VFS2200</td>
<td>Double</td>
<td></td>
<td></td>
<td>1/2</td>
<td>2.5, 0.18</td>
<td>0.58, 2.8</td>
<td>0.21, 0.65</td>
<td>15 or less</td>
<td>0.42</td>
<td></td>
</tr>
<tr>
<td>VFS2300</td>
<td>Closed center</td>
<td></td>
<td></td>
<td>1/2</td>
<td>2.4, 0.16</td>
<td>0.55, 2.8</td>
<td>0.20, 0.65</td>
<td>15 or less</td>
<td>0.43</td>
<td></td>
</tr>
<tr>
<td>VFS2400</td>
<td>Exhaust center</td>
<td></td>
<td></td>
<td>1/2</td>
<td>2.5, 0.18</td>
<td>0.58, 2.8</td>
<td>0.21, 0.65</td>
<td>15 or less</td>
<td>0.43</td>
<td></td>
</tr>
<tr>
<td>VFS2500</td>
<td>Pressure center</td>
<td></td>
<td></td>
<td>1/2</td>
<td>2.5, 0.20</td>
<td>0.60, 2.7</td>
<td>0.24, 0.63</td>
<td>20 or less</td>
<td>0.43</td>
<td></td>
</tr>
<tr>
<td>VFS2600</td>
<td>Double check</td>
<td></td>
<td></td>
<td>1/2</td>
<td>2.5, 0.20</td>
<td>0.60, 2.7</td>
<td>0.24, 0.63</td>
<td>20 or less</td>
<td>0.43</td>
<td></td>
</tr>
</tbody>
</table>

### Standard Specifications

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Air/Inert gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. operating pressure</td>
<td>0.1 MPa</td>
</tr>
<tr>
<td>Max. operating pressure</td>
<td>1.0 MPa</td>
</tr>
<tr>
<td>Proof pressure</td>
<td>1.5 MPa</td>
</tr>
<tr>
<td>Ambient and fluid temperature</td>
<td>-10 to 60°C</td>
</tr>
<tr>
<td>Lubrication</td>
<td>Non-lube</td>
</tr>
</tbody>
</table>

### Option Specifications

<table>
<thead>
<tr>
<th>Pilot type</th>
<th>External pilot type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual override</td>
<td>Non-locking push type (Extended), Locking type (Tool required), Locking type (Lever)</td>
</tr>
<tr>
<td>Coil rated voltage</td>
<td>110 to 220, 240 VAC, 50/60 Hz, 12, 100 VDC</td>
</tr>
<tr>
<td>Power consumption DC</td>
<td>1.8 W (2.04 W with light/surge voltage suppressor)</td>
</tr>
</tbody>
</table>

### Compact, lightweight type sub-plate

Compared with the standard type, this is the sub-plate having the reduced external dimensions and lighter weight. But, use caution that Cv factor or piping port position is different from the standards. For details, refer to page 1161.

---

1. Based on JIS B 8375 (Once per 30 days) for the minimum operating frequency. 2. Based on JIS B 8375-1981 (The value at supply press. 0.5 MPa). 3. Values for VFS2100 → F27-01. 4. Factors of “Note 1)” and “Note 2)” are ones achieved in controlled clean air.
How to Order Pilot Valve Assembly

SF4 - 1 DZ - 20

Coil rated voltage

1 100 VAC, 50/60 Hz
2 200 VAC, 50/60 Hz
3 110/120 VAC (50/60 Hz)
4 220 VAC, 50/60 Hz
5 24 VDC
6 12 VDC
7 240 VAC, 50/60 Hz
9 Other

Note) Please note Cv factor and piping port location of compact sub-plate are different from standard. Refer to page 1161 for details.

Approved

Manual override

Non plug-in

Non-locking push type (Flush)
Non-locking push type (Extended)

Plug-in

Locking type (Lever)

Plug-in type

Non plug-in type

Standard type

Option

None

Port size

Nil

Without sub-plate

A C

Plug-in type conduit terminal (With attachment plug lead wire)

B C

Plug-in type grommet (With surge voltage suppressor, not w/ indicator light)

B C

Plug-in type grommet (With attachment plug lead wire)

B C

Plug-in type grommet (With terminal block)

B C

Standard type

Joint small

C

Rc Plug-in type conduit

Rc Plug-in type grommet

Rc Non plug-in type, plug-in type

Other

Thread type

Note) Please note Cv factor and piping port location of compact sub-plate are different from standard. Refer to page 1161 for details.

Symbol

Body type

1 2 position single
2 2 position double
3 3 position closed center
4 3 position exhaust center
5 3 position pressure center
6 3 position double check

Nil

Included

Body type

1 2 position single
2 2 position double
3 3 position closed center
4 3 position exhaust center
5 3 position pressure center
6 3 position double check

Nil

None

Electrical entry

Plugs in type

DIN terminal with light/surge voltage suppressor

Grommet terminal

Conduit terminal

DIN terminal

CE-compliant

Nil

- Option

Port size

Nil

- Option

P1

Plug-in type conduit terminal

P2

Plug-in type grommet

Note) Please note Cv factor and piping port location of compact sub-plate are different from standard. Refer to page 1161 for details.

Approved

Piping

1161 for details.

Note

Please note Cv factor and piping port location of compact sub-plate are different from standard. Refer to page 1161 for details.

How to Order Pilot Valve Assembly

Pilot valve manual override

Non-locking grommet

Locking type (Extended)

Locking type (Lever)

Locking type

Internal pilot

External pilot

Option

None

Coil rated voltage

1 100 VAC, 50/60 Hz
2 200 VAC, 50/60 Hz
3 110/120 VAC (50/60 Hz)
4 220 VAC, 50/60 Hz
5 24 VDC
6 12 VDC
7 240 VAC, 50/60 Hz
9 Other

Note) Please note Cv factor and piping port location of compact sub-plate are different from standard. Refer to page 1161 for details.

Approved

Porting specifications

Nil

Side ported

B Bottom ported

Option

None

With light/surge voltage suppressor

Option

Without sub-plate

Option

None

With light/surge voltage suppressor

Option

None

With light/surge voltage suppressor

Option

None

With light/surge voltage suppressor

 ocasional double check spacer with external pilot will not work.
### Cylinder Speed Chart

Use as a guide for selection. Please confirm the actual conditions with SMC Sizing Program.

<table>
<thead>
<tr>
<th>System</th>
<th>Average speed (mm/s)</th>
<th>Boresize</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>800</td>
<td>ø20 ø25 ø32 ø40 ø50 ø63 ø80 ø100 ø125 ø140 ø160</td>
</tr>
<tr>
<td>B</td>
<td>800</td>
<td>ø20 ø25 ø32 ø40 ø50 ø63 ø80 ø100 ø125 ø140 ø160</td>
</tr>
</tbody>
</table>

#### System Components

<table>
<thead>
<tr>
<th>System</th>
<th>Solenoid valve</th>
<th>Speed controller</th>
<th>Silencer</th>
<th>Tube bore x Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Series VS2000</td>
<td>Rc 1/4</td>
<td>AS4000-02 (S = 21 mm²)</td>
<td>AN110-01 (S = 35 mm²)</td>
</tr>
<tr>
<td>B</td>
<td>Series VS2000</td>
<td>Rc 1/4</td>
<td>AS4000-02 (S = 21 mm²)</td>
<td>AN110-01 (S = 35 mm²)</td>
</tr>
</tbody>
</table>

#### Double Check Spacer/Specifications

Can hold an intermediate cylinder position for an extended time if the double check spacer with a built-in double check valve is combined, it will enable the cylinder to stop in the intermediate stroke and maintain its position for a long time without being affected by the leakage between the spools.

**Specifications**

- **Double check spacer part no.**
  - Plug-in type: VS2000-22A-1
  - Non plug-in type: VS2000-22A-2

- **Applicable valve model**
  - VS2401F
  - VS2410I

**Check Valve Operating**

- **Cylinder pressure**
  - SUP side pressure (P1)
- **Opening range**
  - 0.5 - 1.0

- **Caution**
  - In the case of 3 position double check valve (VFS2600), check the leakage from piping and fittings in between valve and cylinder by means of synthetic detergent solutions, and ensure that there is no such leakage found there. Also check the leakage from cylinder seal and piston seal. If there is any leakage, sometimes the cylinder, when valve is de-energized, can move without stopping at intermediate position.
  - Be aware that if the exhaust side is restricted excessively, the intermediate stopping accuracy will decrease and will lead to improper intermediate stops.
  - Combining double check spacer with external pilot will not work.

### System Solenoid valve Speed controller Silencer

- **Series VFS2000**
  - AN110-01 (S = 35 mm²)
  - AS3000-02 (S = 12 mm²)

- **Series AS4000-02**
  -.set (S = 21 mm²)

### Use as a guide for selection.

- **Pressure 0.5 MPa**
- **Load factor 50%**
- **Stroke 300 mm**

### **Average speed (mm/s)**

- **Series CM**
  - Pressure 0.5 MPa
  - Load factor 50%
  - Stroke 300 mm

- **Series MB, CA2**
  - Pressure 0.5 MPa
  - Load factor 50%
  - Stroke 500 mm

- **Series CS1/CS2**
  - Pressure 0.5 MPa
  - Load factor 50%
  - Cylinder stroke 1000 mm

### System Components

- **Series VFS2000**
  - AN110-01 (S = 35 mm²)
  - AS3000-02 (S = 12 mm²)

### Cylinder pressure Check valve

- **Operating range**
  - Cylinder pressure P2 (MPa)
  - Piston SUP side pressure (P1)

- **In the case of 3 position double check valve (VFS2600), check the leakage from piping and fittings in between valve and cylinder by means of synthetic detergent solutions, and ensure that there is no such leakage found there. Also check the leakage from cylinder seal and piston seal. If there is any leakage, sometimes the cylinder, when valve is de-energized, can move without stopping at intermediate position.**

- **Be aware that if the exhaust side is restricted excessively, the intermediate stopping accuracy will decrease and will lead to improper intermediate stops.**

- **Combining double check spacer with external pilot will not work.**

---

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### Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Aluminum die-casted</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>2</td>
<td>Sub-plate</td>
<td>Aluminum die-casted</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>3</td>
<td>Spool/Sleeve</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Adapter plate</td>
<td>Resin</td>
<td>Black</td>
</tr>
<tr>
<td>5</td>
<td>End plate</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Piston</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Junction cover</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Cover</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Return spring</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Gasket</td>
<td>HNBR</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Hexagon socket head screw</td>
<td>Steel</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Detent assembly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Pilot valve assembly</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Sub-plate Assembly (Standard) Part No.

<table>
<thead>
<tr>
<th>Type</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in</td>
<td>VFS2000-LP-01</td>
</tr>
<tr>
<td>Non plug-in</td>
<td>VFS2000-LS-02</td>
</tr>
</tbody>
</table>

* Mounting bolt and gasket are not included.

### Sub-plate Assembly (For External Pilot) Part No.

<table>
<thead>
<tr>
<th>Type</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in</td>
<td>VFS2000-LP-R01</td>
</tr>
<tr>
<td>Non plug-in</td>
<td>VFS2000-LS-R02</td>
</tr>
</tbody>
</table>

Part no. for mounting bolt and gasket: BG-VFS2000-1

* Refer to “How to Order Pilot Valve Assembly” on page 1139.
Series VFS2000

Plug-in — 2 Position single/Double/3 Position closed center/Exhaust center/Pressure center/Double check

2 position single: VFS2100-

2 position double: VFS2200-

3 position closed center: VFS2300-

3 position exhaust center: VFS2400-

3 position pressure center: VFS2500-

3 position double check: VFS2600-
5 Port Pilot Operated Solenoid Valve
Metal Seal, Plug-in/Non Plug-in Series VFS2000

Non Plug-in — 2 Position single

Grommet: VFS2110-G-01

DIN terminal: VFS2110-D-01

Conduit terminal: VFS2110-T-01

With light/surge voltage suppressor

With light/surge voltage suppressor

Applicable heavy-duty cord O.D. ø6 to ø8

Lead wire O.D. Max. ø3.5

With light/surge voltage suppressor

Applicable heavy-duty cord O.D. ø6 to ø8

Manual override (Non-locking)

Bottom ported

Pilot EXH port M5 x 0.8

≅ 300 mm

(Lead wire length)
Series VFS2000

Non Plug-in — 2 Position double/3 Position closed center/Exhaust center/Pressure center

Grommet: Double VFS2210-□G-01
Closed center VFS2310-□G-02
Exhaust center VFS2410-□G-01
Pressure center VFS2510-□G-02

DIN terminal: Double VFS2210-□D-01
Closed center VFS2310-□D-01
Exhaust center VFS2410-□D-01
Pressure center VFS2510-□D-02

Conduit terminal: Double VFS2210-□T-01
Closed center VFS2310-□T-01
Exhaust center VFS2410-□T-01
Pressure center VFS2510-□T-02

Volume, ( ): Y, YZ

With light/surge voltage suppressor

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Non Plug-in — 3 Position double check

Grommet: VFS2610-□G-01

DIN terminal: VFS2610-□D-01

Conduit terminal: VFS2610-□T-01

With light/surge voltage suppressor

Applicable heavy-duty code

O.D. ø6 to ø8

(Y: ø4.7 to ø7)

(P): Y, YZ
Series VFS2000
Manifold Specifications

**Plug-in Type: With Attachment Plug Lead Wire**
The insert plug is attached to the manifold block and lead wire is plugged into the valve side. Please connect with corresponding power side.

---

**Plug-in Type: With Terminal Block**
Since lead wires of solenoid valve are connected with the terminals on upper surface of terminal block, corresponding lead wires from power source can be wired at the bottom of terminal block.

---

**Plug-in Type: With Multi-connector** (Wiring specifications: Refer to page 1227.)
- Master connection of power and solenoid valves.
- Quick wiring permits ease of installation.

---

**Plug-in Type: With D-sub Connector** (Wiring specifications: Refer to page 1227.)
- Wide range of interchangeability.
- Quick wiring permits easier installation.

---

**Non Plug-in Type: Grommet, Grommet Terminal, Conduit Terminal, DIN Terminal**
- Wiring for every valve

---

**Note:** The individual specification of the P port at the composition symbol 3 to 8 or the EA, EB, ports should be taken as individual port using a block plate. Therefore, if an individual port is using a single SUP spacer of option or a single EXH spacer, the composition symbol mark is “1.”

---

**Series VFS2000 Manifold Specifications**

<table>
<thead>
<tr>
<th>Plug-in Type</th>
<th>Symbol</th>
<th>Port size</th>
<th>CE-compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VV5FS2-01</strong></td>
<td>06</td>
<td>1 - 01</td>
<td>Option</td>
</tr>
<tr>
<td><strong>VV5FS2-01T</strong></td>
<td>08</td>
<td>1 - 02</td>
<td>Option</td>
</tr>
<tr>
<td><strong>VV5FS2-01C</strong></td>
<td>D</td>
<td>05 - 2 - 01</td>
<td>Option</td>
</tr>
<tr>
<td><strong>VV5FS2-01F</strong></td>
<td>U</td>
<td>06 - 1 - 01</td>
<td>Option</td>
</tr>
</tbody>
</table>

---

**Plug-in Type: With Attachment Plug Lead Wire**

<table>
<thead>
<tr>
<th>Stations</th>
<th>Passage Porting</th>
<th>Symbol</th>
<th>Port Size</th>
<th>Thread Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nil</td>
<td>RC 1/4</td>
</tr>
</tbody>
</table>

**Plug-in Type: With Terminal Block**

<table>
<thead>
<tr>
<th>Stations</th>
<th>Passage Porting</th>
<th>Symbol</th>
<th>Port Size</th>
<th>Thread Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nil</td>
<td>RC 1/4</td>
</tr>
</tbody>
</table>

**Plug-in Type: With Multi-connector**

<table>
<thead>
<tr>
<th>Stations</th>
<th>Passage Porting</th>
<th>Symbol</th>
<th>Port Size</th>
<th>Thread Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nil</td>
<td>RC 1/4</td>
</tr>
</tbody>
</table>

**Plug-in Type: With D-sub Connector**

<table>
<thead>
<tr>
<th>Stations</th>
<th>Passage Porting</th>
<th>Symbol</th>
<th>Port Size</th>
<th>Thread Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nil</td>
<td>RC 1/4</td>
</tr>
</tbody>
</table>

**Non Plug-in Type: Grommet, Grommet Terminal, Conduit Terminal, DIN Terminal**

<table>
<thead>
<tr>
<th>Stations</th>
<th>Passage Porting</th>
<th>Symbol</th>
<th>Port Size</th>
<th>CE-compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nil</td>
<td>Option</td>
</tr>
</tbody>
</table>

---

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5 Port Pilot Operated Solenoid Valve  
Metal Seal, Plug-in/Non Plug-in Series VFS2000

How to Order Manifold Assembly
Please indicate manifold base type, corresponding valve, and option parts.

<Example>
• Plug-in type with terminal block  
  (Manifold base) VV5FS2-01T-061-02... 1  
  (2 position single) VFS2100-5FZ ... 3  
  (2 position double) VFS2200-5FZ ... 2  
  (Blanking plate) VFS2000-10A ... 1
• Non plug-in type (6 stations)  
  (Manifold base) VV5FS2-10-061-01 ... 1  
  (2 position single) VFS2110-5D ... 3  
  (3 position exhaust center) VFS2410-5D ... 1  
  (Individual EXH spacer) VVFS2000-R-01-2 ... 1

Manifold Specifications

<table>
<thead>
<tr>
<th>Base model</th>
<th>Wiring</th>
<th>Flow characteristics at the number of manifold stations (Operated individually)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in type</td>
<td>VV5FS2-01</td>
<td>• With attachment plug lead wire • With terminal block • With multi-connector • With D-sub connector</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stations</td>
</tr>
<tr>
<td>Non plug-in type</td>
<td>VV5FS2-10</td>
<td>• Grommet • Grommet terminal • Conduit terminal • DIN terminal</td>
</tr>
</tbody>
</table>

Flow Characteristics at the Number of Manifold Stations (Operated individually)

<table>
<thead>
<tr>
<th>Model</th>
<th>Passage/Stations</th>
<th>Station 1</th>
<th>Station 5</th>
<th>Station 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS2</td>
<td>1 → 4/2 (P → A/B)</td>
<td>2.4</td>
<td>2.4</td>
<td>2.4</td>
</tr>
<tr>
<td></td>
<td>4/2 → 5/3 (A/B → R1/R2)</td>
<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
</tr>
</tbody>
</table>

* Port size Rc 1/4

* With multi-connector, with D-sub connector: 8 stations at the maximum.
Series VFS2000

Manifold Option Parts Assembly

Individual SUP spacer
An individual SUP spacer set on manifold block can form SUP port for every valve.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rc 1/8</td>
<td>VFS2000-P-01-1</td>
<td>VFS2000-P-01-2</td>
</tr>
<tr>
<td>Rc 1/4</td>
<td>VFS2000-P-02-1</td>
<td>VFS2000-P-02-2</td>
</tr>
</tbody>
</table>

Individual EXH spacer
An individual EXH spacer set on manifold block can form EXH port for every valve. (Common EXH type)

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rc 1/8</td>
<td>VFS2000-R-01-1</td>
<td>VFS2000-R-01-2</td>
</tr>
<tr>
<td>Rc 1/4</td>
<td>VFS2000-R-02-1</td>
<td>VFS2000-R-02-2</td>
</tr>
</tbody>
</table>

SUP block plate
When supplying manifold with more than two different pressures, high and low, insert a block plate in between stations subjected to different pressures.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>AXT625-12A</td>
<td></td>
</tr>
</tbody>
</table>

EXH block plate
When valve exhaust affects the other stations on the circuit or when the reverse pressure valve is used to standard manifold valve, insert EXH block plate in between stations to separate valve exhaust.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>AXT625-12A</td>
<td></td>
</tr>
</tbody>
</table>

Throttle valve spacer
Needle valve set on the manifold block can control cylinder speed by throttling exhaust.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
</table>

Interface regulator (P port regulation)
Interface regulator set on manifold block can regulate the pressure to each valve. Refer to "Flow Characteristics" on page 1225.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>ARBF2000-01-P-1</td>
<td>ARBF2000-01-P-2</td>
</tr>
</tbody>
</table>

Air shutoff valve spacer
When stopping supply air and releasing residual pressure after completion of work, actuators may move from original position. Air shut off valve spacer makes it possible to stop actuators in original position for extended periods.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
</table>

Blanking plate
It is used by attaching on the manifold block for being prepared for removing a valve for maintenance reasons or planning to mount a spare valve, etc.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>VFS20000-10A</td>
<td></td>
</tr>
</tbody>
</table>

Accessory
One pair of gasket and mounting thread is attached to every option parts assembly.

With control unit
Plug-in type/Non plug-in type
- Filter, regulation valve, pressure switch and air release valve are all combined to form one unit.
- Piping processes are eliminated.

Interface regulator (P port regulation)
Interface regulator set on manifold block can regulate the pressure to each valve. Refer to "Flow Characteristics" on page 1225.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>VFS2000-01-P-1</td>
<td>VFS2000-01-P-2</td>
</tr>
</tbody>
</table>

Air release valve spacer
The concurrent use of air release valve spacer with VFS21L50132 can release air.

Note) L: U side mount   R: D side mount

Double check spacer
If the double check spacer with a built-in double check valve is combined, it will enable the cylinder to stop in the intermediate stroke and maintain its position for a long time without being affected by the leakage between the spools.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
</table>

Blending block
It is used by attaching on the manifold block for being prepared for removing a valve for maintenance reasons or planning to mount a spare valve, etc.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>VFS20000-10A</td>
<td></td>
</tr>
</tbody>
</table>

Accessory
One pair of gasket and mounting thread is attached to every option parts assembly.

With control unit
Plug-in type/Non plug-in type
- Filter, regulation valve, pressure switch and air release valve are all combined to form one unit.
- Piping processes are eliminated.

Interface regulator (P port regulation)
Interface regulator set on manifold block can regulate the pressure to each valve. Refer to "Flow Characteristics" on page 1225.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>VFS2000-01-P-1</td>
<td>VFS2000-01-P-2</td>
</tr>
</tbody>
</table>

Air release valve spacer
The concurrent use of air release valve spacer with VFS21L50132 can release air.

Note) L: U side mount   R: D side mount

Double check spacer
If the double check spacer with a built-in double check valve is combined, it will enable the cylinder to stop in the intermediate stroke and maintain its position for a long time without being affected by the leakage between the spools.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
</table>

Series VFS2000
5 Port Pilot Operated Solenoid Valve  
Metal Seal, Plug-in/Non Plug-in  
**Series VFS2000**

**Manifold — Plug-in type, Non plug-in type**

**Plug-in type (Insert plug with lead wire): VV5FS2-01-**

<table>
<thead>
<tr>
<th>Station</th>
<th>Port size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bottom ported: VV5FS2-01-</td>
</tr>
<tr>
<td>2</td>
<td>Bottom ported: VV5FS2-01-</td>
</tr>
<tr>
<td>3</td>
<td>Bottom ported: VV5FS2-01-</td>
</tr>
<tr>
<td>4</td>
<td>Bottom ported: VV5FS2-01-</td>
</tr>
<tr>
<td>5</td>
<td>Bottom ported: VV5FS2-01-</td>
</tr>
<tr>
<td>6</td>
<td>Bottom ported: VV5FS2-01-</td>
</tr>
<tr>
<td>7</td>
<td>Bottom ported: VV5FS2-01-</td>
</tr>
<tr>
<td>8</td>
<td>Bottom ported: VV5FS2-01-</td>
</tr>
<tr>
<td>9</td>
<td>Bottom ported: VV5FS2-01-</td>
</tr>
<tr>
<td>10</td>
<td>Bottom ported: VV5FS2-01-</td>
</tr>
</tbody>
</table>

**Formula for manifold weight** \( M = 0.201n + 0.299 \) (kg)  
\( n \): Station

**Non plug-in type: VV5FS2-10-**

<table>
<thead>
<tr>
<th>Station</th>
<th>Port size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bottom ported: VV5FS2-10-</td>
</tr>
<tr>
<td>2</td>
<td>Bottom ported: VV5FS2-10-</td>
</tr>
<tr>
<td>3</td>
<td>Bottom ported: VV5FS2-10-</td>
</tr>
<tr>
<td>4</td>
<td>Bottom ported: VV5FS2-10-</td>
</tr>
<tr>
<td>5</td>
<td>Bottom ported: VV5FS2-10-</td>
</tr>
<tr>
<td>6</td>
<td>Bottom ported: VV5FS2-10-</td>
</tr>
<tr>
<td>7</td>
<td>Bottom ported: VV5FS2-10-</td>
</tr>
<tr>
<td>8</td>
<td>Bottom ported: VV5FS2-10-</td>
</tr>
<tr>
<td>9</td>
<td>Bottom ported: VV5FS2-10-</td>
</tr>
<tr>
<td>10</td>
<td>Bottom ported: VV5FS2-10-</td>
</tr>
</tbody>
</table>

**Formula for manifold weight** \( M = 0.174n + 0.218 \) (kg)  
\( n \): Station
Series VFS2000

Manifold — Plug-in type: Individual/One-piece junction cover

Plug-in type with terminal block (Individual junction covers): VV5FS2-01T-Station 1-Port size

Formula for manifold weight \( M = 0.215n + 0.35 \) (kg)  
\( n: \) Station

Bottom ported: VV5FS2-01T-Station 2-Port size

Plug-in type with terminal block (One-piece junction covers): VV5FS2-01T1-Station 1-Port size

Bottom ported: VV5FS2-01T1-Station 2-Port size

Formula for manifold weight \( M = 0.236n + 0.354 \) (kg)  
\( n: \) Stations

<table>
<thead>
<tr>
<th>Station</th>
<th>Port size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1-Port size</td>
</tr>
<tr>
<td>2</td>
<td>2-Port size</td>
</tr>
</tbody>
</table>

L1 = 28 x n + 47

Series VFS2000

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Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com
5 Port Pilot Operated Solenoid Valve
Metal Seal, Plug-in/Non Plug-in Series VFS2000

Manifold — Plug-in with multi-connector/with D-sub connector

Plug-in with multi-connector: VV5FS2-01CD1-[Station]-1-Port size, VV5FS2-01CU1-[Station]-1-Port size

Bottom ported: VV5FS2-01CD1-[Station]-2-Port size

Plug-in type with D-sub connector: VV5FS2-01FD1-[Station]-1-Port size, VV5FS2-01FU1-[Station]-1-Port size

Bottom ported: VV5FS2-01FD1-[Station]-2-Port size

Formula for manifold weight M = 0.211n + 0.442 (kg)

n: Station

Wiring specifications: Refer to page 1227.

Formula for manifold weight M = 0.178n + 0.378 (kg)

n: Station

Wiring specifications: Refer to page 1227.
Series VFS2000

Manifold Option Parts — Plug-in type, Non plug-in type

Individual SUP spacer:
VVFS2000-P-01-1 (Plug-in type)
VVFS2000-P-01-2 (Non plug-in type)

Individual EXH spacer:
VVFS2000-R-01-1 (Plug-in type)
VVFS2000-R-01-2 (Non plug-in type)

SUP block plate: AXT625-12A
EXH block plate: AXT625-12A

Interface regulator:
ARBF2000-00-P-1 (Plug-in type)
ARBF2000-00-P-2 (Non plug-in type)

Air shutoff valve spacer:
VVFS2000-21A-1 (Plug-in type)
VVFS2000-21A-2 (Non plug-in type)

Release valve spacer:
VVFS2000-24A-1R (Plug-in type)
VVFS2000-24A-2R (Non plug-in type)

Throttle valve spacer:
VVFS2000-20A-1 (Plug-in type)
VVFS2000-20A-2 (Non plug-in type)

Double check spacer:
VVFS2000-22A-1 (Plug-in type)
VVFS2000-22A-2 (Non plug-in type)

5 Port Pilot Operated Solenoid Valve
Metal Seal, Plug-in/Non Plug-in
Series VFS2000

Manifold with Control Unit

- Control unit (Filter, Regulator, Pressure switch, Air release valve) are all standardized to the one unit, and can be mounted on the manifold base without any attachments.
- Piping processes are eliminated.

**Plug-in type**

**Non plug-in type**

**Caution**

When using an air filter with auto-drain or manual drain, mount the filter vertically.

### How to Order

**Plug-in type with attachment plug lead wire**

- Piping processes are eliminated.
- Control unit (Filter, Regulator, Pressure switch, Air release valve) are all standardized to the one unit, and can be mounted on the manifold base without any attachments.
- Piping processes are eliminated.

**Non plug-in type**

- With multi-connector, or D-sub connector: 8 stations max.

#### How to Order Manifold Assembly [Example]

- Add the valve and option part numbers in order starting from the first station on the D side.
- Non plug-in type cannot be mounted afterwards.

---

**Series VFS2000**

**Manifold**

- **Base type/Electrical entry**
- **Connector mounting direction**
- **Junction cover**

**Control Unit specifications**

- **Control unit type**
- **Control equipment**
- **Air release valve coil rating**
- **Pressure switch**
- **Blanking plate (Air release valve)**
- **Blanking plate (Filter, Regulator)**
- **Blanking plate (Pressure switch)**

**How to Order**

- The manifold of plug-in type with attachment plug lead wire is applied to individual type only. Non-plug-in type has no junction cover.

---

**Table**

<table>
<thead>
<tr>
<th>Port size</th>
<th>B. A.</th>
<th>M</th>
<th>01</th>
<th>B. A.</th>
<th>M</th>
<th>02</th>
<th>B. A.</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Re/1/4</td>
<td></td>
<td></td>
<td></td>
<td>Re/1/4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Re/1½</td>
<td></td>
<td></td>
<td></td>
<td>Re/1½</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Note**

- Voltage: 24 VDC to 100 VAC
- Inner voltage drop: 4 V
- Voltage range:
  - IS1000P-2-1
  - IS1000P-2-1R

---

**Control Unit Option**

- Air release valve
- Air filter
- Pressure switch
- Air release valve coil rating
- Pressure switch
- Blanking plate (Air release valve)
- Blanking plate (Filter, Regulator)
- Blanking plate (Pressure switch)

---

**Control Unit Specifications**

- Air filter
- Pressure switch
- Air release valve
- Pressure switch
- Blanking plate

---

**Filtration degree**

- 5 μm

---

**Control equipment**

- Air filter
- Air release valve
- Pressure switch

---

**CE-compliant**

- Nil
- CE-compliant

---

**Manifold Specifications**

<table>
<thead>
<tr>
<th>Manifold</th>
<th>Plug-in type: VVFS2-01</th>
<th>Non plug-in type: VVFS2-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiring</td>
<td>Plug-in with attachment plug lead wire</td>
<td>Grommet terminal</td>
</tr>
<tr>
<td></td>
<td>With terminal block</td>
<td>Condut terminal</td>
</tr>
<tr>
<td></td>
<td>With multi-connector</td>
<td>DIN terminal</td>
</tr>
<tr>
<td></td>
<td>With D-sub connector</td>
<td></td>
</tr>
</tbody>
</table>

---

**Applicable valve model**

- VFS2-0100-CF
- VFS2-0100-CG
- VFS2-0100-CE
- VFS2-0100-CD

---

**Porting specifications**

- Common SUP, Common EXH

---

**Stations**

- 2 to 15 stations

---

**Symbol**

- Nil
- A
- AP
- M
- MP
- F
- G
- C
- E

---

**Thread type**

- M

---

**How to Order**

- Manifold type: VVFS2-01-071-01-M
- Individual specification of the P port in the composition symbol marks 3 to 8 or EA, EB ports should be taken as individual port using a block plate. Therefore, if an individual port is taken using a single SUP spacer of option or a single EXH spacer, the composition symbol mark is "*".

---

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**Approved**

- CE

- SMC

---

**Contact**

- 1a

---

**Pressure switch**

- Type
- Pressure range
- Operating pressure range

---

**Filter element**

- 1115115-1B

---

**Regulator**

- Max. operating current
- Max. switch capacity

---

**Air release valve coil rating**

- 2 VA AC, 2 W DC

---

**Contact**

- LED (RED)

---

**Pressure switch**

- 1115115-1B

---

**Operating pressure range**

- 0.1 to 1.0 MPa

---

**VFS2000**

- Series VFS2000
- Manifold
- Base type/Electrical entry
- Connector mounting direction
- Junction cover

---

**Control Unit/Option**

- Air release valve
- Air protection valve
- Pressure switch
- Air release valve coil rating
- Pressure switch
- Blanking plate (Air release valve)
- Blankling plate (Filter, Regulator)
- Blankling plate (Pressure switch)

---

**Control equipment**

- Air filter
- Air release valve
- Pressure switch
- Air release valve coil rating
- Pressure switch
- Blankling plate (Air release valve)
- Blankling plate (Filter, Regulator)
- Blankling plate (Pressure switch)

---

**Control Unit Specifications**

- Air filter
- Pressure switch
- Air release valve
- Pressure switch
- Blankling plate

---

**Control Unit/Option**

- Air release valve
- Air protection valve
- Pressure switch
- Air release valve coil rating
- Pressure switch
- Blankling plate (Air release valve)
- Blankling plate (Filter, Regulator)
- Blankling plate (Pressure switch)

---

**Control equipment**

- Air filter
- Air release valve
- Pressure switch
- Air release valve coil rating
- Pressure switch
- Blankling plate (Air release valve)
- Blankling plate (Filter, Regulator)
- Blankling plate (Pressure switch)

---

**Control Unit Specifications**

- Air filter
- Pressure switch
- Air release valve
- Pressure switch
- Blankling plate
Series VFS2000

Manifold with Control Unit — Plug-in type, Non plug-in type

Plug-in type:
VV5FS2-01T

Non plug-in type:
VV5FS2-10

Example for manifold

<table>
<thead>
<tr>
<th>Station</th>
<th>Port size</th>
<th>Control unit</th>
<th>Voltage for release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Example for manifold

<table>
<thead>
<tr>
<th>Station</th>
<th>Port size</th>
<th>Control unit</th>
<th>Voltage for release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4</td>
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<td></td>
</tr>
<tr>
<td>5</td>
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<tr>
<td>6</td>
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<td>8</td>
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<td></td>
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<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

n: Stations

<table>
<thead>
<tr>
<th>Station</th>
<th>Port size</th>
<th>Control unit</th>
<th>Voltage for release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>4</td>
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<tr>
<td>5</td>
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<td>6</td>
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<td>8</td>
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<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**5 Port Pilot Operated Solenoid Valve**

**Series VFS2000**

---

**Dripproof Manifold (Equivalent to IP65)**

**Manifold Specifications**

<table>
<thead>
<tr>
<th>Manifold</th>
<th>VV5FS2-01WTBU</th>
<th>VV5FS2-01W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiring</td>
<td>Common terminal Box</td>
<td>Attachment plug lead wire</td>
</tr>
<tr>
<td>Applicable value model</td>
<td>VFS2:000-65-X54</td>
<td>Common SUP, Common EXH</td>
</tr>
<tr>
<td>Porting specifications</td>
<td>2(8), 4(A) port</td>
<td>Side: Rc 1/8, 1/4, Bottom: Rc 1/8 (Option)</td>
</tr>
<tr>
<td>Re</td>
<td>1(1), 3(12), 5(11) port</td>
<td>Side: Rc 1/4</td>
</tr>
<tr>
<td>Stations</td>
<td>2 to 10 stations</td>
<td>2 to 15 stations</td>
</tr>
</tbody>
</table>

**How to order manifold**

**VV5FS2-01WTBU**

- 08 - 02

**How to order valves**

**VFS2**

- 100

- 5

- X54

---

**How to Order**

**Manifold Specifications**

- Plug-in dripproof manifold (Equivalent to IP65)
- Common terminal box (U side mounting)
- Common terminal box (D side mounting)
- Attachment plug lead wire
- Stations: 2 to 10 stations / 2 to 15 stations

**How to order valves**

- 2 position single
- 2 position double
- 3 position closed center
- 3 position exhaust center
- 3 position pressure center
- 3 position double check

---

**Option**

- CE-compliant
- Port size
- Symbol
- Passage
- P, R1, R2, A, B
- M
- Rc 1/8
- Rc 1/4
- Mixed
- Option

---

**Approved**

**Coil rated voltage**

1. 100 VAC, 50/60 Hz
2. 200 VAC, 50/60 Hz
3. 110 to 125 VAC, 50/60 Hz
4. 220 VAC, 50/60 Hz
5. 24 VDC
6. 12 VDC
7. 240 VAC, 50/60 Hz
8. Other

---

**Option**

- With light/surge voltage suppressor

---

**Symbol**

- 1
- 2
- 3
- 4
- 5
- 6

---

**Series VFS2000**

**Metal Seal, Plug-in/Non Plug-in**

---

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Series VFS2000

Dripproof Manifold

With common terminal box: VV5FS2-01WTB

- Terminal mounting stations are not included.
- Indicates Solenoid valve mounting stations.

Bottom ported: VV5FS2-01WTBD

With attachment plug lead wire: VV5FS2-01W
Made to Order
Serial Transmission Kit Manifold: EX123/124 Integrated Type (For Output)
Serial Transmission System

How to Order

How to Order Manifold
VV5FS2-01S V 01 -02- X460

Correspondence of SI unit output numbers and solenoid valve coils

How to Order Valves
VFS2-00-5 F

Coil rated voltage
Nil None
5 Port Pilot Operated Solenoid Valve
Metal Seal, Plug-in/Non Plug-in  
**Series VFS2000**

Serial Transmission Kit Manifold: EX123/124 Integrated Type (For Output) Serial Transmission System

**VVFS2-01S Model - Stations Symbol - Port size - X460**

Formula: \( L_1 = 28n + 47 \)  
\( L_2 = 28n + 56 \)

<table>
<thead>
<tr>
<th>Stations (Max. 18 stations)</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>( L_1 )</td>
<td>131</td>
<td>159</td>
<td>187</td>
<td>215</td>
<td>243</td>
<td>271</td>
<td>299</td>
<td>327</td>
<td>355</td>
<td>383</td>
<td>411</td>
<td>439</td>
<td>467</td>
<td>495</td>
<td>523</td>
<td>551</td>
</tr>
<tr>
<td>( L_2 )</td>
<td>140</td>
<td>168</td>
<td>196</td>
<td>224</td>
<td>252</td>
<td>280</td>
<td>308</td>
<td>336</td>
<td>364</td>
<td>392</td>
<td>420</td>
<td>448</td>
<td>476</td>
<td>504</td>
<td>532</td>
<td>560</td>
</tr>
</tbody>
</table>

Note: Actual number of manifold base stations: Add 2 SI unit mounting stations to the number of valve stations.
Series VFS2000

Manifold Base Construction — Plug-in type, Non plug-in type

- Manifold Base/Construction: Plug-in type with terminal block (01T1).
- For increasing the manifold bases, please order the manifold block assembly number of the principle number assembly ① and ③.
  For plug-in type: The manifold base with terminal stand (integrated with a junction cover) is required with the ⑨ junction cover assembly.
- Manifold base is consisted of the junction of 2 and 3 station bases.

Example: ①side ②→③→④→⑤→⑥→⑦ ⑧ ⑤side
  - <5 stations (Odd number)> 2 stations 2 stations 1 station
  - <6 stations (Even number)> 2 stations 2 stations 1 station
## Replacement Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Connection fitting assembly</td>
<td>Steel plate</td>
<td>AXT625-4-1A</td>
</tr>
<tr>
<td>2</td>
<td>Connection fitting B</td>
<td>Steel plate</td>
<td>AXT625-5</td>
</tr>
<tr>
<td>3</td>
<td>Gasket A</td>
<td>NBR</td>
<td>AXT625-17</td>
</tr>
<tr>
<td>4</td>
<td>Gasket B</td>
<td>NBR</td>
<td>AXT625-16</td>
</tr>
<tr>
<td>5</td>
<td>Gasket</td>
<td>HNBR</td>
<td>VVF2000-32-1H</td>
</tr>
<tr>
<td>6</td>
<td>O-ring</td>
<td>NBR</td>
<td>18 x 15 x 1.5</td>
</tr>
<tr>
<td>7</td>
<td>O-ring</td>
<td>NBR</td>
<td>10.5 x 7.5 x 1.5</td>
</tr>
<tr>
<td>8</td>
<td>O-ring</td>
<td>NBR</td>
<td>8 x 5 x 1.5</td>
</tr>
</tbody>
</table>

### Adapter plate assembly

**For 01**

- AXT625-6

**For 01T**

- AXT625-28-13A (Terminal section with adapter plate and lead wire assembly)

**For 01C**

- AXT625-28-1

**For 01F**

- VVF2000-26-6

**For 01G**

- AXT625-6

### Junction cover assembly

**For 01**

- AXT625-7A

**For 01T**

- AXT625-28-3A

**For 01C**

- AXT625-28-7A

**For 01F**

- VVF2000-26-6A

**For 01G**

- AXT625-6

### Rubber plug

**For 13T**

- AXT625-22

### Plug

**For 01W**

- EXP22S

### Guard

**For 01U**

- AXT625-28-4

## Replacement Parts: Sub Assembly

### Manifold block assembly (for 1 station)

- AXT625-01A-1

### Manifold block assembly (for 2 stations)

- AXT625-01A-2

### End plate (U side) assembly

- AXT625-2A

### End plate (D side) assembly

- AXT625-3A

### Component parts

- Manifold block
- Metal joint
- O-ring
- Junction cover
- Adapter plate
- Pin housing, Guide
- Insert plug lead wire

### Applicable manifold base

- With attachment plug lead wire
- Plug-in type
- With terminal block
- Non plug-in type

### Notes

1. A, B port size Rc 1/8, 2: A, B port size Rc 1/4, (-B): A, B port bottom ported
## 5 Port Pilot Operated Solenoid Valve
**Metal Seal, Plug-in/Non Plug-in**
**Series VFS2000**

### Light Compact Type Sub-plate/C: 2.8 dm³/(s·bar)

<table>
<thead>
<tr>
<th>Type</th>
<th>L dimension (mm)</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compact type</td>
<td>25.5</td>
<td>0.13</td>
</tr>
<tr>
<td>Standard type</td>
<td>31</td>
<td>0.2</td>
</tr>
</tbody>
</table>

#### Sub-plate — Compact: Plug-in, Grommet (With attachment plug lead wire)

Sub-plate assembly part no.: VFS2000-CP-(B) 01/02 (01: Rc 1/8, 02: Rc 1/4)

#### Precautions
Please pay attention to piping port location of sub-plate.

### Electrical Connection
- Compact type, plug-in type grommet sub-plate (With attachment plug lead wire)
- The attachment plug lead wire is attached to the manifold block and lead wire is plugged in with valve side as shown in the following list. Please connect with corresponding power side.

#### Lead wire color
- A side: Red
- B side: Black, Brown, White
- There is no polarity.

---

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## 5 Port Pilot Operated Solenoid Valve
### Metal Seal, Plug-in/Non Plug-in
### Series VFS3000

#### Compact Yet Provides a Large Flow Capacity
- **3/8**: C: 5.8 dm³/(s·bar)

#### Low Power Consumption: 1.8 W DC

#### Easy Maintenance
- 2 types of sub-plates:
  - Plug-in and non plug-in

### Model Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Port Size Rc</th>
<th>Flow Characteristics</th>
<th>Max. operating pressure</th>
<th>Response time</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS3100</td>
<td>1/4</td>
<td>6.0</td>
<td>1.2</td>
<td>1200</td>
<td>0.31</td>
</tr>
<tr>
<td>VFS3110</td>
<td>1/4</td>
<td>6.0</td>
<td>1.2</td>
<td>1500</td>
<td>0.41</td>
</tr>
<tr>
<td>VFS3200</td>
<td>1/4</td>
<td>7.3</td>
<td>1.8</td>
<td>600</td>
<td>0.43</td>
</tr>
<tr>
<td>VFS3210</td>
<td>1/4</td>
<td>7.3</td>
<td>1.8</td>
<td>600</td>
<td>0.43</td>
</tr>
<tr>
<td>VFS3300</td>
<td>1/4</td>
<td>5.8</td>
<td>1.4</td>
<td>600</td>
<td>0.43</td>
</tr>
<tr>
<td>VFS3310</td>
<td>1/4</td>
<td>6.8</td>
<td>1.7</td>
<td>600</td>
<td>0.43</td>
</tr>
<tr>
<td>VFS3400</td>
<td>1/4</td>
<td>6.1</td>
<td>1.4</td>
<td>600</td>
<td>0.43</td>
</tr>
<tr>
<td>VFS3410</td>
<td>1/4</td>
<td>7.4</td>
<td>1.8</td>
<td>600</td>
<td>0.43</td>
</tr>
<tr>
<td>VFS3500</td>
<td>1/4</td>
<td>6.0</td>
<td>1.5</td>
<td>600</td>
<td>0.43</td>
</tr>
<tr>
<td>VFS3510</td>
<td>1/4</td>
<td>7.2</td>
<td>1.8</td>
<td>600</td>
<td>0.43</td>
</tr>
<tr>
<td>VFS3600</td>
<td>1/4</td>
<td>4.0</td>
<td>—</td>
<td>600</td>
<td>0.31</td>
</tr>
<tr>
<td>VFS3610</td>
<td>1/4</td>
<td>4.0</td>
<td>—</td>
<td>600</td>
<td>0.31</td>
</tr>
</tbody>
</table>

### Standard Specifications

- Fluid: Air/nitrogen
- Maximum operating pressure: 1.0 MPa
- Minimum operating pressure: 0.1 MPa
- Proof pressure: 1.5 MPa
- Ambient and fluid temperature: -10 to 60°C
- Lubrication: Non-lube
- Pilot valve manual override: Non-locking push type (Flush)
- Shock/Vibration resistance: 150/50 m/s²
- Release temperature: 1 C
- Enclosure: Type E (Enclosure Level 0), Type F (Enclosure Level 2)
- Coil rated voltage: 100, 200 VAC, 50/60 Hz, 24 VDC
- Allowable voltage fluctuation: ±15% ±10% of rated voltage
- Coil inductance: Class B or equivalent (130°C)
- Apparent power (Power consumption): AC: 5.6 VA/50 Hz, 5.0 VA/60 Hz
- Power consumption DC: 1.8 W (2.0 W with light-surge voltage suppressor)
- Electrical entry: Non-plug-in type
- DIN terminal, Grommet terminal
- Holding time: 3.4 VA (2.1 W) 50 Hz, 2.3 VA (1.5 W) 60 Hz
- Inrush current: 3.7 A

### Option Specifications

- **Pilot type**: External pilot
- **Manual override**: Direct manual override type
- **Main valve**: Non-locking push type (Extended), Locking type (Tool required), Locking type (Level)
- **Coil rated voltage**: 110 to 120, 220, 240 VAC (50/60 Hz)
- **Pilot pressure**: 0.1 to 1.0 MPa
- **Flow capacity**: 1.8 W (2.0 W with light-surge voltage suppressor)

### Notes
- Note 1: Based on JIS B 8375 (once per 30 days) for the minimum operating frequency.
- Note 2: Based on JIS B 8375-1981 (the value at supply press. 0.5 MPa).
- Note 3: The figures in the above list are for without sub-plate. In the case of with plug-in sub-plate and with non plug-in sub-plate, add 0.30 kg and 0.27 kg respectively.
- Note 4: “Note 1)” and “Note 2)” are with controlled clean air.
- Note 5: “Note 1)” and “Note 2)” are with controlled dry air.

---

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5 Port Pilot Operated Solenoid Valve
Metal Seal, Plug-in/Non Plug-in

Series VFS3000

How to Order

Body type
Q: Plug-in type
Non plug-in

Electrical entry
F: Plug-in type
D: Non plug-in

Porting specifications
Nil
Side ported
Bottom ported

Thread type
CE-compliant
Nil

Body Option
Standard
Option

Manual override
Non-locking push type
Tool required
Lever

Coil rated voltage
1: 100 VAC, 50/60 Hz
2: 200 VAC, 50/60 Hz
3: 110 to 120 VAC, 50/60 Hz
4: 220 VAC, 50/60 Hz
5: 24 VDC
6: 12 VDC
7: 240 VAC, 50/60 Hz
9: Other

Pilot valve
A: Non-locking push type
B: Locking type
C: Locking type

How to Order Pilot Valve Assembly
SF4 - F - 30

Related to:
Series VFS3000
Metal Seal, Plug-in/Non Plug-in

Courtesy of Steven Engineering, Inc. - 230 Ryan Way, South San Francisco, CA 94080 - Main Office: (650) 588-9200 - Outside Local Area: (800) 258-9200 - www.stevenengineering.com
### System Components

<table>
<thead>
<tr>
<th>System</th>
<th>Solenoid valve</th>
<th>Speed controller</th>
<th>Silencer</th>
<th>SGP (Steel pipe)</th>
<th>Port size x Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Series VFS3000 Rc 7/8</td>
<td>AS4000-02 (S = 24 mm²)</td>
<td>AN200-02 (S = 35 mm²)</td>
<td>6A x 1 m</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Series VFS3000 Rc 7/8</td>
<td>AS420-03 (S = 73 mm²)</td>
<td>AN300-03 (S = 60 mm²)</td>
<td>10A x 1 m</td>
<td></td>
</tr>
</tbody>
</table>

### Double Check Spacers/Specifications

**Can hold an intermediate cylinder position for an extended time**

If the double check spacer with a built-in double check valve is combined, it will enable the cylinder to stop in the intermediate stroke and maintain its position for a long time without being affected by the leakage between the spools.

### Specifications

<table>
<thead>
<tr>
<th>Double check spacer part no.</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS3000-22A-1</td>
<td>VFS3000-22A-2</td>
<td></td>
</tr>
</tbody>
</table>

- **Applicable valve model:** VFS3400-CF, VFS3410-CD, VFS3410-CC

### Check Valve Operation

- **Cylinder side pressure (P2):**
- **SUP side pressure (P1):**
- **Operating range:**
- **Cylinder side pressure P2 (MPa):**
- **SUP side pressure P1 (MPa):**

**Caution**

- In the case of 3 position double check valve (VFS36/L0), check the leakage from piping and fittings in between valve and cylinder by means of synthetic detergent solutions, and ensure that there is no such leakage found there. Also check the leakage from cylinder seal and piston seal. If there is any leakage, sometimes the cylinder, when valve is de-energized, can move without stopping at intermediate position.
- Be aware that if the exhaust side is restricted excessively, the intermediate stopping accuracy will decrease and will lead to improper intermediate stops.

- The combination of VFS31/L0, VFS32/L0 and double check spacer can be used as prevention for falling at the stroke end but cannot hold the intermediate position of the cylinder.
## Construction

### 2 position single

- **Body**
- **Adapter plate**
- **End plate**
- **Piston**
- **Junction cover**
- **Light cover**
- **Gasket**
- **Hexagon socket head screw**
- **Detent assembly**
- **Pilot valve assembly**

### 2 position double

- **Sub-plate**
- **Body**
- **Spool/Sleeve**
- **Adapter plate**
- **End plate**
- **Piston**
- **Junction cover**
- **Light cover**
- **Return spring**
- **Gasket**
- **Hexagon socket head screw**
- **Detent assembly**
- **Pilot valve assembly**

### 3 position closed center/exhaust center/pressure center

- **Closed center**
- **Exhaust center**
- **Pressure center**

---

### Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Aluminum die-casted</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>2</td>
<td>Sub-plate</td>
<td>Aluminum die-casted</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>3</td>
<td>Spool/Sleeve</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Adapter plate</td>
<td>Resin</td>
<td>Black</td>
</tr>
<tr>
<td>5</td>
<td>End plate</td>
<td>Resin</td>
<td>Black</td>
</tr>
<tr>
<td>6</td>
<td>Piston</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Junction cover</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Light cover</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Return spring</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Gasket</td>
<td>NBR</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Hexagon socket head screw</td>
<td>Steel</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Detent assembly</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Pilot valve assembly</td>
<td>---</td>
<td></td>
</tr>
</tbody>
</table>

### Sub-plate Assembly Part No.

- **Plug-in**
  - VFS3000-P-
- **Non plug-in**
  - VFS3000-S-<br>
  - VFS3000-S-R-

Mounting bolt and gasket are not included.

### Sub-plate Assembly (For External Pilot) Part No.

- **Plug-in**
  - VFS3000-P-R-
- **Non plug-in**
  - VFS3000-S-R-

Part no. for mounting bolt and gasket: BG-7F3000

---

* Refer to "How to Order Pilot Valve Assembly" on page 1163.
Series VFS3000

Plug-in — 2 Position single/3 Position closed center/Exhaust center/Pressure center/Double check

2 position single: VFS3100-□F

2 position double: VFS3200-□F

3 position closed center: VFS3300-□F

3 position exhaust center: VFS3400-□F

3 position pressure center: VFS3500-□F

3 position double check: VFS3600-□F

Bottom ported

( ): Rc 1/4

<table>
<thead>
<tr>
<th>2 position double: VFS3200-□F</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 position closed center: VFS3300-□F</td>
</tr>
<tr>
<td>3 position exhaust center: VFS3400-□F</td>
</tr>
<tr>
<td>3 position pressure center: VFS3500-□F</td>
</tr>
<tr>
<td>3 position double check: VFS3600-□F</td>
</tr>
</tbody>
</table>

Pilot valve manual override

Light window At FZ

G 1/2 electrical entry

Rc 1/8 external pilot port

(Only for external pilot)

Pilot valve manual override

Light window At FZ

G 1/2 electrical entry

Rc 1/8 external pilot port

(PE port)

( ): Rc 1/4
5 Port Pilot Operated Solenoid Valve
Metal Seal, Plug-in/Non Plug-in Series VFS3000

Non Plug-in — 2 Position single/Double/3 Position closed center/Exhaust center/Pressure center/Double check

2 position single: VFS3110-□E, VFS3110-□D

2 position double: VFS3210-□E, VFS3210-□D

3 position closed center: VFS3310-□E, VFS3310-□D

3 position exhaust center: VFS3410-□E, VFS3410-□D

3 position pressure center: VFS3510-□E, VFS3510-□D

3 position double check: VFS3610-□E, VFS3610-□D

Bottom ported

2 x ø5.6 mounting hole

Bottom ported

2 x ø5.6 mounting hole

Rc 1/8 external pilot port (Only for external pilot)

Rc 1/8 (PE port)

Application: heavy-duty cord O.D. ø8 to ø10

Application: heavy-duty cord O.D. ø8 to ø10

Pilot valve manual override

Pilot valve manual override

Light window at DZ, EZ

Light window at DZ, EZ

With direct manual override

With direct manual override

Cable ø8 to ø10

Cable ø8 to ø10

With direct manual override

With direct manual override

 Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com
# Series VFS3000 Manifold Specifications

## Plug-in Type: With Terminal Block

Since lead wires of solenoid valve are connected with the terminals on upper surface of terminal block, corresponding lead wires from power source can be wired at the bottom of terminal block.

### VV5FS3 - 01T

<table>
<thead>
<tr>
<th>Port size</th>
<th>Symbol</th>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>A, BP, EA, EB</td>
<td>16 stations</td>
</tr>
<tr>
<td>02</td>
<td>M</td>
<td>2 stations</td>
</tr>
</tbody>
</table>

## Plug-in Type: With Multi-connector

Master connection of power and solenoid valves, Quick wiring permits easier installation.

### VV5FS3 - 01C

<table>
<thead>
<tr>
<th>Port size</th>
<th>Symbol</th>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>A, BP, EA, EB</td>
<td>16 stations</td>
</tr>
<tr>
<td>02</td>
<td>M</td>
<td>2 stations</td>
</tr>
</tbody>
</table>

## Plug-in Type: With D-sub Connector

Wide range of interchangeability (MIL Spec D-sub connector terminal 25 pcs attached), Quick wiring permits easier installation.

### VV5FS3 - 01F

<table>
<thead>
<tr>
<th>Port size</th>
<th>Symbol</th>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>A, BP, EA, EB</td>
<td>16 stations</td>
</tr>
<tr>
<td>02</td>
<td>M</td>
<td>2 stations</td>
</tr>
</tbody>
</table>

## Non Plug-in Type: Grommet Terminal, DIN Terminal

Wiring for every valve.

### VV5FS3 - 10

<table>
<thead>
<tr>
<th>Port size</th>
<th>Symbol</th>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
<td>A, BP, EA, EB</td>
<td>16 stations</td>
</tr>
<tr>
<td>02</td>
<td>M</td>
<td>2 stations</td>
</tr>
</tbody>
</table>
5 Port Pilot Operated Solenoid Valve
Metal Seal, Plug-in/Non Plug-in  **Series VFS3000**

### How to Order Manifold Assembly

Please indicate manifold base type, corresponding valve, and option parts.

**Example**
- Plug-in type with terminal block: 6 stations (Manifold base) VVFS3-01T-061-02 ....1
- (2 position single) VFS3100-5FZ .......3
- (2 position double) VFS3200-5FZ .......2
- (Blanking plate) VVFS3000-10A .......1

**Example**
- Non plug-in type: 6 stations
  - (Manifold base) VVFS3-10-061-03 .......1
  - (2 position single) VFS3110-5D .........5
  - (3 position exhaust center) VFS3410-5D ....1
  - (Individual EXH spacer) VVFS3000-R-03-2 ....1

### Manifold Specifications

<table>
<thead>
<tr>
<th>Base model</th>
<th>Wiring</th>
<th>Port size Rc</th>
<th>Stations</th>
<th>Applicable valve model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in type</td>
<td>VVFS3-01T</td>
<td>1/2, 3/4</td>
<td>2 to 10</td>
<td>VFS3000-□F</td>
</tr>
<tr>
<td>Non plug-in type</td>
<td>VVFS3-10</td>
<td>DIN terminal</td>
<td></td>
<td>VFS3100-□D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Grommet terminal</td>
<td></td>
<td>VFS3200-□E</td>
</tr>
</tbody>
</table>

**Note 1)** Appropriate silencer for EA, EB port: "AN403-04" (O.D. ø27).
**Note 2)** With multi-connector, or with D-sub connector: 8 stations max.

### Flow Characteristics at the Number of Manifold Stations (Operated individually)

<table>
<thead>
<tr>
<th>Model</th>
<th>Passage/Stations</th>
<th>Station 1</th>
<th>Station 5</th>
<th>Station 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>VVFS3</td>
<td>1 → 4/2 (P → A/B)</td>
<td>6.0</td>
<td>6.0</td>
<td>6.0</td>
</tr>
<tr>
<td></td>
<td>4/2 → 5/3 (A/B → R1/R2)</td>
<td>1.4</td>
<td>1.4</td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td>C [dm³/(s·bar)]</td>
<td>7.0</td>
<td>7.0</td>
<td>7.0</td>
</tr>
<tr>
<td></td>
<td>b</td>
<td>0.20</td>
<td>0.20</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>Cv</td>
<td>1.8</td>
<td>1.8</td>
<td>1.8</td>
</tr>
</tbody>
</table>

* Port size: Rc 3/8
### Series VFS3000

#### Manifold Option Parts Assembly

**Individual SUP spacer**
An individual SUP spacer set on manifold block can form SUP port for every valve.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>VVFS3000-P-03-1</td>
<td>VVFS3000-P-03-2</td>
</tr>
</tbody>
</table>

**Individual EXH spacer**
An individual EXH spacer set on manifold block can form EXH port for every valve. (common EXH type)

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>VVFS3000-R-03-1</td>
<td>VVFS3000-R-03-2</td>
</tr>
</tbody>
</table>

**SUP block plate**
When supplying manifold with more than two different pressures, high and low, insert a block plate in between stations subjected to different pressures.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>AXT636-1A</td>
<td></td>
</tr>
</tbody>
</table>

**EXH block plate**
When valve exhaust affects the other stations on the circuit or when the reverse pressure valve is used to standard manifold valve, insert EXH block plate between stations to separate valve exhaust.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>AXT636-1A</td>
<td></td>
</tr>
</tbody>
</table>

**Throttle valve spacer**
Needle valve set on the manifold block can control cylinder speed by throttling exhaust.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>VVFS3000-20A-1</td>
<td>VVFS3000-20A-2</td>
</tr>
</tbody>
</table>

**Double check spacer**
If the double check spacer with a built-in double check valve is combined, it will enable the cylinder to stop in the intermediate stroke and maintain its position for a long time without being affected by the leakage between the spools.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>VVFS3000-22A-1</td>
<td>VVFS3000-22A-2</td>
</tr>
</tbody>
</table>

**Interface regulator**
Interface regulator set on manifold block can regulate the pressure to each valve. (Refer to page 1225 for “Flow Characteristics”.)

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Blanking plate**
It is used by attaching on the manifold block for being prepared for removing a valve for maintenance reasons or planning to mount a spare valve, etc.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>VVFS3000-10A</td>
<td></td>
</tr>
</tbody>
</table>

#### Manifold Option

**With exhaust cleaner**
Plug-in type/Non Plug-in type
- Valve exhaust noise dampening: 35 dB or more.
- Oil mist collection: Rate of collection 99.9% or more.
- Piping process reduced.

For details, refer to page 1173.

**With control unit**
Plug-in type/Non Plug-in type
- Filter, regulation valve, pressure switch and air release valve are all combined to form one unit.
- Piping processes are eliminated.

For details, refer to page 1175.

**Made to Order**
Serial transmission kit manifold Plug-in type
- Solenoid valve wiring process reduced considerably.

For details, refer to page 1178.

### Made to Order Part Numbers

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Body type Plug-in type

- VVFS3000-P-03-1
- VVFS3000-P-03-2
- VVFS3000-20A-1
- VVFS3000-20A-2
- VVFS3000-22A-1
- VVFS3000-22A-2
- VVFS3000-R-03-1
- VVFS3000-R-03-2
- VVFS3000-20A-1
- VVFS3000-20A-2
- VVFS3000-22A-1
- VVFS3000-22A-2
- AXT636-1A
- ARBF3050-00-P-1
- ARBF3050-00-P-2
- ARBF3050-00-A-1
- ARBF3050-00-A-2
- ARBF3050-00-B-1
- ARBF3050-00-B-2
- VVFS3000-10A

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 Courtesy of Steven Engineering, Inc. -332 Ryan Way, South San Francisco, CA 94080-6370 -Main Office: (650) 588-9200 -Outside Local Area: (800) 258-9200 -www.stevenengineering.com
Manifold — Plug-in type, Non plug-in type

Plug-in type (With terminal block): VV5FS3-01T- Station 1 - Port size

Non plug-in type: VV5FS3-10- Station 1 - Port size

Formula for manifold weight M = 0.405n + 0.665 (kg)  n: Station

Formula for manifold weight M = 0.309n + 0.532 (kg)  n: Station
Series VFS3000

Manifold — Plug-in type with multi-connector/D-sub connector

Plug-in type with multi-connector: VVFS3-01CD- [Station 1- Port size], VVFS3-01CU- [Station 1- Port size]

Bottom ported:
VVFS3-01 [Station 2- Port size]

Plug-in type with D-sub connector: VVFS3-01FD- [Station 1- Port size], VVFS3-01FU- [Station 1- Port size]

Bottom ported:
VVFS3-01 [Station 2- Port size]

Formula for manifold weight $M = 0.41n + 0.753$ (kg)  $n$: Station

Wiring specifications: Refer to page 1227.

Table:

<table>
<thead>
<tr>
<th>Stations</th>
<th>L1</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>129</td>
<td>141</td>
</tr>
<tr>
<td>3</td>
<td>162</td>
<td>174</td>
</tr>
<tr>
<td>4</td>
<td>195</td>
<td>207</td>
</tr>
<tr>
<td>5</td>
<td>228</td>
<td>240</td>
</tr>
<tr>
<td>6</td>
<td>261</td>
<td>273</td>
</tr>
<tr>
<td>7</td>
<td>294</td>
<td>306</td>
</tr>
<tr>
<td>8</td>
<td>327</td>
<td>339</td>
</tr>
</tbody>
</table>

Formula for manifold weight $M = 0.41n + 0.677$ (kg)  $n$: Station

Wiring specifications: Refer to page 1227.
Manifold with Exhaust Cleaner

- Serves to protect working environment.
- Valve exhaust noise dampening: 35 dB or more.
- Collection rate of drainage and oil mist: 99.9% or more.
- Piping work is reduced.

**Manifold Specifications**

<table>
<thead>
<tr>
<th>Manifold</th>
<th>Plug-in type: VV5FS3-01</th>
<th>Non plug-in type: VVFS3-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiring</td>
<td>With terminal blocks</td>
<td>DIN terminal</td>
</tr>
<tr>
<td></td>
<td>With multi-connector</td>
<td></td>
</tr>
<tr>
<td></td>
<td>With D-sub connector</td>
<td></td>
</tr>
<tr>
<td>Applicable valve model</td>
<td>VVFS3-01-0E</td>
<td></td>
</tr>
<tr>
<td>Porting specifications</td>
<td>Rc, 4(4A) port</td>
<td>1/4, 3/8</td>
</tr>
<tr>
<td>Stations</td>
<td>P: 1/2, EXH: 1</td>
<td></td>
</tr>
<tr>
<td>Applicable exhaust cleaners</td>
<td>AMC610-10 (Connecting port size R1)</td>
<td></td>
</tr>
</tbody>
</table>

**Caution**

When using an exhaust cleaner, mount it downwards.

- For details about exhaust cleaners, refer to Best Pneumatic Vol. 6.

---

**How to Order**

**Manifold Assembly [Example]**

Add the valve and option part numbers in order starting from the first station on the D side.

- Plug-in type with terminal block (6 stations)
  - (Manifold base) VVFS3-01T-061-03-CD
  - (Valve exhaust noise dampening) VFS3100-5FZ
  - (Blanking plate) VVFS3000-10A
  - (Exhaust cleaner) AMC610-10

- Non plug-in type (6 stations)
  - (Manifold base) VVFS3-106-01-03-CU
  - (Valve exhaust noise dampening) VFS3110-5E
  - (Blanking plate) VVFS3000-10A

The asterisk denotes the symbol for assembly. Prefix it to the part numbers of the solenoid valve.
**Series VFS3000**

**Manifold with Exhaust — Plug-in type, Non plug-in type**

Plug-in type: VV5FS3-01-Station1-Port size-CD

![Diagram of plug-in type manifold](image)

Non plug-in type: VV5FS3-10-Station1-Port size-CD

![Diagram of non plug-in type manifold](image)

**Formulas**

\[ L_1 = 33 \times n + 63 \]
\[ L_2 = 33 \times n + 75 \]
5 Port Pilot Operated Solenoid Valve
Metal Seal, Plug-in/Non Plug-in
Series VFS2000

Manifold with Control Unit

- Control unit (Filter, Regulator, Pressure switch, Air release valve) are all standardized to the one unit, and can be mounted on the manifold base without any attachments.
- Piping processes are eliminated.

**CAUTION**
When using an air filter with auto-drain or manual drain, mount the filter vertically.

**Manifold Specifications**

<table>
<thead>
<tr>
<th></th>
<th>Plug-in type: VVF5S3-01F</th>
<th>Non plug-in type: VVF5S3-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiring</td>
<td>With terminal block</td>
<td>DIN terminal</td>
</tr>
<tr>
<td></td>
<td>With D-sub connector</td>
<td>Grommet terminal</td>
</tr>
<tr>
<td>Applicable valve model</td>
<td>VVF5S3-10-CF</td>
<td>VVF5S3-10-D, VVF5S3-10-E</td>
</tr>
<tr>
<td>Porting specifications</td>
<td>Rc: (2B), (4A) port</td>
<td>1/4, 3/8</td>
</tr>
<tr>
<td></td>
<td>(1P), (3R), (5R) port</td>
<td>1/2</td>
</tr>
<tr>
<td>Stations</td>
<td>2 to 10</td>
<td>8 stations max.</td>
</tr>
</tbody>
</table>

- With multi-connector, or with D-sub connector: 8 stations max.

**Control Unit Specifications**

- Air filter (With auto-drain/With manual drain)
- Pressure switch (1)
- Set pressure (Outlet pressure)
- Differential
- Contact
- Indicator light
- Max. switch capacity: 2 VA AC, 2 W DC
- Max. operating current: 100 VAC/DC, or less
- Air release valve (Single only)
- Operating pressure range: 0.1 to 1.0 MPa

**How to Order**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Option</th>
<th>Station size</th>
<th>Station number</th>
<th>Port size</th>
</tr>
</thead>
<tbody>
<tr>
<td>01F</td>
<td>01C</td>
<td>01T</td>
<td>01F</td>
<td>01C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 to 10</td>
<td>2 to 10 stations</td>
<td>2 to 8 stations</td>
</tr>
</tbody>
</table>

**How to Order Manifold Assembly [Example]**

Add the valve and option part numbers in order starting from the first station on the D side.

**Example**

- Plug-in type with terminal block — In order to mount control unit, it requires 2 stations.
  - (Manifold base) VVF5S3-01T-081-03-AP5 .............. 1
  - (2 position single) VVF5S3000-24A-1R ............... 4
  - (2 position double) VVF5S3000-24A-9R .............. 2

- Non plug-in type — In order to mount control unit, it requires 2 stations.
  - (Manifold base) VVF5S3-10-061-03-AP5 .............. 1
  - (2 position single) VVF5S3100-5FZ ................. 4

The asterisk denotes the symbol for assembly. Prefix it to the part numbers of the solenoid valve.
Series VFS3000

Manifold with Control unit — Plug-in type, Non plug-in type

Plug-in type: VV5FS3-01T

<table>
<thead>
<tr>
<th>Station</th>
<th>Port size</th>
<th>Voltage for release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Non plug-in type: VV5FS3-10

Example for manifold

<table>
<thead>
<tr>
<th>Port size</th>
<th>Voltage for release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Example for manifold

<table>
<thead>
<tr>
<th>Voltage for release valve</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>162</td>
<td>195</td>
<td>228</td>
<td>261</td>
<td>294</td>
<td>327</td>
<td>360</td>
<td>393</td>
</tr>
<tr>
<td>L2</td>
<td>174</td>
<td>207</td>
<td>240</td>
<td>273</td>
<td>306</td>
<td>339</td>
<td>372</td>
<td>405</td>
</tr>
<tr>
<td>L(MP)</td>
<td>283</td>
<td>296</td>
<td>329</td>
<td>362</td>
<td>395</td>
<td>428</td>
<td>461</td>
<td>494</td>
</tr>
<tr>
<td>L(AP)</td>
<td>384.5</td>
<td>417.5</td>
<td>450.5</td>
<td>483.5</td>
<td>516.5</td>
<td>549.5</td>
<td>582.5</td>
<td>615.5</td>
</tr>
</tbody>
</table>
Made to Order
Serial Transmission Kit Manifold: EX123/124 Integrated Type (For Output)
Serial Transmission System

How to Order

How to Order Manifold
VV5FS3-01SV-081-02-X279

Symbol
F1 EX123U-SUW1 NKE Corporation: Uni-wire System (16 outputs)
H EX123U-SUH1 NKE Corporation: Uni-wire H System (16 outputs)
J1 EX123U-SSL1 SUNX Corporation: S-LINK System (16 outputs)
J2 EX123U-SSL2 SUNX Corporation: S-LINK System (8 outputs)
Q EX124U-SDN1 DevieNet (2 power supply systems)
R1 EX124U-SCS1 OMRON Corporation: CompoBus/S (16 outputs) (2 power supply systems)
R2 EX124U-SCS2 OMRON Corporation: CompoBus/S (8 outputs) (2 power supply systems)
V EX124U-SMU1 CC-Link (2 power supply systems)

Correspondence of SI unit output numbers and solenoid valve coils

Wiring Example 1: Double wiring (Standard)

Wiring Example 2: Single/Double mixed wiring (Option)

How to Order Valves
VFS3-005F

Pilot valve manual override
A Non-locking push type (Flush)
B Locking type (Tool required)
C Locking type (Lever)

Option
Z With light/surge voltage suppressor

Coil rated voltage
Nil None

Thread type
Nil Rc
N NPT
T NPTF
F G

Applicable models

<table>
<thead>
<tr>
<th>Symbol</th>
<th>SI unit part no.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>—</td>
<td>Without SI unit</td>
</tr>
<tr>
<td>F1</td>
<td>EX123U-SUW1</td>
<td>NKE Corporation: Uni-wire System (16 outputs)</td>
</tr>
<tr>
<td>H</td>
<td>EX123U-SUH1</td>
<td>NKE Corporation: Uni-wire H System (16 outputs)</td>
</tr>
<tr>
<td>J1</td>
<td>EX123U-SSL1</td>
<td>SUNX Corporation: S-LINK System (16 outputs)</td>
</tr>
<tr>
<td>J2</td>
<td>EX123U-SSL2</td>
<td>SUNX Corporation: S-LINK System (8 outputs)</td>
</tr>
<tr>
<td>Q</td>
<td>EX124U-SDN1</td>
<td>DevieNet (2 power supply systems)</td>
</tr>
<tr>
<td>R1</td>
<td>EX124U-SCS1</td>
<td>OMRON Corporation: CompoBus/S (16 outputs) (2 power supply systems)</td>
</tr>
<tr>
<td>R2</td>
<td>EX124U-SCS2</td>
<td>OMRON Corporation: CompoBus/S (8 outputs) (2 power supply systems)</td>
</tr>
<tr>
<td>V</td>
<td>EX124U-SMU1</td>
<td>CC-Link (2 power supply systems)</td>
</tr>
</tbody>
</table>

Symbol
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

SI unit output no.

Option
Nil
R Internal pilot

24 VDC

Refer to pages 1653 to 1655 for the details of the EX123/124 integrated type (for output) serial transmission system.
5 Port Pilot Operated Solenoid Valve
Metal Seal, Plug-in/Non Plug-in  Series VFS3000

Serial Transmission Kit Manifold: EX123/124 Integrated Type (For Output) Serial Transmission System
VV5FS3-01S  Model - Stations  Symbol  - Port size  Thread - X279

Dimensions

<table>
<thead>
<tr>
<th>n</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>129</td>
<td>162</td>
<td>195</td>
<td>228</td>
<td>261</td>
<td>294</td>
<td>327</td>
<td>360</td>
<td>393</td>
<td>426</td>
<td>459</td>
<td>492</td>
<td>525</td>
<td>558</td>
<td>591</td>
<td>624</td>
</tr>
<tr>
<td>2</td>
<td>141</td>
<td>174</td>
<td>207</td>
<td>240</td>
<td>273</td>
<td>306</td>
<td>339</td>
<td>372</td>
<td>405</td>
<td>438</td>
<td>471</td>
<td>504</td>
<td>537</td>
<td>570</td>
<td>603</td>
<td>636</td>
</tr>
</tbody>
</table>

Formula  \( L_1 = 33n + 63 \)  \( L_2 = 33n + 75 \)

Note) Actual number of manifold base stations: Add 1 SI unit mounting station to the number of valve stations.

* Use a dripproof plug assembly (AXT100-B04A) for the unused conduit port (G 1/2).
**Series VFS3000**

### Manifold Option Parts — Plug-in type, Non plug-in type

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Plug-in type Models</th>
<th>Non plug-in type Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual SUP spacer</td>
<td>VVFS3000-P-03-1 (Plug-in type)</td>
<td>VVFS3000-P-03-2 (Non plug-in type)</td>
</tr>
<tr>
<td>Individual EXH spacer</td>
<td>VVFS3000-R-03-1 (Plug-in type)</td>
<td>VVFS3000-R-03-2 (Non plug-in type)</td>
</tr>
<tr>
<td>SUP/EXH block plate</td>
<td>AXT636-1A</td>
<td></td>
</tr>
<tr>
<td>Throttle valve spacer</td>
<td>VVFS3000-20A-1 (Plug-in type)</td>
<td>VVFS3000-20A-2 (Non plug-in type)</td>
</tr>
<tr>
<td>Double check spacer</td>
<td>VVFS3000-22A-1 (Plug-in type)</td>
<td>VVFS3000-22A-2 (Non plug-in type)</td>
</tr>
<tr>
<td>Interface regulator/P port regulation</td>
<td>ARBF3050-00-P-1 (Plug-in type)</td>
<td>ARBF3050-00-P-2 (Non plug-in type)</td>
</tr>
<tr>
<td>Interface regulator/A port regulation</td>
<td>ARBF3050-00-A-1 (Plug-in type)</td>
<td>ARBF3050-00-A-2 (Non plug-in type)</td>
</tr>
<tr>
<td>Interface regulator/B port regulation</td>
<td>ARBF3050-00-B-1 (Plug-in type)</td>
<td>ARBF3050-00-B-2 (Non plug-in type)</td>
</tr>
</tbody>
</table>

(157: With direct manual override)

(168: With direct manual override)
Replacement Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Connection fitting A</td>
<td>Steel plate</td>
<td>VVFS3000-5-1A</td>
</tr>
<tr>
<td>2</td>
<td>Connection fitting B</td>
<td>Steel plate</td>
<td>VVFS3000-5-2</td>
</tr>
<tr>
<td>3</td>
<td>Gasket</td>
<td>NBR</td>
<td>VVFS3000-7-1</td>
</tr>
<tr>
<td>4</td>
<td>Gasket</td>
<td>NBR</td>
<td>VVFS3000-8</td>
</tr>
<tr>
<td>5</td>
<td>O-ring</td>
<td>NBR</td>
<td>19.8 x 19.8 x 1.6 (End plate)</td>
</tr>
<tr>
<td>6</td>
<td>O-ring</td>
<td>NBR</td>
<td>20 x 16 x 2 (Manifold block)</td>
</tr>
<tr>
<td>7</td>
<td>O-ring</td>
<td>NBR</td>
<td>6.2 x 3 x 1.6</td>
</tr>
<tr>
<td>8</td>
<td>Terminal assembly</td>
<td></td>
<td>VVFS3000-6A</td>
</tr>
<tr>
<td>9</td>
<td>Junction cover assembly</td>
<td></td>
<td>VVFS3000-4A</td>
</tr>
<tr>
<td>10</td>
<td>Rubber plug</td>
<td>NBR</td>
<td>AXT336-9</td>
</tr>
</tbody>
</table>

Note) For increasing the manifold bases, please order the manifold block assembly number of the principal part assembly 10. For plug-in type: The manifold base with terminal stand (integrated with a junction cover) is required with the 9 junction cover assembly.

Replacement Parts: Sub Assembly

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Assembly part no.</th>
<th>Component parts</th>
<th>Applicable manifold base</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Manifold block assembly</td>
<td>VVFS3000-1A-1</td>
<td>Manifold block, Terminal, Metal joint, O-ring, Receptacle assembly</td>
<td>Plug-in type</td>
</tr>
<tr>
<td>11</td>
<td>End plate (U side) assembly</td>
<td>VVFS3000-2A-1</td>
<td>End plate, Metal joint, O-ring</td>
<td>Non plug-in type</td>
</tr>
<tr>
<td>12</td>
<td>End plate (O side) assembly</td>
<td>VVFS3000-2A-2</td>
<td>End plate, Metal joint, O-ring</td>
<td>Non plug-in type</td>
</tr>
</tbody>
</table>

For plug-in type: The manifold base with terminal stand (integrated with a junction cover) is required with the 9 junction cover assembly.

Note) Manifold Base/Construction: Plug-in with terminal block.
## 5 Port Pilot Operated Solenoid Valve
### Metal Seal, Plug-in/Non Plug-in

**Series VFS4000**

<table>
<thead>
<tr>
<th>Model</th>
<th>Model</th>
<th>Port size</th>
<th>Flow characteristics (1)</th>
<th>Max. operating pressure</th>
<th>Response time (ms)</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Plug-in</td>
<td>Non-plug-in</td>
<td>1 → 4/2 (P → A/B)</td>
<td>b</td>
<td>Cv</td>
<td>1 → 4/2 (P → A/B)</td>
</tr>
<tr>
<td>Single</td>
<td>VFS4100</td>
<td>VFS4110</td>
<td>1/2</td>
<td>11</td>
<td>0.18</td>
<td>2.6</td>
</tr>
<tr>
<td>Double</td>
<td>VFS4200</td>
<td>VFS4210</td>
<td>1/2</td>
<td>12</td>
<td>0.15</td>
<td>2.6</td>
</tr>
<tr>
<td>Closed center</td>
<td>VFS4300</td>
<td>VFS4310</td>
<td>1/2</td>
<td>11</td>
<td>0.18</td>
<td>2.6</td>
</tr>
<tr>
<td>Exhaust center</td>
<td>VFS4400</td>
<td>VFS4410</td>
<td>1/2</td>
<td>11</td>
<td>0.16</td>
<td>2.6</td>
</tr>
<tr>
<td>Pressure center</td>
<td>VFS4500</td>
<td>VFS4510</td>
<td>1/2</td>
<td>12</td>
<td>0.15</td>
<td>2.9</td>
</tr>
<tr>
<td>Double</td>
<td>VFS4600</td>
<td>VFS4610</td>
<td>1/2</td>
<td>11</td>
<td>0.18</td>
<td>2.7</td>
</tr>
</tbody>
</table>

### Standard Specifications

- **Fluid**: Air/inert gas
- **Maximum operating pressure**: 1.0 MPa
- **Minimum operating pressure**: 0.1 MPa
- **Plug-in type**: Non-locking push type (Flush)
- **Shock/Vibration resistance**: 150/50 m/s²
- **Coil rated voltage**: 100, 200 VAC, 50/60 Hz; 24 VDC
- **Allowable voltage fluctuation**: ±10% of rated voltage
- **Coil insulation type**: Class B or equivalent (180°C)
- **Electrical entry**: Non-plug-in type (Grommet terminal, DIN terminal)

### Option Specifications

- **Pilot type**: External pilot (2)
- **Manual override**: Direct manual override
- **Pilot valve**: Non-locking push type (Extended), Locking type (Tool required), Locking type (Level)
- **Coil rated voltage**: 110 to 120, 220, 240 VAC, 50/60 Hz
- **Power consumption DC**: 1.8 W (2.04 W with light/surge voltage suppressor)

### Note

1. Use dry air at low temperatures.
2. Use turbine oil of Class 1 (ISO VG32) if lubricated.
3. Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)
4. Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. Test was performed at both energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)

---

**Plug-in type**

**Non-plug-in type**

---

**VFS.qxd 10.11.25 9:49 AM Page 8**

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com
How to Order

**5 Port Pilot Operated Solenoid Valve**

**Metal Seal, Plug-in/Non Plug-in**

Series VFS4000

### How to Order

**Body type**
- Q: Plug-in type sub-plate
- P: Non plug-in type sub-plate

**Electrical entry**
- E: Grommet terminal
- D: DIN terminal

**Porting specifications**
- F: Plug-in type conduit terminal
- B: Bottom ported

**Port size**
- N: Without sub-plate
- O: EA, EB, Rc 3/8

**Thread type**
- N: NPT
- T: NPTF
- F: G

**CE-compliant**
- Q: CE-compliant

**Option**
- A: Non-locking push type (Flush)
- B: Non-locking push type (Extended)
- C: Locking type (Tool required)
- C*: Locking type (Lever)

**Coil rated voltage**
1. 100 VAC, 50/60 Hz
2. 200 VAC, 50/60 Hz
3. 110 to 120 VAC, 50/60 Hz
4. 220 VAC, 50/60 Hz
5. 24 VDC
6. 12 VDC
7. 240 VAC, 50/60 Hz
8. Other

**Manual override**
- A: Non-locking push type (Flush)
- B*: Locking type (Tool required)
- C*: Locking type (Lever)

**How to Order Pilot Valve Assembly**

**SF4**

**Body option**
- 0: Direct manual override

**Coil rated voltage**
1. 100 VAC, 50/60 Hz
2. 200 VAC, 50/60 Hz
3. 110 to 120 VAC, 50/60 Hz
4. 220 VAC, 50/60 Hz
5. 24 VDC
6. 12 VDC
7. 240 VAC, 50/60 Hz
8. Other

**Reverse pressure:** Can be used by external pilot specifications.

---

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Series VFS4000

Cylinder Speed Chart

Use as a guide for selection. Please confirm the actual conditions with SMC Sizing Program.

<table>
<thead>
<tr>
<th>System</th>
<th>Average speed (mm/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1000 900 800 700 600 500 400 300 200 100 0</td>
</tr>
</tbody>
</table>

| B      | 1000 900 800 700 600 500 400 300 200 100 0 |

**System Components**

- **Plug-in type**
  - VFS4000-22A-1
  - VFS4400-L50132-F

- **Non plug-in type**
  - VFS4000-22A-2
  - VFS4410-L50132-D
  - VFS4410-L50132-E

**Double Check Spacer/Specifications**

- Can hold an intermediate cylinder position for an extended time.
- If the double check spacer with a built-in double check valve is combined, it will enable the cylinder to stop in the intermediate stroke and maintain its position for a long time without being affected by the leakage between the spools.

**Specifications**

- **Plug-in type**
  - VFS4000-22A-1
  - VFS4400-L50132-F

- **Non plug-in type**
  - VFS4000-22A-2
  - VFS4410-L50132-D
  - VFS4410-L50132-E

**Check Valve Operation**

- The combination of VFS4110, VFS4210, and Double check spacer for prevention of falling at the stroke end but cannot hold the intermediate position of the cylinder.

**Caution**

- In the case of 3 position double check valve (VFS46C/3D), check the leakage from piping and fittings in between valve and cylinder by means of synthetic detergent solutions, and ensure that there is no such leakage found there. Also check the leakage from cylinder seal and piston seal. If there is any leakage, sometimes the cylinder, when valve is de-energized, can move without stopping at intermediate position.
- Be aware that if the exhaust side is restricted excessively, the intermediate stopping accuracy will decrease and will lead to improper intermediate stops.

**Use as a guide for selection. Please confirm the actual conditions with SMC Sizing Program.**

<table>
<thead>
<tr>
<th>Bore size</th>
<th>ø50</th>
<th>ø63</th>
<th>ø80</th>
<th>ø100</th>
<th>ø125</th>
<th>ø140</th>
<th>ø160</th>
<th>ø180</th>
<th>ø200</th>
<th>ø250</th>
<th>ø300</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**System Components**

- **Plug-in type**
  - AS420-03 (S = 73 mm²)
  - AN300-03 (S = 60 mm²)

- **Non plug-in type**
  - AS420-04 (S = 97 mm²)
  - AN400-04 (S = 90 mm²)

**Caution**

- It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
- The average velocity of the cylinder is what the stroke is divided by the total stroke time.
- Load factor: ((Load weight x 9.8)/Theoretical force) x 100%
Construction

2 position single

2 position double

3 position closed center/exhaust center/pressure center

Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Aluminum die-casted</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>2</td>
<td>Sub-plate</td>
<td>Aluminum die-casted</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>3</td>
<td>Spool/Sleeve</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Adapter plate</td>
<td>Resin</td>
<td>Black</td>
</tr>
<tr>
<td>5</td>
<td>End plate</td>
<td>Resin</td>
<td>Black</td>
</tr>
<tr>
<td>6</td>
<td>Piston</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Junction cover</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Light cover</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Return spring</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Gasket</td>
<td>HNBR</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Hexagon socket heat screw</td>
<td>Steel</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Detent assembly</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Pilot valve assembly</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

Sub-plate Assembly Part No.

<table>
<thead>
<tr>
<th></th>
<th>Plug-in</th>
<th>Non plug-in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td>VFS4000-P</td>
<td>VFS4000-S</td>
</tr>
</tbody>
</table>

Note: Mounting bolt and gasket are not included.

Refer to “How to Order Pilot Valve Assembly” on page 1183.

Sub-plate Assembly (For External Pilot) Part No.

<table>
<thead>
<tr>
<th></th>
<th>Plug-in</th>
<th>Non plug-in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td>VFS4000-P-R</td>
<td>VFS4000-S-R</td>
</tr>
</tbody>
</table>

Part no. for mounting bolt and gasket: BG-VFS4000

5 Port Pilot Operated Solenoid Valve
Metal Seal, Plug-in/Non Plug-in Series VFS4000
Series VFS4000

Plug-in — 2 Position single/Double/3 Position closed center/Exhaust center/Pressure center/Double check

2 position single: VFS4100-□F

2 x ø6.5 mounting hole

Pilot valve manual override

With light/surge voltage suppressor

Electrical entry

187 (3 position: 196.5)

2 position double: VFS4200-□F

3 position closed center: VFS4300-□F

3 position exhaust center: VFS4400-□F

3 position pressure center: VFS4500-□F

3 position double check: VFS4600-□F

2 x ø6.5 mounting hole

Pilot valve manual override

With light/surge voltage suppressor

Light window

Electrical entry
Non Plug-in — 2 Position single/Double/3 Position closed center/Exhaust center/Pressure center/Double check

2 position single: VFS4110-□E, VFS4110-□D

2 position double: VFS4210-□E, VFS4210-□D

3 position closed center: VFS4310-□E, VFS4310-□D

3 position exhaust center: VFS4410-□E, VFS4410-□D

3 position pressure center: VFS4510-□E, VFS4510-□D

3 position double check: VFS4610-□E, VFS4610-□D
Series VFS4000
Manifold Specifications

Plug-in Type: With Terminal Block

• Since lead wires of solenoid valve are connected with the terminals on upper surface of terminal block, corresponding lead wires from power source can be wired at the bottom of terminal block.

VV5FS4 - 01T - 06 1 - 03 -
Series VFS4000 Manifold Plug-in type with terminal block

Symbol

Stations

Passage

P

R1, R2

1

Common

02

2 stations

10

10 stations

Port size

04

M

Rc

½

1

Rec

A, B

Thread type

Nil

P

CE-compliant

Nil

Q

CE-compliant

For bottom ported, Rc ½ is only available.

Plug-in Type: With Multi-connector (Wiring specifications: Refer to page 1227.)

• Master connection of power and solenoid valves.
• Quick wiring permits easier installation.

VV5FS4 - 01C D - 05 2 - 03 -
Series VFS4000 Manifold Plug-in type with multi-connector

Connector mounting direction

D side mounting

U side mounting

Symbol

Stations

Passage

P

R1, R2

1

Common

02

2 stations

08

8 stations

* Max. 8 stations

Port size

04

M

Rc

½

1

Rec

A, B

Thread type

Nil

P

CE-compliant

Nil

Q

CE-compliant

For bottom ported, Rc ½ is only available.

Plug-in Type With: D-sub Connector (Wiring specifications: Refer to page 1227.)

• Wide range of interchangeability (Mil Spec D-sub connector terminal 25 pcs attached.)
• Quick wiring permits easier installation.

VV5FS4 - 01F D - 06 1 - 03 -
Series VFS4000 Manifold Plug-in type with D-sub connector

Connector mounting direction

D side mounting

U side mounting

Symbol

Stations

Passage

P

R1, R2

1

Common

02

2 stations

08

8 stations

* Max. 8 stations

Port size

04

M

Rc

½

1

Rec

A, B

Thread type

Nil

P

CE-compliant

Nil

Q

CE-compliant

For bottom ported, Rc ½ is only available.

Non Plug-in Type: Grommet Terminal, DIN Terminal

• Wiring for every valve.

VV5FS4 - 10 - 05 2 - 03 -
Series VFS4000 Manifold Non plug-in type

Symbol

Stations

Passage

P

R1, R2

1

Common

10

10 stations

Port size

04

M

Rc

½

1

Rec

A, B

Thread type

Nil

P

CE-compliant

Nil

Q

CE-compliant

For bottom ported, Rc ½ is only available.

1188

Courtesy of Steven Engineering, Inc. - 230 Ryan Way, South San Francisco, CA 94080-6370 Main Office: (650) 588-9200 Outside Local Area: (800) 258-9200 www.stevenengineering.com
5 Port Pilot Operated Solenoid Valve
Metal Seal, Plug-in/Non Plug-in Series VFS4000

How to Order Manifold Assembly
Please indicate manifold base type, corresponding valve, and option parts.

<Example>
- Plug-in type with terminal block: 6 stations
  (Manifold base) VV5FS4-01T-061-03 ·····1
  (2 position single) VFS4100-5FZ ·············3
  (2 position double) VFS4200-5FZ ·············2
  (Blanking plate) VVFS4000-10A ··············1
- Non plug-in type: 6 stations
  (Manifold base) VV5FS4-10-061-04 ·····1
  (2 position single) VFS4110-5D ···············5
  (3 position exhaust center) VFS4410-5D ····1
  (Individual EXH spacer) VVFS4000-R-04-2······1

• With multi-connector, or with D-sub connector: 8 stations max.

<table>
<thead>
<tr>
<th>Model</th>
<th>Wiring</th>
<th>Port size Rc</th>
<th>Stations</th>
<th>Applicable valve model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in type</td>
<td>With terminal block</td>
<td>Side/Bottom</td>
<td>1/2</td>
<td>VFS4100-02F</td>
</tr>
<tr>
<td>VVFS4-01T</td>
<td>With multi-connector</td>
<td></td>
<td>2/3</td>
<td>VFS4100-03F</td>
</tr>
<tr>
<td></td>
<td>With D-sub connector</td>
<td></td>
<td>2 to 10</td>
<td>VFS4100-04F</td>
</tr>
<tr>
<td>Non plug-in type</td>
<td>DIN terminal</td>
<td></td>
<td></td>
<td>VFS4100-05F</td>
</tr>
<tr>
<td>VVFS4-10T</td>
<td>Grommet terminal</td>
<td></td>
<td></td>
<td>VFS4100-06F</td>
</tr>
</tbody>
</table>

Flow Characteristics at the Number of Manifold Stations (Operated individually)

<table>
<thead>
<tr>
<th>Model</th>
<th>Passage/Stations</th>
<th>Station 1</th>
<th>Station 5</th>
<th>Station 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>VVFS4</td>
<td>1 → 4/2 (P → A/B)</td>
<td>C [dm³/(s·bar)]</td>
<td>10.5</td>
<td>10.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b</td>
<td>0.20</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cv</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>4/2 → 5/3 (A/B → R1/R2)</td>
<td>C [dm³/(s·bar)]</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b</td>
<td>0.20</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cv</td>
<td>2.9</td>
<td>2.9</td>
</tr>
</tbody>
</table>

* Port size: Rc 1/2
Series VFS4000

**Manifold Option Parts Assembly**

**Individual SUP spacer**
An individual SUP spacer set on manifold block can form SUP port for every valve.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>VVFS4000-P-03-1</td>
<td>VVFS4000-P-03-2</td>
</tr>
</tbody>
</table>

**Individual EXH spacer**
An individual EXH spacer set on manifold block can form EXH port for every valve. (common EXH type)

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>VVFS4000-R-04-1</td>
<td>VVFS4000-R-04-2</td>
</tr>
</tbody>
</table>

* **SUP block plate**
When supplying manifold with more than two different pressures, high and low, insert a block plate in between stations subjected to Plug-in different pressures.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td></td>
<td>AXT634-10A</td>
</tr>
</tbody>
</table>

* **EXH block plate**
When valve exhaust affects the other stations on the circuit or when a reverse pressure valve is used to a standard manifold valve, insert EXH block plate in between stations to separate valve exhaust.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td></td>
<td>AXT634-11A</td>
</tr>
</tbody>
</table>

**Throttle valve spacer**
Needle valve set on the manifold block can control cylinder speed by throttling exhaust.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>VVFS4000-20A-1</td>
<td>VVFS4000-20A-2</td>
</tr>
</tbody>
</table>

**Double check spacer**
If the double check spacer with a built-in double check valve is combined, it will enable the cylinder to stop in the intermediate stroke and maintain its position for a long time without being affected by the leakage between the spools.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td></td>
<td>VVFS4000-22A-1</td>
</tr>
</tbody>
</table>

**Interface regulator**
Interface regulator set on manifold block can regulate the pressure to each valve. (Refer to page 1225 for “Flow Characteristics”)

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td></td>
<td>AXT634-11A</td>
</tr>
</tbody>
</table>

**Blanking plate**
It is used by attaching on the manifold block for being prepared for removing a valve for maintenance reasons or planning to mount a spare valve, etc.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>VVFS4000-10A</td>
<td></td>
</tr>
</tbody>
</table>

**Manifold Option**

**With exhaust cleaner**
Plug-in type/Non Plug-in type
- Valve exhaust noise dampening: 35 dB or more.
- Oil mist collection: Rate of collection 99.9% or more.
- Piping process reduced.

For details, refer to page 1193.

**With control unit**
Plug-in type/Non Plug-in type
- Filter, regulation valve, pressure switch and air release valve are all combined to form one unit.
- Piping processes are eliminated.

For details, refer to page 1195.

**Made to Order**
Manifold with serial transmission kit Plug-in type
- Solenoid valve wiring process reduced considerably.

For details, refer to page 1198.
Formula for manifold weight M = 0.565n + 0.923 (kg)

n: Stations

Non plug-in type: VV5FS4-10- Station 1- Port size

Bottom ported:
VV5FS4-10- Station 2- Port size

Formula for manifold weight M = 0.478n + 0.671 (kg)

n: Stations

5 Port Pilot Operated Solenoid Valve
Metal Seal, Plug-in/Non Plug-in Series VFS4000

Plug-in type (With terminal block): VV5FS4-01T- Station 1- Port size

Bottom ported:
VV5FS4-01T- Station 2- Port size

Pilot valve manual override

2 x Rε ½ (Pilot EXH port: PE)

Electrical entry (Pilot EXH port: PE)

Series VFS4000

5 Port Pilot Operated Solenoid Valve
Metal Seal, Plug-in/Non Plug-in

Manifold — Plug-in type, Non plug-in type

Plug-in type (With terminal block): VV5FS4-01T- Station 1- Port size

Formula

L1 = 43 x n + 70

L2 = 43 x n + 82

Non plug-in type: VV5FS4-10- Station 1- Port size

Bottom ported:
VV5FS4-10- Station 2- Port size

Formula for manifold weight M = 0.478n + 0.671 (kg)

n: Stations

L1 = 156 199 242 285 328 371 414 457 500
L2 = 168 211 254 297 340 383 426 469 512

L1 = 43 x n + 70

L2 = 43 x n + 82

Pilot valve manual override

2 x Rε ½ (Pilot EXH port: PE)

Electrical entry (Pilot EXH port: PE)
Series VFS4000

Manifold — Plug-in type with multi-connector/D-sub connector

Plug-in type with multi-connector: VV5FS4-01CD-Station1-Port size, VV5FS4-01CU-Station1-Port size

Plug-in type with D-sub connector: VV5FS4-01FD-Station1-Port size, VV5FS4-01FU-Station1-Port size

Formula for manifold weight $M = 0.57n + 1.011$ (kg) $n$: Station

Wiring specifications: Refer to page 1227.

Bottom ported:
VV5FS4-01CU-Station2-Port size

Formula: $L_1 = 43x n + 70$

Bottom ported:
VV5FS4-01FD-Station2-Port size

Formula: $L_2 = 43x n + 82$

Series VFS4000
Manifold with Exhaust Cleaner

- Serves to protect working environment.
- Valve exhaust noise dampening: 35 dB or more.
- Collection rate of drainage and oil mist: 99.9% or more.
- Piping work is reduced.

**Caution**
When using an exhaust cleaner, mount it downwards.

* Refer to Best Pneumatics Vol. 6 for Exhaust Cleaner details.

### Manifold Specifications

<table>
<thead>
<tr>
<th>Manifold Type</th>
<th>Non-plug-in type: VVFS4-10-061-03-CD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wiring</strong></td>
<td>With terminal block</td>
</tr>
<tr>
<td></td>
<td>With D-sub connector</td>
</tr>
<tr>
<td><strong>Applicable valve model</strong></td>
<td>VVFS4-00-CD F</td>
</tr>
<tr>
<td><strong>Porting specifications</strong></td>
<td>Rc: 2(1); 4(1) port</td>
</tr>
<tr>
<td></td>
<td>Side: 3/8, 1/2, Bottom: 3/8 (Option)</td>
</tr>
</tbody>
</table>

**Stations**
2 to 10

- **Applicable exhaust cleaners**: AMC610-10 (Connecting port size R 1), AMC810-14 (Connecting port size R 1 1/2)

**How to Order**

**Manifold Assembly [Example]**
Add the valve and option part numbers in order starting from the first station on the D side.

- **Example**
  - Plug-in type with terminal block (6 stations) (Manifold base): VVFS4-01T-061-03-CD
  - (2 position single): VVFS4000-9FZ
  - (2 position double): VVFS4000-8FZ
  - (Blanking plate): VVFS4000-10A
  - (Exhaust cleaner): AMC610-10

- **Non-plug-in type (6 stations)**
  - (Manifold base): VVFS4-01T-061-04-CU
  - (2 position single): VVFS410-05E
  - (2 position double): VVFS4210-5E
  - (Blanking plate): VVFS4000-10A
  - (Exhaust cleaner): AMC810-14

The asterisk denotes the symbol for assembly. Prefix it to the part numbers of the solenoid valve.

![Manifold Diagram](image-url)
Series VFS4000

Manifold with Exhaust Cleaner — Plug-in type, Non plug-in type

Plug-in type: VV5FS4-01T-Station 1-Port size -CD

Non plug-in type: VV5FS4-10-Station 1-Port size -CD

<table>
<thead>
<tr>
<th>Stations</th>
<th>L1</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>156</td>
<td>168</td>
</tr>
<tr>
<td>2</td>
<td>199</td>
<td>211</td>
</tr>
<tr>
<td>3</td>
<td>242</td>
<td>254</td>
</tr>
<tr>
<td>4</td>
<td>285</td>
<td>297</td>
</tr>
<tr>
<td>5</td>
<td>328</td>
<td>340</td>
</tr>
<tr>
<td>6</td>
<td>371</td>
<td>383</td>
</tr>
<tr>
<td>7</td>
<td>414</td>
<td>426</td>
</tr>
<tr>
<td>8</td>
<td>457</td>
<td>469</td>
</tr>
<tr>
<td>9</td>
<td>500</td>
<td>512</td>
</tr>
</tbody>
</table>

Formula:
- \( L_1 = 43 \times n + 70 \)
- \( L_2 = 43 \times n + 82 \)

Exhaust cleaner (Option)

Manual valve override (External pilot port)

Electrical entry (Pilot EXH port: PE)
# 5 Port Pilot Operated Solenoid Valve

**Series VFS4000**

## Manifold with Control Unit

- **Control unit (Filter, Regulator, Pressure switch, Air release valve)** are all standardized to the one unit, and can be mounted on the manifold base without any attachments.
- **Piping processes are eliminated.**

### Manual drain, mount the filter vertically.

When using an air filter with auto-drain or manual drain, mount the filter vertically.

### Base type/Electrical entry

- **Base type 01C, 01F:**
  - Non plug-in type
- **Base type 01T, 10:**
  - Plug-in type with D-sub connector

### Connector mounting direction

- **With connector:**
  - Symbol: O1T, O1C, O1F
- **U side mounting:**
  - Symbol: D

### Porting specifications

- **Symbol:** P, R1, R2
- **Passage:** Common, Common, Bottom

### How to Order

**Manifold Specifications**

<table>
<thead>
<tr>
<th>Manifold</th>
<th>Plug-in type: VVF5S4-01C</th>
<th>Non plug-in type: VVF5S4-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiring</td>
<td>With terminal block</td>
<td>With terminal block</td>
</tr>
<tr>
<td></td>
<td>With D-sub connector</td>
<td>With D-sub connector</td>
</tr>
<tr>
<td>Applicable valve model</td>
<td>VVF542-0D/DF</td>
<td>VVF542-10-0D/DF</td>
</tr>
<tr>
<td>Porting specifications</td>
<td>2(8), 4(A) port</td>
<td>Side: 3/8, 1/2, Bottom: 3/8</td>
</tr>
<tr>
<td></td>
<td>(P), (S2), (S1) port</td>
<td>Side: 1/2</td>
</tr>
<tr>
<td>Stations</td>
<td>2 to 10</td>
<td>2 to 10</td>
</tr>
</tbody>
</table>

- With multi-connector, or with D-sub connector: 8 stations max.

### Control Unit Specifications

**Air filter (With auto-drain/With manual drain)**

- **Filtration degree:** 5 μm
- **Regulator**
  - Pressure (Outlet pressure)
  - Differential
  - Set pressure (Outlet pressure)
  - Set pressure range (Outlet pressure)
  - Operating pressure range

- **Pressure switch**
  - Pressure switch
  - Pressure switch

- **Indicator light**
  - LED (RED)

- **Max. switch capacity**
  - 2 VA AC, 2 W DC

- **Max. operating current**
  - 48 VACDC: 40 mA
  - 100 VACDC: 20 mA

- **Air release valve:**
  - 0.08 MPa or less
  - 0.1 to 0.6 MPa
  - 0.1 to 1.0 MPa

### Control Unit/Option

- **Air release valve**: VVF5400-24A-1R (D side mounting)
- **Air release valve**: VVF5400-24A-2R (D side mounting)
- **Blanking plate**
  - FVFS4000-24A-1R (D side mounting)
  - FVFS4000-24A-2R (D side mounting)

### How to Order Manifold Assembly [Example]

Add the valve and option part numbers in order starting from the first station on the D side.

**Plug-in type with terminal block**

- In order to mount control unit, it requires 2 stations.

- **Manifold base**
  - VVF5S4-01T-081-03-AP5
  - VVF5S4-01T-081-03-A

- **Option**
  - VFS4100-5FZ

### How to Order

**Air release valve coil rating**

<table>
<thead>
<tr>
<th>Nil</th>
<th>A</th>
<th>AP</th>
<th>M</th>
<th>MP</th>
<th>F</th>
<th>G</th>
<th>CE-compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
</tbody>
</table>

### Control unit type

- **Control equipment**
  - Air filter with auto-drain
  - Air filter with manual drain
  - Filter regulator
  - Air release valve
  - Pressure switch
  - Blanking plate (Air release valve)
  - Blanking plate (Filter, Regulator)
  - Blanking plate (Pressure switch)

### Number of manifold blocks required for mounting (stations)

- 2 stations
- 2 stations
- 2 stations
- 2 stations
- 2 stations

### Note

1. Voltage: 24 VDC to 100 VAC
2. Inner voltage drop: 4 V
3. The non plug-in type cannot be mounted afterwards.

### Approval

- SMC
- CE-compliant
- Approved

**Example**

- **Plug-in type with terminal block:** In order to mount control unit, it requires 2 stations.

- **Manifold base**
  - VVF5S4-01T-081-03-AP5
  - VVF5S4-01T-081-03-A

- **Option**
  - VFS4100-5FZ

The asterisk denotes the symbol for assembly. Prefix X to the part numbers of the solenoid valve.

**Series VFS4000**

**Metal Seal, Plug-in/Non Plug-in**

**Series VFS4100**

**Metal Seal, Non Plug-in**

**Vendor: SMC**

<table>
<thead>
<tr>
<th>SMC</th>
<th>SQ</th>
<th>VQ</th>
<th>VQ5</th>
<th>VQC</th>
<th>VOZ</th>
<th>VQ7</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFR</td>
<td>VQ6</td>
<td>VQ4</td>
<td>VQ2</td>
<td>VQ1</td>
<td>VQ0</td>
<td>VQ9</td>
</tr>
<tr>
<td>VQ3</td>
<td>VQ8</td>
<td>VQ7</td>
<td>VQ6</td>
<td>VQ5</td>
<td>VQ4</td>
<td>VQ3</td>
</tr>
</tbody>
</table>

**Supplier:** Steven Engineering, Inc.

<table>
<thead>
<tr>
<th>Customer Service</th>
<th>(650) 588-9200</th>
<th>Fax: (650) 588-9200</th>
</tr>
</thead>
</table>

**Website:** www.stevenengineering.com

**Address:** 230 Ryan Way, South San Francisco, CA 94080-6370

- Main Office: (650) 588-9200
- Outside Local Area: (800) 258-9200
**Series VFS4000**

**Manifold with Control Unit — Plug-in type, Non plug-in type**

**Example for manifold**

<table>
<thead>
<tr>
<th>n (Stations)</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
<th>L5</th>
<th>L6</th>
<th>L7</th>
<th>L8</th>
<th>L9</th>
<th>L10</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>199</td>
<td>242</td>
<td>285</td>
<td>328</td>
<td>371</td>
<td>414</td>
<td>457</td>
<td>500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>211</td>
<td>254</td>
<td>297</td>
<td>340</td>
<td>383</td>
<td>426</td>
<td>469</td>
<td>512</td>
<td>L2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>285</td>
<td>328</td>
<td>371</td>
<td>414</td>
<td>457</td>
<td>500</td>
<td></td>
<td></td>
<td>L3</td>
<td>L1</td>
</tr>
<tr>
<td>6</td>
<td>385.5</td>
<td>428.5</td>
<td>471.5</td>
<td>514.5</td>
<td>557.5</td>
<td>600.5</td>
<td>643.5</td>
<td>686.5</td>
<td>L4</td>
<td>L1</td>
</tr>
<tr>
<td>7</td>
<td>427</td>
<td>470</td>
<td>513</td>
<td>556</td>
<td>599</td>
<td>642</td>
<td>685</td>
<td>728</td>
<td>L3</td>
<td>L1</td>
</tr>
</tbody>
</table>

**Formula**

\[ L_1 = 43 \times n + 70 \]

**Series VFS4000**

**Non plug-in type: VVFS4-10**

**Example for manifold**

- Individual EXH spacer
- Double check spacer
- Individual SUP spacer

**Table of Measurements**

<table>
<thead>
<tr>
<th>n (Stations)</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
<th>L5</th>
<th>L6</th>
<th>L7</th>
<th>L8</th>
<th>L9</th>
<th>L10</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>199</td>
<td>242</td>
<td>285</td>
<td>328</td>
<td>371</td>
<td>414</td>
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<td>297</td>
<td>340</td>
<td>383</td>
<td>426</td>
<td>469</td>
<td>512</td>
<td>L2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>285</td>
<td>328</td>
<td>371</td>
<td>414</td>
<td>457</td>
<td>500</td>
<td></td>
<td></td>
<td>L3</td>
<td>L1</td>
</tr>
<tr>
<td>6</td>
<td>385.5</td>
<td>428.5</td>
<td>471.5</td>
<td>514.5</td>
<td>557.5</td>
<td>600.5</td>
<td>643.5</td>
<td>686.5</td>
<td>L4</td>
<td>L1</td>
</tr>
<tr>
<td>7</td>
<td>427</td>
<td>470</td>
<td>513</td>
<td>556</td>
<td>599</td>
<td>642</td>
<td>685</td>
<td>728</td>
<td>L3</td>
<td>L1</td>
</tr>
</tbody>
</table>

**Formula**

\[ L_1 = 43 \times n + 256.5 \]

**Series VFS4000**

**Plug-in type: VVFS4-01T**

**Example for manifold**

- Individual EXH spacer
- Double check spacer
- Individual SUP spacer

**Table of Measurements**

<table>
<thead>
<tr>
<th>n (Stations)</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
<th>L5</th>
<th>L6</th>
<th>L7</th>
<th>L8</th>
<th>L9</th>
<th>L10</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>199</td>
<td>242</td>
<td>285</td>
<td>328</td>
<td>371</td>
<td>414</td>
<td>457</td>
<td>500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>211</td>
<td>254</td>
<td>297</td>
<td>340</td>
<td>383</td>
<td>426</td>
<td>469</td>
<td>512</td>
<td>L2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>285</td>
<td>328</td>
<td>371</td>
<td>414</td>
<td>457</td>
<td>500</td>
<td></td>
<td></td>
<td>L3</td>
<td>L1</td>
</tr>
<tr>
<td>6</td>
<td>385.5</td>
<td>428.5</td>
<td>471.5</td>
<td>514.5</td>
<td>557.5</td>
<td>600.5</td>
<td>643.5</td>
<td>686.5</td>
<td>L4</td>
<td>L1</td>
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<tr>
<td>7</td>
<td>427</td>
<td>470</td>
<td>513</td>
<td>556</td>
<td>599</td>
<td>642</td>
<td>685</td>
<td>728</td>
<td>L3</td>
<td>L1</td>
</tr>
</tbody>
</table>
Made to Order
Serial Transmission Kit Manifold: EX123/124 Integrated Type (For Output)
Serial Transmission System

How to Order

How to Order Manifold

VV5FS4 -01S [U V -08 1 -03 ] -X199

Plug-in type
Serial transmission kit

SI unit mounting position
D: D side mounting
U: U side mounting

Stations
2 stations
10 stations
2 stations
10 stations

Thread type
Nil
Rc
NPT
NPTF
G

Port size
Symbol
P, R1, R2
Rc 1/2
Rc 3/8
Rc 1/2
M

+ Option
* For bottom ported: Rc 1/8 only

SI unit can be mounted on either U or D side.

Applicable models
Symbol
SI unit part no.
For U side mounting
For D side mounting
Description
Nil
Without SI unit
0
F1
EX123U-SUW1
EX123D-SUW1
KNE Corporation: Uni-wire System (16 outputs)
H
EX123U-SUH1
EX123D-SUH1
KNE Corporation: Uni-wire H System (16 outputs)
J1
EX123U-SSL1
EX123D-SSL1
SUNX Corporation: S-LINK System (16 outputs)
J2
EX123U-SSL2
EX123D-SSL2
SUNX Corporation: S-LINK System (8 outputs)
Q
EX124U-SDN1
EX124D-SDN1
DeviNet (2 power supply systems)
R1
EX124U-SCS1
EX124D-SCS1
OMRON Corporation: CompoBus/S (16 outputs) (2 power supply systems)
R2
EX124U-SCS2
EX124D-SCS2
OMRON Corporation: CompoBus/S (8 outputs) (2 power supply systems)
V
EX124U-SMJ1
EX124D-SMJ1
CC-Link (2 power supply systems)

Correspondence of SI unit output numbers and solenoid valve coils

Wiring Example 1: Double wiring (Standard)

Wiring Example 2: Single/Double mixed wiring (Option)

How to Order Valves

VFS4 [00] -5 F

Symbol
1
2
3
4
5
6
Pilot type
Nil
R

Pilot valve manual override
Nil
Non-locking push type (Flush)
A
Non-locking push type (Extended)
B
Locking type (Tool required)
C
Locking type (Lever)

Option
Z
With light/surge voltage suppressor

Coil rated voltage
Nil
None

24 VDC

How to Order Manifold

1198

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com
5 Port Pilot Operated Solenoid Valve
Metal Seal, Plug-in/Non Plug-in Series VFS4000

Serial Transmission Kit Manifold (EX123/124): Plug-in Type

VV5FS4-01S Mounting position | Model | Stations | Symbol | Port size | Thread | -X199

Dimensions

<table>
<thead>
<tr>
<th>L₁</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
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<tbody>
<tr>
<td>L₁</td>
<td>156</td>
<td>199</td>
<td>242</td>
<td>285</td>
<td>328</td>
<td>371</td>
<td>414</td>
<td>457</td>
<td>500</td>
</tr>
<tr>
<td>L₂</td>
<td>168</td>
<td>211</td>
<td>254</td>
<td>297</td>
<td>340</td>
<td>383</td>
<td>426</td>
<td>469</td>
<td>512</td>
</tr>
</tbody>
</table>

Formula: L₁ = 43n + 70  L₂ = 43n + 82

n: Stations (Max. 10 stations)

Note: Actual number of manifold base stations. Add 1 SI unit mounting station to the number of valve stations.

* Use a dripproof plug assembly (AXT100-B04A) for the unused conduit port (G 1/2).
## Manifold Option Parts — Plug-in type, Non plug-in type

<table>
<thead>
<tr>
<th>Individual SUP spacer:</th>
<th>Double check spacer:</th>
</tr>
</thead>
<tbody>
<tr>
<td>VVFS4000-P-03-1 (Plug-in type)</td>
<td>VVFS4000-22A-1 (Plug-in type)</td>
</tr>
<tr>
<td>VVFS4000-P-03-2 (Non plug-in type)</td>
<td>VVFS4000-22A-2 (Non plug-in type)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Individual EXH spacer:</th>
<th>Interface regulator/P port regulation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>VVFS4000-R-04-1 (Plug-in type)</td>
<td>ARBF4050-00-P-1 (Plug-in type)</td>
</tr>
<tr>
<td>VVFS4000-R-04-2 (Non plug-in type)</td>
<td>ARBF4050-00-P-2 (Non plug-in type)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUP block plate: AXT634-10A</th>
<th>Interface regulator/A port regulation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXH block plate: AXT634-11A</td>
<td>ARBF4050-00-A-1 (Plug-in type)</td>
</tr>
<tr>
<td></td>
<td>ARBF4050-00-A-2 (Non plug-in type)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Throttle valve spacer:</th>
<th>Interface regulator/B port regulation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>VVFS4000-20A-1 (Plug-in type)</td>
<td>ARBF4050-00-B-1 (Plug-in type)</td>
</tr>
<tr>
<td>VVFS4000-20A-2 (Non plug-in type)</td>
<td>ARBF4050-00-B-2 (Non plug-in type)</td>
</tr>
</tbody>
</table>
Manifold Base Construction — Plug-in type, Non Plug-in type

Replacement Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Connection fitting A</td>
<td>Steel plate</td>
<td>VVF4000-5-1A</td>
</tr>
<tr>
<td>2</td>
<td>Connection fitting B</td>
<td>Steel plate</td>
<td>VVF4000-5-2</td>
</tr>
<tr>
<td>3</td>
<td>Gasket</td>
<td>NBR</td>
<td>VVF4000-7</td>
</tr>
<tr>
<td>4</td>
<td>Gasket</td>
<td>NBR</td>
<td>VVF4000-8</td>
</tr>
<tr>
<td>5</td>
<td>Gasket</td>
<td>NBR</td>
<td>A5568-011</td>
</tr>
<tr>
<td>6</td>
<td>O-ring</td>
<td>NBR</td>
<td>P-3</td>
</tr>
<tr>
<td>7</td>
<td>O-ring</td>
<td>NBR</td>
<td>—</td>
</tr>
<tr>
<td>8</td>
<td>Terminal assembly</td>
<td>—</td>
<td>VVF4000-6A</td>
</tr>
<tr>
<td>9</td>
<td>Junction cover assembly</td>
<td>For 01T</td>
<td>VVF4000-4A</td>
</tr>
<tr>
<td>10</td>
<td>Junction cover assembly</td>
<td>For 01SU</td>
<td>A2738-30A</td>
</tr>
<tr>
<td>11</td>
<td>Rubber plug</td>
<td>NBR</td>
<td>AX7336-9</td>
</tr>
</tbody>
</table>

Replacement Parts: Sub Assembly

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Assembly part no.</th>
<th>Component parts</th>
<th>Applicable manifold base</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Manifold block assembly</td>
<td>VVF4000-1A-01-04</td>
<td>Manifold block 10, Terminal 11, Metal joint 12, Gasket 13, Receptacle assembly</td>
<td>Plug-in type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VVF4000-1A-02-04</td>
<td></td>
<td>Non plug-in type</td>
</tr>
<tr>
<td>11</td>
<td>End plate (U side) assembly</td>
<td>VVF4000-2A-1</td>
<td>End plate (U) 14, Metal joint 15, O-ring 16</td>
<td>Plug-in type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VVF4000-2A-2</td>
<td>End plate (U) 14, Metal joint 15, O-ring 16</td>
<td>Non plug-in type</td>
</tr>
<tr>
<td>12</td>
<td>End plate (O side) assembly</td>
<td>VVF4000-3A-1</td>
<td>End plate (D) 17, Metal joint 18, Gasket 19, O-ring 20</td>
<td>Plug-in type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VVF4000-3A-2</td>
<td>End plate (D) 17, Metal joint 18, Gasket 19, O-ring 20</td>
<td>Non plug-in type</td>
</tr>
</tbody>
</table>

Note: For increasing the manifold bases, please order the manifold block assembly number of the principal part assembly 10. For plug-in type, the manifold base with terminal stand (integrated with a junction cover) is required with the junction cover assembly.
### Model Specifications

#### Flow characteristics

<table>
<thead>
<tr>
<th>Model</th>
<th>Type of actuation</th>
<th>Port size Rc</th>
<th>Flow characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single</td>
<td>3/4</td>
<td>C (dm³/(s·bar)) bC (dm³/(s·bar))</td>
</tr>
<tr>
<td>VFS5100</td>
<td>Plug-in</td>
<td>3/8</td>
<td>0.30</td>
</tr>
<tr>
<td>VFS5200</td>
<td>Plug-in</td>
<td>1/2</td>
<td>0.15</td>
</tr>
<tr>
<td>VFS5300</td>
<td>Plug-in</td>
<td>1/4</td>
<td>0.15</td>
</tr>
<tr>
<td>VFS5400</td>
<td>Plug-in</td>
<td>1/8</td>
<td>0.25</td>
</tr>
<tr>
<td>VFS5500</td>
<td>Plug-in</td>
<td>1/4</td>
<td>0.25</td>
</tr>
<tr>
<td>VFS5600</td>
<td>Plug-in</td>
<td>1/8</td>
<td>0.25</td>
</tr>
</tbody>
</table>

#### Standard Specifications

- **Fluid**: Air/inert gas
- **Maximum operating pressure**: 1.0 MPa
- **Minimum operating pressure**: 0.1 MPa
- **Proof pressure**: 1.2 MPa
- **Ambient and fluid temperature**: –10 to 60°C (1)
- **Lubrication**: Non-lube (2)
- **Pilot valve manual override**: Non-locking push type (Flush)
- **Shock/Vibration resistance**: 150/50 m/s² (3)
- **Enclosure**: Type E: Dustproof (Level 0), Type F: Dripproof (Level 2), Type D: Splashproof (Level 4) (4)
- **Coil rated voltage**: 100, 200 VAC, 50/60 Hz; 24 VDC
- **Allowable voltage fluctuation**: –15 to +15% of rated voltage
- **Coil insulation type**: Class B or equivalent (130°C) (5)
- **Apparent power (Power consumption) AC**: 3.4 VA (2.1 W) @ 50 Hz, 2.3 VA (1.5 W) @ 60 Hz
- **Power consumption DC**: 1.8 W (2.04 W: With light/surge voltage suppressor)
- **Electrical entry**: Plug-in type, Grommet terminal, DIN terminal
- **Non-locking push type (Flush)**
- **Non-locking push type (Extended)**
- **Locking type (Tool required)**
- **Locking type (Lever)**

#### Option Specifications

- **Pilot type**: External pilot
- **Main valve**: Direct manual override
- **Pilot valve**: Non-locking push type (Extended), Locking type (Tool required), Locking type (Lever)
- **Coil rated voltage**: 110 to 120, 220, 240 VAC (50/60 Hz)
- **Porting specifications**: Bottom ported

#### Note

1. Based on JIS B 8375 (once per 30 days) for the minimum operating frequency.
2. Based on JIS B8375-1981. (The value at supply pressure 0.5 MPa.)
3. The figures in the above list are without sub-plate. In the case of with plug-in sub-plate and, with non plug-in sub-plate add Rc 3/8, 1/2—0.744 kg, Rc 3/4—0.966 kg and Rc 3/8, 1/2—0.577 kg, Rc 3/4—0.823 kg respectively.
4. "Note 1)" and "Note 2)" are with controlled clean air.
5. "Note 3)" Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)

---

**Model and Flow Characteristics**

- **Model**: VFS5000
- **Flow Characteristics**:
  - **3/4**: C: 20 dm³/(s·bar)
  - **1/2**: C: 20 dm³/(s·bar)
  - **1/4**: C: 20 dm³/(s·bar)
  - **1/8**: C: 20 dm³/(s·bar)
  - **3/8**: C: 20 dm³/(s·bar)
  - **1/2**: C: 20 dm³/(s·bar)
  - **1/4**: C: 20 dm³/(s·bar)
  - **1/8**: C: 20 dm³/(s·bar)
  - **3/8**: C: 20 dm³/(s·bar)

---

**Standard Specifications**

- **Fluid**: Air/inert gas
- **Maximum operating pressure**: 1.0 MPa
- **Minimum operating pressure**: 0.1 MPa
- **Proof pressure**: 1.2 MPa
- **Ambient and fluid temperature**: –10 to 60°C (1)
- **Lubrication**: Non-lube (2)
- **Pilot valve manual override**: Non-locking push type (Flush)
- **Shock/Vibration resistance**: 150/50 m/s² (3)
- **Enclosure**: Type E: Dustproof (Level 0), Type F: Dripproof (Level 2), Type D: Splashproof (Level 4) (4)
- **Coil rated voltage**: 100, 200 VAC, 50/60 Hz; 24 VDC
- **Allowable voltage fluctuation**: –15 to +15% of rated voltage
- **Coil insulation type**: Class B or equivalent (130°C) (5)
- **Apparent power (Power consumption) AC**: 3.4 VA (2.1 W) @ 50 Hz, 2.3 VA (1.5 W) @ 60 Hz
- **Power consumption DC**: 1.8 W (2.04 W: With light/surge voltage suppressor)
- **Electrical entry**: Plug-in type, Grommet terminal, DIN terminal

---

**Option Specifications**

- **Pilot type**: External pilot
- **Main valve**: Direct manual override
- **Pilot valve**: Non-locking push type (Extended), Locking type (Tool required), Locking type (Lever)
- **Coil rated voltage**: 110 to 120, 220, 240 VAC (50/60 Hz)
- **Porting specifications**: Bottom ported

---

**Note**

1. Use dry air at low temperatures.
2. Use turbine oil Class 1 (ISO VG32), if lubricated.
3. Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)
4. Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz.

---

**5 Port Pilot Operated Solenoid Valve Metal Seal, Plug-in/Non Plug-in Series VFS5000**

**Approvals**

- **Approved**
- **Approved**
5 Port Pilot Operated Solenoid Valve
Metal Seal, Plug-in/Non Plug-in  Series VFS5000

How to Order

<table>
<thead>
<tr>
<th>Symbol</th>
<th>2 position single</th>
<th>2 position double</th>
<th>3 position closed center</th>
<th>3 position pressure center</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
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<td>3</td>
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<td></td>
</tr>
<tr>
<td>7</td>
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<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Porting specifications</th>
<th>Electrical entry</th>
<th>Electrical entry</th>
<th>Electrical entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Side ported</td>
<td>Bottom ported</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Port size</th>
<th>Nil</th>
<th>Without sub-plate</th>
<th>03</th>
<th>Rc-3/4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>04</td>
<td>Rc-3/4</td>
<td>06</td>
<td>Rc-3/4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Thread type</th>
<th>Nil</th>
<th>N</th>
<th>T</th>
<th>NPT</th>
<th>NPTF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>CE-compliant</th>
<th>Nil</th>
<th>Q</th>
<th>CE-compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type sub-plate</th>
<th>Non plug-in type sub-plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS5</td>
<td>1 0</td>
<td>1 1</td>
</tr>
<tr>
<td>0</td>
<td>F</td>
<td>D</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>6</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Body option</th>
<th>Standard</th>
<th>Direct manual override</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pilot type</th>
<th>Internal pilot</th>
<th>External pilot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Coil rated voltage</th>
<th>100 VAC, 50/60 Hz</th>
<th>200 VAC, 50/60 Hz</th>
<th>110 to 120 VAC, 50/60 Hz</th>
<th>220 VAC, 50/60 Hz</th>
<th>24 VDC</th>
<th>12 VDC</th>
<th>240 VAC, 50/60 Hz</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>9</td>
<td>10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Manual override</th>
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<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>9</td>
<td>10</td>
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<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type sub-plate</th>
<th>Non plug-in type sub-plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS5</td>
<td>1 0</td>
<td>1 1</td>
</tr>
<tr>
<td>0</td>
<td>F</td>
<td>D</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Option</th>
<th>Type &quot;P&quot;, &quot;ZP&quot; is available for DIN type only.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>None</td>
</tr>
<tr>
<td>Z</td>
<td>With light/surge voltage suppressor</td>
</tr>
<tr>
<td>P</td>
<td>Non-rotating DIN terminal</td>
</tr>
<tr>
<td>ZP*</td>
<td>Light/Surge Voltage Suppressor</td>
</tr>
<tr>
<td>Non-rotating DIN terminal</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Body option</th>
<th>Standard</th>
<th>Direct manual override</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
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</tr>
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<table>
<thead>
<tr>
<th>Pilot type</th>
<th>Internal pilot</th>
<th>External pilot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R</td>
<td></td>
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</tr>
</tbody>
</table>

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Series VFS5000

Cylinder Speed Chart

Use as a guide for selection. Please confirm the actual conditions with SMC Sizing Program.

<table>
<thead>
<tr>
<th>Series</th>
<th>Average speed (mm/s)</th>
<th>Bore size</th>
<th>Cylinder side pressure P2 (MPa)</th>
<th>SUP side pressure P1 (MPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS5100-06</td>
<td>800-700-600-500-400-300</td>
<td>ø125 ø140 ø160 ø180 ø200 ø250 ø300</td>
<td>Vertical, upward actuation</td>
<td>Horizontal actuation</td>
</tr>
</tbody>
</table>

- It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
- The average velocity of the cylinder is what the stroke is divided by the total stroke time.
- Load factor: ((Load weight x 9.8)/Theoretical force) x 100%

Conditions

<table>
<thead>
<tr>
<th>Series CS1</th>
<th>Tube bore x Length</th>
<th>Speed controller</th>
<th>Silencer</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS5100-06</td>
<td>SGP20A x 1 m</td>
<td>AS500-06</td>
<td>AN500-06</td>
</tr>
</tbody>
</table>

Double Check Spacer/Specifications

Can hold an intermediate cylinder position for an extended time
If the double check spacer with a built-in double check valve is combined, it will enable the cylinder to stop in the intermediate stroke and maintain its position for a long time without being affected by the leakage between the spools.

Specifications

<table>
<thead>
<tr>
<th>Double check spacer part no.</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS5000-22A-1</td>
<td>VFS5400-0F</td>
<td>VFS5410-0D</td>
</tr>
<tr>
<td>VFS5000-22A-2</td>
<td>VFS5410-0E</td>
<td></td>
</tr>
</tbody>
</table>

Applicable valve model

VFS5100-06-0F VFS5200-06-0D VFS5410-0E

Check Valve Operation

- In the case of 3 position double check valve (VFS56-0), check the leakage from piping and fittings in between valve and cylinder by means of synthetic detergent solutions, and ensure that there is no such leakage found there.
- Also check the leakage from cylinder seal and piston seal. If there is any leakage, sometimes the cylinder, when valve is de-energized, can move without stopping at intermediate position.
- Be aware that if the exhaust side is restricted excessively, the intermediate stopping accuracy will decrease and will lead to improper intermediate stops.

Caution

- The combination of VFS510-0, VFS520-0 and a double check spacer can be used as prevention of falling at the stroke end but cannot hold the intermediate position of the cylinder.
Construction

2 position single

2 position double

Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Aluminum die-casted</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>2</td>
<td>Sub-plate</td>
<td>Aluminum die-casted</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>3</td>
<td>Spool/Sleeve</td>
<td>Stainless steel</td>
<td>—</td>
</tr>
<tr>
<td>4</td>
<td>Adapter plate</td>
<td>Resin</td>
<td>Black</td>
</tr>
<tr>
<td>5</td>
<td>End plate</td>
<td>Resin</td>
<td>Black</td>
</tr>
<tr>
<td>6</td>
<td>Piston</td>
<td>Resin</td>
<td>—</td>
</tr>
<tr>
<td>7</td>
<td>Junction cover</td>
<td>Resin</td>
<td>—</td>
</tr>
<tr>
<td>8</td>
<td>Light cover</td>
<td>Resin</td>
<td>—</td>
</tr>
<tr>
<td>9</td>
<td>Return spring</td>
<td>Stainless steel</td>
<td>—</td>
</tr>
<tr>
<td>10</td>
<td>Gasket</td>
<td>NBR</td>
<td>—</td>
</tr>
<tr>
<td>11</td>
<td>Hexagon socket head screw</td>
<td>Steel</td>
<td>—</td>
</tr>
<tr>
<td>12</td>
<td>Detent assembly</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>13</td>
<td>Pilot valve assembly</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

Sub-plate Assembly Part No.

<table>
<thead>
<tr>
<th></th>
<th>Plug-in</th>
<th>Non plug-in</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VFS5000-P-</td>
<td>VFS5000-S-</td>
</tr>
</tbody>
</table>

* Mounting bolt and gasket are not included.

* Refer to "How to Order Pilot Valve Assembly" on page 1203.
Series VFS5000

Plug-in — 2 Position single/Double/3 Position closed center/Exhaust center/Pressure center/Double check

2 position single: VFS5100-□F
2 position double: VFS5200-□F
3 position closed center: VFS5300-□F
3 position exhaust center: VFS5400-□F
3 position pressure center: VFS5500-□F

Bottom ported

2 x ø7 mounting hole

With light/surge voltage suppressor

G 1/2 electrical entry

Direct manual override

Pilot valve manual override

Rc 1/8 external pilot
(Port size: Rc 3/8, 1/2)

Rc 1/8 external pilot
(Port size: Rc 3/4)

2 x ø7 (□)

Series VFS5000

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Non Plug-in — 2 Position single/Double/3 Position closed center/Exhaust center/Pressure center/Double check

2 position single: VFS5110-□E, VFS5110-□D

2 position double: VFS5210-□E, VFS5210-□D

3 position closed center: VFS5310-□E, VFS5310-□D

3 position exhaust center: VFS5410-□E, VFS5410-□D

3 position pressure center: VFS5510-□E, VFS5510-□D

3 position double check: VFS5610-□E, VFS5610-□D
Series VFS5000
Manifold Specifications

Plug-in Type: With Terminal Block
• Since lead wires of solenoid valve are connected with the terminals on upper surface of terminal block, corresponding lead wires from power source can be wired at the bottom of terminal block.

Plug-in Type: With Multi-connector
• Master connection of power and solenoid valves.
• Quick wiring permits easier installation.

Plug-in Type: With D-sub Connector
• Wide range of interchangeability (MIL Spec. D-sub connector terminal 25 pcs attached.)
• Quick wiring permits easier installation.

Non Plug-in Type: Grommet Terminal, DIN Terminal
• Wiring for every valve.
How to Order Manifold Assembly
Please indicate manifold base type, corresponding valve, and option parts.

Example
• Plug-in type with terminal block: 6 stations (manifold base) VVFS5-10-601-04----1 (2 position single) VFS5100-5FZ -------3 (2 position double) VFS5200-5FZ -------2 (blanking plate) VFS5000-10A -------1
• Non plug-in type: 6 stations (manifold base) VVFS5-10-061-04------1 (2 position single) VFS5110-5D -------6 (3 position exhaust center) VFS410-5D -------1 (individual EXH center) VVFS5000-R-04-2----1

Flow Characteristics at the Number of Manifold Stations (Operated individually)

### Model
<table>
<thead>
<tr>
<th>Passage/Stations</th>
<th>Station 1</th>
<th>Station 5</th>
<th>Station 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>VVFS5-10-061-04</td>
<td>0.02</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>VVFS5-10-061-04</td>
<td>0.02</td>
<td>0.03</td>
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</tr>
<tr>
<td>VVFS5-10-061-04</td>
<td>0.02</td>
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**Manifold Option Parts Assembly**

**Individual SUP spacer**
An individual SUP spacer set on manifold block can form SUP port for every valve.

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<tbody>
<tr>
<td>Part no.</td>
<td>VVFS5000-P-04-1</td>
<td>VVFS5000-F-02-2</td>
</tr>
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</table>

**Individual EXH spacer**
An individual EXH spacer set on manifold block can form EXH port for every valve. (common EXH type)

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<td>VVFS5000-R-04-1</td>
<td>VVFS5000-R-04-2</td>
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**SUP block plate**
When supplying manifold with more than two different pressures, high and low, insert a block plate in between stations subjected to different pressures.

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</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>AX16C-13A</td>
<td>AX16C-13A</td>
</tr>
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**EXH block plate**
When valve exhaust affects the other stations on the circuit or when a reverse pressure valve is used on a standard manifold valve, insert EXH block plate in between stations to separate valve exhaust.

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<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>AX1512-14-1A</td>
<td>AX1512-14-1A</td>
</tr>
</tbody>
</table>

**Interface regulator**
Interface regulator set on manifold block can regulate the pressure to each valve. (in the event of using, refer to "Flow Characteristics" on page 1225).

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>ARFS5000-00-A-1</td>
<td>ARFS5000-00-A-2</td>
</tr>
</tbody>
</table>

**Made to Order Manifold with serial transmission kit**
Plug-in type • Solenoid valve wiring process reduced considerably.

**Exhaust noise dampening**
With exhaust cleaner Plug-in type/Non plug-in type
• Valve exhaust noise dampening: 35 dB or more.
• Oil mist collection: Rate of collection 99.9% or more.
• Piping process reduced.
Series VFS5000

Manifold — Plug-in type, Non plug-in type

Plug-in type (With terminal block): VV5FS5-01T-Station1- Port size

Non plug-in type: VV5FS5-10-Station1- Port size

DIN terminal

VV5FS5-10-Station2- Port size

Formula for manifold weight \( M = 0.811n + 1.231 \) (kg)  \( n: \) Station

Formula for manifold weight \( M = 0.911n + 1.621 \) (kg)  \( n: \) Station

Applicable cable O.D. ø8 to ø10

Formula for manifold weight \( M = 0.811n + 1.231 \) (kg)  \( n: \) Station

(1): 2(B)/4(A) port Rc \( \frac{1}{4} \)
5 Port Pilot Operated Solenoid Valve  
Metal Seal, Plug-in/Non Plug-in  **Series VFS5000**

**Manifold — Plug-in type with multi-connector/D-sub connector**

Plug-in type with multi-connector: VV5FS5-01CD-Station 1-Port size, VV5FS5-01CU-Station 1-Port size

**Formula**

\[ L_1 = 51 \times n + 92 \]

\[ L_2 = 51 \times n + 110 \]

Plug assembly VV5FS2000-30A

**Bottom ported:**

- VV5FS5-01CD-Station 2-Port size

**Formula for manifold weight**

\[ M = 0.916n + 1.709 \text{ (kg)} \]

\[ n: \text{ Station} \]

Refer to page 1227. For wiring specifications.

**Plug-in type with D-sub connector:**

VV5FS5-01FD-Station 1-Port size, VV5FS5-01FU-Station 1-Port size

**Formula for manifold weight**

\[ M = 0.916n + 1.633 \text{ (kg)} \]

\[ n: \text{ Station} \]

Refer to page 1227. For wiring specifications.
**Series VFS5000**

**Manifold with Exhaust Cleaner**

- Serves to protect working environment.
- Valve exhaust noise dampening: 35 dB or more.
- Collection rate of drainage and oil mist: 99.9% or more.
- Piping work is reduced.

### Manifold Specifications

<table>
<thead>
<tr>
<th>Manifold</th>
<th>Plug-in type: VV5FS5-01</th>
<th>Non plug-in type: VV5FS5-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiring</td>
<td>With terminal block</td>
<td>DIN terminal block</td>
</tr>
<tr>
<td></td>
<td>With D-sub connector</td>
<td>D-sub connector</td>
</tr>
<tr>
<td>Applicable valve model</td>
<td>VFS5000-10/E</td>
<td>VFS5000-10/D, VFS5000-10/E</td>
</tr>
<tr>
<td>Porting specifications</td>
<td>Side: 1/2, 3/4, Bottom: 1/2 (Option)</td>
<td>Side: 1/2, 3/4, Bottom: 1/2 (Option)</td>
</tr>
<tr>
<td>Stations</td>
<td>2 to 10*</td>
<td>2 to 10*</td>
</tr>
<tr>
<td>Applicable exhaust cleaner</td>
<td>AMC810-14 (Connecting port size R 1 1/2)</td>
<td>AMC810-14 (Connecting port size R 1 1/2)</td>
</tr>
</tbody>
</table>

*Note 1) With multi-connector, or with D-sub connector: 8 stations max.
*Note 2) Exhaust cleaner: Not attached.

**How to Order**

**Series VFS5000 Manifold**

- **Connector mounting direction**
  - With connector: None
  - D side mounting: 01T, 01F
  - U side mounting: 01C, 01F

- **Port size**
  - P: 3/4, EXH: 1 1/2

**Manifold Assembly [Example]**

Add the valve and option part numbers in order starting from the first station on the D side.

- **Example**
  - Plug-in type with terminal block (6 stations)
    - VV5FS5-01T-061-04-CD
  - Non plug-in type (6 stations)
    - VV5FS5-01C-061-04-CU

- **Symbol**
  - Passage: P, R1, R2
  - Porting specifications (A, B)
  - Side: Common, Common

**Approved**

---

**Caution**

When using an exhaust cleaner, mount it downwards.

* Refer to Best Pneumatics Vol. 6 for Exhaust Cleaner details.
Manifold with Exhaust Cleaner — Plug-in type, Non plug-in type

Plug-in type: VV5FS5-01T- Station 1- Port size -CD

Non plug-in type: VV5FS5-10- Station 1- Port size -CD

Table:

<table>
<thead>
<tr>
<th>n</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>194</td>
<td>245</td>
<td>296</td>
<td>347</td>
<td>398</td>
<td>449</td>
<td>500</td>
<td>551</td>
<td>602</td>
</tr>
<tr>
<td>L2</td>
<td>212</td>
<td>263</td>
<td>314</td>
<td>365</td>
<td>416</td>
<td>467</td>
<td>518</td>
<td>569</td>
<td>620</td>
</tr>
</tbody>
</table>

Formula:

\[ L_1 = 51 \times n + 92 \]
\[ L_2 = 51 \times n + 110 \]

Notes:

[:2(B)/4(A) port Rc 3/4]
**Made to Order**

Serial Transmission Kit Manifold: EX123/124 Integrated Type (For Output)

**Serial Transmission System**

---

### How to Order

**How to Order Manifold**

**VV5FS5-01S**

- Plug-in type Serial transmission kit
- Stations: 2 stations
- SI unit mounting position: D side mounting, U side mounting

**Note 1:** Max. 10 stations. Add 1 station for serial unit mounting.

**Note 2:** Max. 10 Stations: For single and double mixed wiring. (No. of valves: 9)

Max. 9 stations: For standard double wiring (No. of valves: 8)

- **Port size**
  - Symbol: P, R1, R2, A, B
  - Thread type: N, Rc, NPT, Rp, BA

- **Port size**
  - Symbol: 04, 06, M
  - Thread type: Rc 3/4, Rc 1/8

- **Combination symbol**
  - Symbol: P, R1, R2, A, B
  - Port specification: P, R1, R2
  - Piping specification: A, B

---

**SI unit part no.**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Without SI unit</td>
</tr>
<tr>
<td>F1</td>
<td>NKE Corporation: Uni-wire System (16 outputs)</td>
</tr>
<tr>
<td>H</td>
<td>NKE Corporation: Uni-wire H System (16 outputs)</td>
</tr>
<tr>
<td>J1</td>
<td>SUNX Corporation: S-LINK System (16 outputs)</td>
</tr>
<tr>
<td>J2</td>
<td>SUNX Corporation: S-LINK System (8 outputs)</td>
</tr>
<tr>
<td>Q</td>
<td>OMRON Corporation: CompoBus/S (16 outputs) (2 power supply systems)</td>
</tr>
<tr>
<td>R1</td>
<td>OMRON Corporation: CompoBus/S (16 outputs) (2 power supply systems)</td>
</tr>
<tr>
<td>R2</td>
<td>OMRON Corporation: CompoBus/S (8 outputs) (2 power supply systems)</td>
</tr>
<tr>
<td>V</td>
<td>CC-Link (2 power supply systems)</td>
</tr>
</tbody>
</table>

---

**How to Order Valves**

**VFS5-00-5F**

- **Symbol**
  - 1: 2 position single
  - 2: 2 position double
  - 3: 3 position closed center
  - 4: 3 position exhaust center
  - 5: 3 position pressure center
  - 6: 3 position double check

- **Pilot type**
  - Nil: Internal pilot
  - R: External pilot

- **Pilot valve manual override**
  - Nil: Non-locking push type (Flush)
  - A: Non-locking push type (Extended)
  - B: Locking type (Tool required)
  - C: Locking type (Lever)

- **Option**
  - Z: With light/surge voltage suppressor

- **Coil rated voltage**
  - Nil: None

---

**Correspondence of SI unit output numbers and solenoid valve coils**

**<Wiring Example 1> Double wiring (Standard)**

<table>
<thead>
<tr>
<th>SI unit output no.</th>
<th>U side 1</th>
<th>U side 2</th>
<th>U side 3</th>
<th>U side 4</th>
<th>U side 5</th>
<th>U side 6</th>
<th>U side 7</th>
<th>U side 8</th>
<th>U side 9</th>
<th>U side 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>3</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>5</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>A</td>
<td>B</td>
</tr>
</tbody>
</table>

**<Wiring Example 2> Single/Double mixed wiring (Option)**

<table>
<thead>
<tr>
<th>SI unit output no.</th>
<th>U side 10</th>
<th>U side 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>B</td>
</tr>
</tbody>
</table>

---

**How to Order Manifold**

**How to Order Manifold**

**VV5FS5-01S**

- **Plug-in type Serial transmission kit**
- **Stations**
  - 2 stations
  - 10 stations

- **SI unit mounting position**
  - D side mounting
  - U side mounting

**Note 1:** Max. 10 stations. Add 1 station for serial unit mounting.

**Note 2:** Max. 10 Stations: For single and double mixed wiring. (No. of valves: 9)

Max. 9 stations: For standard double wiring (No. of valves: 8)

**Port size**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port specification</th>
<th>Piping specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>P, R1, R2</td>
<td>A, B</td>
<td>A, B</td>
</tr>
</tbody>
</table>

**Combination symbol**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port specification</th>
<th>Piping specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>P, R1, R2</td>
<td>A, B</td>
<td>A, B</td>
</tr>
</tbody>
</table>

---

**SI unit can be mounted on either U or D side.**

Refers to pages 1653 to 1655 for the details of the EX123/124 integrated type (for output) serial transmission system.
5 Port Pilot Operated Solenoid Valve
Metal Seal, Plug-in/Non Plug-in Series VFS5000

Serial Transmission Kit Manifold: EX123/124 Integrated Type (For Output) Serial Transmission System
VV5FS5-01S Mounting position Model - Stations Symbol - Port size Thread - X199

Dimensions

Formula \( L_1 = 51n + 92 \), \( L_2 = 51n + 110 \)

<table>
<thead>
<tr>
<th>( n )</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>( L_1 )</td>
<td>194</td>
<td>245</td>
<td>296</td>
<td>347</td>
<td>398</td>
<td>449</td>
<td>500</td>
<td>551</td>
<td>602</td>
<td></td>
</tr>
<tr>
<td>( L_2 )</td>
<td>212</td>
<td>263</td>
<td>314</td>
<td>365</td>
<td>416</td>
<td>467</td>
<td>518</td>
<td>569</td>
<td>620</td>
<td></td>
</tr>
</tbody>
</table>

Note) Actual number of manifold base stations: Add 1 SI unit mounting station to the number of valve stations.

* Use a dripproof plug assembly (AXT100-B04A) for the unused conduit port (G 1/2).
**Series VFS5000**

**Manifold Option Parts — Plug-in type, Non plug-in type**

**Individual SUP spacer:**
- VVFS5000-P-04-1 (Plug-in type)
- VVFS5000-P-04-2 (Non plug-in type)

**Double check spacer:**
- VVFS5000-22A-1 (Plug-in type)
- VVFS5000-22A-2 (Non plug-in type)

**Individual EXH spacer:**
- VVFS5000-R-04-1 (Plug-in type)
- VVFS5000-R-04-2 (Non plug-in type)

**Interface regulator/P port regulation:**
- ARBF5050-00-P-1 (Plug-in type)
- ARBF5050-00-P-2 (Non plug-in type)

**Interface regulator/A port regulation:**
- ARBF5050-00-A-1 (Plug-in type)
- ARBF5050-00-A-2 (Non plug-in type)

**Interface regulator/B port regulation:**
- ARBF5050-00-B-1 (Plug-in type)
- ARBF5050-00-B-2 (Non plug-in type)

**Throttle valve spacer:**
- VVFS5000-20A-1 (Plug-in type)
- VVFS5000-20A-2 (Non plug-in type)

**SUP block plate:** AXT628-12A
**EXH block plate:** AXT512-14-1A

() : SUP block plate

---

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com
5 Port Pilot Operated Solenoid Valve  
Metal Seal, Plug-in/Non Plug-in  Series VFS5000

Manifold Base Construction — Plug-in type, Non plug-in type

![Diagram of manifold base construction](image)

**Replacement Parts**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Connection fitting A</td>
<td>Steel plate</td>
<td>AXT628-6-1A</td>
</tr>
<tr>
<td>2</td>
<td>Connection fitting B</td>
<td>Steel plate</td>
<td>AXT628-6-2</td>
</tr>
<tr>
<td>3</td>
<td>O-ring</td>
<td>NBR</td>
<td>AS566-006</td>
</tr>
<tr>
<td>4</td>
<td>O-ring</td>
<td>NBR</td>
<td>AS566-010</td>
</tr>
<tr>
<td>5</td>
<td>O-ring</td>
<td>NBR</td>
<td>AS566-013</td>
</tr>
<tr>
<td>6</td>
<td>O-ring</td>
<td>NBR</td>
<td>AS566-022</td>
</tr>
<tr>
<td>7</td>
<td>O-ring</td>
<td>NBR</td>
<td>AS566-026</td>
</tr>
<tr>
<td>8</td>
<td>Terminal assembly</td>
<td>—</td>
<td>AXT628-5-1A</td>
</tr>
<tr>
<td>9</td>
<td>Junction cover assembly</td>
<td>For 01T</td>
<td>VVFS5000-4A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For 01SU</td>
<td>A2738-31A</td>
</tr>
<tr>
<td>10</td>
<td>Rubber plug</td>
<td>NBR</td>
<td>AXT336-9</td>
</tr>
</tbody>
</table>

**Replacement Parts: Sub Assembly**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Assembly part no.</th>
<th>Component parts</th>
<th>Applicable manifold base</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Manifold block assembly</td>
<td>VVFS5000-1A-1-2</td>
<td>Manifold block 10, Metal joint 1, 2, Terminal 8, O-ring 3, 4, 5, 6, 7, Receptacle assembly</td>
<td>Plug-in type</td>
</tr>
<tr>
<td>10</td>
<td>Manifold block assembly</td>
<td>VVFS5000-1A-2-1</td>
<td>Manifold block 10, Metal joint 1, 2, O-ring 3, 4, 5, 6, 7, Receptacle assembly</td>
<td>Non plug-in type</td>
</tr>
<tr>
<td>11</td>
<td>End plate (U side) assembly</td>
<td>VVFS5000-2A-1</td>
<td>End plate (U) 11, Metal joint 1, 2</td>
<td>Plug-in type</td>
</tr>
<tr>
<td>11</td>
<td>End plate (D side) assembly</td>
<td>VVFS5000-2A-2</td>
<td>End plate (U) 11, Metal joint 1, 2</td>
<td>Non plug-in type</td>
</tr>
<tr>
<td>12</td>
<td>End plate (D side) assembly</td>
<td>VVFS5000-3A-1</td>
<td>End plate (D) 13, Metal joint 1, 2, O-ring 3, 4, 5, 6, 7</td>
<td>Plug-in type</td>
</tr>
<tr>
<td>12</td>
<td>End plate (D side) assembly</td>
<td>VVFS5000-3A-2</td>
<td>End plate (D) 13, Metal joint 1, 2, O-ring 3, 4, 5, 6, 7</td>
<td>Non plug-in type</td>
</tr>
</tbody>
</table>

*For increasing the manifold bases, please order the manifold block assembly number of the principal part assembly (11). For plug-in type. The manifold base with terminal stand (integrated with a junction cover) is required with the 11 junction cover assembly.*

Note) Manifold Base/Construction: Plug-in type with terminal block.
5 Port Pilot Operated Solenoid Valve
Metal Seal, Plug-in/Non Plug-in

Series VFS6000

Model specifications:

<table>
<thead>
<tr>
<th>Model</th>
<th>Type of actuation</th>
<th>Flow characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Plug-in</td>
<td>Non plug-in</td>
</tr>
<tr>
<td></td>
<td>Port size Rc</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>3/4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Max. operating cycle (cpm)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Response time (ms)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mass (kg)</td>
<td></td>
</tr>
</tbody>
</table>

Standard Specifications:

- Fluid: Air/Inert gas
- Maximum operating pressure: 1.0 MPa
- Minimum operating pressure: 0.1 MPa
- Proof pressure: 1.5 MPa
- Ambient and fluid temperature: −10 to 60 °C
- Pilot valve manual override: Non-locking push type (Flush)
- Shock/Vibration resistance: 150/50 m/s²
- Enclosure: Type D: Dripproof (Level 2), Type E: Dustproof (Level 0)
- Coil rated voltage: 100, 200 VAC, 50/60 Hz; 24 VDC
- Allowable voltage fluctuation: ±15% to ±10% of rated voltage
- Coil insulation type: Class B or equivalent (130 °C)
- Power consumption: 1.8 W (with light/surge voltage suppressor)
- Electrical entry: Plug-in type
- Enclosure: Non plug-in type

Option Specifications:

- Pilot type: External plug
- Manual override: Direct manual override
- Coil rated voltage: 110 to 120, 200, 240 VAC (150 Hz/60 Hz)
- Porting specifications: Bottom ported
- Option: With light/surge voltage suppressor, Non-rotating DIN terminal

Note 1) Use dry air at low temperatures.
Note 2) Use turbine oil Class 1 (ISO VG32), if lubricated.
Note 3) Impact resistance: No malfunction occurred when it is tested with a drop test in the axial direction and the right angles to the main valve and armature in both energized and de-energized states every once for each condition.

(Values at the initial period)

Note 4) Based on JIS C 0950.
Note 5) Based on JIS C 4003.

JIS Symbol:

- Single
- Double
How to Order Pilot Valve Assembly

**Series VFS6000**

5 Port Pilot Operated Solenoid Valve  
Metal Seal, Plug-in/Non Plug-in

---

**How to Order**

**Porting specifications**

- **Nil**: Slide ported

**Thread type**

- **Nil**: None
- **Rc**: NPT
- **G**: G
- **N**: NPTF
- **F**: G

**Body type**

- **Plug-in type**
- **Non plug-in type**

**Electrical entry**

- **F**: Plug-in type conduit terminal
- **Z**: Plug-in type sub-plate
- **D**: Non plug-in type sub-plate
- **E**: Grommet terminal
- **D**: DIN terminal

**Coil rated voltage**

1. 100 VAC, 50/60 Hz
2. 200 VAC, 50/60 Hz
3. 110 to 120 VAC, 50/60 Hz
4. 220 VAC, 50/60 Hz
5. 24 VDC
6. 12 VDC
7. 240 VAC, 50/60 Hz
8. Other

- **Nil**: None
- **Z**: With light/surge voltage suppressor

**CE-compliant**

- **Nil**: CE-compliant

**Body Option**

- **0**: Standard
- **1**: Direct manual override

**Pilot type**

- **Nil**: Internal pilot
- **R**: External pilot

**How to Order Pilot Valve Assembly**

**SF4-1 F - 22**

**Coil rated voltage**

1. 100 VAC, 50/60 Hz
2. 200 VAC, 50/60 Hz
3. 110 to 120 VAC, 50/60 Hz
4. 220 VAC, 50/60 Hz
5. 24 VDC
6. 12 VDC
7. 240 VAC, 50/60 Hz
8. Other

- **Nil**: Refer to page 1224 for voltage conversion.
Series **VFS6000**

**Cylinder Speed Chart**

Use as a guide for selection. Please confirm the actual conditions with SMC Sizing Program.

<table>
<thead>
<tr>
<th>Series</th>
<th>Average speed (mm/s)</th>
<th>Bore size</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS6100-10</td>
<td></td>
<td>ø125</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø140</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø160</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø180</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø250</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ø300</td>
</tr>
</tbody>
</table>

* It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.

* The average velocity of the cylinder is what the stroke is divided by the total stroke time.

* Load factor: \((\text{Load weight} \times 9.8)/\text{Theoretical force}\) x 100%

**Conditions**

<table>
<thead>
<tr>
<th>Tube bore x Length</th>
<th>SGP25A x 1 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed controller</td>
<td>AS600-10</td>
</tr>
<tr>
<td>Silencer</td>
<td>AN600-10</td>
</tr>
</tbody>
</table>

**Construction**

<table>
<thead>
<tr>
<th>Component Parts</th>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Aluminum die-casted</td>
<td>Platinum silver</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Sub-plate</td>
<td>Stainless steel</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Spool/Sleeve</td>
<td>Aluminum die-casted</td>
<td>Black</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Adapter plate</td>
<td>Aluminum die-casted</td>
<td>Black</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>End plate</td>
<td>Aluminum die-casted</td>
<td>Black</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Piston</td>
<td>Resin</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Junction cover</td>
<td>Resin</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Light cover</td>
<td>Resin</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Return spring</td>
<td>Stainless steel</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Gasket</td>
<td>NBR</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Detent assembly</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Pilot valve assembly</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

* Refer to “How to Order Pilot Valve Assembly” on page 1219.

**Sub-plate Assembly Part No.**

<table>
<thead>
<tr>
<th>Plug-in</th>
<th>VFS6000-P-**&lt;sup&gt;10&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non plug-in</td>
<td>VFS6000-S-**&lt;sup&gt;10&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

* Mounting bolt and gasket are not included.

**Sub-plate Assembly (For External Pilot) Part No.**

<table>
<thead>
<tr>
<th>Plug-in</th>
<th>VFS6000-P-R**&lt;sup&gt;20&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non plug-in</td>
<td>VFS6000-S-R**&lt;sup&gt;20&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Part no. for mounting bolt and gasket:

BG-VFS6000
Plug-in — 2 Position single/Double

2 position single: VFS6100-□F

- Pilot valve manual override
- 2 x Rc 1/8 pilot EXH port
- G 1/2 electrical entry
- 4 x M8 x 80 with SW
- Solenoid valve mounting bolt (Hexagon socket head cap screw)
- 4 x ø9 mounting hole
- Light window (□FZ)

2 position double: VFS6200-□F

- Pilot valve manual override
- 2 x Rc 1/8 pilot EXH port
- G 1/2 electrical entry
- 4 x M8 x 80 with SW
- Solenoid valve mounting bolt (Hexagon socket head cap screw)
- 4 x ø9 mounting hole
- Light window (□FZ)
Series VFS6000

Non Plug-in — 2 Position single/Double

2 position single: VFS6110-□E, VFS6110-□D

2 position double: VFS6210-□E, VFS6210-□D
5 Port Pilot Operated Solenoid Valve
Metal Seal, Non Plug-in
Series VFS2000

How to Order

Conforming to CSA standard

Symbol

Non plug-in 30 – VFS2 2 10 1 02

Body type

1 Position single
2 Position single
2 Position double
3 Position closed center
3 Position exhaust center
3 Position pressure center
3 Position double check
+ Combining double check spacer with external pilot will not work.

Pilot type

Nil Internal pilot
Option: External pilot is possible only to the one with sub-plate.
A* External pilot

Coil rated voltage

1 100 VAC, 50/60 Hz
2 200 VAC, 50/60 Hz
3 110 to 120 VAC, 50/60 Hz
4* 220 VAC, 50/60 Hz
5 24 VDC
6 12 VDC
7* 240 VAC, 50/60 Hz
+ Option

Thread type

Nil Rc
NPT
+ Option

Port size

Nil Without sub-plate
Rc 1/8
Re 5/32
+ Option

Porting specifications

Nil Side ported
B Bottom ported
+ Option

Pilot valve manual override

Nil Non-locking push type
A* Non-locking push type (Extended)
B* Locking type (Tool required)
C* Locking type (Lever)
+ Option

Electrical entry

D: DIN terminal

Refer to standard products for specifications and dimensions.
5 Port Pilot Operated Solenoid Valve
Metal Seal, Non Plug-in
Series VFS3000

How to Order

Non plug-in

30 - VFS3 2 1 1 - 2 D 02

Symbol

1 2 position single
2 2 position double
3 3 position closed center
4 3 position exhaust center
5 3 position pressure center
6 3 position double check

Body type

1: Non plug-in type sub-plate

Pilot type

Nil: Internal pilot
R: External pilot

Electrical entry

D: DIN terminal

Coil rated voltage

1 100 VAC, 50/60 Hz
2 200 VAC, 50/60 Hz
3 110 to 120 VAC, 50/60 Hz
4 220 VAC, 50/60 Hz
5 24 VDC
6 12 VDC
7 240 VAC, 50/60 Hz

Thread type

Nil: Rc
N: NPT
T: NPTF
F: G

Port size

Nil: Without sub-plate
02: Rc 1/4
03: Rc 3/8

Porting specifications

Nil: Side ported
B: Bottom ported

Option

- With light/surge voltage suppressor

Pilot valve

Manual override

Nil: None
Z: Non-locking push type

Body option

0: Standard
1: Direct manual override

Approved

Refer to standard products for specifications and dimensions.
5 Port Pilot Operated Solenoid Valve
Metal Seal, Non Plug-in

Series VFS4000

How to Order

Non plug-in

30 - VFS 2101 D 03

Conforming to CSA standard

Symbol

1 2 position single 5 3 position pressure center
2 2 position double 6 3 position double check
3 3 position closed center 4 3 position exhaust center

Reverse pressure: Can be used by external pilot specifications.

Body type

1: Non plug-in type sub-plate

Body option

0 Standard
1 Direct manual override

Option

Electrical entry

D: DIN terminal

Coil rated voltage

1 100 VAC, 50/60 Hz
2 200 VAC, 50/60 Hz
3 110 to 120 VAC, 50/60 Hz
4 220 VAC, 50/60 Hz
5 24 VDC
6 12 VDC
7 240 VAC, 50/60 Hz

Option

Pilot type

Nil Internal pilot
R External pilot

Option

Thread type

Nil Rc
N RP
T NP
F G

Port size

Nil Without sub-plate
03 Rc 3/8
04 Rc 1/2

Porting specifications

Nil Side ported
B Bottom ported

Pilot valve manual override

Nil: Non locking push type (Flush)

A*: Non locking push type (Extended)

B*: Locking type (Tool required)

C*: Locking type (Lever)

Refer to standard products for specifications and dimensions.

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com
5 Port Pilot Operated Solenoid Valve
Metal Seal, Non Plug-in
Series VFS5000

How to Order

Non plug-in 30-VFS5 1 1 0 5 D 06

Symbol

1 2 position single
2 2 position double
3 3 position closed center
4 3 position exhaust center
5 3 position pressure center
6 3 position double check

Body type

1: Non plug-in type
sub-plate

Body option

1: Standard
b: Direct manual override

Pilot type

N: Internal pilot
R: External pilot

Coil rated voltage

1 100 VAC, 50/60 Hz
2 200 VAC, 50/60 Hz
3 110 to 125 VAC, 50/60 Hz
4 220 VAC, 50/60 Hz
5 24 VDC
6 12 VDC
7 240 VAC, 50/60 Hz

Electrical entry

D: DIN terminal

Port size

- Without sub-plate
- With sub-plate

Thread type

- N
- NPT

- T
- NPTF

- F
- G

Porting specifications

A: Side ported
B: Bottom ported

- In the case of external pilot (Option), bottom piping is not available.

Pilot valve manual override

Nil: Non-locking push type (Flush)
A: Non-locking push type (Extended)
B: Locking type (Tool required)
C: Locking type (Lever)

Option

- Nil
- Z: With light/surge voltage suppressor

Refer to standard products for specifications and dimensions.
# 5 Port Pilot Operated Solenoid Valve

## Metal Seal, Non Plug-in

### Series VFS6000

## How to Order

### Non plug-in

<table>
<thead>
<tr>
<th>Symbol</th>
<th>1</th>
<th>0</th>
<th>5</th>
<th>D</th>
<th>Z</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conforming to CSA standard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Body type

1: Non plug-in type sub-plate

### Body option

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>Direct manual override</td>
<td>- Option</td>
</tr>
</tbody>
</table>

### Porting specifications

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

- **Port size**
  - Nil
  - Without sub-plate
  - 06: Rc 3/8
  - 10: Rc 1

### Electrical entry

- D: DIN terminal

- **Body type**
  - Nil
  - Z
  - With light/surge voltage suppressor

### Coil rated voltage

<table>
<thead>
<tr>
<th>1</th>
<th>100 VAC, 50/60 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>200 VAC, 50/60 Hz</td>
</tr>
<tr>
<td>3</td>
<td>110 to 120 VAC, 50/60 Hz</td>
</tr>
<tr>
<td>4</td>
<td>220 VAC, 50/60 Hz</td>
</tr>
<tr>
<td>5</td>
<td>24 VDC</td>
</tr>
<tr>
<td>6</td>
<td>12 VDC</td>
</tr>
<tr>
<td>7</td>
<td>240 VAC, 50/60 Hz</td>
</tr>
</tbody>
</table>

### Refer to standard products for specifications and dimensions.
Series VFS
Specific Product Precautions 1

Be sure to read before handling.
Refer to front matters 58 and 59 for Safety Instructions and pages 3 to 7 for 3/4/5 Port Solenoid Valve Precautions.

Caution

Light/Surge Voltage Suppressor, Electrical Entry

Single unit

Base Mounted

Series VFS2000

Exchange of pilot valve (Voltage exchange)
• When changing rated voltage and electrical entry etc., pilot valve assembly can be changed. But in case of a plug-in type with light/surge voltage suppressor, pilot valve assembly cannot be changed for changing rated voltage.

Electrical Connection

Single unit/Plug-in type sub-plate: T
Conduit terminal (With terminal block)
• If the junction cover (1) of the sub-plate is removed, you can see the plug-in type terminal block (2) (part no. NVF2000-27A-1) mounted inside the sub-plate.
The following markings are on the terminal block board. Connect with corresponding power side.

Description: Solenoid A side Solenoid B side
Terminal block marking A B

Switching Direction of DIN Terminal/Cable Entry

To change direction of DIN terminal retaining screw, pull off outer cover, rotate the connector board through 180°. Replace cover and tighten screw.

Changing Direction of Electrical Entry and Manual Override
Loosen the set screw (M3-2 pcs.), take out pilot operator, turn solenoid valve 180° degrees to change the direction of lead wire and manual override. (Possible on Series VFS1000 only.)

Solenoid valve
• Loosen 3 set screws (hexagonal socket head cap screw M3 x 31) and pull solenoid valve out vertically, otherwise it may cause damage to the solenoid valve. Never remove a valve at an angle.
• When mounting solenoid valve onto the base, plug pin assembly (base-side) into receptacle assembly (body-side) vertically.

Changing Direction of DIN Terminal/Cable Entry

• Change of the electrical entry of DIN type connector cable
Unscrew retaining screw, pull off outer cover, rotate connector board through 180°. Replace cover and tighten screw. Applicable cable: O.D. ø6 to ø8.

Wiring
In the case of DIN terminal and terminal block (with indicator light/surge voltage suppressor), the interior wiring is shown below.

Surge voltage suppressor

DC + Black – Red

Applicable terminal: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S, but in the case of with DIN terminal block, is not a terminal structure.

Note) There is no polarity.

Changing Direction of Terminal block (2) (part no. NVF2000-27A-1) mounted inside the sub-plate.

Description: Solenoid A side Solenoid B side
Terminal block marking A B

Switching Direction of DIN Terminal/Cable Entry

To change direction of DIN terminal retaining screw, pull off outer cover, rotate the connector board through 180°. Replace cover and tighten screw.

Changing Direction of Electrical Entry and Manual Override
Loosen the set screw (M3–2 pcs.), take out pilot operator, turn solenoid valve 180° degrees to change the direction of lead wire and manual override. (Possible on Series VFS1000 only.)

Solenoid valve
• Loosen 3 set screws (hexagonal socket head cap screw M3 x 31) and pull solenoid valve out vertically, otherwise it may cause damage to the solenoid valve. Never remove a valve at an angle.
• When mounting solenoid valve onto the base, plug pin assembly (base-side) into receptacle assembly (body-side) vertically.

Changing Direction of DIN Terminal/Cable Entry

• Change of the electrical entry of DIN type connector cable
Unscrew retaining screw, pull off outer cover, rotate connector board through 180°. Replace cover and tighten screw. Applicable cable: O.D. ø6 to ø8.

Wiring
In the case of DIN terminal and terminal block (with indicator light/surge voltage suppressor), the interior wiring is shown below.

Surge voltage suppressor

DC + Black – Red

Applicable terminal: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S, but in the case of with DIN terminal block, is not a terminal structure.

Note) There is no polarity.
Series VFS
Specific Product Precautions 2

Be sure to read before handling.
Refer to front matters 58 and 59 for Safety Instructions and pages 3 to 7 for 3/4/5 Port Solenoid Valve Precautions.

Caution

Light/Surge Voltage Suppressor, Electrical Entry

<table>
<thead>
<tr>
<th>Base Mounted</th>
<th>Series VFS3000/4000/5000/6000</th>
<th>Single unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light/Surge Voltage Suppressor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the case of surge voltage suppressor, surge voltage absorption element is attached to terminal block on body area.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 VAC/DC or more</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 VDC or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How to Exchange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solenoid valve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Loosen set screw and take solenoid valve out vertically, otherwise it may cause damage to the solenoid valve. Never remove a valve at an angle.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• When mounting solenoid valve onto the base, plug pin assembly (base side) into receptacle assembly (body side) vertically.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pilot valve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• When changing the rated voltage, electrical entry, etc., pilot valve assembly can be exchanged easily since this is plug-in type. Then, when changing the rated voltage with indicator light/surge voltage suppressor, change of indicator light/surge voltage suppressor substrate is also needed. So, order together with pilot valve assembly.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VFS3000/4000/5000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pilot valve cover</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pilot valve assembly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIN terminal block type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Male pin terminal of DIN terminal block board of solenoid valve and wires as shown below. Connect to corresponding terminal block on the connector.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIN terminal (Wiring)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ground</td>
<td>A side</td>
<td>B side</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>COM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• There is no polarity. 100 VAC/DC or more</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With indicator light</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Double</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With indicator light</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 VDC or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With indicator light</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Double</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With indicator light</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Heavy-duty cord Application cable O. D.: ø8 to ø10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Applicable terminal Applicable terminal on block board: 3 (kinds): 1.25Y-3L, 1.25Y-3S, 1.25Y-3M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Connector/Clamping torque Set screw 0.6 N·m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Incorrect common (DIN terminal no. 3) causes damage on power side circuit.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terminal block marking</td>
<td>Solenoid A side</td>
<td>Solenoid B side</td>
</tr>
<tr>
<td>A side</td>
<td>B side</td>
<td></td>
</tr>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>• Applicable terminal: VFS3000: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VFS4000: 1.25-3.5M, 1.25Y-3L, 1.25Y-3M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VFS5000: 1.25-4, 1.25-4M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VFS6000: 1.25-3.5M, 1.25Y-3L, 1.25Y-3M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• There is no polarity.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Tightening torque for terminal: 0.6 N·m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non plug-in type (With terminal)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Remove cover (1), over terminal block (2) attached to the inside of body. Connect with corresponding power side. For a type with indicator light and surge voltage suppressor, pull out the light and surge voltage suppressor substrate (3) in a straight direction and then connect them.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Applicable terminal: VFS3000: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VFS4000/5000/6000: 1.25-3.5M, 1.25Y-3L, 1.25Y-3M</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• There is no polarity.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Tightening torque for terminal: 0.6 N·m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plug-in type (With terminal)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• If the junction cover (1) of the sub-plate is removed, you can see the plug-in type terminal block (2) mounted inside the sub-plate.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• The following markings are on the terminal block. Connect with corresponding power side.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Light/Surge Voltage Suppressor Substrate Part No.

| VFS3000 | VFS3000-10A-□ |
| VFS4000 | VFS4000-9A-□ |
| VFS4000 | VFS4000-9B-□ |
| VFS5000 | VFS5000-7A-□ |
| VFS5000 | VFS5000-7B-□ |
| VFS6000 | VFS6000-9A-□ |
| VFS6000 | VFS6000-9B-□ |

- Coil rated voltage Symbol: Refer to below.
  1: 100 to 120 V
  2: 200 to 220 V
  3: 24V

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Interface Regulator Specifications

### Interface Regulator Specifications

**Interface regulator**

- **Applicable solenoid valve series**
  - ARBF2000
  - ARBF3050
  - ARBF4050
  - ARBF5050

**Regulating port**

- **P**
  - **A**
  - **B**
  - **P**

**Proof pressure**

- 1.5 MPa

**Maximum operating pressure**

- 1.0 MPa

**Set pressure range**

- 0.05 to 0.83 MPa
- 0.1 to 0.83 MPa

**Ambient and fluid temperature**

- -5 to 60°C (No freezing)

**Port size for connection of pressure gauge**

- M5 x 0.8

**Weight (kg)**

- 0.16
- 0.46
- 0.72
- 0.83

**Effective area at supply side (mm²)**

- **S** at **P** = 0.7 MPa, **P** = 0.5 MPa
  - **P → A**: 5.5 → 21 → 18.5 → 11 → 35 → 26 → 44 → 38 → 32
  - **P → B**: 5.1 → 18.5 → 22 → 12 → 31 → 24 → 38 → 40 → 31

**Effective area at exhaust side (mm²)**

- **A → EA**: 12 → 40 → 55 → 90

**Note 1**

- Set within the operating pressure range of solenoid valve.

**Note 2**

- Synthesized effective area with solenoid valve 2 position single type.

**Note 3**

- Operate an interface regulator only by applying pressure from the “P” port of the base, except when using it as a reverse pressure valve.
  - To combine a pressure center valve and the A and B port pressure reduction of an interface regulator, use the ARBF3000, 4000, or 5000 model.
  - To combine a reverse pressure valve and an interface regulator, use the ARBF3000, 4000, or 5000 model. Furthermore, the **P** port pressure reduction cannot be used for the reverse pressure valve.
  - When combining a double check valve and an interface regulator, use a manifold or sub-plate as a basis, and stack them in the following order: the perfect spacer → the interface regulator → the valve.
  - When a closed center valve is combined with the interface regulator’s A, B port regulation, note that it cannot be used for intermediate stops of a cylinder because there is leakage from relief port on the regulator.

### Flow Characteristics (P → A)

- **JIS Symbol**
- **Flow rate (l/min (ANR))**

<table>
<thead>
<tr>
<th>Interface regulator</th>
<th>ARBF2000</th>
<th>ARBF3050</th>
<th>ARBF4050</th>
<th>ARBF5050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulating port</td>
<td>P</td>
<td>A</td>
<td>B</td>
<td>P</td>
</tr>
<tr>
<td>Port size for connection of pressure gauge</td>
<td>M5 x 0.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>0.16</td>
<td>0.46</td>
<td>0.72</td>
<td>0.83</td>
</tr>
<tr>
<td>Effective area at supply side (mm²)</td>
<td><strong>S</strong> at <strong>P</strong> = 0.7 MPa, <strong>P</strong> = 0.5 MPa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>P → A</strong></td>
<td>5.5</td>
<td>21</td>
<td>18.5</td>
<td>11</td>
</tr>
<tr>
<td><strong>P → B</strong></td>
<td>5.1</td>
<td>18.5</td>
<td>22</td>
<td>12</td>
</tr>
<tr>
<td>Effective area at exhaust side (mm²)</td>
<td><strong>A → EA</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>A → EA</strong></td>
<td>12</td>
<td>40</td>
<td>55</td>
<td>90</td>
</tr>
</tbody>
</table>

**Note 3**

- Synthesized effective area with solenoid valve 2 position single type.

### How to Calculate the Flow Rate

Refer to front matters 44 to 47 for How to Calculate the Flow Rate.
Series VFS
Specific Product Precautions 4

Caution

Lead Wire Connection Manifold/Plug-in

Type 01 Insert Plug with Lead Wire

Series VFS2000 (Insert plug with lead wire is not available for Series VF3000, 4000, and 5000.)

How to remove junction cover (Type 01)
Turn the knob (2) of junction cover (1) on the manifold block side by hand or slotted screwdriver to the C → O direction (counterclockwise) 90°. While holding the knob and upper part of junction cover, pull outward to remove junction cover.

When reassembling, do the opposite.

How to Insert Plug
- When removing insert plug (1) from manifold base, push the lever area (2) of insert plug downward with thumb and pull it together with the lead wire (3) outward.
- When placing the inset plug (1) into the manifold base, push the lever area of inset plug with thumb and plug it in its place in the receptacle housing (4) horizontally. After plugging, pull lead wire out a little bit to ensure that insert plug is secure.

Wiring

The insert plug (1) is attached to the manifold block and lead wire is plugged in with valve side as shown in the following list.
- Single solenoid: AXT624-52A-S-1
- Double solenoid: AXT624-52A-D-1

Connect with corresponding power side.

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Valve model</th>
<th>Solenoid A</th>
<th>Solenoid B</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC</td>
<td>Single</td>
<td>Red, Black</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Double</td>
<td>Red, Black</td>
<td>Brown, White</td>
</tr>
</tbody>
</table>

* There is no polarity.
* Lead wire length is 1 m.

Type 01 with Terminal Block

Series VFS2000
- Remove junction cover of manifold, exposing terminal block attached to the manifold block. Lead wires from solenoid valve are connected with the terminals on upper side of terminal block. (On the terminal block, lead wire is connected with both A and B sides of solenoid valve in accordance with the corresponding markings A and B on the block.) Connect each lead wire of power side corresponding to respective solenoid valve on the lower terminal block.

VFS2000 has the marking + COM on the block board, but – COM specification is also available.

<table>
<thead>
<tr>
<th>Model</th>
<th>A side</th>
<th>COM</th>
<th>B side</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS2100</td>
<td>A side</td>
<td>COM</td>
<td>B side</td>
</tr>
<tr>
<td>VFS2200</td>
<td>A side</td>
<td>COM</td>
<td>B side</td>
</tr>
<tr>
<td>VFS2300</td>
<td>A side</td>
<td>COM</td>
<td>B side</td>
</tr>
</tbody>
</table>

- Applicable terminal: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S
- Plugging COM bridge (part no. AXT625-73: 5 stations) in between each + COM on the block board will make the specifications of all the stations + COM and enables you to understand the wiring process.
- There is no polarity.
- Tightening torque for terminal: 0.6 N·m

Series VFS3000
- Applicable terminal: 1.25-3.5M, 1.25Y-3L, 1.25Y-3M
- There is no polarity.
- VFS 3000 has the marking + COM on the block board, but – COM specification is also available.
- Tightening torque for terminal: 0.6 N·m

<table>
<thead>
<tr>
<th>Model</th>
<th>A side</th>
<th>COM</th>
<th>B side</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS3100</td>
<td>A side</td>
<td>COM</td>
<td>B side</td>
</tr>
<tr>
<td>VFS3200</td>
<td>A side</td>
<td>COM</td>
<td>B side</td>
</tr>
<tr>
<td>VFS3300</td>
<td>A side</td>
<td>COM</td>
<td>B side</td>
</tr>
</tbody>
</table>

Series VFS4000/5000
- Applicable terminal: 1.25-3.5M, 1.25Y-3L, 1.25Y-3M
- There is no polarity.
- Tightening torque for terminal: 0.6 N·m

<table>
<thead>
<tr>
<th>Model</th>
<th>A side</th>
<th>A–</th>
<th>B side</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS4000</td>
<td>A side</td>
<td></td>
<td>B side</td>
</tr>
<tr>
<td>VFS5000</td>
<td>A side</td>
<td></td>
<td>B side</td>
</tr>
</tbody>
</table>
Lead Wire Connection | Manifold/Plug-in

**Type 01C Circular Connector**

**Series VFS2000/3000/4000/5000**

- Wire connection specifications
- Lead wire for both solenoid A and B sides in manifold are connected to connector terminal as COM specifications.

**Internal Wiring of Manifold**

- Multi-connector
  - 1 station: 1 station
  - 2 station: 2 station
  - 3 station: 3 station
  - 4 station: 4 station
  - 5 station: 5 station
  - 6 station: 6 station
  - 7 station: 7 station
  - Max. 8 stations

**Cable Color List of Each Terminal No.**

<table>
<thead>
<tr>
<th>Terminal no.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead wire color</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
</tr>
<tr>
<td>Opt. marking</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Cable Color List of Each Terminal No.**

<table>
<thead>
<tr>
<th>Terminal no.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opt. marking</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Type 01F D-sub Connector**

**Series VFS2000/3000/4000/5000**

- Wire connection specifications
- Lead wire for both solenoid A and B sides in manifold are connected to connector terminal as COM specifications.

**Internal Wiring of Manifold**

- D-sub connector
  - 1 station
  - 2 station
  - 3 station
  - 4 station
  - 5 station
  - 6 station
  - 7 station
  - Max. 8 stations

**Cable Color List of Each Terminal No.**

<table>
<thead>
<tr>
<th>Terminal no.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead wire color</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
<td>Orange</td>
</tr>
<tr>
<td>Opt. marking</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Notes**

1) Maximum stations are 8.
2) There is no polarity.
3) Indication of stations are one station from D side regardless of the connector mounting side, D or U.

---

**Applicable Plug Assembly (Option)**

<table>
<thead>
<tr>
<th>Assembly part no.</th>
<th>Cable length</th>
<th>Component parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFS2000-30A-1</td>
<td>1.5 m</td>
<td>Plug 206837-1-1 pc.</td>
</tr>
<tr>
<td>VFS2000-30A-2</td>
<td>3 m</td>
<td>Cable clamp 206138-1-1 pc.</td>
</tr>
<tr>
<td>VFS2000-30A-3</td>
<td>5 m</td>
<td>Socket 66101-2-24 pcs.</td>
</tr>
<tr>
<td>VFS2000-30A-4*</td>
<td>7 m</td>
<td>Cable VCTF 24 cores x 0.75 mm² made by Tyco Electronics AMP K.K.</td>
</tr>
<tr>
<td>VFS2000-30A-6</td>
<td>15 m</td>
<td></td>
</tr>
<tr>
<td>VFS2000-30A-7*</td>
<td>20 m</td>
<td></td>
</tr>
</tbody>
</table>

* Option

---

**Applicable Plug Assembly (Option)**

<table>
<thead>
<tr>
<th>Assembly part no.</th>
<th>Cable length</th>
<th>Component parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>AXT100-D2S5-015</td>
<td>1.5 m</td>
<td>Plug MIL standard D type connector</td>
</tr>
<tr>
<td>AXT100-D2S5-020</td>
<td>3 m</td>
<td>25 terminals Cable: 25 cores wire x 0.3 mm²</td>
</tr>
<tr>
<td>AXT100-D2S5-040</td>
<td>5 m</td>
<td></td>
</tr>
<tr>
<td>AXT100-D2S5-060</td>
<td>8 m</td>
<td></td>
</tr>
<tr>
<td>AXT100-D2S5-100</td>
<td>10 m</td>
<td></td>
</tr>
<tr>
<td>AXT100-D2S5-150</td>
<td>15 m</td>
<td></td>
</tr>
<tr>
<td>AXT100-D2S5-200</td>
<td>30 m</td>
<td></td>
</tr>
<tr>
<td>AXT100-D2S5-300</td>
<td>20 m</td>
<td></td>
</tr>
</tbody>
</table>

---

**Approved**

---

**SJC**

**SY**

**SV**

**SYJ**

**SZ**

**VP4**

**S0700**

**VQ**

**VQ4**

**VQ5**

**VQC**

**VQZ**

**SQ**

**VFS**

**VFR**

**VQ7**