

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

## Series VFS2000



### Model

| Type of<br>actuation |                    | Model   |             | Port<br>size<br>Rc | Flow characteristics |      |      |                        |      |      | Max. <sup>(1)</sup><br>operating<br>cycle<br>cpm | Response <sup>(2)</sup><br>time<br>(ms) | Mass <sup>(3)</sup><br>(kg) |
|----------------------|--------------------|---------|-------------|--------------------|----------------------|------|------|------------------------|------|------|--------------------------------------------------|-----------------------------------------|-----------------------------|
|                      |                    | Plug-in | Non plug-in |                    | 1 → 4/2(P → A/B)     |      |      | 4/2 → 5/3(A/B → R1/R2) |      |      |                                                  |                                         |                             |
|                      |                    |         |             |                    | C<br>[dm³/(s·bar)]   | b    | Cv   | C<br>[dm³/(s·bar)]     | b    | Cv   |                                                  |                                         |                             |
| 2 position           | Single             | VFS2100 | VFS2110     | 1/8                | 2.4                  | 0.16 | 0.55 | 2.8                    | 0.20 | 0.65 | 1200                                             | 15 or less                              | 0.34                        |
|                      |                    |         |             | 1/4                | 2.5                  | 0.18 | 0.58 | 2.8                    | 0.21 | 0.65 |                                                  |                                         |                             |
|                      | Double             | VFS2200 | VFS2210     | 1/8                | 2.4                  | 0.16 | 0.55 | 2.8                    | 0.20 | 0.65 | 1200                                             | 13 or less                              | 0.42                        |
|                      |                    |         |             | 1/4                | 2.5                  | 0.18 | 0.58 | 2.8                    | 0.21 | 0.65 |                                                  |                                         |                             |
| 3 position           | Closed<br>center   | VFS2300 | VFS2310     | 1/8                | 2.3                  | 0.14 | 0.53 | 2.6                    | 0.20 | 0.61 | 600                                              | 20 or less                              | 0.43                        |
|                      |                    |         |             | 1/4                | 2.5                  | 0.18 | 0.58 | 2.6                    | 0.23 | 0.62 |                                                  |                                         |                             |
|                      | Exhaust<br>center  | VFS2400 | VFS2410     | 1/8                | 2.4                  | 0.15 | 0.54 | 2.7                    | 0.25 | 0.63 | 600                                              | 20 or less                              | 0.43                        |
|                      |                    |         |             | 1/4                | 2.5                  | 0.20 | 0.60 | 2.7                    | 0.24 | 0.63 |                                                  |                                         |                             |
|                      | Pressure<br>center | VFS2500 | VFS2510     | 1/8                | 2.5                  | 0.11 | 0.55 | 2.7                    | 0.20 | 0.62 | 600                                              | 20 or less                              | 0.43                        |
|                      |                    |         |             | 1/4                | 2.8                  | 0.17 | 0.63 | 2.7                    | 0.22 | 0.63 |                                                  |                                         |                             |
|                      | Double<br>check    | VFS2600 | VFS2610     | 1/8                | 1.2                  | —    | —    | 1.3                    | —    | —    | 600                                              | 25 or less                              | 0.6                         |
|                      |                    |         |             | 1/4                | 1.2                  | —    | —    | 1.3                    | —    | —    |                                                  |                                         |                             |

Note 1) Based on JIS B 8375 (Once per 30 days) for the minimum operating frequency. Note 2) Based on JIS B 8375-1981 (The value at supply press. 0.5 MPa).  
Note 3) Values for VFS2□00-□FZ-01. Note 4) Factors of "Note 1)" and "Note 2)" are ones achieved in controlled clean air.

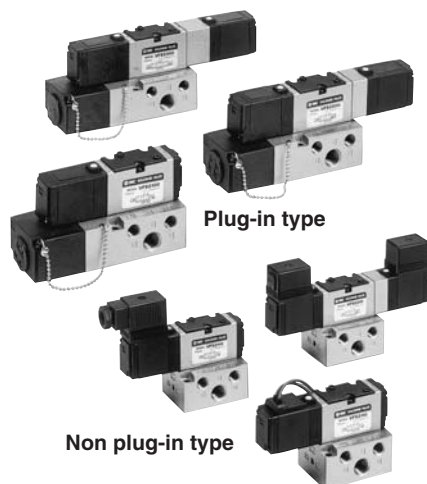
**Compact yet provides a large flow capacity**  
1/4: C: 2.8 dm<sup>3</sup>/(s·bar)

**Low power consumption: 1.8 W DC**

**Easy maintenance**

2 types of sub-plates:

Plug-in and non plug-in



### Standard Specifications

| Valve specifications       | Fluid                                    |            | Air/Inert gas                                                                         |                                |
|----------------------------|------------------------------------------|------------|---------------------------------------------------------------------------------------|--------------------------------|
|                            | Maximum operating pressure               |            | 1.0 MPa                                                                               |                                |
|                            | Min. operating pressure                  | 2 position | 0.1 MPa                                                                               |                                |
|                            |                                          | 3 position | 0.15 MPa                                                                              |                                |
|                            | Proof pressure                           |            | 1.5 MPa                                                                               |                                |
|                            | Ambient and fluid temperature            |            | -10 to 60°C <sup>(1)</sup>                                                            |                                |
|                            | Lubrication                              |            | Non-lube <sup>(2)</sup>                                                               |                                |
|                            | Pilot valve manual override              |            | Non-locking push type (Flush)                                                         |                                |
|                            | Shock/Vibration resistance               |            | 150/50 m/s <sup>2</sup> <sup>(3)</sup>                                                |                                |
|                            | Enclosure                                |            | Type G, E: Dustproof (Class 0),<br>Type F, T, D: Splashproof (Class 4) <sup>(4)</sup> |                                |
| Electricity specifications | Coil rated voltage                       |            | 100, 200 VAC, 50/60 Hz; 24 VDC                                                        |                                |
|                            | Allowable voltage fluctuation            |            | -15 to +10% of rated voltage                                                          |                                |
|                            | Coil insulation type                     |            | Class B or equivalent (130°C) <sup>(5)</sup>                                          |                                |
|                            | Apparent power<br>(Power consumption) AC | Inrush     | 5.6 VA/50 Hz, 5.0 VA/60 Hz                                                            |                                |
|                            |                                          | Holding    | 3.4 VA (2.1 W)/50 Hz, 2.3 VA (1.5 W)/60 Hz                                            |                                |
|                            | Power consumption DC                     |            | 1.8 W (2.04 W: With light/surge voltage suppressor)                                   |                                |
|                            | Electrical entry                         |            | Plug-in type                                                                          | Conduit terminal               |
|                            |                                          |            | Non plug-in type                                                                      | Grommet terminal, DIN terminal |

Note 1) Use dry air at low temperatures.  
Note 2) Use turbine oil Class 1 (ISO VG32), if lubricated.  
Note 3) Impact resistance: No malfunction occurred when it is tested with a drop 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)  
Note 4) Based on JIS C 920. Note 5) Based on JIS C 4003.

### JIS Symbol

| 2 position | 3 position      |
|------------|-----------------|
| Single     | Closed center   |
| Double     | Exhaust center  |
|            | Pressure center |
|            | Double check    |

### Option Specifications

| Pilot type             | External pilot <sup>(Note)</sup>                                                     |
|------------------------|--------------------------------------------------------------------------------------|
| Manual override        | Non-locking push type (Extended), Locking type (Tool required), Locking type (Lever) |
| Coil rated voltage     | 110 to 120, 220, 240 VAC, 50/60 Hz<br>12, 100 VDC                                    |
| Porting specifications | Bottom ported                                                                        |
| Option                 | With light/surge voltage suppressor                                                  |

Note) Operating pressure: 0 to 1.0 MPa  
Pilot pressure 2 position: 0.1 to 1.0 MPa 3 position: 0.15 to 1.0 MPa

### Compact, lightweight type sub-plate

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

| Sub-plate     | L<br>(mm) | Mass<br>(kg) | Sonic conductance *<br>C [dm <sup>3</sup> /(s·bar)] |
|---------------|-----------|--------------|-----------------------------------------------------|
| Standard type | 31.0      | 0.2          | 2.2                                                 |
| Compact type  | 25.5      | 0.13         | 2.8                                                 |

\* 2 position single Rc 1/4

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## How to Order



With attachment plug lead wire



With terminal block

**Porting specifications**

|     |               |
|-----|---------------|
| Nil | Side ported   |
| B*  | Bottom ported |

\* Option

**Option**

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

**Body type**

O: Plug-in type sub-plate

**Electrical entry**

F: Plug-in type

**Port size**

| Nil | Without sub-plate                                                            |
|-----|------------------------------------------------------------------------------|
| 01  | Rc 1/8<br>Plug-in type conduit terminal (With terminal block) Standard type  |
| 02  | Rc 1/4<br>Plug-in type grommet (With attachment plug lead wire) Compact type |

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

**Thread type**

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

\* Option

**Plug-in**

VFS2 2 00 - 5 F - 01

**Non plug-in**

VFS2 2 10 - 1 E - 02

**Symbol**

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

**Body type**

1: Non plug-in type sub-plate

**Pilot type**

|     |                |
|-----|----------------|
| Nil | Internal pilot |
| R*  | External pilot |

\* Option: External pilot is possible only to the one with sub-plate.

**Coil rated voltage**

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

\* Option

**Pilot valve manual override**

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

\* Option

**Option**

|     |                                     |
|-----|-------------------------------------|
| Nil | None                                |
| Z   | With light/surge voltage suppressor |
| S*  | With surge voltage suppressor       |

\* Grommet type is available only w/ surge voltage suppressor, not w/ indicator light.

**Electrical entry**

|            |                     |                     |                    |
|------------|---------------------|---------------------|--------------------|
| G: Grommet | E: Grommet terminal | T: Conduit terminal | D, Y: DIN terminal |
|------------|---------------------|---------------------|--------------------|

## How to Order Pilot Valve Assembly

SF4 - 1 DZ - 20

**Coil rated voltage**

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

\* Option

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

|     |                                                   |             |
|-----|---------------------------------------------------|-------------|
| F   | Plug-in                                           | Plug-in     |
| G   | Grommet                                           | Non plug-in |
| GS  | Grommet with surge voltage suppressor             |             |
| D   | DIN terminal                                      |             |
| DZ  | DIN terminal with light/surge voltage suppressor  |             |
| DO  | DIN terminal*                                     |             |
| DOZ | DIN terminal with light/surge voltage suppressor* |             |
| Y   | DIN terminal                                      |             |
| YZ  | DIN terminal with light/surge voltage suppressor  |             |

**Manual override**

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

\* Option

**YO** DIN terminal\*

**YOZ** DIN terminal with light/surge voltage suppressor\*

**T** Conduit terminal

**TZ** Conduit terminal with light/surge voltage suppressor

**E** Grommet terminal

**EZ** Grommet terminal with light/surge voltage suppressor

\* DIN connector is not attached.  
\*\* Refer to page 1223 for voltage conversion.  
D: Conforming to DIN43650 standard;  
Y: Conforming to DIN43650B standard