## Series Variations

<table>
<thead>
<tr>
<th>Series</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>VFR2000</td>
<td>2 position single</td>
<td>Plug-in type</td>
<td>Conduit terminal (F)</td>
<td>With light/surge voltage suppressor</td>
<td>Non-locking push type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non plug-in type</td>
<td>Grommet terminal (G)</td>
<td>• Plug-in type</td>
<td>Non-locking push type A (Extended)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Conduit terminal (T)</td>
<td>• Non plug-in type Grommet terminal (EZ)</td>
<td>Locking type B (Tool required)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L plug connector (L)</td>
<td>• With surge voltage suppressor</td>
<td>Locking type C (Lever)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>M plug connector (M)</td>
<td></td>
<td>Non plug-in type Grommet (GS)</td>
</tr>
<tr>
<td>VFR3000</td>
<td>2 position double</td>
<td>Plug-in type</td>
<td>Conduit terminal (F)</td>
<td>With light/surge voltage suppressor</td>
<td>Non-locking push type</td>
</tr>
<tr>
<td></td>
<td>(Standard)</td>
<td>Non plug-in type</td>
<td>Grommet terminal (E)</td>
<td>• Plug-in type</td>
<td>Non-locking push type A (Extended)</td>
</tr>
<tr>
<td></td>
<td>3 position</td>
<td></td>
<td>(Option)</td>
<td>• Non plug-in type Grommet terminal (EZ)</td>
<td>Locking type B (Tool required)</td>
</tr>
<tr>
<td></td>
<td>closed center</td>
<td></td>
<td>(110~125 V (50 Hz)</td>
<td>• With surge voltage suppressor</td>
<td>Locking type C (Lever)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>220 V (50 Hz)</td>
<td></td>
<td>Non plug-in type Grommet (GS)</td>
</tr>
<tr>
<td>VFR4000</td>
<td>3 position</td>
<td>Plug-in type</td>
<td>Conduit terminal (F)</td>
<td>With light/surge voltage suppressor</td>
<td>Non-locking push type</td>
</tr>
<tr>
<td></td>
<td>exhaust center</td>
<td>Non plug-in type</td>
<td>Grommet terminal (E)</td>
<td>• Plug-in type</td>
<td>Non-locking push type A (Extended)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Option)</td>
<td>• Non plug-in type Grommet terminal (EZ)</td>
<td>Locking type B (Tool required)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(VFR3C/10/4/10)</td>
<td>• With surge voltage suppressor</td>
<td>Locking type C (Lever)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DIN terminal (D)</td>
<td></td>
<td>Non plug-in type Grommet (GS)</td>
</tr>
<tr>
<td>VFR5000</td>
<td>3 position</td>
<td>Plug-in type</td>
<td>Conduit terminal (F)</td>
<td>With light/surge voltage suppressor</td>
<td>Non-locking push type</td>
</tr>
<tr>
<td></td>
<td>pressure center</td>
<td>Non plug-in type</td>
<td>Grommet terminal (E)</td>
<td>• Plug-in type</td>
<td>Non-locking push type A (Extended)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Option)</td>
<td>• Non plug-in type Grommet terminal (EZ)</td>
<td>Locking type B (Tool required)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(VFR3C/30/4/30)</td>
<td>• With surge voltage suppressor</td>
<td>Locking type C (Lever)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DIN terminal (D)</td>
<td></td>
<td>Non plug-in type Grommet (GS)</td>
</tr>
<tr>
<td>VFR6000</td>
<td>3 position</td>
<td>Plug-in type</td>
<td>Conduit terminal (F)</td>
<td>With light/surge voltage suppressor</td>
<td>Non-locking push type</td>
</tr>
<tr>
<td></td>
<td>pressure center</td>
<td>Non plug-in type</td>
<td>Grommet terminal (E)</td>
<td>• Plug-in type</td>
<td>Non-locking push type A (Extended)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Option)</td>
<td>• Non plug-in type Grommet terminal (EZ)</td>
<td>Locking type B (Tool required)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(VFR3C/30/4/30)</td>
<td>• With surge voltage suppressor</td>
<td>Locking type C (Lever)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DIN terminal (D)</td>
<td></td>
<td>Non plug-in type Grommet (GS)</td>
</tr>
</tbody>
</table>
## Manifold Variations

### Base Mounted Plug-in Type

<table>
<thead>
<tr>
<th>Manifold</th>
<th>VFR2000 P.1240</th>
<th>VFR3000 P.1259</th>
<th>VFR4000 P.1282</th>
<th>VFR5000 P.1303</th>
</tr>
</thead>
<tbody>
<tr>
<td>With multi-connector</td>
<td>![Image]</td>
<td>![Image]</td>
<td>![Image]</td>
<td>![Image]</td>
</tr>
<tr>
<td>With terminal block</td>
<td>![Image]</td>
<td>![Image]</td>
<td>![Image]</td>
<td>![Image]</td>
</tr>
<tr>
<td>With D-sub connector</td>
<td>![Image]</td>
<td>![Image]</td>
<td>![Image]</td>
<td>![Image]</td>
</tr>
</tbody>
</table>

#### Manifold Option Parts

<table>
<thead>
<tr>
<th>Part</th>
<th>VFR2000</th>
<th>VFR3000</th>
<th>VFR4000</th>
<th>VFR5000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual SUP spacer</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Individual EXH spacer</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>SUP block disk</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>EXH block disk</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Throttle valve spacer</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Interface regulator</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Blanking plate</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Air release valve spacer</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>SUP stop valve spacer</td>
<td>● (1)</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

**Note:**
1. Used with the manifold base. Please contact SMC for details.
2. There is no manifold base in Series VFR6000.

### With exhaust cleaner

- Plug-in type, Non plug-in type
- High noise reduction effect: 35 dB or more
- Collects oil mist: collecting rate 99.9% or more
- Piping work is reduced.

### With control unit (Note)

- Plug-in type, Non plug-in type
- Filter, regulator, pressure switch and air release valve in one unit
- Piping work eliminated

**Note:** There is no option with control unit in Series VFR5000.
### Base Mounted Non Plug-in Type

<table>
<thead>
<tr>
<th>VFR2000</th>
<th>VFR3000</th>
<th>VFR4000</th>
<th>VFR5000</th>
</tr>
</thead>
<tbody>
<tr>
<td>P.1241</td>
<td>P.1260</td>
<td>P.1283</td>
<td>P.1304</td>
</tr>
</tbody>
</table>

#### Manifold
- **Common electrical entry**
  - Grommet terminal
  - DIN terminal
- **Individual electrical entry**
  - Grommet
  - Grommet terminal
  - Conduit terminal
  - DIN terminal
  - L plug connector (Note)
  - M plug connector (Note)

#### Individual Option Parts
- **Individual SUP spacer**
- **Individual EXH spacer**
- **SUP block disk**
- **EXH block disk**
- **Throttle valve spacer**
- **Interface regulator**
- **Blanking plate**
- **Air release valve spacer**
- **SUP stop valve spacer**

#### With exhaust cleaner
- Plug-in type. Non plug-in type
- High noise reduction effect: 35 dB or more
- Collects oil mist: collecting rate 99.9% or more
- Piping work is reduced.

#### With control unit (Note)
- Plug-in type. Non plug-in type
- Filter, regulator, pressure switch and air release valve in one unit
- Piping work eliminated

Note 1) Used with the manifold base. Please contact SMC for details.
Note 2) There is no manifold base in Series VFR6000.

Note) Series VFR2000 only

---

**Manifold Option**

- **With exhaust cleaner**
- **With control unit** (Note)
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in
Series VFR2000

Standard Specifications

<table>
<thead>
<tr>
<th>Fluid specifications</th>
<th>Operating pressure range</th>
<th>Lubrication</th>
<th>Mounting orientation</th>
<th>Shock/Vibration resistance</th>
<th>Enclosure</th>
<th>Coil rated voltage</th>
<th>Allowable voltage fluctuation</th>
<th>Apparent power (AC)</th>
<th>Power consumption (DC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid</td>
<td>2 position single</td>
<td>Not required</td>
<td>Unrestricted</td>
<td>300/50 mV²</td>
<td>Opaque</td>
<td>100, 200 VAC</td>
<td>–15 to –10% of rated voltage</td>
<td>5.6 VA/50 Hz</td>
<td>1.8 W</td>
</tr>
<tr>
<td></td>
<td>3 position</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24 VDC</td>
<td></td>
<td>3.4 VA (2.1 W)/50 Hz, 2.3 VA (1.5 W)/60 Hz</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Valve specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Fluid</th>
<th>Operating pressure range</th>
<th>Lubrication</th>
<th>Mounting orientation</th>
<th>Shock/Vibration resistance</th>
<th>Enclosure</th>
<th>Specified Voltage</th>
<th>Power Consumption (DC)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2 position single</td>
<td>Not required</td>
<td>Unrestricted</td>
<td>300/50 mV²</td>
<td>Opaque</td>
<td>100, 200 VAC</td>
<td>1.8 W</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 position</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24 VDC</td>
<td></td>
</tr>
</tbody>
</table>

Option Specifications

Pilot type
External pilot [Note 1]

Manual override
Non-locking push type A (Extended), Locking type B (Tool required), Locking type C (Lever)

Coil rated voltage
110 to 120, 220, 240 VAC 50/60 Hz
12 VDC

Power consumption (DC) [Note 3]
1.8 W

Model

<table>
<thead>
<tr>
<th>Type of actuation</th>
<th>Model</th>
<th>Plug-in</th>
<th>Non plug-in</th>
<th>Port size Rc</th>
<th>Flow characteristics</th>
<th>Max. operating cycle (Hz)</th>
<th>Response time (ms)</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 position</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>VFR2100</td>
<td>1/4</td>
<td>2.5 0.18 0.58 3.0 0.27 0.70</td>
<td>10 20 or less</td>
<td>0.34 (0.32)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Double</td>
<td>VFR2200</td>
<td>1/4</td>
<td>2.8 0.24 0.62 3.0 0.27 0.70</td>
<td>10 20 or less</td>
<td>0.42 (0.44)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closed center</td>
<td>VFR2300</td>
<td>1/4</td>
<td>1.3 0.45 0.36 1.4 0.46 0.41</td>
<td>5 30 or less</td>
<td>0.43 (0.45)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust center</td>
<td>VFR2400</td>
<td>1/4</td>
<td>0.79 0.53 0.24 3.1 [0.88] 0.24 [0.51] 0.74 [0.27]</td>
<td>5 30 or less</td>
<td>0.43 (0.45)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure center</td>
<td>VFR2500</td>
<td>1/4</td>
<td>2.8 (0.65) 0.24 (0.60) 0.68 (0.21) 0.89 0.53 0.27</td>
<td>5 30 or less</td>
<td>0.43 (0.45)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 position</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 1) Use turbine oil Class 1 (ISO VG32), if lubricated.
Note 2) 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 3) At rated voltage

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)
How to Order

**Series VFR2000**

5 Port Pilot Operated Solenoid Valve

Rubber Seal, Plug-in/Non Plug-in

**How to Order**

**Pilot Valve Assembly**

**SF4** – **1 DZ** – **60** –

**How to Order Pilot Valve Assembly**

**Coil rated voltage**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Electrical entry</th>
<th>Indicator light</th>
<th>With surge voltage suppressor</th>
<th>Body type</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Plug-in type</td>
<td>–</td>
<td>–</td>
<td>Plug-in type</td>
</tr>
<tr>
<td>G</td>
<td>Grommet</td>
<td>–</td>
<td>–</td>
<td>Grommet</td>
</tr>
<tr>
<td>D</td>
<td>DIN terminal</td>
<td>–</td>
<td>–</td>
<td>DIN terminal</td>
</tr>
<tr>
<td>Y</td>
<td>DIN terminal</td>
<td>–</td>
<td>–</td>
<td>DIN terminal</td>
</tr>
<tr>
<td>T</td>
<td>Conduit terminal</td>
<td>–</td>
<td>–</td>
<td>Conduit terminal</td>
</tr>
<tr>
<td>E</td>
<td>Grommet terminal</td>
<td>–</td>
<td>–</td>
<td>Grommet terminal</td>
</tr>
<tr>
<td>EZ</td>
<td>L plug connector</td>
<td>–</td>
<td>–</td>
<td>L plug connector</td>
</tr>
<tr>
<td>M</td>
<td>M plug connector</td>
<td>–</td>
<td>–</td>
<td>M plug connector</td>
</tr>
<tr>
<td>MO</td>
<td>M plug connector</td>
<td>–</td>
<td>–</td>
<td>M plug connector</td>
</tr>
</tbody>
</table>

**Electrical entry, Light/Surge voltage suppressor**

- **Symbol**
  - F: Plug-in type
  - G: Grommet
  - D: DIN terminal
  - Y: DIN terminal
  - T: Conduit terminal
  - E: Grommet terminal
  - EZ: L plug connector
  - M: M plug connector
  - MO: M plug connector

- **Option**
  - Electrical entry: D/DO, Y/YO and F only

**Piping (P, A, B, EA, EB port)**

- **Option**
  - Electrical entry is available only on sub-plate type.

**Electrical entry, Light/Surge voltage suppressor**

- **Body type**
  - Plug-in type
  - Grommet
  - DIN terminal
  - Conduit terminal
  - Non plug-in type

**Thread type**

- **Symbol**
  - F: Plug-in type
  - G: Grommet
  - Rc: DIN terminal
  - N: NPT
  - T: NPTF

- **Option**
  - Electrical entry: D/DO, Y/YO and F only

**CE-compliant**

- **Symbol**
  - Nil
  - Q: CE-compliant

- **Option**
  - Electrical entry: D/DO, Y/YO and F only

**How to Order**

**Pilot Valve Assembly**

**Symbol**

- F: Plug-in type
- G: Grommet
- D: DIN terminal
- Y: DIN terminal
- T: Conduit terminal
- E: Grommet terminal
- EZ: L plug connector
- M: M plug connector
- MO: M plug connector

**Piping (P, A, B, EA, EB port)**

- **Option**
  - Electrical entry is available only on sub-plate type.

**How to Order**

**Pilot Valve Assembly**

**Symbol**

- F: Plug-in type
- G: Grommet
- D: DIN terminal
- Y: DIN terminal
- T: Conduit terminal
- E: Grommet terminal
- EZ: L plug connector
- M: M plug connector
- MO: M plug connector

**Piping (P, A, B, EA, EB port)**

- **Option**
  - Electrical entry is available only on sub-plate type.

**How to Order**

**Pilot Valve Assembly**

**Symbol**

- F: Plug-in type
- G: Grommet
- D: DIN terminal
- Y: DIN terminal
- T: Conduit terminal
- E: Grommet terminal
- EZ: L plug connector
- M: M plug connector
- MO: M plug connector

**Piping (P, A, B, EA, EB port)**

- **Option**
  - Electrical entry is available only on sub-plate type.

**How to Order**

**Pilot Valve Assembly**

**Symbol**

- F: Plug-in type
- G: Grommet
- D: DIN terminal
- Y: DIN terminal
- T: Conduit terminal
- E: Grommet terminal
- EZ: L plug connector
- M: M plug connector
- MO: M plug connector

**Piping (P, A, B, EA, EB port)**

- **Option**
  - Electrical entry is available only on sub-plate type.

**How to Order**

**Pilot Valve Assembly**

**Symbol**

- F: Plug-in type
- G: Grommet
- D: DIN terminal
- Y: DIN terminal
- T: Conduit terminal
- E: Grommet terminal
- EZ: L plug connector
- M: M plug connector
- MO: M plug connector

**Piping (P, A, B, EA, EB port)**

- **Option**
  - Electrical entry is available only on sub-plate type.

**How to Order**

**Pilot Valve Assembly**

**Symbol**

- F: Plug-in type
- G: Grommet
- D: DIN terminal
- Y: DIN terminal
- T: Conduit terminal
- E: Grommet terminal
- EZ: L plug connector
- M: M plug connector
- MO: M plug connector

**Piping (P, A, B, EA, EB port)**

- **Option**
  - Electrical entry is available only on sub-plate type.

**How to Order**

**Pilot Valve Assembly**

**Symbol**

- F: Plug-in type
- G: Grommet
- D: DIN terminal
- Y: DIN terminal
- T: Conduit terminal
- E: Grommet terminal
- EZ: L plug connector
- M: M plug connector
- MO: M plug connector

**Piping (P, A, B, EA, EB port)**

- **Option**
  - Electrical entry is available only on sub-plate type.
**Series VFR2000**

### Cylinder Speed Chart

<table>
<thead>
<tr>
<th>System</th>
<th>Average speed (mm/s)</th>
<th>Bore size</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Series CM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pressure 0.5 MPa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Load factor 50%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stroke 300 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Series MB, CA2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pressure 0.5 MPa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Load factor 50%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stroke 500 mm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Series CS1/CS2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pressure 0.5 MPa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Load factor 50%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stroke 1000 mm</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 what the stroke is divided by the total stroke time.

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

### System Components

- **Series VFR2000**
- **Rc 1/8**

<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>AS2000-01 (S = 2.5 mm²)</td>
<td>AN110-01 (S = 35 mm²)</td>
<td>T0425 x 1 m</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>AS3000-02 (S = 12 mm²)</td>
<td>AN110-01 (S = 35 mm²)</td>
<td>T0604 x 1 m</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>AS3000-02 (S = 12 mm²)</td>
<td>AN110-01 (S = 35 mm²)</td>
<td>T0806 x 1 m</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>AS4000-02 (S = 21 mm²)</td>
<td>AN110-01 (S = 35 mm²)</td>
<td>T1075 x 1 m</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>AS4000-02 (S = 21 mm²)</td>
<td>AN110-01 (S = 35 mm²)</td>
<td>T1209 x 1 m</td>
<td></td>
</tr>
</tbody>
</table>

### How to Order Sub-plate Assembly

- **Pilot type**
  - Nil: Internal pilot
  - R: External pilot
- **Thread type**
  - Nil, Rc, N, T
  - NPT, NPTF

**Side ported**
- **VFR2000 – LP –**
- **VFS2000 – LS –**

**Bottom ported**
- **VFR2000 – LP – B**
- **VFS2000 – LS – B**

Note) Mounting bolts and gaskets are not attached.

1/8

EA, EB port: Rc 1/8
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in Series VFR2000

Construction

VFR21□0
2 position single

VFR22□0
2 position double

3 position closed center/exhaust center/pressure center

Closed center: VFR23□0

Exhaust center: VFR24□0

Pressure center: VFR25□0

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-cast</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>2</td>
<td>Sub-plate</td>
<td>Aluminum die-cast</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>3</td>
<td>Spool valve</td>
<td>Aluminum, NBR</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Adapter plate</td>
<td>Aluminum die-cast</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>5</td>
<td>Adapter plate</td>
<td>Aluminum die-cast</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>6</td>
<td>End plate</td>
<td>Resin</td>
<td>Black</td>
</tr>
</tbody>
</table>

Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Piston</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Piston</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Junction cover</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Light cover assembly</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Spool spring</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Return spring</td>
<td>Stainless steel</td>
<td></td>
</tr>
</tbody>
</table>

Replacement Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Gasket</td>
<td>NBR</td>
<td>AXT624-20-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>AXT624-26 (M3 x 31)</td>
</tr>
<tr>
<td>14</td>
<td>Hexagon socket head screw</td>
<td>Steel</td>
<td>AXT624-26 (M3 x 31)</td>
</tr>
<tr>
<td>15</td>
<td>Pilot valve assembly</td>
<td>—</td>
<td>AXT624-20-2</td>
</tr>
<tr>
<td></td>
<td>Sub-plate assembly</td>
<td>—</td>
<td>AXT624-26 (M3 x 31)</td>
</tr>
</tbody>
</table>

Refer to "How to Order Pilot Valve Assembly" on page 1233.
Refer to "How to Order Sub-plate Assembly" on page 1234.

This figure shows a closed center type.
**Series VFR2000**

Plug-in: 2 Position Single/Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position single: VFR2100-□F-

2 position double: VFR2200-□F-

3 position closed center: VFR2300-□F-

3 position exhaust center: VFR2400-□F-

3 position pressure center: VFR2500-□F-

* Other dimensions are the same as the single type.

(PE port)

Manual override

Non-locking

Mounting hole

Electrical entry

Light/Surge voltage suppressor

(At FZ)

Bottom ported

2×0.5 (Mounting hole)

9×1/8 (P, A, B bottom piping)

9×1/8 (EA, EB bottom piping)

2×0.8 (PE port)

Rc 1/8
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in Series VFR2000

Non Plug-in: 2 Position Single
Grommet: VFR2110-□G-□

Bottom ported

Grommet terminal: VFR2110-□E-□

Conduit terminal: VFR2110-□T-□

DIN terminal: VFR2110-□D-□

L plug connector: VFR2110-□L-□

M plug connector: VFR2110-□M-□

* Other dimensions are the same as the grommet type.

"[ ]" Type Y
Other dimensions are the same as the grommet type.

Applicable cable O.D.
ø2.3 to ø2.8

Light/Surge voltage suppressor
At EZ

- Other dimensions are the same as the grommet type.
Series VFR2000

Non Plug-in: 2 Position Double

Grommet: VFR2210-[G-01]

Conduit terminal: VFR2210-[T-01]

DIN terminal: VFR2210-[D-01]

L plug connector: VFR2210-[L-01]

M plug connector: VFR2210-[M-01]

* Other dimensions are the same as the grommet type.

---

DIN terminal: VFR2210-[D-01]

L plug connector: VFR2210-[L-01]

M plug connector: VFR2210-[M-01]
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in Series VFR2000

Non Plug-in: 3 Position Closed Center/Exhaust Center/Pressure Center

Grommet
Closed center: VFR2310-□G-01
Exhaust center: VFR2410-□G-01
Pressure center: VFR2510-□G-02

<table>
<thead>
<tr>
<th>Max. 10</th>
<th>10178.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>26.5</td>
<td>96.4</td>
</tr>
<tr>
<td>109.1</td>
<td>98.6</td>
</tr>
<tr>
<td>113.4</td>
<td>106.6</td>
</tr>
<tr>
<td>117.1</td>
<td>108.6</td>
</tr>
<tr>
<td>126</td>
<td>119.6</td>
</tr>
<tr>
<td>118.0</td>
<td>111.7</td>
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<tr>
<td>115.6</td>
<td>108.6</td>
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<tr>
<td>106.6</td>
<td>99.3</td>
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<tr>
<td>98.6</td>
<td>91.3</td>
</tr>
<tr>
<td>86.2</td>
<td>79.3</td>
</tr>
<tr>
<td>72.85</td>
<td>65.3</td>
</tr>
<tr>
<td>59.9</td>
<td>52.3</td>
</tr>
<tr>
<td>49.2</td>
<td>41.3</td>
</tr>
<tr>
<td>36.5</td>
<td>28.3</td>
</tr>
<tr>
<td>25.9</td>
<td>18.3</td>
</tr>
<tr>
<td>17.2</td>
<td>9.3</td>
</tr>
</tbody>
</table>

⇒ Manual override (Non-locking)
⇒ [ ]: Type Y
⇒ Other dimensions are the same as the grommet type.

DIN terminal
Closed center: VFR2310-□E-01
Exhaust center: VFR2410-□E-01
Pressure center: VFR2510-□E-02

<table>
<thead>
<tr>
<th>Max. 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>109.1</td>
</tr>
<tr>
<td>102.5</td>
</tr>
<tr>
<td>95.5</td>
</tr>
<tr>
<td>88.5</td>
</tr>
<tr>
<td>81.5</td>
</tr>
<tr>
<td>74.5</td>
</tr>
<tr>
<td>67.5</td>
</tr>
<tr>
<td>60.5</td>
</tr>
<tr>
<td>53.5</td>
</tr>
<tr>
<td>46.5</td>
</tr>
<tr>
<td>39.5</td>
</tr>
<tr>
<td>32.5</td>
</tr>
<tr>
<td>25.5</td>
</tr>
<tr>
<td>18.5</td>
</tr>
<tr>
<td>11.5</td>
</tr>
</tbody>
</table>

⇒ [ ]: Type Y
⇒ Other dimensions are the same as the grommet type.

L plug connector
Closed center: VFR2310-□L-01
Exhaust center: VFR2410-□L-01
Pressure center: VFR2510-□L-02

<table>
<thead>
<tr>
<th>Max. 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>109.1</td>
</tr>
<tr>
<td>102.5</td>
</tr>
<tr>
<td>95.5</td>
</tr>
<tr>
<td>88.5</td>
</tr>
<tr>
<td>81.5</td>
</tr>
<tr>
<td>74.5</td>
</tr>
<tr>
<td>67.5</td>
</tr>
<tr>
<td>60.5</td>
</tr>
<tr>
<td>53.5</td>
</tr>
<tr>
<td>46.5</td>
</tr>
<tr>
<td>39.5</td>
</tr>
<tr>
<td>32.5</td>
</tr>
<tr>
<td>25.5</td>
</tr>
<tr>
<td>18.5</td>
</tr>
<tr>
<td>11.5</td>
</tr>
</tbody>
</table>

⇒ [ ]: Type Y
⇒ Other dimensions are the same as the grommet type.

M plug connector
Closed center: VFR2310-□M-01
Exhaust center: VFR2410-□M-01
Pressure center: VFR2510-□M-02

<table>
<thead>
<tr>
<th>Max. 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>109.1</td>
</tr>
<tr>
<td>102.5</td>
</tr>
<tr>
<td>95.5</td>
</tr>
<tr>
<td>88.5</td>
</tr>
<tr>
<td>81.5</td>
</tr>
<tr>
<td>74.5</td>
</tr>
<tr>
<td>67.5</td>
</tr>
<tr>
<td>60.5</td>
</tr>
<tr>
<td>53.5</td>
</tr>
<tr>
<td>46.5</td>
</tr>
<tr>
<td>39.5</td>
</tr>
<tr>
<td>32.5</td>
</tr>
<tr>
<td>25.5</td>
</tr>
<tr>
<td>18.5</td>
</tr>
<tr>
<td>11.5</td>
</tr>
</tbody>
</table>

⇒ [ ]: Type Y
⇒ Other dimensions are the same as the grommet type.
**Series VFR2000 Manifold Specifications**

**How to Order Manifold Assembly**
When ordering, specify the part nos. in order from the 1st. station in the D side. Valve arrangement is counted from the D side. When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

**Specifications**

- **Base model**: Wiring, Porting specifications, Port size, Stations, Applicable valve model

<table>
<thead>
<tr>
<th>Base model</th>
<th>Wiring</th>
<th>Porting specifications</th>
<th>Port size</th>
<th>Stations</th>
<th>Applicable valve model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in type VV5FR2-01T1-001-02</td>
<td>- With terminal block&lt;br&gt;- With multi-connector&lt;br&gt;- With D-sub connector</td>
<td>Individual junction cover</td>
<td>1/4</td>
<td>1 to 15</td>
<td>VFR2-100-CF(-Q)</td>
</tr>
<tr>
<td>VV5FR2-010-10-001-02</td>
<td>- Grommet&lt;br&gt;- Grommet terminal&lt;br&gt;- Condut terminal&lt;br&gt;- DIN terminal&lt;br&gt;- L plug connector&lt;br&gt;- M plug connector</td>
<td>Individual junction cover</td>
<td>1/2, 1/4</td>
<td>2 to 15</td>
<td>VFR2-100-CG</td>
</tr>
</tbody>
</table>

**How to Order Manifold Assembly**
When ordering, specify the part nos. in order from the 1st. station in the D side. valve arrangement is counted from the D side. When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

**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 ease of installation.

**Series VFR2000 Manifold**

- **Junction cover**: Individual junction cover
- **Connector mounting direction**: D side mounting, U side mounting

**Series VFR2000 Manifold**

- **Junction cover**: Individual junction cover
- **Connector mounting direction**: D side mounting, U side mounting

**Passage Porting**

- **Symbol**: P, EA, EB
- **Port size**: C6, C8
- **Stations**: 2 to 15 stations

**Thread type**

- **Symbol**: F, G, T, NPTF

**CE-compliant**

- **Symbol**: Nil, Q

**Option**

- When an individual passage is used, P, EA and EB ports will be bottom ported.

For bottom ported, 1/8 is only available.
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in  Series VFR2000

Plug-in Type: With D-sub Connector
(For wiring specifications, refer to page 1326.)

- Wide range of interchangeability (D-sub connector (25P) conforming to MIL standard)
- Quick wiring permits easier installation.

**Series VFR2000 Manifold**

**Symbol**

- **Passage**
  - P: Common
  - EA, EB: Side
- **Porting specification**
  - A, B

**Junction cover**

- **Plug-in type**
  - With D-sub connector

**Series VFR2000 Manifold**

**Symbol**

- **Passage**
  - P: Common
  - EA, EB: Side
- **Porting specification**
  - A, B

**Passage Porting specification**

- A, BEA, EBP
- **Common**
  - Individual
- **Common Individual**

- **Option**
  - When an individual passage is used, P, EA and EB ports will be bottom ported.

**Port size**

- **Symbol**
  - C6
  - C8
- **A, B**
  - P, EA, EB
- **Porting specification**
  - M
  - N
  - T
  - NPT
  - NPTF

**Thread type**

- CE-compliant
- Nil
- Q

**Port size**

- **Symbol**
  - C6
  - C8
- **A, B**
  - P, EA, EB
- **Porting specification**
  - M
  - N
  - T
  - NPT
  - NPTF

**Note:**
- P port or EA/EB port of symbol “3” to “8” can be individual port with block plate.
- Therefore, if using individual SUP spacer or individual EXH interface for individual port, its symbol is “1”.

---

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

- Wiring for every valve

**Series VFR2000 Manifold**

**Symbol**

- **Passage**
  - P: Common
  - EA, EB: Side
- **Porting specification**
  - A, B

**Passage Porting specification**

- A, BEA, EBP
- **Common**
  - Individual
- **Common Individual**

- **Option**
  - When an individual passage is used, P, EA and EB ports will be bottom ported.

**Port size**

- **Symbol**
  - C6
  - C8
- **A, B**
  - P, EA, EB
- **Porting specification**
  - M
  - N
  - T
  - NPT
  - NPTF

**Thread type**

- CE-compliant
- Nil
- Q

**Port size**

- **Symbol**
  - C6
  - C8
- **A, B**
  - P, EA, EB
- **Porting specification**
  - M
  - N
  - T
  - NPT
  - NPTF

**Note:**
- P port or EA/EB port of symbol “3” to “8” can be individual port with block plate.
- Therefore, if using individual SUP spacer or individual EXH spacer for individual port, its symbol is “1”.

---

SMC

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### Series VFR2000

#### Manifold/Option Parts Assembly

**Individual SUP spacer**
Setting individual SUP spacer on the manifold block enables individual SUP port for each 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 1/4</td>
<td>VVFS2000-P-01-1/2</td>
<td>VVFS2000-P-02-1/2</td>
</tr>
</tbody>
</table>

**Individual EXH spacer**
Setting individual EXH spacer on the manifold block enables individual EXH port for each 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 1/4</td>
<td>VVFS2000-R-01-1/2</td>
<td>VVFS2000-R-02-1/2</td>
</tr>
</tbody>
</table>

**SUP block disk**
When supplying manifold with more than two different kinds of pressure, high and low, insert a block disk 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>RC 1/4</td>
<td>AXT625-12A</td>
<td></td>
</tr>
</tbody>
</table>

**EXH block disk**
When valve exhaust affects the other stations in the circuit, insert EXH block disk 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>RC 1/4</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**
Interface regulator set on the manifold block can regulate pressure for each valve. (Refer to “Flow Characteristics” on page 1324 before operation.)

<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>VVFS2000-05-P-1</td>
<td>VVFS2000-05-P-2</td>
</tr>
</tbody>
</table>

**Air release valve spacer**
Valve VFR21□□ (single) can be used as air release valve by combining with release valve spacer.

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

**SUP stop valve spacer**
If SUP stop valve spacer is set, valve can be removed for maintenance without stopping air pressure supply for other valves.

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

(Height will be 23.2 mm higher.)

**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>VVFS2000-10A</td>
<td></td>
</tr>
</tbody>
</table>

#### Manifold Option

**With control unit**

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

---

**For details, refer to page 1247.**
## Manifold/Plug-in Type

**With terminal block (Individual junction cover): VV5FR2-01T**

- Station 1 - Port size

**Bottom ported:**

- VV5FR2-01T - Station 2 - Port size

**With terminal block (One-piece junction cover): VV5FR2-01T1**

- Station 1 - Port size

**Bottom ported:**

- VV5FR2-01T1 - Station 2 - Port size

### Stations

<table>
<thead>
<tr>
<th></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>L1</td>
<td>75</td>
<td>103</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>
</tr>
<tr>
<td>L2</td>
<td>84</td>
<td>112</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>
</tr>
</tbody>
</table>

**Formula**

- \( L_1 = 28 \times n + 47 \)
- \( L_2 = 28 \times n + 56 \)
**Series VFR2000**

**Manifold/Plug-in Type**

With multi-connector: VV5FR2-01CD1-Station1-Port size, VV5FR2-01CU1-Station1-Port size

Bottom ported: VV5FR2-01CD1-Station2-Port size

With D-sub connector: VV5FR2-01FD1-Station1-Port size, VV5FR2-01FU1-Station1-Port size

Bottom ported: VV5FR2-01FD1-Station2-Port size

---

For wiring specifications, refer to page 1326.

<table>
<thead>
<tr>
<th>Stations</th>
<th>L1</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>75</td>
<td>84</td>
</tr>
<tr>
<td>2</td>
<td>103</td>
<td>112</td>
</tr>
<tr>
<td>3</td>
<td>131</td>
<td>140</td>
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<tr>
<td>4</td>
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<td>168</td>
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<tr>
<td>5</td>
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<td>196</td>
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<td>6</td>
<td>215</td>
<td>224</td>
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<tr>
<td>7</td>
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<td>252</td>
</tr>
<tr>
<td>8</td>
<td>271</td>
<td>280</td>
</tr>
</tbody>
</table>

Formula:

- $L_1 = 28 \times n + 47$
- $L_2 = 28 \times n + 56$

---

For wiring specifications, refer to page 1326.
Manifold/Non plug-in type: VV5FR2-10 Station 1-Port size

Grommet: G

Bottom ported:
VV5FR2-10 Station 2-Port size

Grommet terminal: E
Light/Surge voltage suppressor
(At EZ)

Conduit terminal: T
Light/Surge voltage suppressor
(At DZ, YZ)

DIN terminal: D, Y
Light/Surge voltage suppressor
(At MZ)

L plug connector: L

M plug connector: M

<table>
<thead>
<tr>
<th>Station</th>
<th>L1</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>75</td>
<td>84</td>
</tr>
<tr>
<td>2</td>
<td>103</td>
<td>112</td>
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<tr>
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<td>280</td>
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<td>8</td>
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<td>9</td>
<td>299</td>
<td>336</td>
</tr>
<tr>
<td>10</td>
<td>327</td>
<td>364</td>
</tr>
</tbody>
</table>

Formula

L1 = 28 x n + 47
L2 = 28 x n + 56

Lplug connector:

Mplug connector:

Formula

<table>
<thead>
<tr>
<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>L1</td>
<td>75</td>
<td>103</td>
<td>131</td>
<td>159</td>
<td>187</td>
<td>215</td>
<td>243</td>
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</tr>
<tr>
<td>L2</td>
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<td>112</td>
<td>140</td>
<td>168</td>
<td>196</td>
<td>224</td>
<td>252</td>
<td>280</td>
<td>308</td>
</tr>
</tbody>
</table>
Series VFR2000

Manifold/Option Parts Assembly: Plug-in Type/Non Plug-in Type

Individual SUP spacer:
VVFS2000-P-01-1 (Plug-in type)
VVFS2000-P-02-2 (Non plug-in type)

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

Individual EXH spacer:
VVFS2000-R-01-1 (Plug-in type)
VVFS2000-R-02-2 (Non plug-in type)

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

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

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

Note) VVFS2000-24A-1/2R (D side mounting)
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**
Air filter with auto-drain or manual drain must be mounted with the air filter at the bottom.

---

### Manifold Specifications

<table>
<thead>
<tr>
<th>Manifold</th>
<th>Plug-in type: VV5FR2-01(-Q)</th>
<th>Non plug-in type: VV5FR2-10(-Q)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wiring</strong></td>
<td>With terminal block</td>
<td>Grommet, Grommet terminal</td>
</tr>
<tr>
<td></td>
<td>With multi-connector</td>
<td>Conduit terminal, DIN terminal</td>
</tr>
<tr>
<td></td>
<td>With D-sub connector</td>
<td>L plug connector, M plug connector</td>
</tr>
<tr>
<td><strong>Applicable valve model</strong></td>
<td>VFR2C00(-Q)</td>
<td>VFR2C10-CG, VFR2C10-CE</td>
</tr>
<tr>
<td></td>
<td>VFR2C10-DT, VFR2C10-DY(-Q)</td>
<td>VFR2C10-CIM</td>
</tr>
<tr>
<td><strong>Porting specifications</strong></td>
<td>A, B port</td>
<td>Common SUP, Common EXH</td>
</tr>
<tr>
<td></td>
<td>Side: Rc 1/8, 1/4, C6, C8, Bottom: Rc 1/8 (Option)</td>
<td>Side: Rc 1/8, Bottom: Rc 1/8 (Option)</td>
</tr>
<tr>
<td><strong>Stations</strong></td>
<td>2 to 15 stations *</td>
<td>(With multi-connector/D-sub connector: 2 to 8 stations)</td>
</tr>
</tbody>
</table>

* Including station of control unit

---

### Control Unit Specifications

<table>
<thead>
<tr>
<th>Air filter (With auto-drain/With manual drain)</th>
<th>Filtration degree</th>
<th>5 μm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regulator</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Set pressure (Outlet pressure)</strong></td>
<td>0.05 to 0.85 MPa</td>
<td></td>
</tr>
<tr>
<td><strong>Pressure switch</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Set pressure range: OFF</strong></td>
<td>0.1 to 0.6 MPa</td>
<td></td>
</tr>
<tr>
<td><strong>Differential</strong></td>
<td>0.08 MPa</td>
<td></td>
</tr>
<tr>
<td><strong>Contact</strong></td>
<td>1a</td>
<td></td>
</tr>
<tr>
<td><strong>Indicator light</strong></td>
<td>LED (RED)</td>
<td></td>
</tr>
<tr>
<td><strong>Max. switch capacity</strong></td>
<td>2 VA AC, 2 W DC</td>
<td></td>
</tr>
<tr>
<td><strong>Max. operating current</strong></td>
<td>24 VAC, DC or less: 50 mA, 100 VAC, DC: 20 mA</td>
<td></td>
</tr>
<tr>
<td><strong>Inside voltage drop</strong></td>
<td>4 V or less</td>
<td></td>
</tr>
<tr>
<td><strong>Air release valve</strong></td>
<td>Single only</td>
<td></td>
</tr>
<tr>
<td><strong>Operating pressure range</strong></td>
<td>0.2 to 0.9 MPa</td>
<td></td>
</tr>
</tbody>
</table>

---

### Control Unit/Option

- **Air release valve** | VVFS2000-24A-1R (D side mounting) |
- **For filter regulator** | MP2-2 |
- **For pressure switch** | MP3-2 |
- **For air release valve** | AX1025-18A |
- **Filter element** | 111511-5B |

Note 1) Refer to “Manifold Option” on page 1246.
Note 2) Pressure switch cannot be mounted later on non plug-in type.
Series VFR2000

How to Order

**VV5FR2**

**Series VFR2000**

**Manifold**

**Symbol** | **Electrical entry** | **Connector mounting direction** | **Junction cover**
---|---|---|---
01T | Plug-in type | terminal block | — |
01T1 | Plug-in type | multi-connector | D side |
01CD1 | Plug-in type | D-sub connector | D side |
01CU1 | Plug-in type | U side | — |
01FD1 | Non plug-in type | — | — |
01FU1 | — | — | — |

**Stations**

- **02** 2 stations
- **15** 15 stations

Note: 01CD1, 01CU1, 01FD1, 01FU1: Max. 8 stations
- 01T, 01T1, 10: Max. 15 stations
- Including station of control unit

**Passage Porting specifications**

- **Symbol**
- **P**
- **EA, EB**
- **A, B**
- **Option**

**Port size**

- **Symbol**
- **P, EA, EB**
- **A, B**
- **1/4**
- **1/8**
- **Mixed**

**Thread type**

- **Symbol**
- **Rc**
- **F**
- **G**
- **N**
- **NPT**
- **T**
- **NPTF**

**Control unit type**

- **Symbol**
- **Nil**
- **MP**
- **AP**
- **A**
- **G**
- **F**
- **C**
- **E**

**Air release valve coil rating**

- **Symbol**
- **Nil**
- **None**
- **1** 100 VAC, 50/60 Hz
- **9** Other

**How to Order Manifold Assembly**

*Example:* Plug-in type with terminal block

- **VV5FR2-01T1-091-02**
- **MP5** 1 set (Manifold base part no.)
- **01T1** 5 sets (2 position single part no.)
- **01FD1-02** 2 sets (2 position double part no.)

The asterisk denotes the symbol for assembly. Prefix it to the part nos. of the solenoid valve, etc.

**How to Order**

1. The 1st and 2nd station are used for control unit mounting.
2. When ordering, specify the part nos. in order from the 3rd. station in the D side.
3. When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

*Example:* Non plug-in type

- **VV5FR2-10-071-01**
- **M5** 1 set (Manifold base part no.)
- **01T1** 5 sets (2 position single part no.)
- **01FD1-10** 2 sets (2 position double part no.)

The asterisk denotes the symbol for assembly. Prefix it to the part nos. of the solenoid valve, etc.

*Note:* Control unit is D side mounting only.
5 Port Pilot Operated Solenoid Valve  
Rubber Seal, Plug-in/Non Plug-in Type  
Series VFR2000

Manifold with Control Unit: Plug-in Type/Non Plug-in Type

**Plug-in type:**  
VV5FR2-01T  Station 1  Port size  Control unit  Voltage of air release valve

**Non plug-in type:**  
VV5FR2-10  Station 1  Port size  Control unit  Voltage of air release valve

**Example for manifold**

- Individual EXH spacer
- Individual SUP spacer
- Control unit
- Pressure switch
- Air release valve
- Filter regulator

**Formula**

<table>
<thead>
<tr>
<th>n</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>L = 28 x n + 47</td>
</tr>
<tr>
<td>4</td>
<td>L = 28 x n + 56</td>
</tr>
<tr>
<td>5</td>
<td>L = 28 x n + 194</td>
</tr>
<tr>
<td>6</td>
<td>L = 28 x n + 235.5</td>
</tr>
</tbody>
</table>

**Notes:**

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VAZ
- SQ
- VFS
- VQ
- VQ7
Series VFR2000

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>AXT625-4-1</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>O-ring</td>
<td>NBR</td>
<td>18 x 15 x 1.5</td>
</tr>
<tr>
<td>6</td>
<td>O-ring</td>
<td>NBR</td>
<td>10.5 x 7.5 x 1.5</td>
</tr>
<tr>
<td>7</td>
<td>Adapter plate</td>
<td>—</td>
<td>For 01T AXT625-28-1A</td>
</tr>
<tr>
<td></td>
<td>Assembly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Adapter plate</td>
<td>Resin</td>
<td>For 01C AXT625-28-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>For 01F VVF2000-28-6A</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 (1)</td>
<td>AXT625-20A</td>
<td>Manifold block (1), Metal joint (1), 2, O-ring (3), 6, 7, Terminal (8), Junction cover (9), Adapter plate, Pin housing, Guide</td>
<td>Plug-in type (For 01T)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AXT625-10A</td>
<td>Manifold block (1), Metal joint (1), 2, O-ring (3), 6, 7</td>
<td>Non plug-in type</td>
</tr>
<tr>
<td>11</td>
<td>End plate (U side) assembly</td>
<td>AXT625-2A-20</td>
<td>End plate (U) (1), Metal joint (1), 2, Gasket A (3)</td>
<td>Plug-in type (For 01T)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AXT625-2A-10</td>
<td>End plate (U) (1), Metal joint (1), 2, Gasket A (3)</td>
<td>Non plug-in type (For 10)</td>
</tr>
<tr>
<td>12</td>
<td>End plate (D side) assembly</td>
<td>AXT625-3A-20</td>
<td>End plate (D) (1), Metal joint (1), 2, Gasket B (4), Guard (3), Steel ball</td>
<td>Plug-in type (For 01T)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AXT625-3A-10</td>
<td>End plate (D) (1), Metal joint (1), 2, Gasket B (4), Guard (3), Steel ball</td>
<td>Non plug-in type (For 10)</td>
</tr>
</tbody>
</table>

Note 1) For side ported
Note 2) 1: A, B port size Rc 1/8, 2: A, B port size Rc 1/4
Note 3) Please contact SMC if parts except for 10/01T/01T1 are needed.

* Contact SMC for CE-compliant products.
## Standard Specifications

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Operating pressure range</th>
<th>Ambient and fluid temperature</th>
<th>Lubrication</th>
<th>Manual override</th>
<th>Mounting orientation</th>
<th>Shock/Vibration resistance</th>
<th>Enclosure</th>
<th>Coil rated voltage</th>
<th>Allowable voltage fluctuation</th>
<th>Apparent power (AC) (1)</th>
<th>Power consumption (DC) (1)</th>
<th>Electrical entry</th>
<th>Electrical entry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air</td>
<td>0.2 to 0.9 MPa</td>
<td>−10 to 50°C (No freezing)</td>
<td>Not required</td>
<td>Non-locking push type</td>
<td>Unrestricted</td>
<td>300/50 m/s² (2)</td>
<td>Dustproof</td>
<td>100, 200 VAC (50/60 Hz), 24 VDC</td>
<td>−15 to −10% of rated voltage</td>
<td>Inrush: 5.6 VA/50 Hz, 5.0 VA/60 Hz</td>
<td>Holding: 3.4 VA (2.1 W/50 Hz), 2.3 VA (1.5 W)/60 Hz</td>
<td>Plug-in type</td>
<td>Condut terminal</td>
</tr>
</tbody>
</table>

### Valve specifications

<table>
<thead>
<tr>
<th>Type of actuation</th>
<th>2 position single/3 position</th>
<th>3 position double</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Double</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closed center</td>
<td></td>
<td></td>
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<tr>
<td>Exhaust center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure center</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Option Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>External pilots</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFR</td>
<td>Direct manual override</td>
</tr>
</tbody>
</table>

### Electricity specifications

- Coil rated voltage: 110 to 120, 220, 240 VAC 50/60 Hz
- With light/surge voltage suppressor
- 12 VDC

### Fluid characteristics

<table>
<thead>
<tr>
<th>Model</th>
<th>Flow characteristics (1)</th>
<th>Max. operating cycle (Hz)</th>
<th>Response time (ms)</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 → 4/2 (P → A/B)</td>
<td>4/2 → 5/3 (A/B → EA/EB)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C (dm³/s·bar)</td>
<td>b</td>
<td>Cv</td>
<td>C (dm³/s·bar)</td>
</tr>
<tr>
<td>VFR310</td>
<td>1/4</td>
<td>7.5</td>
<td>0.38</td>
<td>1.9</td>
</tr>
<tr>
<td>VFR311</td>
<td>3/8</td>
<td>8.4</td>
<td>0.39</td>
<td>2.2</td>
</tr>
<tr>
<td>VFR314</td>
<td>3/8</td>
<td>7.7</td>
<td>0.36</td>
<td>2.0</td>
</tr>
<tr>
<td>VFR321</td>
<td>1/4</td>
<td>7.1</td>
<td>0.41</td>
<td>1.9</td>
</tr>
<tr>
<td>VFR324</td>
<td>3/8</td>
<td>7.9</td>
<td>0.36</td>
<td>2.0</td>
</tr>
<tr>
<td>VFR331</td>
<td>1/4</td>
<td>7.2</td>
<td>0.39</td>
<td>1.8</td>
</tr>
<tr>
<td>VFR334</td>
<td>3/8</td>
<td>7.0</td>
<td>0.39</td>
<td>1.9</td>
</tr>
<tr>
<td>VFR341</td>
<td>1/4</td>
<td>6.5</td>
<td>0.42</td>
<td>1.7</td>
</tr>
<tr>
<td>VFR344</td>
<td>3/8</td>
<td>6.9</td>
<td>0.42</td>
<td>1.8</td>
</tr>
<tr>
<td>VFR351</td>
<td>1/4</td>
<td>7.6 (2.4)</td>
<td>0.33 (0.48)</td>
<td>1.9 (0.69)</td>
</tr>
<tr>
<td>VFR354</td>
<td>3/8</td>
<td>9.3 (2.4)</td>
<td>0.34 (0.47)</td>
<td>2.2 (0.69)</td>
</tr>
</tbody>
</table>

### Notes

1. Denotes the normal position.
2. Min. operating frequency is once in 30 days.
3. Based on dynamic performance test, JIS B 8375-1981. (0.5 MPa, Coil temperature: 20°C, at rated voltage, without surge voltage suppressor)
4. For VFR300-□F□□-□□: □□ < □□, Valve specifications

---

**Series VFR3000**

Rubber Seal, Plug-in/Non Plug-in

[Image of VFR3000 valve]

**Model**

<table>
<thead>
<tr>
<th>Type of actuation</th>
<th>Model</th>
<th>Port size Rc</th>
<th>Flow characteristics (1)</th>
<th>Max. operating cycle (Hz)</th>
<th>Response time (ms)</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>VFR310</td>
<td>1/4</td>
<td>7.5</td>
<td>0.38</td>
<td>1.9</td>
<td>7.5</td>
</tr>
<tr>
<td>VFR311</td>
<td>3/8</td>
<td>8.4</td>
<td>0.39</td>
<td>2.2</td>
<td>8.7</td>
<td>0.38</td>
</tr>
<tr>
<td>VFR314</td>
<td>3/8</td>
<td>7.7</td>
<td>0.36</td>
<td>2.0</td>
<td>8.6</td>
<td>0.37</td>
</tr>
<tr>
<td>Double</td>
<td>VFR321</td>
<td>1/4</td>
<td>7.1</td>
<td>0.41</td>
<td>1.9</td>
<td>7.4</td>
</tr>
<tr>
<td>VFR324</td>
<td>3/8</td>
<td>7.9</td>
<td>0.36</td>
<td>2.0</td>
<td>8.6</td>
<td>0.37</td>
</tr>
<tr>
<td>Closed center</td>
<td>VFR331</td>
<td>1/4</td>
<td>7.2</td>
<td>0.39</td>
<td>1.8</td>
<td>6.3</td>
</tr>
<tr>
<td>VFR334</td>
<td>3/8</td>
<td>7.0</td>
<td>0.39</td>
<td>1.9</td>
<td>6.5</td>
<td>0.40</td>
</tr>
<tr>
<td>Exhaust center</td>
<td>VFR341</td>
<td>1/4</td>
<td>6.5</td>
<td>0.42</td>
<td>1.7</td>
<td>7.9 (3.4)</td>
</tr>
<tr>
<td>VFR344</td>
<td>3/8</td>
<td>6.9</td>
<td>0.42</td>
<td>1.8</td>
<td>9.5 (3.4)</td>
<td>0.40 (0.46)</td>
</tr>
<tr>
<td>Pressure center</td>
<td>VFR351</td>
<td>1/4</td>
<td>7.6 (2.4)</td>
<td>0.33 (0.48)</td>
<td>1.9 (0.69)</td>
<td>6.1</td>
</tr>
<tr>
<td>VFR354</td>
<td>3/8</td>
<td>9.3 (2.4)</td>
<td>0.34 (0.47)</td>
<td>2.2 (0.69)</td>
<td>6.5</td>
<td>0.41</td>
</tr>
</tbody>
</table>
**Series VFR3000**

### How to Order

#### Electrical entry

- **F**: Plug-in type, conduit terminal
- **D**: DIN terminal
- **G**: Grommet

#### Common electrical entry

**VFR3**
- 1: 0 0 5 F
- 02

#### Individual electrical entry

**VFR3**
- 1: 1 1 1 D
- 02

#### Non plug-in

**VFR3**
- 1: 4 0 1 G
- 02

#### Symbol

- **0**: Standard
- **1**: Direct manual override

#### Body option

- **Option**

#### Pilot type

- **Nil**: Internal pilot
- **Z**: 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
- **8**: Other

#### Electrical entry: VFR3

**E**: Grommet terminal

**D**: DIN terminal

**T**: Conduit terminal

**D**: DIN terminal (DIN43650B type)

#### Pilot valve manual override

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

#### Electrical entry: VFR3

**Option/VFR3**

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

#### How to Order Pilot Valve Assembly

**SF4**

- 1 F
- 70

### Electrical entry, Light/Surge voltage suppressor

- **F**: Plug-in type
- **G**: Grommet

### Manual override

- **Nil**: Non-locking push type
- **A** (Option)

### Symbol

- **1**: VFR3-000
- **0**: VFR3-001
- **4**: VFR3-004

### CE-compliant

- **Q**: CE-compliant

**Note:** Pilot valve assembly is all plug-in (F).
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in  Series VFR3000

Cylinder Speed Chart

<table>
<thead>
<tr>
<th>System</th>
<th>Average speed (mm/s)</th>
<th>Bore size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series MB, CA2</td>
<td>Pressure 0.5 MPa</td>
<td>Load factor 50%</td>
</tr>
<tr>
<td>Stroke 500 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ø40</td>
<td>ø50</td>
<td>ø63</td>
</tr>
<tr>
<td>A</td>
<td>1000</td>
<td>900</td>
</tr>
<tr>
<td>B</td>
<td>1000</td>
<td>900</td>
</tr>
</tbody>
</table>

- It is when the cylinder is extending that it 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%

System Components

<table>
<thead>
<tr>
<th>System</th>
<th>Solenoid valve</th>
<th>Speed controller</th>
<th>Silencer</th>
<th>SPG (Steel pipe) dia. x Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Series VFR3000</td>
<td>AS4000-02</td>
<td>AN200-02</td>
<td>6A x 1 m</td>
</tr>
<tr>
<td>B</td>
<td>Series VFR3000</td>
<td>AS420-03</td>
<td>AN300-03</td>
<td>10A x 1 m</td>
</tr>
</tbody>
</table>

How to Order Sub-plate Assembly

<table>
<thead>
<tr>
<th>Pilot type</th>
<th>Piping port (P, A, B, EA, EB port)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>02 1/4</td>
</tr>
<tr>
<td>R</td>
<td>03 5/8</td>
</tr>
</tbody>
</table>

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

Piping port (P, A, B, EA, EB port)

Note: Mounting bolts and gaskets are not attached.
Series VFR3000

Construction

2 position single

VFR31□0

(A)(B)

5 1 3

(EA)(P)(E)(B)

2 position double

VFR32□0

(A)(B)

5 1 3

(EA)(P)(E)(B)

3 position closed center/exhaust center/pressure center

Closed center: VFR33□0

Exhaust center: VFR34□0

Pressure center: VFR35□0

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 valve</td>
<td>Aluminum, NBR</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></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Piston</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Piston</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Junction cover</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Light cover</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Return spring</td>
<td>Stainless steel</td>
<td></td>
</tr>
</tbody>
</table>

Replacement Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Description</th>
<th>VFR31□0</th>
<th>VFR32□0</th>
<th>VFR33□34□35□36□</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Gasket</td>
<td>NBR</td>
<td></td>
<td>VFR3000-26-4</td>
<td>VFR3000-26-4</td>
<td>VFR3000-26-4</td>
</tr>
<tr>
<td>12</td>
<td>Hexagon socket head screw</td>
<td>Steel</td>
<td></td>
<td>AXT632-3 (M3 x 32)</td>
<td>AXT632-3 (M3 x 32)</td>
<td>AXT632-3 (M3 x 32)</td>
</tr>
<tr>
<td>13</td>
<td>Pilot valve assembly</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td>Refer to &quot;How to Order Pilot Valve Assembly&quot; on page 1252.</td>
</tr>
<tr>
<td></td>
<td>Sub-plate assembly</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
<td>Refer to &quot;How to Order Sub-plate Assembly&quot; on page 1253.</td>
</tr>
</tbody>
</table>

This figure shows a closed center type.
Plug-in: 2 Position Single/Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position single: VFR310 \(\square\) - \(\square\)FZ

- Other dimensions are the same as the single type.

3 position closed center: VFR330 \(\square\) - \(\square\)FZ
3 position exhaust center: VFR340 \(\square\) - \(\square\)FZ
3 position pressure center: VFR350 \(\square\) - \(\square\)FZ

- Other dimensions are the same as the single type.
Series VFR3000

Non Plug-in: 2 Position Single/Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position single: VFR311\(\frac{3}{4}\)E, VFR311\(\frac{3}{4}\)DZ

2 position double: VFR321\(\frac{3}{4}\)E, VFR321\(\frac{3}{4}\)DZ

3 position closed center: VFR331\(\frac{3}{4}\)E, VFR341\(\frac{3}{4}\)DZ

3 position exhaust center: VFR341\(\frac{3}{4}\)E, VFR341\(\frac{3}{4}\)DZ

3 position pressure center: VFR351\(\frac{3}{4}\)E, VFR351\(\frac{3}{4}\)DZ

* Other dimensions are the same as the single type.

Bottom ported

Mounting hole: G1/2

Electrical entry: (ø2.3)

(External pilot port)

(PE port)

(Mounting hole)

Mounting hole: (ø5.6)

Max. 10

Applicable cable O.D. ø8 to ø10

1/8" (PE port)

1/8" (Non-locking)

(Non-locking)

Manual override

2 x ø5.6

1/8" (Mounting hole)

2 x ø5.6

Mounting hole

2 x ø5.6

Mounting hole

Other dimensions are the same as the single type.
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in Series VFR3000

Non Plug-in: 2 Position Single

2 position single: VFR3147-□G

Applicable cable O.D. ø4.5 to ø7

(With direct manual override: 112.5)

Max. 10

Applicable cable O.D. ø2.3 to ø2.8

(With direct manual override: 112.4)

Max. 10

Applicable cable O.D. ø6 to ø8

(With direct manual override: 103)

Max. 10

With light/surge voltage suppressor

E: Grommet terminal

T: Conduit terminal

D, Y: DIN terminal

With light/surge voltage suppressor

With light/surge voltage suppressor

With light/surge voltage suppressor
Series VFR3000

Non Plug-in: 2 Position Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position double: VFR324 $\varpi$-
3 position closed center: VFR334 $\varpi$-
3 position exhaust center: VFR344 $\varpi$-
3 position pressure center: VFR354 $\varpi$-

E: Grommet terminal

T: Conduit terminal

D, Y: DIN terminal

Applicable cable O.D.: ø2.3 to ø2.8

Applicable cable O.D.: ø6 to ø8

Max. 1.0

Applicable cable O.D.: ø4.5 to ø7

With direct manual override: 103

With light/surge voltage suppressor

With light/surge voltage suppressor

With light/surge voltage suppressor

Max. 10

44.5

44.5

44.5

With direct manual override: 103

With light/surge voltage suppressor

With light/surge voltage suppressor

With light/surge voltage suppressor

E: Grommet terminal

T: Conduit terminal

D, Y: DIN terminal

Max. 1.0

Max. 1.0

Max. 1.0

Manual override (Non-locking)

(External pilot port)

(PE port)

Non Plug-in: 2 Position Double, 3 Position Closed Center/Exhaust Center/Pressure Center

Approx. 300

(Lead wire length) (Mounting hole)

3 position

3 position

3 position
**Series VFR3000 Manifold Specifications**

### Manifold Specifications

<table>
<thead>
<tr>
<th>Base mounted</th>
<th>Wiring</th>
<th>Porting specifications</th>
<th>Port size</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>½</td>
<td>1, 6, 8</td>
<td>VFS3000-10 (-Q)</td>
</tr>
<tr>
<td>VVFR3-01T-061-02</td>
<td>• With multi-connector</td>
<td></td>
<td></td>
<td>2 stations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• With D-sub connector</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non plug-in type</td>
<td>• Grommet terminal</td>
<td></td>
<td></td>
<td>2 to 10</td>
<td></td>
</tr>
<tr>
<td>VVFR3-10 (-Q)</td>
<td>• DIN terminal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Grommet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Grommet terminal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Conduit terminal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• DIN terminal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** If silencer is mounted to EA/EB port, use silencer "AN403-04" (O.D. ø27).

**How to Order Manifold Assembly**

**Example** Plug-in type with terminal block: 6 stations

- VVFR3-01T-061-02 1 set (Manifold base part nos.)
- VVFR3100-01T-061-02 1 set (Blanking plate)

**Example** Non plug-in type: 6 stations

- VVFR3-10-061-02 1 set (Manifold base part nos.)

**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.

**Symbol**

- P, EA, EB
- Common
- Side
- Bottom
- Conduit

**Port size**

- ½
- ¾
- 1

**Thread type**

- Nil
- F
- G

**CE-compliant**

- Q

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

- Master connection of power and solenoid valves.
- Quick wiring permits ease of installation.

**Symbol**

- P, EA, EB
- Common
- Side
- Bottom
- Conduit

**Port size**

- ½
- ¾
- 1

**Thread type**

- Nil
- F
- G

**CE-compliant**

- Q

**How to Install**

- Conduit wiring: Terminal block (Internal)
- Conduit wiring: Conduit wiring

**Passage Porting**

- Common
- Side

**Porting specifications**

- P, EA, EB

**Applicable valve model**

- VFS3000-10 (-Q)
- VFR3410-5D
- VFR3110-5D
- VVFS3000-R-03-2
- VVFS3000-R-03-2
- VVFS3000-R-03-2
- VVFS3000-R-03-2

**Valve arrangement**

- Counted from the D side.
Series VFR3000

Plug-in Type: With D-sub Connector (For wiring specifications, refer to page 1328.)

- Wide range of interchangeability (25 pin D-sub connector conforms to MIL standard)
- Quick wiring permits easier installation.

**VV5FR3 - 01F**

```
Series VFR3000 Manifold
Plug-in type with D-sub connector

Connector mounting direction

D-sub connector

D side: U side mounting

D side: D side mounting

Stations

02 2 stations
08 8 stations
+ Max: 8 stations

Symbol

Port size

P, EA, EB

A, B *

C8

C10

* Option

Porting specifications (A, B)

Side Bottom

Thread type

Nil G CE-compliant

Nil Rc

1/4

3/8

N NPT

T NPTF

For bottom ported: Rc 1/4, 3/8 only.
```

Non Plug-in Type: Grommet Terminal, DIN Terminal (Common electrical entry)

- Individual wiring for every valve

**VV5FR3 - 10**

```
Series VFR3000 Manifold
Non plug-in type Common electrical

Grommet terminal

DIN terminal

Stations

02 2 stations
10 10 stations

Symbol

Port size

P, EA, EB

A, B *

C8

C10

* Option

Porting specifications (A, B)

Side Bottom

Thread type

Nil G CE-compliant

Nil Rc

1/4

3/8

F G

N NPT

T NPTF

For bottom ported: Rc 1/4, 3/8 only.
```

Non Plug-in Type: Grommet, Grommet Terminal, Conduit Terminal, DIN Terminal (Individual electrical entry)

- Individual wiring for every valve

**VV5FR3 - 40**

```
Series VFR3000 Manifold
Non plug-in type Individual electrical entry

Stations

02 2 stations
10 10 stations

Symbol

Port size

P, EA, EB

A, B *

C8

C10

* Option

Porting specifications (A, B)

Side Bottom

Thread type

Nil G CE-compliant

Nil Rc

1/4

3/8

F G

N NPT

T NPTF

* For bottom ported: Rc 1/4, 3/8 only.
```

Note) Manifold base is in common with Series VFS3000.
# 5 Port Pilot Operated Solenoid Valve

**Rubber Seal, Plug-in/Non Plug-in Series VFR3000**

## Manifold/Option Parts Assembly

### Individual SUP spacer
Setting individual SUP spacer on the manifold block enables individual SUP port for each 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>

### 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>

### Individual EXH spacer
Setting individual EXH spacer on the manifold block enables individual EXH port for each 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-R-03-1</td>
<td>VVFS3000-R-03-2</td>
</tr>
</tbody>
</table>

### Interface regulator
Interface regulator set on the manifold block can regulate pressure for each valve. (Refer to “Flow Characteristics” on page 1324 before operation.)

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>P port regulation</td>
<td>ARBF3050-00-P-1</td>
<td>ARBF3050-00-P-2</td>
</tr>
<tr>
<td>A port regulation</td>
<td>ARBF3050-00-A-1</td>
<td>ARBF3050-00-A-2</td>
</tr>
<tr>
<td>B port regulation</td>
<td>ARBF3050-00-B-1</td>
<td>ARBF3050-00-B-2</td>
</tr>
</tbody>
</table>

### SUP block disk
When supplying manifold with more than two different pressures, high and low, insert a block disk 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>VVFS3000-P-03-1</td>
<td>VVFS3000-P-03-2</td>
</tr>
</tbody>
</table>

### EXH block disk
When valve exhaust affects the other stations on the circuit, insert EXH block disk 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>AX1636-1A</td>
<td></td>
</tr>
</tbody>
</table>

### SUP stop valve spacer
If SUP stop valve spacer is set, valve can be removed for maintenance without stopping air pressure supply for other valves.

<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>VVFS3000-37A-1</td>
<td>VVFS3000-37A-2</td>
</tr>
</tbody>
</table>

(Height will be 27.5 mm higher.)

### 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>

* Mounting screws: 4 positions

## Manifold Option

### With exhaust cleaner
Plug-in type/Non plug-in type
- Valve exhaust noise dampening: 35 dB or more.
- Collects oil mist: collecting rate 99.9% or more
- Piping process reduced.

For details, refer to page 1266.

### 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 1269.
Series VFR3000

Manifold: Plug-in Type

With terminal block: VV5FR3-01T-Station 1-Port size

With multi-connector: VV5FR3-01CD-Station 1-Port size, VV5FR3-01CU-Station 1-Port size

Bottom ported:
VV5FR3-01T-Station 2-Port size

Formula

\[ L_1 = 33 \times n + 63 \]
\[ L_2 = 33 \times n + 75 \]

Stations

n: Station

<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>L_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>
</tr>
<tr>
<td>L_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>
</tr>
</tbody>
</table>

With direct manual override: 132.5

Light/Surge voltage suppressor

Manual override (Non-locking)

C8, C10

Plug assembly: VVFS2000-30A-L50132

Option: Refer to page 1326.

(LPE port)

(P, EA, EB port)

Max. 3

C8: Max. 6.5
C10: Max. 7

Formula

\[ L_1 = 33 \times n + 63 \]
\[ L_2 = 33 \times n + 75 \]

Stations

n: Station
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in Series VFR3000

Manifold: Plug-in Type

With D-sub connector: VV5FR3-01FD-Station 1-Port size, VV5FR3-01FU-Station 1-Port size

For wiring specifications, refer to page 1326.

<table>
<thead>
<tr>
<th>n</th>
<th>L1</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>129</td>
<td>141</td>
</tr>
<tr>
<td>2</td>
<td>162</td>
<td>174</td>
</tr>
<tr>
<td>3</td>
<td>195</td>
<td>207</td>
</tr>
<tr>
<td>4</td>
<td>228</td>
<td>240</td>
</tr>
<tr>
<td>5</td>
<td>261</td>
<td>273</td>
</tr>
<tr>
<td>6</td>
<td>294</td>
<td>306</td>
</tr>
<tr>
<td>7</td>
<td>327</td>
<td>339</td>
</tr>
<tr>
<td>8</td>
<td>360</td>
<td>372</td>
</tr>
<tr>
<td>9</td>
<td>393</td>
<td>405</td>
</tr>
</tbody>
</table>

Formula:

\[ L = \text{station number} \times 33 + 63 \]

Manifold: Non Plug-in Type

VV5FR3-10-Station 1-Port size

Bottom ported:

VV5FR3-10-Station 2-Port size

C8, C10

Grommet with terminal
**Series VFR3000**

**Manifold: Plug-in Type**

**VV5FR3-40**

- **Station 1**
  - **Port size**
  - **G: Grommet**

  Manual override (Non-locking)

  - Ø4.5 to Ø7

  - Lead wire length: 300

  - (PE port)

  - (P, EA, EB port) (Pitch)

  - Lead wire length: 300

  - (A, B port)

- **Applicable cable O.D.**
  - Ø4.2 to Ø7

- **With light/surge voltage suppressor**

- **With direct manual override**

**E: Grommet terminal**

- **With light/surge voltage suppressor**

**T: Conduit terminal**

- **With light/surge voltage suppressor**

**D, Y: DIN terminal**

- **With light/surge voltage suppressor**

Formula:

\[ L_1 = 33 \times n + 63 \]

\[ L_2 = 33 \times n + 75 \]
Manifold/Option Parts Assembly: Plug-in Type/Non Plug-in Type

Individual SUP spacer:
- VVFS3000-P-03-1 (Plug-in type)
- VVFS3000-P-03-2 (Non plug-in type)

Individual EXH spacer:
- VVFS3000-R-03-1 (Plug-in type)
- VVFS3000-R-03-2 (Non plug-in type)

SUP/EXH block disk: AXT636-1A

Note) Used with exclusive manifold block

Interface regulator/P port regulation:
- ARBF3050-00-P-1 (Plug-in type)
- ARBF3050-00-P-2 (Non plug-in type)

Interface regulator/A port regulation:
- ARBF3050-00-A-1 (Plug-in type)
- ARBF3050-00-A-2 (Non plug-in type)

Interface regulator/B port regulation:
- ARBF3050-00-B-1 (Plug-in type)
- ARBF3050-00-B-2 (Non plug-in type)
Series VFR3000

Manifold with Exhaust Cleaner

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

When using an exhaust cleaner, mount it downwards.

Caution
When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

How to Order Manifold Assembly

Example: Plug-in type with terminal block (6 stations)

Example: Non plug-in type: 6 stations

Note) Exhaust cleaner “AMC610-10” is not included.

Refer to Best Pneumatics No. 6 for Exhaust Cleaner details.
Manifold with Exhaust Cleaner: Plug-in Type/Non Plug-in Type

Plug-in type: VV5FR3-01T-Station 1-Port size

Non plug-in type: VV5FR3-10-Station 1-Port size

With direct manual override

Formula

\[ L_1 = 33 \times n + 63 \]

\[ L_2 = 33 \times n + 75 \]
**Series VFR3000**

Manifold with Exhaust Cleaner: Non Plug-in Type

Non plug-in type: VV5FR3-40-[Station]-[Port size]-CD

**Formula**

\[ L_1 = 33 \times n + 63 \]

\[ L_2 = 33 \times n + 75 \]

<table>
<thead>
<tr>
<th>Station</th>
<th>( L_1 )</th>
<th>( L_2 )</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>
<tr>
<td>9</td>
<td>360</td>
<td>372</td>
</tr>
<tr>
<td>10</td>
<td>393</td>
<td>405</td>
</tr>
</tbody>
</table>

\( n \) is the station number.

**: With direct manual override**
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.

**Manifold Specifications**

<table>
<thead>
<tr>
<th>Manifold</th>
<th>Plug-in type: V5FR3-01(-Q)</th>
<th>Non plug-in type: V5FR3-10(-Q)</th>
<th>Non plug-in type: V5FR3-40(-Q)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiring</td>
<td>With terminal block</td>
<td>With multi-connector</td>
<td>With D-sub connector</td>
</tr>
<tr>
<td>Applicable valve model</td>
<td>VFR3C0C0C0F(-Q)</td>
<td>VFR3C1C1C1E(-Q)</td>
<td>VFR3C0C0C0E, VFR3C0C0C0E(-Q)</td>
</tr>
<tr>
<td>Stations</td>
<td>2 to 10 (With multi-connector/D-sub connector: 2 to 8)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Including station of control unit

**Control Unit Specifications**

- Air filter (With auto-drain/With manual drain)
  - Filtration degree: 5 μm
- Regulator
  - Set pressure (Outlet pressure): 0.05 to 0.85 MPa
  - Pressure switch
    - Air pressure range: 0.1 to 0.6 MPa
    - Differential: 0.08 MPa
    - Contact: 1A
- Indicator light: LED (RED)
- Max. switch capacity: 2 VA AC, 2 W DC
- Max. operating current: 24 VAC, DC or less: 50 mA
  - 100 VAC, DC: 20 mA
- Inside voltage drop: 4 V or less
- Air release valve (Single only)
  - Operating pressure range: 0.2 to 0.9 MPa

**Control Unit/Option**

- Air release valve
  - VVFS3000-24A-1R (D side mounting)
  - VVFS3000-24A-2R (D side mounting)
- Pressure switch
  - IS1000P-2-1
  - MP2-3
  - MP3-2
- Blanking plate
  - For filter regulator
  - For pressure switch
- Filter element
  - INA-13-854-12-5B

Note 1) Combining valve “VFR31[L50132/L50132]” (single) and release valve spacer makes it possible to use this as an air release valve.
Note 2) Pressure switch cannot be mounted later on non plug-in type.

---

**Caution**

Air filter with auto-drain or manual drain must be mounted with the air filter at the bottom.
Series VFR3000

How to Order

**VV5FR3**

- **Base type/Electrical entry**
  - **01T**: Plug-in with terminal block
  - **01C**: Plug-in with multi-connector
  - **01F**: Plug-in type with D-sub connector
  - **10**: Non plug-in type (Common entry)
  - **40**: Non plug-in type (Individual entry)

- **Control unit type**
  - **Nil**: None
  - **1**: 100 VAC, 50/60 Hz
  - **5**: 24 VDC
  - **9**: Other

- **Control unit type**
  - **Nil**: None
  - **CE-compliant**: Nil

- **Connector mounting direction**
  - **Symbol**: With connector • Applicable base
  - **Nil**: None
  - **D**: D side mounting
  - **U**: U side mounting

- **Stations**
  - **Symbol**: 02
  - **2 stations**
  - **...**
  - **10 stations**

- **Symbol**
  - **Passage Porting specifications (A, B)**
  - **1**: Common
  - **2**: Common

- **Option**
  - *****: For bottom ported: only 1/4, 3/8

- **Port size**
  - **Symbol**: P, EA, EB
  - **02**: 1/4
  - **03**: 3/8
  - **C8**: One-touch fitting for ø8
  - **C10**: One-touch fitting for ø10
  - **M**: Mixed

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

- **Required stations**
  - **2 stations**

**Note**
- **Base 01T/10/40: 2 to 10 stations**
- **Base 01C/01F: 2 to 8 stations**
- **Including stations of control unit.**

How to Order Manifold Assembly

- **<Example> Plug-in type with terminal block**
  - **VV5FR3-01T-081-03-AP5**
  - **1 set** (Manifold base part no.)
  - **VFR3100-5FZ**
  - **4 sets** (2 position single part no.)
  - **VFR3200-5FZ**
  - **2 sets** (2 position double part no.)

- **<Example> Non plug-in type**
  - **VV5FR3-10-061-03-A5**
  - **1 set** (Manifold base part no.)
  - **VFR3110-5D**
  - **4 sets** (2 position single part no.)

The 1st and 2nd station are used for control unit mounting. When ordering, specify the part nos. in order from the 3rd station in the D side. When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

The asterisk denotes the symbol for assembly. Prefix it to the part nos. of the solenoid valve, etc.
Manifold with Control Unit: Plug-in Type/Non Plug-in Type

Plug-in type:
VV5FR3-01T- [Station] 1- [Port size] -AP  [Voltage of air release valve]

Example for manifold

Non plug-in type:
VV5FR3-10- [Station] 1- [Port size] -AP  [Voltage of air release valve]

Example for manifold

<table>
<thead>
<tr>
<th>n: Station</th>
<th>L₁</th>
<th>L₂</th>
<th>L₃ (MP)</th>
<th>L₃ (AP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>162</td>
<td>228</td>
<td>296</td>
<td>317.5</td>
</tr>
<tr>
<td>4</td>
<td>174</td>
<td>250</td>
<td>317.5</td>
<td>317.5</td>
</tr>
<tr>
<td>5</td>
<td>188</td>
<td>283</td>
<td>329.5</td>
<td>329.5</td>
</tr>
<tr>
<td>6</td>
<td>204</td>
<td>316</td>
<td>339.5</td>
<td>339.5</td>
</tr>
<tr>
<td>7</td>
<td>220</td>
<td>350</td>
<td>350</td>
<td>350</td>
</tr>
<tr>
<td>8</td>
<td>236</td>
<td>383</td>
<td>383</td>
<td>383</td>
</tr>
<tr>
<td>9</td>
<td>252</td>
<td>415</td>
<td>415</td>
<td>415</td>
</tr>
<tr>
<td>10</td>
<td>268</td>
<td>448</td>
<td>448</td>
<td>448</td>
</tr>
</tbody>
</table>

Formulas:

- L₁ = 33 x n + 63
- L₂ = 33 x n + 75
- L₃ (MP) = 33 x n + 264
- L₃ (AP) = 33 x n + 285.5

Notes:
- [: With direct manual override]
**Series VFR3000**

**Manifold with Control Unit: Non Plug-in Type**

Non plug-in type: VV5FR3-40- [Station]- [Port size]- AP Voltage of air release valve

---

![Diagram of manifold with control unit](image)

- **Manual override**: (Non-locking)
- **Air release valve**
- **Pressure switch**
- **External pilot port**
- **Po port**
- **PE port**

---

### Voltage of Air Release Valve

<table>
<thead>
<tr>
<th>Station</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>L3 (MP)</td>
</tr>
<tr>
<td>2</td>
<td>L3 (AP)</td>
</tr>
<tr>
<td>3</td>
<td>363</td>
</tr>
<tr>
<td>4</td>
<td>384.5</td>
</tr>
<tr>
<td>5</td>
<td>396</td>
</tr>
<tr>
<td>6</td>
<td>417.5</td>
</tr>
<tr>
<td>7</td>
<td>429</td>
</tr>
<tr>
<td>8</td>
<td>450.5</td>
</tr>
<tr>
<td>9</td>
<td>462</td>
</tr>
<tr>
<td>10</td>
<td>483.5</td>
</tr>
</tbody>
</table>

### Station Formulas

- **L1**: \( L1 = 33 \times n + 63 \)
- **L2**: \( L2 = 33 \times n + 75 \)

---

- **With direct manual override**
- **MP**

---

**Notes**

- [1]: With direct manual override

---

**Page 1272**
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in Series VFR3000

Manifold Base Construction: Plug-in Type/Non Plug-in Type

Replacement Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Connection fitting A</td>
<td>VVFS3000-5-1A</td>
</tr>
<tr>
<td>2</td>
<td>Connection fitting B</td>
<td>VVFS3000-5-2</td>
</tr>
<tr>
<td>3</td>
<td>Gasket</td>
<td>VVFS3000-7-1</td>
</tr>
<tr>
<td>4</td>
<td>Gasket</td>
<td>VVFS3000-8</td>
</tr>
<tr>
<td>5</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>6</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>7</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>8</td>
<td>Terminal assembly</td>
<td>VVFS3000-6A</td>
</tr>
<tr>
<td>9</td>
<td>Junction cover assembly</td>
<td>For 01T VVFS3000-4A-Station</td>
</tr>
<tr>
<td>10</td>
<td>Rubber plug</td>
<td>AXT336-9</td>
</tr>
</tbody>
</table>

Replacement Parts: Sub Assemblies

<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, Connection bracket, Gasket, O-ring, Receptacle assembly</td>
<td>Plug-in type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VVFS3000-1A-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>End plate (U side) assembly</td>
<td>VVFS3000-2A-1</td>
<td>End plate (U), Connection bracket, Gasket, O-ring</td>
<td>Plug-in type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VVFS3000-2A-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>End plate (D side) assembly</td>
<td>VVFS3000-3A-1</td>
<td>End plate (D), Connection bracket, Gasket</td>
<td>Non plug-in type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VVFS3000-3A-2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note) For side ported

Note) Manifold Base/Construction: Plug-in type with terminal block.

* Contact SMC for CE-compliant products.
### 5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in

**Series VFR4000**

#### Model

<table>
<thead>
<tr>
<th>Type of actuation</th>
<th>Plug-in</th>
<th>Non plug-in</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 position</td>
<td>VFR410</td>
<td>VFR411</td>
</tr>
<tr>
<td>3 position</td>
<td>VFR412</td>
<td>VFR414</td>
</tr>
<tr>
<td></td>
<td>VFR420</td>
<td>VFR421</td>
</tr>
<tr>
<td></td>
<td>VFR422</td>
<td>VFR424</td>
</tr>
<tr>
<td></td>
<td>VFR430</td>
<td>VFR431</td>
</tr>
<tr>
<td></td>
<td>VFR432</td>
<td>VFR433</td>
</tr>
<tr>
<td></td>
<td>VFR440</td>
<td>VFR441</td>
</tr>
<tr>
<td></td>
<td>VFR442</td>
<td>VFR443</td>
</tr>
<tr>
<td></td>
<td>VFR450</td>
<td>VFR451</td>
</tr>
<tr>
<td></td>
<td>VFR452</td>
<td>VFR453</td>
</tr>
</tbody>
</table>

#### Flow characteristics

<table>
<thead>
<tr>
<th>1 → 4/2 (P → A/B)</th>
<th>4/2 → 5/3 (A/B → EA/EB)</th>
<th>Max. operating cycle (Hz)</th>
<th>Response time (ms)</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>b</td>
<td>Cv</td>
<td>C</td>
<td>b</td>
</tr>
<tr>
<td>[dm³/(s·bar)]</td>
<td></td>
<td></td>
<td>[dm³/(s·bar)]</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>0.30</td>
<td>3.2</td>
<td>14</td>
<td>0.28</td>
</tr>
<tr>
<td>14</td>
<td>0.31</td>
<td>3.4</td>
<td>14</td>
<td>0.26</td>
</tr>
<tr>
<td>13</td>
<td>0.30</td>
<td>3.2</td>
<td>13</td>
<td>0.25</td>
</tr>
<tr>
<td>14</td>
<td>0.28</td>
<td>3.5</td>
<td>13</td>
<td>0.29</td>
</tr>
<tr>
<td>13</td>
<td>0.31</td>
<td>3.2</td>
<td>14 (13)</td>
<td>0.32 (0.30)</td>
</tr>
<tr>
<td>14</td>
<td>0.30</td>
<td>3.7</td>
<td>14 (13)</td>
<td>0.32 (0.30)</td>
</tr>
<tr>
<td>13 (5.0)</td>
<td>0.27 (0.42)</td>
<td>3.2 (1.3)</td>
<td>13</td>
<td>0.28</td>
</tr>
<tr>
<td>15 (5.3)</td>
<td>0.22 (0.42)</td>
<td>3.7 (1.5)</td>
<td>13</td>
<td>0.28</td>
</tr>
</tbody>
</table>

#### Note

1) EA, EB port: Rc 3/8
2) Normal position
3) Min. operating frequency is once in 30 days.
4) Based on dynamic performance test, JIS B 8375-1981. (0.5 MPa, Coil temperature: 20°С, at rated voltage, without surge voltage suppressor)
5) For VFR4000-CFZ-*, VFR410-DZ, VFR440-DG
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in Series VFR4000

How to Order

**Plug-in**
VFR4 0 0 5 F - 03 -

**Non plug-in**
VFR4 1 1 1 D - 03 -

**Non plug-in**
VFR4 4 0 1 G - 03 -

### How to Order Pilot Valve Assembly

**SF4** - 1 F 70 - -

### Porting specifications
(P, A, B, EA, EB port)
- Nil: Side ported
- B: Bottom ported

### 2 position single
- Nil: Standard
- Z: Direct manual override

### 2 position double
- Nil: Internal pilot
- R: External pilot

### 3 position closed center
- Nil: Grommet terminal
- E: Grommet terminal

### 3 position exhaust center
- Nil: Conduit terminal
- T: Conduit terminal

### 3 position pressure center
- Nil: DIN terminal
- Y: DIN terminal

### Coil rated voltage
1. 100 VAC, 50/60 Hz
2. 200 VAC, 50/60 Hz
3. 110 V 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

### Body option
- Nil: None
- Z: With light/surge voltage suppressor

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

### Pilot type
- Nil: Internal pilot
- R: External pilot

### Thread type
- Nil: Without sub-plate
- 03: 1/8
- 04: 1/4
- EA, EB port: Rc 3/8

### CE-compliant
- Nil: CE-compliant
- Q: CE-compliant

### Electrical entry
- Nil: Electrical entry: D, Y and F only

### Common electrical entry

### Individual electrical entry

### CE-compliant
- Nil: CE-compliant
- Q: CE-compliant

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

### Manual override
- Nil: Non-locking push type
- A: Non-locking push type A (Extended)
- B: Locking type B (Tool required)
- C: Locking type C (Lever)

### Series VFR4000 Pilot valve assembly is all plug-in (F).
**Series VFR4000**

**Cylinder Speed Chart**

<table>
<thead>
<tr>
<th>System</th>
<th>Average speed (mm/s)</th>
<th>Bore size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Series MB, CA2</td>
<td>ø50 ø63 ø80 ø100 ø125 ø140 ø160 ø180 ø200 ø250 ø300</td>
</tr>
<tr>
<td>A</td>
<td>Pressure 0.5 MPa</td>
<td>800 700 600 500 400 300 200 100 0</td>
</tr>
<tr>
<td>B</td>
<td>Load factor 50%</td>
<td>800</td>
</tr>
<tr>
<td>C</td>
<td>Stroke 500 mm</td>
<td>900</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%

**System Components**

<table>
<thead>
<tr>
<th>System</th>
<th>Solenoid valve</th>
<th>Speed controller</th>
<th>Silencer</th>
<th>SPG (Steel pipe) dia. x Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Series VFR4000 Rc 3/8</td>
<td>AS4000-03 (S = 21mm²)</td>
<td>AN300-03 (S = 60mm²)</td>
<td>10A x 1 m</td>
</tr>
<tr>
<td>B</td>
<td>Series VFR4000 Rc 3/8</td>
<td>AS420-03 (S = 73mm²)</td>
<td>AN300-03 (S = 60mm²)</td>
<td>10A x 1 m</td>
</tr>
<tr>
<td>C</td>
<td>Series VFR4000 Rc 1/2</td>
<td>AS420-04 (S = 97mm²)</td>
<td>AN400-04 (S = 90mm²)</td>
<td>15A x 1 m</td>
</tr>
</tbody>
</table>

**How to Order Sub-plate Assembly**

- **<Side ported>**
  - **Plug-in** VFR4000-P - 04
  - **Non plug-in** VFS4000-S - 04

- **<Bottom ported>**
  - **Plug-in** VFR4000-P - B 04
  - **Non plug-in** VFS4000-S - B 04

- **Piping port** (P, A, B port)
  - 03 3/8
  - 04 1/2

**Note**
- Bottom ported is not available for external pilot.
- Mounting bolts and gaskets are not included.
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in  Series VFR4000

Construction

2 position single

VFR41□0

2 position double

VFR42□0

3 position closed center/exhaust center/pressure center

Closed center: VFR43□0

Exhaust center: VFR44□0

Pressure center: VFR45□0

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 valve</td>
<td>Aluminum, NBR</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Adapter plate</td>
<td>Resin</td>
<td>Black</td>
</tr>
</tbody>
</table>

Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>End plate</td>
<td>Resin</td>
<td>Black</td>
</tr>
<tr>
<td>6</td>
<td>Junction cover</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Light cover</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Spool spring</td>
<td>Stainless steel</td>
<td></td>
</tr>
</tbody>
</table>

Replacement Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Gasket</td>
<td>NBR</td>
<td>VFR41□0</td>
</tr>
<tr>
<td>10</td>
<td>Hexagon socket head screw</td>
<td>Steel</td>
<td>VFR42□0</td>
</tr>
<tr>
<td>11</td>
<td>Pilot valve assembly</td>
<td>—</td>
<td>VFR43□0</td>
</tr>
<tr>
<td></td>
<td>Sub-plate assembly</td>
<td>—</td>
<td>VFR44□0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>VFR45□0</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td>VFR4000-32-3</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td>VFR4000-32-3</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td>VFR4000-32-3</td>
</tr>
</tbody>
</table>

This figure shows a closed center type.

Refer to “How to Order Pilot Valve Assembly” on page 1275.
Refer to “How to Order Sub-plate Assembly” on page 1276.
Series VFR4000

Plug-in: 2 Position Single/Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position single: VFR4100°F

2 position double: VFR4200°F

3 position closed center: VFR4300°F

3 position exhaust center: VFR4400°F

3 position pressure center: VFR4500°F
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in Series VFR4000

Non Plug-in: 2 Position Single/Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position single: VFR411\(^\circ\)\(^{-}\)E, VFR411\(^{\circ\circ}\)\(^{-}\)D

2 position double: VFR421\(^{\circ\circ}\)\(^{-}\)E, VFR421\(^{\circ\circ}\)\(^{-}\)D

3 position closed center: VFR431\(^{\circ\circ}\)\(^{-}\)E, VFR431\(^{\circ\circ}\)\(^{-}\)D

3 position exhaust center: VFR441\(^{\circ\circ}\)\(^{-}\)E, VFR441\(^{\circ\circ}\)\(^{-}\)D

3 position pressure center: VFR451\(^{\circ\circ}\)\(^{-}\)E, VFR451\(^{\circ\circ}\)\(^{-}\)D

Other dimensions are the same as the single type.
**Series VFR4000**

**Non Plug-in: 2 Position Single**

2 position single: VFR414\(\frac{1}{2}\)-G

---

**E: Grommet terminal**

- Applicable cable O.D.: \(\Phi 2.3\) to \(\Phi 2.8\)
- \(180.5 \times 185.5\)
- \(171 \times 18\)

- With light/surge voltage suppressor

---

**T: Conduit terminal**

- Applicable cable O.D.: \(\Phi 6\) to \(\Phi 8\)
- \(192.4 \times 182.4\)
- \(173.2 \times 192.2\)

- With light/surge voltage suppressor

---

**D, Y: DIN terminal**

- Applicable cable O.D.: \(\Phi 4.5\) to \(\Phi 7\)
- \(192.4 \times 192.4\)
- \(173.2 \times 192.2\)

- With light/surge voltage suppressor
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in Series VFR4000

Non Plug-in: 2 Position Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position double: VFR424 - G
3 position closed center: VFR434 - G
3 position exhaust center: VFR444 - G
3 position pressure center: VFR454 - G

E: Grommet terminal
T: Conduit terminal
D: DIN terminal

Applicable cable O.D.: ø4.5 to ø7
Applicable cable O.D.: ø2.3 to ø2.8
Applicable cable O.D.: ø6 to ø8
Applicable cable O.D.: ø4.5 to ø7
**Series VFR4000**

**Manifold Specifications**

<table>
<thead>
<tr>
<th>Base model</th>
<th>Wiring</th>
<th>Porting specifications</th>
<th>Port size</th>
<th>Stations</th>
<th>Applicable valve model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VV5FR4-01T-061-03</td>
<td>With terminal block</td>
<td>Side/Bottom</td>
<td>½, ½</td>
<td>2 to 10</td>
<td>VFR4□□□□□□-□□-□(-Q)</td>
</tr>
<tr>
<td></td>
<td>With multi-connector</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>With D-sub connector</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non plug-in type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VV5FR4-01□(-Q)</td>
<td>Grommet terminal</td>
<td></td>
<td></td>
<td>2 to 10</td>
<td>VFR4□□□□□□-□□-□(E-Q)</td>
</tr>
<tr>
<td></td>
<td>DIN terminal</td>
<td></td>
<td></td>
<td></td>
<td>VFR4□□□□□□-□□-□(G-E)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>VFR4□□□□□□-□□-□(C-E)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>VFR4□□□□□□-□□-□(C-T)</td>
</tr>
<tr>
<td>Non plug-in type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VV5FR4-04□(-Q)</td>
<td>Grommet</td>
<td></td>
<td></td>
<td>2 to 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**How to Order Manifold Assembly**

*Example* Plug-in type with terminal block: 6 stations

**Series VFR4000**

**Manifold**

**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.

![Diagram of terminal block and conduit wiring]

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

- Master connection of power and solenoid valves.
- Quick wiring permits ease of installation.

![Diagram of multi-connector and conduit wiring]

**Examples**

- **Plug-in type with terminal block:** 6 stations
  - VV5FR4-01T-061-03 1 set (Manifold base part no.)
  - VFR4100-5FZ 3 sets (2 position single part no.)
  - VFR4200-5FZ 2 sets (2 position double part no.)
  - VVFS4000-R-04-2 1 set (Individual EXH spacer part no.)

- **Non plug-in type:** 6 stations
  - VV5FR4-10-061-03 1 set (Manifold base part no.)
  - VFR4110-5D 5 sets (2 position single part no.)
  - VFR4410-5D 1 set (3 position exhaust center part no.)
  - VVFS4000-R-04-2 1 set (Individual EXH spacer part no.)

Valve arrangement is counted from the D side.

When ordering, specify the part nos. in order from the 1st. station in the D side.

When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

- The asterisk denotes the symbol for assembly. Prefix it to the part nos. of the solenoid valve, etc.

- CE-compliant

- Nil

- Rc

- G

- N

- NPTF

- T

- F

- Nil

- Rc

- G

- N

- NPTF

- T

- F

- Nil

- Rc

- G

- N

- NPTF

- T

- F

- Nil

- Rc

- G

- N

- NPTF

- T

- F

- Nil

- Rc

- G

- N

- NPTF

- T

- F
Plug-in Type: With D-sub Connector
(For wiring specifications, refer to page 1326.)

- Wide range of interchangeability (D-sub connector (25P) conforming to MIL standard)
- Quick wiring permits easier installation.

Non Plug-in Type: Grommet Terminal, DIN Terminal (Common electrical entry)
- Individual wiring for every valve

Note) Manifold base is in common with VV5FR4-10.

Note) Manifold base is in common with Series VFS4000 but the connection of terminal block for plug-in type is different.
**Series VFR4000**

### Manifold/Option Parts Assembly

#### Individual SUP spacer
Setting individual SUP spacer on the manifold block enables individual SUP port for each 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
Setting individual EXH spacer on the manifold block enables individual EXH port for each 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-R-04-1</td>
<td>VVFS4000-R-04-2</td>
</tr>
</tbody>
</table>

#### SUP block disk
When supplying manifold with more than two different pressures, high and low, insert a block disk 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>AXT634-10A</td>
<td></td>
</tr>
</tbody>
</table>

#### EXH block disk
When valve exhaust affects the other stations on the circuit, insert EXH block disk 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>AXT634-11A</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>VVFS4000-20A-1</td>
<td>VVFS4000-20A-2</td>
</tr>
</tbody>
</table>

### Interface regulator
Interface regulator set on the manifold block can regulate pressure for each valve. (Refer to “Flow Characteristics” on page 1324 before operation.)

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
<th>Port regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>ARBF4050-00-P-1</td>
<td>ARBF4050-00-P-2</td>
<td>P port</td>
</tr>
<tr>
<td></td>
<td>ARBF4050-00-A-1</td>
<td>ARBF4050-00-A-2</td>
<td>A port</td>
</tr>
<tr>
<td></td>
<td>ARBF4050-00-B-1</td>
<td>ARBF4050-00-B-2</td>
<td>B port</td>
</tr>
</tbody>
</table>

### Interface regulator
Interface regulator set on the manifold block can regulate pressure for each valve. (Refer to “Flow Characteristics” on page 1324 before operation.)

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
<th>Port regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part no.</td>
<td>ARBF4050-00-P-1</td>
<td>ARBF4050-00-P-2</td>
<td>P port</td>
</tr>
<tr>
<td></td>
<td>ARBF4050-00-A-1</td>
<td>ARBF4050-00-A-2</td>
<td>A port</td>
</tr>
<tr>
<td></td>
<td>ARBF4050-00-B-1</td>
<td>ARBF4050-00-B-2</td>
<td>B port</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
- Valve exhaust noise dampening: 35 dB or more.
- Collects oil mist: collecting rate 99.9% or more
- Piping process reduced.

For details, refer to page 1289.

#### 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 1292.
5 Port Pilot Operated Solenoid Valve  
Rubber Seal, Plug-in/Non Plug-in  Series VFR4000

Manifold/Plug-in Type

With terminal block: VV5FR4-01T-Station 1-Port size

Bottom ported: VV5FR4-01T-Station 2-Port size

With multi-connector: VV5FR4-01CD-Station 1-Port size, VV5FR4-01CU-Station 1-Port size

Bottom ported: VV5FR4-01CD-Station 2-Port size

For wiring specifications, refer to page 1326.

Stations  

n: Station  

Formula  

L₁ = 43 x n + 70  
L₂ = 43 x n + 82

Max. 3

Light/Surge voltage suppressor

Manual override  

(Non-locking)

External pilot port  

(P, EA, EB port)

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Series VFR4000

Manifold/Plug-in Type

With D-sub connector: VV5FR4-01FD- Station 1- Port size, VV5FR4-01FU- Station 1- Port size

Bottom ported: VV5FR4-01CO- Station 2- Port size

For wiring specifications, refer to page 1326.

Manifold/Non Plug-in Type

VV5FR4-10- Station 1- Port size

Bottom ported: VV5FR4-10- Station 2- Port size

Applicable cable O.D. ø8 to ø10

Formula
L1 = 43 x n + 70
L2 = 43 x n + 82

For wiring specifications, refer to page 1326.
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in Series VFR4000

Manifold/Non Plug-in Type

VV5FR4-40-Station1-Port size

Manual override
(Non-locking)

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

Formula
L1 = 43 x n + 70
L2 = 43 x n + 82

E: Grommet terminal
With light/surge voltage suppressor

T: Conduit terminal
With light/surge voltage suppressor

D, Y: DIN terminal
With light/surge voltage suppressor
Series VFR4000

Manifold/Option Parts Assembly: Plug-in Type/Non Plug-in Type

Individual SUP spacer:
VVFS4000-P-03-1 (Plug-in type)
VVFS4000-P-03-2 (Non plug-in type)

Individual EXH spacer:
VVFS4000-R-04-1 (Plug-in type)
VVFS4000-R-04-2 (Non plug-in type)

SUP block disk: AXT634-10A
EXH block disk: AXT634-11A

Throttle valve spacer:
VVFS4000-20A-1 (Plug-in type)
VVFS4000-20A-2 (Non plug-in type)

Interface regulator/P port regulation:
ARBF4050-00-P-1 (Plug-in type)
ARBF4050-00-P-2 (Non plug-in type)

Interface regulator/A port regulation:
ARBF4050-00-A-1 (Plug-in type)
ARBF4050-00-A-2 (Non plug-in type)

Interface regulator/B port regulation:
ARBF4050-00-B-1 (Plug-in type)
ARBF4050-00-B-2 (Non plug-in type)

Note) Used with exclusive manifold block ( ): EXH block disk

Dimensions: FZ type dimensions of direct manual style are also the same.
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in Series VFR4000

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: VVFR4010(-Q)</th>
<th>Non plug-in type: VVFR4010(-Q)</th>
<th>Non plug-in type: VVFR4010(-Q)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiring</td>
<td>With terminal block</td>
<td>DIN terminal</td>
<td>Grommet, Grommet terminal, Condut terminal, DIN terminal</td>
</tr>
<tr>
<td></td>
<td>With multi-connector</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>With D-sub connector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applicable valve model</td>
<td>VFR4010-CF(-Q)</td>
<td>VFR4010-CF(-Q)</td>
<td>VFR4010-CF(-Q)</td>
</tr>
<tr>
<td>Porting specifications</td>
<td>A, B port</td>
<td>Side: 3/8, 1/2</td>
<td>Bottom: 3/8 (Option)</td>
</tr>
<tr>
<td></td>
<td>P port</td>
<td>Side: 3/8 EXH 1 1/2</td>
<td></td>
</tr>
<tr>
<td>Stations</td>
<td>2 to 10 stations (With multi-connector/D-sub connector: 2 to 8 stations)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applicable exhaust cleaners</td>
<td>AMC610-10 (Port size: R 1), AMC810-14 (Port size: R 11/2) (1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 1) Use "AMC810-14" when used with 5 or more stations or in high frequency. Exhaust cleaner "AMC610-10" and "AMC810-14" are not attached.

How to Order

Series VFR4000 Manifold

Base type/Electrical entry

- 01T: Plug-in type with terminal block
- 01C: Plug-in type with multi-connector
- 01F: Plug-in type with D-sub connector
- 10: Non plug-in type
- 40: Individual electrical entry

Connector mounting direction

- With connector
- Applicable base
- 01T, 10, 40
- 01C, 01F
- U side mounting
- D side mounting

Stations

- 02: 2 stations
- 10: 10 stations

How to Order Manifold Assembly

<Example> Plug-in type with terminal block (6 stations)

- VVFR4010T-061-03-CD 1 set (Manifold base part no.)
- VVFR4100-5FZ 3 sets (2 position single part no.)
- VVFR4200-5FZ 2 sets (2 position double part no.)
- VVFS4000-10A 1 set (Blanking plate assembly part no.)
- AMC610-10 1 set (Exhaust cleaner part no.)

Valve arrangement is counted from the D side.
When ordering, specify the part nos. in order from the 1st. station in the D side.
When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

⚠ Caution

When using an exhaust cleaner, mount it downwards.

Refer to Best Pneumatics No. 6 for Exhaust Cleaner details.
Series VFR4000

Manifold with Exhaust Cleaner: Plug-in Type/Non Plug-in Type

Plug-in type: VV5FR4-01T-[Station]-[Port size] - CB

Non plug-in type: VV5FR4-10-[Station]-[Port size] - CB

Formula: 
\[ L = 43 \times n + 70 \]

<table>
<thead>
<tr>
<th>Station</th>
<th>L1</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>156</td>
<td>199</td>
</tr>
<tr>
<td>3</td>
<td>192</td>
<td>224</td>
</tr>
<tr>
<td>4</td>
<td>224</td>
<td>260</td>
</tr>
<tr>
<td>5</td>
<td>254</td>
<td>290</td>
</tr>
<tr>
<td>6</td>
<td>285</td>
<td>321</td>
</tr>
<tr>
<td>7</td>
<td>316</td>
<td>352</td>
</tr>
<tr>
<td>8</td>
<td>347</td>
<td>383</td>
</tr>
<tr>
<td>9</td>
<td>378</td>
<td>414</td>
</tr>
<tr>
<td>10</td>
<td>409</td>
<td>445</td>
</tr>
</tbody>
</table>

Notes: AMC810

Manifold with Exhaust Cleaner: Plug-in Type/Non Plug-in Type

Plug-in type: VV5FR4-01T-[Station]-[Port size] - CB

Non plug-in type: VV5FR4-10-[Station]-[Port size] - CB

Formula: 
\[ L = 43 \times n + 70 \]

<table>
<thead>
<tr>
<th>Station</th>
<th>L1</th>
<th>L2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>156</td>
<td>199</td>
</tr>
<tr>
<td>3</td>
<td>192</td>
<td>224</td>
</tr>
<tr>
<td>4</td>
<td>224</td>
<td>260</td>
</tr>
<tr>
<td>5</td>
<td>254</td>
<td>290</td>
</tr>
<tr>
<td>6</td>
<td>285</td>
<td>321</td>
</tr>
<tr>
<td>7</td>
<td>316</td>
<td>352</td>
</tr>
<tr>
<td>8</td>
<td>347</td>
<td>383</td>
</tr>
<tr>
<td>9</td>
<td>378</td>
<td>414</td>
</tr>
<tr>
<td>10</td>
<td>409</td>
<td>445</td>
</tr>
</tbody>
</table>

Notes: AMC810
Manifold with Exhaust Cleaner: Non Plug-in Type

Non plug-in type: VV5FR4-40-Station 1-Port size-88

<table>
<thead>
<tr>
<th>Station</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>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

\[ L1 = 43 \times n + 70 \]

\[ L2 = 43 \times n + 80 \]
Series VFR4000

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
Air filter with auto-drain or manual drain must be mounted with the air filter at the bottom.

Manifold Specifications

<table>
<thead>
<tr>
<th>Manifold</th>
<th>Plug-in type: VVFS4000-01(-Q)</th>
<th>Non plug-in type: VVFS4000-10(-Q)</th>
<th>Non plug-in type: VVFS4000-40(-Q)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiring</td>
<td>With terminal block</td>
<td>DIN terminal</td>
<td>Grommet, Grommet terminal, Condut terminal, DIN terminal</td>
</tr>
<tr>
<td></td>
<td>With multi-connector</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>With D-sub connector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applicable valve model</td>
<td>VVFR4C00C-0F(-Q)</td>
<td>VVFR4C10C-LDN(-Q)</td>
<td>VVFR4C40C-LDN, VVFR4C60C-LDN</td>
</tr>
<tr>
<td></td>
<td>VVFR4C10C-DE</td>
<td>VVFR4C40C-LDN, VVFR4C60C-LDN</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VVFR4C10C-DT, VVFR4C40C-CD(-Q)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Porting specifications</td>
<td>A, B port</td>
<td>Common SUP, Common EXH</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P, EA, EB port</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stations</td>
<td>2 to 10 (With multi-connector/D-sub connector: 2 to 8) *</td>
<td>Including station of control unit</td>
<td></td>
</tr>
</tbody>
</table>

Control Unit Specifications

- Air filter (With auto-drain/With manual drain)
- Filtration degree: 5 μm
- Regulator
  - Set pressure (Outlet pressure): 0.05 to 0.85 MPa
  - Pressure switch
    - Set pressure range: OFF: 0.1 to 0.6 MPa
    - Differential: 0.08 MPa
    - Contact: 1a
    - Indicator light: LED (RED)
- Max. switch capacity: 2 VA, AC, 2 W DC
- Max. operating current: 24 VAC, DC or less: 50 mA, 48 VAC, DC: 40 mA, 100 VAC, DC: 20 mA
- Inside voltage drop: 4 V or less
- Air release valve (Single only)
- Operating pressure range: 0.2 to 0.9 MPa

Control Unit/Option

- Air release valve spacer
  - Pressure switch: IS1000P-2-1
  - Blanking plate: MP2-3
  - For filter regulator
  - For pressure switch: MP3-2
  - For air release valve: VVFS4000-24A-10
- Filter element: 11104-SB

Note 1) Combining valve "VFR41/-L50132" (single) and release valve spacer makes it possible to use this as an air release valve.
Note 2) Pressure switch cannot be mounted later on non plug-in type.
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in Series VFR4000

How to Order

<table>
<thead>
<tr>
<th>Base type/Electrical entry</th>
<th>Series VFR4000 Manifold</th>
</tr>
</thead>
<tbody>
<tr>
<td>01T</td>
<td>Plug-in type with terminal block</td>
</tr>
<tr>
<td>01C</td>
<td>Plug-in type with multi-connector</td>
</tr>
<tr>
<td>01F</td>
<td>Plug-in type with D-sub connector</td>
</tr>
<tr>
<td>10</td>
<td>Non plug-in type (Common entry)</td>
</tr>
<tr>
<td>40</td>
<td>Non plug-in type (Individual entry)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Connector mounting direction</th>
<th>Symbol</th>
<th>With connector</th>
<th>Applicable base</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>None</td>
<td>01T, 10, 40</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>D side mounting</td>
<td>01C, 01F</td>
</tr>
<tr>
<td></td>
<td>U</td>
<td>U side mounting</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stations</th>
<th>02</th>
<th>2 stations</th>
<th>...</th>
<th>...</th>
<th>10</th>
<th>10 stations</th>
</tr>
</thead>
</table>

Note: Base 01T/10/40: 2 to 10 stations
Base 01C/01F: 2 to 8 stations
Including stations of control unit.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Passage</th>
<th>Porting specifications (A, B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>P</td>
<td>EA, EB</td>
</tr>
<tr>
<td>2</td>
<td>Control</td>
<td>Common</td>
</tr>
<tr>
<td></td>
<td>Side</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bottom</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port size</th>
<th>Symbol</th>
<th>A, B</th>
<th>Passage</th>
<th>Porting specifications (A, B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>03</td>
<td>3/8</td>
<td>EA</td>
<td>EB</td>
</tr>
<tr>
<td>04</td>
<td>04</td>
<td>1/2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>M</td>
<td>Mixed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: For bottom ported: only 3/8

<table>
<thead>
<tr>
<th>Thread type</th>
<th>Symbol</th>
<th>C, E, F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NPT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NPTF</td>
<td></td>
</tr>
</tbody>
</table>

How to Order Manifold Assembly

Example: Plug-in type with terminal block

VV5FR4-01T-081-03-AP5 1 set (Manifold base part no.)
VV4100-5FZ 5 sets (Position single part no.)
VV4200-5FZ 2 sets (Position double part no.)

The asterisk denotes the symbol for assembly. Prefix it to the part nos. of the solenoid valve, etc.

Example: Non plug-in type

VV5FR4-10-061-03-A5 1 set (Manifold base part no.)
VV4110-5D 5 sets (Position single part no.)

The asterisk denotes the symbol for assembly. Prefix it to the part nos. of the solenoid valve, etc.

The 1st and 2nd station are used for control unit mounting.
When ordering, specify the part nos. in order from the 3rd station in the D side.
When entry of part numbers becomes complicated, specify on the manifold specification sheet.

Note: Control unit is D side mounting only.

CE-compliant

<table>
<thead>
<tr>
<th>Control unit type</th>
<th>Symbol</th>
<th>Nil</th>
<th>MP</th>
<th>AP</th>
<th>M</th>
<th>A</th>
<th>G</th>
<th>F</th>
<th>C</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air release valve</td>
<td>⋄ ⋄ ⋄ ⋄ ⋄ ⋄ ⋄ ⋄</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air filter regulator with manual drain</td>
<td>⋄ ⋄ ⋄</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air filter regulator with auto-drain</td>
<td>⋄ ⋄ ⋄</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure switch</td>
<td>⋄ ⋄ ⋄</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blanking plate (Air release valve)</td>
<td>⋄ ⋄ ⋄</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blanking plate (Filter regulator)</td>
<td>⋄ ⋄ ⋄</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blanking plate (Pressure switch)</td>
<td>⋄ ⋄ ⋄</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Required stations 2 stations

Note: Control unit is D side mounting only.

When ordering, specify the part nos. in order from the 3rd station in the D side.
When entry of part numbers becomes complicated, indicate on the manifold specification sheet.
**Series VFR4000**

**Manifold with Control Unit: Plug-in Type/Non Plug-in Type**

Plug-in type:

**VV5FR4-01T**-[Station]-1-[Port size]-AP Voltage of air release valve

Example for manifold

Non plug-in type:

**VV5FR4-10**-[Station]-1-[Port size]-AP Voltage of air release valve

Example for manifold

<table>
<thead>
<tr>
<th>Station</th>
<th>L1</th>
<th>L2</th>
<th>L3 (MP)</th>
<th>L3 (AP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>199</td>
<td>211</td>
<td>385.5</td>
<td>427</td>
</tr>
<tr>
<td>4</td>
<td>242</td>
<td>254</td>
<td>428.5</td>
<td>470</td>
</tr>
<tr>
<td>5</td>
<td>285</td>
<td>297</td>
<td>512.5</td>
<td>515</td>
</tr>
<tr>
<td>6</td>
<td>328</td>
<td>340</td>
<td>515.5</td>
<td>555</td>
</tr>
<tr>
<td>7</td>
<td>371</td>
<td>383</td>
<td>527.5</td>
<td>589</td>
</tr>
<tr>
<td>8</td>
<td>414</td>
<td>426</td>
<td>530.5</td>
<td>610.5</td>
</tr>
<tr>
<td>9</td>
<td>457</td>
<td>469</td>
<td>543.5</td>
<td>643.5</td>
</tr>
<tr>
<td>10</td>
<td>500</td>
<td>512</td>
<td>586.5</td>
<td>728</td>
</tr>
</tbody>
</table>

Formula:

- \( L_1 = 43 \times n + 70 \)
- \( L_2 = 43 \times n + 82 \)
- \( L_3 = 43 \times n + 256.5 \)
- \( L_3 = 43 \times n + 298 \)
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in Series VFR4000

Manifold with Control Unit: Non Plug-in Type

Non plug-in type: VV5FR4-40-Station1-Port size-AP

Voltage of air release valve

<table>
<thead>
<tr>
<th>Station</th>
<th>L1</th>
<th>L2</th>
<th>L3 (MP)</th>
<th>L3 (AP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>199</td>
<td>211</td>
<td>355</td>
<td>385.5</td>
</tr>
<tr>
<td>2</td>
<td>242</td>
<td>254</td>
<td>428.5</td>
<td>428.5</td>
</tr>
<tr>
<td>3</td>
<td>285</td>
<td>297</td>
<td>471.5</td>
<td>471.5</td>
</tr>
<tr>
<td>4</td>
<td>328</td>
<td>340</td>
<td>514.5</td>
<td>514.5</td>
</tr>
<tr>
<td>5</td>
<td>371</td>
<td>383</td>
<td>577.5</td>
<td>577.5</td>
</tr>
<tr>
<td>6</td>
<td>414</td>
<td>426</td>
<td>600.5</td>
<td>600.5</td>
</tr>
<tr>
<td>7</td>
<td>457</td>
<td>469</td>
<td>643.5</td>
<td>643.5</td>
</tr>
<tr>
<td>8</td>
<td>500</td>
<td>512</td>
<td>686.5</td>
<td>686.5</td>
</tr>
<tr>
<td>9</td>
<td>545</td>
<td>557</td>
<td>728.5</td>
<td>728.5</td>
</tr>
<tr>
<td>10</td>
<td>599</td>
<td>602</td>
<td>771.5</td>
<td>771.5</td>
</tr>
</tbody>
</table>

Formula:
- \( L_1 = 43 \times n + 70 \)
- \( L_2 = 43 \times n + 82 \)
- \( L_{MP} = 43 \times n + 256.5 \)
- \( L_{AP} = 43 \times n + 298 \)

Pressures:
- \( P \) port
- \( Po \) port
- \( Po \) port
- \( PE \) port
- \( EA \) port
- \( EB \) port
- \( FA \) port
- \( FB \) port
- \( SFA \) port
- \( SFB \) port

Pressure switch

D side

U side

Manual override (Non-locking)

Air release valve

Pitch

Stations

Series:
- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- SO700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7
**Series VFR4000**

**Manifold Base Construction: Plug-in Type/Non Plug-in Type**

<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</td>
<td>VVF4000-5-1A</td>
</tr>
<tr>
<td>2</td>
<td>Connection fitting B</td>
<td>Steel</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>VVF4000-7-1</td>
</tr>
<tr>
<td>5</td>
<td>Gasket</td>
<td>NBR</td>
<td>VVF4000-6</td>
</tr>
<tr>
<td>6</td>
<td>O-ring</td>
<td>NBR</td>
<td>AS568-011</td>
</tr>
<tr>
<td>7</td>
<td>O-ring</td>
<td>NBR</td>
<td>P-3</td>
</tr>
<tr>
<td>8</td>
<td>Terminal assembly</td>
<td>—</td>
<td>VFR4000-14-1A</td>
</tr>
<tr>
<td>9</td>
<td>Junction cover assembly</td>
<td>—</td>
<td>For 01T VVF4000-4A-Plastics</td>
</tr>
<tr>
<td>10</td>
<td>End plate (U side) assembly</td>
<td>—</td>
<td>VVF4000-7 (for end plate)</td>
</tr>
<tr>
<td>11</td>
<td>End plate (D side) assembly</td>
<td>—</td>
<td>VVF4000-4-1</td>
</tr>
<tr>
<td>12</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>VFR4000-19-1A-1</td>
<td>Manifold block, Terminal, Connection bracket, Gasket, O-ring, Receptacle assembly</td>
<td>Plug-in type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VFR4000-19-2A-1</td>
<td>Manifold block, Connection bracket, Gasket, O-ring,</td>
<td>Non plug-in type</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Receptacle assembly</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>End plate (U side) assembly</td>
<td>VVF4000-2A-1</td>
<td>End plate (U), Metal joint</td>
<td>Plug-in type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VVF4000-2A-2</td>
<td>End plate (U), Metal joint</td>
<td>Non plug-in type</td>
</tr>
<tr>
<td>12</td>
<td>End plate (D side) assembly</td>
<td>VVF4000-3A-1</td>
<td>End plate (D), Connection bracket, Gasket, O-ring,</td>
<td>Plug-in type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VVF4000-3A-2</td>
<td>Receptacle assembly</td>
<td>Non plug-in type</td>
</tr>
</tbody>
</table>

Note) Manifold Base/Construction: Plug-in type with terminal block.

Note) For side ported

* Contact SMC for CE-compliant products.
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in

Series VFR5000

JIS Symbol

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>Flow characteristics (1)</th>
<th>Max. operating cycle (Hz)</th>
<th>Response time (ms)</th>
<th>Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of actuation</td>
<td></td>
<td>1 → 4/2 (P → A/B)</td>
<td>4/2 → 5/3 (A/B → EA/EB)</td>
<td>C (dm³/s·bar)</td>
<td>b</td>
</tr>
<tr>
<td>Single</td>
<td>Plug-in</td>
<td>VFR500</td>
<td>VFR510</td>
<td>2 position single 0 to 0.9 MPa</td>
<td>3 position 0.15 to 0.9 MPa</td>
</tr>
<tr>
<td></td>
<td>Non plug-in</td>
<td>VFR520</td>
<td>VFR521</td>
<td>2 position single 0.2 to 0.9 MPa</td>
<td>2 position double 0.1 to 0.9 MPa</td>
</tr>
<tr>
<td></td>
<td>Closed center</td>
<td>VFR530</td>
<td>VFR531</td>
<td>2 position single 0.2 to 0.9 MPa</td>
<td>2 position double 0.1 to 0.9 MPa</td>
</tr>
<tr>
<td></td>
<td>Exhaust center</td>
<td>VFR540</td>
<td>VFR541</td>
<td>2 position single 0.2 to 0.9 MPa</td>
<td>2 position double 0.1 to 0.9 MPa</td>
</tr>
<tr>
<td></td>
<td>Pressure center</td>
<td>VFR550</td>
<td>VFR551</td>
<td>2 position single 0.2 to 0.9 MPa</td>
<td>2 position double 0.1 to 0.9 MPa</td>
</tr>
</tbody>
</table>

Note 1) [ ] Denotes the normal position.
Note 2) Min. operating frequency is once in 30 days.
Note 3) Based on dynamic performance test, JIS B 8375-1981. (Coil temperature: 20°C, at rated voltage, without surge voltage suppressor)
Note 4) For VFR5000-090-DF2-06, [ ] VFR5000-100-DF2-06

Standard Specifications

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating pressure range</td>
<td>2 position single 0.2 to 0.9 MPa</td>
</tr>
<tr>
<td>2 position double 0.1 to 0.9 MPa</td>
<td></td>
</tr>
<tr>
<td>Environment</td>
<td>Non-lube (lubrication)</td>
</tr>
<tr>
<td>Temperature</td>
<td>Unrestricted</td>
</tr>
<tr>
<td>Fluid</td>
<td>300/500/500 [2]</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Dustproof</td>
</tr>
<tr>
<td>Coil voltage</td>
<td>100, 200 VAC (50/60 Hz), 24 VDC</td>
</tr>
<tr>
<td>Voltage fluctuation</td>
<td>75 to 95% of rated voltage</td>
</tr>
<tr>
<td>Apparent power (AC)</td>
<td>Inrush 5.6 VA/50 Hz, 5.0 VA/60 Hz</td>
</tr>
<tr>
<td>Power consumption (DC)</td>
<td>Holding 3.4 VA/50 Hz, 2.3 VA/60 Hz</td>
</tr>
<tr>
<td>Electrical entry</td>
<td>Plug-in type</td>
</tr>
<tr>
<td>Option Specifications</td>
<td>External Pilot (Note)</td>
</tr>
<tr>
<td>Pilot type</td>
<td>Direct manual override</td>
</tr>
<tr>
<td>Manual override</td>
<td>Non-locking push type A (Extended), Locking type B (Tool required), Locking type C (Lever)</td>
</tr>
<tr>
<td>Main valve</td>
<td>Bottom ported</td>
</tr>
<tr>
<td>Pilot valve</td>
<td>With light/surge voltage suppressor</td>
</tr>
</tbody>
</table>

Note 1) Use turbine oil Class 1 (ISO VG32), if lubricated. Note 3) At rated voltage
Note 2) 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.
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)
Series VFR5000

How to Order

Plug-in VFR5

Non plug-in VFR5

Symbol

Porting specifications

Port size

Thread type

Electrical entry

Option

None

With light/surge voltage suppressor

Pilot valve, Manual override

Body option

Standard

Direct manual override

CE-compliant

Nil

—

Q CE-compliant

Option

Option

Option

Option

Option

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

Electrical entry

A: DIN terminal

B: Non-locking push type A (Extended)

C: Locking type C (Lever)

CE-compliant

Nil

Q CE-compliant

How to Order Pilot Valve Assembly

SF4

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

Manual override

Nil

A* Non-locking push type A (Extended)

B* Locking type B (Tool required)

C* Locking type C (Lever)

CE-compliant

Nil

Q CE-compliant

Option

Option
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in Series VFR5000

Cylinder Speed Chart

<table>
<thead>
<tr>
<th>Series</th>
<th>Average speed (mm/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFR5100-06</td>
<td></td>
</tr>
<tr>
<td>Series CS1/CS2</td>
<td>Pressure 0.5 MPa</td>
</tr>
<tr>
<td>Load factor 50%</td>
<td>Stroke 300 mm</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.

Conditions

<table>
<thead>
<tr>
<th>Series</th>
<th>Tube x Length</th>
<th>Speed controller</th>
<th>Silencer</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFR510-06</td>
<td>SGP20A x 1 m</td>
<td>AS500-06</td>
<td>AN500-06</td>
</tr>
</tbody>
</table>

How to Order Sub-plate Assembly

Pilot type:
- Nil: Internal pilot
- R: External pilot

Thread type:
- N: Rc
- NPT:
- T: NPTF

Piping port:
- 03
- 04
- 06

Note:
- Bottom ported is not available for external pilot.
- Mounting bolts and gaskets are not included.
Series VFR5000

Construction

2 position single

2 position double

3 position closed center/exhaust center/pressure center

Closed center: VFR53□0
Exhaust center: VFR54□0
Pressure center: VFR55□0

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 valve</td>
<td>Aluminum, NBR</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Adapter plate</td>
<td>Resin</td>
<td>Black</td>
</tr>
</tbody>
</table>

Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>End plate</td>
<td>Resin</td>
<td>Black</td>
</tr>
<tr>
<td>6</td>
<td>Junction cover</td>
<td>Resin</td>
<td>Black</td>
</tr>
<tr>
<td>7</td>
<td>Light cover</td>
<td>Resin</td>
<td></td>
</tr>
</tbody>
</table>

Replacement Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Gasket</td>
<td>NBR</td>
<td>AXT627-10-1</td>
</tr>
<tr>
<td>9</td>
<td>Hexagon socket head screw</td>
<td>Steel</td>
<td>AXT627-42-1 (M5 x 50)</td>
</tr>
<tr>
<td>10</td>
<td>Pilot valve assembly</td>
<td>—</td>
<td>Refer to &quot;How to Order Pilot Valve Assembly&quot; on page 1298.</td>
</tr>
</tbody>
</table>

This figure shows a closed center type.
Plug-in: 2 Position Single/Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position single: VFR510\textsuperscript{\textcircled{1}}-\textsuperscript{\textcircled{2}}F(Z)

2 position double: VFR520\textsuperscript{\textcircled{1}}-\textsuperscript{\textcircled{2}}F(Z)

3 position closed center: VFR530\textsuperscript{\textcircled{1}}-\textsuperscript{\textcircled{2}}F(Z)

3 position exhaust center: VFR540\textsuperscript{\textcircled{1}}-\textsuperscript{\textcircled{2}}F(Z)

3 position pressure center: VFR550\textsuperscript{\textcircled{1}}-\textsuperscript{\textcircled{2}}F(Z)

Other dimensions are the same as the single type.

\[ \text{[ ] = } \frac{3}{4} \]
**Series VFR5000**

**Plug-in: 2 Position Single/Double, 3 Position Closed Center/Exhaust Center/Pressure Center**

2 position single: VFR511\(\varnothing\)E, VFR511\(\varnothing\)D(Z)

2 position double: VFR521\(\varnothing\)E, VFR521\(\varnothing\)D(Z)

3 position closed center: VFR531\(\varnothing\)E, VFR531\(\varnothing\)D(Z)

3 position exhaust center: VFR541\(\varnothing\)E, VFR541\(\varnothing\)D(Z)

3 position pressure center: VFR551\(\varnothing\)E, VFR551\(\varnothing\)D(Z)

Other dimensions are the same as the single type.

\[ = \frac{3}{4} \]
**Series VFR5000 Manifold Specifications**

### Manifold Specifications

<table>
<thead>
<tr>
<th>Base model</th>
<th>Wiring</th>
<th>Porting specifications</th>
<th>Port size Rc</th>
<th>Stations</th>
<th>Applicable valve model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in type</td>
<td>VV5FR5-01□(-Q)</td>
<td>With terminal block</td>
<td>Side/Bottom</td>
<td>3/4</td>
<td>2 to 10</td>
</tr>
<tr>
<td></td>
<td>Non plug-in type</td>
<td>VV5FR5-10□(-Q)</td>
<td>Grommet terminal</td>
<td>3/4</td>
<td>2 to 10</td>
</tr>
</tbody>
</table>

- **Porting specifications**
  - A, B port
  - P, EA, EB
- **Stations**
  - VFR5□□□□□□□-□F(-Q): 2 to 8
  - VFR5□□□□□□□-□□□(-Q): 2 to 10

### How to Order Manifold Assembly

**Instruct by specifying the valves, blanking plate and manifold option parts assembly to be mounted on the manifold along with the manifold base model no.**

**Plug-in type: With terminal block**

- **Example** Plug-in type with terminal block: 6 stations

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

- **Example** Non plug-in type: 6 stations

**Valve arrangement is counted from the D side.**

- When ordering, specify the part nos. in order from the 1st. station in the D side.
- When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

**CE-compliant**

- Nil
- Q

**Thread type**

- nil
- F
- G
- N
- NPT
- T
- NPT

**For bottom ported:**

- 1/2 only.

---

**Series VFR5000 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.

**Example** Plug-in type with terminal block: 6 stations

**Non plug-in type**

- Master connection of power and solenoid valves.
- Quick wiring permits ease of installation.

**Example** Non plug-in type: 6 stations

**Valve arrangement is counted from the D side.**

- When ordering, specify the part nos. in order from the 1st. station in the D side.
- When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

**Series VFR5000 Manifold**

**Plug-in type with terminal block**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Passage</th>
<th>Porting applications (A, B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>Common</td>
<td>Side</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Bottom</td>
</tr>
</tbody>
</table>

**Series VFR5000 Manifold**

**Plug-in Type with multi-connector**

Refer to page 1326.
Series VFR5000

Plug-in Type: With D-sub Connector (For wiring specifications, refer to page 1326.)

- Wide range of interchangeability (D-sub connector (25P) conforming to MIL standard)
- Quick wiring permits easier installation.

**VV5FR5 - 01F**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Passage</th>
<th>Porting Indicators (A, B)</th>
<th>CE-compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td>04</td>
<td>P, EA, EB</td>
<td>Side Bottom</td>
<td>Nil</td>
</tr>
<tr>
<td>06</td>
<td>NPT</td>
<td>Side Bottom</td>
<td>Nil</td>
</tr>
<tr>
<td>08</td>
<td>M</td>
<td>Side Bottom</td>
<td>CE-compliant</td>
</tr>
</tbody>
</table>

- **Stations:**
  - D side: 2 stations
  - U side: 8 stations
  - Max: 8 stations

- **Thread type:**
  - Nil: Rc
  - CE-compliant: Q

- **Port size:**
  - 1/4, 3/8, 3/4

Non Plug-in Type: Grommet Terminal, DIN Terminal

- Wiring for every valve

**VV5FR5 - 10F**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Passage</th>
<th>Porting Indicators (A, B)</th>
<th>CE-compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td>04</td>
<td>P, EA, EB</td>
<td>Side Bottom</td>
<td>Nil</td>
</tr>
<tr>
<td>06</td>
<td>NPT</td>
<td>Side Bottom</td>
<td>Nil</td>
</tr>
<tr>
<td>08</td>
<td>M</td>
<td>Side Bottom</td>
<td>CE-compliant</td>
</tr>
</tbody>
</table>

- **Stations:**
  - D side: 2 stations
  - U side: 10 stations

- **Symbol:**
  - 04, 06, 08

- **Port size:**
  - 1/4, 3/8, 3/4

- **Thread type:**
  - Nil: Rc
  - CE-compliant: Q

Note) Manifold base is common for Series VFS5000. Terminal block is not required.
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in Series VFR5000

Manifold/Option Parts Assembly

**Individual SUP spacer**
Supply port can be located at each valve individually after individual SUP spacer is mounted on manifold block.

- **Body type**: Plug-in type, Non plug-in type
- **Part no.**: VVFS5000-P-04-1, VVFS5000-P-04-2

**Individual EXH spacer**
Exhaust port can be located at each valve individually after individual EXH spacer is mounted on manifold block. (Common EXH type)

- **Body type**: Plug-in type, Non plug-in type
- **Part no.**: VVFS5000-R-04-1, VVFS5000-R-04-2

**SUP block disk**
When 2 or more pressures (high and low) are supplied to one manifold, insert a disk between the stations which are supplied different pressures.

- **Body type**: Plug-in type, Non plug-in type
- **Part no.**: AXT628-12A

**EXH block disk**
Use exhaust blocks to eliminate back flow to other stations. Use supply disks to operate two pressures on the same manifold.

- **Body type**: Plug-in type, Non plug-in type
- **Part no.**: AXT512-14-1A

**Throttle valve spacer**
Mount interface speed control on manifold block. Cylinder speed can be controlled by metered out flow.

- **Body type**: Plug-in type, Non plug-in type
- **Part no.**: VVFS5000-20A-1, VVFS5000-20A-2

**Interface regulator**
When interface regulator is mounted on manifold block, regulation to that valve is possible. (Refer to “Flow Characteristics” on page 1324 before operation.)

- **Body type**: Plug-in type, Non plug-in type
- **Part no.**: ARBF5050-00-P-1, ARBF5050-00-P-2, ARBF5050-00-A-1, ARBF5050-00-A-2, ARBF5050-00-B-1, ARBF5050-00-B-2

**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.

- **Body type**: Plug-in type, Non plug-in type
- **Part no.**: VVFS5000-10A

Manifold Option

With exhaust cleaner
Plug-in type/Non plug-in type
- High noise reduction effect: 35 dB or more
- Drainage and mist are collected (99.9% or more)
- Piping work is reduced.

For details, refer to page 1308.
**Series VFR5000**

**Manifold: Plug-in Type/Non Plug-in Type**

**Plug-in type (With terminal block):**

**VV5FR5-01T-Stations 1-Bore size**

**Bottom ported:**

**VV5FR5-01T-Stations 2-Bore size**

Formula for manifold weight $M = 0.911n + 1.621$ (kg) $n$: Station

**Non plug-in type: VV5FR5-10-Stations 1-Bore size**

**Bottom ported:**

**VV5FR5-10-Stations 2-Port size**

**DIN terminal**

Applicable cable O.D.

$\phi 6.8$ to $\phi 10$

$G \ 1/2$

$4 \times 1/8''$ (PE port)

$6 \times 3/4''$ (PE port)

$2n \times 1/2, 3/4$ (A, B port)

Light/Surge voltage suppressor

(For DZ)

**Grommet with terminal**

External pilot port $v_B$

$4 \times 1/8''$ (PE port)

$6 \times 3/4''$ (PE, EA, EB port)

Formula for manifold weight $M = 0.811n + 1.231$ (kg) $n$: Stations

$[ ] = A, B$ port $3/4$

**Stations**

<table>
<thead>
<tr>
<th>Li</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>Li</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>$L_1 = 51 \times n + 92$</td>
</tr>
<tr>
<td>Li</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>$L_1 = 51 \times n + 110$</td>
</tr>
</tbody>
</table>

---

Note: The diagram includes several technical specifications and measurements related to the VFR5000 series manifold, including bore sizes, port sizes, and applicable cable diameters. The formulas for manifold weight and the stations are also included.
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in Series VFR5000

Manifold/Plug-in type: With Multi-connector/With D-sub connector

Plug-in type/With multi-connector: VV5FR5-01CD - Station 1 - Bore size, VV5FR5-01CU - Station 1 - Bore size

Formula for manifold weight \( M = 0.916n + 1.709 \) (kg)  
\( n \): Stations

For wiring specifications, refer to page 1326.

Formula for manifold weight \( M = 0.916n + 1.633 \) (kg)  
\( n \): Station

---

Bottom ported:
VV5FR5-01CD - Station 2 - Bore size

Formula for manifold weight

For wiring specifications, refer to page 1326.

---

Plug-in type/With D-sub connector: VV5FR5-01FD - Station 1 - Bore size, VV5FR5-01FU - Station 1 - Bore size

Light/Surge voltage suppressor

Bottom ported:
VV5FR5-01FU - Station 2 - Bore size

Formula for manifold weight

For wiring specifications, refer to page 1326.
Series VFR5000

Manifold with Exhaust Cleaner

- Protection of work environment
- Reduction of valve exhaust noise of 35 dB or more
- Drainage and mist are collected. (99.9% or more)
- Piping work is reduced.

Manifold Specifications

<table>
<thead>
<tr>
<th>Manifold</th>
<th>Plug-in type: VV5FR5-01T-(-Q)</th>
<th>Non plug-in type: VV5FR5-10T-(-Q)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiring</td>
<td>With terminal block</td>
<td>With terminal block</td>
</tr>
<tr>
<td></td>
<td>With multi-connector</td>
<td>With D-sub connector</td>
</tr>
<tr>
<td></td>
<td>With D-sub connector</td>
<td>DIN terminal</td>
</tr>
<tr>
<td></td>
<td>Grommet terminal</td>
<td>Grommet terminal</td>
</tr>
</tbody>
</table>

Applicable valve model: VFR5100-5FZ, VFR5000-10A

Porting specifications:
- A, B port: Side: ½, ⅔, Bottom: ½ (Option)
- P port: Side: ⅔, EXH: ⅔ ⅔

Stations: 2 to 10

Applicable exhaust cleaners: AMC810-14 (Connecting port R 1 ⅔)

Note 1) With multi connector, or with D-sub connector: 8 stations max.
Note 2) Exhaust cleaner: Not attached.

How to Order

Series VFR5000 Manifold

<table>
<thead>
<tr>
<th>Base type/Electrical entry</th>
<th>01T</th>
<th>01C</th>
<th>01F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
<td>01T</td>
<td>01C</td>
<td>01F</td>
</tr>
<tr>
<td>With connector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With applicable base</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Exhaust cleaner mounting direction:
- D side mounting
- U side mounting

Port size:
- P: ¾, ⅔, M: Mixed
- T: NPTF

How to Order Manifold Assembly

Instruct by specifying the valves and blanking plate to be mounted on the manifold along with the manifold base model no.

Example:
- Plug-in type with terminal block: 6 stations
  - VV5FR5-01T-061-04-CD: 1 set (Manifold part no.)
  - VV5S100-5FZ: 3 sets (2 position single part no.)
  - VV5S200-5FZ: 2 sets (2 position double part no.)
  - VV5S500-10A: 1 set (Blanking plate assembly part no.)
  - AMC810-14: 1 set (Exhaust cleaner part no.)

Example:
- Non plug-in type: 6 stations
  - VV5FR5-10-061-04-CU: 1 set (Manifold part no.)
  - VV5S110-5E: 3 sets (2 position single part no.)
  - VV5S210-5E: 2 sets (2 position double part no.)
  - VVFS5000-10A: 1 set (Blanking plate assembly part no.)
  - AMC810-14: 1 set (Exhaust cleaner part no.)

The asterisk denotes the symbol for assembly. Prefix it to the part nos. of the solenoid valve, etc.

Note: Valve arrangement is counted from the D side.
When ordering, specify the part nos. in order from the 1st. station in the D side.
When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

Caution

When using exhaust cleaner, mount it downwards.
Manifold with Exhaust Cleaner: Plug-in Type/Non Plug-in Type

Plug-in type: VV5FR5-01T

Non plug-in type: VV5FR5-10

Formula

\[ L_1 = 51 \times n + 92 \]

\[ L_2 = 51 \times n + 110 \]

n: Stations
## Series VFR5000

<table>
<thead>
<tr>
<th>Individual SUP spacer</th>
<th>Interface regulator/P port regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>VVFS5000-P-04-1 (Plug-in type)</td>
<td>ARBF5050-00-P-1 (Plug-in type)</td>
</tr>
<tr>
<td>VVFS5000-P-04-2 (Non plug-in type)</td>
<td>ARBF5050-00-P-2 (Non plug-in type)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Individual EXH spacer</th>
<th>Interface regulator/A port regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>VVFS5000-R-04-1 (Plug-in type)</td>
<td>ARBF5050-00-A-1 (Plug-in type)</td>
</tr>
<tr>
<td>VVFS5000-R-04-2 (Non plug-in type)</td>
<td>ARBF5050-00-A-2 (Non plug-in type)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUP block disk: AXT628-12A</th>
<th>Interface regulator/B port regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXH block disk: AXT512-14-1A</td>
<td>ARBF5050-00-B-1 (Plug-in type)</td>
</tr>
<tr>
<td></td>
<td>ARBF5050-00-B-2 (Non plug-in type)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Throttle valve spacer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VVFS5000-20A-1 (Plug-in type)</td>
<td></td>
</tr>
<tr>
<td>VVFS5000-20A-2 (Non plug-in type)</td>
<td></td>
</tr>
</tbody>
</table>
**Manifold Base Construction: Plug-in Type/Non Plug-in Type**

- **Replacement Parts**
  - **No.** | **Description** | **Material** | **Part no.** |
  - 1 | Connection fitting A | Steel plate | AXT628-6-1A |
  - 2 | Connection fitting B | Steel plate | AXT628-6-2 |
  - 3 | O-ring | NBR | A5568-006 |
  - 4 | O-ring | NBR | A5568-010 |
  - 5 | O-ring | NBR | A5568-013 |
  - 6 | O-ring | NBR | A5568-022 |
  - 7 | O-ring | NBR | A5568-026 |
  - 8 | Terminal block assembly | — | VFR5000-21-1A |
  - 9 | Junction cover assembly | For 01T | VVFS5000-4A |
  - 10 | Rubber plug | NBR | AXT336-9 |

- **When requiring replacement manifold stations, order replacement parts assembly no. 10: manifold block assembly part. For plug-in type: The manifold base with terminal stand (integrated with a junction cover) is required with the junction cover assembly.**

**Replacement Parts: Sub Assembly**

- **No.** | **Description** | **Assembly part no.** | **Component parts** | **Applicable manifold base** |
  - 10 | Manifold block assembly | VFR5000-20-1A | Manifold block 19, Metal joint 1, 2, Terminal block 10, O-ring 3, 4, 5, 6, 7, Receptacle assembly | Plug-in type |
  - 11 | End plate (U side) assembly | VVFS5000-2A-1 | End plate (U) 11, Metal joint 3, 2 | Non plug-in type |
  - 12 | End plate (D side) assembly | VVFS5000-3A-1 | End plate (D) 14, Metal joint 3, 2, O-ring 3, 4, 5, 6, 7 | Plug-in type |

+ Contact SMC for CE-compliant products.
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in

Series VFR6000

Standard Specifications

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating pressure range (2 position single/3 position)</td>
<td>0.2 to 0.9 MPa</td>
</tr>
<tr>
<td></td>
<td>0.1 to 0.9 MPa</td>
</tr>
<tr>
<td>Ambient and fluid temperature</td>
<td>–10 to 50°C (No freezing. Refer to page 5.)</td>
</tr>
<tr>
<td>Lubrication</td>
<td>Non-lube (1)</td>
</tr>
<tr>
<td>Manual override</td>
<td>Non-locking push type</td>
</tr>
<tr>
<td>Shock/Vibration resistance</td>
<td>300/50m/s² (2)</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Dustproof</td>
</tr>
<tr>
<td>Coil rated voltage</td>
<td>100, 200 VAC (50/60 Hz), 24 VDC</td>
</tr>
<tr>
<td>Allowable voltage fluctuation</td>
<td>–15 to –10% of rated voltage</td>
</tr>
<tr>
<td>Apparent power (AC) (3) Inrush</td>
<td>5.6 VA/50 Hz, 5.0 VA/60 H</td>
</tr>
<tr>
<td></td>
<td>3.4 VA/50 H, 2.3 VA/60 H</td>
</tr>
<tr>
<td>Power consumption (DC) (2)</td>
<td>1.8 W</td>
</tr>
</tbody>
</table>

Electrical entry
- Plug-in type
- Conduit terminal
- Non plug-in type
- Grommet terminal, DIN terminal

Option Specifications

Main valve manual override
- Direct manual override

Coil rated voltage
- 110 to 120, 220, 240 VAC 50/60 Hz
- 12 VDC

Option
- With light/surge voltage suppressor

Model

<table>
<thead>
<tr>
<th>Type of actuation</th>
<th>Model</th>
<th>Port size</th>
<th>Flow characteristics (1)</th>
<th>Max. operating cycle (Hz)</th>
<th>(3) Response time (ms)</th>
<th>(4) Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in Non plug-in</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>VFR610</td>
<td>¼ ½</td>
<td>0.12 0.15 9.6 2 100 or less</td>
<td>4.73 (4.56)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Double</td>
<td>VFR620</td>
<td>¼ ½</td>
<td>0.12 0.15 9.6 2 100 or less</td>
<td>4.79 (4.61)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closed center</td>
<td>VFR630</td>
<td>¼ ½</td>
<td>0.12 0.15 9.6 2 100 or less</td>
<td>4.72 (4.55)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust center</td>
<td>VFR640</td>
<td>¼ ½</td>
<td>0.12 0.15 9.6 2 100 or less</td>
<td>4.72 (4.55)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure center</td>
<td>VFR650</td>
<td>¼ ½</td>
<td>0.12 0.15 9.6 2 100 or less</td>
<td>4.72 (4.55)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of actuation</th>
<th>Model</th>
<th>Port size</th>
<th>Flow characteristics (1)</th>
<th>Max. operating cycle (Hz)</th>
<th>(3) Response time (ms)</th>
<th>(4) Mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in Non plug-in</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>VFR610</td>
<td>½ ½</td>
<td>0.12 0.15 9.6 2 100 or less</td>
<td>4.73 (4.56)</td>
<td></td>
<td></td>
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<tr>
<td>Double</td>
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<td>½ ½</td>
<td>0.12 0.15 9.6 2 100 or less</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Closed center</td>
<td>VFR630</td>
<td>½ ½</td>
<td>0.12 0.15 9.6 2 100 or less</td>
<td>4.72 (4.55)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust center</td>
<td>VFR640</td>
<td>½ ½</td>
<td>0.12 0.15 9.6 2 100 or less</td>
<td>4.72 (4.55)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure center</td>
<td>VFR650</td>
<td>½ ½</td>
<td>0.12 0.15 9.6 2 100 or less</td>
<td>4.72 (4.55)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Caution
When double solenoid is used, spool valve should be mounted horizontally.
If there are vibrations, spool valve should be mounted perpendicular to the vibration direction.

Note 1) Denotes the normal position.
Note 2) Min. operating frequency is once in 30 days.
Note 3) Based on dynamic performance test, JIS B 8375-1981. (Coil temperature: 20°C, at rated voltage, without surge voltage suppressor)
Note 4) For VFR6C00-FZ-06, ( ) VFR6C10-C0Z-06
### How to Order

#### Electrical entry

- **F**: Plug-in type, conduit type

#### Option

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

#### Port size

- **Nil**: Without sub-plate
- **06**: 3/4
- **10**: 1

#### CE-compliant

- **Nil**: —
- **Q**: CE-compliant

#### Electrical entry

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

#### Body option

- **Standard**: Direct manual override (optional)

#### Thread type

- **Nil**: Rc
- **F**: G
- **N**: NPT
- **T**: NPTF

#### Coils rated voltage

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100 VAC, 50/60 Hz</td>
</tr>
<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>
<tr>
<td>9</td>
<td>Other</td>
</tr>
</tbody>
</table>

#### How to Order Pilot Valve Assembly

- **SF4**: F - 22 -

#### Coil rated voltage

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100 VAC, 50/60 Hz</td>
</tr>
<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>
<tr>
<td>9</td>
<td>Other</td>
</tr>
</tbody>
</table>

* Option
**Series VFR6000**

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

### Cylinder Speed Chart

<table>
<thead>
<tr>
<th>Series</th>
<th>VFR6100-10</th>
<th>Average speed (mm/s)</th>
<th>Bore size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ø125</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ø140</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ø160</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ø180</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ø200</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ø250</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ø300</td>
</tr>
</tbody>
</table>

- Perpendicular, upward actuation
- Horizontal actuation

<table>
<thead>
<tr>
<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>Ø125</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ø140</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ø160</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ø180</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ø200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ø250</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ø300</td>
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<td></td>
<td></td>
<td></td>
<td></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 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</th>
<th>VFR6110-10</th>
<th>Tube x Length</th>
<th>Speed controller</th>
<th>Silencer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SGP25A x 1 m</td>
<td>AS600-10</td>
<td>AN600-10</td>
</tr>
</tbody>
</table>

### How to Order Sub-plate Assembly

**Plug-in** VFR6000-P-

**Non plug-in** VFS6000-S-

Note: • Not applicable for external pilot.
• Not applicable for bottom ported.
• Mounting bolt and gasket are not included.

![Thread type]

- Piping port (P, A, B, EA, EB port)

<table>
<thead>
<tr>
<th>Thread type</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPT</td>
</tr>
<tr>
<td>Rc</td>
</tr>
</tbody>
</table>

*Perpendicular, upward actuation*

*Horizontal actuation*
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in  **Series VFR6000**

**Construction**

2 position single

VFR61

2 position double

VFR62

3 position closed center/exhaust center/pressure center

Closed center: VFR63

Exhaust center: VFR64

Pressure center: VFR65

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 valve</td>
<td>Aluminum, NBR</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Adapter plate</td>
<td>Aluminum die-casted</td>
<td>Black</td>
</tr>
</tbody>
</table>

Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>End plate</td>
<td>Aluminum die-casted</td>
<td>Black</td>
</tr>
<tr>
<td>6</td>
<td>Junction cover</td>
<td>Resin</td>
<td>Black</td>
</tr>
<tr>
<td>7</td>
<td>Light cover</td>
<td>Resin</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Pilot valve cover</td>
<td>Resin</td>
<td>Black</td>
</tr>
</tbody>
</table>

Replacement Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Gasket</td>
<td>NBR</td>
<td>VFS6000-15</td>
</tr>
<tr>
<td>10</td>
<td>Hexagon socket head screw</td>
<td>Steel</td>
<td>M8 x 80</td>
</tr>
<tr>
<td>11</td>
<td>Pilot valve assembly</td>
<td>—</td>
<td>Refer to &quot;How to Order Pilot Valve Assembly&quot; on page 1313.</td>
</tr>
</tbody>
</table>

This figure shows a closed center type.
Series VFR6000

Plug-in: 2 Position Single/Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position single: VFR610\(\square\)\(\text{F(Z)}\)

![Diagram of VFR610 with dimensions and features]

2 position double: VFR620\(\square\)\(\text{F(Z)}\)

3 position closed center: VFR630\(\square\)\(\text{F(Z)}\)

3 position exhaust center: VFR640\(\square\)\(\text{F(Z)}\)

3 position pressure center: VFR650\(\square\)\(\text{F(Z)}\)

- Other dimensions are the same as the single type.
5 Port Pilot Operated Solenoid Valve
Rubber Seal, Plug-in/Non Plug-in Series VFR6000

Non Plug-in: 2 Position Single/Double, 3 Position Closed Center/Exhaust Center/Pressure Center

2 position single: VFR611\(^{+}E\), VFR611\(^{-}D(Z)\)

2 position double: VFR621\(^{+}E\), VFR621\(^{-}D(Z)\) 3 position closed center: VFR631\(^{+}E\), VFR631\(^{-}D(Z)\)
3 position exhaust center: VFR641\(^{+}E\), VFR641\(^{-}D(Z)\)
3 position pressure center: VFR651\(^{+}E\), VFR651\(^{-}D(Z)\)

Other dimensions are the same as the single type.

SMC
Refer to the standard product for product specifications, dimensions and model selection procedures.
# 5 Port Pilot Operated Solenoid Valve

**Series VFR3000**

## How to Order

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

- **Piping (P, A, B, EA, EB port)**
  - Nil: Side ported
  - B*: Bottom ported
  - * Option

- **Port size (P, A, B, EA, EB port)**
  - Nil: Without sub-plate
  - 02: 1/4
  - 03: 3/8
- * For bottom ported: 1/4

- **Body option**
  - Nil: Standard

- **Symbol**
  - Conforming to CSA standard

- **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

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

- **Thread type**
  - Nil: Rc
  - N: NPT
  - T: NPTF

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

- **Individual electrical entry**
  - Z: With light/surge voltage suppressor

- **Option**
  - Nil: None

Refer to the standard product for product specifications, dimensions and model selection procedures.
## 5 Port Pilot Operated Solenoid Valve
Rubber Seal, Non Plug-in

**Series VFR4000**

### How to Order

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>Non plug-in</td>
</tr>
</tbody>
</table>

| 4      | VFR4        |
| 0      |             |
| 1      | D           |
| 03     |             |

### Conforming to CSA standard

### Piping (P, A, B, EA, EB port)
- Side ported
- Bottom ported
- Option: Bottom ported is not available for external pilot.

### Port size (P, A, B port)
- Nil: Without sub-plate
- 03: 3/8
- 04: 1/2

### Individual electrical entry

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>External pilot</td>
</tr>
</tbody>
</table>

### Coil rated voltage

<table>
<thead>
<tr>
<th>Position</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100 VAC, 50/60 Hz</td>
</tr>
<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>

### Pilot type
- Nil: Non-locking push type
- R: External pilot

### Body option
- 0: Standard
- 1*: Direct manual override

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

### Thread type
- Nil: Flc
- N: NPT
- T: NPTF
- F: G

### Electrical entry
- D: DIN terminal

### Electrical entry
- Nil: None
- Z: With light/surge voltage suppressor

---

⚠️ Refer to the standard product for product specifications, dimensions and model selection procedures.
**Series VFR2000/3000/4000/5000/6000**

**Specific Product Precautions 1**

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions Instructions and pages 3 to 7 for 3/4/5 Port Solenoid Valve Precautions.

---

**Caution**

**Lead Wire Connection**

**Plug-in type (With terminal block)**

**Series VFR2000/3000/4000**

- If you remove the junction cover ① on the sub-plate, you will see the plug-in terminal block ② attached to the inside of sub-plate.

- The following markings are on the terminal block. Connect with corresponding power side.

  - Although “A–”, “B+” and “B–” marks are indicated, the following markings are on the terminal block.
  
  - Terminal block assembly can be used as “+” and “–” common regardless of markings. Do not remove jumper bar because it is used for common connection.
  
  - Applicable terminal: 1.25-4, 1.25-4M

**Series VFR6000**

- If you remove the junction cover ① on the sub-plate, you will see the plug-in terminal block ② attached to the inside of sub-plate.

- Terminal block assembly is wired like the following figure. Connect it to each power supply side.

**Series VFR5000**

- Remove junction cover for sub-plate ①, depress levers ② of terminal block assembly ③, pull out terminal block assembly.

- Terminal block assembly is marked as below. Connect it to power supply side.

**Series VFR2000**

**Non plug-in type**

**Series VFR3000/4000 (VFR3□□□□□0)**

- Male pin terminal of DIN terminal block of solenoid valves are wired as shown below. Connect to corresponding terminal on the connector.

- Can be used as either “+COM” or “–COM”.

<table>
<thead>
<tr>
<th>Model</th>
<th>Position</th>
<th>Left</th>
<th>Center</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFR610</td>
<td>A side</td>
<td>COM</td>
<td>B side</td>
<td></td>
</tr>
<tr>
<td>VFR620</td>
<td>A side</td>
<td>COM</td>
<td>B side</td>
<td>B side</td>
</tr>
<tr>
<td>VFR400</td>
<td>A side</td>
<td>COM</td>
<td>B side</td>
<td>B side</td>
</tr>
</tbody>
</table>

**Series VFR3000/4000/5000/6000**

(DIN terminal block type)

- Male pin terminal of DIN terminal block of solenoid valves are wired as shown below. Connect to corresponding terminal on the connector.

- Can be used as either “+COM” or “–COM”.

- Applicable cable O.D.
  - Type T: ø6 to ø8 mm
  - Type E: ø2.3 to ø2.8 mm
  - Type D: ø6 to ø8 mm

- Applicable crimp terminal
  - Type E, T: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S
  - (Round shape or Y shape crimp terminal cannot be used for Type D.)

**Surge voltage suppressor**

- Type E, T, D, Y. In the case of DIN terminal block and terminal block, there is no polarity of positive [+], and negative [–]. Connect no. 1 and no. 2 terminals with corresponding power side.

- With DIN terminal block

- With terminal block

**Terminal block type**

- Remove cover ① over terminal block ② attached to the inside of body. Connect with corresponding power side. For a style with light and surge voltage suppressor substrate, pull out the light and surge voltage suppressor substrate ③ and then connect them.

- Applicable terminal
  - Type VFR3000: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S
  - Type VFR4000: 1.25-3.5M, 1.25Y-3L, 1.25Y-3M
  - Type VFR5000/6000: 1.25-3.5M, 1.25-3L, 1.25-3M
**Series VFR2000/3000/4000/5000/6000**

**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.

---

### Attaching and Detaching Connectors

1. To attach a connector, hold the lever and connector unit between your fingers and insert straight onto the pins of the solenoid valve so that the lever’s pawl is pushed into the groove and locks.
2. To detach a connector, remove the pawl from the groove by pushing the lever downward with your thumb, and pull the connector straight out.

### Attaching and Detaching Lead Wires with Sockets

Peel 3.2 to 3.7 mm of the tip of lead wire, enter the core wires neatly into a socket and crimp it with a special crimp tool. Be careful so that the cover of core wires does not enter into the crimping part. To detach a socket from a connector, pull out the lead wire while pressing the socket’s hook with a stick having a thin tip (approx. 1 mm). If the socket will be used again, first spread the hook outward.

### Lead Wire Color

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Lead Wire Color</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Without lead wire only</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Blue (2 pcs.)</td>
<td>For 100 VAC</td>
</tr>
<tr>
<td>2</td>
<td>Red (2 pcs.)</td>
<td>For 200 V AC</td>
</tr>
<tr>
<td>3</td>
<td>Gray (2 pcs.)</td>
<td>Other VAC</td>
</tr>
<tr>
<td>4</td>
<td>Red: + Black: –</td>
<td>For DC</td>
</tr>
</tbody>
</table>

### Plug Connector Lead Wire Length

Standard length is 300 mm, but the following lengths are also available.

#### How to Order Connector Assembly

DXT170-80-A-1

---

### Attaching and Detaching Lead Wires with Sockets

#### How to Order

Include the connector assembly part number together with the part number for the plug connector’s solenoid valve without a connector.

**Example:** For lead wire length 2000 mm

- VFR2210-SMO-02 3 pcs.
- DXT170-80-4A-20 6 pcs.
Series VFR2000/3000/4000/5000/6000
Specific Product Precautions 3

Caution

Plugging one of the cylinder ports (A or B) enables use as a normally closed (N.C.) or normally open (N.O.) 3 port valve. It is convenient when 3 port valve is needed on a manifold, etc., but it can’t be used in special applications such as using as a non-leakage valve. Use it with the exhaust port leaving open.

How to Exchange Solenoid Valves, Pilot Valve Assemblies

How to exchange solenoid valves
• Loose set screw and take solenoid valve out vertically, otherwise it may cause damage to the solenoid valve. Never remove valve at an angle.
• When mounting solenoid valve on to the base, plug pin assembly (base-side) into receptacle assembly (body-side) vertically.

How to Exchange Pilot Valve Assemblies
• Possible to exchange pilot valve assemblies like the following figures. Note) Do not change the rated voltage.

Change Direction of DIN Connector/Cable Entry

• Unscrew retaining screw, pull off outer cover, rotate connector block through 180°, Replace cover and tighten screw.

How to Calculate the Flow Rate

For obtaining the flow rate, refer to front matter 44 to 47.

Tightening Torque for Mounting Bolt

<table>
<thead>
<tr>
<th>Model</th>
<th>Thread</th>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFR2000</td>
<td>M3 (2 pcs.)</td>
<td>0.6 N·m</td>
</tr>
<tr>
<td>VFR3000</td>
<td>M3 (3 pcs.)</td>
<td>0.9 N·m</td>
</tr>
<tr>
<td>VFR4000</td>
<td>M3 (3 pcs.)</td>
<td>1.1 N·m</td>
</tr>
<tr>
<td>VFR5000</td>
<td>M4 (4 pcs.)</td>
<td>1.4 N·m</td>
</tr>
<tr>
<td>VFR6000</td>
<td>M5 (4 pcs.)</td>
<td>2.8 N·m</td>
</tr>
<tr>
<td></td>
<td>M8 (4 pcs.)</td>
<td>16 N·m</td>
</tr>
</tbody>
</table>

Note) For more information about the procedure, refer to the instruction manual.
Series VFR2000/3000/4000/5000/6000
Specific Product Precautions

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.

**Interface Regulator**

**Caution**

**Specifications**

<table>
<thead>
<tr>
<th>Interface regulator</th>
<th>ARBF2000</th>
<th>ARBF3050</th>
<th>ARBF4050</th>
<th>ARBF5050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable solenoid valve series</td>
<td>VFR2000</td>
<td>VFR3000</td>
<td>VFR4000</td>
<td>VFR5000</td>
</tr>
<tr>
<td>Regulating port</td>
<td>P</td>
<td>A</td>
<td>B</td>
<td>P</td>
</tr>
<tr>
<td>Maximum operating pressure</td>
<td>1.0 MPa (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set pressure range</td>
<td>0.25 to 0.83 MPa</td>
<td>0.1 to 0.83 MPa (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient and fluid temperature</td>
<td>–5 to 60°C (No freezing) (3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port size for connection of pressure gauge</td>
<td>M5 x 0.8</td>
<td>Rc 1/8</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>P → A</td>
<td>5.5</td>
<td>21</td>
<td>18.5</td>
</tr>
<tr>
<td>S at P₁ = 0.7 MPa/P₂ = 0.5 MPa</td>
<td>P → B</td>
<td>5.1</td>
<td>18.5</td>
<td>22</td>
</tr>
<tr>
<td>Effective area at exhaust side (mm²)</td>
<td>A → EA</td>
<td>12</td>
<td>40</td>
<td>55</td>
</tr>
<tr>
<td>S at P₂ = 0.5 MPa</td>
<td>B → EB</td>
<td>11</td>
<td>36</td>
<td>45</td>
</tr>
</tbody>
</table>

**Note 1)** Maximum operating pressure of solenoid valve is 0.9 MPa.
**Note 2)** Set the pressure within operating pressure range of solenoid valve.
**Note 3)** Solenoid valve: Max. 50°C
**Note 4)** Synthesized effective area with 2 position.
**Note 5)** 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 interface regulator, use the ARBF3000, ARBF4000, or the ARBF5000 model.
- To combine a reverse pressure valve and an interface regulator, use the ARBF3000, ARBF4000, or the ARBF5000 model. The P port pressure reduction cannot be used.
- When combining a double check valve and an interface regulator, use a manifold or subplate 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)** (Condition: Inlet pressure 0.7 MPa when 2 position solenoid valve is mounted.)

**JIS Symbol**

- P port regulation
- A port regulation
- B port regulation

**ARBF2000-00-P**

**ARBF3050-00-P**

**ARBF4050-00-P**

**ARBF5050-00-P**
### Lead Wire Connection

⚠️ **Caution**

#### Type 01T with Terminal Block

**Series VFR2000**

- 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. Terminal block wiring specifications is in accordance with COM.

<table>
<thead>
<tr>
<th>Model</th>
<th>Terminal Block Marking</th>
<th>A</th>
<th>B+</th>
<th>B–</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFR2100</td>
<td>A side</td>
<td>COM</td>
<td>B side</td>
<td></td>
</tr>
<tr>
<td>VFR2200</td>
<td>A side</td>
<td>COM</td>
<td>B side</td>
<td></td>
</tr>
</tbody>
</table>

- Applicable terminal: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S
- Although “A–”, “B+” and “B–” marks are indicated on the terminal block, VFR2000 can be used as either “+COM” or “–COM”.

**Series VFR4000**

<table>
<thead>
<tr>
<th>Model</th>
<th>Terminal Block Marking</th>
<th>A</th>
<th>B+</th>
<th>B–</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFR4100</td>
<td>A side</td>
<td>COM</td>
<td>B side</td>
<td></td>
</tr>
<tr>
<td>VFR4200</td>
<td>A side</td>
<td>COM</td>
<td>B side</td>
<td></td>
</tr>
<tr>
<td>VFR4 00</td>
<td>A side</td>
<td>COM</td>
<td>B side</td>
<td></td>
</tr>
</tbody>
</table>

- Applicable terminal: 1.25-3.5M, 1.25Y-3L, 1.25-3M
- Although “A–”, “B+” and “B–” marks are indicated on the terminal block, VFR4000 can be used as either “+COM” or “–COM”.

**Series VFR5000**

<table>
<thead>
<tr>
<th>Model</th>
<th>Terminal Block Marking</th>
<th>A</th>
<th>B+</th>
<th>B–</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFR5100</td>
<td>A side</td>
<td>COM</td>
<td>B side</td>
<td></td>
</tr>
<tr>
<td>VFR5200</td>
<td>A side</td>
<td>COM</td>
<td>B side</td>
<td></td>
</tr>
<tr>
<td>VFR5 00</td>
<td>A side</td>
<td>COM</td>
<td>B side</td>
<td></td>
</tr>
</tbody>
</table>

- Applicable terminal: 1.25-3.5M, 1.25Y-3L, 1.25-3M
- Although “A–”, “B+” and “B–” marks are indicated on the terminal block, VFR5000 can be used as either “+COM” or “–COM”.

**Series VFR3000**

<table>
<thead>
<tr>
<th>Model</th>
<th>Terminal Block Marking</th>
<th>A</th>
<th>COM+</th>
<th>B–</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFR3100</td>
<td>A side</td>
<td>COM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VFR3200</td>
<td>A side</td>
<td>COM</td>
<td>B side</td>
<td></td>
</tr>
<tr>
<td>VFR3 00</td>
<td>A side</td>
<td>COM</td>
<td>B side</td>
<td></td>
</tr>
</tbody>
</table>

- Applicable terminal: 1.25-3.5M, 1.25Y-3L, 1.25-3M
- Although “A–”, “COM+” and “B–” marks are indicated on the terminal block, VFR3000 can be used as either “+COM” or “–COM”.

---

**Caution**

Wiring area Markings

---

---
Series VFR2000/3000/4000/5000/6000 Specific Product Precautions 6

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**

**Lead Wire Connection / Manifold/Plug-in Type**

### Type 01C Circular Connector

**Series VFR2000/3000/4000/5000**
- When multi-connector is used, mass-termination between power supply side and solenoid valve can be done. This saves the wiring connection labor.
- Wire connection specifications
  - Lead wire for both solenoid A and B sides in manifold are connected to connector terminal as COM specifications.
  - Multi-connector is used, mass-termination between internal wiring

#### 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>VVFS2000-30A-1</td>
<td>1.5 m</td>
<td>Plug 206837-1 1 pc.</td>
</tr>
<tr>
<td>VVFS2000-30A-2</td>
<td>3 m</td>
<td>Cable clamp 206138-1 1 pc.</td>
</tr>
<tr>
<td>VVFS2000-30A-3</td>
<td>5 m</td>
<td>Socket 66101-2 24 pcs.</td>
</tr>
<tr>
<td>VVFS2000-30A-4</td>
<td>7 m</td>
<td>Cable VCTF 24 cores x 0.75 mm²</td>
</tr>
<tr>
<td>VVFS2000-30A-5</td>
<td>10 m</td>
<td>Made by Tyco Electronics AMP K.K.</td>
</tr>
<tr>
<td>VVFS2000-30A-6</td>
<td>15 m</td>
<td></td>
</tr>
<tr>
<td>VVFS2000-30A-7</td>
<td>20 m</td>
<td></td>
</tr>
</tbody>
</table>

* Option

#### 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>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead wire color</td>
<td>Red</td>
<td>Blue</td>
<td>Black</td>
<td>White</td>
<td>Pink</td>
<td>Yellow</td>
<td>Red</td>
<td>Blue</td>
<td>Black</td>
<td>White</td>
<td>Pink</td>
<td>Yellow</td>
<td></td>
</tr>
<tr>
<td>Dot 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>
<td>Yes</td>
</tr>
</tbody>
</table>

### Type 01F D-sub Connector

**Series VFR2000/3000/4000/5000**
- MIL standard type D connector (Terminal: 25 pins) has wide exchangeability and saves wiring labor.
- Wire connection specifications
  - Lead wire for both solenoid A and B sides in manifold are connected to connector terminal as COM specifications.

#### 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>VVZS3000-21A-1</td>
<td>1.5 m</td>
<td>Plug MIL standard type D connector</td>
</tr>
<tr>
<td>VVZS3000-21A-2</td>
<td>3 m</td>
<td>Number of terminals: 25 pins</td>
</tr>
<tr>
<td>VVZS3000-21A-3</td>
<td>5 m</td>
<td>Cable: 25 cores x 0.3 mm²</td>
</tr>
<tr>
<td>VVZS3000-21A-4</td>
<td>8 m</td>
<td></td>
</tr>
<tr>
<td>VVZS3000-21A-5</td>
<td>10 m</td>
<td></td>
</tr>
<tr>
<td>VVZS3000-21A-6</td>
<td>15 m</td>
<td></td>
</tr>
<tr>
<td>VVZS3000-21A-7</td>
<td>30 m</td>
<td></td>
</tr>
<tr>
<td>VVZS3000-21A-8</td>
<td>20 m</td>
<td></td>
</tr>
</tbody>
</table>

* Option

#### Cable Color List of Each Terminal No.

| Terminal no. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
|--------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Dot marking | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Note 1) Maximum number is 8 stations. Note 2) It is used as +COM and –COM. Note 3) Station numbers are started from D side although connector is mounted.
4 Way • 5 Port / Solenoid/Pilot Operated

**NVFR Series**

Rubber Seal Models 2000/3000/4000

Large Flow Capacity - Cv 0.9 ~ 3.7
Low Power Consumption
Block Type Manifold
Plug-in and Non Plug-in Styles
Wide Variety of Options and Accessories
5 Port Pilot Type/Rubber Seal Series NVFR2000
Plug-in Type, Non Plug-in Type

Model

<table>
<thead>
<tr>
<th>Position/No. of solenoid</th>
<th>Type</th>
<th>Port size (NPTF)</th>
<th>Cv factor</th>
<th>Max. Operating cycle CPM</th>
<th>Response time (ms)</th>
<th>Weight lbs (kgf)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Plug-in</td>
<td>Non Plug-in</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 position</td>
<td>Single</td>
<td>NVFR2100</td>
<td>1/8</td>
<td>0.9</td>
<td>300</td>
<td>20 or less</td>
</tr>
<tr>
<td></td>
<td>Single</td>
<td>NVFR2110</td>
<td>1/4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Double</td>
<td>NVFR2200</td>
<td>1/8</td>
<td>0.9</td>
<td>300</td>
<td>20 or less</td>
</tr>
<tr>
<td></td>
<td>Double</td>
<td>NVFR2210</td>
<td>1/4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 position</td>
<td>Closed</td>
<td>NVFR2300</td>
<td>1/8</td>
<td>0.7</td>
<td>180</td>
<td>30 or less</td>
</tr>
<tr>
<td></td>
<td>Closed</td>
<td>NVFR2310</td>
<td>1/4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exhaust</td>
<td>NVFR2400</td>
<td>1/8</td>
<td>0.7</td>
<td>180</td>
<td>30 or less</td>
</tr>
<tr>
<td></td>
<td>Exhaust</td>
<td>NVFR2410</td>
<td>1/4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pressure</td>
<td>NVFR2500</td>
<td>1/8</td>
<td>0.7</td>
<td>180</td>
<td>30 or less</td>
</tr>
<tr>
<td></td>
<td>Pressure</td>
<td>NVFR2510</td>
<td>1/4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* In case of NVFR2000-OFZ-01T
† Special Order

Optional Specifications*

<table>
<thead>
<tr>
<th>Pilot type</th>
<th>Note</th>
<th>External pilot type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual</td>
<td>Operator</td>
<td>Non-locking push type (extended), Lock type (tool), Lock type (lever)</td>
</tr>
<tr>
<td>Voltage</td>
<td>AC</td>
<td>100V±5%±5 Hz, 200V±5%±5 Hz</td>
</tr>
<tr>
<td></td>
<td>DC</td>
<td>6V, 48V, 100V</td>
</tr>
<tr>
<td>Porting</td>
<td>Bottom ported subplate</td>
<td></td>
</tr>
<tr>
<td>Option</td>
<td>With indicator light and surge voltage suppressor</td>
<td></td>
</tr>
</tbody>
</table>

*Some options listed as "Special Order" items.

Standard Specifications

<table>
<thead>
<tr>
<th>Valve</th>
<th>Fluid</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Max. operating pressure</td>
<td>130 PSI (9.0kgf/cm²)</td>
</tr>
<tr>
<td></td>
<td>Min. operating pressure</td>
<td>2.0 psi (15 PSI (1.0kgf/cm²)</td>
</tr>
<tr>
<td></td>
<td>Ambient and fluid temperature</td>
<td>32 ~ 120°F (0 ~ +50°C)</td>
</tr>
<tr>
<td></td>
<td>Lubrication</td>
<td>Not required</td>
</tr>
<tr>
<td></td>
<td>Pilot operator manual override</td>
<td>Non-locking push type (Flush)</td>
</tr>
<tr>
<td></td>
<td>Protection construction</td>
<td>Dust proof</td>
</tr>
<tr>
<td></td>
<td>Rated voltage</td>
<td>AC: 110VAC±5%±5 Hz, 220V±5%±5 Hz, 24V±5%±5 Hz</td>
</tr>
<tr>
<td></td>
<td>DC: 12V, 24V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Allowable voltage range</td>
<td>−15 ~ +10% rated voltage</td>
</tr>
<tr>
<td></td>
<td>Coil insulation</td>
<td>Class B or equivalent</td>
</tr>
<tr>
<td></td>
<td>Apparent power (Power consumption)</td>
<td>AC Inrush: 5.0VA/60Hz, 5.6VA/50Hz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DC Holding: 2.3VA(1.5W)/60Hz, 3.4VA(2.1W)/50Hz</td>
</tr>
<tr>
<td></td>
<td>Power consumption DC</td>
<td>1.8W</td>
</tr>
<tr>
<td></td>
<td>Electrical entry</td>
<td>Plug-in: Conduit terminal (base access)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non plug-in: Grommet, DIN connector (Conduit terminal, grommet terminal)</td>
</tr>
</tbody>
</table>

Note) Operating pressure: 0 ~ 130PSI (0 ~ 9.0kgf/cm²)
Pilot operating pressure 2 position double: 15 ~ 150PSI (1 ~ 9.9kgf/cm²)
2 position single; 3 position: 30 ~ 130PSI (2.0 ~ 9.0kgf/cm²)
Series NVFR2000: Base Mounted Type

How To Order

Porting
- Side
  - B Bottom
  - 1/8 NPTF only

Option
- None
- Z With indicator light and surge voltage suppressor

Body type
- O-Plug in
- F-Through base

Electrical entry
- Through base

Plug-in
NVFR2 200 5 F 01T
Non plug-in
NVFR2 210 5 D 02T

Port size
- Without subplate
  - 01T 1/4 NPTF
  - 02T 1/4 NPTF

Porting:
- Bottom ported 1/8 NPTF only.

Option
- None
- Z With indicator light and surge voltage suppressor

Body type
- Non plug-in
- Lock type

Electrical entry
- G-Grommet
- D-DIN Connector

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 type
1-Non plug-in

Pilot operator
- Internal
- External
- Special Order

Voltage
1 100VAC/Hz
2 200VAC/Hz
3 110VAC/Hz
4 220VAC/Hz
5 24VDC
6 12VDC
8 Others Note 1

Note 1) Indicate in parentheses at end of part no.
Ex. (AC24V).

Note 2) See pg. 16 for individual subplate part nos.

Note 3) Special Order

(See pg. 16 for individual subplate part nos.)
Series NVFR2000: Base Mounted Type

Manifold Specifications

Plug in Type: Connector with Lead Wire (“wire harness”)

- The insert plug is attached to the manifold block and is connected with valve side. Connect leads with corresponding power supply.

**NVV5FR2-01**

Series NVFR2000 Manifold valve

Plug-in Type
Connector with Lead wire

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port specifications</th>
<th>Porting Specifications (A,B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>O1T</td>
<td>P, EA, EB</td>
<td>Side</td>
</tr>
<tr>
<td>O2T</td>
<td>%NPTF</td>
<td>%NPTF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port size</th>
<th>Symbol</th>
<th>P, EA, EB</th>
<th>A, B</th>
</tr>
</thead>
<tbody>
<tr>
<td>O1T</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O2T</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Stations:
- 02: 2 stations
- 15: 15 stations

**Symbol**
- Station: 01

**NVV5FR2-01T**

Series NVFR2000 Manifold valve

Plug-in Type
Connector with Lead wire

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port specifications</th>
<th>Porting Specifications (A,B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01T</td>
<td>P, EA, EB</td>
<td>Side</td>
</tr>
<tr>
<td>02T</td>
<td>%NPTF</td>
<td>%NPTF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port size</th>
<th>Symbol</th>
<th>P, EA, EB</th>
<th>A, B</th>
</tr>
</thead>
<tbody>
<tr>
<td>O1T</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O2T</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Stations:
- 02: 2 stations
- 15: 15 stations

**Symbol**
- Station: 01

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

- 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.

**NVV5FR2-01**

Series NVFR2000 Manifold valve

Plug-in type
With terminal block

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port specifications</th>
<th>Porting Specifications (A,B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>O1T</td>
<td>P, EA, EB</td>
<td>Side</td>
</tr>
<tr>
<td>O2T</td>
<td>%NPTF</td>
<td>%NPTF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port size</th>
<th>Symbol</th>
<th>P, EA, EB</th>
<th>A, B</th>
</tr>
</thead>
<tbody>
<tr>
<td>O1T</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O2T</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Stations:
- 02: 2 stations
- 15: 15 stations

**Symbol**
- Station: 01

**NVV5FR2-01T**

Series NVFR2000 Manifold valve

Plug-in type
With terminal block

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port specifications</th>
<th>Porting Specifications (A,B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01T</td>
<td>P, EA, EB</td>
<td>Side</td>
</tr>
<tr>
<td>02T</td>
<td>%NPTF</td>
<td>%NPTF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port size</th>
<th>Symbol</th>
<th>P, EA, EB</th>
<th>A, B</th>
</tr>
</thead>
<tbody>
<tr>
<td>O1T</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O2T</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Stations:
- 02: 2 stations
- 15: 15 stations

**Symbol**
- Station: 01

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

- Individual wiring for each valve

**NVV5FR2-10**

Series NVFR2000 Manifold valve

Non plug-in type

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port specifications</th>
<th>Porting Specifications (A,B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01T</td>
<td>P, EA, EB</td>
<td>Side</td>
</tr>
<tr>
<td>02T</td>
<td>%NPTF</td>
<td>%NPTF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port size</th>
<th>Symbol</th>
<th>P, EA, EB</th>
<th>A, B</th>
</tr>
</thead>
<tbody>
<tr>
<td>O1T</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O2T</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Stations:
- 02: 2 stations
- 15: 15 stations

**Symbol**
- Station: 01

**NVV5FR2-10T**

Series NVFR2000 Manifold valve

Non plug-in type

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port specifications</th>
<th>Porting Specifications (A,B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01T</td>
<td>P, EA, EB</td>
<td>Side</td>
</tr>
<tr>
<td>02T</td>
<td>%NPTF</td>
<td>%NPTF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Port size</th>
<th>Symbol</th>
<th>P, EA, EB</th>
<th>A, B</th>
</tr>
</thead>
<tbody>
<tr>
<td>O1T</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O2T</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Stations:
- 02: 2 stations
- 15: 15 stations

**Symbol**
- Station: 01

Note: Individual cover part no. above. One-piece type, see pg. 16

See "How to Order Manifold Assemblies," p. 39

NVFR manifold base is the same as for NVFS Series.
Series NVFR2000: Base Mounted Type

Plug-in Type: With Multi-Connector

- Master connection of power and solenoid valves
- Quick wiring permits ease of installation.

<table>
<thead>
<tr>
<th>NVV5FR2</th>
<th>01C</th>
<th>D</th>
<th>05</th>
<th>2</th>
<th>01T</th>
</tr>
</thead>
</table>
| Series NVFR2000 Manifold valve
| Plug-in type
| Mounting direction of connector
| D | D side mounting
| U | U side mounting
| Port size
<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port specifications</th>
<th>Porting specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>01T</td>
<td>P, EA, EB A, B</td>
<td>1/4 NPTF</td>
</tr>
<tr>
<td>02T</td>
<td></td>
<td>1/4 NPTF</td>
</tr>
<tr>
<td>Symbol</td>
<td>Port specifications</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>EA, EB</td>
<td>A, B</td>
</tr>
<tr>
<td>01F</td>
<td>Common</td>
<td>Side</td>
</tr>
<tr>
<td>02F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottom porting: 1/4 only</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Stations
- 02: 2 stations
- 08: 8 stations
- Max: 8 stations

Plug-in Type: With D-Sub Connector

- Wide range of interchangeability (MIL Spec DIN type connector terminal-25 pin.)
- Quick wiring permits ease of installation.

D-Subconnector for 2000 Series

Orientation of D-Sub connector for 2000 Series manifold is parallel with mounting surface. For other manifold sizes the connector receptacle is perpendicular to the mounting surface.

<table>
<thead>
<tr>
<th>NVV5FR2</th>
<th>01F</th>
<th>U</th>
<th>06</th>
<th>1</th>
<th>01T</th>
</tr>
</thead>
</table>
| Series NVFR2000 Manifold valve
| Plug-in type
| Mounting direction of connector
| D | D side mounting
| U | U side mounting
| Port size
<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port specifications</th>
<th>Porting specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>P, EA, EB A, B</td>
<td>1/4 NPTF</td>
</tr>
<tr>
<td>02</td>
<td></td>
<td>1/4 NPTF</td>
</tr>
<tr>
<td>Symbol</td>
<td>Port specifications</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>EA, EB</td>
<td>A, B</td>
</tr>
<tr>
<td>01F</td>
<td>Common</td>
<td>Side</td>
</tr>
<tr>
<td>02F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottom porting: 1/4 only</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Stations
- 02: 2 stations
- 08: 8 stations
- Max: 8 stations
Series NVFR2000: Base Mounted Type

**Plug-in Type: Serial Interface Manifold**

<table>
<thead>
<tr>
<th>NVV5FR2</th>
<th>01SU</th>
<th>08</th>
<th>02T</th>
<th>X200</th>
</tr>
</thead>
</table>

- The use of serial interface technology offers advantages such as reduced wiring, quicker installation time, easier start-up and simplified maintenance.

- Include 1 station to mount SI unit.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port specifications</th>
<th>Porting specifications (A,B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01T</td>
<td>P, EA, EB</td>
<td>A, B</td>
</tr>
<tr>
<td>02T</td>
<td>1/4 NPTF</td>
<td>1/2 NPTF</td>
</tr>
</tbody>
</table>

- Symbol:
  - Port size:
    - 01T: 1/4 NPTF
    - 02T: 1/2 NPTF

**Series IN313 Serial Interface Modules**

<table>
<thead>
<tr>
<th>IN313</th>
<th>AB</th>
<th>1</th>
</tr>
</thead>
</table>

- **Protocol**:
  - AB: Allen Bradley
  - DN: DeviceNet
  - MB: Mitsubishi
  - PR: Profibus
  - TA: Omron

- **Output/Inputs**:
  - 1: 16 outputs
  - 2: 32 outputs/32 inputs (Available on Allen Bradley only)

**AB2 Accessories**

<table>
<thead>
<tr>
<th>Part #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VVZ3000-21A-6-X2</td>
<td>D-sub cable with connectors on both ends</td>
</tr>
<tr>
<td>EX300-IB1-AB</td>
<td>Input Base Unit</td>
</tr>
<tr>
<td>EX300-IE1-AB</td>
<td>Input Expander Unit</td>
</tr>
</tbody>
</table>
Series NVFR2000: Base Mounted Type

Construction/Parts List

Main 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 diecast</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>2</td>
<td>Subplate</td>
<td>Aluminum diecast</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>3</td>
<td>Spool</td>
<td>Aluminum/NBR</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Adapter plate</td>
<td>Aluminum diecast</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>5</td>
<td>Adapter plate</td>
<td>Aluminum diecast</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>6</td>
<td>End plate</td>
<td>Resin</td>
<td>Black</td>
</tr>
</tbody>
</table>

Spare Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Part Nos.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gasket</td>
<td>NBR</td>
<td>NVFR21C0, AXT624-20-2</td>
</tr>
<tr>
<td>2</td>
<td>Valve mounting bolt</td>
<td>Steel</td>
<td>NVFR22C0, AXT624-20-2</td>
</tr>
<tr>
<td>3</td>
<td>Pilot Ass'Y</td>
<td></td>
<td>NVFR23C0, 24C0, 25C0, AXT624-26</td>
</tr>
</tbody>
</table>

Refer to "Pilot Operator Ass'y/How to Order" on page 8.
**Series NVFR2000: Base Mounted Type**

**Pilot Operator Ass'y/How to Order**

- **SF4~3 DZ 60**

**Voltage**
- 1: 100VAC 50Hz
- 2: 200VAC 50Hz
- 3: 110VAC 60Hz
- 4: 220VAC 50Hz
- 5: 24VDC
- 6: 12VDC
- 9: Others [Note 1]

**Manual override classification**
- ▲: Non-locking (Push type)
- ▼: Non-locking (Screw type)
- ▼: Lock type (Screw type)
- ▼: Special Order

**Valve Series**
- 60: NVFR2000 Series

**Manifold stations vs. Effective Orifice Area (Cv-Factor)**

<table>
<thead>
<tr>
<th>Porting/No. of stations</th>
<th>First station</th>
<th>Fifth station</th>
<th>Tenth station</th>
<th>Fifteenth station</th>
</tr>
</thead>
<tbody>
<tr>
<td>P → A or B</td>
<td>0.72</td>
<td>0.72</td>
<td>0.71</td>
<td>0.70</td>
</tr>
<tr>
<td>A → EA, B → EB</td>
<td>0.9</td>
<td>0.9</td>
<td>0.9</td>
<td>0.9</td>
</tr>
</tbody>
</table>

2 position single. Port size: ½ NPTF
Plug-in type 2 position single, double, 3 position/Dimensions

2 position single: NVFR2100-OF

3 position closed center: NVFR2300-OF
3 position exhaust center: NVFR2400-OF
3 position pressure center: NVFR2500-OF

With indicator light and surge voltage suppressor
Series NVFR2000: Base Mounted Type

Non Plug-in type 2 position single / Dimensions

Grommet: NVFR2110-OG

With indicator light and surge voltage suppressor

DIN Connector: NVFR2110-OD

With indicator light and surge voltage suppressor

Conduit (1/4) Terminal: NVFR2110-OT

With indicator light and surge voltage suppressor
Non Plug-in type 2 position double, 3 position /Dimensions
inch (mm)

Grommet: 2 position double/NVFR2210-OG 3 position closed center/NVFR2310-OG 3 position exhaust center/NVFR2410-OG 3 position pressure center/NVFR2510-OG

2.85(72.5) 0.20(5) Dia
5.93(150.5) 3 position:8.22(158)
0.36(10) 0.39(10) 2 Mounting holes
0.33(8.5) 0.33(8.5)

2.87(73) 3.92(99.5)
5.94(151) 3 position:6.26(159)

Conduit (%): Terminal: 2 position double/NVFR2210-OT
3 position closed center/NVFR2310-OT
3 position exhaust center/NVFR2410-OT
3 position pressure center/NVFR2510-OT

0.24(6) ~ 0.31(8) Dia
4.64(117)
3.05(77.5)
3.07(78)

DIN connector: 2 position double/NVFR2210-OD
3 position closed center/NVFR2310-OD
3 position exhaust center/NVFR2410-OD
3 position pressure center/NVFR2510-OD

0.24(6) ~ 0.31(8) Dia
4.64(117)
3.05(77.5)
3.07(78)

With indicator light and surge voltage suppressor
**Series NVFR2000: Base Mounted Type**

**Manifold Plug-in Type / Non Plug-in Type / Dimensions**

Plug-in type (connector plug with lead wire): NVV5FR2-01

**Bottom porting**

NVV5FR2-01-stations (2) - port size

- 1/8 NPTF 3 ports:
  - 0.5 (13)
  - 0.5 (13)
  - 0.5 (13)
  - 0.5 (13)
  - 0.5 (13)

**Non plug-in type: NVV5FR2-10- stations (1) - port size**

- 1/8 NPTF 3 ports:
  - 0.5 (13)
  - 0.5 (13)

<table>
<thead>
<tr>
<th>L</th>
<th>station</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>L₁</td>
<td></td>
<td>2.95 (75)</td>
<td>4.06 (103)</td>
<td>5.16 (131)</td>
<td>6.26 (159)</td>
<td>7.36 (187)</td>
<td>8.46 (215)</td>
<td>9.57 (243)</td>
<td>10.67 (271)</td>
<td>11.77 (299)</td>
<td>12.87 (327)</td>
</tr>
<tr>
<td>L₂</td>
<td></td>
<td>3.31 (84)</td>
<td>4.41 (112)</td>
<td>5.51 (140)</td>
<td>6.61 (168)</td>
<td>7.72 (196)</td>
<td>8.82 (224)</td>
<td>9.92 (252)</td>
<td>11.02 (280)</td>
<td>12.13 (308)</td>
<td>13.23 (336)</td>
</tr>
</tbody>
</table>

**Equation**

\[ L₁ = 1.10 \times n + 1.85 \]
\[ L₂ = 1.10 \times n + 2.20 \]
**Series NVFR2000: Base Mounted Type**

**Manifold Plug-in Type: One-piece type, Unit type of junction cover**

*Dimensions: inch (mm)*

Plug-in type with terminal block (unit type individual junction covers): NVSVF2-01T

- Stations: 1-15
- Port size

**Dimensions:**

<table>
<thead>
<tr>
<th>Port Type</th>
<th>Station</th>
<th>Dimensions</th>
</tr>
</thead>
</table>
| 1/8NPTF 3 ports | 1-15 | 0.85 (21.5) | surge voltage suppressor
| 2-NPTF 2 ports | 1-15 | 0.85 (21.5) | surge voltage suppressor

**Bottom porting NVSVF2-01T:**

- Stations: 2-15
- Port size

**Dimensions:**

<table>
<thead>
<tr>
<th>Port Type</th>
<th>Station</th>
<th>Dimensions</th>
</tr>
</thead>
</table>
| 1/8NPTF 3 ports | 2-15 | 0.85 (21.5) | surge voltage suppressor
| 2-NPTF 2 ports | 2-15 | 0.85 (21.5) | surge voltage suppressor

**Equation:**

For station n:

- \( L_1 = 1.10 \times n + 1.85 \)
- \( L_2 = 28 \times n + 47 \)

Where:

- \( L_1 \) is the length for station n
- \( L_2 \) is the length for station n

**Diagram:**

- Illustrations of plug-in types and dimensions
- Annotations for porting
- Indicator light and surge voltage suppressor

**Table:**

<table>
<thead>
<tr>
<th>Station</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>L₁</td>
<td>2.95 (75)</td>
<td>4.06 (103)</td>
<td>5.16 (131)</td>
<td>6.26 (159)</td>
<td>7.36 (187)</td>
<td>8.46 (215)</td>
<td>9.57 (243)</td>
<td>10.67 (271)</td>
<td>11.77 (299)</td>
<td>12.87 (327)</td>
</tr>
<tr>
<td>L₂</td>
<td>3.31 (84)</td>
<td>4.41 (112)</td>
<td>5.51 (140)</td>
<td>6.61 (168)</td>
<td>7.72 (196)</td>
<td>8.82 (224)</td>
<td>9.92 (252)</td>
<td>11.02 (280)</td>
<td>12.13 (308)</td>
<td>13.23 (336)</td>
</tr>
</tbody>
</table>
Series NVFR2000: Base Mounted Type

**Manifold/Option Parts Ass'y**

### SUP Relocation spacer
An individual SUP spacer on manifold block can form individual P port for the 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></td>
<td></td>
</tr>
<tr>
<td>1/8NPTF</td>
<td>NVFS2000-P-01T-1</td>
<td>NVFS2000-P-01T-2</td>
</tr>
<tr>
<td>1/8NPTF</td>
<td>NVFS2000-P-02T-1</td>
<td>NVFS2000-P-02T-2</td>
</tr>
</tbody>
</table>

### EXH gallery block disc
When valve exhaust affects the other stations on the circuit or when the reverse pressure valve is used on a standard manifold, insert EXH block disc(s) in between stations to isolate 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></td>
</tr>
<tr>
<td>1/8NPTF</td>
<td>NVFS2000-R-01T-1</td>
<td>NVFS2000-R-01T-2</td>
</tr>
<tr>
<td>1/8NPTF</td>
<td>NVFS2000-R-02T-1</td>
<td>NVFS2000-R-02T-2</td>
</tr>
</tbody>
</table>

### Interface speed control
Needle valve 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></td>
<td></td>
</tr>
</tbody>
</table>

### EXH Relocation spacer
An individual EXH spacer on manifold block can form individual EXH port for the 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></td>
<td></td>
</tr>
<tr>
<td>1/8NPTF</td>
<td>AXT625-12A</td>
<td></td>
</tr>
</tbody>
</table>

### Blank plate
When disassembling valve for maintenance purposes or when spare manifold stations are required, install Blank plate on the manifold block.

<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>
<tr>
<td>VVFS2000-10A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Interface regulator
Spacer type regulating valve on manifold block can regulate the pressure to the valve. Available with standard gauge.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Regulation P</td>
<td>NARBF2000-00-P-1</td>
<td>NARBF2000-00-P-2</td>
</tr>
</tbody>
</table>

### SUP gallery block disc
When supplying manifold with more than one pressure, insert block disc 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></td>
<td></td>
</tr>
<tr>
<td>AXT625-12A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Other Options Available:
- (See NVFS Series Catalog)
  - Air Shutoff Valve spacer
  - Single-check Drop Guard spacer
  - Double-check "Perfect" spacer
  - Control Unit
**Series NVFR2000: Base Mounted Type**

**Manifold/Option Parts Plug-in Type/Non Plug-in Type/Dimensions**

**SUP Relocation spacer**
- NVVFS2000-P-3/4-T-1 (Plug-in type)
- NVVFS2000-P-3/4-T-2 (Non plug-in type)
  (Specify 1/8 (01) or 1/4 (02))

**EXH Relocation spacer**
- NVVFS2000-R-3/4-T-1 (Plug-in type)
- NVVFS2000-R-3/4-T-2 (Non plug-in type)
  (Specify 1/8 (01) or 1/4 (02))

**Interface Speed Control**
- VVFS2000-20A-1 (Plug-in type)
- VVFS2000-20A-2 (Non plug-in type)

**Interface Regulator**
- NARBF2000-00-P-1 (Plug-in type)
- NARBF2000-00-P-2 (Non plug-in type)

**SUP/EXH gallery block disc**
- AXT 625-12A
### Series NVFR2000: Base Mounted Type

#### Manifold Base/Construction Plug-in Type/Non Plug-in Type

Note) Manifold Base/Construction shown: Plug-in type with terminal block and one-pc. cover.

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Clamp A</td>
<td>Steel plate</td>
<td>AXT625-4A</td>
</tr>
<tr>
<td>1</td>
<td>Clamp B</td>
<td>Steel plate</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>O-ring</td>
<td>NBR</td>
<td>AXT050-031</td>
</tr>
<tr>
<td>1</td>
<td>O-ring (3 req’d)</td>
<td>NBR</td>
<td>AXT625-34</td>
</tr>
<tr>
<td>1</td>
<td>O-ring</td>
<td>NBR</td>
<td>AXT625-35</td>
</tr>
<tr>
<td>1</td>
<td>Adapter</td>
<td>–</td>
<td>AXT625-28-1</td>
</tr>
<tr>
<td>2</td>
<td>Terminal ass’y</td>
<td>–</td>
<td>AXT625-28-2A</td>
</tr>
<tr>
<td>3</td>
<td>Conduit cover ass’y</td>
<td>–</td>
<td>NVVF2000-4A</td>
</tr>
</tbody>
</table>

#### Main Parts sub-ass’y

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Part No.</th>
<th>Note</th>
<th>Component parts</th>
<th>Applicable manifold base</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Manifold block ass’y * : O-side ports A, B 1-1/8 P, A, B bottom w/ (1/4 A, B side)</td>
<td>MBF261*-*01-1B</td>
<td></td>
<td>Manifold block  1, Clamp  1, 2, O-ring  1, 2, 3, 4, 5, 6 Adapter  7, Pin housing, Guide, Insert plug lead wire</td>
<td>Plug-in type Connector lead wires</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MBF261*-*01-1A</td>
<td></td>
<td>Manifold block  1, Clamp  1, 2, O-ring  1, 2, 3, 4, 5, 6 Adapter  7, Terminal 8, Pin housing, Guide.</td>
<td>Non plug-in type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MB261*-*01-1</td>
<td></td>
<td>Manifold block  1, Metal joint  1, 2, O-ring  1, 2, 3, 4, 5 Adapter  7, Pin housing, Guide.</td>
<td>Non plug-in type</td>
</tr>
<tr>
<td>1</td>
<td>End plate (kit) ass’y</td>
<td>ME263LR-02-1</td>
<td></td>
<td>End plate (U)  1, End plate (D) 1, Clamp  1, 2, O-ring  1, 2, 3, 4, 5 Conduit Plug.</td>
<td>Plug-in type Connector lead wires</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>ME272LR-02-1</td>
<td></td>
<td>End plate (U)  1, End plate (D) 1, Clamp  1, 2, O-ring  1, 2, 3, 4, 5.</td>
<td>Non plug-in type</td>
</tr>
</tbody>
</table>

#### Subplate ass’y †

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Part No.</th>
<th>Note</th>
<th>Component parts</th>
<th>Applicable manifold base</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Subplate ass’y †</td>
<td>SPF0191-1S</td>
<td></td>
<td>Plug-in type</td>
<td>Non Plug-in type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SPF0193-1S</td>
<td></td>
<td>with terminal block</td>
<td>1/8NPTF Side Ports</td>
</tr>
</tbody>
</table>

Note) A,B ports: 01 (1/8NPTF), 02 (1/4NPTF)

Note: NVFR/NVFS Series manifolds are constructed using the same parts.

Note) Subplate shown: Plug-in type with terminal.
5 Port Pilot Type/Rubber Seal
Series NVFR3000
Plug-in Type, Non Plug-in Type

**Model**

<table>
<thead>
<tr>
<th>Position/No. of solenoid</th>
<th>Type</th>
<th>Port size (NPTF)</th>
<th>Cv factor</th>
<th>Max Operating cycle CPM</th>
<th>Response time (ms)</th>
<th>Weight lbs (kgf)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Plug-in</td>
<td>Non Plug-in</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 position</td>
<td>Single</td>
<td>NVFR3100</td>
<td>NVFR3110</td>
<td>1/4, 2.1</td>
<td>300</td>
<td>0.68 (0.31)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30 or less</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Double</td>
<td>NVFR3200</td>
<td>NVFR3210</td>
<td>1/4, 2.3</td>
<td>300</td>
<td>0.90 (0.41)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30 or less</td>
<td></td>
</tr>
<tr>
<td>3 position</td>
<td>Closed center</td>
<td>NVFR3300</td>
<td>NVFR3310</td>
<td>1/4, 1.9</td>
<td>180</td>
<td>0.95 (0.43)</td>
</tr>
<tr>
<td></td>
<td>Exhaust center</td>
<td>NVFR3400</td>
<td>NVFR3410</td>
<td>1/4, 2.0</td>
<td>180</td>
<td>0.95 (0.43)</td>
</tr>
<tr>
<td></td>
<td>Pressure center</td>
<td>NVFR3500</td>
<td>NVFR3510</td>
<td>1/4, 2.2</td>
<td>180</td>
<td>0.95 (0.43)</td>
</tr>
</tbody>
</table>

* The figures listed are without subplate. In case of plug-in subplate or non plug-in subplate, and 0.65 lbs., and 0.59 lbs. respectively.
† Special Order

**Standard Specifications**

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Air</th>
<th>Max. operating pressure</th>
<th>130 PSI (9.0kgf/cm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. operating pressure</td>
<td>30 PSI (2.0kgf/cm²)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient and fluid temperature</td>
<td>32 ~ 120°F (0 ~ +50°C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubrication</td>
<td>Not required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pilot operator manual override</td>
<td>Non-locking push type (Flush)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection construction</td>
<td>Dust proof</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Optional Specifications**

<table>
<thead>
<tr>
<th>Pilot type</th>
<th>Note) External pilot type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot operator</td>
<td>Non-locking push type (extended), Lock type (screw), Lock type (lever)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Voltage</th>
<th>AC 100V±5%, 200V±5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC</td>
<td>6V, 48V, 100V</td>
</tr>
</tbody>
</table>

**Porting**

Bottom ported subplate

**Option**

With indicator light and surge voltage suppressor

---

Note) Operating pressure: 0 ~ 130PSI (0 ~ 9.0kgf/cm²)

Pilot operating pressure: 30 ~ 130PSI (2 ~ 9.0kgf/cm²)

*Some options listed as “Special Order” items.*
### How to Order

**Series NVFR3000: Base Mounted Type**

#### Plug-in NVFR3

<table>
<thead>
<tr>
<th>Port size</th>
<th>Body type</th>
<th>Electrical entry</th>
<th>Porting</th>
<th>Option</th>
<th>Electrical entry</th>
<th>Pilot operator manual override/ classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>02T</td>
<td>O-Plug in</td>
<td>F-Through base</td>
<td>Side</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>02T</td>
<td>O-Plug in</td>
<td>F-Through base</td>
<td>B Bottom</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>02T</td>
<td>O-Plug in</td>
<td>F-Through base</td>
<td>Special order</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

#### Non Plug-in NVFR3

<table>
<thead>
<tr>
<th>Port size</th>
<th>Body type</th>
<th>Electrical entry</th>
<th>Porting</th>
<th>Option</th>
<th>Electrical entry</th>
<th>Pilot operator manual override/ classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>02T</td>
<td>1/4 NPTF</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>03T</td>
<td>3/8 NPTF</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

#### Symbol

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

#### Body type

- 1: Non plug-in

#### Electrical entry

- E: Grommet terminal
- D: DIN Connector

#### Option

- Note Z: With indicator light and surge voltage suppressor

#### Voltage

- *1: 100VAC50/60Hz
- *2: 200VAC50/60Hz
- *3: 110VAC50/60Hz
- *4: 220VAC50/60Hz
- 5: 24VDC
- 6: 12VDC
- *9: Others

#### Manual option

- 0: Standard
- *1: Std. + Direct-manual
- * Special order

#### Pilot operator

- Internal
- *R: External
- * Special order

#### Pilot operator manual override/ classification

- - Non-locking push type
- *A: Non-locking push type (Extended)
- B: Lock type (Screw type)
- *C: Lock type (Lever type)
- Special Order.
**Manifold Specifications**

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

- 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.

**Non Plug-in Type: Grommet Terminal/ DIN Connector**

- Individual wiring for each valve

See "How to Order Manifold Assemblies," pg. 46

---

**Manifold Specifications**

<table>
<thead>
<tr>
<th>Base mounted type</th>
<th>Wiring</th>
<th>Porting specifications</th>
<th>Port size</th>
<th>No. of Stations</th>
<th>Applicable solenoid valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in type NVVF5FR3-01T</td>
<td>With terminal blocks</td>
<td>A,B port</td>
<td>P, EA, EB</td>
<td>2-10</td>
<td>NVFR3000-OF</td>
</tr>
<tr>
<td>Non plug-in type NVVF5FR3-10</td>
<td>DIN Connector Grommet terminal</td>
<td>Side, Bottom</td>
<td>1/4 NPTF, 3/8 NPTF</td>
<td>2-10</td>
<td>NVFR3010-OD NVFR3010-DE</td>
</tr>
</tbody>
</table>
Plug-in Type: With Multi-Connector

- Master connection of power and solenoid valves
- Quick wiring permits ease of installation.

**NVV5FR3 — 01C D — 05 1 — 02T**

Series NVFR3000 Manifold valve

- Plug-in type
- With multi connector

Mounting direction of connector
- D: D side mounting
- U: U side mounting

**Symbols**
- Port size
  - Symbol: P, EA, EB
  - Porting specifications: A, B
  - 02T: 1/2 NPTF
  - 03T: 3/4 NPTF

**Stations**
- 02: 2 stations
- 06: 8 stations
- Max: 8 stations

---

Plug-in Type: With D-Sub Connector

- Wide range of interchangeability (MIL Spec DIN type connector terminal 25 pin.)
- Quick wiring permits ease of installation

**NVV5FR3 — 01F D — 06 1 — 02T**

Series NVFR3000 Manifold valve

- Plug-in type
- With D-sub connector

Mounting direction of connector
- D: D side mounting
- U: U side mounting

**Symbols**
- Port size
  - Symbol: P, EA, EB
  - Porting specifications: A, B
  - 02T: 1/2 NPTF
  - 03T: 3/4 NPTF

**Stations**
- 02: 2 stations
- 06: 8 stations
- Max: 8 stations
The use of serial interface technology offers advantages such as reduced wiring, quicker installation time, easier start-up and simplified maintenance.

**Serial Interface Manifold**

**NVV5FR3** — **01SU** — **08** — **02T** — **X200**

- **Stations**
  - **02** 2 stations
  - **11** 11 stations
  - *includes 1 station to mount Si unit.

- **Port size**
  - **Symbol**
    - **P**
    - **EA, EB**
    - **Porting specifications (A,B)**
    - **Side**
    - **Bottom**
    - **Bottom porting: ½ only**

**Serial Interface Modules**

**IN313** — **AB** — **1**

- **Protocol**
  - **AB** Allen Bradley
  - **DN** DeviceNet
  - **MB** Mitsubishi
  - **PR** Profibus
  - **TA** Omron

- **Output/Inputs**
  - 1 16 outputs
  - 2 32 outputs/32 inputs (Available on Allen Bradley only)

**AB2 Accessories**

<table>
<thead>
<tr>
<th>Part #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VVZR3000-21A-6-X2</td>
<td>D-sub cable with connectors on both ends</td>
</tr>
<tr>
<td>EX300-IB1-AB</td>
<td>Input Base Unit</td>
</tr>
<tr>
<td>EX300-E1-AB</td>
<td>Input Expander Unit</td>
</tr>
</tbody>
</table>
Series NVFR3000: Base Mounted Type

Construction/Parts List

Main 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 diecast</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>2</td>
<td>Subplate</td>
<td>Aluminum diecast</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>3</td>
<td>Spool</td>
<td>Aluminum/NBR</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>
</tbody>
</table>

Spare Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Part Nos.</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Gasket</td>
<td>NBR</td>
<td>VFS3000-20</td>
</tr>
<tr>
<td>12</td>
<td>Valve mounting</td>
<td>Steel</td>
<td>AXT632-3 (M3X32)</td>
</tr>
<tr>
<td>13</td>
<td>Pilot Ass'y</td>
<td>–</td>
<td>SF4- F # -70</td>
</tr>
</tbody>
</table>
Series NVFR3000: Base Mounted Type

Plug-in type 2 Position Single, 3 Position/Dimensions

2 position single: NVFR3100-OF

2 position double: NVFR3200-OF
3 position closed center: NVFR3300-OF
3 position exhaust center: NVFR3400-OF
3 position pressure center: NVFR3500-OF
Series NVFR3000: Base Mounted Type

Non plug-in type 2 position single, double, 3 position/Dimensions

<table>
<thead>
<tr>
<th>2 position single: NVFR3110-0E, NVFR3110-0D</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 position double: NVFR3210-0E, NVFR3210-0D</td>
</tr>
<tr>
<td>3 position closed center: NVFR3310-0E, NVFR3310-0D</td>
</tr>
<tr>
<td>3 position exhaust center: NVFR3410-0E, NVFR3410-0D</td>
</tr>
<tr>
<td>3 position pressure center: NVFR3510-0E, NVFR3510-0D</td>
</tr>
</tbody>
</table>

Components and Dimensions:
- External pilot: NPTF
- Operator port: NPTF
- Pilot manual override: NPTF
- Cable: NPTF
- Mounting holes: 1/4 inch (6.4 mm)
- External diameter: 0.22 inch (5.6 mm)
- Pressure drop: 0.22 inch (5.6 mm)
- Exhaust drop: 0.47 inch (12 mm)
- Exhaust pressure: 0.31 inch (7.9 mm)
- Exhaust position: 1.13 inch (28.7 mm)
- Exhaust pressure center: 0.31 inch (7.9 mm)
- Exhaust position/Dimensions:
  - Internal diameter: 0.22 inch (5.6 mm)
  - Exhaust pressure: 0.22 inch (5.6 mm)
  - Exhaust position: 1.13 inch (28.7 mm)

Dimensions in inches (mm):
- 2 position single: NVFR3110-0E, NVFR3110-0D
- 2 position double: NVFR3210-0E, NVFR3210-0D
- 3 position closed center: NVFR3310-0E, NVFR3310-0D
- 3 position exhaust center: NVFR3410-0E, NVFR3410-0D
- 3 position pressure center: NVFR3510-0E, NVFR3510-0D

Diagrams showing the components and their arrangements are provided for each configuration.
Series NVFR3000: Base Mounted Type

Manifold Plug-in Type / Non Plug-in Type / Dimensions

Plug-in type (with terminal block): NVV5FR3-01T- stations 1- port size

<table>
<thead>
<tr>
<th>Station</th>
<th>Dimension</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.08</td>
<td>inch</td>
</tr>
<tr>
<td>2</td>
<td>6.38</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>7.68</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>8.98</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>10.28</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>11.57</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>12.87</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>14.17</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>15.47</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>16.77</td>
<td></td>
</tr>
</tbody>
</table>

Non-plug-in type: NVV5FR3-10- stations 1- port size

<table>
<thead>
<tr>
<th>Station</th>
<th>Dimension</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.55</td>
<td>inch</td>
</tr>
<tr>
<td>2</td>
<td>6.86</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>8.15</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>9.45</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>10.75</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>12.05</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>13.35</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>14.65</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>15.94</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>17.24</td>
<td></td>
</tr>
</tbody>
</table>

Equation:

\[ L_1 = 1.30 \times n + 2.48 \]  
\[ L_2 = 1.30 \times n + 2.95 \]
## Series NVFR3000: Base Mounted Type

### Manifold/Option Parts

#### SUP Relocation spacer
An individual SUP spacer on manifold block can form individual P port for the 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>NVFS3000-P-03T-1</td>
<td>NVFS3000-P-03T-2</td>
</tr>
</tbody>
</table>

#### EXH gallery block disc
When valve exhaust affects the other stations on the circuit or when the reverse pressure valve is used on a standard manifold, insert EXH block disc(s) 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>AZ703-59A</td>
<td></td>
</tr>
</tbody>
</table>

#### EXH Relocation spacer
An individual EXH spacer on the manifold block can form individual R port for the 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>NVFS3000-R-03T-1</td>
<td>NVFS3000-R-03T-2</td>
</tr>
</tbody>
</table>

#### Interface Speed Control
Needle valve 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>WFS3000-20A-1</td>
<td>WFS3000-20A-2</td>
</tr>
</tbody>
</table>

### Interface regulator
Spacer type regulating valve on manifold block can regulate the pressure to the valve.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure</td>
<td>NARBF3050-NO-P-1</td>
<td>NARBF3050-NO-P-2</td>
</tr>
<tr>
<td>Pressure</td>
<td>NARBF3050-NO-A-1</td>
<td>NARBF3050-NO-A-2</td>
</tr>
<tr>
<td>Pressure</td>
<td>NARBF3050-NO-B-1</td>
<td>NARBF3050-NO-B-2</td>
</tr>
</tbody>
</table>

Note) For pressure center type valves, use pin NARBF3000.

### Blank plate
When disassembling valve for maintenance purposes or when spare manifold stations are required, install Blank plate on the manifold block.

<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>

### SUP gallery block disc
When supplying manifold with more than one pressure, insert block disc 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>AZ703-59A</td>
<td></td>
</tr>
</tbody>
</table>
Series NVFR3000: Base Mounted Type

**Manifold / Option Parts**  Plug-in Type / Non Plug-in Type / Dimensions

**SUP Relocation spacer**
NVVFS3000-P-03T-1 (Plug-in type)
NVVFS3000-P-03T-2 (Non plug-in type)

**EXH Relocation spacer**
NVVFS3000-R-03T-1 (Plug-in type)
NVVFS3000-R-03T-2 (Non plug-in type)

**SUP/EXH gallery block disc:** AZ703-59A

**Interface regulator/regulation to P**
NARBF3050-N0-P-1 (Plug-in type)
NARBF3050-N0-P-2 (Non plug-in type)

**Interface regulator/regulation to A**
NARBF3050-N0-A-1 (Plug-in type)
NARBF3050-N0-A-2 (Non plug-in type)

**Interface regulator/regulation to B**
NARBF3050-N0-B-1 (Plug-in type)
NARBF3050-N0-B-2 (Non plug-in type)

**Interface speed control**
VVFS3000-20A-1 (Plug-in type)
VVFS3000-20A-2 (Non plug-in type)

*Gauge nipple sizes may vary slightly.*
Series NVFR3000: Base Mounted Type

Manifold Base / Construction  Plug-in Type / Non plug-in Type

Parts List

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Metal clamp A</td>
<td>Steel</td>
<td>WFS3000-5-2A</td>
</tr>
<tr>
<td>2</td>
<td>Metal joint B</td>
<td>Steel</td>
<td>WFS3000-8</td>
</tr>
<tr>
<td>3</td>
<td>Gasket</td>
<td>NBR</td>
<td>WFS3000-7</td>
</tr>
<tr>
<td>4</td>
<td>Gasket</td>
<td>NBR</td>
<td>19.8×16.6×1.6</td>
</tr>
<tr>
<td>5</td>
<td>O-ring</td>
<td>NBR</td>
<td>6×3×1.5</td>
</tr>
<tr>
<td>6</td>
<td>Terminal ass'y</td>
<td></td>
<td>WFS3000-6A</td>
</tr>
<tr>
<td>7</td>
<td>Conduit cover ass'y</td>
<td></td>
<td>WFS3000-4A-(stations)</td>
</tr>
</tbody>
</table>

Main Parts sub-ass'y

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Part No. Note)</th>
<th>Component parts</th>
<th>Applicable valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Manifold block ass'y</td>
<td>MBF3610-5-1</td>
<td>Manifold block 1, Terminal 2, Metal joint/clamp 3, O-ring 4, Receptacle ass'y 5</td>
<td>Plug-in type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MBF3611-02-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MBF371+5-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>End plate (kit) ass'y</td>
<td>MEF363LR-04-1</td>
<td>End plates 1, Joint/clamp 2, Gasket 3, O-ring 4</td>
<td>Plug-in type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MEF373LR-04-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Subplate ass'y †</td>
<td>SPF028*0-5-D</td>
<td>Subplate Ass'y (see note below)</td>
<td>Plug-in type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SPF027*0-5-D</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: NVFR/NVFS Series manifolds are constructed using the same parts.

Note) Manifold Base/Construction shown: Plug-in type with terminal block.

Note) Subplate shown: Non plug-in type.

Note) Manifold: 0=s1de ports; 1=bottom ports. Subplate: 1=s1de ports; 2=bottom ports (1/4" only).
All Bases: 02=1/4"NPTF; 03=3/8"NPTF.

†External pilot type order SPF02 5*R---
Model

<table>
<thead>
<tr>
<th>Position/No. of solenoid</th>
<th>Type</th>
<th>Port size (NPTF)</th>
<th>Cv factor</th>
<th>Max. Operating cycle CPM</th>
<th>Response time (ms)</th>
<th>Weight lbs (kgf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 position</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>NVFR4100</td>
<td>NVFR4110</td>
<td>¾ 3.6</td>
<td>300</td>
<td>50 or less</td>
<td>1.35 (0.61)</td>
</tr>
<tr>
<td>Double</td>
<td>NVFR4200</td>
<td>NVFR4210</td>
<td>½ 3.7</td>
<td>300</td>
<td>50 or less</td>
<td>1.61 (0.73)</td>
</tr>
<tr>
<td>Closed center</td>
<td>NVFR4300</td>
<td>NVFR4310</td>
<td>¾ 3.2</td>
<td>180</td>
<td>70 or less</td>
<td>1.61 (0.73)</td>
</tr>
<tr>
<td>Exhaust center</td>
<td>NVFR4400</td>
<td>NVFR4410</td>
<td>½ 2.8</td>
<td>180</td>
<td>70 or less</td>
<td>1.61 (0.73)</td>
</tr>
<tr>
<td>Pressure center</td>
<td>NVFR4500</td>
<td>NVFR4510</td>
<td>½ 3.6</td>
<td>180</td>
<td>70 or less</td>
<td>1.61 (0.73)</td>
</tr>
</tbody>
</table>

*The Figures listed are without subplate. In the case of plug-in subplate and non plug-in subplate, add 1.10lbs. (0.50kgf) and 0.95lbs. (0.43kgf) respectively.
† Special Order

Optional Specifications*

<table>
<thead>
<tr>
<th>Pilot type</th>
<th>Note) External pilot type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual override</td>
<td>Non-locking push type (extended), Lock type (screw), Lock type (lever)</td>
</tr>
<tr>
<td>Pilot operator</td>
<td></td>
</tr>
<tr>
<td>AC</td>
<td>100V±3%Hz, 200V±3%Hz</td>
</tr>
<tr>
<td>DC</td>
<td>6V, 48V, 100V</td>
</tr>
</tbody>
</table>

*Some options listed as "Special Order" items.
## Series NVFR4000: Base Mounted Type

### How to Order

#### Body type
- **O**—Plug-in
- **Non Plug-in**

#### Electrical entry
- **F**—Through base

#### Port size
- **Without sub plate**
  - **03T**  3/8 NPTF
  - **04T**  1/2 NPTF
  - **EA, EB**  3/8 NPTF
  - Bottom ported: 3/8 only
  - (See pg. 40 for part no. of individual subplates)

#### Porting
- **Slide**
- **B**—Bottom
- **X**—Special order

#### Symbol
- **Single**
- **Double**
- **Closed center**
- **Exhaust center**
- **Pressure center**

#### Body type
- **1**—Non plug-in

#### Option
- **-**—Note
- **Z**—With indicator light and surge voltage suppressor
- **P**—Non-rotating DIN connector
- **P, ZP**—Only DIN type

#### Electrical entry
- **E**—Grommet terminal
- **D**—DIN connector

#### Voltage
- **1**—100VAC/60Hz
- **2**—200VAC/60Hz
- **3**—110VAC/60Hz
- **4**—220VAC/60Hz
- **5**—24VDC
- **6**—12VDC
- **9**—Others Note 1
- **X**—Special order
  - Note 1) indicate in parentheses at end of part no.
  - Ex. (AC24V)

#### Manual option
- **0**—Standard
- **1**—Std. + Direct-manual
- **X**—Special order

#### Pilot operator
- **-**—Internal
- **R**—External
- **X**—Special order

#### Pilot operator manual override/classification
- **-**—Non-locking push type (Flush)
- **A**—Non-locking push type (Extended)
- **B**—Lock type (Screw)
- **C**—Lock type (Lever)
- **X**—Special order
Series NVFR4000: Base Mounted Type

Manifold Specifications

Plug-in Type: With Terminal Block

- 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.

**NVV5FR4 - 01T**

Series NVFR4000 Manifold valve

- Plug-in type - With terminal block

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port specifications</th>
<th>Port size</th>
</tr>
</thead>
<tbody>
<tr>
<td>[\text{P, EA, EB}]</td>
<td>[A, B]</td>
<td>[\text{\textit{O3T}}] 1/2\text{NPTF}]</td>
</tr>
<tr>
<td>[\text{Bottom ported 3/8NPTF only.}]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Port size

- Stations

<table>
<thead>
<tr>
<th>Stations</th>
<th>02</th>
<th>2 stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10 stations</td>
<td></td>
</tr>
</tbody>
</table>

Non Plug-in Type: Grommet Terminal/DIN Connector

- Individual wiring for each valve.

**NVV5FR4 - 10 - 05 - 03T**

Series NVFR4000 Manifold valve

- Non Plug-in type

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port specifications</th>
<th>Port size</th>
</tr>
</thead>
<tbody>
<tr>
<td>[\text{P, EA, EB}]</td>
<td>[A, B]</td>
<td>[\text{\textit{O3T}}] 1/2\text{NPTF}]</td>
</tr>
<tr>
<td>[\text{\textit{Non Plug-in type: Grommet Terminal/DIN Connector}}]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Stations

<table>
<thead>
<tr>
<th>Stations</th>
<th>02</th>
<th>2 stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10 stations</td>
<td></td>
</tr>
</tbody>
</table>

See "How to Order Manifold Assemblies," pg. 46

Manifold Specifications

<table>
<thead>
<tr>
<th>Base mounted type</th>
<th>Wiring</th>
<th>Porting specifications</th>
<th>Port size</th>
<th>No. of Stations</th>
<th>Applicable solenoid valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug-in type NVV5FR4-01T</td>
<td>With terminal blocks</td>
<td>A, B port</td>
<td>PE, EA</td>
<td>A, B</td>
<td>Side, Bottom</td>
</tr>
<tr>
<td>Non Plug-in type NVV5FR4-10</td>
<td>DIN Connector</td>
<td>Grommet terminal</td>
<td>Side, Bottom</td>
<td>1/2 NPTF</td>
<td>3/4 NPTF</td>
</tr>
</tbody>
</table>
**Series NVFR4000: Base Mounted Type**

### Plug-in Type: With Multi-Connector

- Master connection of power and solenoid valves
- Quick wiring permits ease of installation.

**NVV5FR4** — **01C**

**Series NVFR4000**
Manifold valve

**Plug-in type**
With multi connector

**Mounting direction of connector**
- D: D side mounting
- U: U side mounting

**Stations**
- 02: 2 stations
- 08: 8 stations
  - Max: 8 stations

**Symbols**
- P, EA, EB: A, B
- 03T: 1/2 NPTF
- 04T: 3/8 NPTF

---

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

- Wide range of interchangeability
  (MIL Spec DIN type connector terminal 25 pin.)
- Quick wiring permits ease of installation.

**NVV5FR4** — **01F**

**Series NVFR4000**
Manifold valve

**Plug-in type**
With D-sub connector

**Mounting direction of connector**
- D: D side mounting
- U: U side mounting

**Stations**
- 02: 2 stations
- 08: 8 stations
  - Max: 8 stations

**Symbols**
- P, EA, EB: A, B
- 03T: 1/2 NPTF
- 04T: 3/8 NPTF

---

**Port size**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Port specifications</th>
<th>Porting specifications (A, B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P, EA, EB</td>
<td>A, B</td>
<td></td>
</tr>
<tr>
<td>03T</td>
<td>1/2 NPTF</td>
<td>3/8 NPTF</td>
</tr>
<tr>
<td>04T</td>
<td>3/8 NPTF</td>
<td>3/8 NPTF</td>
</tr>
</tbody>
</table>

---

**Note:** Bottom porting: 1/4 only
Series NVFR4000: Base Mounted Type

Plug-in Type: Serial Interface Manifold

NVV5FR4 — 01SU — 08 1 — 02T — X200

Stations
02 2 stations
11 11 stations
* Includes 1 station to mount SI unit.

Symbol

Port specifications
P EA, EB Porting specifications (A,B)
1 Common Common Side
x 2 Common Common Bottom

* SI option
- For standard **1 type modules
  X200 For AB2 modules
  * SI module must be ordered separately

The use of serial interface technology offers advantages such as reduced wiring, quicker installation time, easier start-up and simplified maintenance.

Symbol: Port size

Port size
Symbol P, EA, EB A, B
03T ½ NPTF ½ NPTF
04T ½ NPTF ½ NPTF

Series IN313 Serial Interface Modules

IN313 — AB 1

Protocol
AB Allen Bradley
DN DeviceNet
MB Mitsubishi
PR Profinet
TA Omron

Output/Inputs

1 16 outputs
2 32 outputs/32 inputs
(Available on Allen Bradley only)

AB2 Accessories

<table>
<thead>
<tr>
<th>Part #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VVZR3000-21A-6-X2</td>
<td>D-sub cable with connectors on both ends.</td>
</tr>
<tr>
<td>EX300-IB1-AB</td>
<td>Input Base Unit</td>
</tr>
<tr>
<td>EX300-IE1-AB</td>
<td>Input Expander Unit</td>
</tr>
</tbody>
</table>
**Series NVFR4000: Base Mounted Type**

**Construction/Parts List**

**Main 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 diecast</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>2</td>
<td>Subplate</td>
<td>Aluminum diecast</td>
<td>Platinum silver</td>
</tr>
<tr>
<td>3</td>
<td>Spool</td>
<td>Aluminum/NBR</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Adapter plate</td>
<td>Aluminum diecast</td>
<td>Black</td>
</tr>
</tbody>
</table>

**Spare Parts**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Part Nos.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gasket</td>
<td>NBR</td>
<td>VF4000-20</td>
</tr>
<tr>
<td>2</td>
<td>Valve mounting bolt</td>
<td>Steel</td>
<td>AXT335-1-11 (M4X40)</td>
</tr>
<tr>
<td>3</td>
<td>Pilot Ass'y</td>
<td>—</td>
<td>SF4- <strong>F</strong> -70</td>
</tr>
</tbody>
</table>

Note: The diagrams show the assembly and component parts of NVFR4000 series valves, with labels indicating positions and materials. The tables list main and spare parts with their respective materials and part numbers.
Series NVFR4000: Base Mounted Type

Plug-in type 2 Position Single, Double, 3 Position/Dimensions

2 position single: NVFR4100-OF

2 position double: NVFR4200-OF
3 position closed center: NVFR4300-OF
3 position exhaust center: NVFR4400-OF
3 position pressure center: NVFR4500-OF

With indicator light and surge voltage suppressor

Pilot operator manual override

Bottom Ported

With 3/8 NPTF 5 port (EA, EB: 3/8 NPTF)
Series NVFR4000: Base Mounted Type

Non Plug-in type: 2 position Single, Double, 3 position/Dimensions

2 position single: NVFR4110-0E, NVFR4110-0D

2 position double: NVFR4210-0E, NVFR4210-0D

3 position closed center: NVFR4310-0E, NVFR4310-0D

3 position exhaust center: NVFR4410-0E, NVFR4410-0D

3 position pressure center: NVFR4510-0E, NVFR4510-0D
Series NVFR4000: Base Mounted Type

Manifold Plug-in Type/Non Plug-in Type/Dimensions

Plug-in type (with terminal block): NVV5FR4-01T

Non plug-in type: NVV5FR4-10

Bottom porting

<table>
<thead>
<tr>
<th>Station</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>L1</td>
<td>6.14</td>
<td>7.83</td>
<td>9.53</td>
<td>11.22</td>
<td>12.91</td>
<td>14.61</td>
<td>17.99</td>
<td>19.69</td>
<td>L1 = 1.69n + 2.76</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(156)</td>
<td>(199)</td>
<td>(242)</td>
<td>(285)</td>
<td>(328)</td>
<td>(371)</td>
<td>(457)</td>
<td>(500)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L2</td>
<td>8.61</td>
<td>10.00</td>
<td>11.69</td>
<td>13.39</td>
<td>15.08</td>
<td>16.77</td>
<td>18.46</td>
<td>20.16</td>
<td>L2 = 1.69n + 3.23</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(168)</td>
<td>(254)</td>
<td>(297)</td>
<td>(340)</td>
<td>(383)</td>
<td>(426)</td>
<td>(469)</td>
<td>(512)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Series NVFR4000: Base Mounted Type

Manifold/Option Parts

**SUP Relocation spacer**
An individual SUP spacer on manifold block can form individual P port for the 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>NVFS4000-03T-1</td>
<td>NVFS4000-03T-2</td>
</tr>
</tbody>
</table>

**EXH gallery block disc**
When valve exhaust affects the other stations on the circuit or when the reverse pressure valve is used on a standard manifold, insert EXH block disc(s) 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>Parts No.</td>
<td>AXT634-11A</td>
<td></td>
</tr>
</tbody>
</table>

**EXH Relocation spacer**
An individual EXH spacer on manifold block can form individual R port for the 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>NVFS4000-04T-1</td>
<td>NVFS4000-04T-2</td>
</tr>
</tbody>
</table>

**Interface speed control**
Needle valve 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>

**SUP gallery block disc**
When supplying manifold with more than one pressure, insert block disc 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>AXT634-10A</td>
<td></td>
</tr>
</tbody>
</table>

**Interface regulator**
Spacer type regulating valve on manifold block can regulate the pressure to the valve.

With std. gauge.

<table>
<thead>
<tr>
<th>Body type</th>
<th>Plug-in type</th>
<th>Non plug-in type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure regulation P</td>
<td>NARBF3050-N0-P-1</td>
<td>NARBF3050-N0-P-2</td>
</tr>
<tr>
<td>Pressure regulation B</td>
<td>NARBF3050-N0-B-1</td>
<td>NARBF3050-N0-B-2</td>
</tr>
</tbody>
</table>

Note: For pressure center type valves, use pin NARBF3000.

**Blank plate: VVFS4000-10A**
When disassembling valve for maintenance purposes or when spare manifold stations are required, install Blank plate on the manifold block.

<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>

SUP block disc

EXH block disc

EXH block disc
Series NVFR4000: Base Mounted Type

**Manifold/Option Parts Plug-in Type/Non plug-in Type/Dimensions**  
inch (mm)

### SUP Relocation spacer

- SUP gallery block disc: AXT634-10A
- EXH gallery block disc: AXT634-11A

### EXH Relocation spacer

- Individual EXH spacer
- Individual EXH ø5 (ø12.7) with direct manual override

### Interface regulator/regulation to P

- NARBF4050-N0-P-1 (Plug-in type)
- NARBF4050-N0-P-2 (Non plug-in type)

### Interface regulator/regulation to A

- NARBF4050-N0-A-1 (Plug-in type)
- NARBF4050-N0-A-2 (Non plug-in type)

### Interface regulator/regulation to B

- NARBF4050-N0-B-1 (Plug-in type)
- NARBF4050-N0-B-2 (Non plug-in type)

*Gauge nipple size may vary slightly.*
Series NVFR4000: Base Mounted Type

Manifold Base/Construction Plug-in Type/Non plug-in Type

Parts List

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Parts No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Metal clamp A</td>
<td>Steel</td>
<td>VFFS4000-5-2A</td>
</tr>
<tr>
<td>2</td>
<td>Metal joint B</td>
<td>Steel</td>
<td></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>O-ring</td>
<td>NBR</td>
<td>A5568-001</td>
</tr>
<tr>
<td>6</td>
<td>O-ring</td>
<td>NBR</td>
<td>A5568-006</td>
</tr>
<tr>
<td>7</td>
<td>Terminal ass'y</td>
<td>—</td>
<td>VVF4000-6A</td>
</tr>
<tr>
<td>8</td>
<td>Conduit cover ass'y</td>
<td>—</td>
<td>VFFS4000-4A* stations</td>
</tr>
</tbody>
</table>

Note) Manifold Base/Construction shown: Plug-in type with terminal block.

Note) NVFR/NVFS Series manifolds are constructed using the same parts

Main Parts sub-ass'y

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Part No.</th>
<th>Note</th>
<th>Component parts</th>
<th>Applicable valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Manifold block</td>
<td>MBF4610-0-1</td>
<td></td>
<td>Manifold block, Terminal, Metal joint/clamp, Gasket, O-ring, Receptacle ass'y</td>
<td>Plug-in type</td>
</tr>
<tr>
<td></td>
<td>ass'y</td>
<td>MBF4611-03-1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MBF471-0-1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>End plate (kit)</td>
<td>MEF463LR-04-1</td>
<td></td>
<td>End plate (U), End plate (D), Metal joint/clamp, Gasket, O-ring</td>
<td>Plug-in type</td>
</tr>
<tr>
<td></td>
<td>ass'y</td>
<td>MEF473LR-04-1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Subplate ass'y</td>
<td>SPF038-0-D</td>
<td></td>
<td>Subplate (see note below)</td>
<td>Plug-in type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SPF037-27</td>
<td></td>
<td></td>
<td>Non plug-in type</td>
</tr>
</tbody>
</table>

Note) Manifolds: 0=side ports; 1=bottom ports. Subplate: 1=side ports; 2=bottom ports (3/8" only).
All bases: 03=3/8" NPTF; 04=1/2" NPTF.

†External pilot type order SPF03* R-**
**Operational Guide For Series NVFR**

**Light/Surge Voltage Surge Suppressor/Electrical Entry**

### Base Mounted Type (NVFR2000 only)

#### Light/Surge Voltage Suppressor

- In the case of surge voltage suppressor, voltage absorption element ZNR is attached to AC power.
- A directional diode is attached for DC power. (24 VDC or less)

**AC and 100VDC**

**Single**

**Double**

**24VDC or less**

**Single**

**Double**

### Base Mounted Types (NVFR3/4000)

#### Light/Surge Voltage Suppressor

In the case of Voltage suppressor, surge voltage adsorption element is attached to terminal block board on body area.

### Valve Removal/Replacement

**Solenoid valve**

- Loosen set screw and pull solenoid valve out vertically to avoid damage. Never remove valve at an angle.

**Pilot operator**

- When mounting pilot operator to the valve, plug pin ass'y (valve side) into receptacle ass'y vertically.
Operational Guide For Series NVFR

**Electrical Entry**

**DIN connector type**

- Male pin terminals of DIN connector type solenoid valves are wired as shown below.
- Connect wires to corresponding terminal on the connector.

**DIN connector (Wiring)**

<table>
<thead>
<tr>
<th>Terminal</th>
<th>A side</th>
<th>B side</th>
<th>COM</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>
</tr>
</tbody>
</table>

- (+,-) indicate the direction of DC Solenoid valve with light, surge voltage suppressor. NVFS valves can be used negative (-) COM.

**AC and 100VDC or more**

- Single
- Double

**24VDC or less**

- Single
- Double

**Plug-in type (with terminal)**

- Remove the junction cover on the subplate to expose the plug-in valve terminal block attached to the interior of subplate.
- The following are the markings on the terminal block. Connect with corresponding power side.

<table>
<thead>
<tr>
<th>Designation</th>
<th>Solenoid A side</th>
<th>Solenoid B side</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal block</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Marking</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

- (+,-) indicate the direction of DC solenoid valve with light or with surge voltage suppressor.
- However reverse direction wiring is also possible in some cases.

**When using COM terminal, jumper contacts (Part No. AZ683-56A (NVFR3000); AZ683-56A (NVFR4000) allow easy specification of stations COM.**

**Non plug-in type (with terminal)**

- Remove cover over terminal block attached to the inside of body. Connect with corresponding power supply. (See diagram below.)

**Applicable terminal**

- NVFR3000: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S
- NVFR4000, 5000: 1.25-3.5M, 1.25Y-3L, 1.25Y-3M
- (+,-) indicate the direction of DC solenoid valve with light or with surge voltage suppressor.

Cable

- Applicable cable O.D.: 0.27 (6.8) Dia - 0.45 (11.5) Dia
- Applicable terminal
- Applicable terminal on block board: (3 kinds)
  - 1.25Y-3L, 1.25-3.5S, 1.25-4M (1.25mm centers)
  - (spade or ring type, size 4, 22-16 AWG)
- Connector/Clamping torque
  - Set screw (5.2 in-lbs)
  - Terminal screw (7.8 in-lbs)
- Incorrect common (DIN connector terminal No. 3) causes damage on power side circuit.
Operational Guide For Series NVFR

Lead Wire/ Wiring Manifold/ Plug-in Type

Type 01 Insert Plug Type Lead Wires

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 in the C→O direction (closed-to open) 90 degrees. While holding the knob and upper part of junction cover, pull outward to remove it. When reassembling, do the opposite.

Wiring

The connector plug 1 is inserted into the manifold block and lead wires are connected with valve side as shown in the following list. Please connect with corresponding power supply.

**AC power/Lead wire color identification**

<table>
<thead>
<tr>
<th>Solenoid</th>
<th>A side</th>
<th>B side</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead wire color</td>
<td>Red, Black</td>
<td>Brown, White</td>
</tr>
</tbody>
</table>

**DC power/Lead wire color identification**

<table>
<thead>
<tr>
<th>Solenoid</th>
<th>A side</th>
<th>B side</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead wire color</td>
<td>Red</td>
<td>Black</td>
</tr>
</tbody>
</table>

- When ground wiring is required, use green wire.
- (+,−) indicate the wiring polarity of solenoid valve with light, surge voltage suppressor.

How to Use Connector Plug

- When removing plug 1 from manifold base, push the lever area 2 of plug downward with thumb and pull it out together with the lead wires 3 .

Type 01T With Terminal Block

- Remove junction cover of manifold to expose terminal block attached to the manifold block. Lead wires from solenoid valve are connected with the terminals on the upper side of the terminal block.
- Connect lead wires of power supply corresponding to each respective solenoid valve on the lower terminal block board.
- Terminal block wiring specification is in accordance with +COM. Please consult SMC about specifying −COM.

**Terminal block marking**

<table>
<thead>
<tr>
<th>Model</th>
<th>A−</th>
<th>COM+</th>
<th>B−</th>
</tr>
</thead>
<tbody>
<tr>
<td>NVFR 100</td>
<td>A−</td>
<td>COM+</td>
<td></td>
</tr>
<tr>
<td>NVFR 200</td>
<td>A−</td>
<td>COM+</td>
<td>B−</td>
</tr>
<tr>
<td>NVFR 300</td>
<td>A−</td>
<td>COM+</td>
<td>B−</td>
</tr>
</tbody>
</table>

- Recommended terminals NVFR 2000, 3000: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3M (1.25mm centers) (spade type, size 4, 22-16 AWG).
- NVFR4000: 1.25-3.5M, 1.25Y-3L, 1.25Y-3S.
- Plugging COM bridge in between each + COM on the block boards will make the specifications of all the stations +COM and enables you to rationalize the wiring process. (+,−) indicates the polarity of DC solenoid valve with light/surge voltage suppressor.

**COM bridge part nos.:**

- NVFR 2000: AXT625-73
- NVFR 3000: AZ683-56A
- NVFR 4000: AZ683-56A
Precautions

Piping

1. Use appropriate I.D. piping.
2. Before piping, flush out to remove dust, scale, chips, seal tape, etc. in the pipeline both on the supply side (supply pressure port side) and secondary side (operational equipment port side).
3. In the case of 3 position closed center valve, check leakage from piping and fittings between the valve and cylinder by means of soapy water to ensure that there is no leakage. Also, check the leakage from cylinder rod seal and piston seal. If there is any leakage, sometimes the cylinder, when valve is deenergized, can move without stopping at mid-position. Therefore, leakage from piping and fittings should be avoided.
4. When applying teflon sealing tape to the thread area, wind it around the thread area 1-2 times and fasten it with finger nail. Be sure the thread extends one or two screw pitches beyond the tapered area. Also, when applying liquid seal materials, leave 1-2 threads from the end dry, and avoid over-application.

Never apply to the female side of the equipment.

Clamping torque

<table>
<thead>
<tr>
<th>Thread</th>
<th>Correct clamping torque inch-lbs (kgf/cm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-32</td>
<td>Nom (M5)</td>
</tr>
<tr>
<td>13.0-17.3 (15-20)</td>
<td></td>
</tr>
<tr>
<td>1/8 NPTF</td>
<td>60.7-78.0 (70-90)</td>
</tr>
<tr>
<td>1/4 NPTF</td>
<td>104-121 (120-140)</td>
</tr>
<tr>
<td>3/8 NPTF</td>
<td>190-224 (220-240)</td>
</tr>
<tr>
<td>1/2 NPTF</td>
<td>242-260 (280-300)</td>
</tr>
<tr>
<td>3/4 NPTF</td>
<td>242-260 (280-300)</td>
</tr>
</tbody>
</table>

Mounting

Single-acting valves can be mounted in any direction. In the case of a double solenoid valve or 3 position valve in a place subject to vibration, the valve should be aligned perpendicular to the vibration. (Never use in a vibration condition of more than 5G.)

Environmental Conditions

1. When the valve is installed in a dusty area, protect the cylinder rod area to prevent dust from entering the secondary piping via the rod area. Install a silencer or elbow fitting with its outlet downwards to prevent dust from entering the exhaust port of the valve.
2. When used in environmental conditions such as corrosive gas, chemicals or chemical solutions, steam, sea water, or temperatures higher than 140°F (60°C), etc., contact the SMC factory.

Lubrication

Valves are pre-lubricated. No further lubrication is necessary.
If a lubricant is used (if required for cylinder, etc.), install lubricator in the supply side piping.
Also, please note that the recommended lubricant is turbine oil #1 (ISO VG32). (Never use spindle oil or machine oil.) In addition, when valve is used at low temperature, low temperature oil should be used. The use of turbine oil at temperatures lower than 32°F (0°C) leads to increased viscosity and causes the valve to malfunction.

Leakage Voltage

It must be noted that in case of connecting C-R element parallel to switching element, leakage current flows through C-R element and the leak voltage increases.

Ensure that any voltage leakage across the coil is as follows:
AC coil: No more than 20% of the rated voltage
DC coil: No more than 3% of the rated voltage

Maintenance

1. Excessive carbon powder and oil waste from air source (mostly from compressor) entering into the valve can lead to increased spool seal resistance and cause valve malfunction.
In the worst case the spool can adhere to the valve. It is important to check the quality of air often.
Please note that if SUP pressure is left under pressurization for a long time with inferior quality air, carbon powder and oil waste in the compressed air can deposit in the clearance between the spool and sleeve, build up, and cause the spool to adhere to the valve.
To remedy this case, check the compressor oil and use the appropriate least oxidizing compressor oil.
A high filtration Mist Separator (Series NAFM) installed behind a regular filter (Series NAF) can prevent foreign particles from entering the valve.
2. If waste from air source adheres to spool and sleeve, disassemble adaptor plate area and end plate area (return spring insert area). Remove spool and sleeve from valve and clean them with trichlorane or freon solutions. When cleaning, prevent O-rings from contacting cleaning solutions. Be sure to keep each spool and sleeve assembly paired.
3. When disassembling and re-assembling, please ensure that all components are in their proper positions. Prevent gaskets from slipping, and tighten bolts equally.

Operational Guide For Series NVFR
**Operation Guide For Series NVFR**

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**Type 01C With Multi-Connector**

- Series VFR2000, 3000, 4000, 5000
  - The use of multi-connector in wiring enables mass-termination between the power supply and solenoid valves, and leads to the elimination of wiring labor.
  - Manifold interior wiring is in accordance with +COM specifications and is connected with both A side and B side of solenoid valve through means of receptacle terminal as shown below.

---

**Manifold Interior Wiring**

---

**Type 01F With D Sub Connector**

- Series VFR2000, 3000, 4000, 5000
  - The use with D sub connector when wiring enables the elimination of wiring labor.
  - Also connectors with MIL Specification DIN type connector (terminal 25 pcs) provides them with a wide range of interchangeability.
  - Manifold interior wiring is in accordance with +COM specifications and is connected with both A side and B side of solenoid valve through the receptacle terminal as shown below.

---

**Manifold Interior Wiring**

---

**Compatible Plug Ass'y (Option)**

- **Ass'y No.**: VVFR2000-30A-1
  - **Cable length**: 1.5m
  - **Components**: Plug-206837...1 pc
- **Ass'y No.**: VVFR2000-30A-2
  - **Cable length**: 3m
  - **Components**: Cable clamp 206126...1 pc, Socket 66105-2...24 pcs.
- **Ass'y No.**: VVFR2000-30A-3
  - **Cable length**: 5m
  - **Components**: Nippon AMP's cable VCTF 24 pcs x 0.75mm²
- **Ass'y No.**: VVFR2000-30A-4
  - **Cable length**: 7m

---

**Compatible Plug Ass'y (Option)**

- **Ass'y No.**: VVFR2000-21A-1
  - **Cable length**: 1.5m
  - **Components**: Plug-206837...1 pc
- **Ass'y No.**: VVFR2000-21A-2
  - **Cable length**: 3m
  - **Components**: Cable clamp 206138-1...1 pc, Socket 66105-2...24 pcs.
- **Ass'y No.**: VVFR2000-21A-3
  - **Cable length**: 5m
  - **Components**: Nippon AMP's cable VCTF 24 pcs x 0.75mm²
- **Ass'y No.**: VVFR2000-21A-4
  - **Cable length**: 8m

---

**Wire Color Table by Terminal Number of Cable**

<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>Black</td>
<td>Green</td>
<td>Red</td>
<td>Red</td>
<td>Blue</td>
<td>Blue</td>
<td>Blue</td>
<td>Yellow</td>
<td>Yellow</td>
<td>Yellow</td>
<td></td>
</tr>
<tr>
<td>Dot marking</td>
<td>Blue</td>
<td>White</td>
<td>White</td>
<td>Blue</td>
<td>White</td>
<td>Blue</td>
<td>White</td>
<td>Blue</td>
<td>Blue</td>
<td>Blue</td>
<td></td>
<td></td>
</tr>
</tbody>
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---

**Wire Color Table by Terminal Number of Cable**

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<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>Black</td>
<td>Brown</td>
<td>Red</td>
<td>Orange</td>
<td>Yellow</td>
<td>Pink</td>
<td>Blue</td>
<td>Violet</td>
<td>Gray</td>
<td>White</td>
<td>White</td>
<td>Yellow</td>
</tr>
<tr>
<td>Dot marking</td>
<td>Black</td>
<td>Black</td>
<td>Black</td>
<td>Blue</td>
<td>Blue</td>
<td>Blue</td>
<td>Blue</td>
<td>Blue</td>
<td>Blue</td>
<td>Blue</td>
<td>Blue</td>
<td>Blue</td>
</tr>
</tbody>
</table>

---

(Note 1) Maximum station: 8
(Note 2) (+) and (-) indicate the direction of DC solenoid valve with light, surge voltage suppressor.
(Note 3) Series VFS3000—COM is also possible
**HOW TO ORDER MANIFOLD ASSEMBLIES**

1) Begin the manifold specification process from the LEFT going to the right facing the 'B' end of the valves (and the cylinder ports normally). The first valve on the left is considered Station #1.

2) For each station, specify the valve model number (or blank station kit no.), interface accessories if desired, and lastly, gallery blocking discs if desired. (Blocking discs will be placed between this station and the next one).

3) For identical stations in sequence, specify these at the same time. However, they must be in sequence to avoid confusion.

4) The last specification for the assembly is the manifold base. Specify the entire part number below the last station section. If the manifold is a complex assembly or mixture of block types, please refer carefully to the examples below and specify similarly.

### Example Manifold Assembly Orders:

#### Standard Configuration Manifold:

<table>
<thead>
<tr>
<th>LINE ITEM</th>
<th>QTY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Four Station Manifold Ass'y as follows:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sta. 1) NVFR3100-5FZ</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sta. 2) NVFR3200-5FZ</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NARBF3000-00-P-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VVFS3000-20A-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AXT636-1A (P gallery)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sta. 3-4) NVFR3110-5FZ</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NVV5FR3-01T-041-03T</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See Note 1)</td>
</tr>
</tbody>
</table>

#### Mixed Configuration Manifold:

<table>
<thead>
<tr>
<th>LINE ITEM</th>
<th>QTY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Six Station Manifold Ass'y as follows:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sta. 1) NVFR2110-3G</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sta. 2-6) NVFR2210-3G</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NVV5FR2-10-06M-02T</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mix: sta. 1) 1/4 side</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sta. 2-6) 1/8 bottom</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See Note 2)</td>
</tr>
</tbody>
</table>

#### Mixed Configuration Manifold:

<table>
<thead>
<tr>
<th>LINE ITEM</th>
<th>QTY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>Four Station Manifold Ass'y as follows:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sta. 1-4) NVFR4100-3FZB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NVV5FR4-01T-041-M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mix: sta. 1-2) 3/8 side</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sta. 3-4) 1/2 side</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See Note 3)</td>
</tr>
</tbody>
</table>

**Note 1)** Indicate gallery for all blocking discs (P, EA, or EB), or any combination.

**Note 2)** "02T" for manifold number is always side port size unless manifold is exclusively bottom-ported.

**Note 3)** If mixture is both port size and location, follow this example: NVV5FR3-01T-041M-M; then specify individually. (See note 2.)
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- Rodless Cylinders
- Rotary Actuators
- Pneumatic Grippers

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- Coalescing Filters
- Micro Mist Separators

Fittings
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- Air Fittings

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