

# 5 Port Pilot Operated Solenoid Valve

## VFS1000/2000/3000/4000/5000/6000 Series

**Metal Seal**

### Series Variations

Series	Sonic conductance C [dm <sup>3</sup> /s·bar] 4/2 → 5/3(A/B → R1/R2)		Type of actuation	Voltage	Electrical entry		With light/surge voltage suppressor (Option)	Manual override	
	Single Double	3 position							
<b>Body Ported</b>	<b>VFS1000</b> (P.1114)	1.8	1.8	2 position single 	(Standard) 100 VAC, 50/60 Hz 200 VAC, 50/60 Hz 24 VDC	Grommet (G) 	Grommet terminal (E) 	<input type="checkbox"/> With light/surge voltage suppressor • Grommet terminal (EZ) • Conduit terminal (TZ) • DIN terminal (DZ)	Non-locking push type (Flush)
	<b>VFS2000</b> (P.1122)	3.4	3.4	2 position double  3 position closed center  3 position exhaust center 	(Option) 110 to 120 VAC, 50/60 Hz 220 VAC, 50/60 Hz 240 VAC, 50/60 Hz 12 VDC 100 VDC	Conduit terminal (T) 	DIN terminal (D) 	<input type="checkbox"/> With surge voltage suppressor • Grommet (GS)  Note) • Indicator light is not available for grommet type. Only surge voltage suppressor can be equipped on the middle of lead wire. • DC: There is polarity. (Lead wire Red: +, Black: -)	Non-locking push type (Extended)  Locking type (Tool required)
	<b>VFS3000</b> (P.1130)	6.8	6.5	3 position pressure center 					Locking type* (Lever)
<b>Base Mounted</b>	<b>VFS2000</b> Plug-in type Non plug-in type (P.1138)	2.8	2.7	2 position single  2 position double  3 position closed center  3 position exhaust center 	(Standard) 100 VAC, 50/60 Hz 200 VAC, 50/60 Hz 24 VDC	Plug-in Conduit terminal (F) 	Non plug-in Grommet terminal (E) 	<input type="checkbox"/> With light/surge voltage suppressor • Plug-in type Conduit terminal (FZ) • Non plug-in type Grommet terminal (EZ) Conduit terminal (TZ) DIN terminal (DZ)  <input type="checkbox"/> With surge voltage suppressor • Non plug-in type Grommet (GS)  Note) • Indicator light is not available for grommet type. Only surge voltage suppressor can be equipped on the middle of lead wire. • DC: There is polarity. (Lead wire Red: +, Black: -)	Non-locking push type (Flush)  Non-locking push type (Extended)
	<b>VFS3000</b> Plug-in type Non plug-in type (P.1162)	5.8	5.4	3 position pressure center 	(Option) 110 to 120 VAC, 50/60 Hz 220 VAC, 50/60 Hz 240 VAC, 50/60 Hz 12 VDC 100 VDC	Plug-in Conduit terminal (F) 		<input type="checkbox"/> With light/surge voltage suppressor • Plug-in type Conduit terminal (FZ) • Non plug-in type Grommet terminal (EZ) DIN terminal (DZ)	Locking type (Tool required)  Locking type (Lever)
	<b>VFS4000</b> Plug-in type Non plug-in type (P.1182)	12	11	3 position double check 		Non plug-in Grommet terminal (E) 	DIN terminal (D) 		
	<b>VFS5000</b> Plug-in type Non plug-in type (P.1202)	20	17						
	<b>VFS6000</b> Plug-in type Non plug-in type (P.1218)	38	—	2 position single  2 position double 		Plug-in Conduit terminal (F) 	Non plug-in Grommet terminal (E) 	DIN terminal (D) 	

\* Locking type (lever) is not available for body ported Series VFS2000/3000.

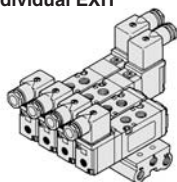
SJ  
SY  
SV  
SYJ  
SZ  
VP4  
S0700  
VQ  
VQ4  
VQ5  
VQC  
VQZ  
SQ  
VFS  
VFR  
VQ7

## Manifold Variations

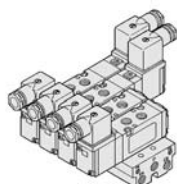
		Manifold						
		Bar base	Stacking base	With attachment plug lead wire	With terminal block	With multi-connector	With D-sub connector	Non plug-in (Connection to each valve)
Body Ported	VFS1000	● (P.1119)						
	VFS2000	● (P.1127)						
	VFS3000		● (P.1136)					
Base Mounted Plug-in Type	VFS2000			● (P.1146)	● (P.1146)	● (P.1146)	● (P.1146)	
	VFS3000				● (P.1168)	● (P.1168)	● (P.1168)	
	VFS4000				● (P.1188)	● (P.1188)	● (P.1188)	
	VFS5000				● (P.1208)	● (P.1208)	● (P.1208)	
Base Mounted Non Plug-in Type	VFS2000							● (P.1146)
	VFS3000							● (P.1168)
	VFS4000							● (P.1188)
	VFS5000							● (P.1208)

### Bar Base (Series VFS1000/2000)

Pilot individual EXH

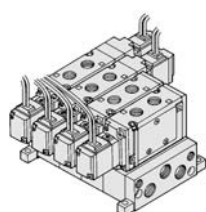


Pilot common EXH



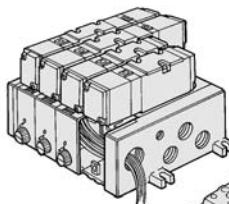
### Stacking base (Series VFS3000)

Pilot common EXH

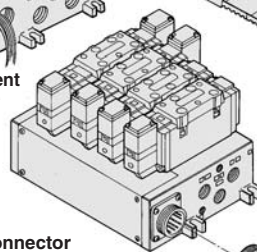


### Plug-in

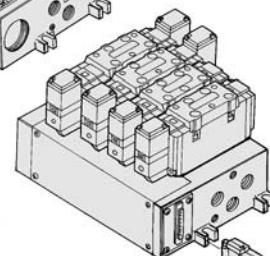
With terminal block



With attachment plug lead wire

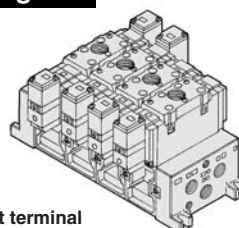


With multi-connector

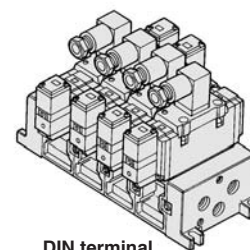


With D-sub connector

### Non Plug-in



Grommet terminal



DIN terminal



### Manifold Option

With exhaust cleaner  
With control unit  
Dripproof manifold (Equivalent to IP65)  
Serial transmission kit manifold (EX123/4-type compatible)

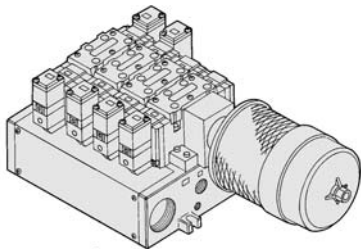
### Manifold Option Parts

Individual SUP spacer  
Individual EXH spacer  
SUP block disk  
EXH block disk  
Throttle valve spacer  
Interface regulator  
Air shutoff valve spacer  
Air release valve spacer  
Double check spacer  
Blanking plate

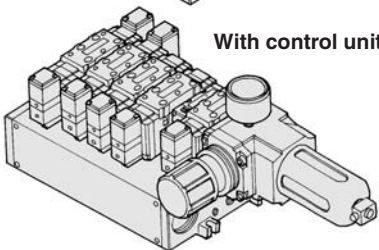
Manifold Option	Individual SUP spacer	Individual EXH spacer	SUP block disk	EXH block disk	Throttle valve spacer	Interface regulator	Air shutoff valve spacer	Air release valve spacer	Double check spacer	Blanking plate
										● (P.1119)
										● (P.1127)
										● (P.1136)
	● (P.1153)	● (P.1155) <small>Note)</small>	● (P.1158) <small>Note)</small>	● (P.1148)	● (P.1148)	● (P.1148)	● (P.1148)	● (P.1148)	● (P.1148)	● (P.1148)
● (P.1173)	● (P.1175)		● (P.1178) <small>Note)</small>	● (P.1170)	● (P.1170)	● (P.1170)			● (P.1170)	● (P.1170)
● (P.1193)	● (P.1195)		● (P.1198) <small>Note)</small>	● (P.1190)	● (P.1190)	● (P.1190)			● (P.1190)	● (P.1190)
● (P.1212)			● (P.1214) <small>Note)</small>	● (P.1209)	● (P.1209)	● (P.1209)			● (P.1209)	● (P.1209)
	● (P.1153)			● (P.1148)	● (P.1148)	● (P.1148)	● (P.1148)	● (P.1148)	● (P.1148)	● (P.1148)
● (P.1173)	● (P.1175)			● (P.1170)	● (P.1170)	● (P.1170)			● (P.1170)	● (P.1170)
● (P.1193)	● (P.1195)			● (P.1190)	● (P.1190)	● (P.1190)			● (P.1190)	● (P.1190)
● (P.1212)				● (P.1209)	● (P.1209)	● (P.1209)			● (P.1209)	● (P.1209)

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

With exhaust cleaner

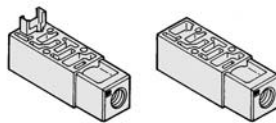


With control unit

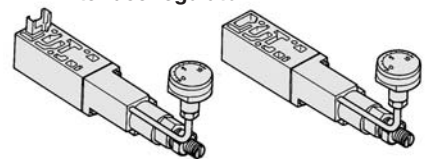


Dripproof Manifold (Equivalent to IP65)  
With serial transmission kit

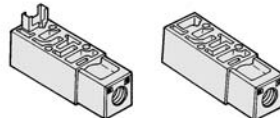
Individual SUP spacer



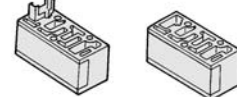
Interface regulator



Individual EXH spacer



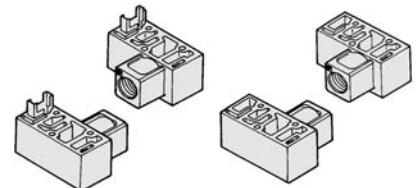
Air shutoff valve spacer



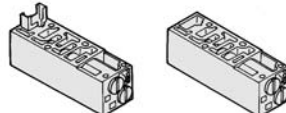
SUP/EXH block disk



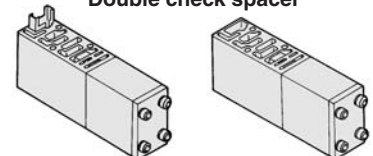
Air release valve spacer



Throttle valve spacer



Double check spacer



Note) Made to Order Specifications

# 5 Port Pilot Operated Solenoid Valve Metal Seal, Body Ported

## Series VFS1000

### Model

Type of actuation	Model		Port size	Flow characteristics						Max. operating cycle (cpm) <sup>(1)</sup>	Response time (ms) <sup>(2)</sup>	Mass (kg) <sup>(3)</sup>	
	Plug-in	Non plug-in		1 → 4/2 (P → A/B)			4/2 → 5/3 (A/B → R1/R2)						
				C [dm <sup>3</sup> /(s·bar)]	b	Cv	C [dm <sup>3</sup> /(s·bar)]	b	Cv				
2 position	Single	VFS1120	VFS1130	1/8	1.7	0.22	0.38	1.8	0.19	0.40	1200	15 or less	0.18
	Double	VFS1220	VFS1230	1/8	1.7	0.22	0.39	1.8	0.19	0.40	1200	13 or less	0.26
3 position	Closed center	VFS1320	VFS1330	1/8	1.6	0.20	0.37	1.8	0.20	0.41	600	20 or less	0.27
	Exhaust center	VFS1420	VFS1430	1/8	1.7	0.18	0.38	1.9	0.19	0.44	600	20 or less	0.27
	Pressure center	VFS1520	VFS1530	1/8	1.7	0.24	0.40	1.6	0.18	0.37	600	20 or less	0.27

- Note 1) Based on JIS B 8375 (once per 30 days) for the minimum operating frequency.  
 Note 2) According to JIS B 8375-1981. (The value at supply pressure 0.5 MPa.)  
 Note 3) In the case of grommet type  
 Note 4) "Note 1)" and "Note 2)" are with controlled clean air.

Compact yet provides a large flow capacity  
**C: 1.8 dm<sup>3</sup>/(s·bar)**

Low power consumption:  
**1.8 W DC**



### 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		Dustproof (Degrees of protection 0) <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 (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		Grommet, Grommet terminal, Conduit 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 0920. Note 5) Based on JIS C 4003.

### JIS Symbol

2 position	3 position
Single	Closed center
Double	Exhaust center
	Pressure center

### Option Specifications

Pilot valve 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)
	12, 100 VDC
Option	With light/surge voltage suppressor <sup>Note)</sup>
Foot bracket (With screw)	Part No.: AXT626-10A, VFS1120 (single) only

- Note) Grommet type is available only w/ surge voltage suppressor (which is directly connected with lead wire).

### Manifold

Body type	Applicable manifold base (Pilot EXH)
VFS1□20	Bar manifold (Individual EXH)
VFS1□30	Bar manifold (Common EXH base side)

- Note) VFS1□30: Manifold only. Cannot be used as a single unit.

# 5 Port Pilot Operated Solenoid Valve Metal Seal, Body Ported *Series VFS1000*

## How to Order

**VFS1 1 20 - 1 G - - - 01 - - -**

**Symbol**

**Body (Pilot exhaust)**

**20:** Individual EXH

**30\*:** Common EXH

\* Manifold only

**Port size**

01	Rc 1/8
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**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

**Manual override**

<b>Nil:</b> Non-locking push type (Flush)	<b>A*:</b> Non-locking push type (Extended)	<b>B*:</b> Locking type	<b>C*:</b> Locking type (Lever)
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\* Option

**Light/Surge voltage suppressor**

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**

<b>G:</b> Grommet	<b>E:</b> Grommet terminal	<b>T:</b> Conduit terminal	<b>D, Y:</b> DIN terminal
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**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

**Option**

**F:** With foot bracket

\* Mountable only for VFS1120.

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

## How to Order Pilot Valve Assembly

**SF4 - 1 DZ - 21**

**Coil rated voltage**

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

\* Option

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

G	Grommet
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
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

\* D: Conforming to DIN43650 standard; Y: Conforming to DIN43650B standard  
\*\* DIN connector is not attached.

**Manual override**

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

\* Option

**Applicable model**

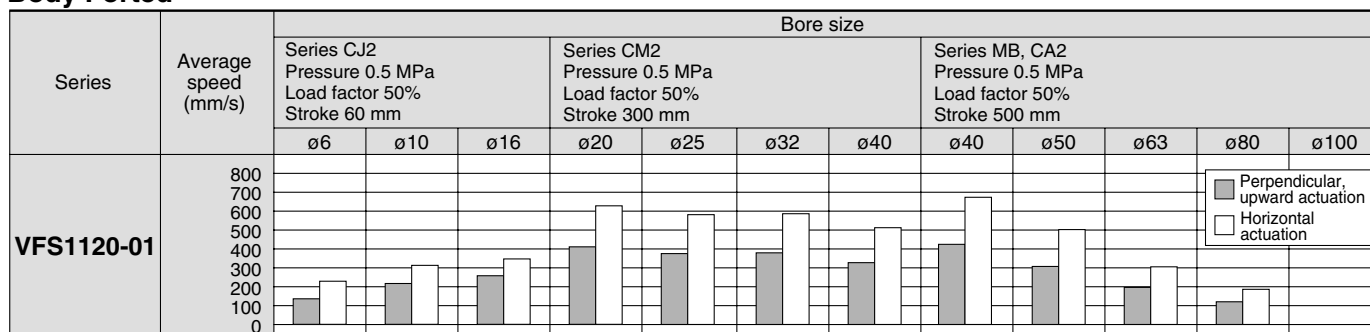
21	For VFS1□20	Individual pilot exhaust
22	For VFS1□30	Common pilot exhaust

# Series VFS1000

## Cylinder Speed Chart

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

### Body Ported

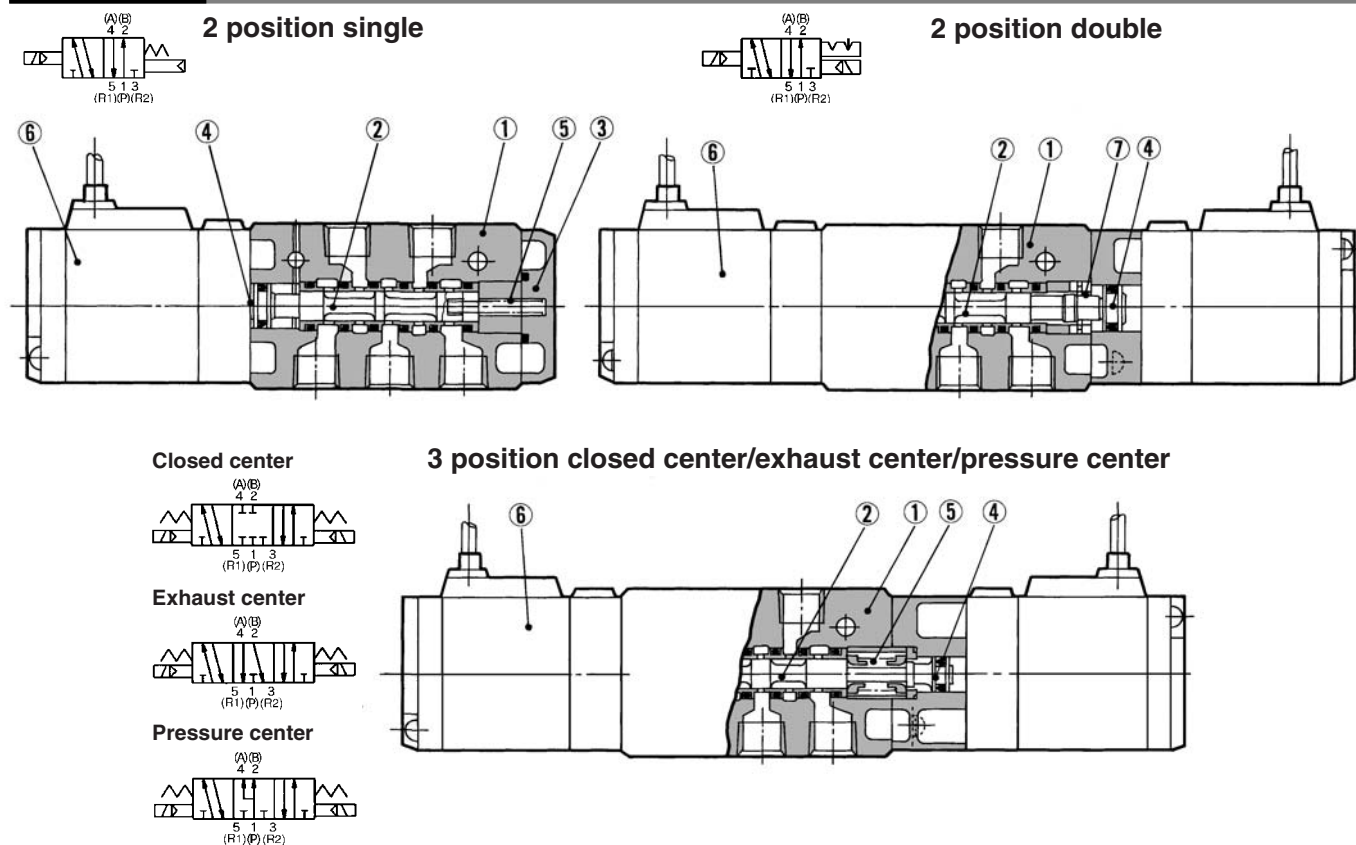


### Conditions

	Body ported	Series CJ2	Series CM2	Series MB, CA2
VFS1120-01	Tube bore x Length	T0604 x 1 m	T0806 x 1 m	
	Speed controller	AS3001F-06	AS3001F-08	
	Silencer	AN101-01		

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

### Construction



### Component Parts

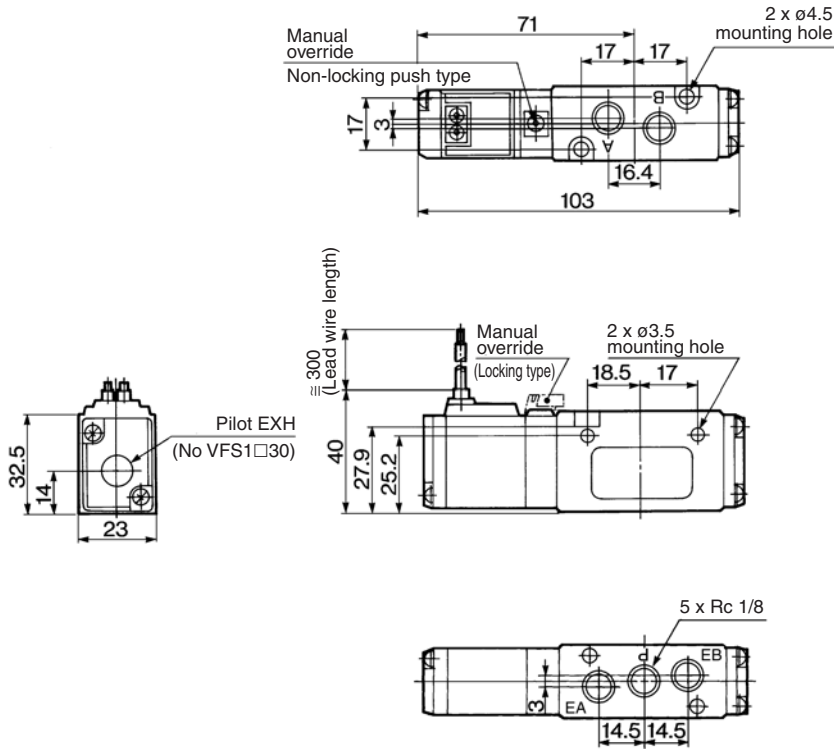
No.	Description	Material	Note
1	Body	Aluminum die-casted	Platinum silver
2	Spool/Sleeve	Stainless steel	—
3	End plate	Resin	—
4	Piston	Resin	—
5	Return spring	Stainless steel	—
6	Pilot valve assembly	—	—
7	Detent assembly	—	—

\* Refer to "How to Order Pilot Valve Assembly" on page 1115.

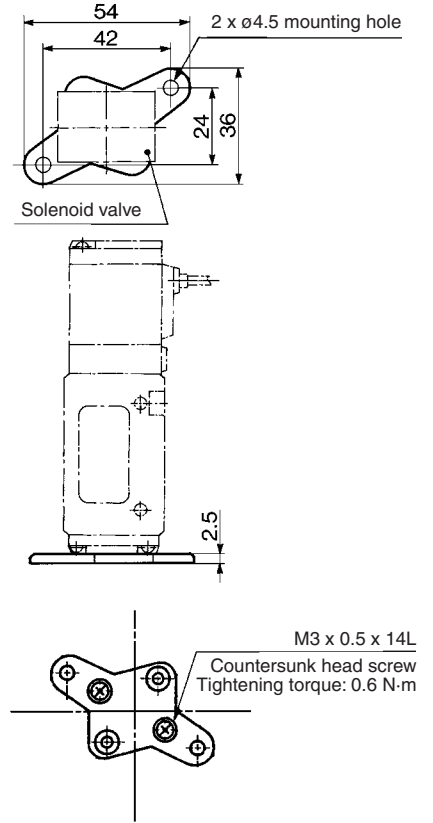
# 5 Port Pilot Operated Solenoid Valve Metal Seal, Body Ported **Series VFS1000**

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

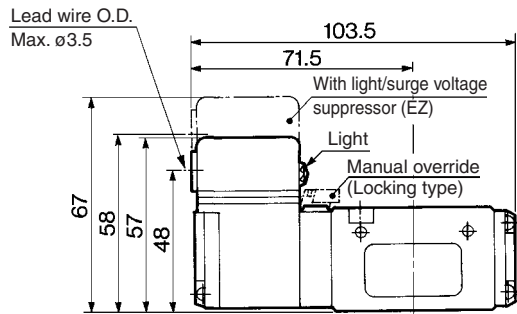
### Grommet : VFS1120-□G



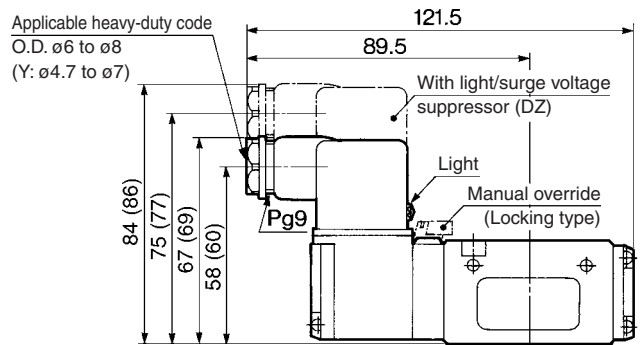
### Foot bracket (F) Part no. : AXT626-10A



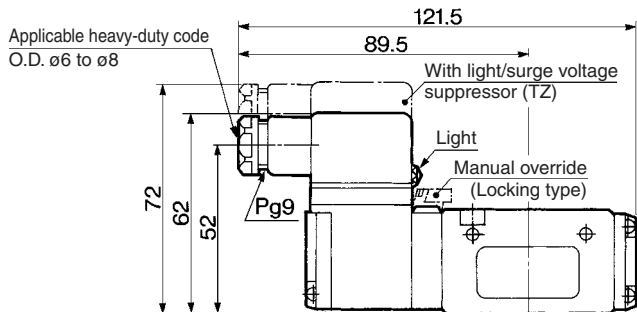
### Grommet terminal: VFS1120-□E/EZ



### DIN terminal: VFS1120-□D/DZ/Y/YZ



### Conduit terminal: VFS1120-□T/TZ



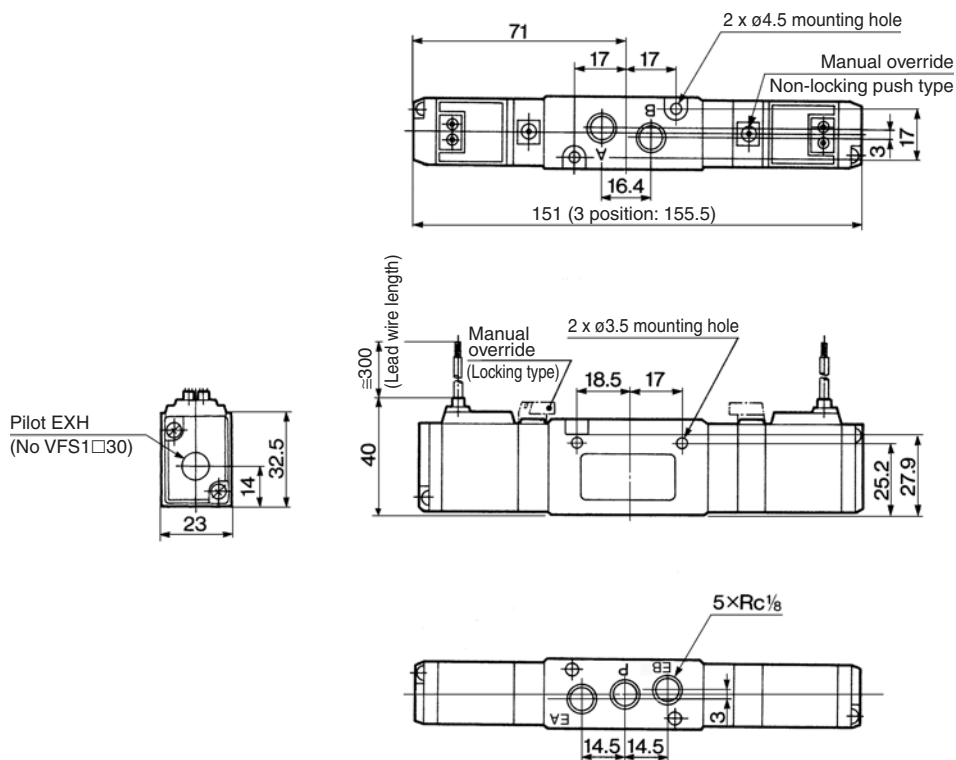
( ): Y, YZ

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

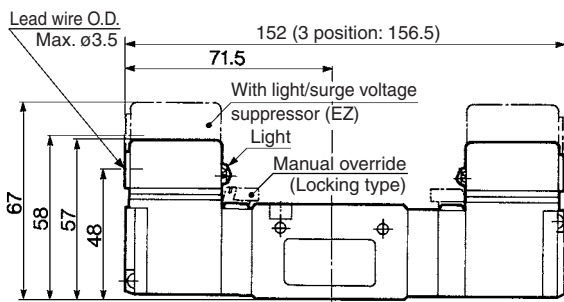
# Series VFS1000

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

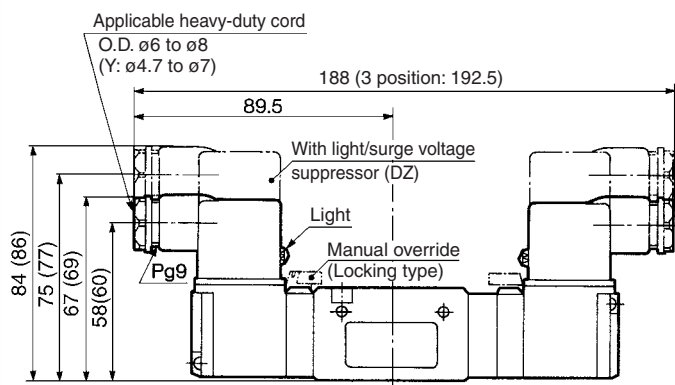
Grommet: VFS1220-□G, VFS1320-□G, VFS1420-□G, VFS1520-□G



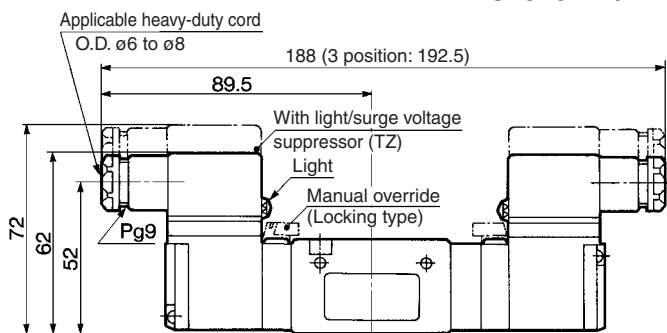
Grommet terminal: VFS1220-□E/EZ VFS1320-□E/EZ  
VFS1420-□E/EZ VFS1520-□E/EZ



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



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



( ): Y, YZ



# Series VFS1000 Manifold Specifications Single Base Type

## Compact and lightweight

Compact due to manifolding on a single base for mounting in small spaces.

## Keeps environmental air clean from pilot exhaust

Use of the VV5FS1-30 manifold can exhaust intensively the pilot exhaust gas to the base side, and can prevent environmental aggravation due to noise and oil mist.



VV5FS1-20



VV5FS1-30

Part no. for mounting bolt and gasket  
BG-VFS1030

## Specifications

Manifold base type	Bar manifold, Body ported
Stations	Max. 15 stations

## Port Specifications

Symbol	Passage		Porting specifications: Rc (Connecting port size)		
	1(P)	5(R1), 3(R2)	Base	Valve	Base
1	Common	Common	Side/Rc 1/8	Top/Rc 1/8	Side/Rc 1/8

## Option

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

## How to Order Manifold Base

**VV5FS1 - 20 - 05 1 - 01**

Series VFS1000 Manifold

• P, EA, EB port size  
01 Rc 1/8

• Thread type  
Nil Rc  
N\* NPT  
T\* NPTF  
F\* G  
\* Option

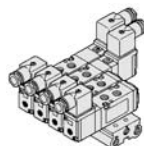
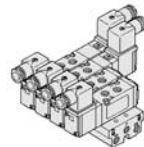
• Stations

02	2 stations
⋮	⋮
15	15 stations

• Symbol

Symbol	Passage		Porting specifications
	1(P)	3(R2), 5(R1)	
1	Common Rc 1/8	Common Rc 1/8	Top Rc 1/8

• Base model

Model	Pilot exhaust	Applicable valve model
20	Pilot individual EXH 	VFS1□20-□□-01
30	Pilot common EXH 	VFS1□30-□□-01 *VFS1□20-□□-01 mountable

SJ  
SY  
SV  
SYJ  
SZ  
VP4  
S0700  
VQ  
VQ4  
VQ5  
VQC  
VQZ  
SQ  
VFS  
VFR  
VQ7

## How to Order Manifold Assembly [Example]

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

<Example>

(Manifold base)  
(2 position single)  
(2 position double)  
(Blanking plate)

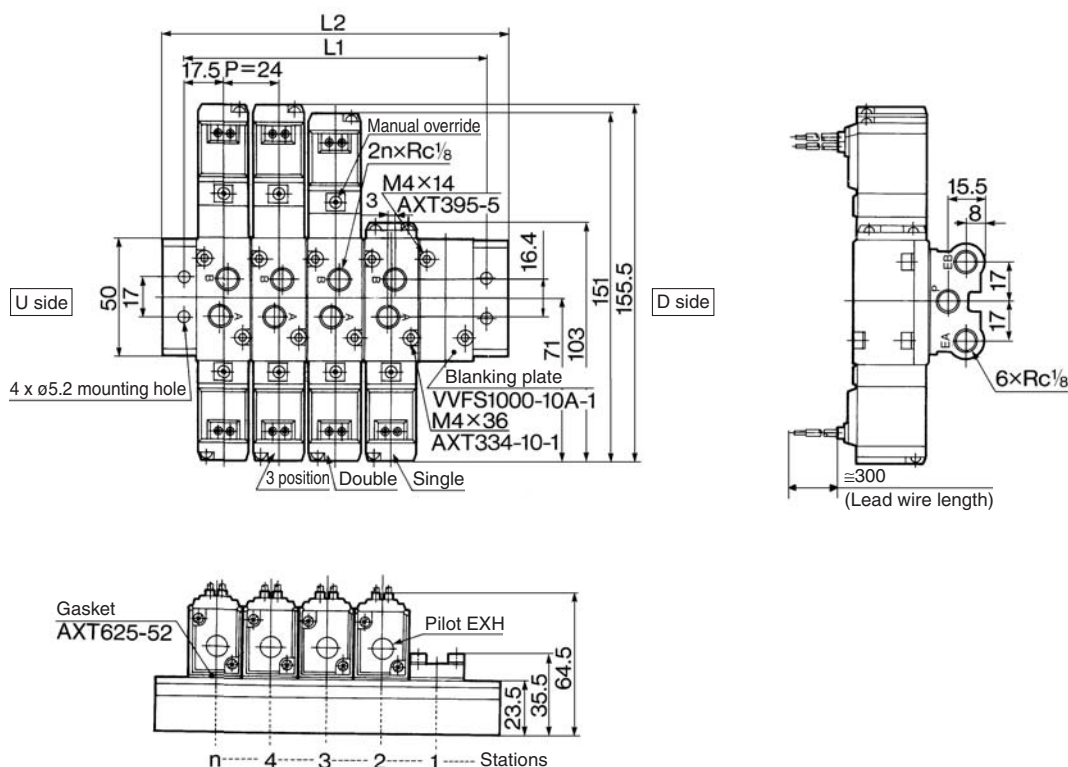
VV5FS1-20-061-01 ..... 1  
\* VFS1120-1D-01 ..... 3  
\* VFS1220-1D-01 ..... 2  
\* VVFS1000-10A-1 ..... 1

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

# Series VFS1000

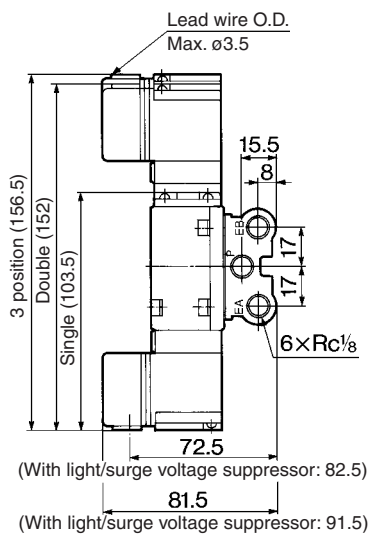
## Type 20 Manifold — Pilot individual exhaust: VVFS100-20- Station 1-01

Grommet: G

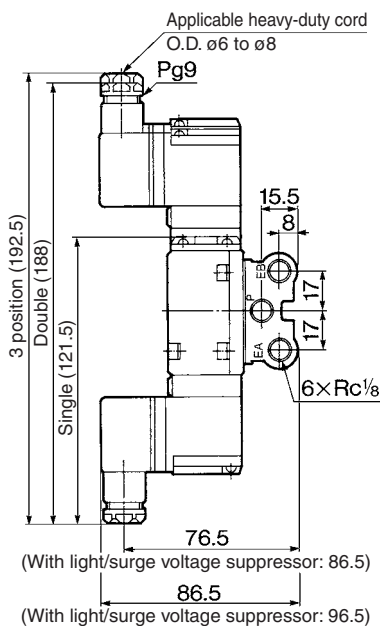


Formula for manifold weight  $M = 0.049n + 0.059$  (kg) n: Station

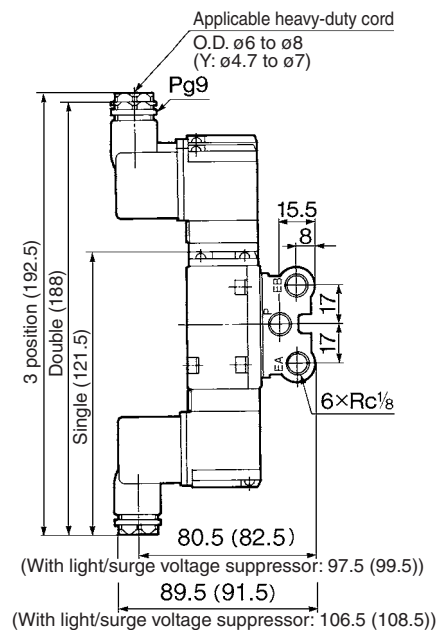
### Grommet terminal: E/EZ



### Conduit terminal: T/TZ



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



( ): Y, YZ

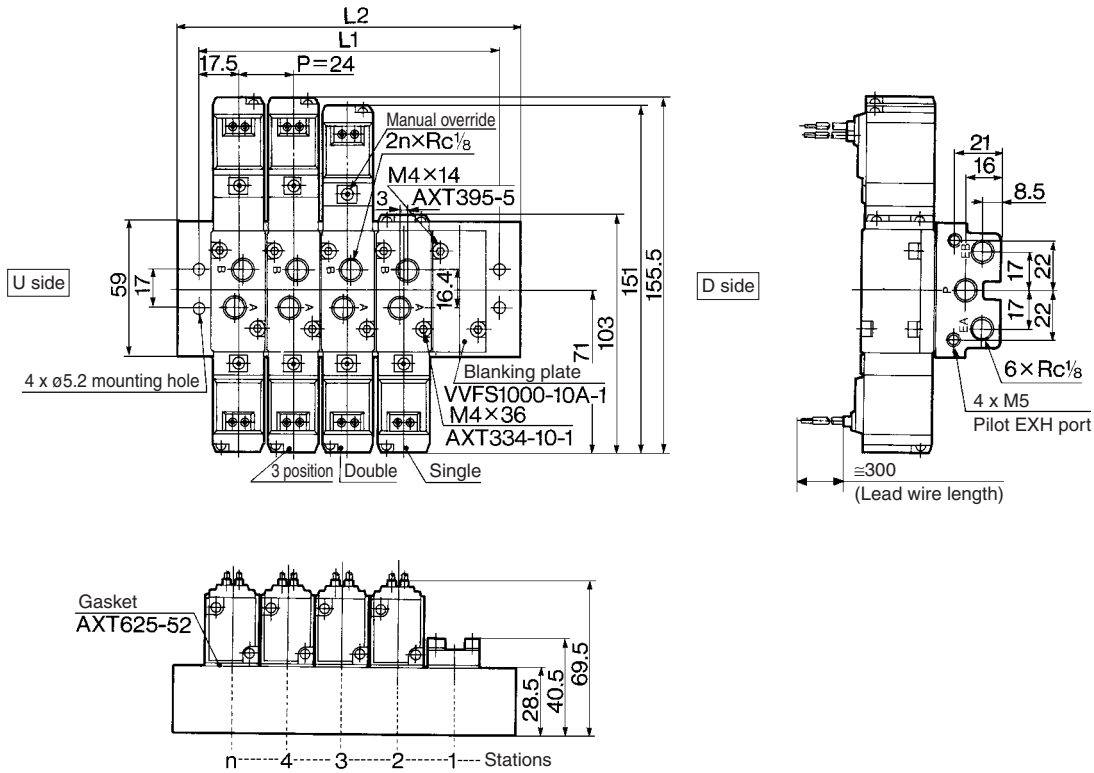
n: Station

Symbol	Stations	2	3	4	5	6	7	8	9	10	Formula
L1		59	83	107	131	155	179	203	227	251	$L1 = 24 \times n + 11$
L2		77	101	125	149	173	197	221	245	269	$L2 = 24 \times n + 29$

# 5 Port Pilot Operated Solenoid Valve Metal Seal, Body Ported *Series VFS1000*

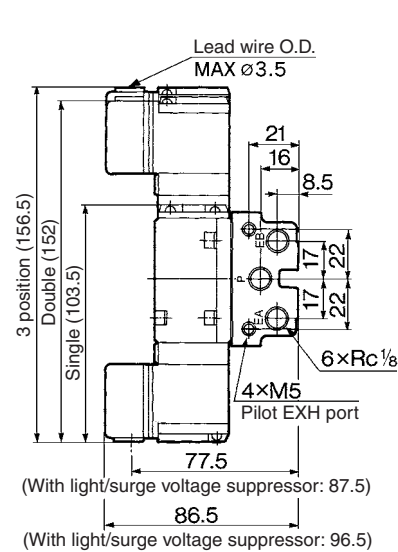
## Type 30 Manifold — Pilot common exhaust: VV5FS1-30- Station 1-01

Grommet: G

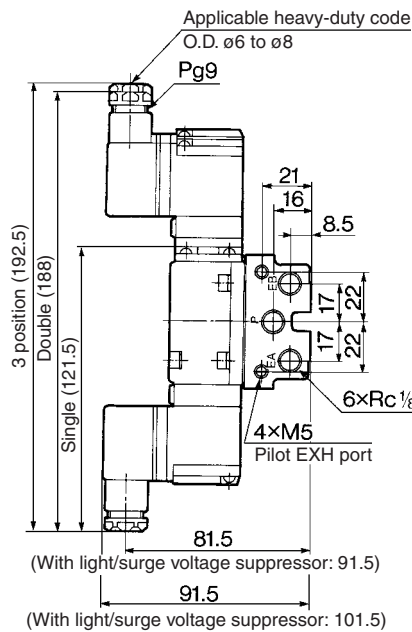


Formula for manifold weight M = 0.079n + 0.093 (kg) n: Station

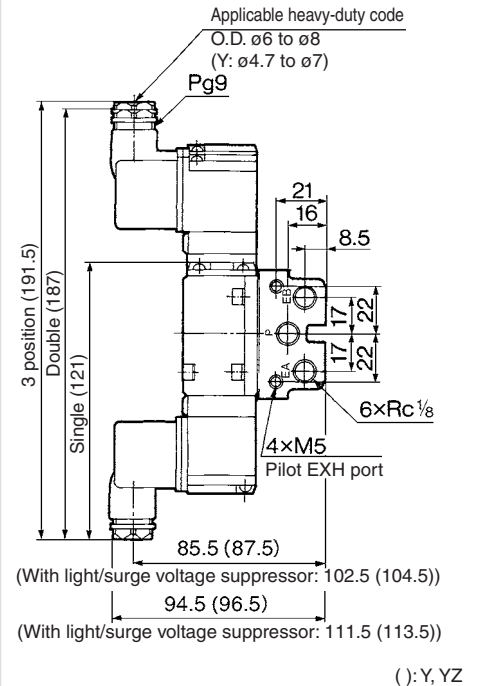
### Grommet terminal: E/EZ



### Conduit terminal: T/TZ



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



( ): Y, YZ

n: Station

Symbol	Stations	2	3	4	5	6	7	8	9	10	Formula
L1		59	83	107	131	155	179	203	227	251	L1 = 24 x n + 11
L2		77	101	125	149	173	197	221	245	269	L2 = 24 x n + 29

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

# 5 Port Pilot Operated Solenoid Valve Metal Seal, Body Ported

## Series VFS2000



### Model

Type of actuation	Model		Port size Rc	Flow characteristics						Max. operating cycle (cpm) <sup>(1)</sup>	Response time (ms) <sup>(2)</sup>	Mass (kg) <sup>(3)</sup>	
	Plug-in	Non plug-in		1 → 4/2 (P → A/B)			4/2 → 5/3 (A/B → R1/R2)						
				C [dm <sup>3</sup> /(s·bar)]	b	Cv	C [dm <sup>3</sup> /(s·bar)]	b	Cv				
2 position	Single	VFS2120	VFS2130	1/8	3.2	0.24	0.78	3.4	0.28	0.82	1200	22 or less	0.26
				1/4	4.0	0.20	0.90	3.5	0.32	0.85			
	Double	VFS2220	VFS2230	1/8	3.2	0.24	0.78	3.4	0.28	0.82	1200	13 or less	0.35
				1/4	4.0	0.20	0.90	3.5	0.32	0.85			
3 position	Closed center	VFS2320	VFS2330	1/8	3.2	0.24	0.78	3.2	0.27	0.80	600	40 or less	0.42
				1/4	4.0	0.20	0.90	3.4	0.29	0.83			
	Exhaust center	VFS2420	VFS2430	1/8	3.2	0.25	0.79	3.4	0.26	0.82	600	40 or less	0.42
				1/4	4.0	0.20	0.90	3.4	0.32	0.84			
	Pressure center	VFS2520	VFS2530	1/8	3.1	0.23	0.75	3.3	0.27	0.80	600	40 or less	0.42
				1/4	4.0	0.24	0.92	3.3	0.30	0.82			



Note 1) Based on JIS B 8375 (once per 30 days) for the minimum operating frequency.

Note 2) According to JIS B 8375-1981. (The value at supply pressure 0.5 MPa.)

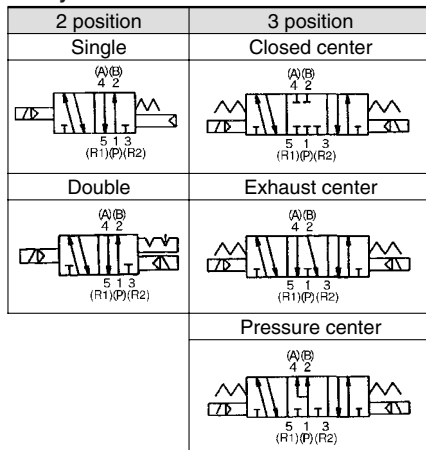
Note 3) In the case of grommet type Note 4) Factors of "Note 1)" and "Note 2)" are achieved in controlled clean air.

Compact yet provides a high flow capacity  
1/4: C: 3.4 dm<sup>3</sup>/(s·bar)

Low power consumption:  
1.8 W DC



### JIS Symbol



### Standard Specifications

Valve specifications	Fluid	Air/Inert gas	
	Maximum operating pressure	1.0 MPa	
	Minimum operating pressure	0.1 MPa	
	Proof pressure	1.5 MPa	
	Ambient and fluid temperature	-10 to 60°C <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	Dustproof (Degrees of protection 0) <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 (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		1.8 W (2.04 W: With light/surge voltage suppressor)	
Electrical entry	Grommet, Grommet terminal, Conduit 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 0920. Note 5) Based on JIS C 4003.

### Option Specifications

Pilot type	External pilot <sup>(1)</sup>
Pilot valve manual override	Non-locking push type (Extended), Locking type (Tool required)
Coil rated voltage	110 to 120, 220, 240 VAC (50/60 Hz)
	12, 100 VDC
Option	With light/surge voltage suppressor <sup>(2)</sup>
Foot bracket (With screw)	Part no.: VFN200-17A, VFS2120 (single) only



Note 1) Operating pressure: 0 to 1.0 MPa. Pilot pressure: 0.1 to 1.0 MPa.

Note 2) Grommet type is available only w/ surge voltage suppressor (which is directly connected with lead wire), not w/ indicator light.

### Manifold

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



Note) VFS2□30: Manifold only. Cannot be used as a single unit.

**How to Order**

**VFS2** **1** **20** **1** **G** **01** **Option**

**Symbol**

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

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

**Port size**

01	Rc 1/8
02	Rc 1/4

**Option**

F: With foot bracket

**Manual override**

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

\* Option

**Light/Surge voltage suppressor**

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
------------	---------------------	---------------------	--------------------

**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

**Body (Pilot exhaust)**

- 20: Individual EXH
- 30: Common EXH\*

\* Manifold only

**Pilot type**

Nil	Internal pilot
R*	External pilot

\* Option: Individual external pilot (External pilot port: Body side)

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

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

**How to Order Pilot Valve Assembly**

**SF4** - **1** **DZ** **12**

**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**

G	Grommet
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
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

\* D: Conforming to DIN43650 standard; Y: Conforming to DIN43650B standard  
\*\* DIN connector is not attached.

**Applicable model**

12	For VFS2□20	Individual pilot exhaust
13	For VFS2□30	Common pilot exhaust

**Manual override**

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

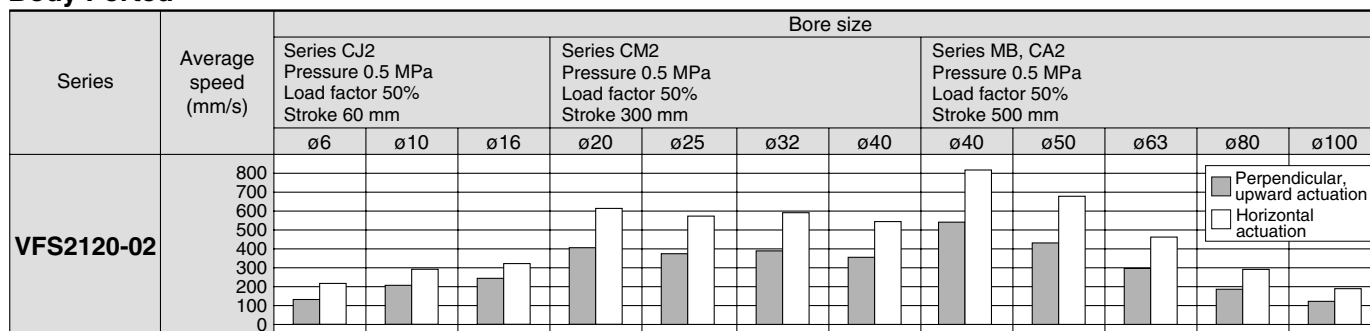
\* Option

# Series VFS2000

## Cylinder Speed Chart

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

### Body Ported

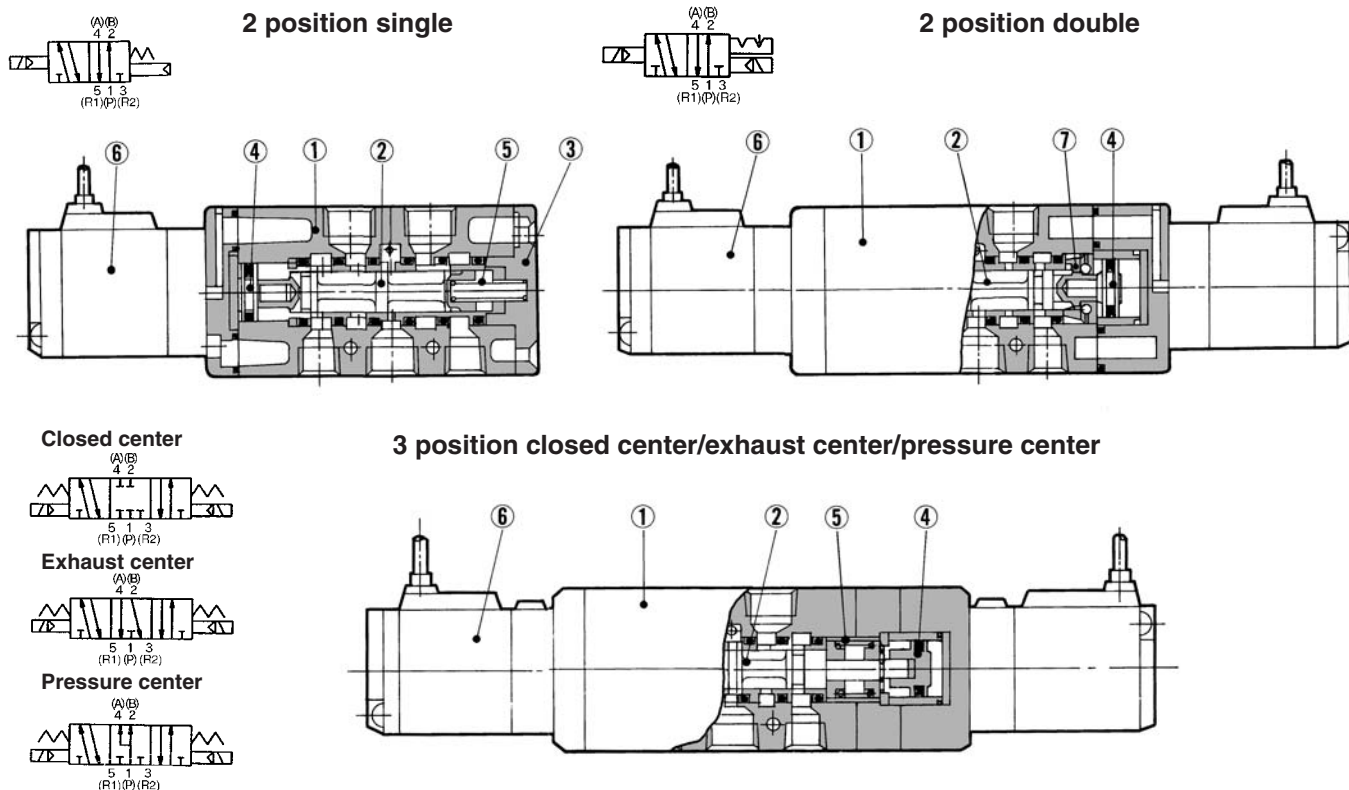


### Conditions

Body ported		Series CJ2	Series CM2	Series MB, CA2
VFS2120-02	Tube bore x Length	T0604 x 1 m	T1075 x 1 m	
	Speed controller	AS3001F-06	AS4001F-10	
	Silencer	AN110-01		

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

### Construction



### Component Parts

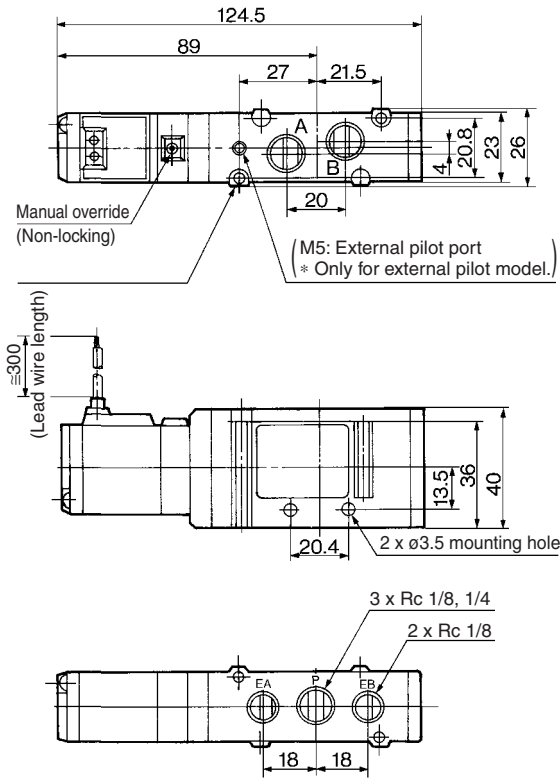
No.	Description	Material	Note
1	Body	Aluminum die-casted	Platinum silver
2	Spool/Sleeve	Stainless steel	—
3	End plate	Resin	—
4	Piston	Resin	—
5	Return spring	Stainless steel	—
6	Pilot valve assembly	—	—
7	Detent assembly	—	—

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

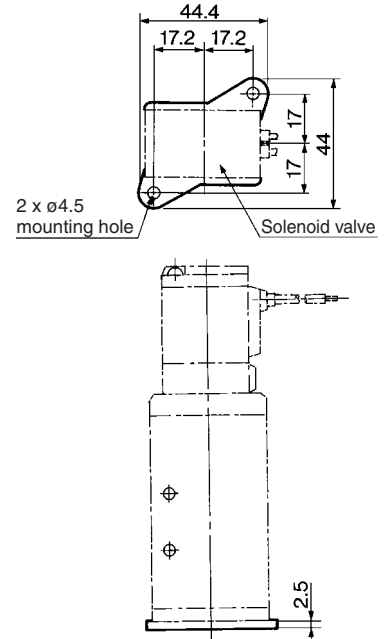
# 5 Port Pilot Operated Solenoid Valve Metal Seal, Body Ported **Series VFS2000**

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

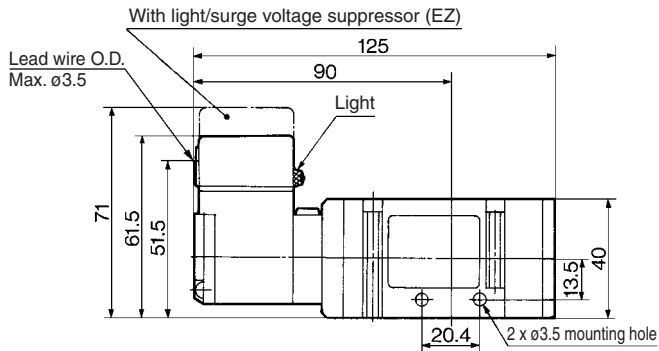
### Grommet: VFS2120-□G



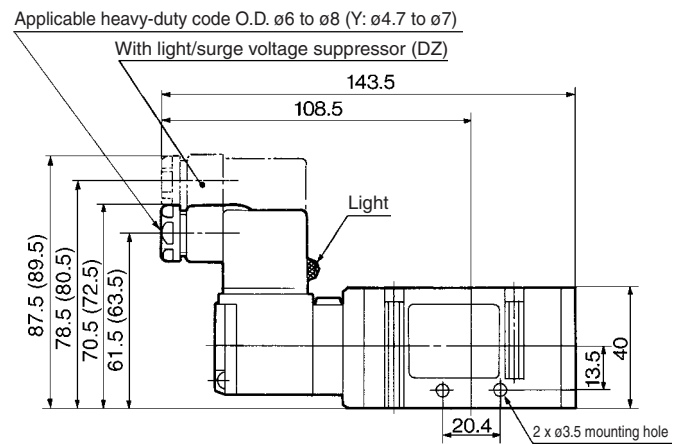
### Foot bracket (F) Part no.: VFN200-17A



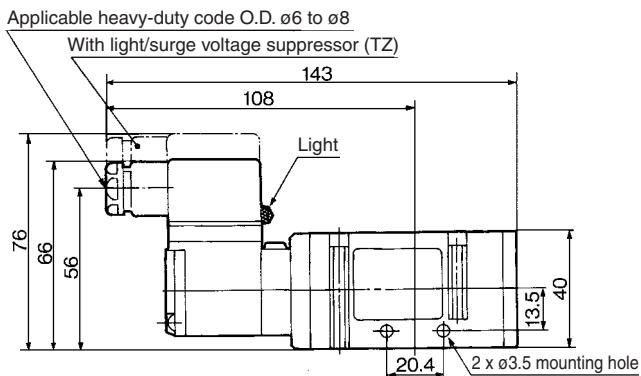
### Grommet terminal: VFS2120-□E/EZ



### DIN terminal: VFS2120-□D/DZ/Y/YZ



### Conduit terminal: VFS2120-□T/TZ



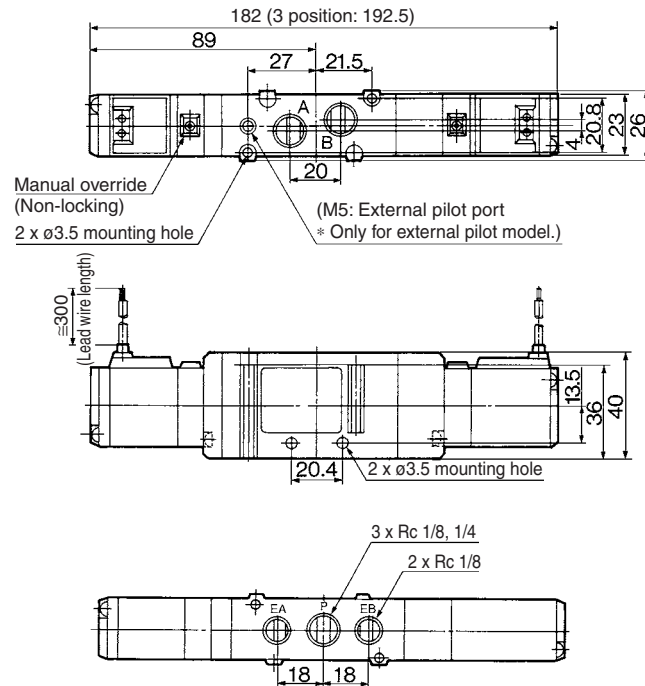
( ): Y, YZ

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS**
- VFR
- VQ7

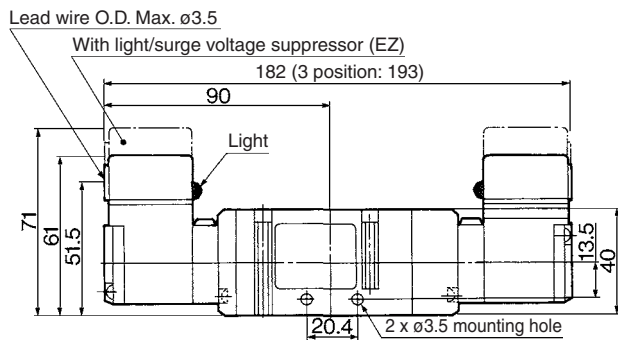
# Series VFS2000

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

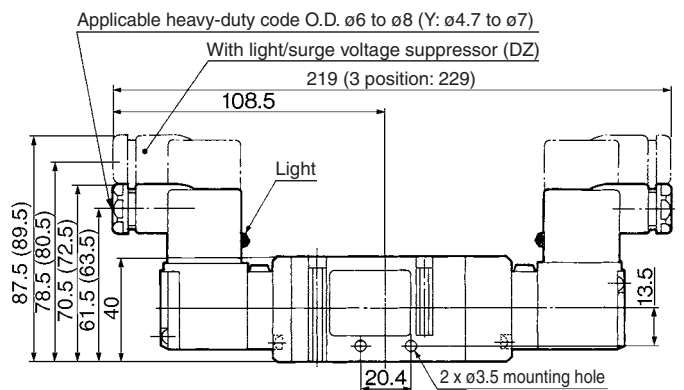
Grommet: VFS2220-□G, VFS2320-□G, VFS2420-□G, VFS2520-□G



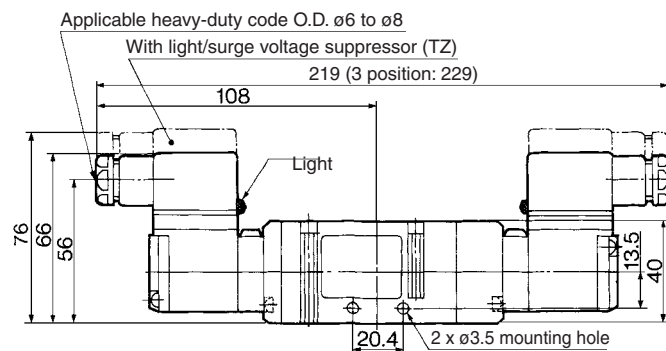
Grommet terminal: VFS2220-□E/EZ VFS2320-□E/EZ  
VFS2420-□E/EZ VFS2520-□E/EZ



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



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



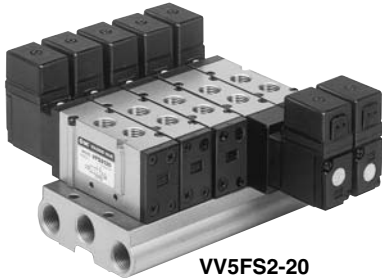
( ): Y, YZ



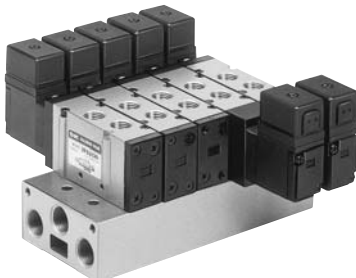
# Series VFS2000 Manifold Specifications Single Base Type

## Keeps environmental air clean from pilot exhaust

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



VV5FS2-20



VV5FS2-30

Part no. for mounting bolt and gasket  
BG-VFS2030

## Specifications

Manifold base type	Bar manifold, Body ported
Stations	Max. 15 stations

## Port Specifications

Symbol	Passage		Porting specifications: Rc		
	1(P)	5(R1), 3(R2)	Base 1(P)	Valve 2(B), 4(A)	Base 3(R2), 5(R1)
1	Common	Common	Side: 3/8	Top: 1/8, 1/4	Side: 3/8

## Option

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

## How to Order Manifold Base

**VV5FS2 - 20 - 05 1 - 03**

- Series VFS2000 Manifold**
- Stations**

02	2 stations
⋮	⋮
15	15 stations
- Symbol**

Passage		Porting specifications
1(P)	3(R2), 5(R1)	2(B), 4(A)
1	Common Rc 3/8	Common Rc 3/8 Top Rc 1/8, 1/4
- P, EA, EB port size**

03	Rc 3/8
----	--------
- Thread type**

Nll	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

## Base model

Model	Pilot exhaust	Applicable valve model
20	Pilot individual EXH 	VFS2□20-□□-01
30	Pilot common EXH 	VFS2□30-□□-01 *VFS2□20-□□-01 mountable

## How to Order Manifold Assembly [Example]

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

<Example>  
(Manifold base) VV5FS2-20-061-03 ..... 1  
(2 position single) \* VFS2120-1D-02 ..... 3  
(2 position double) \* VFS2220-1D-02 ..... 2  
(Blanking plate) \* VVFS2000-10A-1 ..... 1

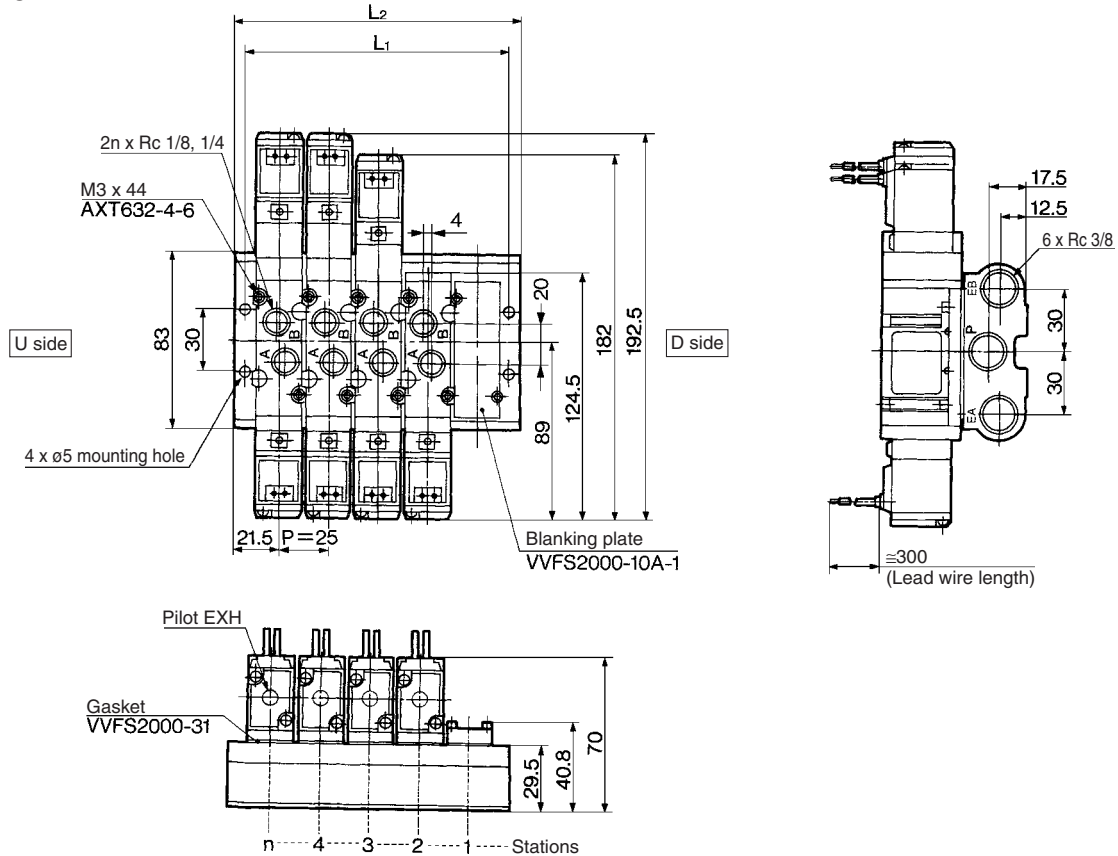
→ The asterisk denotes the symbol for assembly. Prefix it to the part numbers of the solenoid valve.

SJ  
SY  
SV  
SYJ  
SZ  
VP4  
S0700  
VQ  
VQ4  
VQ5  
VQC  
VQZ  
SQ  
VFS  
VFR  
VQ7

# Series VFS2000

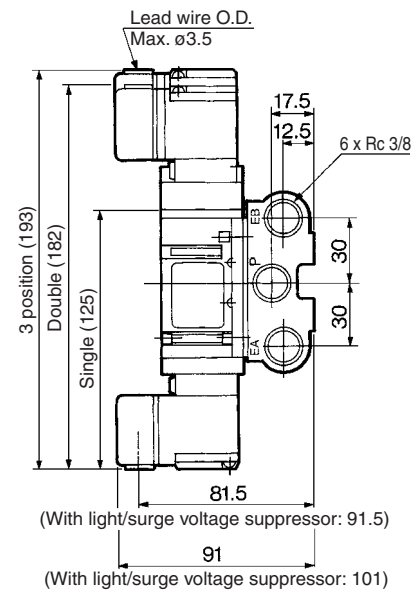
## Type 20 Manifold — Pilot individual exhaust: VV5FS2-20- Station 1-03

Grommet: G

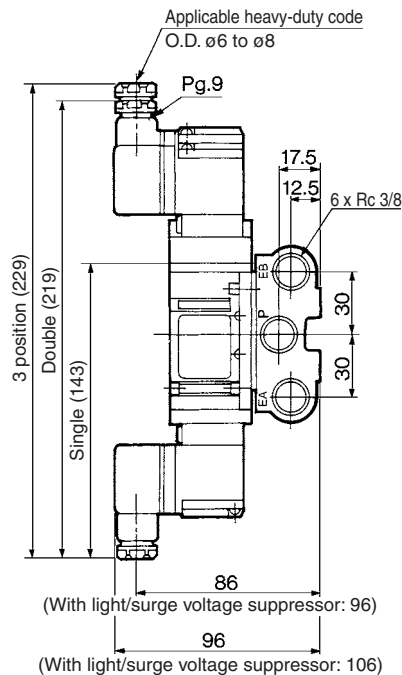


Formula for manifold weight  $M = 0.108n + 0.068$  (kg) n: Station

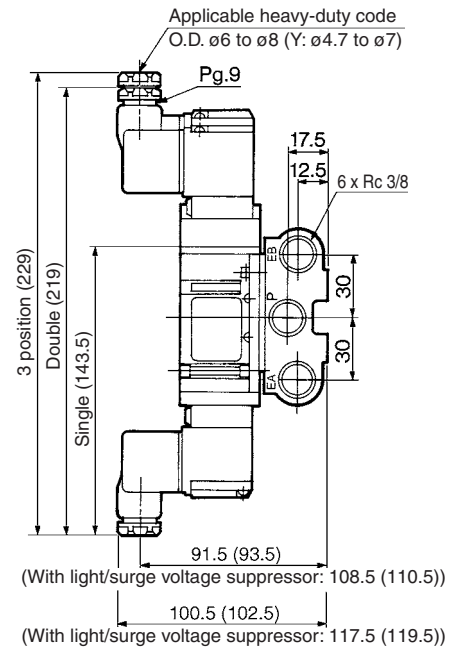
### Grommet terminal: E/EZ



### Conduit terminal: T/TZ



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



( ): Y, YZ

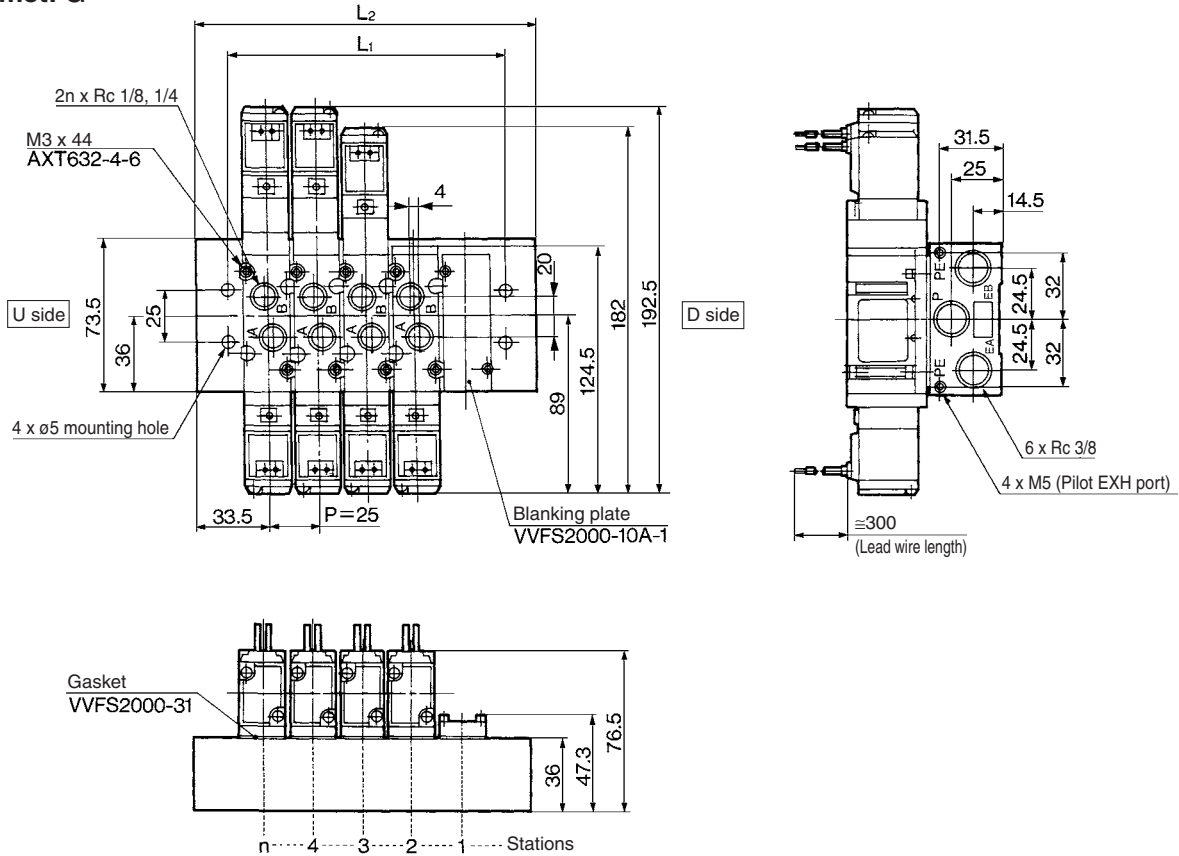
n: Station

L	Stations	2	3	4	5	6	7	8	9	10	Formula
L <sub>1</sub>		58	83	108	133	158	183	208	233	258	L <sub>1</sub> = 25 x n + 8
L <sub>2</sub>		68	93	118	143	168	193	218	243	268	L <sub>2</sub> = 25 x n + 18

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

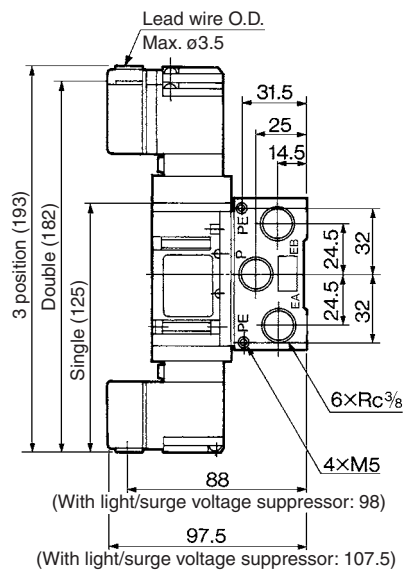
## Type 30 Manifold — Pilot common exhaust: VV5FS2-30- Station 1-03

Grommet: G

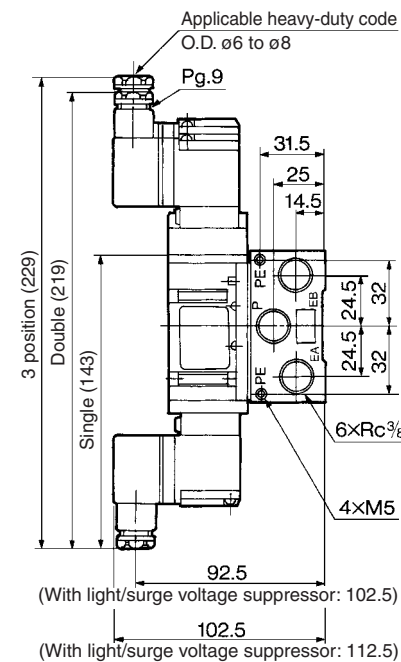


Formula for manifold weight M = 0.12n + 0.21 (kg) n: Station

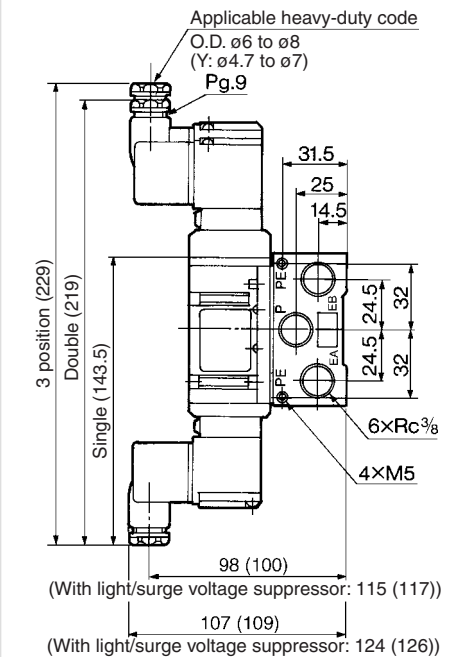
### Grommet terminal: E/EZ



### Conduit terminal: T/TZ



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



( ): Y, YZ

n: Station

L	Stations	2	3	4	5	6	7	8	9	10	Formula
L <sub>1</sub>		62	87	112	137	162	187	212	237	262	L <sub>1</sub> = 25 x n + 12
L <sub>2</sub>		92	117	142	167	192	217	242	267	292	L <sub>2</sub> = 25 x n + 42

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

# 5 Port Pilot Operated Solenoid Valve Metal Seal, Body Ported

## Series VFS3000



### Model

Type of actuation	Model		Port size Rc	Flow characteristics						Max. operating cycle (cpm) <sup>(1)</sup>	Response time (ms) <sup>(2)</sup>	Mass (kg) <sup>(3)</sup>	
	Plug-in	Non plug-in		1 → 4/2(P → A/B)			4/2 → 5/3(A/B → R1/R2)						
				C [dm <sup>3</sup> /(s·bar)]	b	Cv	C [dm <sup>3</sup> /(s·bar)]	b	Cv				
2 position	Single	VFS3120	VFS3130	1/4	5.0	0.20	1.1	6.8	0.30	1.7	1200	20 or less	0.33
				3/8	6.1	0.14	1.4	7.3	0.23	1.8			
	Double	VFS3220	VFS3230	1/4	5.0	0.20	1.1	6.8	0.3	1.7	1500	15 or less	0.43
				3/8	6.1	0.14	1.4	7.3	0.23	1.8			
3 position	Closed center	VFS3320	VFS3330	1/4	5.0	0.20	1.1	6.3	0.27	1.6	600	40 or less	0.45
				3/8	5.7	0.20	1.4	6.8	0.21	1.7			
	Exhaust center	VFS3420	VFS3430	1/4	4.9	0.24	1.1	6.5	0.28	1.6	600	40 or less	0.45
				3/8	5.8	0.15	1.4	7.0	0.22	1.7			
	Pressure center	VFS3520	VFS3530	1/4	4.9	0.23	1.1	6.6	0.28	1.6	600	40 or less	0.45
				3/8	6.5	0.15	1.6	7.0	0.23	1.7			

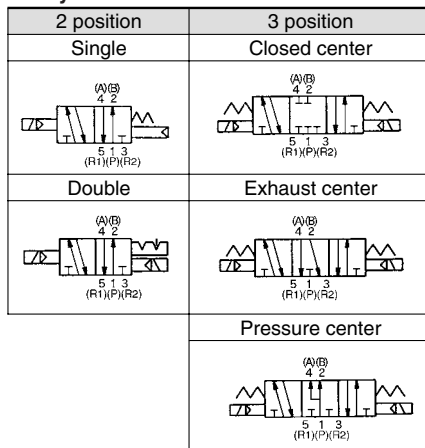
Note 1) Based on JIS B 8375 (once per 30 days) for the minimum operating frequency. Note 3) In the case of grommet type.  
 Note 2) Based on JIS B 8375-1981. (The value at supply pressure 0.5 MPa.) Note 4) Factors of "Note 1)" and "Note 2)" are achieved in controlled clean air.

Compact yet provides a large flow capacity  
 3/8: C: 6.8 dm<sup>3</sup>/(s·bar)

Low power consumption:  
 1.8 W DC



### JIS Symbol



### Standard Specifications

Valve specifications	Fluid	Air/Inert gas
Maximum operating pressure	1.0 MPa	
Minimum operating pressure	0.1 MPa	
Proof pressure	1.5 MPa	
Ambient and fluid temperature	-10 to 60°C <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	Dustproof (Degrees of protection 0) <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 (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	1.8 W (2.04 W: With light/surge voltage suppressor)	
Electrical entry	Grommet, Grommet terminal, Conduit 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 0920. Note 5) Based on JIS C 4003.

### Option Specifications

Pilot type	External pilot <sup>(1)</sup>
Pilot valve manual override	Non-locking push type (Extended), Locking type (Tool required)
Coil rated voltage	110 to 120, 220, 240 VAC (50/60 Hz)
	12, 100 VDC
Option	With light/surge voltage suppressor <sup>(2)</sup>
Foot bracket (With screw)	Part no.: VFS3000-52A, VFS3120 (single) only

Note 1) Operating pressure: 0 to 1.0 MPa Pilot pressure: 0.1 to 1.0 MPa  
 Note 2) Grommet type is available only w/ surge voltage suppressor (which is directly connected with lead wire), not w/ indicator light.

### Manifold

Body type	Applicable manifold base	Pilot EXH
VFS3□20	Stacking manifold	Individual EXH (Valve side)
VFS3□30		Common EXH (Manifold base side)

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

## How to Order

VFS3 1 20 - 1 G - 02 -

**Symbol**

1: 2 position single

2: position double

3: position closed center

4: position exhaust center

5: position pressure center

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

**Body (Pilot exhaust)**

20: Individual EXH

30\*: Common EXH

\* Manifold only

**Pilot type**

Nil	Internal pilot
R*	External pilot

\* Option. It will be an individual external pilot.  
(External pilot port: Body side. For 30 type, common external pilot (on manifold side).)

**Option**

F: With foot bracket

\* Mountable only for VFS3120.

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

**Port size**

02	Rc 1/4
03	Rc 3/8

**Manual override**

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

\* Option

**Light/Surge voltage suppressor**

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 
----------------	-------------------------	-------------------------	------------------------

**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

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

## How to Order Pilot Valve Assembly

SF4 - 1 DZ - 21

**Coil rated voltage**

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

\* Option

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

G	Grommet
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
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

**Manual override**

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

\* Option

**Applicable model**

14	A side pilot operator for VFS3 <sub>2</sub> 20	Individual pilot exhaust
15	B side pilot operator for VFS3 <sub>2</sub> 20	
16	B side pilot operator for VFS3 <sub>2</sub> 20	Common pilot exhaust
17	A side pilot operator for VFS3 <sub>3</sub> 30	
18	B side pilot operator for VFS3 <sub>3</sub> 230	
19	B side pilot operator for VFS3 <sub>3</sub> 30	

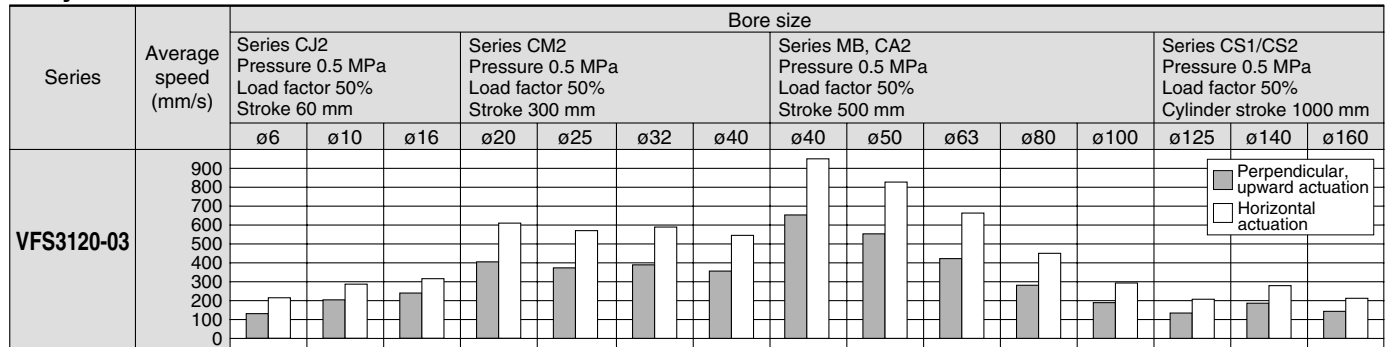
\* D: Conforming to DIN43650 standard;  
Y: Conforming to DIN43650B standard  
\*\* DIN connector is not attached.

# Series VFS3000

## Cylinder Speed Chart

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

### Body Ported



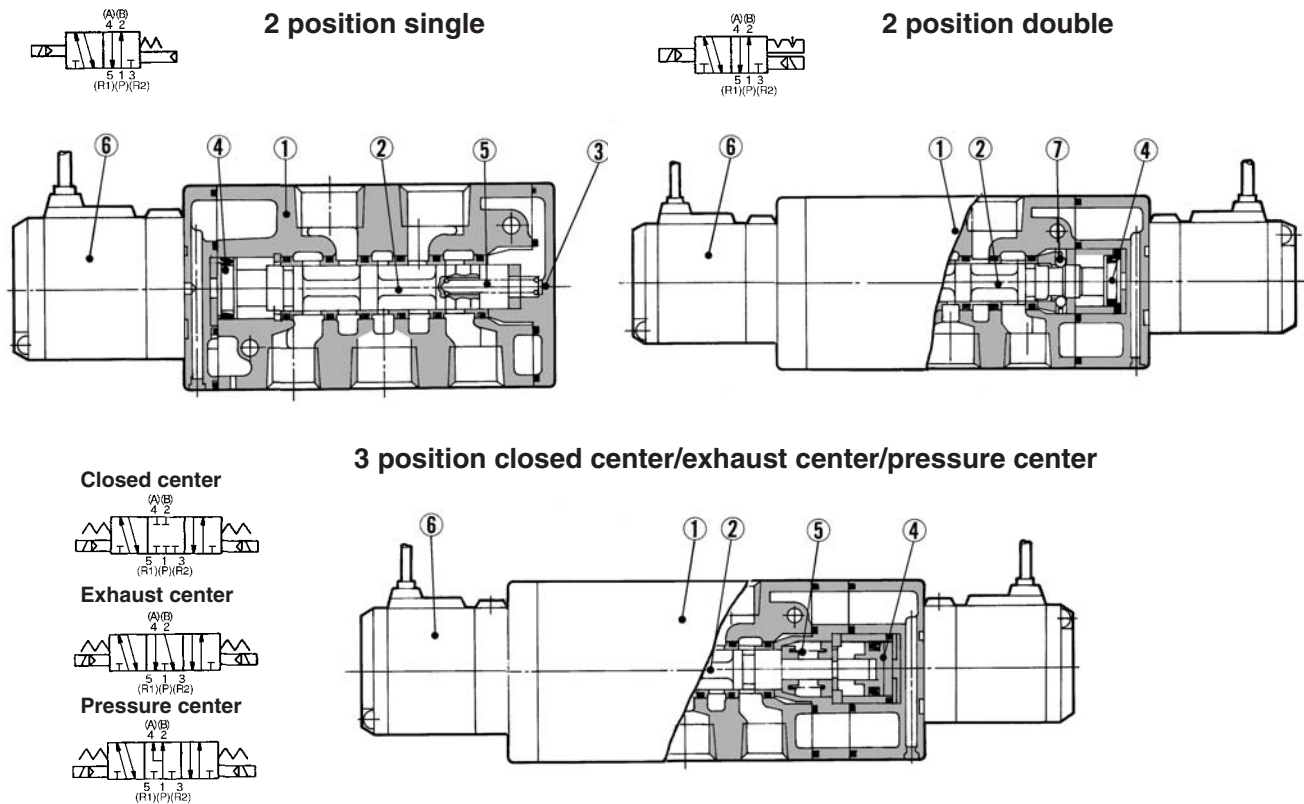
- \* It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
- \* The average velocity of the cylinder is the value that the stroke is divided by the total stroke time.
- \* Load factor: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

### Conditions

Body ported		Series CJ2	Series CM2	Series MB, CA2	Series CS1/CS2
VFS3120-03	Tube bore x Length	T0604 x 1 m	T1075 x 1 m	T1209 x 1 m	
	Speed controller	AS3001F-06	AS4001F-10	AS4001F-12	
	Silencer	AN200-02		AN202-02	

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

## Construction



## Component Parts

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

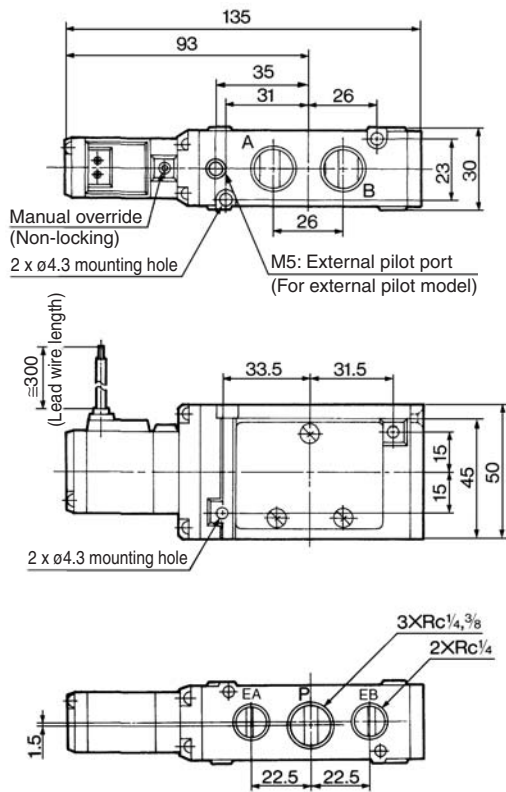
\* Refer to "How to Order Pilot Valve Assembly" on page 1131.

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS**
- VFR
- VQ7

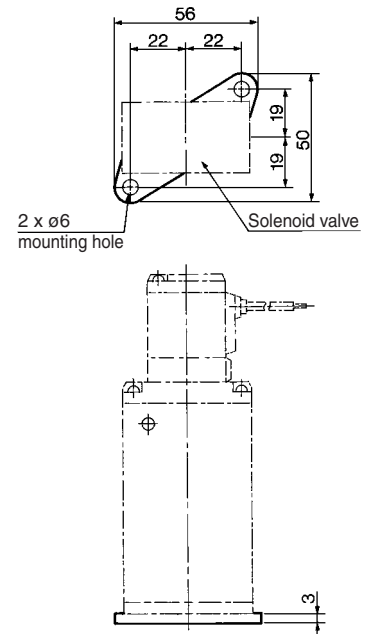
# Series VFS3000

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

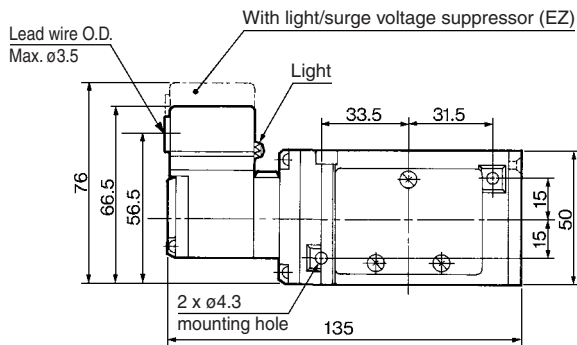
Grommet: VFS3120-□G



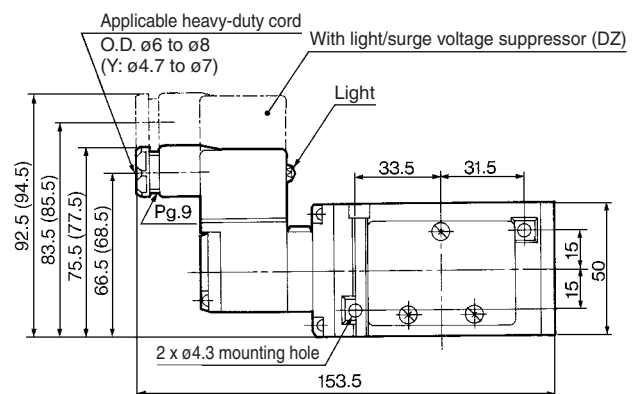
Foot bracket (F)  
Part no.: VFS3000-52A



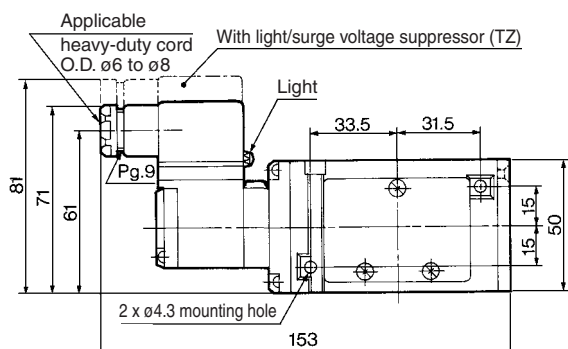
Grommet terminal: VFS3120-□E/EZ



DIN terminal: VFS3120-□D/DZ/Y/YZ



Conduit terminal: VFS3120-□T/TZ



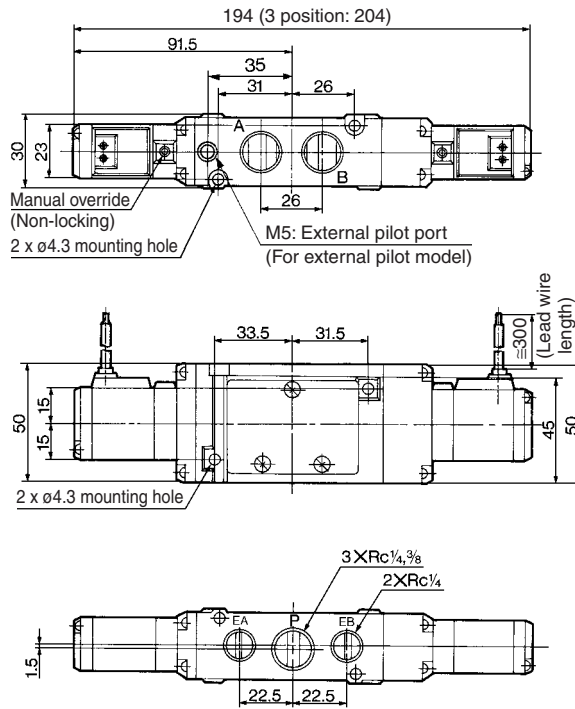
( ): Y, YZ



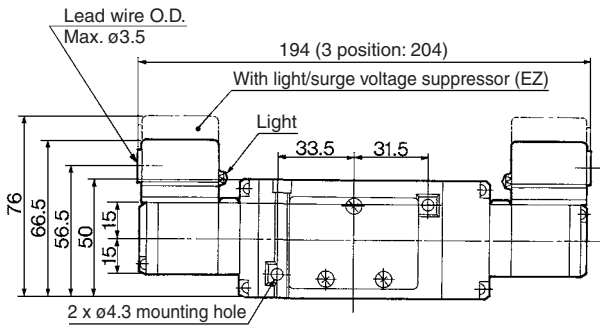
# 5 Port Pilot Operated Solenoid Valve Metal Seal, Body Ported *Series VFS3000*

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

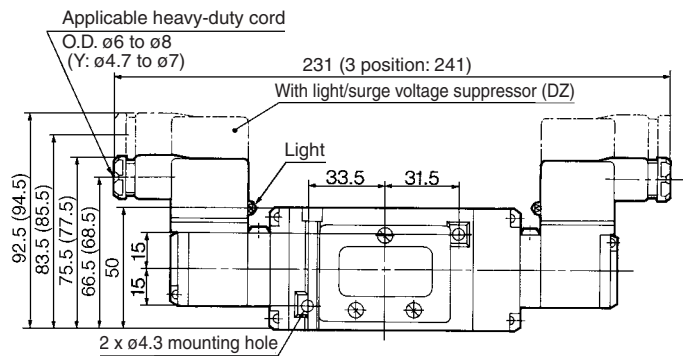
Grommet: VFS3220-□G, VFS3320-□G, VFS3420-□G, VFS3520-□G



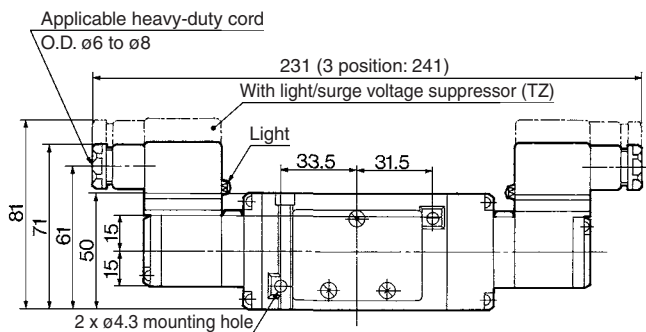
Grommet terminal: VFS3220-□E/EZ VFS3320-□E/EZ  
VFS3420-□E/EZ VFS3520-□E/EZ



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



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



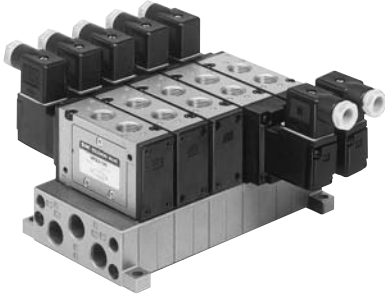
( ): Y, YZ

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

# Series VFS3000 Manifold Specifications Stacking Type

## Keeps environmental air clean from pilot exhaust

Use of the VV5FS3-31 manifold can exhaust intensively the pilot exhaust gas to the base side, and can prevent environmental aggravation due to noise and oil mist.

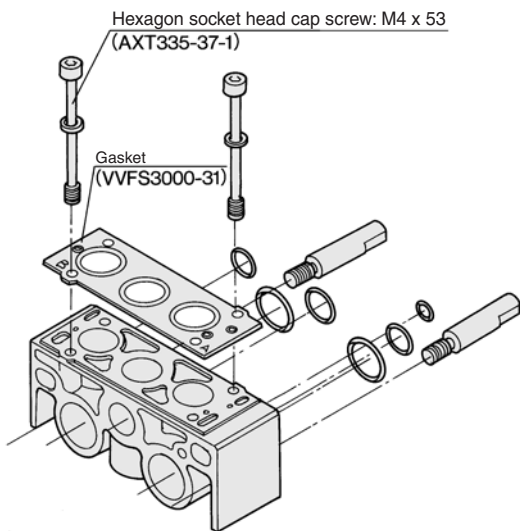


VV5FS3-31

Part no. for mounting bolt and gasket
BG-VFS3030

## Exploded View of Manifold

### Manifold block assembly VVFS3000-1A-30



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

## Specifications

Manifold base type	Stacking type
Stations	Max. 15 stations

## Port Specifications

Symbol	Passage		Porting specifications: Rc		
	1(P)	3(R2), 5(R1)	Base	Valve	Base
1	Common	Common	1(P) Side: 3/8	2(B), 4(A) Top: 1/4, 3/8	3(R2), 5(R1) Side: 3/8

## Option

Blanking plate	VVFS3000-10A-1	With gasket, screw
SUP block plate	AXT636-10A	—
EXH block plate	AXT636-11A	—

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

## How to Order Manifold Base

VV5FS3 - 31 - 05 1 - 03

Series VFS3000  
Manifold

### Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

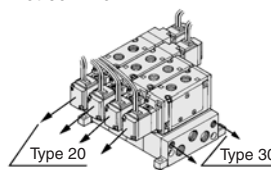
### P, EA, EB port size

03 Rc 3/8

### Symbol

Stations	Passage		Porting specifications
	1(P)	3(R2), 5(R1)	2(B), 4(A)
02 2 stations			
15 15 stations	Common Rc 3/8	Common Rc 3/8	Top Rc 1/4, Rc 3/8

### Base model

Model	Pilot exhaust	Applicable valve model
31	Pilot common EXH 	VFS3□20-□□-02/03 VFS3□30-□□-02/03

Note) Also VFS3□20 is possible to manifold. In this case, it uses an individual pilot exhaust.

## How to Order Manifold Assembly [Example]

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

### <Example>

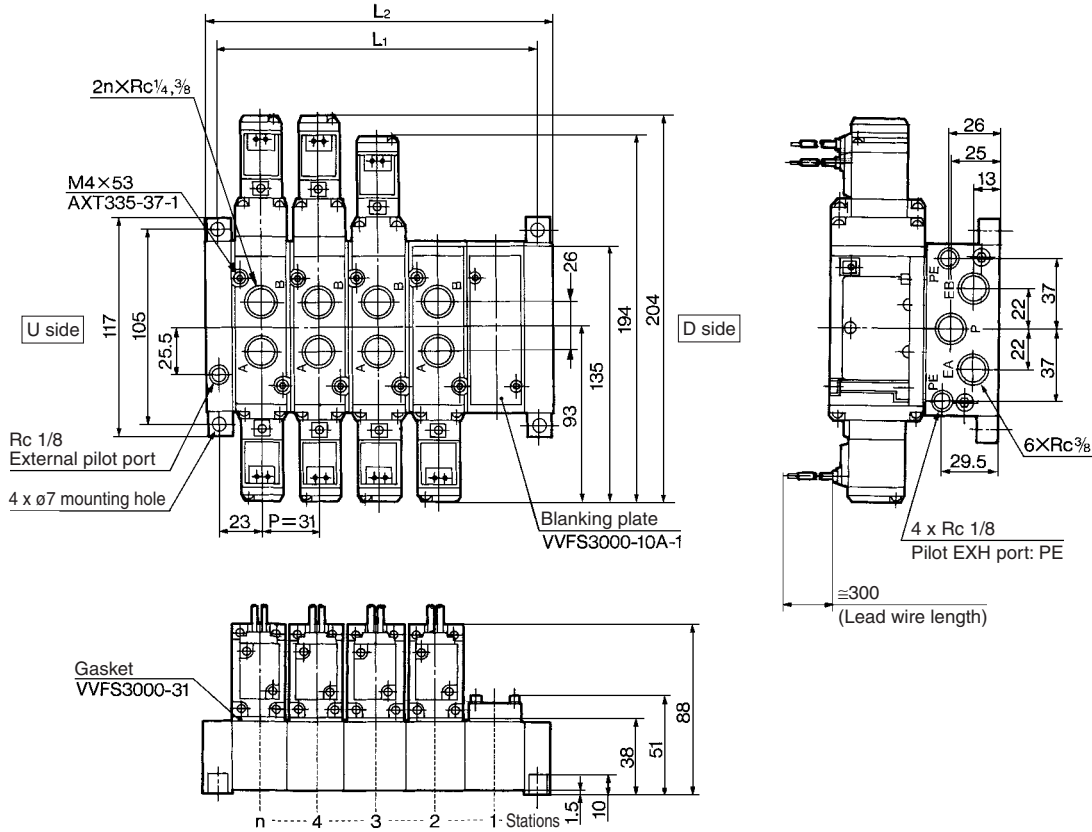
(Manifold base) VV5FS3-31-061-03 ..... 1  
 (2 position single) \* VFS3130-1D-02 ..... 3  
 (2 position double) \* VFS3230-1D-02 ..... 2  
 (Blanking plate) \* VVFS3000-10A-1 ..... 1

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

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

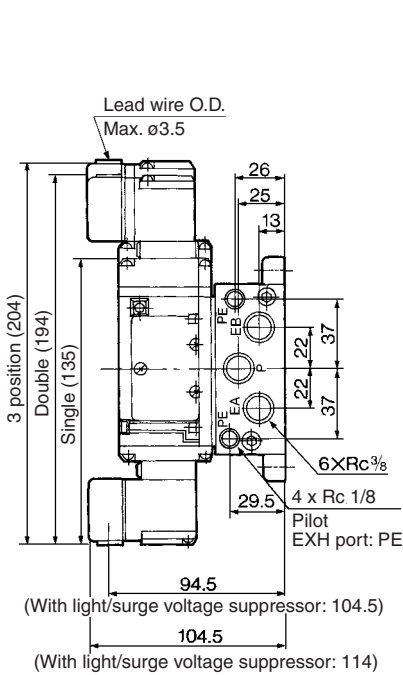
## Type 31 Manifold — Pilot common exhaust: VV5FS3-31- Station 1-03

Grommet: G

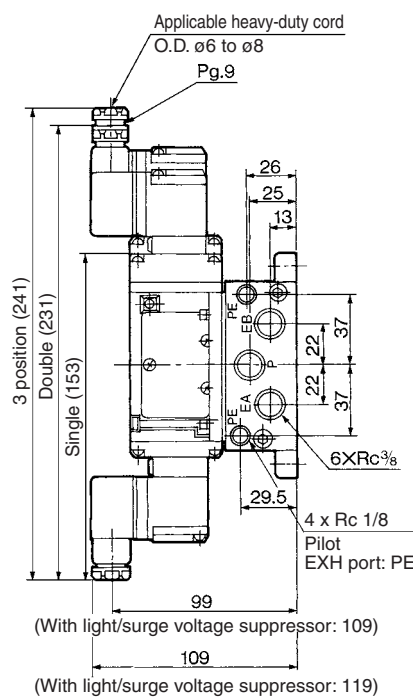


Formula for manifold weight  $M = 0.184n + 0.16$  (kg) n: Station

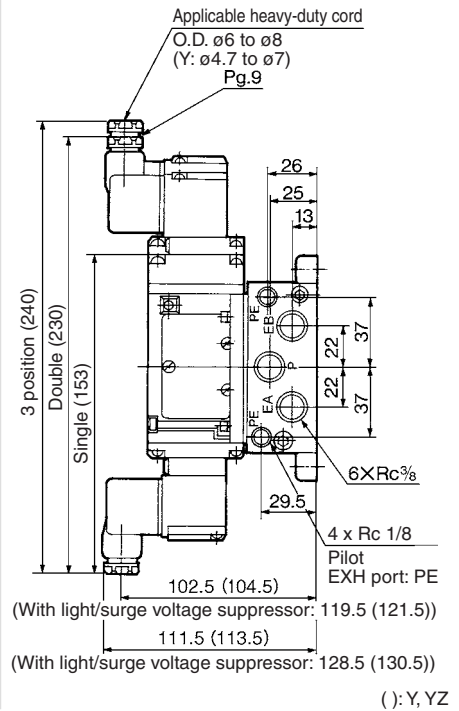
### Grommet terminal: E/EZ



### Conduit terminal: T/TZ



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



( ): Y, YZ

n: Station

L	Stations	2	3	4	5	6	7	8	9	10	Formula
$L_1$		77	108	139	170	201	232	263	294	325	$L_1 = 31 \times n + 15$
$L_2$		92	123	154	185	216	247	278	309	340	$L_2 = 31 \times n + 30$

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

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

## Series VFS2000



### Model

Type of actuation	Model		Port size Rc	Flow characteristics						Max. operating cycle (cpm) <sup>(1)</sup>	Response time (ms) <sup>(2)</sup>	Mass (kg) <sup>(3)</sup>	
	Plug-in	Non plug-in		1 → 4/2(P → A/B)			4/2 → 5/3(A/B → R1/R2)						
				C [dm <sup>3</sup> /(s·bar)]	b	Cv	C [dm <sup>3</sup> /(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 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 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 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 check	VFS2600	VFS2610	1/8	1.2	–	–	1.3	–	–	600	25 or less	0.6
				1/4	1.2	–	–	1.3	–	–			

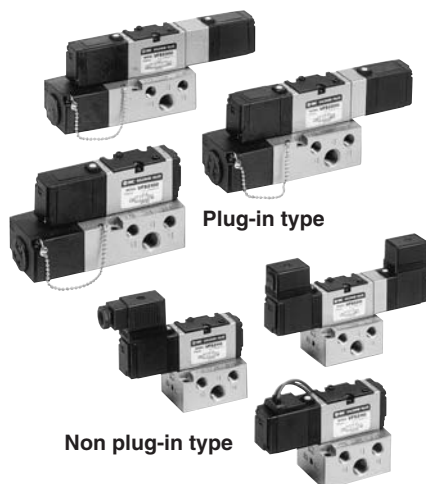
Note 1) Based on JIS B 8375 (Once per 30 days) for the minimum operating frequency. Note 2) Based on JIS B 8375-1981 (The value at supply press. 0.5 MPa). Note 3) Values for VFS2□00-□FZ-01. Note 4) Factors of "Note 1)" and "Note 2)" are ones achieved in controlled clean air.

**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

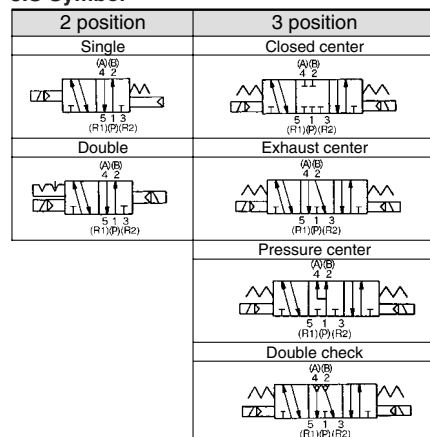


### Standard Specifications

Valve specifications	Fluid		Air/Inert gas	
	Maximum operating pressure	1.0 MPa		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),			
	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 (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 0920. Note 5) Based on JIS C 4003.

### JIS Symbol



### 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 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 (mm)	Mass (kg)	Sonic conductance* 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

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

## 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

**Port size**

Nil		Without sub-plate	
01	Rc 1/8	Plug-in type conduit terminal (With terminal block) Standard type	
02	Rc 1/4		
Note) P01	Rc 1/8	Plug-in type grommet (With attachment plug lead wire) Compact type	
Note) P02	Rc 1/4		

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

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

**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**

0:	Plug-in type sub-plate	
1:	Non plug-in type sub-plate	

**Electrical entry**

F:	Plug-in type	
----	--------------	--

**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

\* Option

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

**Port size**

Nil		Without sub-plate	
01	Rc 1/8	Non plug-in type, Standard type	
02	Rc 1/4		
Note) S01	Rc 1/8	Non plug-in type, Compact type	
Note) S02	Rc 1/4		

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

**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

**Electrical entry**

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

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

## How to Order Pilot Valve Assembly

SF4 - 1 [ ] [ ] - 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	
DO	DIN terminal with light/surge voltage suppressor	
DOZ	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)	Non plug-in
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

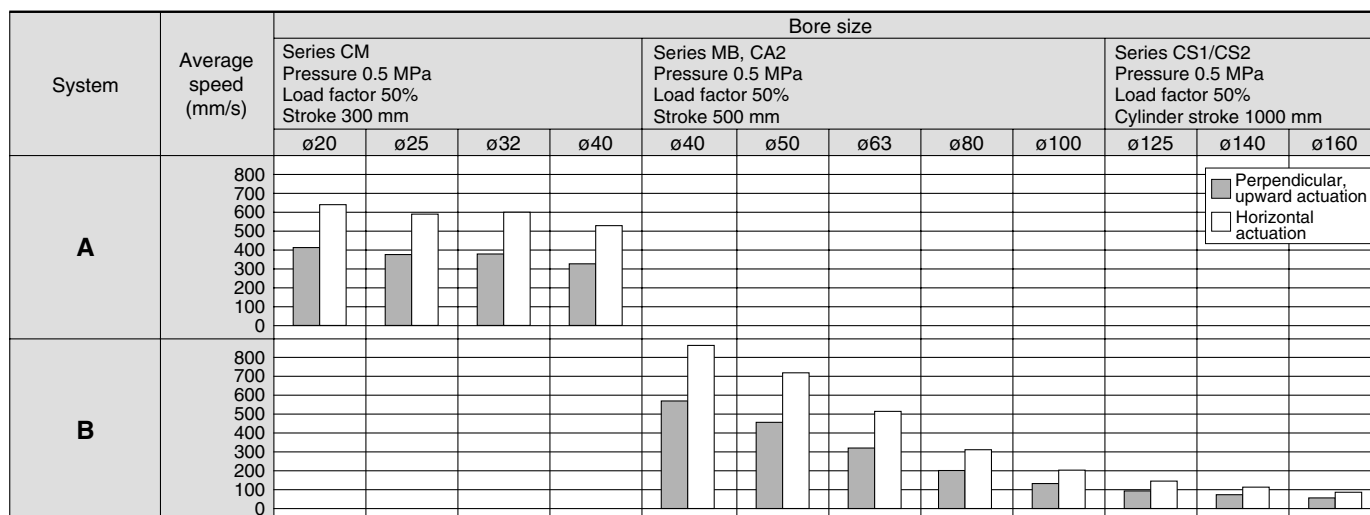
**EZ** Grommet terminal with light/surge voltage suppressor

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

# Series VFS2000

## Cylinder Speed Chart

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



### System Components

System	Solenoid valve	Speed controller	Silencer	Tube bore x Length
A	Series VFS2000 Rc 1/8	AS3000-02 (S = 12 mm <sup>2</sup> )	AN110-01 (S = 35 mm <sup>2</sup> )	T0604 x 1 m
B	Series VFS2000 Rc 1/4	AS4000-02 (S = 21 mm <sup>2</sup> )	AN110-01 (S = 35 mm <sup>2</sup> )	T1075 x 1 m

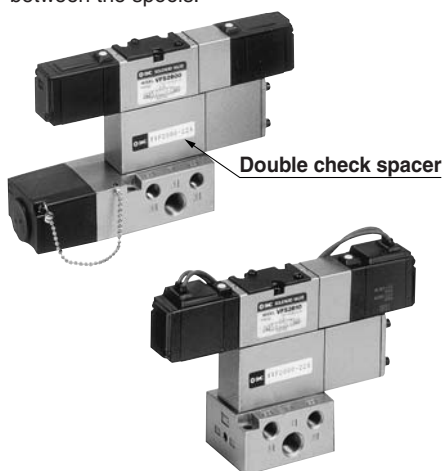


- \* It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
- \* The average velocity of the cylinder is the value that the stroke is divided by the total stroke time.
- \* Load factor: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

## Double Check Spacer/Specifications

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

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



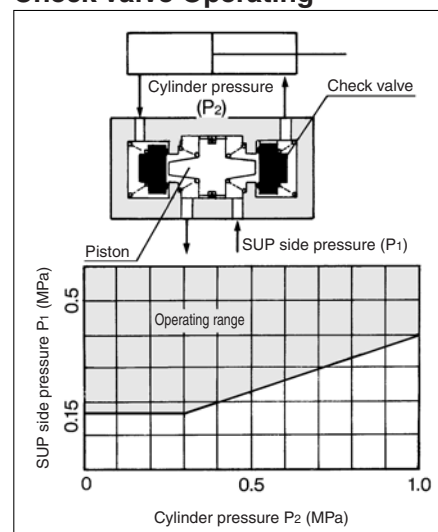
### Specifications

Double check spacer part no.	Plug-in type	Non plug-in type
	VVFS2000-22A-1	VVFS2000-22A-2
Applicable valve model	VFS2400-□F	VFS2410-□ G E T D

### ⚠ Caution

- In the case of 3 position double check valve (VFS26□0), check the leakage from piping and fittings in between valve and cylinder by means of synthetic detergent solutions, and ensure that there is no such leakage found there. Also check the leakage from cylinder seal and piston seal. If there is any leakage, sometimes the cylinder, when valve is de-energized, can move without stopping at intermediate position.
- Be aware that if the exhaust side is restricted excessively, the intermediate stopping accuracy will decrease and will lead to improper intermediate stops.

### Check Valve Operating

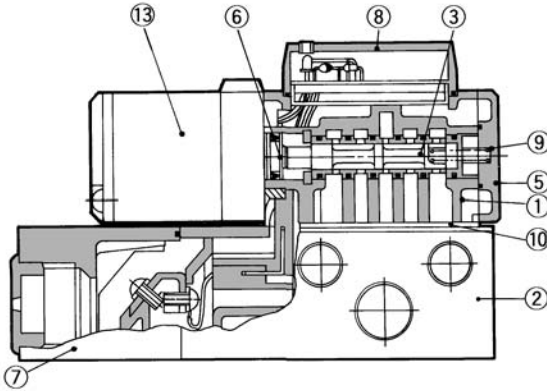
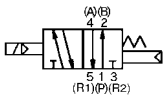


- The combination of VFS21<sup>0</sup>, VFS22<sup>0</sup> and a double check spacer can be used as prevention of falling at the stroke end but cannot hold the intermediate position of the cylinder.

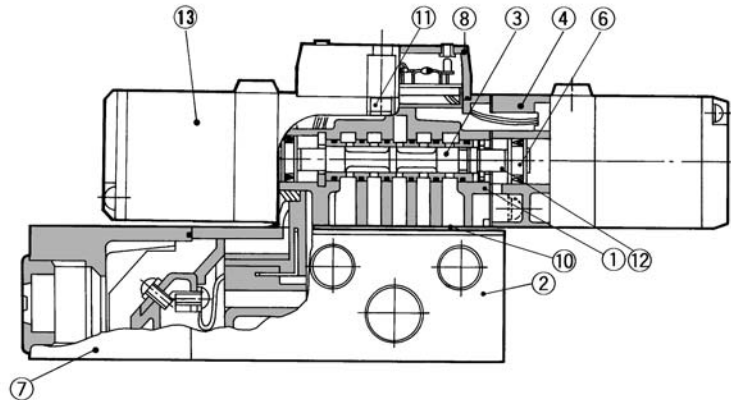
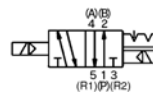
# 5 Port Pilot Operated Solenoid Valve Metal Seal, Plug-in/Non Plug-in *Series VFS2000*

## Construction

### 2 position single

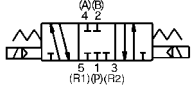


### 2 position double

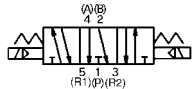


### 3 position closed center/exhaust center/pressure center

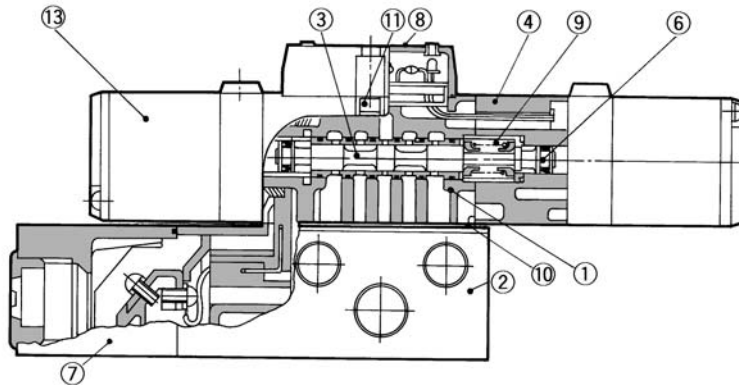
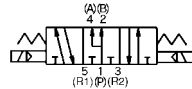
#### Closed center



#### Exhaust center



#### Pressure



## Component Parts

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

\* Refer to "How to Order Pilot Valve Assembly" on page 1139.

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

Plug-in	VFS2000-LP-R <sup>01</sup> <sub>02</sub>
Non plug-in	VFS2000-LS-R <sup>01</sup> <sub>02</sub>



\* Mounting bolt and gasket are not included.

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

Plug-in	VFS2000-LP-R <sup>01</sup> <sub>02</sub>
Non plug-in	VFS2000-LS-R <sup>01</sup> <sub>02</sub>

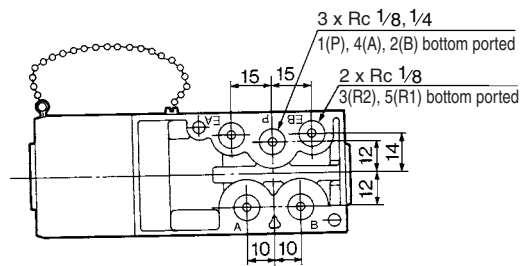
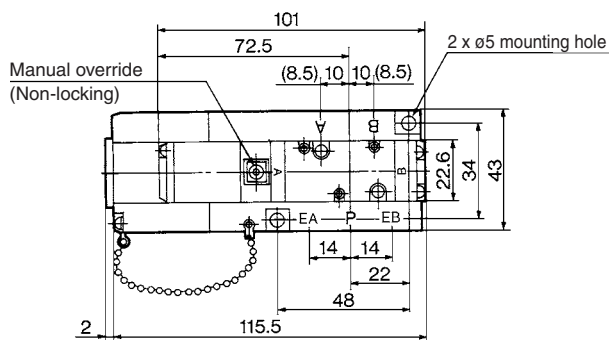
Part no. for mounting bolt and gasket	BG-VFS2000
---------------------------------------	------------

SJ  
SY  
SV  
SYJ  
SZ  
VP4  
S0700  
VQ  
VQ4  
VQ5  
VQC  
VQZ  
SQ  
VFS  
VFR  
VQ7

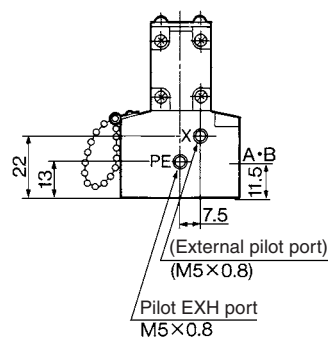
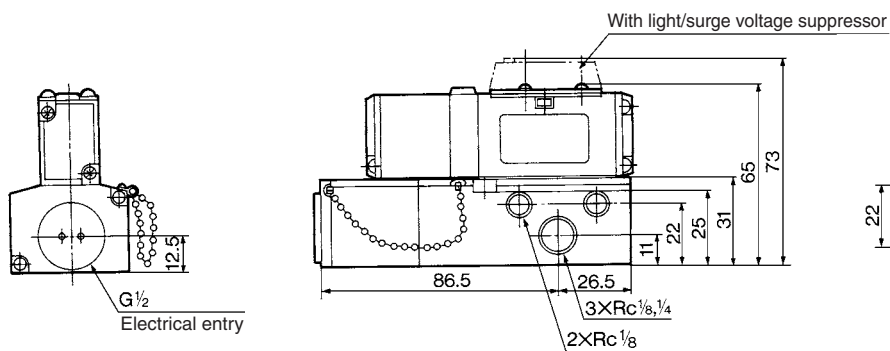
# Series VFS2000

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

2 position single: VFS2100-□F<sub>02</sub><sup>01</sup>



Bottom ported

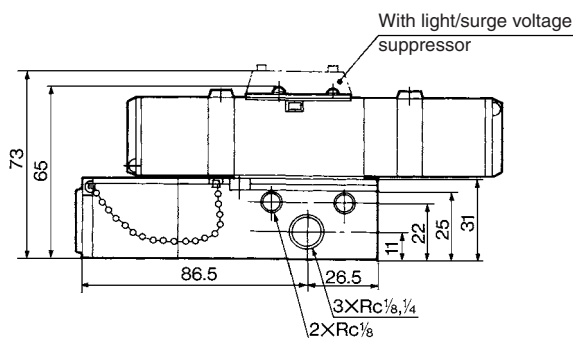
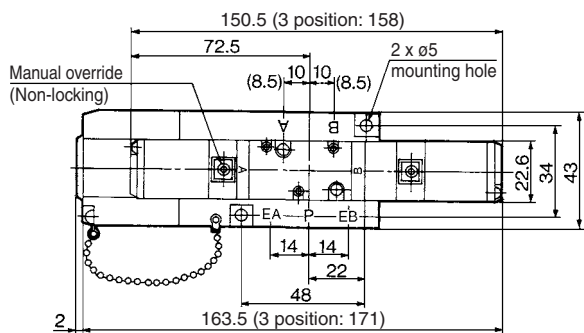


2 position double: VFS2200-□F<sub>02</sub><sup>01</sup>

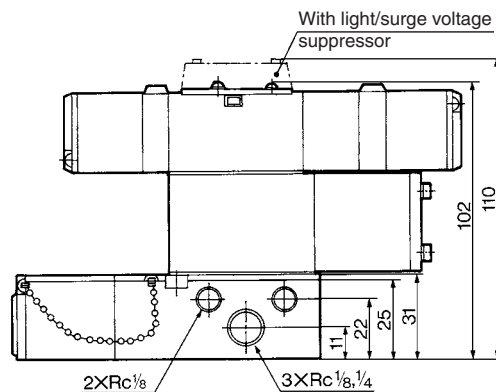
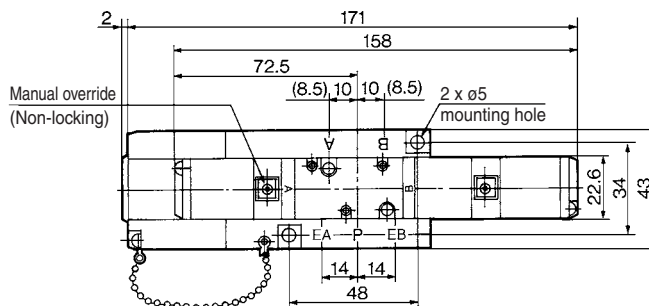
3 position closed center: VFS2300-□F<sub>02</sub><sup>01</sup>

3 position exhaust center: VFS2400-□F<sub>02</sub><sup>01</sup>

3 position pressure center: VFS2500-□F<sub>02</sub><sup>01</sup>



3 position double check: VFS2600-□F<sub>02</sub><sup>01</sup>

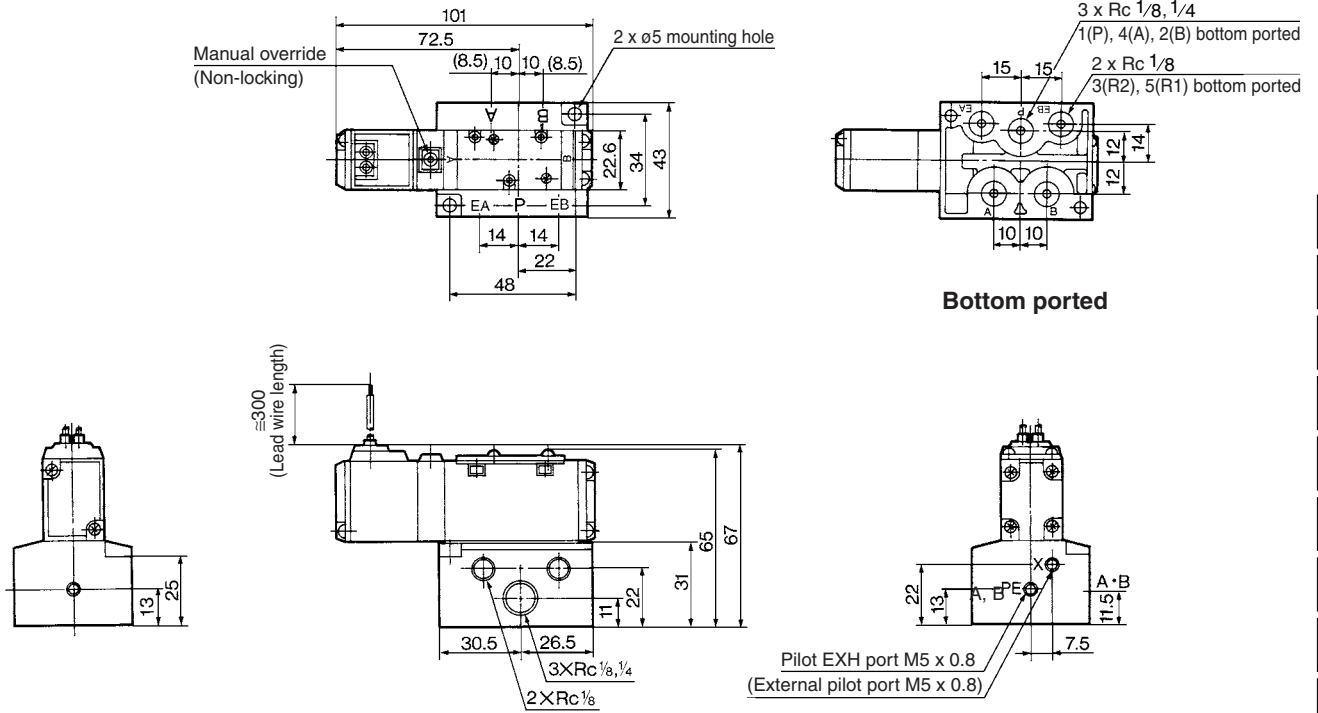




# 5 Port Pilot Operated Solenoid Valve Metal Seal, Plug-in/Non Plug-in *Series VFS2000*

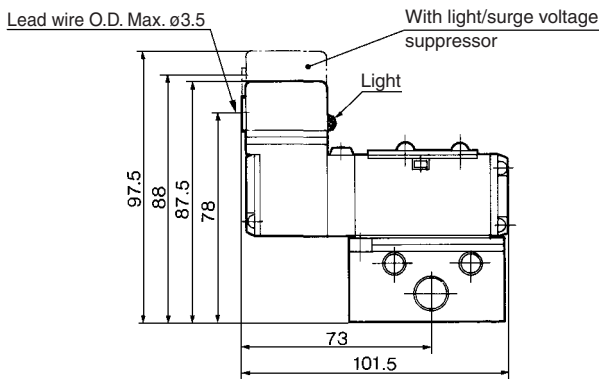
## Non Plug-in — 2 Position single

Grommet: VFS2110-□G-01

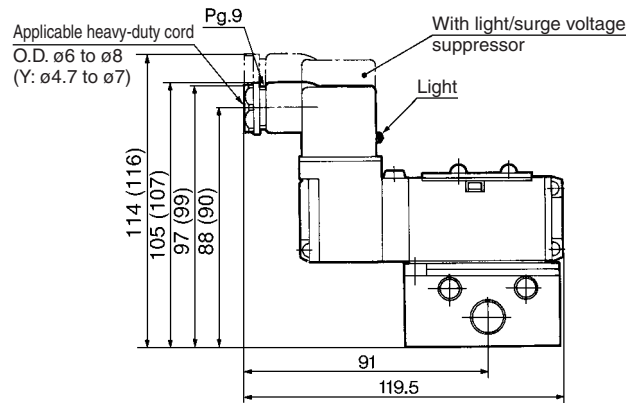


( ): Rc 1/8

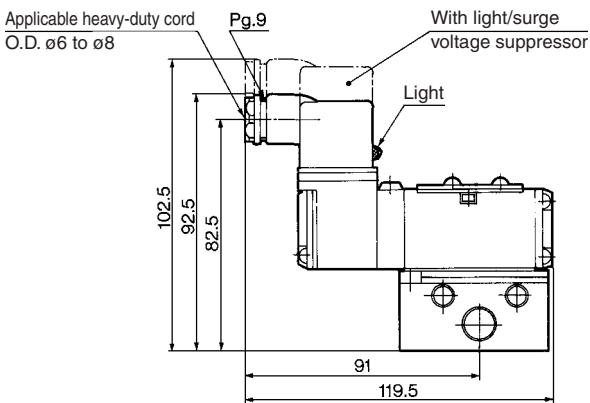
Grommet terminal: VFS2110-□E-01



DIN terminal: VFS2110-□D-01



Conduit terminal: VFS2110-□T-01



( ): Y, YZ

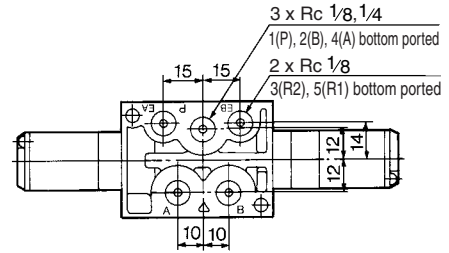
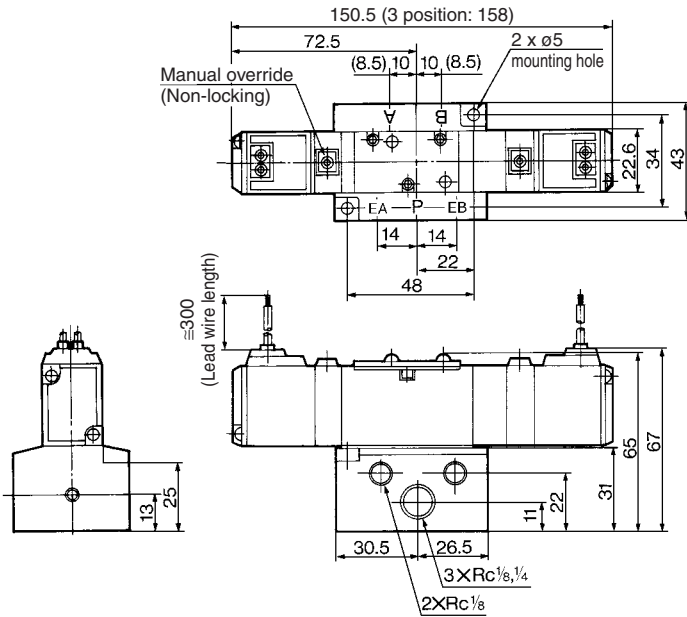
- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

# Series VFS2000

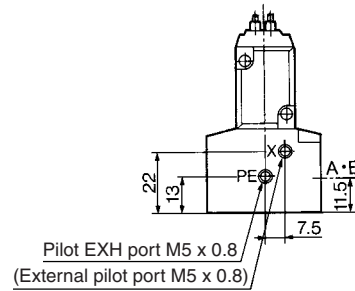
## Non Plug-in — 2 Position double/3 Position closed center/Exhaust center/Pressure center

Grommet: Double VFS2210-□G-01/02

Closed center VFS2310-□G-01/02, Exhaust center VFS2410-□G-01/02, Pressure center VFS2510-□G-01/02



Bottom ported



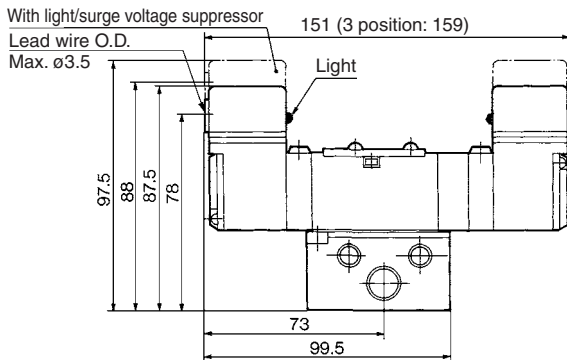
( ): Rc 1/8

Grommet terminal: Double VFS2210-□E-01/02

Closed center VFS2310-□E-01/02

Exhaust center VFS2410-□E-01/02

Pressure center VFS2510-□E-01/02

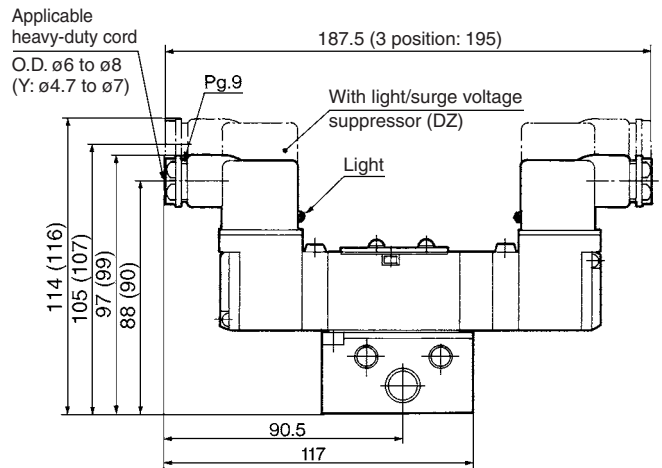


DIN terminal: Double VFS2210-□D-01/02

Closed center VFS2310-□D-01/02

Exhaust center VFS2410-□D-01/02

Pressure center VFS2510-□D-01/02

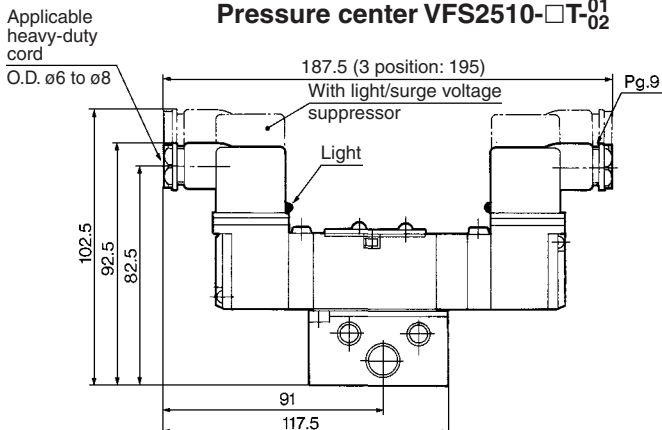


Conduit terminal: Double VFS2210-□T-01/02

Closed center VFS2310-□T-01/02

Exhaust center VFS2410-□T-01/02

Pressure center VFS2510-□T-01/02

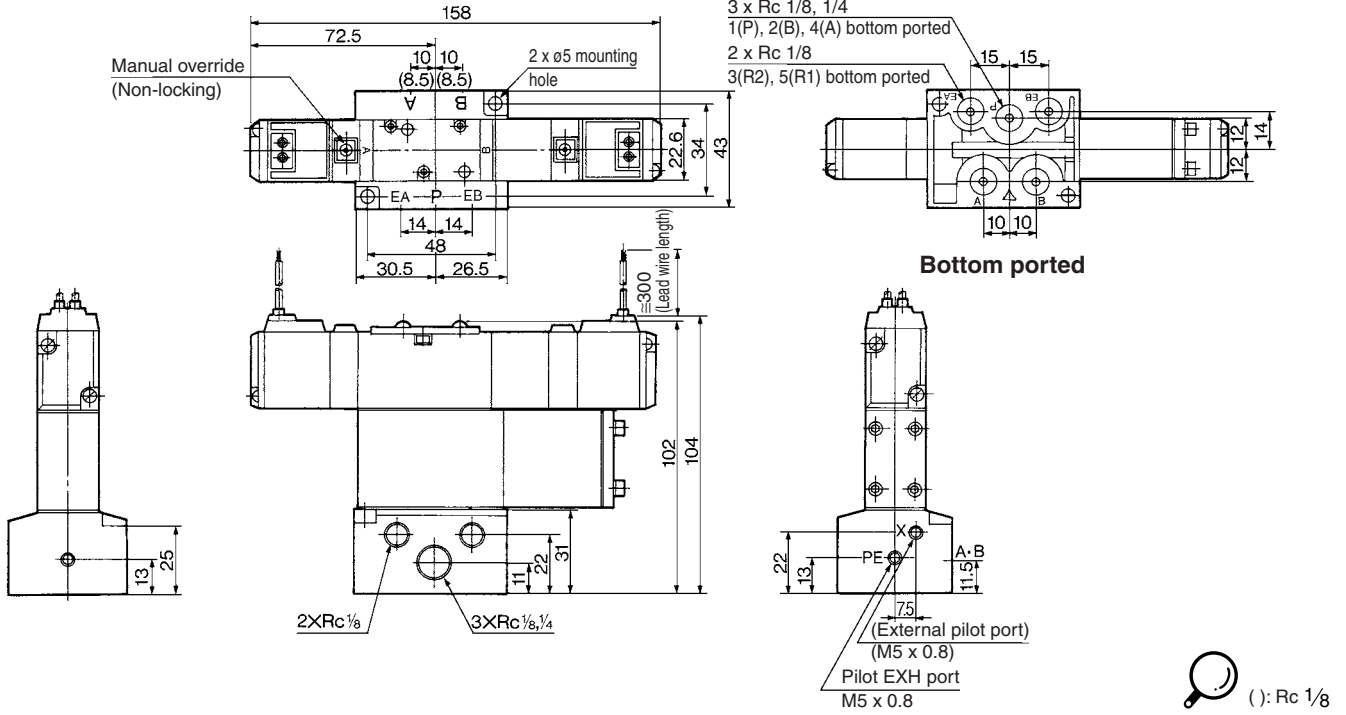


( ): Y, YZ

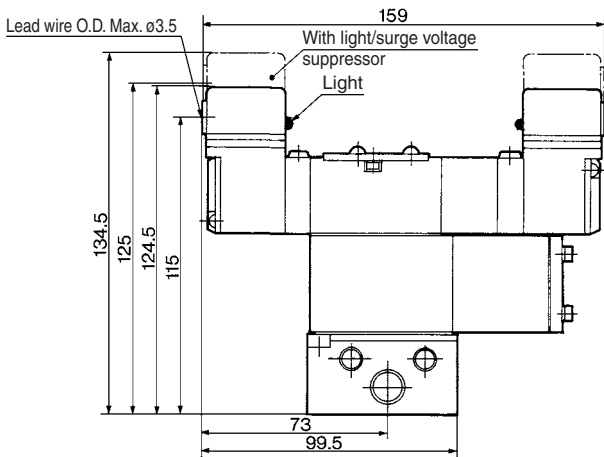
# 5 Port Pilot Operated Solenoid Valve Metal Seal, Plug-in/Non Plug-in **Series VFS2000**

## Non Plug-in — 3 Position double check

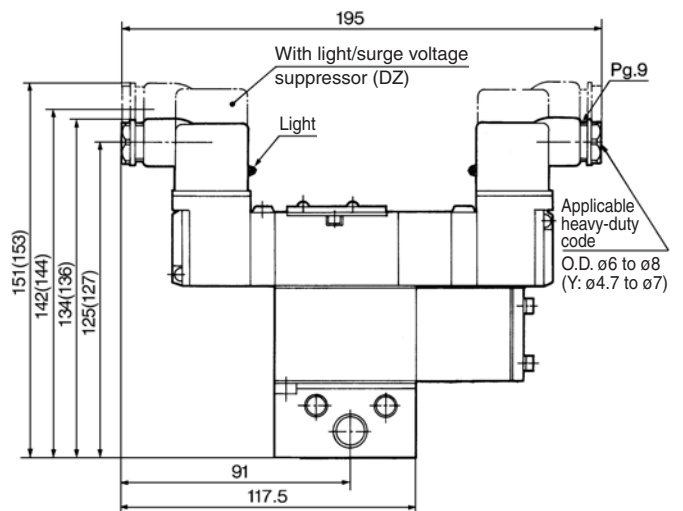
Grommet: VFS2610-□G-01



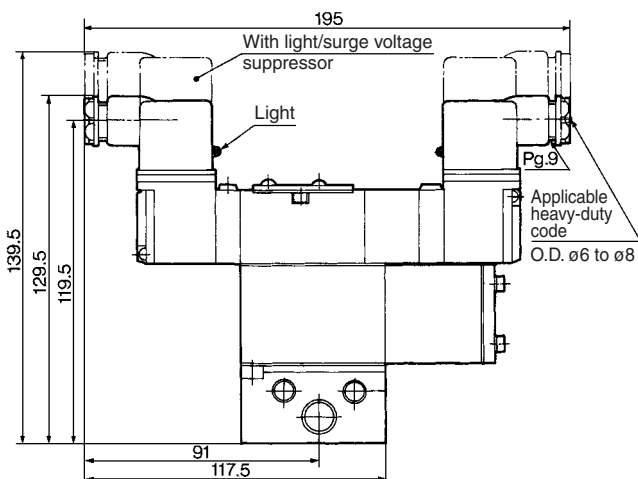
Grommet terminal: VFS2610-□E-01



DIN terminal: VFS2610-□D-01



Conduit terminal: VFS2610-□T-01



( ): Y, YZ

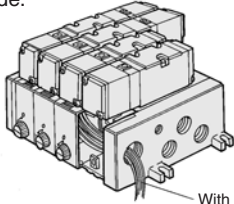
- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

# Series VFS2000

## Manifold Specifications

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

The insert plug is attached to the manifold block and lead wire is plugged into the valve side. Please connect with corresponding power side.



With attachment plug lead wire

**Series VFS2000 Manifold**  
**Plug-in type**  
**With attachment plug lead wire**

**Symbol**

Symbol	Passage P	EA,EB	Porting specifications A, B
1	Common	Common	Side
2*	Common	Common	Bottom
3*	Common	Individual	Side
4*	Common	Individual	Bottom
5*	Individual	Common	Side
6*	Individual	Common	Bottom
7*	Individual	Individual	Side
8*	Individual	Individual	Bottom

**Stations**

02	2 stations
⋮	⋮
16	16 stations

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

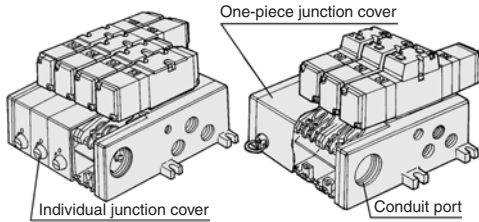
**Port size**

Symbol	P, EA, EB	A, B
01	Rc	Rc 1/8
02	1/4	Rc 1/4
M		Mixed

\* For bottom ported, Rc 1/8 is only available.

### 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.



**Series VFS2000 Manifold**  
**Plug-in type**  
**With terminal block**

**Junction cover**

Nil	Separate junction cover
1	One-piece junction cover

**Stations**

02	2 stations
⋮	⋮
16	16 stations

**Symbol**

Symbol	Passage P	EA,EB	Porting specifications A, B
1	Common	Common	Side
2*	Common	Common	Bottom
3*	Common	Individual	Side
4*	Common	Individual	Bottom
5*	Individual	Common	Side
6*	Individual	Common	Bottom
7*	Individual	Individual	Side
8*	Individual	Individual	Bottom

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

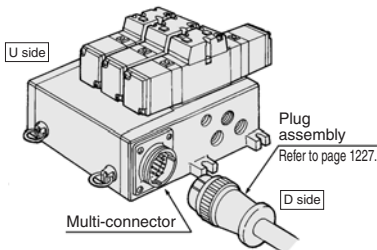
**Port size**

Symbol	P, EA, EB	A, B
01	Rc	Rc 1/8
02	1/4	Rc 1/4
M		Mixed

\* For bottom ported, Rc 1/8 is only available.

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

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



**Series VFS2000 Manifold**  
**Plug-in type**  
**With multi-connector**

**Connector mounting direction**

D	D side mounting
U	U side mounting

**Junction cover**

1	One-piece junction cover
---	--------------------------

**Stations**

02	2 stations
⋮	⋮
08	8 stations

\* Max. 8 stations

**Symbol**

Symbol	Passage P	EA,EB	Porting specifications A, B
1	Common	Common	Side
2*	Common	Common	Bottom
3*	Common	Individual	Side
4*	Common	Individual	Bottom
5*	Individual	Common	Side
6*	Individual	Common	Bottom
7*	Individual	Individual	Side
8*	Individual	Individual	Bottom

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

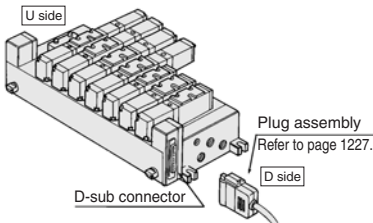
**Port size**

Symbol	P, EA, EB	A, B
01	Rc	Rc 1/8
02	1/4	Rc 1/4
M		Mixed

\* For bottom ported, Rc 1/8 is only available.

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

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



**Series VFS2000 Manifold**  
**Plug-in type**  
**With D-sub connector**

**Connector mounting direction**

D	D side mounting
U	U side mounting

**Junction cover**

1	One-piece junction cover
---	--------------------------

**Stations**

02	2 stations
⋮	⋮
08	8 stations

\* Max. 8 stations

**Symbol**

Symbol	Passage P	EA,EB	Porting specifications A, B
1	Common	Common	Side
2*	Common	Common	Bottom
3*	Common	Individual	Side
4*	Common	Individual	Bottom
5*	Individual	Common	Side
6*	Individual	Common	Bottom
7*	Individual	Individual	Side
8*	Individual	Individual	Bottom

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

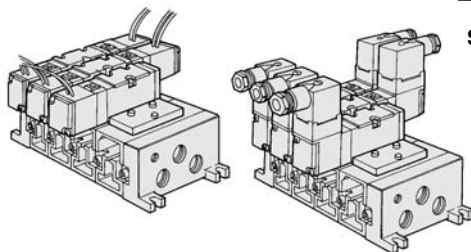
**Port size**

Symbol	P, EA, EB	A, B
01	Rc	Rc 1/8
02	1/4	Rc 1/4
M		Mixed

\* For bottom ported, Rc 1/8 is only available.

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

- Wiring for every valve



**Series VFS2000 Manifold**  
**Non plug-in type**

**Stations**

02	2 stations
⋮	⋮
16	16 stations

**Symbol**

Symbol	Passage P	EA,EB	Porting specifications A, B
1	Common	Common	Side
2*	Common	Common	Bottom
3*	Common	Individual	Side
4*	Common	Individual	Bottom
5*	Individual	Common	Side
6*	Individual	Common	Bottom
7*	Individual	Individual	Side
8*	Individual	Individual	Bottom

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

**Port size**

Symbol	P, EA, EB	A, B
01	Rc	Rc 1/8
02	1/4	Rc 1/4
M		Mixed

\* For bottom ported, Rc 1/8 is only available.

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

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

## How to Order Manifold Assembly

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

### <Example>

- Plug-in type with terminal block  
(6 stations, one-piece style junction cover)  
**(Manifold base) VV5FS2-01T1-061-02..... 1**  
**(2 position single) VFS2100-5FZ.....3**  
**(2 position double) VFS2200-5FZ.....2**  
**(Blanking plate) VVFS2000-10A..... 1**
- Non plug-in type (6 stations)  
**(Manifold base) VV5FS2-10-061-01..... 1**  
**(2 position single) VFS2110-5D..... 3**  
**(3 position exhaust center) VFS2410-5D..... 1**  
**(Individual EXH spacer) VVFS2000-R-01-2... 1**

## Manifold Specifications

Base model	Wiring	Porting specifications		Port size Rc		Stations	Applicable valve model
		A, B port	P, EA, EB	A, B	A, B		
Plug-in type <b>VV5FS2-01□</b>	<ul style="list-style-type: none"> <li>• With attachment plug lead wire</li> <li>• With terminal block</li> <li>• With multi-connector</li> <li>• With D-sub connector</li> </ul>	Side/Bottom	1/4	1/8, 1/4	2 to 15*	VFS2□00-□F	
Non plug-in type <b>VV5FS2-10</b>	<ul style="list-style-type: none"> <li>• Grommet</li> <li>• Grommet terminal</li> <li>• Conduit terminal</li> <li>• DIN terminal</li> </ul>					VFS2□10-□G VFS2□10-□E VFS2□10-□T VFS2□10-□D	



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

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

Model	Passage/Stations		Station 1	Station 5	Station 10
VVFS2	1 → 4/2 (P → A/B)	C [dm <sup>3</sup> /(s·bar)]	2.4	2.4	2.4
		b	0.14	0.14	0.14
		Cv	0.50	0.50	0.50
	4/2 → 5/3 (A/B → R1/R2)	C [dm <sup>3</sup> /(s·bar)]	2.5	2.5	2.5
		b	0.18	0.18	0.18
		Cv	0.60	0.60	0.60



\* Port size Rc 1/4

SJ

SY

SV

SYJ

SZ

VP4

S0700

VQ

VQ4

VQ5

VQC

VQZ

SQ

VFS

VFR

VQ7

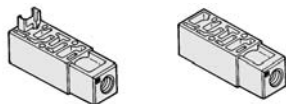
# Series VFS2000

## Manifold Option Parts Assembly

### Individual SUP spacer

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

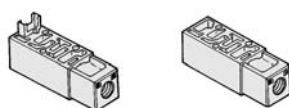
Body type	Plug-in type	Non plug-in type	
Part no.	Rc 1/8	VVFS2000-P-01-1	VVFS2000-P-01-2
	Rc 1/4	VVFS2000-P-02-1	VVFS2000-P-02-2



### Individual EXH spacer

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

Body type	Plug-in type	Non plug-in type	
Part no.	Rc 1/8	VVFS2000-R-01-1	VVFS2000-R-01-2
	Rc 1/4	VVFS2000-R-02-1	VVFS2000-R-02-2



### SUP block plate

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

Body type	Plug-in type	Non plug-in type
Part no.	AXT625-12A	

### EXH block plate

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

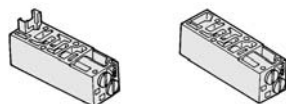
Body type	Plug-in type	Non plug-in type
Part no.	AXT625-12A	



### Throttle valve spacer

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

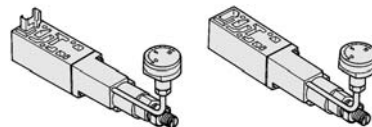
Body type	Plug-in type	Non plug-in type
Part no.	VVFS2000-20A-1	VVFS2000-20A-2



### Interface regulator (P port regulation)

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

Body type	Plug-in type	Non plug-in type
P port regulation	ARBF2000-00-P-1	ARBF2000-00-P-2



### Air shutoff valve spacer

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

Body type	Plug-in type	Non plug-in type
Part no.	VVFS2000-21A-1	VVFS2000-21A-2



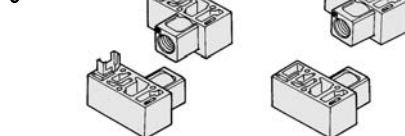
\* Not mountable for standard type sub-plate.

### Air release valve spacer

The concurrent use of air release valve spacer with VFS21□□ (single) can release air.

Body type	Plug-in type	Non plug-in type
Part no.	VVFS2000-24A-1 <sub>L</sub>	VVFS2000-24A-2 <sub>L</sub>

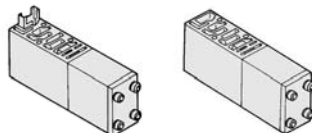
(Note) L: U side mount R: D side mount



### Double check spacer

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

Body type	Plug-in type	Non plug-in type
Part no.	VVFS2000-22A-1	VVFS2000-22A-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.	VVFS2000-10A	

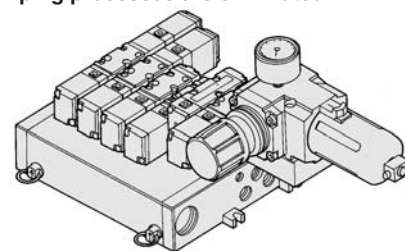
### Accessory

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

## Manifold Option

### 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 1153.

### Drip-proof Manifold

- Plug-in type
- Equivalent to IP65

For details, refer to page 1155.

### Made to Order Manifold with serial transmission kit

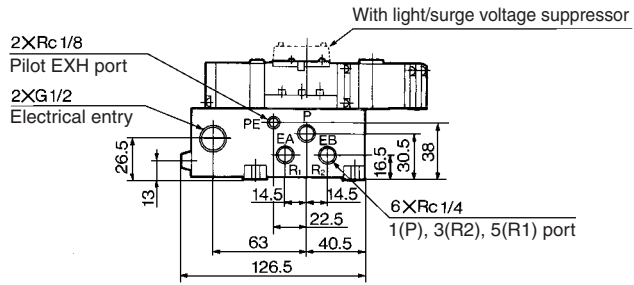
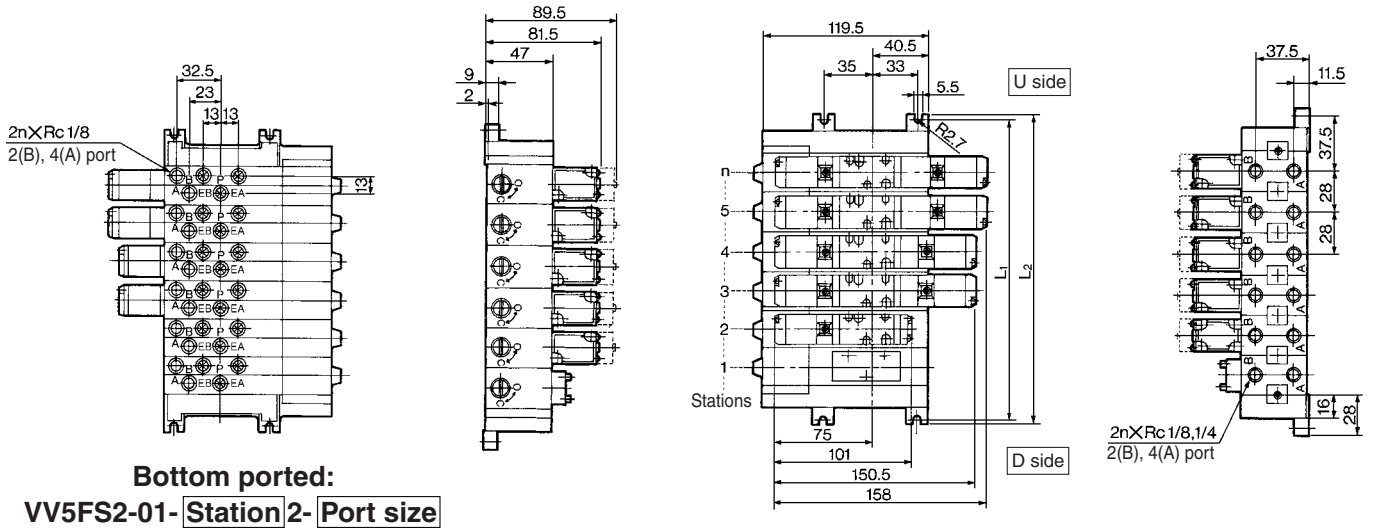
- Plug-in type
- Solenoid valve wiring process reduced considerably.

For details, refer to page 1158.

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

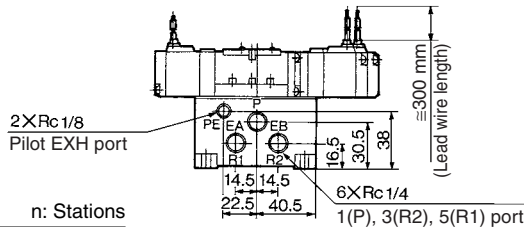
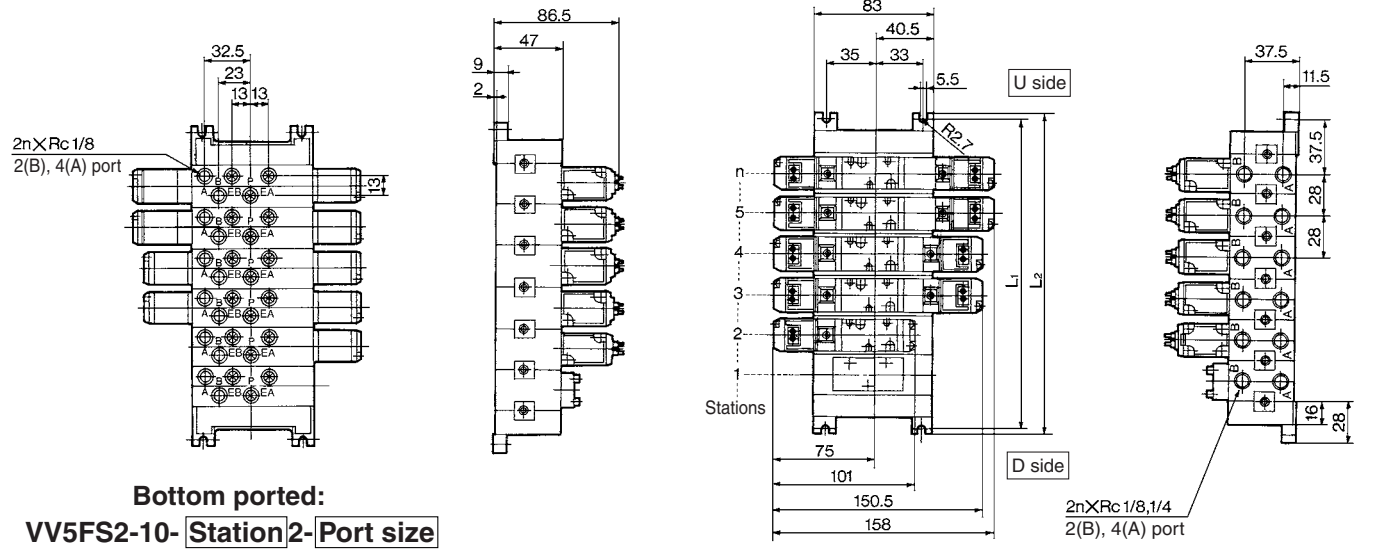
## Manifold — Plug-in type, Non plug-in type

### Plug-in type (Insert plug with lead wire): VV5FS2-01- Station 1- Port size



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

### Non plug-in type: VV5FS2-10- Station 1- Port size



Formula for manifold weight  $M = 0.174n + 0.218$  (kg)

n: Stations

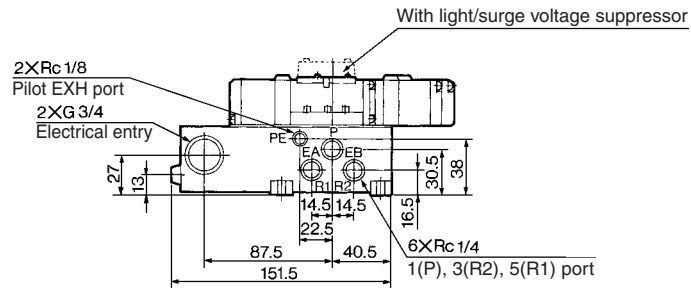
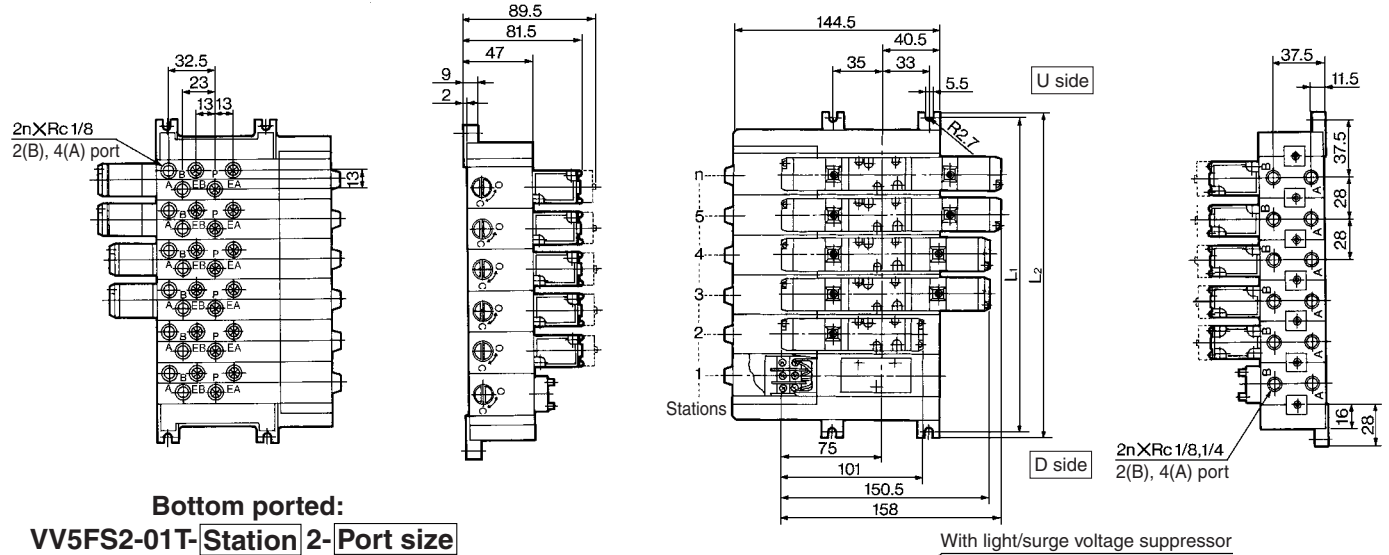
Stations	1	2	3	4	5	6	7	8	9	10	Formula
L <sub>1</sub>	75	103	131	159	187	215	243	271	299	327	L <sub>1</sub> = 28 x n + 47
L <sub>2</sub>	84	112	140	168	196	224	252	280	308	336	L <sub>2</sub> = 28 x n + 56

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

# Series VFS2000

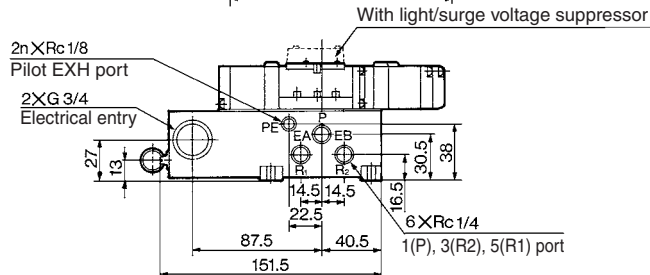
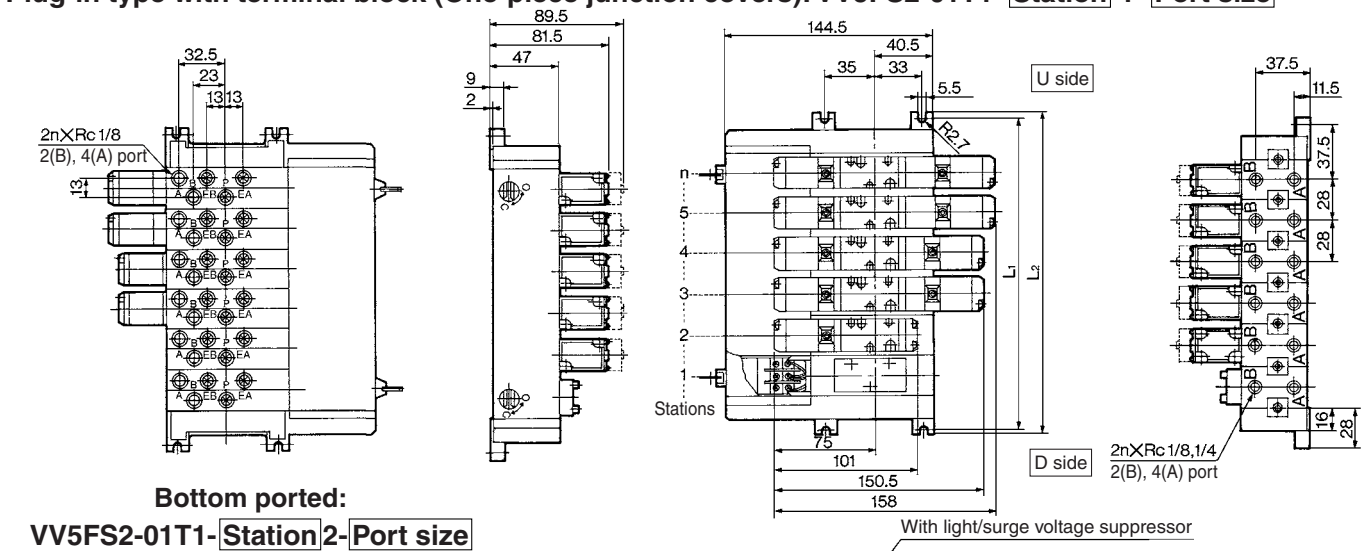
## Manifold — Plug-in type: Individual/One-piece junction cover

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



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

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



Formula for manifold weight  $M = 0.236n + 0.354$  (kg) n: Station

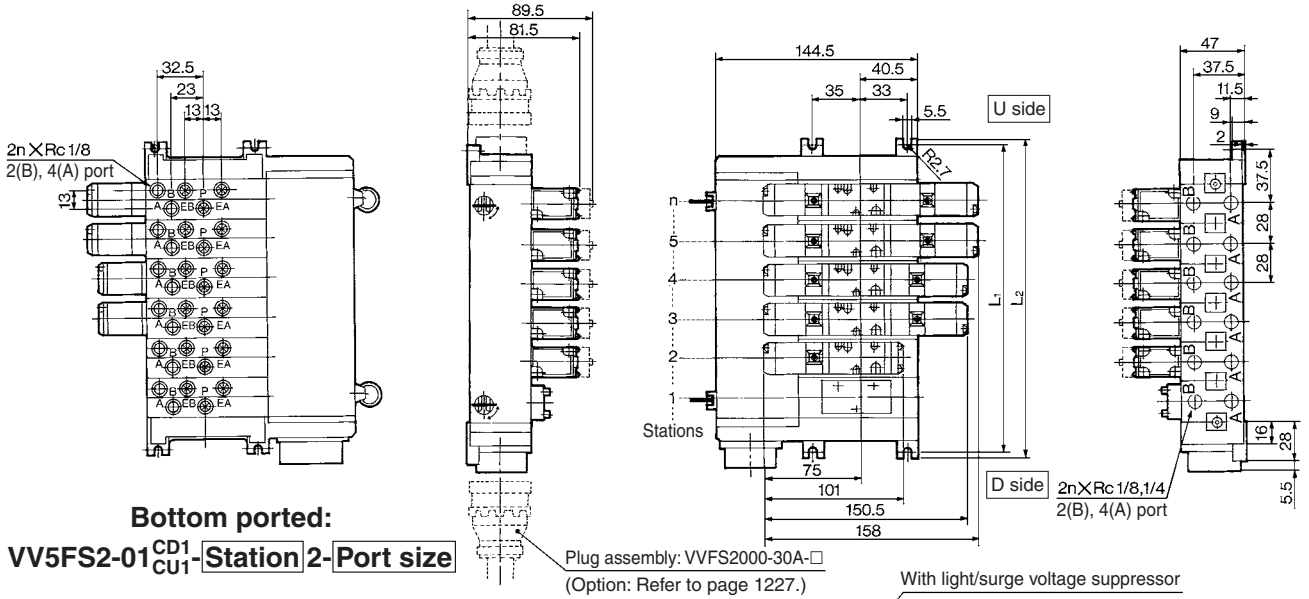
Stations	1	2	3	4	5	6	7	8	9	10	Formula
L <sub>1</sub>	75	103	131	159	187	215	243	271	299	327	L <sub>1</sub> = 28 x n + 47
L <sub>2</sub>	84	112	140	168	196	224	252	280	308	336	L <sub>2</sub> = 28 x n + 56



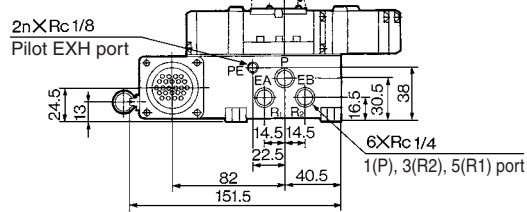
# 5 Port Pilot Operated Solenoid Valve Metal Seal, Plug-in/Non Plug-in *Series VFS2000*

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

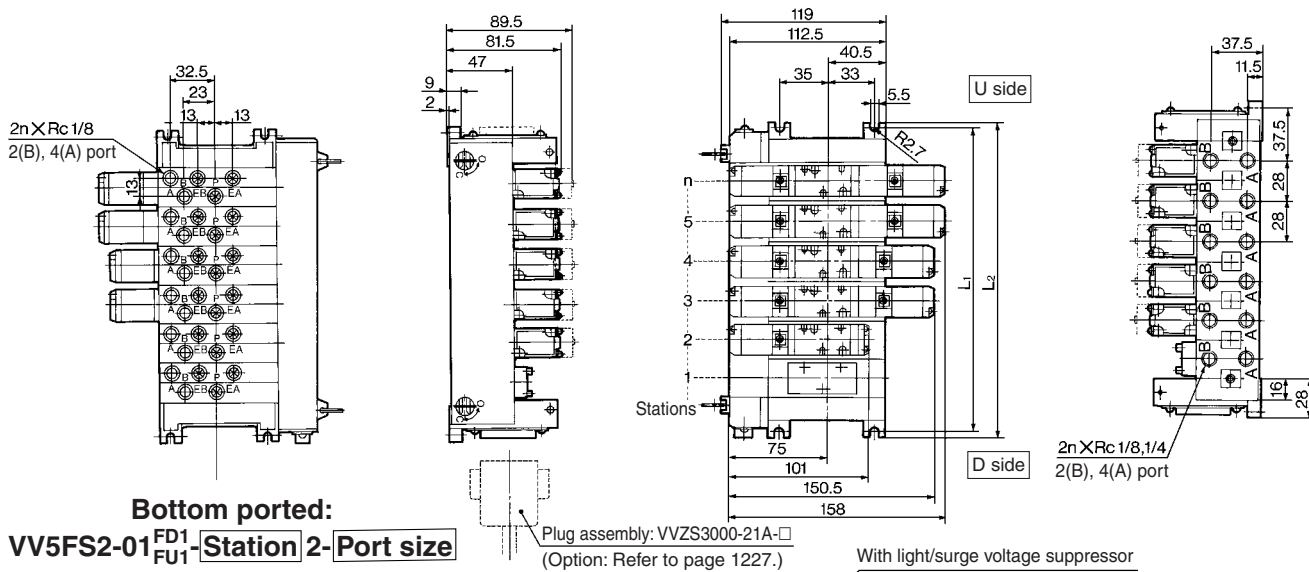
Plug-in with multi-connector: **VV5FS2-01CD1-Station 1-Port size**, **VV5FS2-01CU1-Station 1-Port size**



Formula for manifold weight  $M = 0.211n + 0.442$  (kg) n: Station  
 \* Wiring specifications: Refer to page 1227.



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



Formula for manifold weight  $M = 0.178n + 0.378$  (kg)  
 \* Wiring specifications: Refer to page 1227.



n: Stations

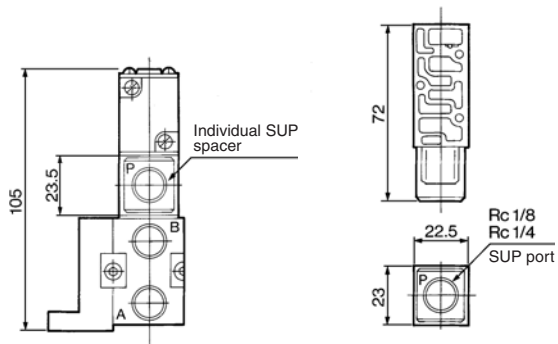
Stations	1	2	3	4	5	6	7	8	Formula
L <sub>1</sub>	75	103	131	159	187	215	243	271	L <sub>1</sub> = 28 x n + 47
L <sub>2</sub>	84	112	140	168	196	224	252	280	L <sub>2</sub> = 28 x n + 56

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

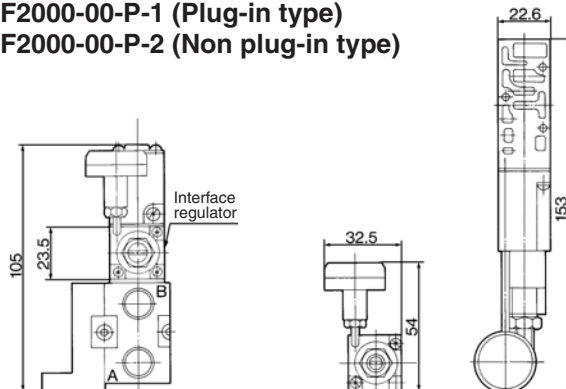
# Series VFS2000

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

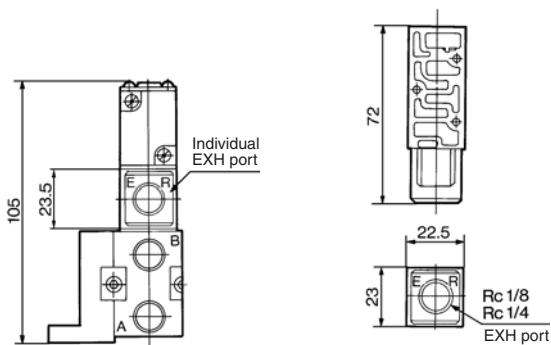
**Individual SUP spacer:**  
**VVFS2000-P-01-1 (Plug-in type)**  
**VVFS2000-P-01-2 (Non plug-in type)**



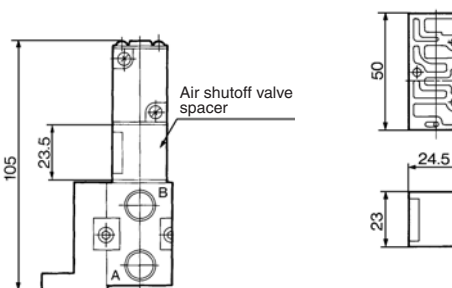
**Interface regulator:**  
**ARBF2000-00-P-1 (Plug-in type)**  
**ARBF2000-00-P-2 (Non plug-in type)**



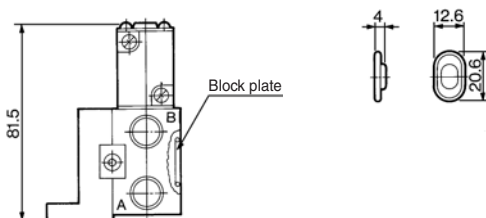
**Individual EXH spacer:**  
**VVFS2000-R-01-1 (Plug-in type)**  
**VVFS2000-R-01-2 (Non plug-in type)**



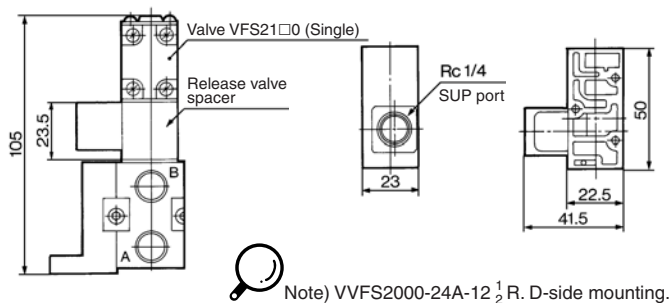
**Air shutoff valve spacer:**  
**VVFS2000-21A-1 (Plug-in type)**  
**VVFS2000-21A-2 (Non plug-in type)**



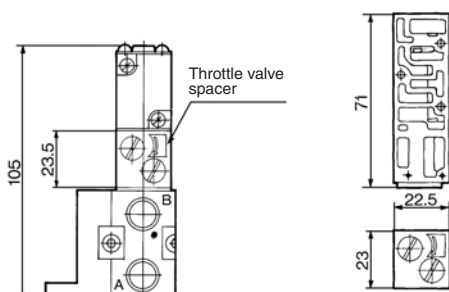
**SUP block plate: AXT625-12A**  
**EXH block plate: AXT625-12A**



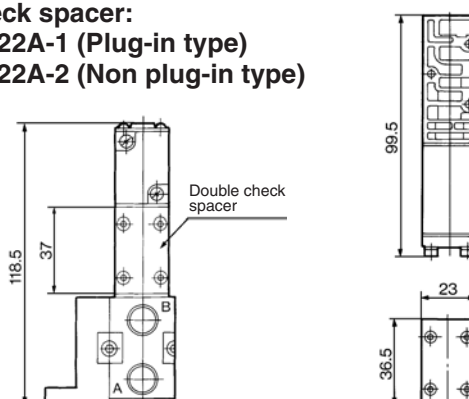
**Release valve spacer:**  
**VVFS2000-24A-1<sup>R</sup> (Plug-in type)**  
**VVFS2000-24A-2<sup>L</sup> (Non plug-in type)**



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



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

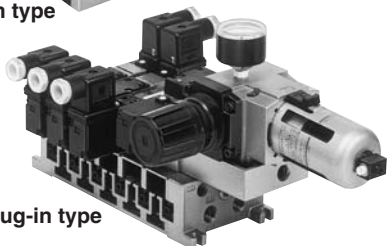


## Manifold with Control Unit

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



Plug-in type



Non plug-in type

### Caution

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

### Manifold Specifications

Manifold	Plug-in type: VV5FS2-01□	Non plug-in type: VV5FS2-10
Wiring	Plug-in with attachment plug lead wire With terminal block With multi-connector With D-sub connector	Grommet Grommet terminal Conduit terminal DIN terminal
Applicable valve model	VFS2□00-□F	VFS2□10-□G, VFS2□10-□E VFS2□10-□T, VFS2□10-□D
Porting specifications Rc	Common SUP, Common EXH	
	2(B), 4(A) port 1 (P), 3(R2), 5(R1) port	Side: Rc 1/8, 1/4, Bottom: Rc 1/8 (Option) Side: Rc 1/4, 1/8, Bottom: Rc 1/8 (Option)
Stations	2 to 15 stations*	

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

### Control Unit Specifications

Air filter (With auto-drain/With manual drain)	
Filteration degree	5 μm
Regulator	
Set pressure (Outlet pressure)	0.05 to 0.85 MPa
Pressure switch <sup>(1)</sup>	
Set pressure range: OFF	0.1 to 0.6 MPa
Differential	0.08 MPa or less
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
Air release valve (Single only)	
Operating pressure range	0.1 to 1.0 MPa

### Control Unit/Option

Air release valve spacer <sup>(2)</sup>	<Plug-in type> VVFS2000-24A-1R (D side mounting) VVFS2000-24A-1L (U side mounting)
	<Non plug-in type> VVFS2000-24A-2R (D side mounting) VVFS2000-24A-2L (U side mounting)
Pressure switch <sup>(3)</sup>	IS1000P-2-1
Blanking plate	With control unit/Filter regulator MP2-2 Pressure switch MP3-2 Release valve AXT625-18A
Filter element	111511-5B



Note 1) Voltage: 24 VDC to 100 VAC  
Inner voltage drop: 4 V



Note 2) Refer to manifold option parts on page 1148.

Note 3) The non plug-in type cannot be mounted afterwards.

### How to Order

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

VV5FS2 - 10 - 08 1 - 01 - AP

Series VFS2000  
Manifold

Base type/Electrical entry

01	Plug-in type with attachment plug lead wire
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

Connector mounting direction

Symbol	With connector	Applicable base
Nil	None	01, 01T, 10
D	D side mounting	
U	U side mounting	01C, 01F

Junction cover

Nil	Stacking type
1	Integrated type

Note) Stacking type:  
Base type 01, 01T  
Integrated type:  
Base type 01T, 01C, 01F

Stations

02	2 stations
⋮	⋮
15*	15 stations

\* Base type  
01, 01T, 10 — 2 to 15 stations  
01C, 01F — 2 to 8 stations

Symbol

Symbol	Passage		Porting specifications B, A
	P	EA, EB	
1	Common	Common	Side
2*	Common	Common	Bottom
3*			Side
4*	Common	Individual	Bottom
5*			Side
6*	Individual	Common	Bottom
7*			Side
8*	Individual	Individual	Bottom



\* Option  
The individual specification of the P port in the composition symbol marks 3 to 8 or EA, EB ports should be taken as individual port using a block plate. Therefore, if an individual port is taken using a single SUP spacer of option or a single EXH spacer, the composition symbol mark is "1".

Air release valve coil rating

Nil	None (F, G type only)
1	100 VAC, 50/60 Hz
5	24 VDC
9	Other

Control unit type

Symbol	Nil	A	AP	M	MP	F	G	C	E
Control equipment									
Air filter with auto-drain	●	●				●			
Air filter with manual drain				●	●		●		
Regulator	●	●	●	●	●	●	●		
Air release valve	●	●	●	●				●	●
Pressure switch			●		●				
Blanking plate (Air release valve)						●	●		
Blanking plate (Filter, Regulator)								●	
Blanking plate (Pressure switch)								●	
Number of manifold blocks required for mounting (stations)	2	2	2	2	2	2	2	2	1

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

Port size

Symbol	P, EA, EB	B, A
01	Rc	Rc 1/8
02	1/4	Rc 1/4
M		Mixed

### How to Order Manifold Assembly [Example]

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

<Example>

• Plug-in type with terminal block  
(Manifold base) VV5FS2-01T1-091-02-MP5 ..... 1  
(2 position single) \* VFS2100-5FZ ..... 5  
(2 position double) \* VFS2200-5FZ ..... 2  
\* 2 stations are needed to mount control unit.

• Non plug-in type  
(Manifold base) VV5FS2-10-071-01-M ..... 1  
(2 position single) \* VFS2110-5D ..... 5  
\* 2 stations are needed to mount control unit.

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

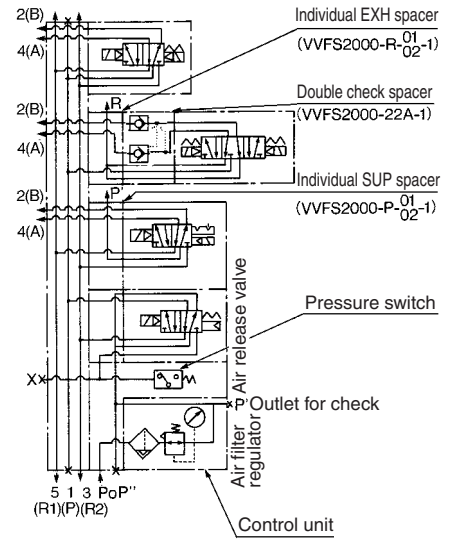
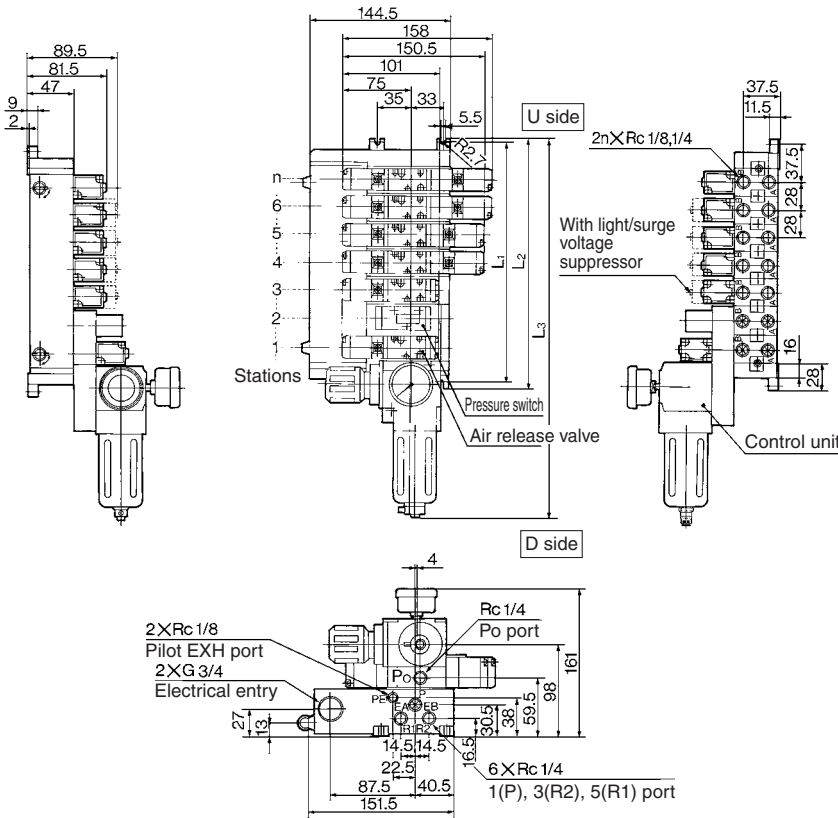
# Series VFS2000

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

### Plug-in type:

VVFS2-01T-Station 1- Port size- Control unit Voltage for release valve

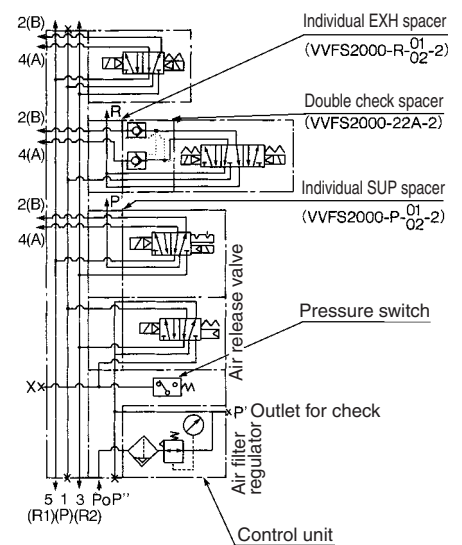
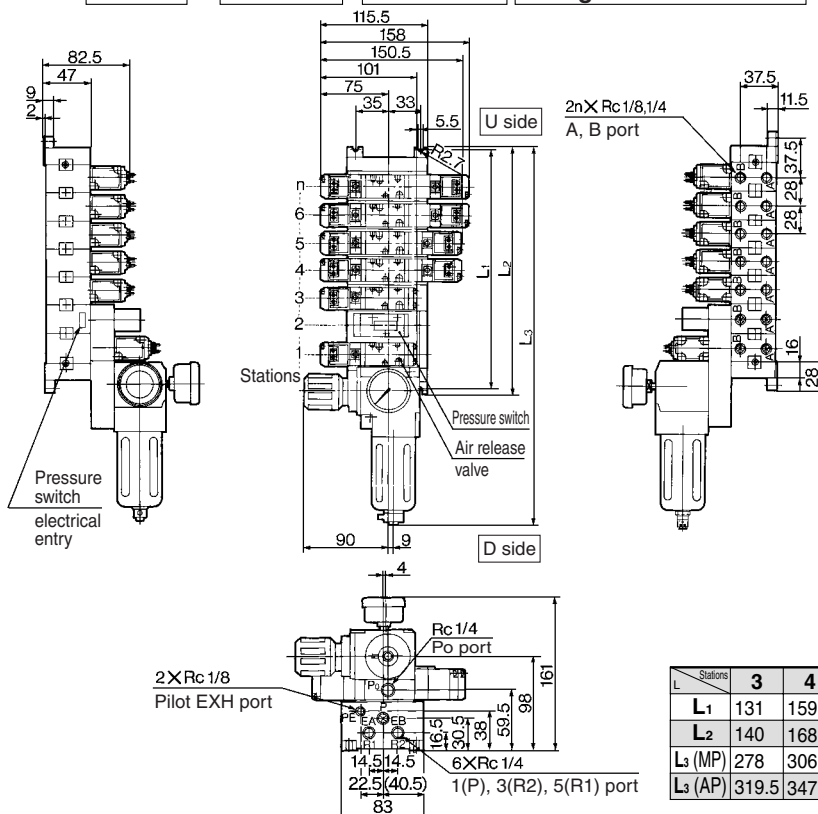
### Example for manifold



### Non plug-in type:

VVFS2-10-Station 1- Port size - Control unit Voltage for release valve

### Example for manifold



n: Stations

L	Stations	3	4	5	6	7	8	9	10	Formula
L <sub>1</sub>		131	159	187	215	243	271	299	327	L <sub>1</sub> = 28 x n + 47
L <sub>2</sub>		140	168	196	224	252	280	308	336	L <sub>2</sub> = 28 x n + 56
L <sub>3</sub> (MP)		278	306	334	362	390	418	446	474	L <sub>3</sub> = 28 x n + 194
L <sub>3</sub> (AP)		319.5	347.5	375.5	403.5	431.5	459.5	487.5	515.5	L <sub>3</sub> = 28 x n + 235.5

## Dripproof Manifold (Equivalent to IP65)

### Manifold Specifications

Manifold	VV5FS2-01WTB <sub>U</sub>	VV5FS2-01W
Wiring	Common terminal box	Attachment plug lead wire
Applicable value model	VFS2□□00-□F-X54	
Porting specifications	Common SUP, Common EXH	
	2(B), 4(A) port	Side: Rc 1/8, 1/4, Bottom: Rc 1/8 (Option)
Rc	1(P), 3(R2), 5(R1) port	Side: Rc 1/4
Stations	2 to 10 stations	2 to 15 stations

### How to Order

#### How to order manifold

VV5FS2 - **01WTBU** - **08** **1** - **02**

Plug-in dripproof manifold  
(Equivalent to IP65)

<b>01WTBU</b>	Common terminal box (U side mounting)
<b>01WTBD</b>	Common terminal box (D side mounting)
<b>01W</b>	Attachment plug lead wire

#### Port size

Symbol	P, R1, R2	A, B
<b>01</b>	Rc 1/4	Rc 1/8
<b>02</b>		Rc 1/4
<b>M</b>	Mixed	

\* For bottom ported, A/B port is available only with Rc 1/8.

#### Stations

<b>02</b>	2 stations
<b>:</b>	<b>:</b>
<b>15</b>	15 stations

#### Symbol

Symbol	Passage	Porting specifications
	P, R1, R2	A, B
<b>1</b>	Common	Side
<b>2*</b>		Bottom

\* Option

#### How to order valves

VFS2 **1** **00** **5** **F** **X54**

#### Symbol

<b>1</b>	2 position single
<b>2</b>	2 position double
<b>3</b>	3 position closed center
<b>4</b>	3 position exhaust center
<b>5</b>	3 position pressure center
<b>6</b>	3 position double check

#### Pilot type

<b>Nil</b>	Internal pilot
<b>R*</b>	External pilot

\* Option

#### Dripproof

#### Pilot valve manual override

<b>Nil</b>	Non-locking push type (Flush)
<b>A*</b>	Non-locking push type (Extended)
<b>B*</b>	Locking type (Tool required)
<b>C*</b>	Locking type (Lever)

\* Option

#### Option

<b>Nil</b>	None
<b>Z</b>	With light/surge voltage suppressor

#### Coil rated voltage

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

\* Option

SJ

SY

SV

SYJ

SZ

VP4

S0700

VQ

VQ4

VQ5

VQC

VQZ

SQ

VFS

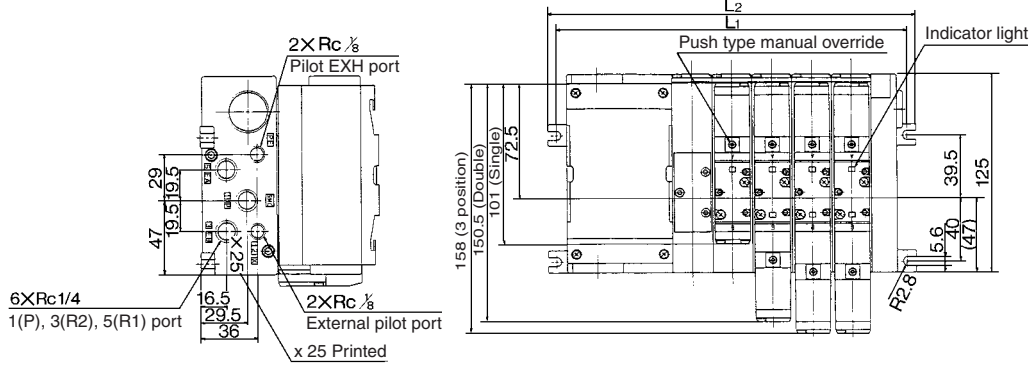
VFR

VQ7

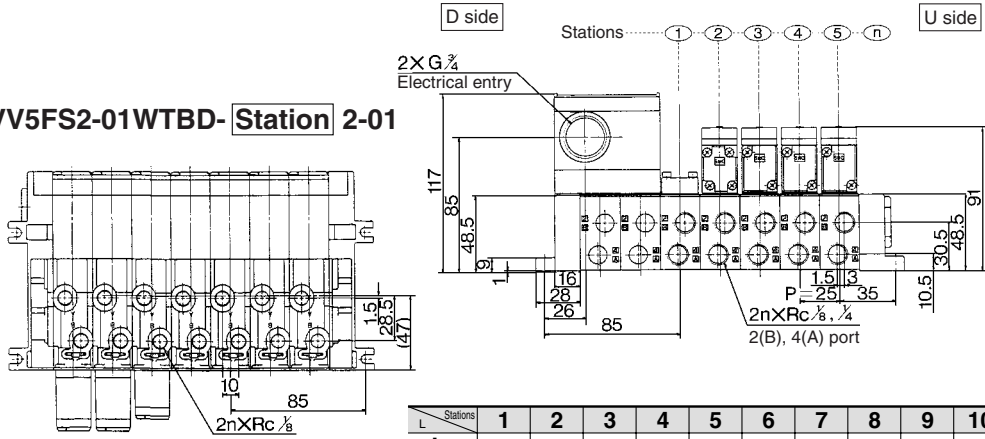
# Series VFS2000

## Dripproof Manifold

With common terminal box: VV5FS2-01WTB  $\frac{U}{D}$  - Station 1- Port size



Bottom ported: VV5FS2-01WTBD - Station 2-01

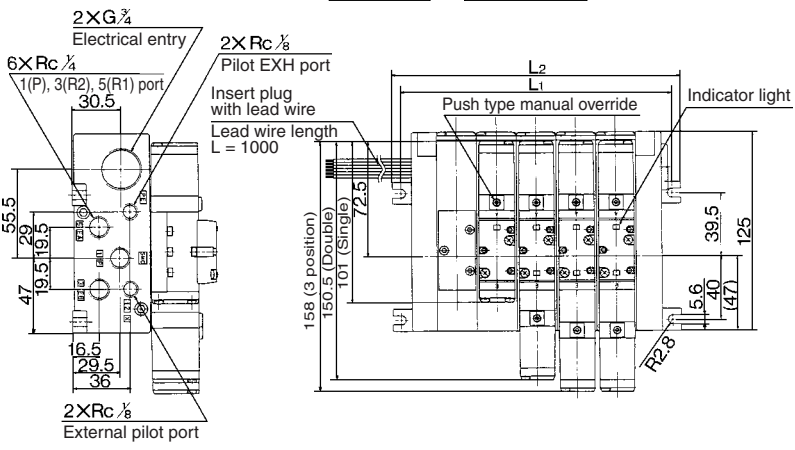


\* Terminal mounting stations are not included. Indicates Solenoid valve mounting stations.

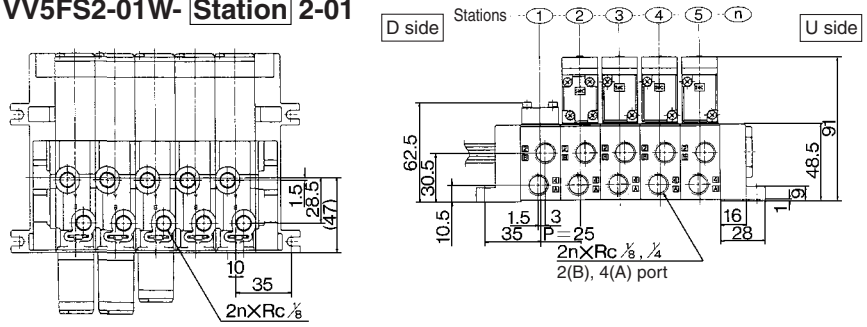
n: Stations

Stations	1	2	3	4	5	6	7	8	9	10	Formula
L <sub>1</sub>	120	145	170	195	220	245	270	295	320	345	L <sub>1</sub> = 25 x n + 95
L <sub>2</sub>	131	156	181	206	231	256	281	306	331	356	L <sub>2</sub> = 25 x n + 106

With attachment plug lead wire: VV5FS2-01W - Station 1- Port size



Bottom ported: VV5FS2-01W - Station 2-01



n: Stations

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Formula
L <sub>1</sub>	70	95	120	145	170	195	220	245	270	295	320	345	370	395	420	L <sub>1</sub> = 25n + 45
L <sub>2</sub>	81	106	131	156	181	206	231	256	281	306	331	356	381	406	431	L <sub>2</sub> = 25n + 56



# Made to Order

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

## How to Order

### How to Order Manifold

**VV5FS2 - 01S V - 0 1 - 02 - X460**

Plug-in type  
Serial transmission kit

Stations

3	3 stations
⋮	⋮
18	18 stations

Note 1) Max. 18 stations. Add 2 stations for serial unit mounting.

Note 2) Max. 18 stations for all-single wiring. (No. of valves: 16)

For the standard double wiring, the maximum number of stations is 10. (No. of valves: 8)

Port size

Symbol	P, R1, R2	A, B
01	Rc 1/4	Rc 1/8
02		Rc 1/4
M		Mixed

\* For bottom ported: Rc 1/8 only

Thread type

Nil	Rc
N	NPT
T	NPTF
F	G

Combination symbol

Symbol	Port specification		Piping specification A, B
	P	R1, R2	
1			Side
2*	Common	Common	Bottom
3*	Common	Individual	Side
4*			Bottom
5*	Individual	Common	Side
6*			Bottom
7*	Individual	Individual	Side
8*			Bottom

\* Option

Compatible with SI unit U side  
mounting only

Applicable models

Symbol	SI unit part no.	Description
0	—	Without SI unit
F1	EX123U-SUW1	NKE Corporation: Uni-wire System (16 outputs)
H	EX123U-SUH1	NKE Corporation: Uni-wire H System (16 outputs)
J1	EX123U-SSL1	SUNX Corporation: S-LINK System (16 outputs)
J2	EX123U-SSL2	SUNX Corporation: S-LINK System (8 outputs)
Q	EX124U-SDN1	DevieNet (2 power supply systems)
R1	EX124U-SCS1	OMRON Corporation: CompoBus/S (16 outputs) (2 power supply systems)
R2	EX124U-SCS2	OMRON Corporation: CompoBus/S (8 outputs) (2 power supply systems)
V	EX124U-SMJ1	CC-Link (2 power supply systems)

Refer to pages 1653 to 1655 for the details of the EX123/124 integrated type (for output) serial transmission system.

### Correspondence of SI unit output numbers and solenoid valve coils

<Wiring Example 1> Double wiring (Standard)

D side		U side	
SI unit output no.	1 2 3 4 5 6 7 8 9 10		
	Double Double Single Single Single Double Single Single		SI unit
	AB AB AB AB AB AB AB AB		
	01 23 45 67 89 1011 1213 1415		

<Wiring Example 2> Single/Double mixed wiring (Option)

D side		U side	
SI unit output no.	1 2 3 4 5 6 7 8 9 10 11 12		
	Double Double Single Single Single Double Single Double Single Single		SI unit
	AB AB A A A AB A AB A A		
	01 23 4 5 6 78 9 1011 11 12		

\* Mixed wiring is available as an option. Use the manifold specification sheet to specify this.

### How to Order Valves

**VFS2 - 00 - 5 F -**

Symbol

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

Pilot type

Nil	Internal pilot
R	External pilot

24 VDC

Pilot valve manual override

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

Option

Nil	None
Z	With light/surge voltage suppressor

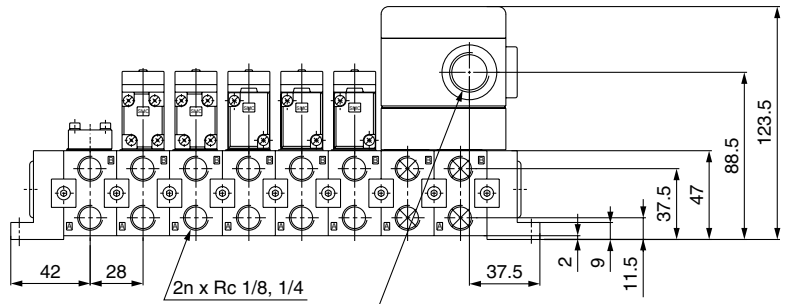
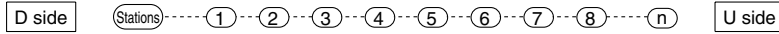
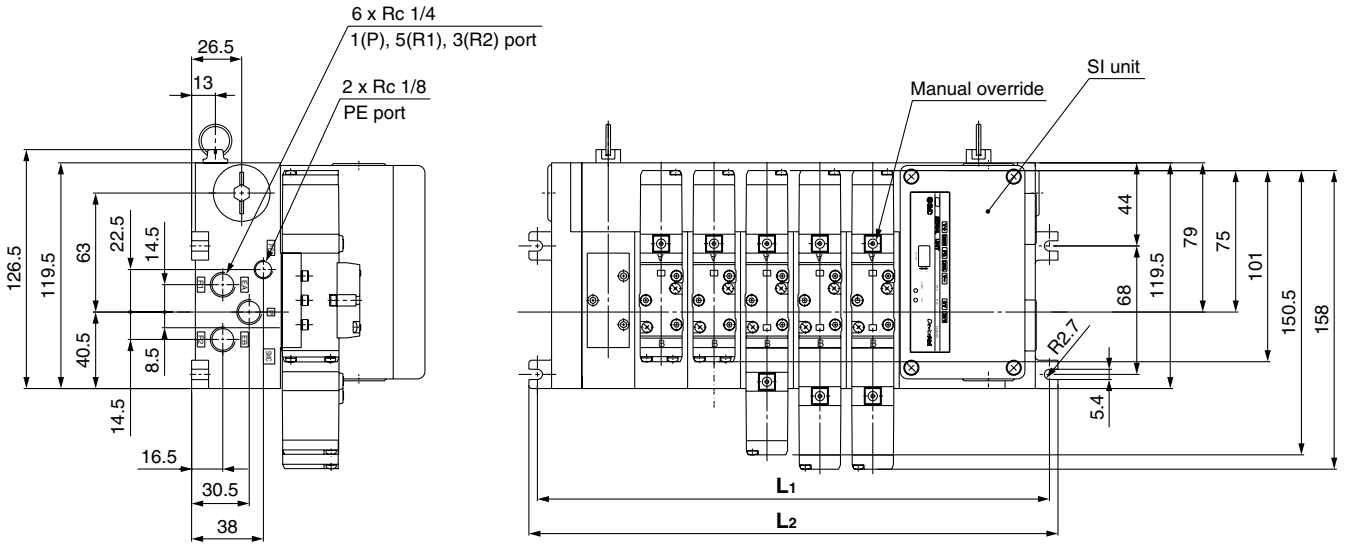
Coil rated voltage

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

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

VV5FS2-01S **Model** - **Stations** **Symbol** - **Port size** -X460



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

Formula  $L_1 = 28n + 47$   $L_2 = 28n + 56$   
n: Stations (Max. 18 stations)

**Dimensions**

L \ n	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<b>L<sub>1</sub></b>	131	159	187	215	243	271	299	327	355	383	411	439	467	495	523	551
<b>L<sub>2</sub></b>	140	168	196	224	252	280	308	336	364	392	420	448	476	504	532	560

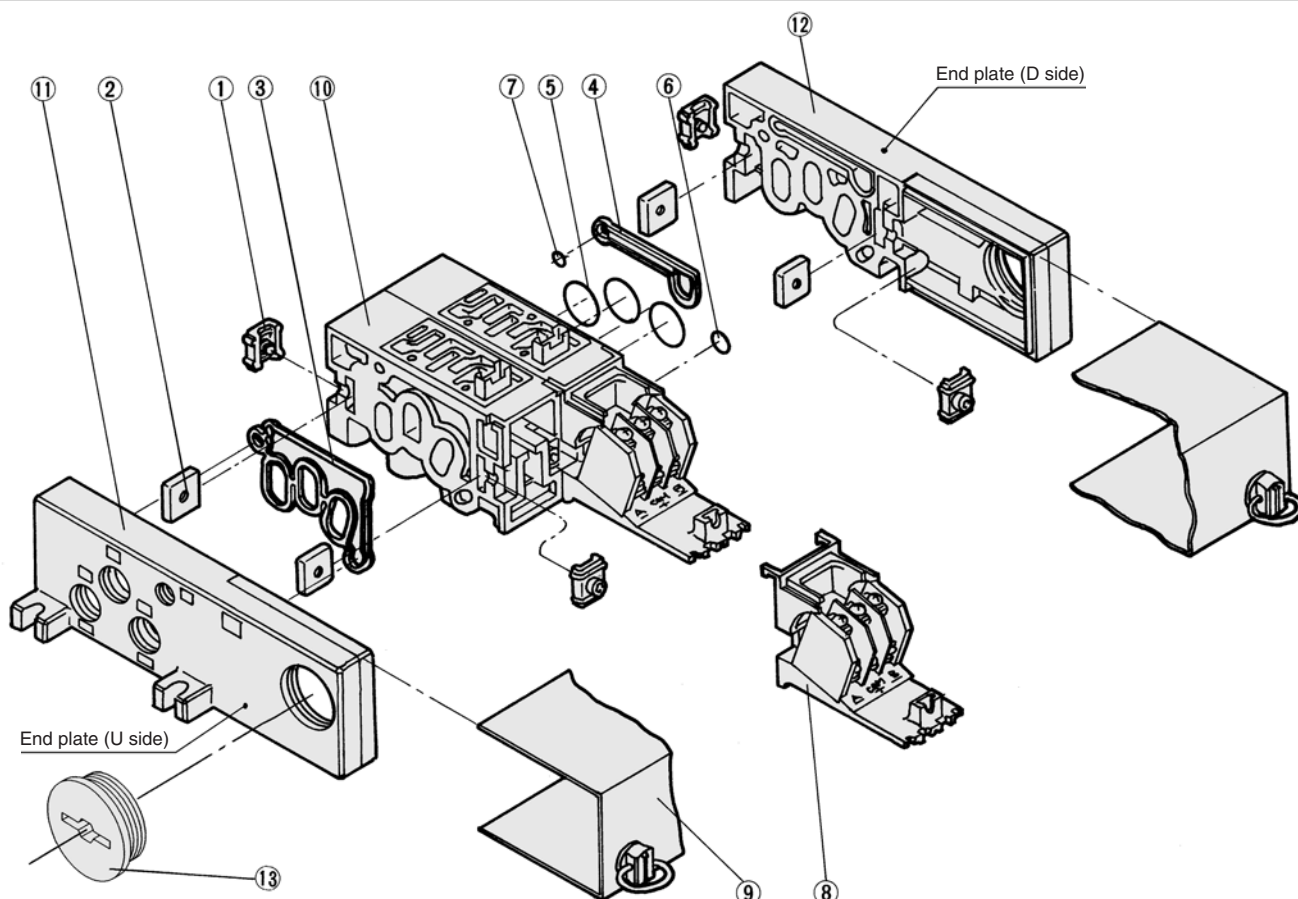
Note) Actual number of manifold base stations: Add 2 SI unit mounting stations to the number of valve stations.

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7



# Series VFS2000

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



### Replacement Parts

No.	Description	Material	Part no.
1	Connection fitting A	Steel plate	AXT625-4-1#1
2	Connection fitting B	Steel plate	AXT625-5
3	Gasket A	NBR	AXT625-17
4	Gasket B	NBR	AXT625-16
5	O-ring	NBR	18 x 15 x 1.5
6	O-ring	NBR	10.5 x 7.5 x 1.5
7	O-ring	NBR	8 x 5 x 1.5
8	Adapter plate	Resin	For 01 AXT625-6
	Adapter plate assembly	—	For 01T AXT625-28-1A (Terminal section with adapter plate)
	Adapter plate	Resin	For 01C AXT625-28-1 For 01F VVF2000-26-6 For 01S□ AXT625-6

No.	Description	Material	Part no.
9	Junction cover assembly	—	For 01 AXT625-7A
			For 01T AXT625-28-3A
			For 01T1 AXT625-28-7A- [Stations]
			For 01C VVF2000-26-5A- [Stations]
			For 01S□ AZ738-10A- [Stations]
13	Rubber plug	NBR	For 01 AXT333-12
	Plug	—	For 01T 01S□ AXT625-22 For 01W EXP22S

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



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

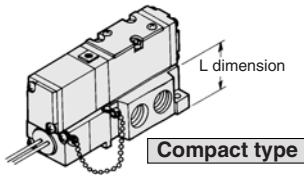
### Replacement Parts: Sub Assembly

No.	Description	Assembly part no.	Component parts	Applicable manifold base
10	Manifold block assembly	AXT625-01A- <sup>1</sup> / <sub>2</sub> <sup>Note)</sup>	Manifold block ⑩, Metal joint ①, ②, O-ring ⑤, ⑥, ⑦ Junction cover, Adapter plate, Pin housing, Guide, Insert plug lead wire	Plug-in type With attachment plug lead wire
		AXT625-20A- <sup>1</sup> / <sub>2</sub> <sup>Note)</sup>	Manifold block ⑩, Metal joint ①, ②, O-ring ⑤, ⑥, ⑦ Terminal ⑧, Junction cover ⑨, Adaptor plate, Pin housing, Guide	Plug-in type With terminal block
		AXT625-10A- <sup>1</sup> / <sub>2</sub> <sup>Note)</sup>	Manifold block ⑩, Metal joint ①, ②, O-ring ⑤, ⑥, ⑦	Non plug-in type
11	End plate (U side) assembly	AXT625-2A	End plate (U) ⑪, Metal joint ①, ②, Gasket A ③, Guard ⑬	Plug-in type With attachment plug lead wire
		AXT625-2A-20	End plate (U) ⑪, Metal joint ①, ②, Gasket A ③, Guard ⑬	Plug-in type With terminal block
		AXT625-2A-10	End plate (U) ⑪, Metal joint ①, ②, Gasket A ③, Guard ⑬	Non plug-in type
12	End plate (D side) assembly	AXT625-3A	End plate (D) ⑫, Metal joint ①, ②, Gasket B ④, Guard ⑬, Steel ball	Plug-in type With attachment plug lead wire
		AXT625-3A-20	End plate (D) ⑫, Metal joint ①, ②, Gasket B ④, Guard ⑬, Steel ball	Plug-in type With terminal block
		AXT625-3A-10	End plate (D) ⑫, Metal joint ①, ②, Gasket B ④, Guard ⑬, Steel ball	Non plug-in type

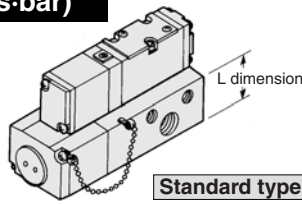
Note) 1: A, B port size Rc 1/8, 2: A, B port size Rc 1/4

## Light Compact Type Sub-plate/C: 2.8 dm<sup>3</sup>/(s·bar)

C: 2.2 dm<sup>3</sup>/(s·bar)



C: 2.8 dm<sup>3</sup>/(s·bar)



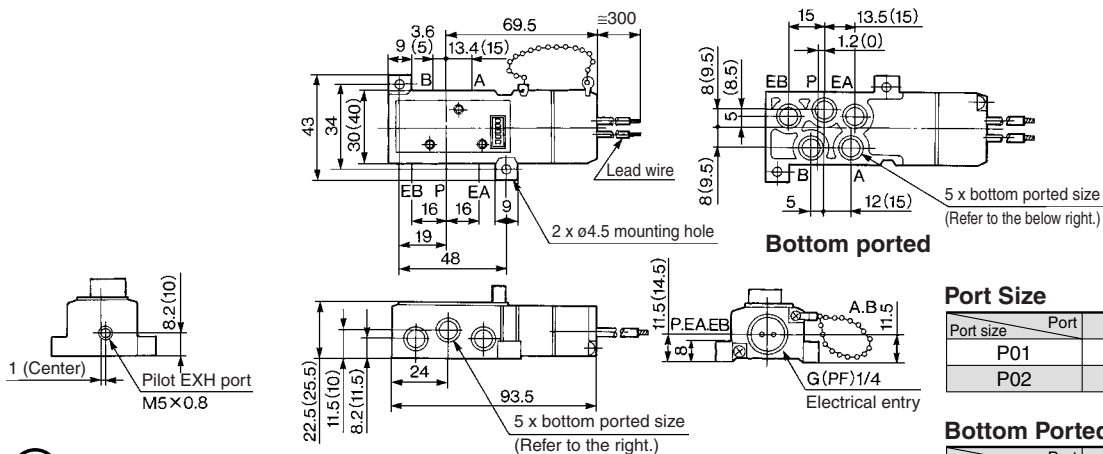
### Sub-plate

Type	L dimension (mm)	Mass (kg)
Compact type	25.5	0.13
Standard type	31	0.2

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

VFS2□00-□F-(B) P01  
P02

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



### Port Size

Port size	Port	P, A, B	EA, EB
P01		Rc 1/8	Rc 1/8
P02		Rc 1/4	Rc 1/8

### Bottom Ported Size

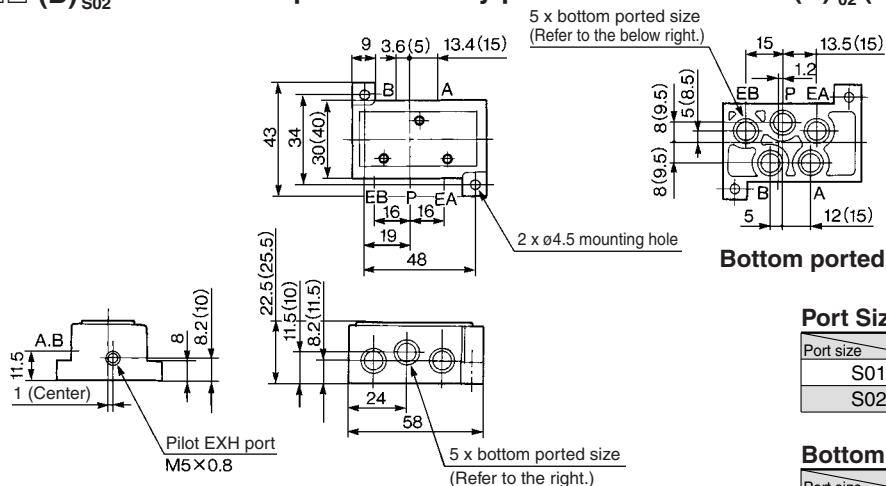
Port size	Port	P, A, B	EA, EB
BP02		Rc 1/8, 1/4	Rc 1/8

( ): Port size P02

### Sub-plate — Compact: Non plug-in

VFS2□10-□□-(B) S01  
S02

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



### Port Size

Port size	Port	P, A, B	EA, EB
S01		Rc 1/8	Rc 1/8
S02		Rc 1/4	Rc 1/8

### Bottom Ported Size

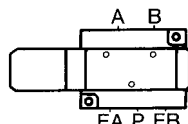
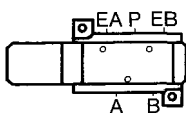
Port size	Port	P, A, B	EA, EB
BS02		Rc 1/8, 1/4	Rc 1/8

( ): Port size S02

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

VFS2□□0-□□-P01/02- Compact type

VFS2□□0-□□-01/02: Standard type



### Electrical Connection

#### Compact type, plug-in type grommet sub-plate (With attachment plug lead wire)

- The attachment plug lead wire is attached to the manifold block and lead wire is plugged in with valve side as shown in the following list. Please connect with corresponding power side.

Solenoid	A side	B side
Lead wire color	Red	Black
	Brown	White

- There is no polarity.

SJ  
SY  
SV  
SYJ  
SZ  
VP4  
S0700  
VQ  
VQ4  
VQ5  
VQC  
VQZ  
SQ  
VFS  
VFR  
VQ7

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

## Series VFS3000



### Model

Type of actuation	Model		Port size Rc	Flow characteristics						Max. operating cycle (cpm) <sup>(1)</sup>	Response time (ms) <sup>(2)</sup>	Mass (kg) <sup>(3)</sup>	
	Plug-in	Non plug-in		1 → 4/2 (P → A/B)			4/2 → 5/3 (A/B → R1/R2)						
				C [dm <sup>3</sup> /(s·bar)]	b	Cv	C [dm <sup>3</sup> /(s·bar)]	b	Cv				
2 position	Single	VFS3100	VFS3110	1/4	6.0	0.15	1.4	5.8	0.12	1.3	1200	20 or less	0.31
				3/8	7.3	0.23	1.8	6.8	0.12	1.6			
	Double	VFS3200	VFS3210	1/4	6.0	0.15	1.4	5.8	0.12	1.3	1500	15 or less	0.41
				3/8	7.3	0.23	1.8	6.8	0.12	1.6			
3 position	Closed center	VFS3300	VFS3310	1/4	5.8	0.21	1.4	5.4	0.14	1.2	600	40 or less	0.43
				3/8	6.8	0.22	1.7	6.3	0.12	1.5			
	Exhaust center	VFS3400	VFS3410	1/4	6.1	0.23	1.4	5.0	0.14	1.2	600	40 or less	0.43
				3/8	7.4	0.20	1.8	5.6	0.18	1.3			
	Pressure center	VFS3500	VFS3510	1/4	6.0	0.22	1.5	5.8	0.16	1.3	600	40 or less	0.43
				3/8	7.2	0.19	1.8	7.1	0.18	1.8			
	Double check	VFS3600	VFS3610	1/4	4.0	—	—	3.5	—	—	600	50 or less	0.91
				3/8	4.0	—	—	3.7	—	—			

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

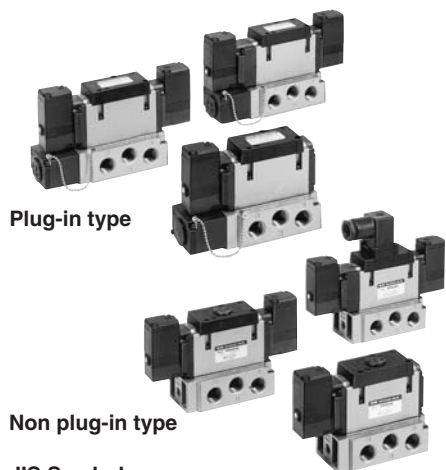
Compact yet provides a large flow capacity  
**3/8: C: 5.8 dm<sup>3</sup>/(s·bar)**

Low power consumption: 1.8 W DC

Easy maintenance

2 types of sub-plates:

Plug-in and non plug-in



Plug-in type

Non plug-in type

### JIS Symbol

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

### Standard Specifications

Valve specifications	Fluid		Air/Inert gas
	Maximum operating pressure		1.0 MPa
	Minimum operating pressure		0.1 MPa
	Proof pressure		1.5 MPa
	Ambient and fluid temperature		-10 to 60°C <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 E: Dustproof (Level 0), Type F: Dripproof (Level 2), Type D: Splashproof (Level 4) <sup>(4)</sup>
	Electricity specifications	Coil rated voltage	
Allowable voltage fluctuation		-15 to +10% of rated voltage	
Coil insulation type		Class B or equivalent (130°C) <sup>(5)</sup>	
Apparent power (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	DIN terminal, Grommet 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 0920. Note 5) Based on JIS C 4003.

### Option

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


Note) Operating pressure: 0 to 1.0 MPa  
 Pilot pressure: 0.1 to 1.0 MPa

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

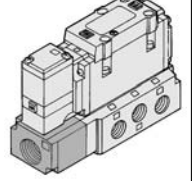
## How to Order

**Body type**

**O:** Plug-in type sub-plate



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



**Porting specifications**

Nil	Side ported
B*	Bottom ported

\* Option

**Port size**

Nil	Without sub-plate
02	Rc 1/4
03	Rc 3/8

\* For bottom ported, Rc 1/4 is only available.

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

**Plug-in**      **VFS3 1 0 0** - **1 F** - **02**

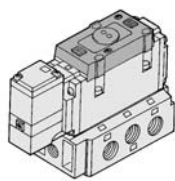
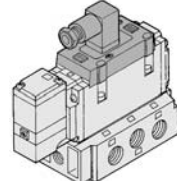
**Non plug-in**      **VFS3 2 1 1** - **2 D** - **02**

**Option**

Nil	None
Z	With light/surge voltage suppressor

**Electrical entry**

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

**Coil rated voltage**

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

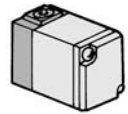
**Pilot type**

Nil	Internal pilot
R*	External pilot

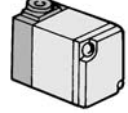
\* Option

**Manual valve override**

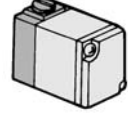
**Nil:** Non-locking push type (Flush)



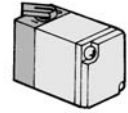
**A\*:** Non-locking push type (Extended)



**B\*:** Locking type (Tool required)



**C\*:** Locking type (Lever)



\* Option

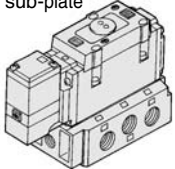
**Symbol**

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

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

**Body type**

**1:** Non plug-in type sub-plate



**Body Option**

0	Standard
1*	Direct manual override

\* Option

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

## How to Order Pilot Valve Assembly

**SF4 - 1 F - 30**

**Coil rated voltage**

Symbol	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

**Manual override**

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

\* Option

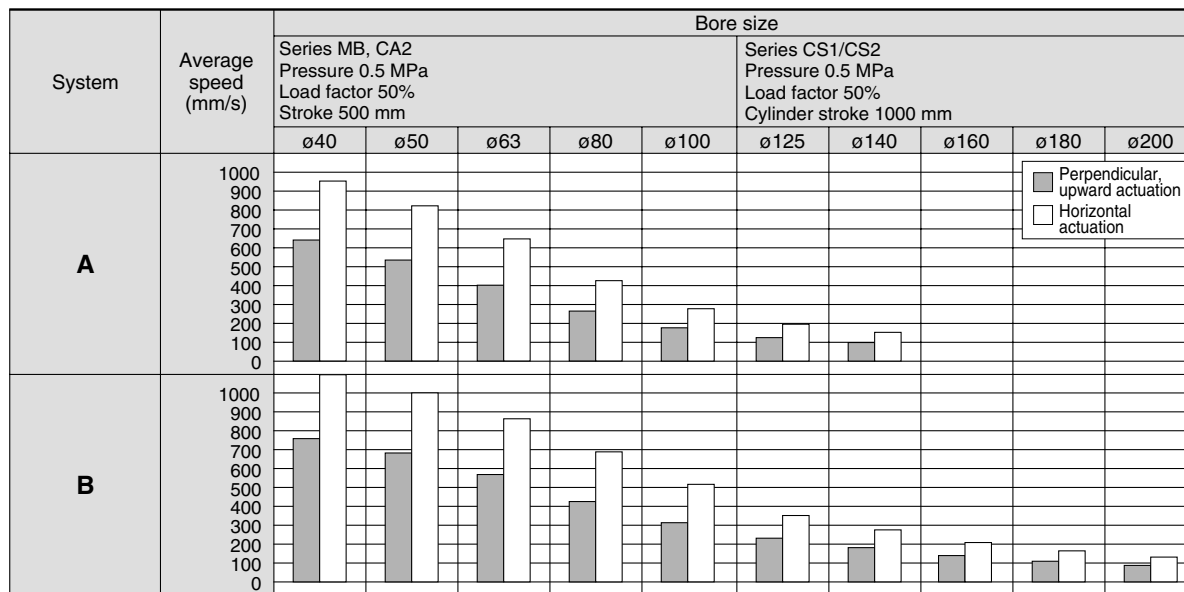


\* Refer to page 1224 for voltage conversion.

# Series VFS3000

## Cylinder Speed Chart

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



### System Components

System	Solenoid valve	Speed controller	Silencer	SGP (Steel pipe) Port size x Length
A	Series VFS3000 Rc 1/4	AS4000-02 (S = 24 mm <sup>2</sup> )	AN200-02 (S = 35 mm <sup>2</sup> )	6A x 1 m
B	Series VFS3000 Rc 3/8	AS420-03 (S = 73 mm <sup>2</sup> )	AN300-03 (S = 60 mm <sup>2</sup> )	10A x 1 m

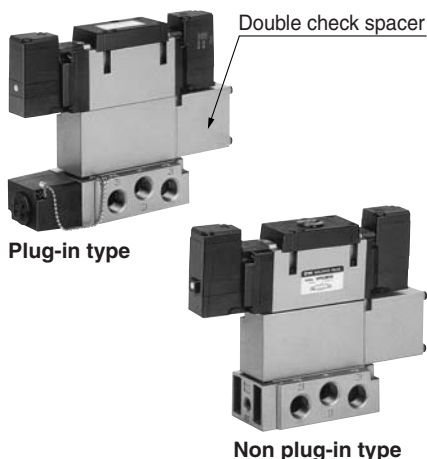


- \* It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
- \* The average velocity of the cylinder is the value that the stroke is divided by the total stroke time.
- \* Load factor: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

## Double Check Spacer/Specifications

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

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



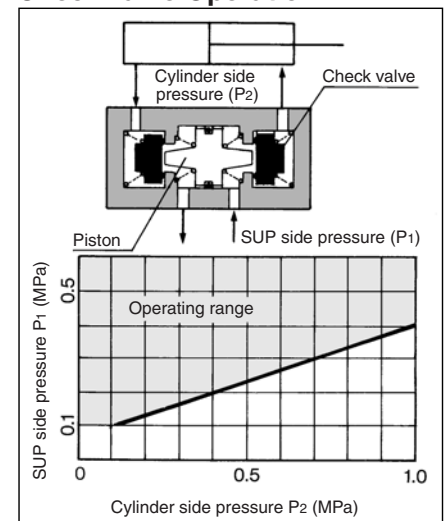
### Specifications

Double check spacer part no.	Plug-in type	Non plug-in type
	VVFS3000-22A-1	VVFS3000-22A-2
Applicable valve model	VFS3400-□F	VFS3410-□D VFS3410-□E

### ⚠ Caution

- In the case of 3 position double check valve (VFS36□0), check the leakage from piping and fittings in between valve and cylinder by means of synthetic detergent solutions, and ensure that there is no such leakage found there. Also check the leakage from cylinder seal and piston seal. If there is any leakage, sometimes the cylinder, when valve is de-energized, can move without stopping at intermediate position.
- Be aware that if the exhaust side is restricted excessively, the intermediate stopping accuracy will decrease and will lead to improper intermediate stops.

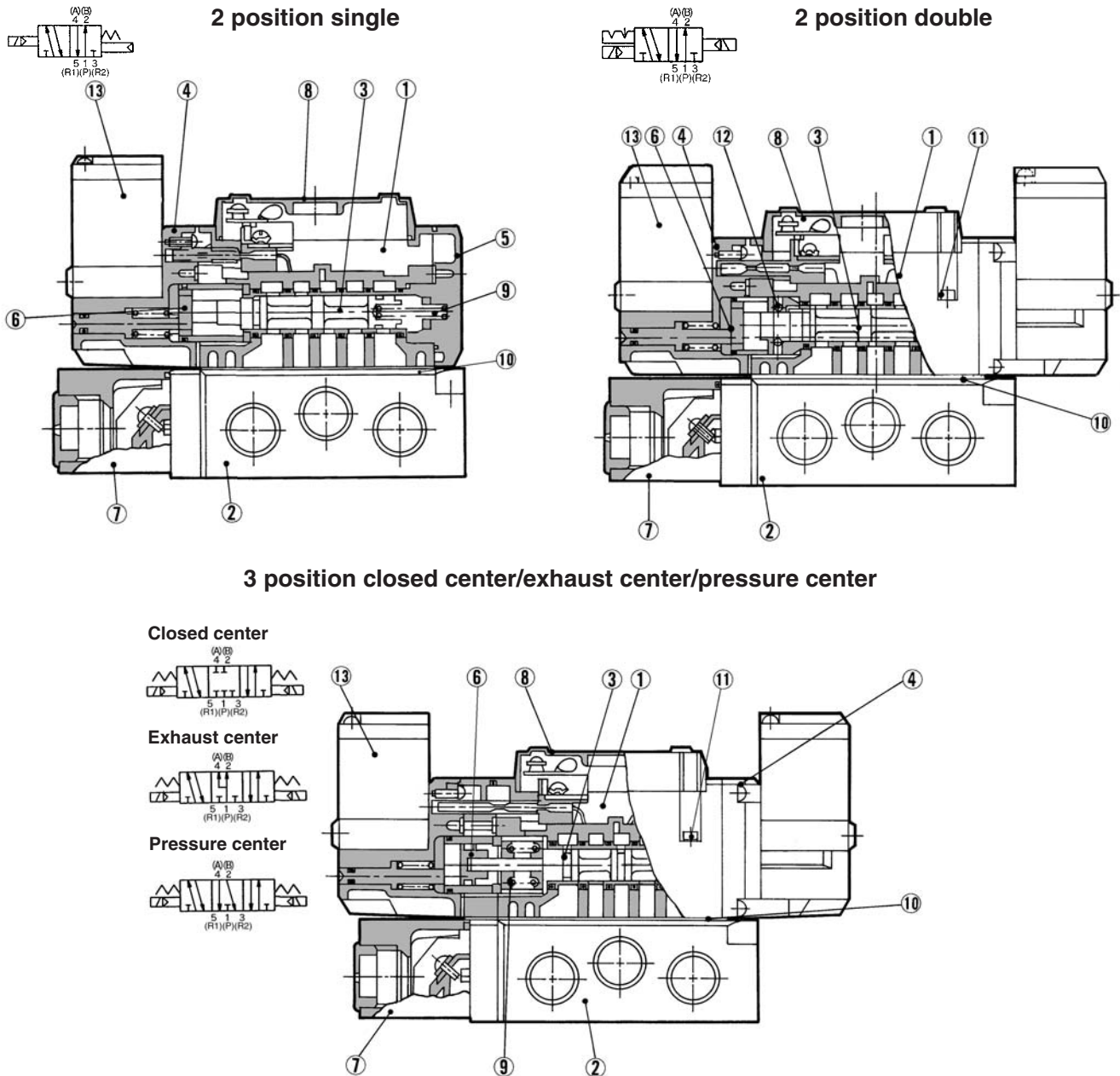
### Check Valve Operation



- The combination of VFS31<sup>0</sup>0, VFS32<sup>0</sup>0 and double check spacer can be used as prevention for falling at the stroke end but cannot hold the intermediate position of the cylinder.

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

## Construction



- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS**
- VFR
- VQ7

### Component Parts

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

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

### Sub-plate Assembly Part No.

Plug-in	VFS3000-P- <sup>02</sup> / <sub>03</sub>
Non plug-in	VFS3000-S- <sup>02</sup> / <sub>03</sub>

\* Mounting bolt and gasket are not included.

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

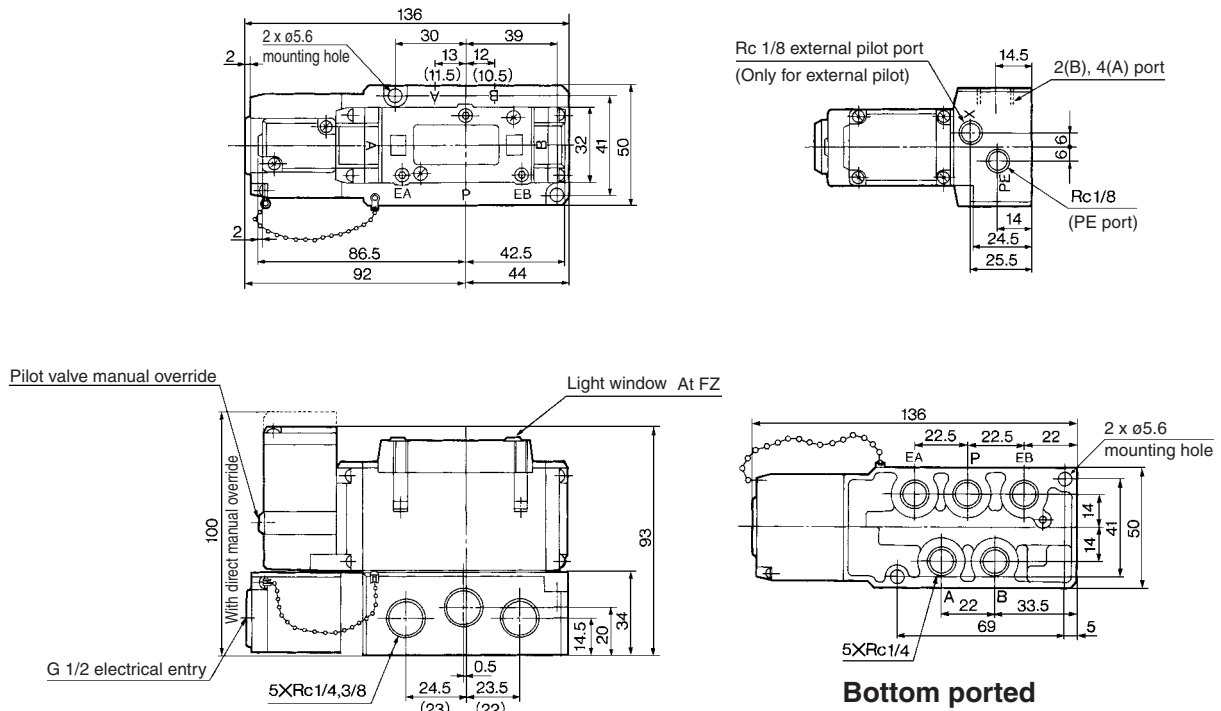
Plug-in	VFS3000-P-R- <sup>02</sup> / <sub>03</sub>
Non plug-in	VFS3000-S-R- <sup>02</sup> / <sub>03</sub>

Part no. for mounting bolt and gasket	BG-VFS3000
---------------------------------------	------------

# Series VFS3000

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

### 2 position single: VFS3100-□F



( ): Rc 1/4

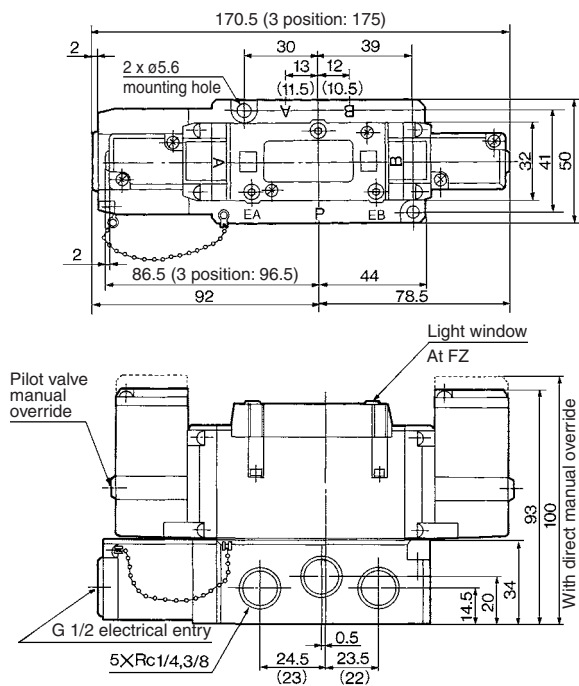
### 2 position double: VFS3200-□F

### 3 position closed center: VFS3300-□F

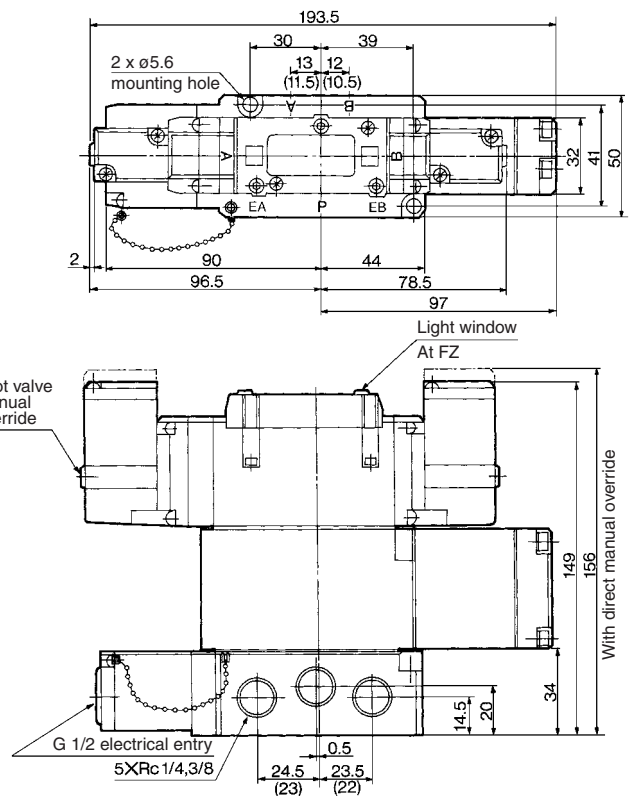
### 3 position exhaust center: VFS3400-□F

### 3 position pressure center: VFS3500-□F

### 3 position double check: VFS3600-□F



( ): Rc 1/4

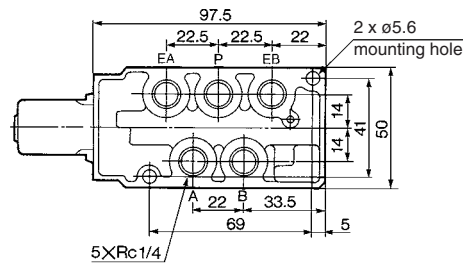
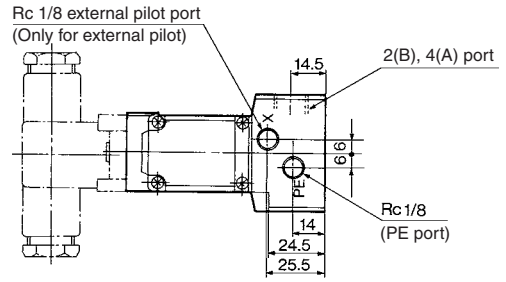
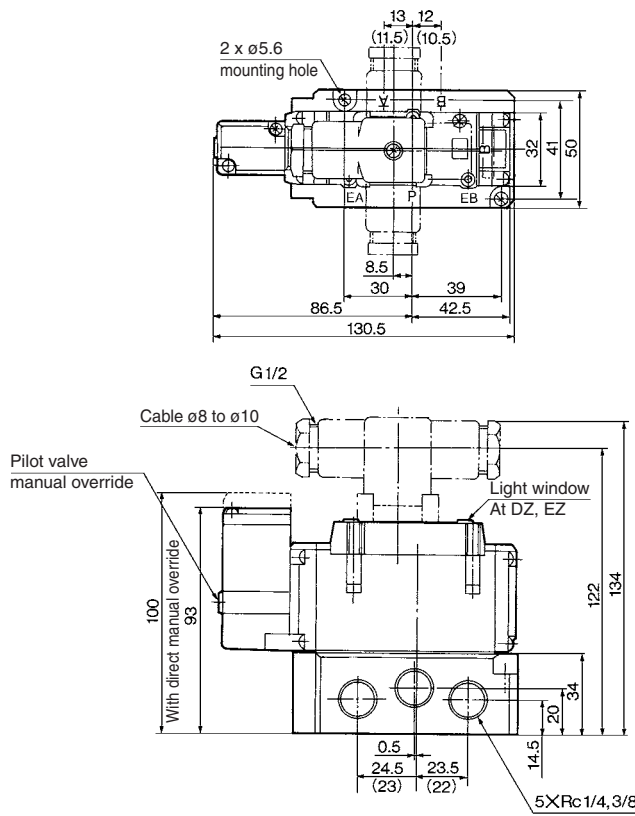


( ): Rc 1/4

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

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

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

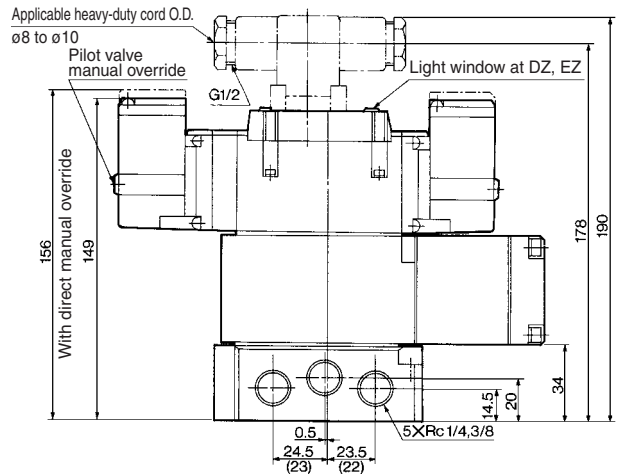
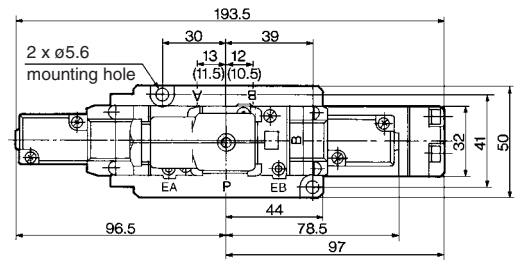
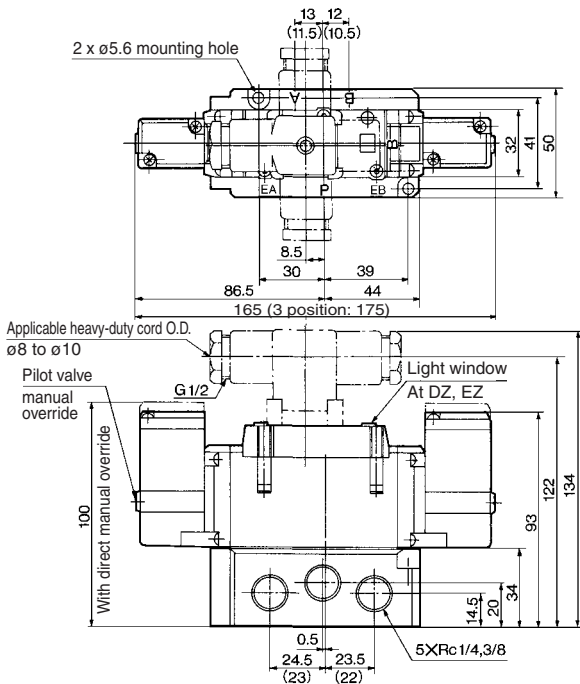


**Bottom ported**



**2 position double: VFS3210-□E, VFS3210-□D**  
**3 position closed center: VFS3310-□E, VFS3310-□D**  
**3 position exhaust center: VFS3410-□E, VFS3410-□D**  
**3 position pressure center: VFS3510-□E, VFS3510-□D**

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



- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

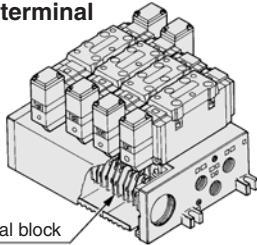


# Series VFS3000

## Manifold Specifications

### Plug-in Type: With Terminal Block

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



VV5FS3-01T-06 1-02

Series VFS3000  
Manifold  
Plug-in type  
with terminal block

**Stations**

02	2 stations
⋮	⋮
16	16 stations

**Port size**

Symbol	P, EA, EB	A, B
02	Rc 1/2	Rc 1/4
03		Rc 3/8
M		Mixed

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

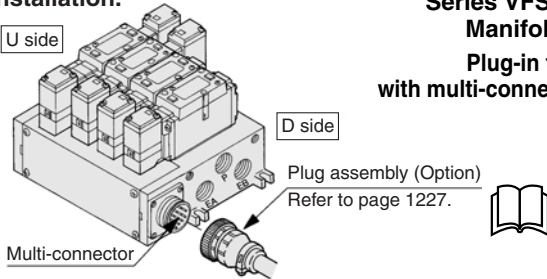
**Symbol**

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2			Bottom*

\* Option

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

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



VV5FS3-01C D-05 2-02

Series VFS3000  
Manifold  
Plug-in type  
with multi-connector

**Connector mounting direction**

D	D side mounting
U	U side mounting

**Stations**

02	2 stations
⋮	⋮
08*	8 stations

\* Max. 8 stations

**Port size**

Symbol	P, EA, EB	A, B
02	Rc 1/2	Rc 1/4
03		Rc 3/8
M		Mixed

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

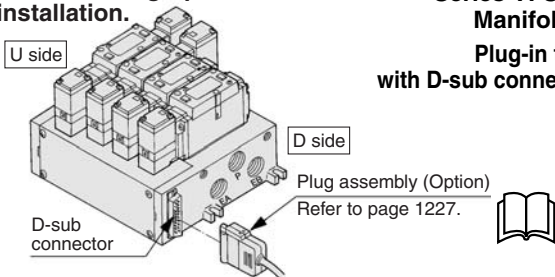
**Symbol**

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2			Bottom*

\* Option

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

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



VV5FS3-01F D-06 1-02

Series VFS3000  
Manifold  
Plug-in type  
with D-sub connector

**Connector mounting direction**

D	D side mounting
U	U side mounting

**Stations**

02	2 stations
⋮	⋮
08*	8 stations

\* Max. 8 stations

**Port size**

Symbol	P, EA, EB	A, B
02	Rc 1/2	Rc 1/4
03		Rc 3/8
M		Mixed

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

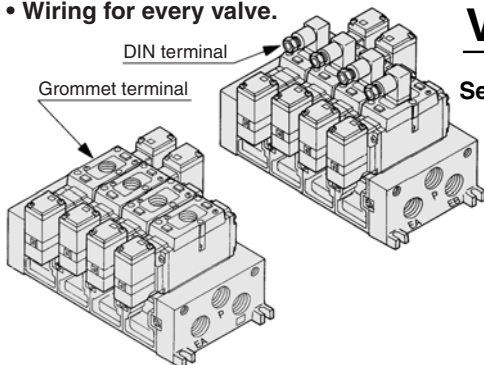
**Symbol**

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2			Bottom*

\* Option

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

- Wiring for every valve.



VV5FS3-10-05 2-02

Series VFS3000  
Manifold  
Non plug-in type

**Stations**

02	2 stations
⋮	⋮
16	16 stations

**Port size**

Symbol	P, EA, EB	A, B
02	Rc 1/2	Rc 1/4
03		Rc 3/8
M		Mixed

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

**Symbol**

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2			Bottom*

\* Option

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

## How to Order Manifold Assembly

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

### <Example>

- Plug-in type with terminal block: 6 stations  
(Manifold base) **VV5FS3-01T-061-02** .....1  
(2 position single) **VFS3100-5FZ** .....3  
(2 position double) **VFS3200-5FZ** .....2  
(Blanking plate) **VVFS3000-10A** .....1

### <Example>

- Non plug-in type: 6 stations  
(Manifold base) **VV5FS3-10-061-03** .....1  
(2 position single) **VFS3110-5D** .....5  
(3 position exhaust center) **VFS3410-5D** .....1  
(Individual EXH spacer) **VVFS3000-R-03-2** ...1

## Manifold Specifications

Base model	Wiring	Porting specifications A, B port	Port size Rc		Stations	Applicable valve model
			P, EA, EB	A, B		
Plug-in type <b>VV5FS3-01</b> □	<ul style="list-style-type: none"> <li>• With terminal block</li> <li>• With multi-connector</li> <li>• With D-sub connector</li> </ul>	Side/ Bottom	1/2 <sup>(1)</sup>	1/4, 3/8	2 to 10 <sup>(2)</sup>	VFS3□00-□F
Non plug-in type <b>VV5FS3-10</b>						<ul style="list-style-type: none"> <li>• DIN terminal</li> <li>• Grommet terminal</li> </ul>



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

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

Model	Passage/Stations		Station 1	Station 5	Station 10
VV5FS3	1 → 4/2 (P → A/B)	C [dm <sup>3</sup> /(s·bar)]	6.0	6.0	6.0
		b	0.20	0.20	0.20
		Cv	1.4	1.4	1.4
	4/2 → 5/3 (A/B → R1/R2)	C [dm <sup>3</sup> /(s·bar)]	7.0	7.0	7.0
		b	0.20	0.20	0.20
		Cv	1.8	1.8	1.8



\* Port size: Rc 3/8

SJ

SY

SV

SYJ

SZ

VP4

S0700

VQ

VQ4

VQ5

VQC

VQZ

SQ

VFS

VFR

VQ7

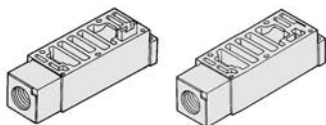
# Series VFS3000

## Manifold Option Parts Assembly

### Individual SUP spacer

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

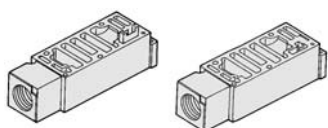
Body type	Plug-in type	Non plug-in type
Part no.	VVFS3000-P-03-1	VVFS3000-P-03-2



### Individual EXH spacer

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

Body type	Plug-in type	Non plug-in type
Part no.	VVFS3000-R-03-1	VVFS3000-R-03-2



### \* SUP block plate

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

Body type	Plug-in type	Non plug-in type
Part no.	AXT636-1A	

### \* EXH block plate

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

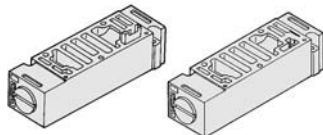
Body type	Plug-in type	Non plug-in type
Part no.	AXT636-1A	



### Throttle valve spacer

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

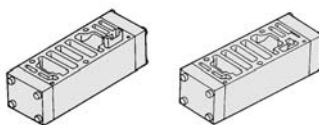
Body type	Plug-in type	Non plug-in type
Part no.	VVFS3000-20A-1	VVFS3000-20A-2



### Double check spacer

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

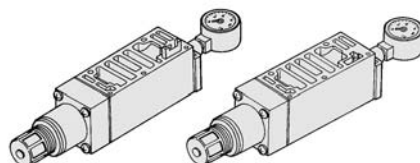
Body type	Plug-in type	Non plug-in type
Part no.	VVFS3000-22A-1	VVFS3000-22A-2



### Interface regulator

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

Body type	Plug-in type	Non plug-in type
P port regulation	ARBF3050-00-P-1	ARBF3050-00-P-2
A port regulation	ARBF3050-00-A-1	ARBF3050-00-A-2
B port regulation	ARBF3050-00-B-1	ARBF3050-00-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.

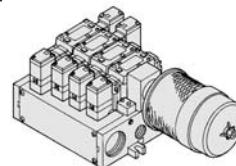
Body type	Plug-in type	Non plug-in type
Part no.	VVFS3000-10A	

## Manifold Option

### With exhaust cleaner

Plug-in type/Non Plug-in type

- Valve exhaust noise dampening: 35 dB or more.
- Oil mist collection: Rate of collection 99.9% or more.
- Piping process reduced.

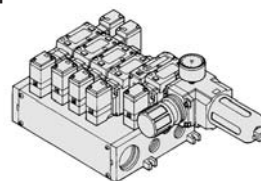


For details, refer to page 1173.

### With control unit

Plug-in type/Non Plug-in type

- Filter, regulation valve, pressure switch and air release valve are all combined to form one unit.
- Piping processes are eliminated.



For details, refer to page 1175.

### Made to Order Serial transmission kit manifold Plug-in type

- Solenoid valve wiring process reduced considerably.

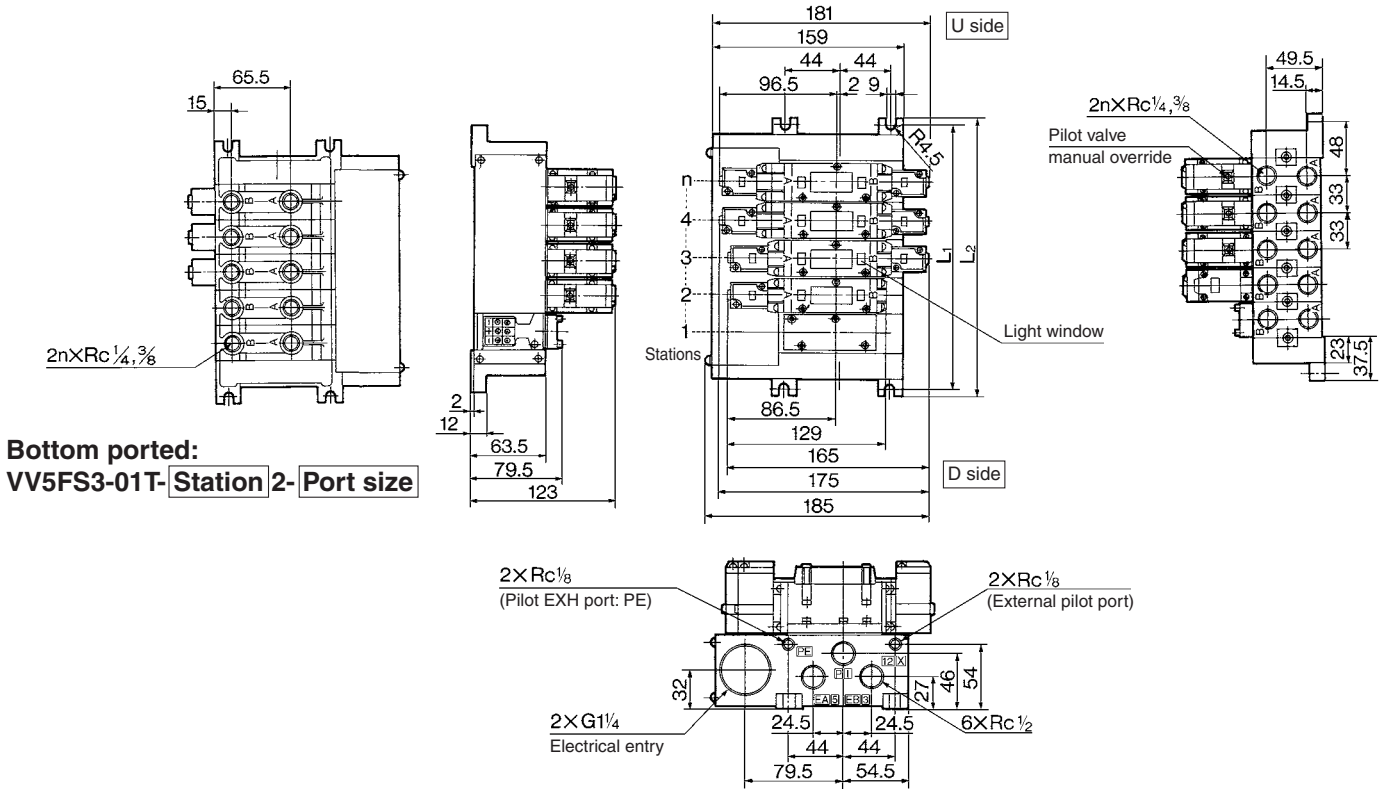


For details, refer to page 1178.

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

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

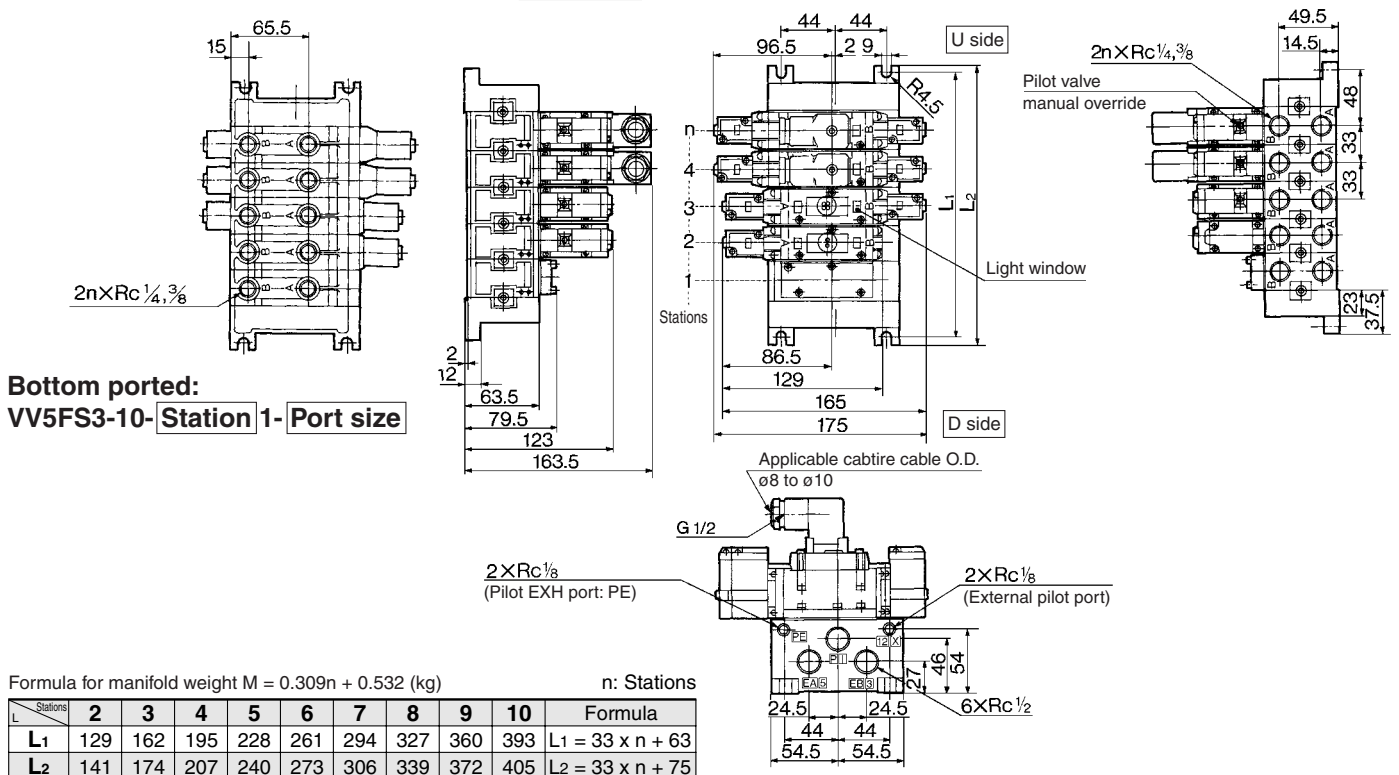
### Plug-in type (With terminal block): VV5FS3-01T- Station 1- Port size



Bottom ported:  
VV5FS3-01T- Station 2- Port size

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

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



Bottom ported:  
VV5FS3-10- Station 1- Port size

Formula for manifold weight  $M = 0.309n + 0.532$  (kg)

n: Stations

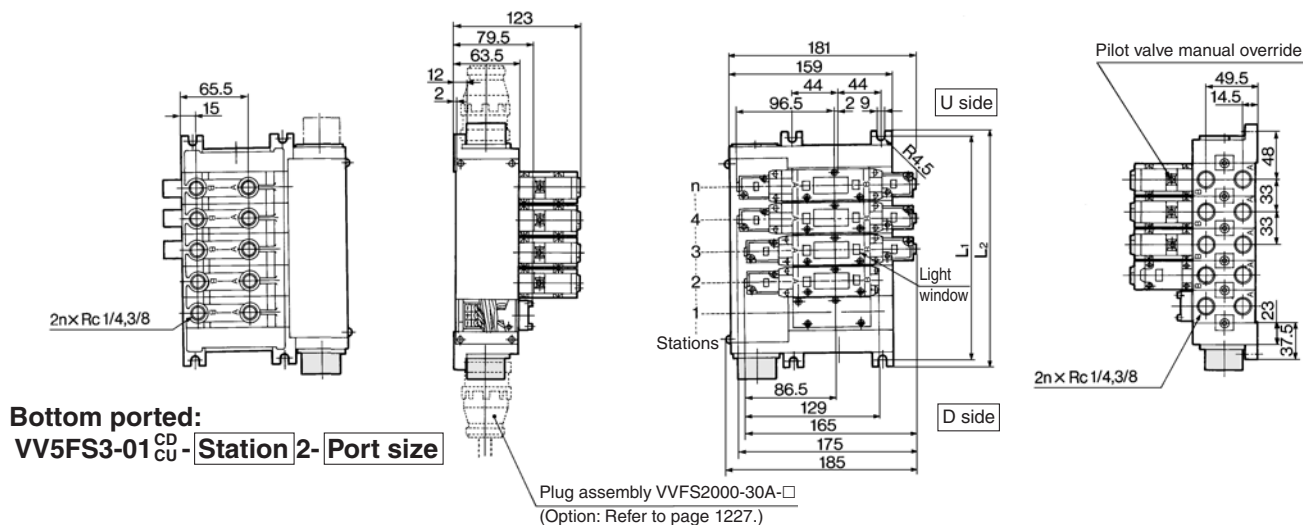
Stations	2	3	4	5	6	7	8	9	10	Formula
L <sub>1</sub>	129	162	195	228	261	294	327	360	393	$L_1 = 33 \times n + 63$
L <sub>2</sub>	141	174	207	240	273	306	339	372	405	$L_2 = 33 \times n + 75$

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

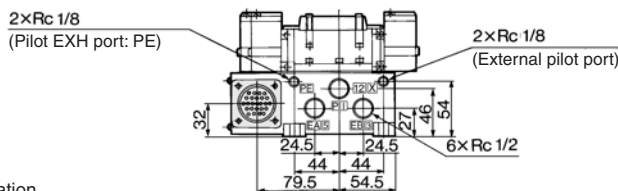
# Series VFS3000

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

Plug-in type with multi-connector: VV5FS3-01CD-Station 1-Port size, VV5FS3-01CU-Station 1-Port size



Bottom ported:  
VV5FS3-01<sup>CD</sup><sub>CU</sub>-Station 2-Port size

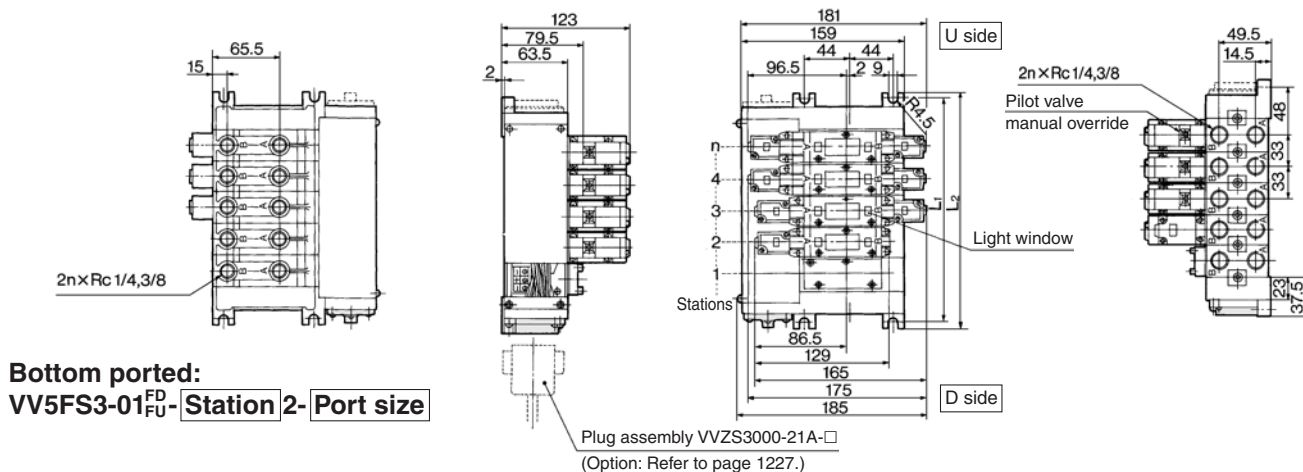


Formula for manifold weight  $M = 0.41n + 0.753$  (kg) n: Station

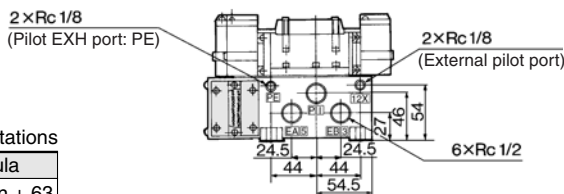
\* Wiring specifications: Refer to page 1227.



Plug-in type with D-sub connector: VV5FS3-01FD-Station 1-Port size, VV5FS3-01FU-Station 1-Port size



Bottom ported:  
VV5FS3-01<sup>FD</sup><sub>FU</sub>-Station 2-Port size



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

\* Wiring specifications: Refer to page 1227.

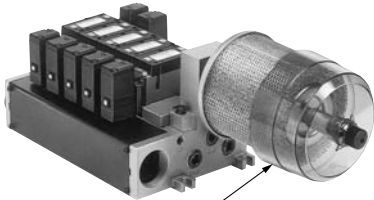


n: Stations

Stations	2	3	4	5	6	7	8	Formula
L <sub>1</sub>	129	162	195	228	261	294	327	$L_1 = 33 \times n + 63$
L <sub>2</sub>	141	174	207	240	273	306	339	$L_2 = 33 \times n + 75$

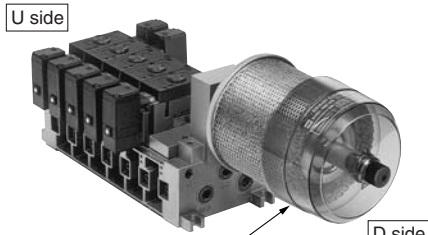
## Manifold with Exhaust Cleaner

- 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.



Plug-in type

Exhaust cleaner AMC610-10  
(Option)



Non plug-in type

Exhaust cleaner AMC610-10  
(Option)

### Manifold Specifications

Manifold	Plug-in type: VV5FS3-01□	Non plug-in type: VV5FS3-10
Wiring	With terminal blocks With multi-connector With D-sub connector	DIN terminal Grommet terminal
Applicable valve model	VFS3□00-□F	VFS3□10-□D, VFS3□10-□E
Porting specifications Rc	Common SUP, Common EXH	
	2(B), 4(A) port 1(P), 3(R2), 5(R1) port	1/4, 3/8 P: 1/2, EXH: 1
Stations	2 to 10 <sup>(1)</sup>	
Applicable exhaust cleaners	AMC610-10 (Connecting port size R 1) <sup>(2)</sup>	



Note 1) With multi-connector, or with D-sub connector: 8 stations max.  
Note 2) Exhaust cleaner "AMC610-10" is not attached.

### How to Order

**VV5FS3 - 10 - 06 1 - 03 - CD**

Series VFS3000 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

Connector mounting direction

Symbol	With connector	Applicable base
Nil	None	01T, 10
D	D side mounting	01C, 01F
U	U side mounting	01C, 01F

Stations

02	2 stations
⋮	⋮
10	10 stations

Base type 01T, 10: 2-10 stations  
Base type 01C, 01F: 2-8 stations

Exhaust cleaner mounting direction

Symbol	Exhaust cleaner mounting direction
CD	D side   D side mounting
CU	U side   U side mounting

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

Port size

Symbol	P	A, B
02	Rc	Rc 1/4
03	Rc 1/2	Rc 3/8
M		Mixed

Symbol

Symbol	Passage		Porting specifications (A, B)
	P	R1, R2	
1	Common	Common	Side
2			Bottom*

\* Option

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

### Caution

When using an exhaust cleaner, mount it downwards.



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

### How to Order Manifold Assembly [Example]

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

#### <Example>

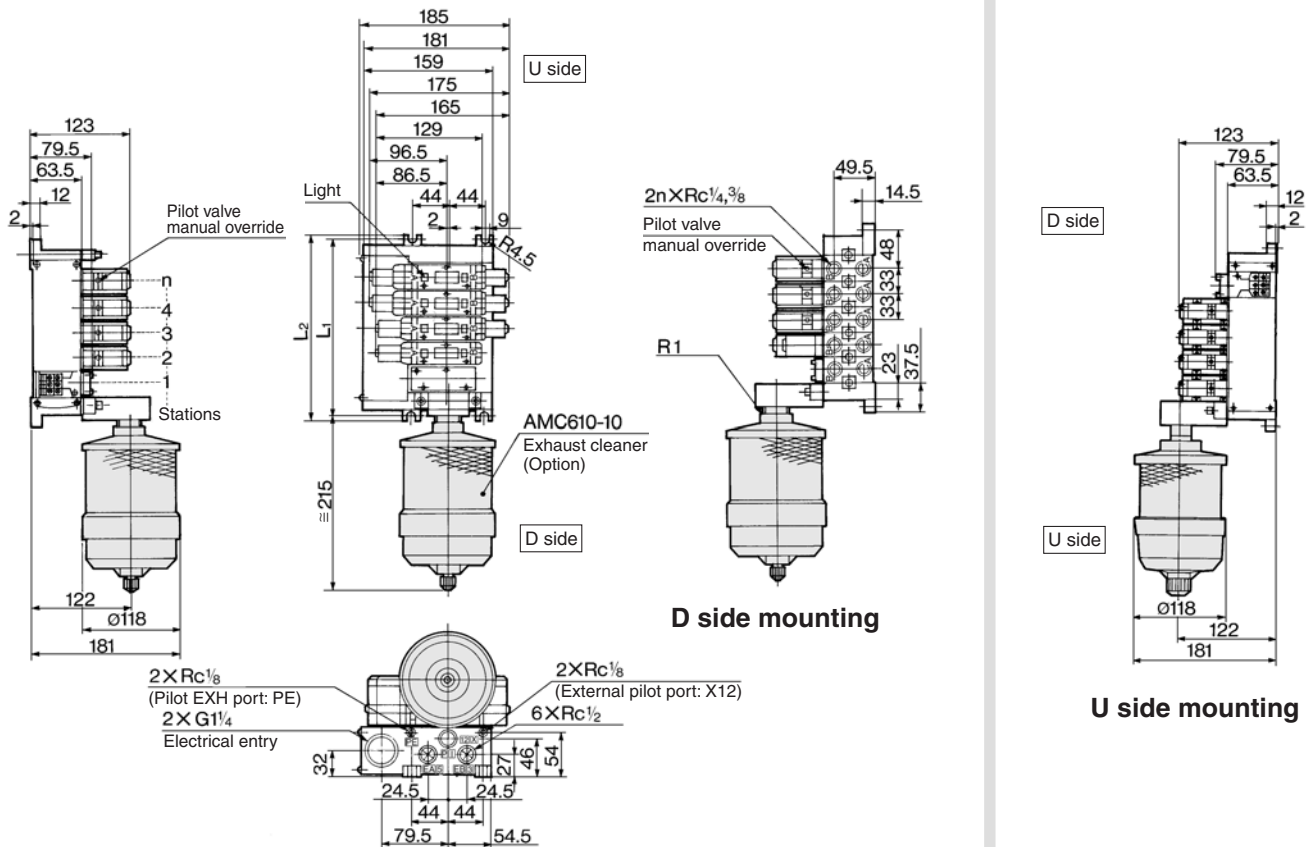
- Plug-in type with terminal block (6 stations)
  - (Manifold base) VV5FS3-01T-061-03-CD ..... 1
  - (2 position single) \* VFS3100-5FZ ..... 3
  - (2 position double) \* VFS3200-5FZ ..... 2
  - (Blanking plate) \* VVFS3000-10A ..... 1
  - (Exhaust cleaner) AMC610-10 ..... 1
- Non plug-in type (6 stations)
  - (Manifold base) VV5FS3-10-061-03-CU ..... 1
  - (2 position single) \* VFS3110-5E ..... 3
  - (2 position double) \* VFS3210-5E ..... 2
  - (Blanking plate) \* VVFS3000-10A ..... 1
  - (Exhaust cleaner) AMC610-10 ..... 1

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

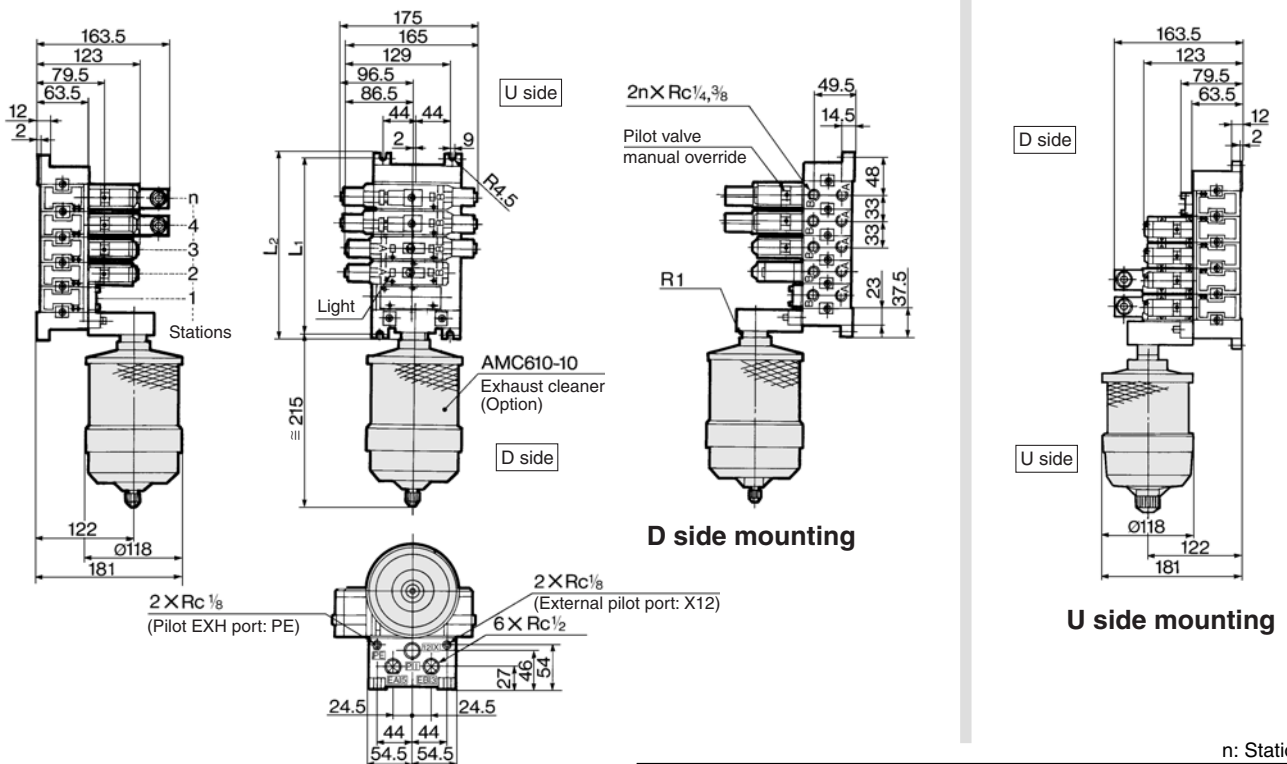
# Series VFS3000

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

Plug-in type: VV5FS3-01T-Station 1- Port size -<sup>CD</sup><sub>CU</sub>



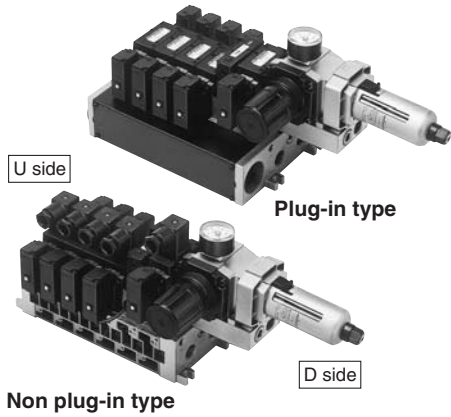
Non plug-in type: VV5FS3-10-Station 1- Port size -<sup>CD</sup><sub>CU</sub>



n: Stations										
Stations	2	3	4	5	6	7	8	9	10	Formula
L <sub>1</sub>	129	162	195	228	261	294	327	360	393	L <sub>1</sub> = 33 x n + 63
L <sub>2</sub>	141	174	207	240	273	306	339	372	405	L <sub>2</sub> = 33 x n + 75

## 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.



Non plug-in type

### Caution

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

### Manifold Specifications

Manifold	Plug-in type: VV5FS3-01□	Non plug-in type: VV5FS3-10
Wiring	With terminal block With multi-connector With D-sub connector	DIN terminal Grommet terminal
Applicable valve model	VFS3□00-□F	VFS3□10-□D, VFS3□10-□E
Porting specifications Rc	Common SUP, Common EXH	
	2(B), 4(A) port	1/4, 3/8
	1(P), 3(R2), 5(R1) port	1/2
Stations	2 to 10 *	

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

### Control Unit Specifications

Air filter (With auto-drain/With manual drain)	
Filtration degree	5 μm
Regulator	
Set pressure (Outlet pressure)	0.05 to 0.85 MPa
Pressure switch <sup>(1)</sup>	
Set pressure range: OFF	0.1 to 0.6 MPa
Differential	0.08 MPa or less
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
Air release valve (Single only)	
Operating pressure range	0.1 to 1.0 MPa

### Control Unit/Option

Air release valve spacer <sup>(2)</sup>	<Plug-in type> VVFS3000-24A-1R (D side mounting)	
	<Non plug-in type> VVFS3000-24A-2R (D side mounting)	
Pressure switch <sup>(3)</sup>	IS1000P-2-1	
Blanking plate	Filter regulator	MP2-3
	Pressure switch	MP3-2
	Release valve	VVFS3000-24A-10
Filter element	INA-13-854-12-5B	

- Note 1) Voltage: 24 VDC to 100 VAC  
Inner voltage drop: 4 V
- Note 2) Combination of valve VFS31□□ (single) and a release valve spacer can be used as an air release valve.
- Note 3) The non plug-in type cannot be mounted afterwards.

## How to Order

**VV5FS3 - 10 - 08 1 - 02 - AP -**

Series VFS3000 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

Connector mounting direction

Symbol	With connector	Applicable base
Nil	None	01T, 10
D	D side mounting	01C, 01F
U	U side mounting	

Stations

02	2 stations
10	10 stations

Base type 01T, 10: 2 to 10 stations  
Base type 01C, 01F: 2 to 8 stations

Symbol

Symbol	Passage		Porting specifications (A, B)
	P	EA, EB	
1	Common	Common	Side
2			Bottom*

\* Option

Port size

Symbol	P, EA, EB	A, B
02		Rc 1/4
03	Rc 1/2	Rc 3/8
M		Mixed

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

Air release valve coil rating

Nil	None (F, G type only)
1	100 VAC, 50/60 Hz
5	24 VDC
9	Other

Control unit type

Control equipment	Symbol	Nil	A	AP	M	MP	F	G	C	E
Air filter with auto-drain		●	●				●			
Air filter with manual drain				●	●			●		
Regulator			●	●	●	●	●	●		
Air release valve		●	●	●	●				●	●
Pressure switch				●	●					
Blanking plate (Air release valve)							●	●		
Blanking plate (Filter, Regulator)								●	●	
Blanking plate (Pressure switch)		●		●			●	●	●	
Number of manifold blocks required for mounting (stations)		2	2	2	2	2	2	2	2	1

### How to Order Manifold Assembly [Example]

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

#### <Example>

- Plug-in type with terminal block — In order to mount control unit, it requires 2 stations.  
(Manifold base) VV5FS3-01T-081-03-AP5 ..... 1  
(2 position single) \* VFS3100-5FZ ..... 4  
(2 position double) \* VFS3200-5FZ ..... 2
- Non plug-in type — In order to mount control unit, it requires 2 stations.  
(Manifold base) VV5FS3-10-061-03-A ..... 1  
(2 position single) \* VFS3110-5D ..... 4

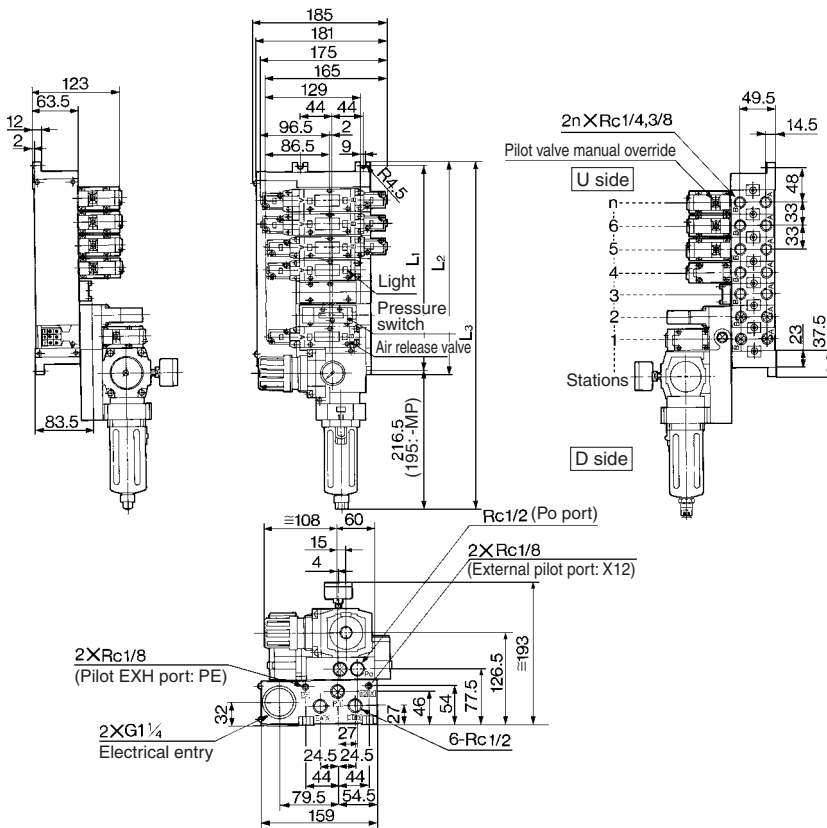
The asterisk denotes the symbol for assembly. Prefix it to the part numbers of the solenoid valve.



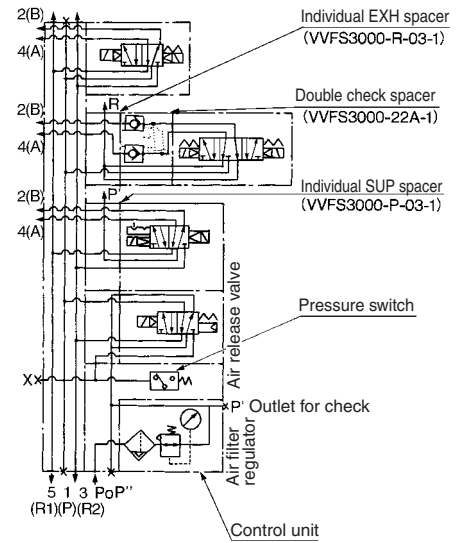
# Series VFS3000

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

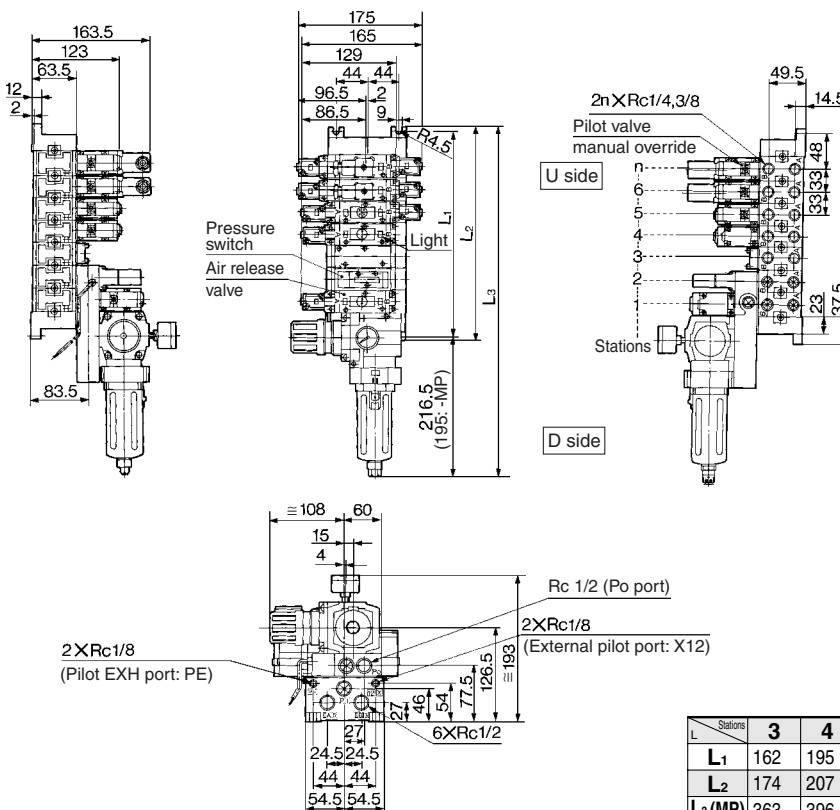
Plug-in type: VV5FS3-01T- **Station 1** - **Port size** -AP **Voltage for release valve**



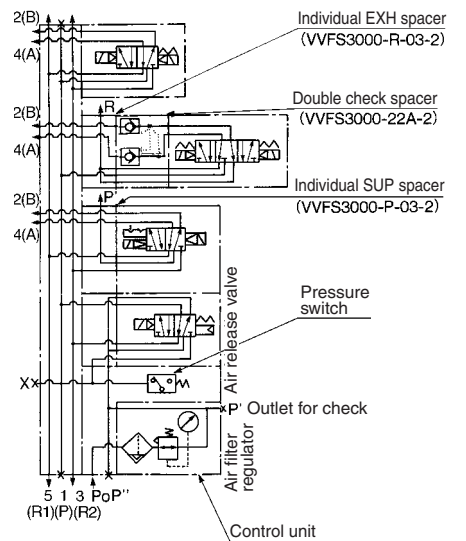
### Example for manifold



Non plug-in type: VV5FS3-10- **Station 1** - **Port size** -AP **Voltage for release valve**



### Example for manifold



L	Stations	3	4	5	6	7	8	9	10	Formula
L <sub>1</sub>		162	195	228	261	294	327	360	393	L <sub>1</sub> = 33 x n + 63
L <sub>2</sub>		174	207	240	273	306	339	372	405	L <sub>2</sub> = 33 x n + 75
L <sub>3</sub> (MP)		363	396	429	462	495	528	561	594	L <sub>3</sub> = 33 x n + 264
L <sub>3</sub> (AP)		384.5	417.5	450.5	483.5	516.5	549.5	582.5	615.5	L <sub>3</sub> = 33 x n + 285.5



# Made to Order

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

## How to Order

### How to Order Manifold

**VV5FS3 - 01S V - 08 1 - 02 - X279**

Plug-in type  
Serial transmission kit

Stations

2	2 stations
⋮	⋮
17	17 stations

Note 1) Max. 17 stations. Add 1 station for serial unit mounting.  
Note 2) Max. 17 stations for all-single wiring. (No. of valves: 16)  
For the standard double wiring, the maximum number of stations is 9. (No. of valves: 8)

Port size

Symbol	P, R1, R2	A, B
02	Rc 1/2	Rc 1/4
03		Rc 3/8
M		Mixed

\* For bottom ported: Rc 1/8 only

Thread type

Nil	Rc
N	NPT
T	NPTF
F	G

Combination symbol

Symbol	Port specification		Piping specification
	P	R1, R2	A, B
1	Common	Common	Side
2*			Bottom

\* Option

Compatible with SI unit U side mounting only

Applicable models

Symbol	SI unit part no.	Description
0	—	Without SI unit
F1	EX123U-SUW1	NKE Corporation: Uni-wire System (16 outputs)
H	EX123U-SUH1	NKE Corporation: Uni-wire H System (16 outputs)
J1	EX123U-SSL1	SUNX Corporation: S-LINK System (16 outputs)
J2	EX123U-SSL2	SUNX Corporation: S-LINK System (8 outputs)
Q	EX124U-SDN1	DevieNet (2 power supply systems)
R1	EX124U-SCS1	OMRON Corporation: CompoBus/S (16 outputs) (2 power supply systems)
R2	EX124U-SCS2	OMRON Corporation: CompoBus/S (8 outputs) (2 power supply systems)
V	EX124U-SMJ1	CC-Link (2 power supply systems)

Refer to pages 1653 to 1655 for the details of the EX123/124 integrated type (for output) serial transmission system.

### Correspondence of SI unit output numbers and solenoid valve coils

<Wiring Example 1> Double wiring (Standard)

SI unit output no.	1	2	3	4	5	6	7	8	9
	Double	Double	Single	Single	Single	Double	Single	Single	SI unit
	AB	AB	AB	AB	AB	AB	AB	AB	
	01	23	45	67	89	1011	1213	1415	

<Wiring Example 2> Single/Double mixed wiring (Option)

SI unit output no.	1	2	3	4	5	6	7	8	9	10
	Double	Double	Single	Single	Single	Double	Single	Double	Single	SI unit
	AB	AB	A	A	A	AB	A	AB	A	
	01	23	4	5	6	78	9	1011	11	

\* Mixed wiring is available as an option. Use the manifold specification sheet to specify this.

### How to Order Valves

**VFS3 - 00 - 5 F -**

Symbol

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

Pilot type

Nil	Internal pilot
R	External pilot

24 VDC

Pilot valve manual override

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

Option

Nil	None
Z	With light/surge voltage suppressor

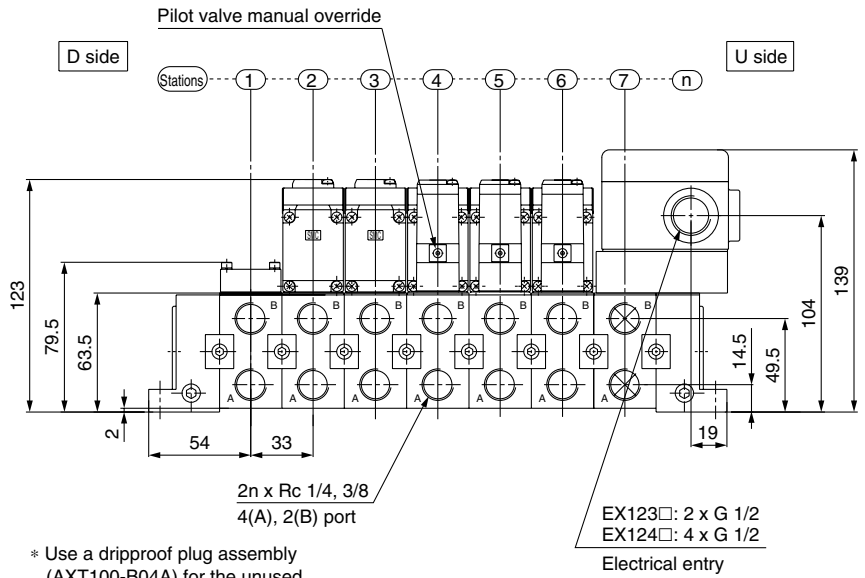
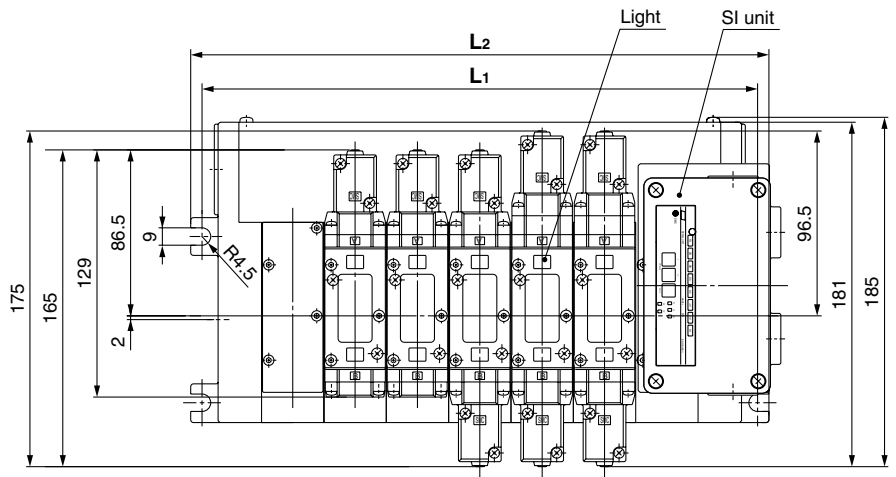
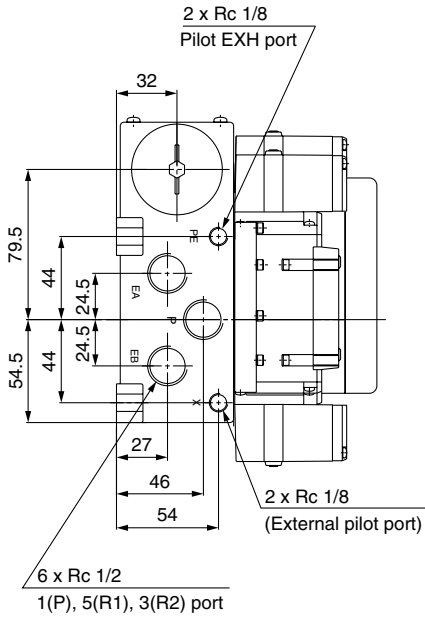
Coil rated voltage

Nil	None
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# 5 Port Pilot Operated Solenoid Valve Metal Seal, Plug-in/Non Plug-in **Series VFS3000**

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

**VV5FS3-01S** Model - Stations Symbol - Port size Thread -X279



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

Formula  $L_1 = 33n + 63$   $L_2 = 33n + 75$   
n: Stations (Max. 17stations)

### Dimensions

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

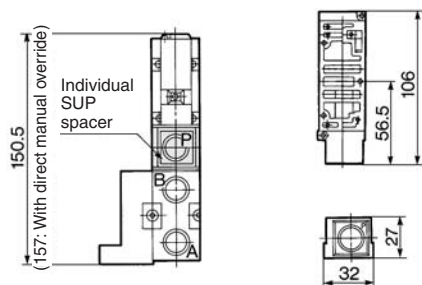
Note) Actual number of manifold base stations: Add 1 SI unit mounting station to the number of valve stations.

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS**
- VFR
- VQ7

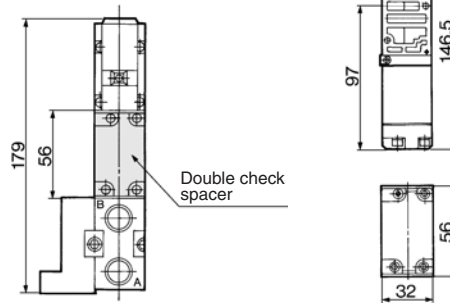
# Series VFS3000

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

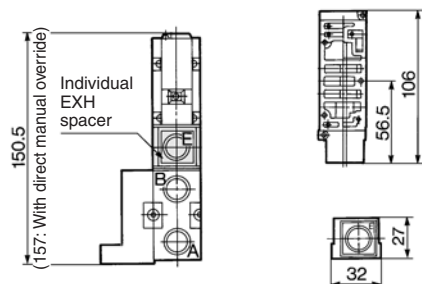
**Individual SUP spacer:**  
 VVFS3000-P-03-1 (Plug-in type)  
 VVFS3000-P-03-2 (Non plug-in type)



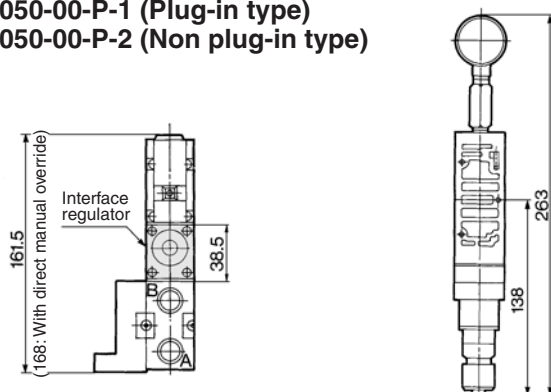
**Double check spacer:**  
 VVFS3000-22A-1 (Plug-in type)  
 VVFS3000-22A-2 (Non plug-in type)



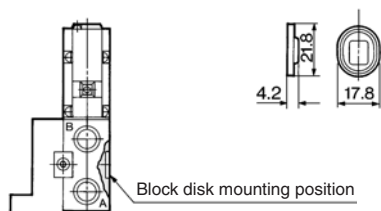
**Individual EXH spacer:**  
 VVFS3000-R-03-1 (Plug-in type)  
 VVFS3000-R-03-2 (Non plug-in type)



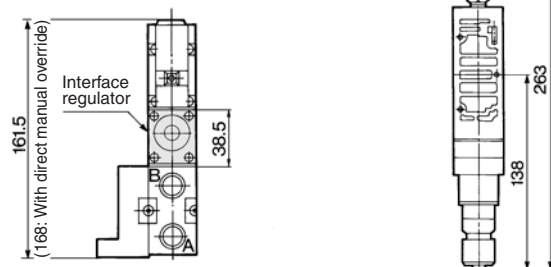
**Interface regulator/P port regulation:**  
 ARBF3050-00-P-1 (Plug-in type)  
 ARBF3050-00-P-2 (Non plug-in type)



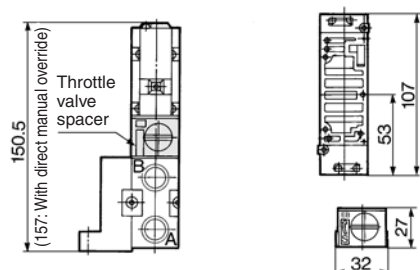
**SUP/EXH block plate: AXT636-1A**



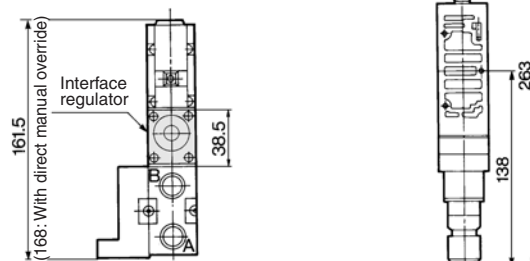
**Interface regulator/A port regulation:**  
 ARBF3050-00-A-1 (Plug-in type)  
 ARBF3050-00-A-2 (Non plug-in type)



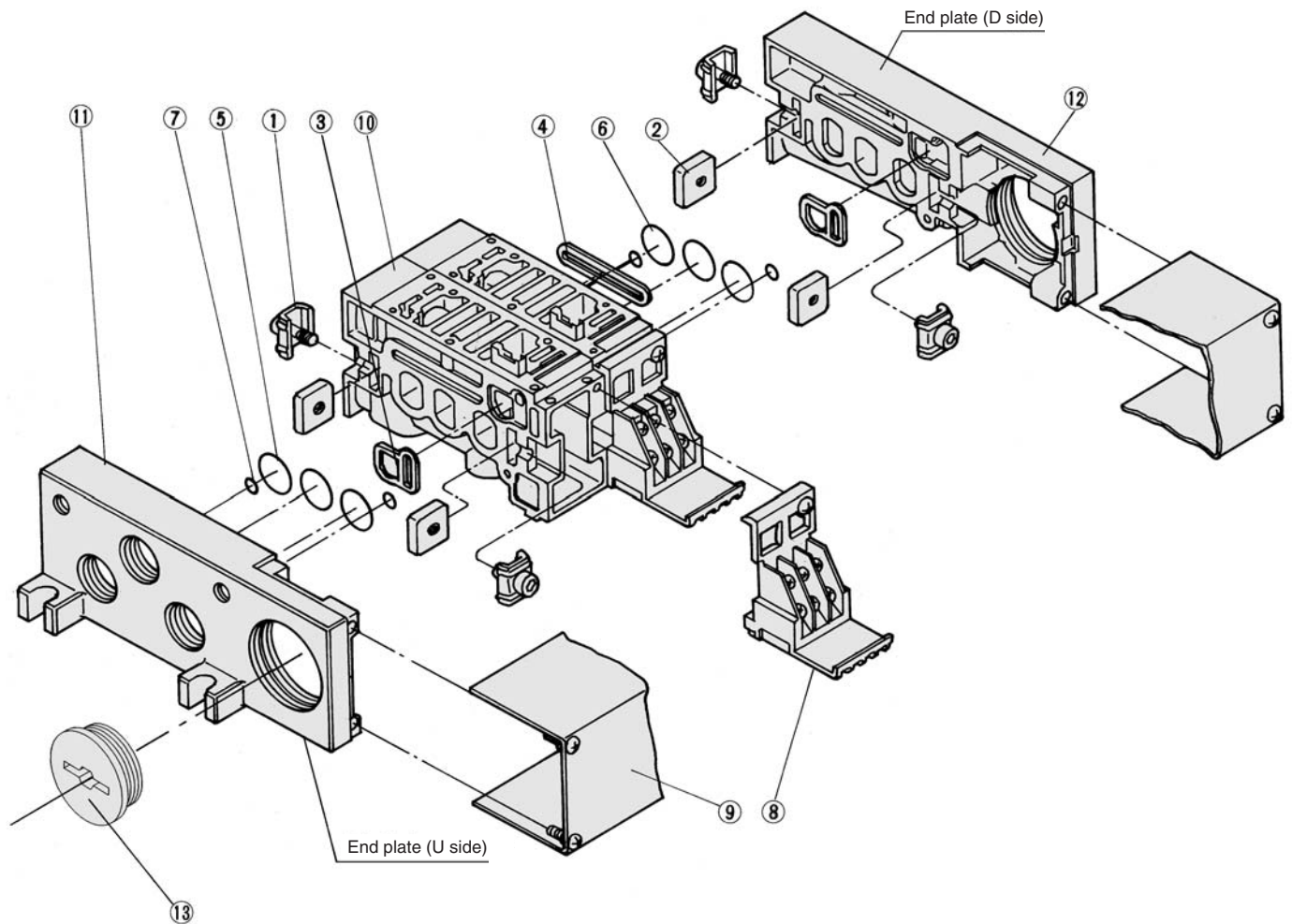
**Throttle valve spacer:**  
 VVFS3000-20A-1 (Plug-in type)  
 VVFS3000-20A-2 (Non plug-in type)



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



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



- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS**
- VFR
- VQ7

**Replacement Parts**

No.	Description	Material	Part no.
1	Connection fitting A	Steel plate	VVFS3000-5-1A
2	Connection fitting B	Steel plate	VVFS3000-5-2
3	Gasket	NBR	VVFS3000-7-1
4	Gasket	NBR	VVFS3000-8
5	O-ring	NBR	19.8 x 16.6 x 1.6 (End plate)
6	O-ring	NBR	20 x 16 x 2 (Manifold block)
7	O-ring	NBR	6.2 x 3 x 1.6
8	Terminal assembly	—	VVFS3000-6A
9	Junction cover assembly	For 01T	VVFS3000-4A- <small>Stations</small>
		For 01S□	AZ738-22A- <small>Stations</small>
13	Rubber plug	NBR	AXT336-9

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

**Replacement Parts: Sub Assembly**

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

No.	Description	Assembly part no.	Component parts	Applicable manifold base
10	Manifold block assembly	VVFS3000-1A-1- <small>02</small> / <small>03</small>	Manifold block ⑩, Terminal ⑧, Metal joint ①, ②, Gasket ③, ④, O-ring ⑥, ⑦, Receptacle assembly	Plug-in type
		VVFS3000-1A-2- <small>02</small> / <small>03</small>	Manifold block ⑩, Metal joint ①, ②, Gasket ③, ④, O-ring ⑥, ⑦	Non plug-in type
11	End plate (U side) assembly	VVFS3000-2A-1	End plate (U) ⑪, Metal joint ①, ②, O-ring ⑤, ⑥	Plug-in type
		VVFS3000-2A-2	End plate (U) ⑪, Metal joint ①, ②, O-ring ⑤, ⑥	Non plug-in type
12	End plate (D side) assembly	VVFS3000-3A-1	End plate (D) ⑫, Metal joint ①, ②, Gasket ③	Plug-in type
		VVFS3000-3A-2	End plate (D) ⑫, Metal joint ①, ②, Gasket ③	Non plug-in type

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

## Series VFS4000



### Model

Type of actuation	Model		Port size	Flow characteristics <sup>(1)</sup>						Max. operating cycle (cpm) <sup>(1)</sup>	Response time (ms) <sup>(2)</sup>	Mass (kg) <sup>(3)(4)</sup>	
	Plug-in	Non plug-in		1 → 4/2 (P → A/B)			4/2 → 5/3 (A/B → R1/R2)						
				C [dm <sup>3</sup> /(s·bar)]	b	Cv	C [dm <sup>3</sup> /(s·bar)]	b	Cv				
2 position	Single	VFS4100	VFS4110	3/8	11	0.18	2.6	12	0.20	2.8	1,000	40 or less	0.63
				1/2	12	0.15	2.8	12	0.22	3.1			
	Double	VFS4200	VFS4210	3/8	11	0.18	2.6	12	0.20	2.8	1,200	15 or less	0.75
				1/2	12	0.15	2.8	12	0.22	3.1			
3 position	Closed center	VFS4300	VFS4310	3/8	10	0.18	2.5	10	0.14	2.3	600	50 or less	0.82
				1/2	11	0.18	2.7	11	0.22	2.6			
	Exhaust center	VFS4400	VFS4410	3/8	11	0.16	2.6	10	0.15	2.3	600	50 or less	0.82
				1/2	12	0.15	2.9	10	0.15	2.4			
	Pressure center	VFS4500	VFS4510	3/8	11	0.22	2.7	11	0.22	2.7	600	50 or less	0.82
				1/2	12	0.22	2.9	11	0.22	2.8			
	Double check	VFS4600	VFS4610	3/8	6.3	—	—	6.5	—	—	200	55 or less	1.71
				1/2	6.8	—	—	6.8	—	—			

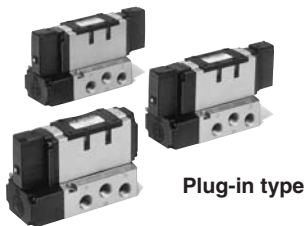
Note 1) Based on JIS B 8375 (once per 30 days) for the minimum operating frequency. Note 2) Based on JIS B 8375-1981 (The value at supply press. 0.5 MPa).  
Note 3) The figures in the above list are for without sub-plate. In the case of with plug-in sub-plate and with non plug-in sub-plate, add 0.50 kg and 0.43 kg respectively. Note 4) "Note 1)" and "Note 2)" are with controlled clean air.

Compact yet provides a large flow capacity  
1/2: C: 12 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



Plug-in type



Non plug-in type

### JIS Symbol

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

### Standard Specifications

Valve specifications	Fluid		Air/Inert gas
	Maximum operating pressure	1.0 MPa	
Minimum 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 E: Dustproof (level 0), Type F: Dripproof (level 2), Type D: Splashproof (level 4) <sup>(4)</sup>		
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 (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 0920.  
Note 5) Based on JIS C 4003.


### Option Specifications

Pilot type		External pilot <sup>(Note)</sup>
Manual override	Main valve	Direct manual override
	Pilot valve	Non-locking push type (Extended), Locking type (Tool required), Locking type (Lever)
Coil rated voltage	110 to 120, 220, 240 VAC, 50/60 Hz	
Porting specifications	Bottom ported	
Option	With light/surge voltage suppressor, Non-rotating DIN terminal	

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

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

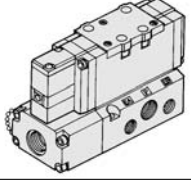
## How to Order



**Plug-in**

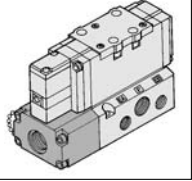
**Body type**

**O:** Plug-in type sub-plate



**Electrical entry**

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



**Porting specifications**


Nil	Side ported
B*	Bottom ported

\* In the case of external pilot (Option), bottom piping is not available.

**Port size**

Nil	Without sub-plate
03	Rc 3/8
04*	Rc 1/2


\* EA, EB: Rc 3/8



**Non plug-in**

**Body type**

**1:** Non plug-in type sub-plate



**Electrical entry**

Nil	None
Z	With light/surge voltage suppressor
P*	Non-rotating DIN terminal

\* In the case of w/ "Z", enter "ZP".  
\* Type "P" is available for DIN type only.

**Option**

Nil	None
Z	With light/surge voltage suppressor
P*	Non-rotating DIN terminal

\* In the case of w/ "Z", enter "ZP".  
\* Type "P" is available for DIN type only.

**Pilot valve Manual override**

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

\* Option

**Symbol**

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

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

**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 type**

Nil	Internal pilot
R*	External pilot

\* Option

**How to Order Pilot Valve Assembly**

SF4 - 1 F - 30

**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

**Manual override**

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

\* Option

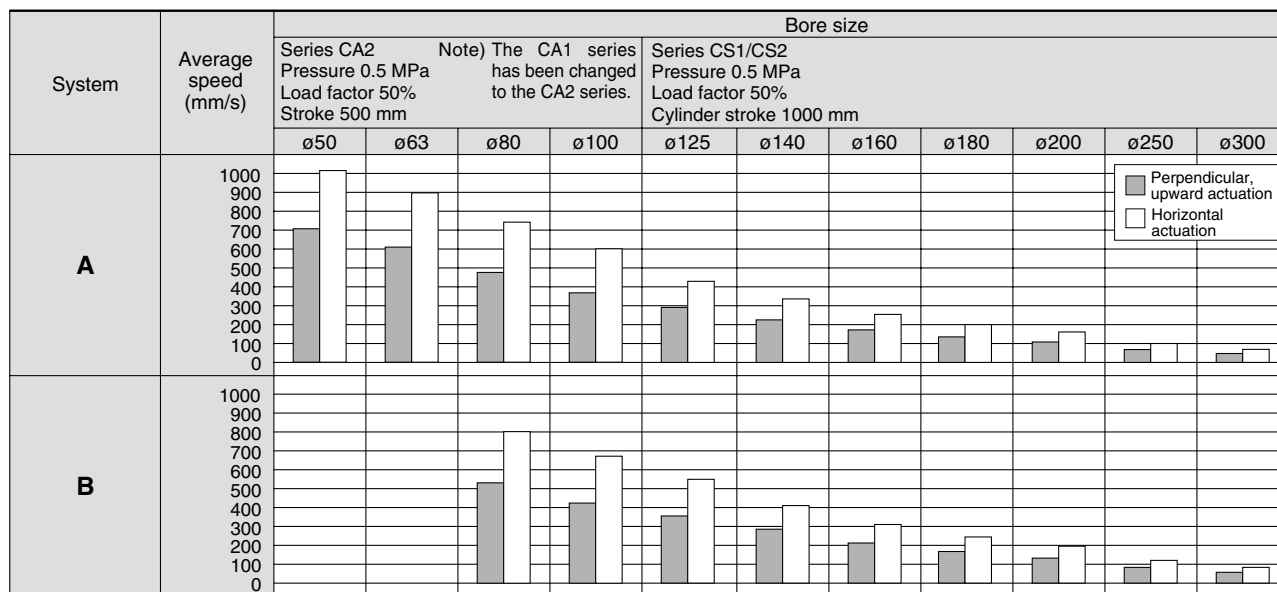
\*\* Refer to page 1224 for voltage conversion.

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

# Series VFS4000

## Cylinder Speed Chart

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



## System Components

System	Solenoid valve	Speed controller	Silencer	SGP (Steel pipe) Port size x Length
A	Series VFS4000 Rc 3/8	AS420-03 (S = 73 mm <sup>2</sup> )	AN300-03 (S = 60 mm <sup>2</sup> )	10A x 1
B	Series VFS4000 Rc 1/2	AS420-04 (S = 97 mm <sup>2</sup> )	AN400-04 (S = 90 mm <sup>2</sup> )	15A x 1

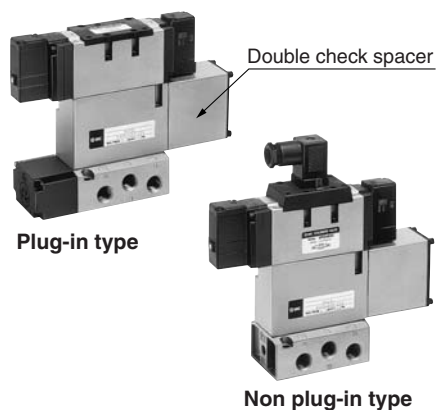


- \* It is when the cylinder is extending that is meter-controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
- \* The average velocity of the cylinder is what the stroke is divided by the total stroke time.
- \* Load factor: ((Load weight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

## Double Check Spacer/Specifications

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

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



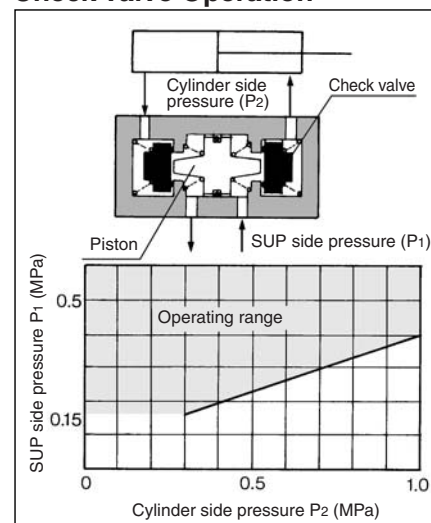
### Specifications

Double check spacer part no.	Plug-in type	Non plug-in type
	VVFS4000-22A-1	VVFS4000-22A-2
Applicable valve model	VFS4400-□F	VFS4410-□D VFS4410-□E

### ⚠ Caution

- In the case of 3 position double check valve (VFS46□0), check the leakage from piping and fittings in between valve and cylinder by means of synthetic detergent solutions, and ensure that there is no such leakage found there. Also check the leakage from cylinder seal and piston seal. If there is any leakage, sometimes the cylinder, when valve is de-energized, can move without stopping at intermediate position.
- Be aware that if the exhaust side is restricted excessively, the intermediate stopping accuracy will decrease and will lead to improper intermediate stops.

### Check Valve Operation

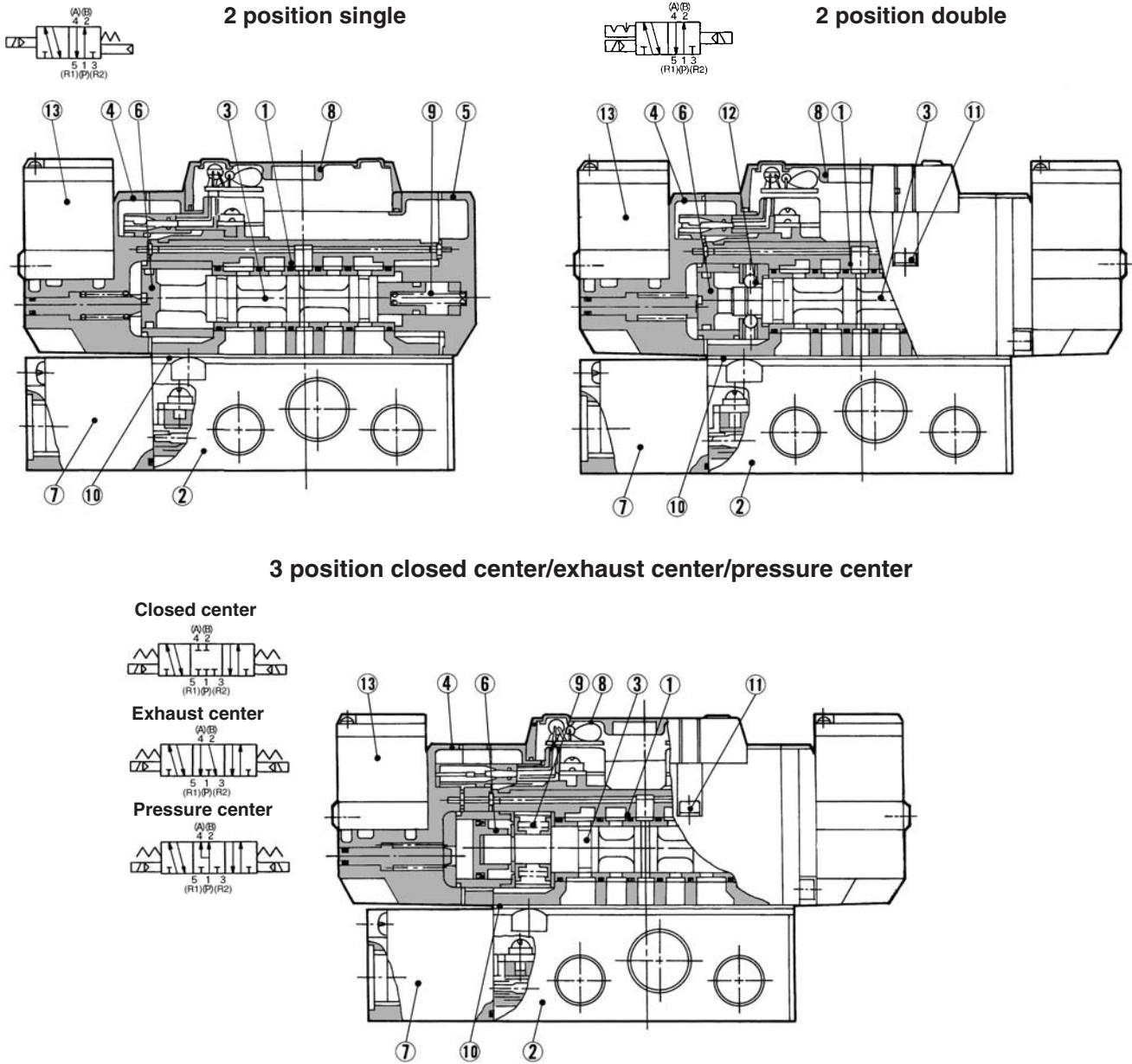


- The combination of VFS41□0, VFS42□0 and Double check spacer for prevention of falling at the stroke end but cannot hold the intermediate position of the cylinder.



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

## Construction



- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS**
- VFR
- VQ7

### Component Parts

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

\* Refer to "How to Order Pilot Valve Assembly" on page 1183.

### Sub-plate Assembly Part No.

Plug-in	VFS4000-P- <sup>03</sup> / <sub>04</sub>
Non plug-in	VFS4000-S- <sup>03</sup> / <sub>04</sub>

\* Mounting bolt and gasket are not included.

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

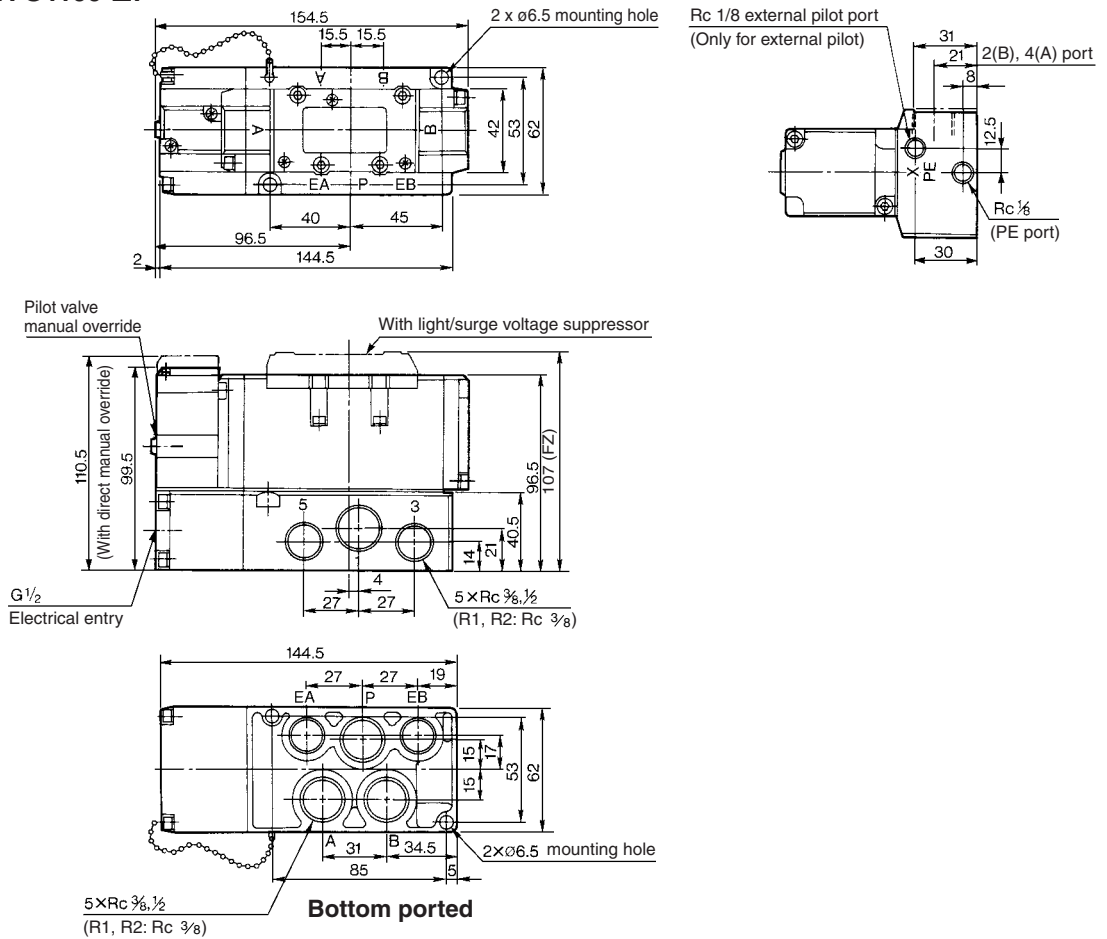
Plug-in	VFS4000-P-R <sup>03</sup> / <sub>04</sub>
Non plug-in	VFS4000-S-R <sup>03</sup> / <sub>04</sub>

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

# Series VFS4000

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

### 2 position single: VFS4100-□F

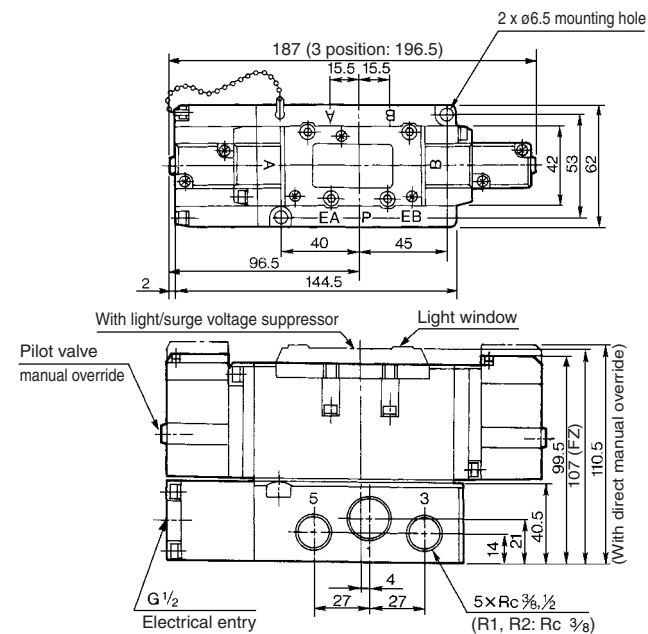


### 2 position double: VFS4200-□F

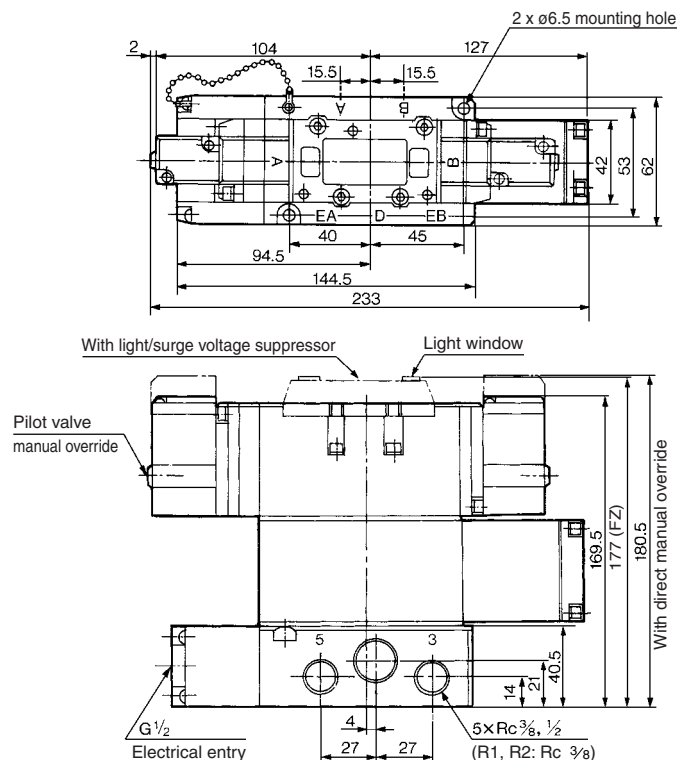
### 3 position closed center: VFS4300-□F

### 3 position exhaust center: VFS4400-□F

### 3 position pressure center: VFS4500-□F



### 3 position double check: VFS4600-□F

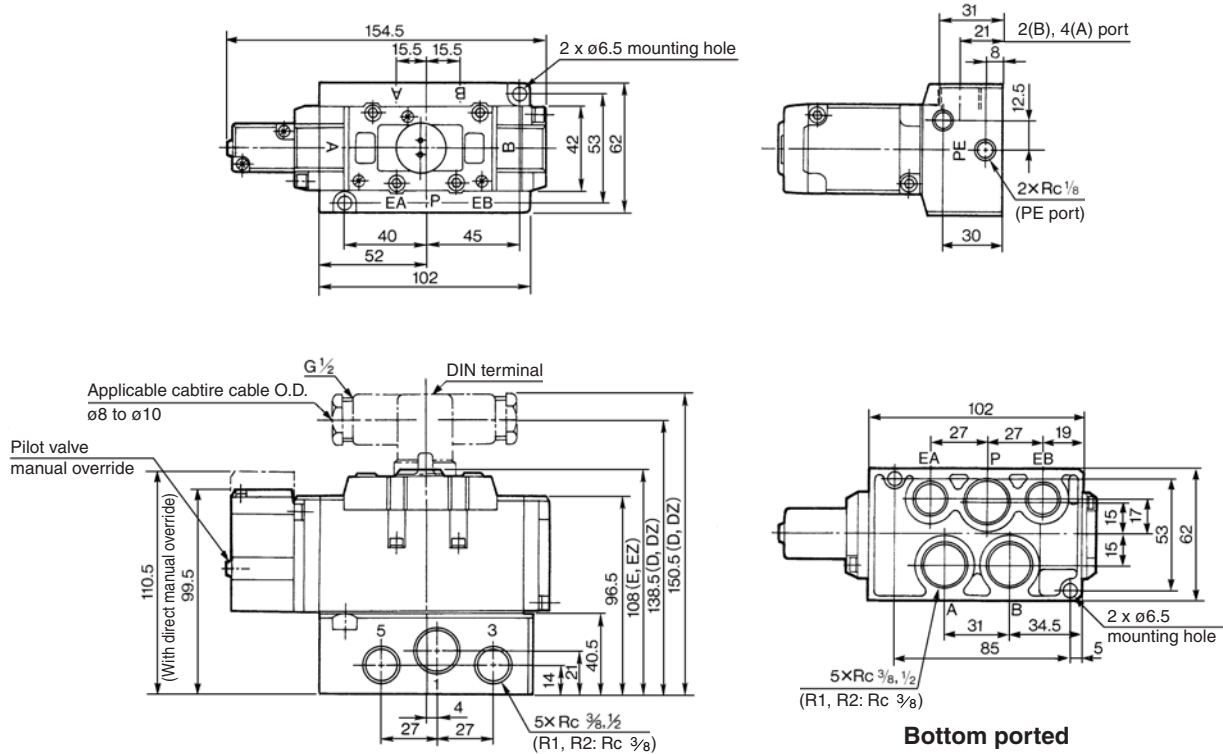


# 5 Port Pilot Operated Solenoid Valve *Series VFS4000*

Metal Seal, Plug-in/Non Plug-in

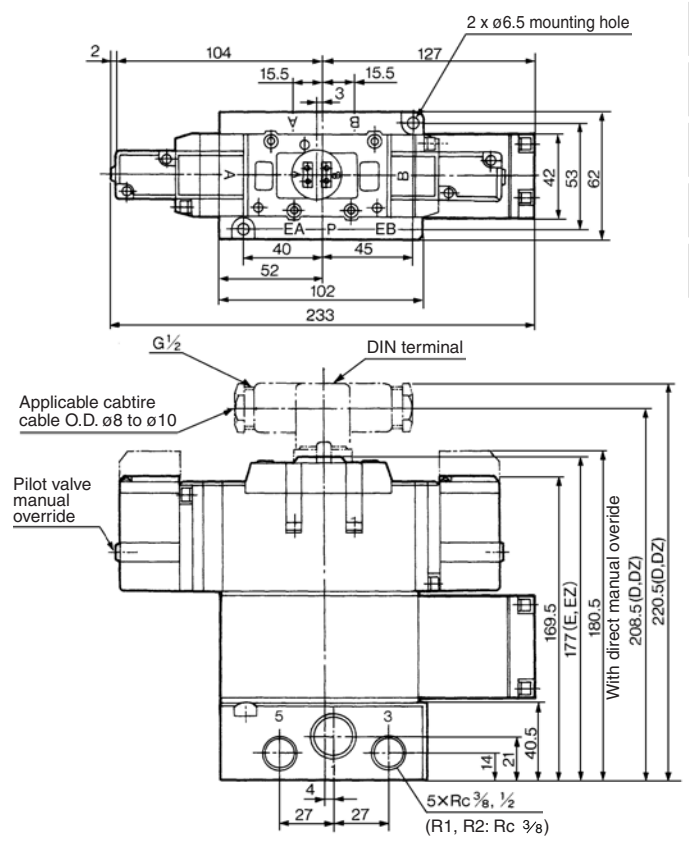
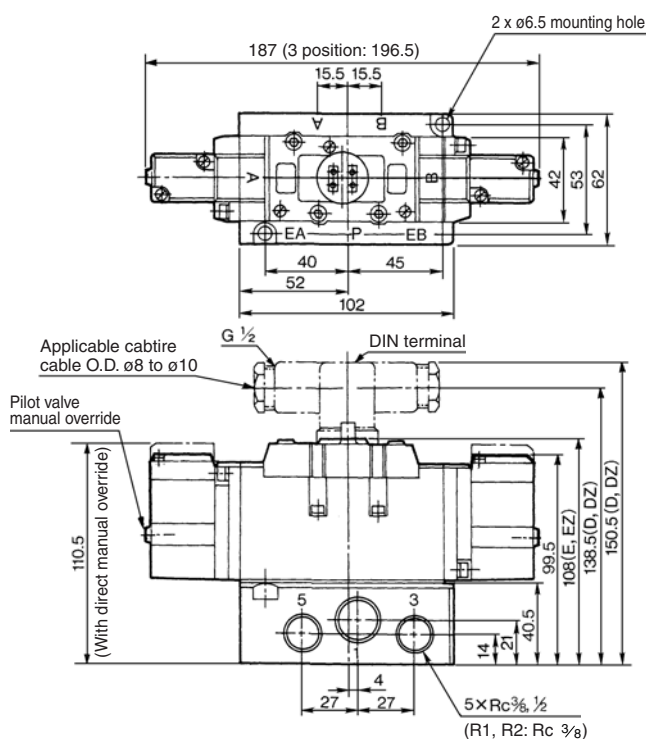
## Non Plug-in — 2 Position single/Double/3 Position closed center/Exhaust center/Pressure center/Double check

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



2 position double: VFS4210-□E, VFS4210-□D  
 3 position closed center: VFS4310-□E, VFS4310-□D  
 3 position exhaust center: VFS4410-□E, VFS4410-□D  
 3 position pressure center: VFS4510-□E, VFS4510-□D

3 position double check: VFS4610-□E, VFS4610-□D



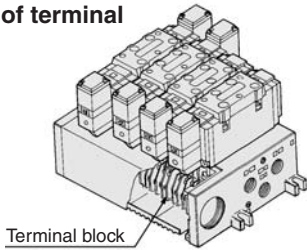
- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

# Series VFS4000

## Manifold Specifications

### Plug-in Type: With Terminal Block

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



**VV5FS4-01T-06 1-03**

Series VFS4000 Manifold Plug-in type with terminal block

**Stations**

02	2 stations
⋮	⋮
10	10 stations

**Symbol**

Symbol	Passage		Porting specifications (A, B)
	P	R1, R2	
1	Common	Common	Side
2			Bottom* * Option

**Port size**

Symbol	P, R1, R2	A, B
03		Rc 3/8
04	Rc 1/2	Rc 1/2
M		Mixed

**Thread type**

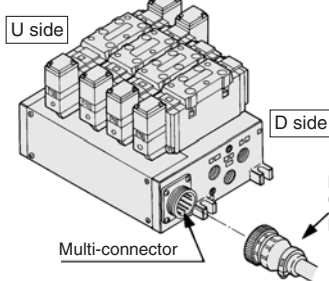
Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

\* For bottom ported, Rc 3/8 is only available.

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

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



**VV5FS4-01C D-05 2-03**

Series VFS4000 Manifold Plug-in type with multi-connector

**Stations**

02	2 stations
⋮	⋮
08*	8 stations

\* Max. 8 stations

**Connector mounting direction**

D	D side mounting
U	U side mounting

**Symbol**

Symbol	Passage		Porting specifications (A, B)
	P	R1, R2	
1			Side
2	Common	Common	Bottom* * Option

**Port size**

Symbol	P, R1, R2	A, B
03		Rc 3/8
04	Rc 1/2	Rc 1/2
M		Mixed

**Thread type**

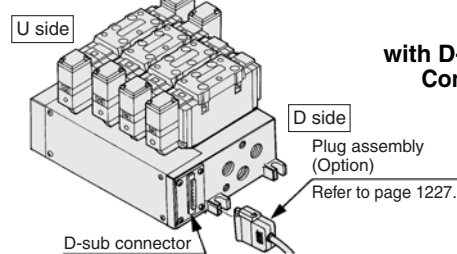
Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

\* For bottom ported, Rc 3/8 is only available.

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

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



**VV5FS4-01F D-06 1-03**

Series VFS4000 Manifold Plug-in type with D-sub connector

**Stations**

02	2 stations
⋮	⋮
08*	8 stations

\* Max. 8 stations

**Connector mounting direction**

D	D side mounting
U	U side mounting

**Symbol**

Symbol	Passage		Porting specifications (A, B)
	P	R1, R2	
1			Side
2	Common	Common	Bottom* * Option

**Port size**

Symbol	P, R1, R2	A, B
03		Rc 3/8
04	Rc 1/2	Rc 1/2
M		Mixed

**Thread type**

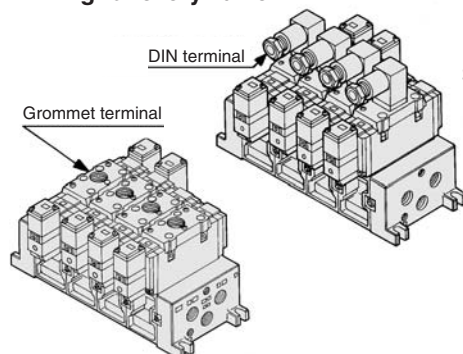
Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

\* For bottom ported, Rc 3/8 is only available.

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

- Wiring for every valve.



**VV5FS4-10-05 2-03**

Series VFS4000 Manifold Non plug-in type

**Stations**

02	2 stations
⋮	⋮
10	10 stations

**Symbol**

Symbol	Passage		Porting specifications (A, B)
	P	R1, R2	
1	Common	Common	Side
2			Bottom* * Option

**Port size**

Symbol	P, R1, R2	A, B
03		Rc 3/8
04	Rc 1/2	Rc 1/2
M		Mixed

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

\* For bottom ported, Rc 3/8 is only available.

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

## How to Order Manifold Assembly

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

### <Example>

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

## Manifold Specifications

Base model	Wiring	Porting specifications	Port size Rc		Stations	Applicable valve model
		A, B port	P, R1, R2	A, B		
Plug-in type <b>VV5FS4-01</b> □	<ul style="list-style-type: none"> <li>• With terminal block</li> <li>• With multi-connector</li> <li>• With D-sub connector</li> </ul>	Side/ Bottom	1/2	3/8, 1/2	2 to 10*	VFS4□00-□F
Non plug-in type <b>VV5FS4-10</b>	<ul style="list-style-type: none"> <li>• DIN terminal</li> <li>• Grommet terminal</li> </ul>					VFS4□10-□D VFS4□10-□E



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

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

Model	Passage/Stations	Station 1	Station 5	Station 10	
VV5FS4	1 → 4/2 (P → A/B)	C [dm <sup>3</sup> /(s·bar)]	10.5	10.5	10.5
		b	0.20	0.20	0.20
		Cv	2.5	2.5	2.5
	4/2 → 5/3 (A/B → R1/R2)	C [dm <sup>3</sup> /(s·bar)]	11	11	11
		b	0.20	0.20	0.20
		Cv	2.9	2.9	2.9



\* Port size: Rc 1/2

SJ

SY

SV

SYJ

SZ

VP4

S0700

VQ

VQ4

VQ5

VQC

VQZ

SQ

VFS

VFR

VQ7

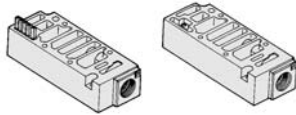
# Series VFS4000

## Manifold Option Parts Assembly

### Individual SUP spacer

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

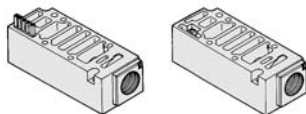
Body type	Plug-in type	Non plug-in type
Part no.	VVFS4000-P-03-1	VVFS4000-P-03-2



### Individual EXH spacer

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

Body type	Plug-in type	Non plug-in type
Part no.	VVFS4000-R-04-1	VVFS4000-R-04-2



### \* SUP block plate

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

Body type	Plug-in type	Non plug-in type
Part no.	AXT634-10A	

### \* EXH block plate

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

Body type	Plug-in type	Non plug-in type
Part no.	AXT634-11A	



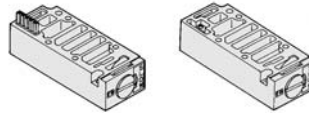
EXH block plate

SUP block plate

### Throttle valve spacer

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

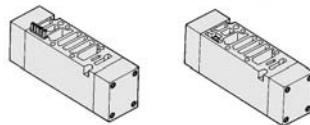
Body type	Plug-in type	Non plug-in type
Part no.	VVFS4000-20A-1	VVFS4000-20A-2



### Double check spacer

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

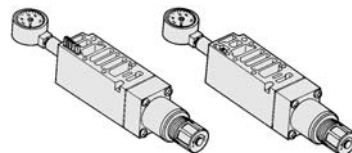
Body type	Plug-in type	Non plug-in type
Part no.	VVFS4000-22A-1	VVFS4000-22A-2



### Interface regulator

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

Body type	Plug-in type	Non plug-in type
P port regulation	ARBF4050-00-P-1	ARBF4050-00-P-2
A port regulation	ARBF4050-00-A-1	ARBF4050-00-A-2
B port regulation	ARBF4050-00-B-1	ARBF4050-00-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.

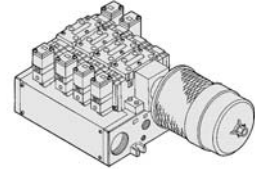
Body type	Plug-in type	Non plug-in type
Part no.	VVFS4000-10A	

## Manifold Option

### With exhaust cleaner

#### Plug-in type/Non Plug-in type

- Valve exhaust noise dampening: 35 dB or more.
- Oil mist collection: Rate of collection 99.9% or more.
- Piping process reduced.

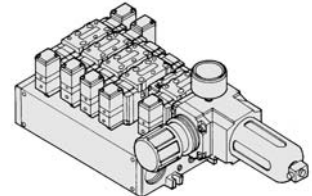


For details, refer to page 1193.

### With control unit

#### Plug-in type/Non Plug-in type

- Filter, regulation valve, pressure switch and air release valve are all combined to form one unit.
- Piping processes are eliminated.



For details, refer to page 1195.

### Made to Order

#### Manifold with serial transmission kit

#### Plug-in type

- Solenoid valve wiring process reduced considerably.

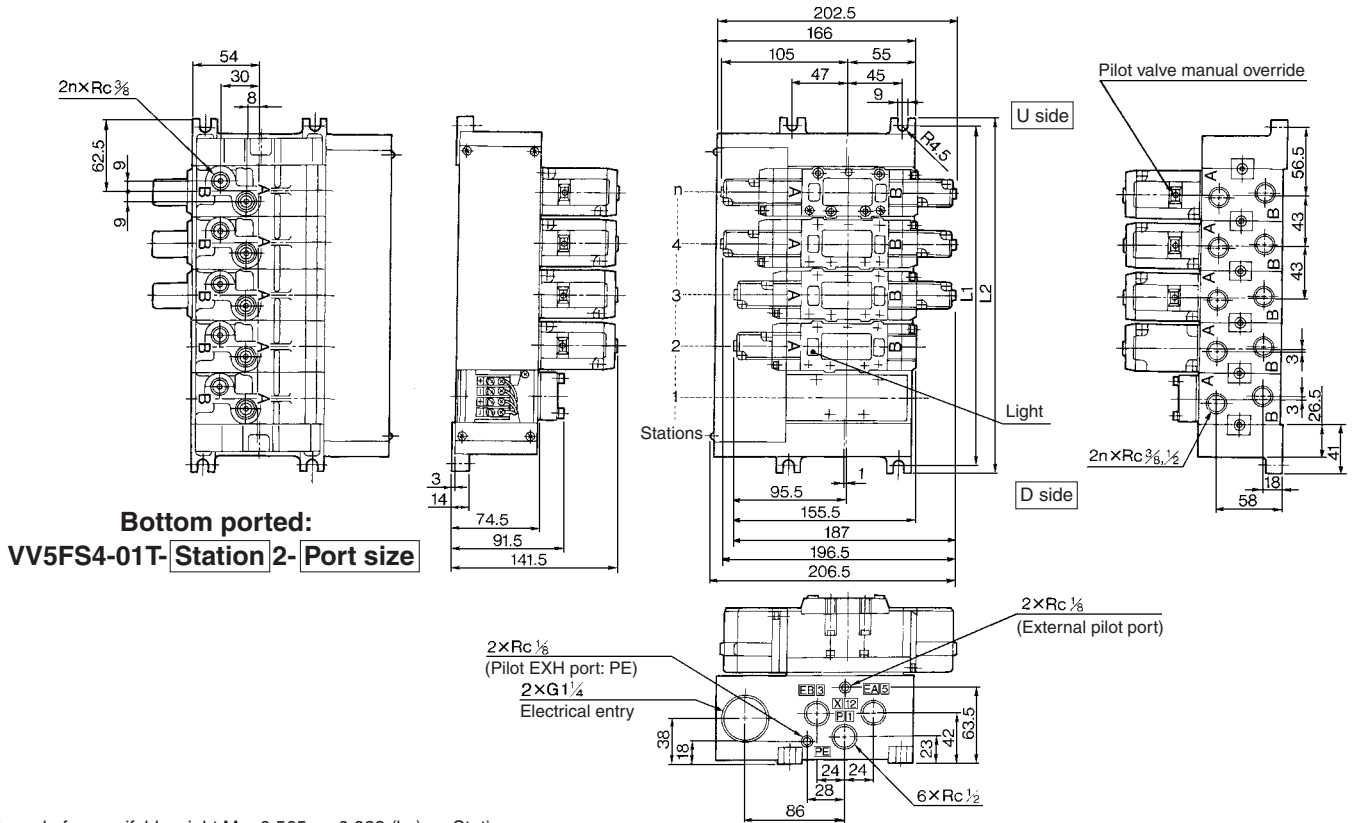


For details, refer to page 1198.

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

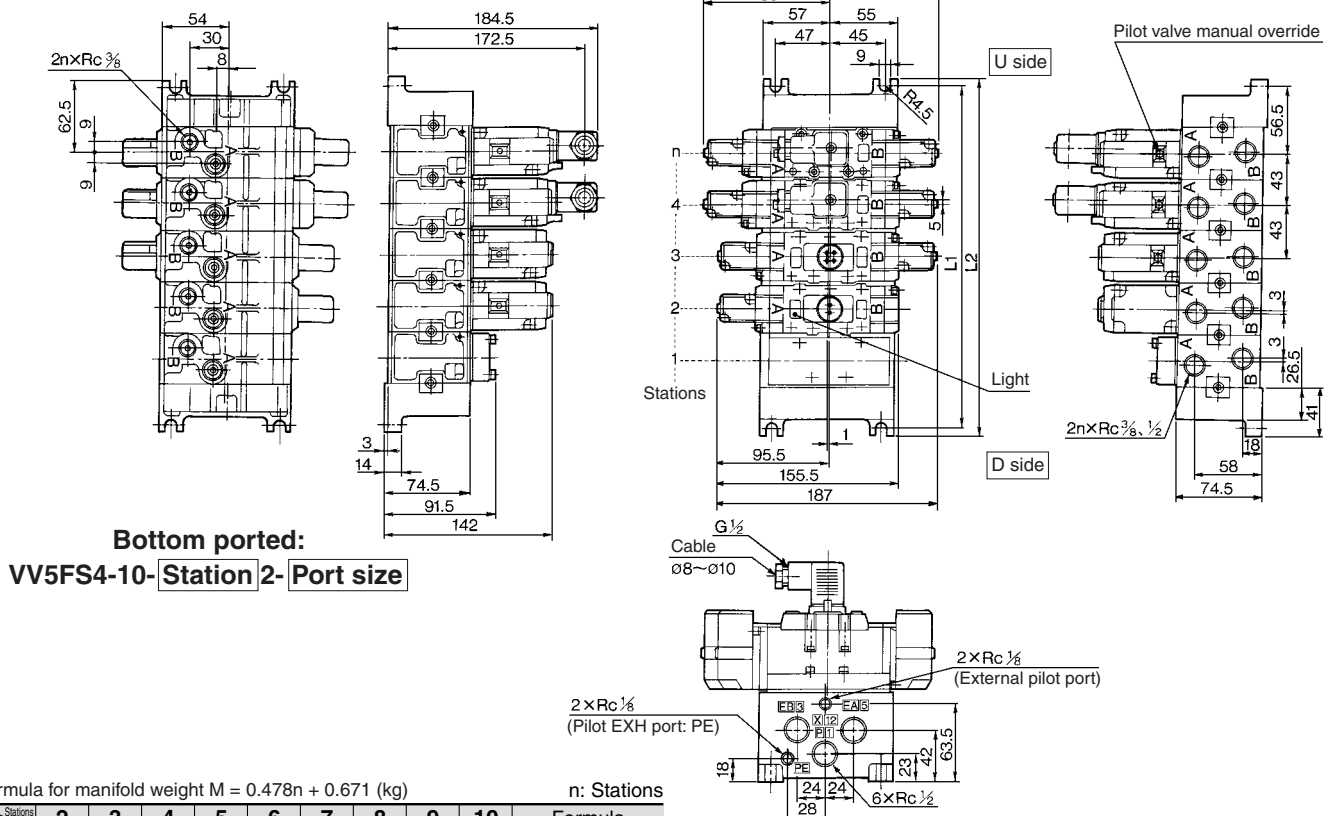
## Manifold — Plug-in type, Non plug-in type

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



Formula for manifold weight  $M = 0.565n + 0.923$  (kg) n: Stations

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



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

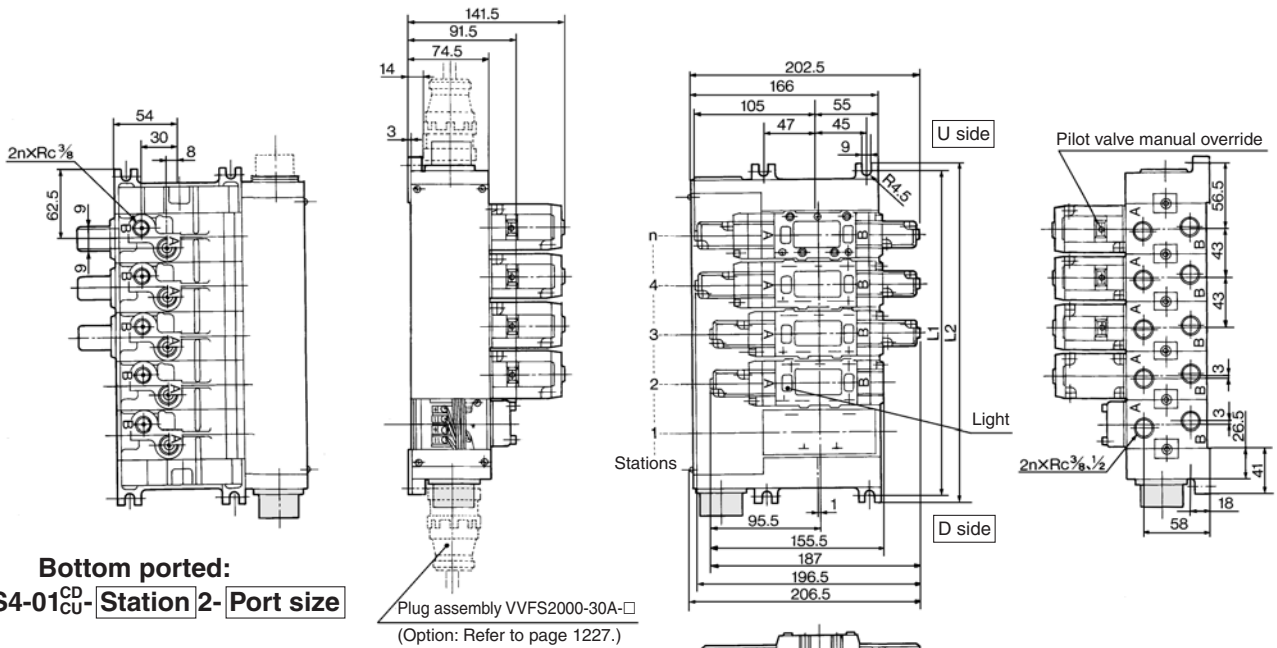
Stations	2	3	4	5	6	7	8	9	10	Formula
L <sub>1</sub>	156	199	242	285	328	371	414	457	500	L <sub>1</sub> = 43 x n + 70
L <sub>2</sub>	168	211	254	297	340	383	426	469	512	L <sub>2</sub> = 43 x n + 82

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

# Series VFS4000

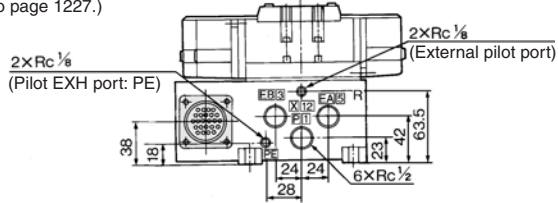
## Manifold — Plug-in type with multi-connector/D-sub connector

Plug-in type with multi-connector: VV5FS4-01CD-Station 1- Port size, VV5FS4-01CU-Station 1- Port size

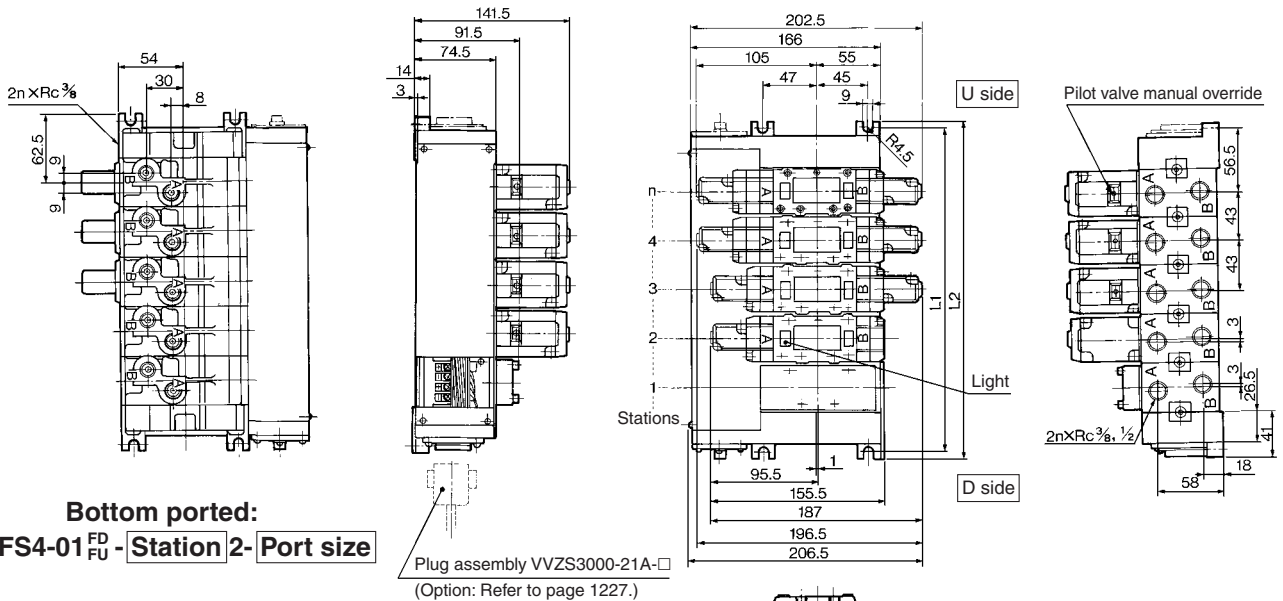


Formula for manifold weight  $M = 0.57n + 1.011$  (kg) n: Station

\* Wiring specifications: Refer to page 1227.

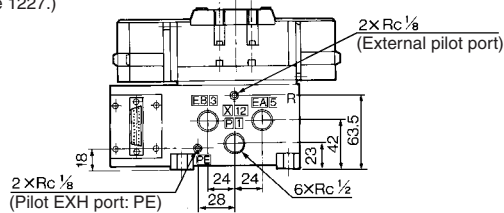


Plug-in type with D-sub connector: VV5FS4-01FD-Station 1- Port size, VV5FS4-01FU-Station 1- Port size



Formula for manifold weight  $M = 0.57n + 0.935$  (kg)

\* Wiring specifications: Refer to page 1227.

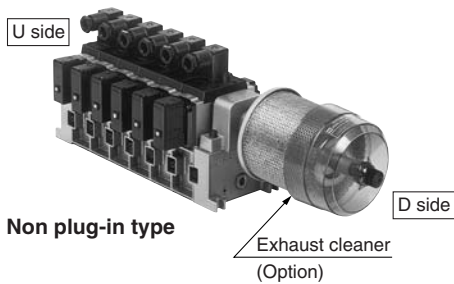
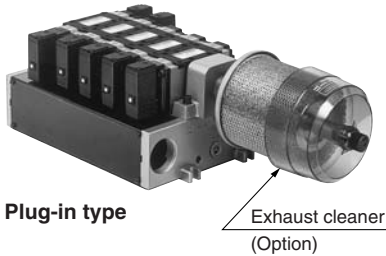


Stations	2	3	4	5	6	7	8	Formula
L <sub>1</sub>	156	199	242	285	328	371	414	L <sub>1</sub> = 43 x n + 70
L <sub>2</sub>	168	211	254	297	340	383	426	L <sub>2</sub> = 43 x n + 82



## 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

Manifold	Plug-in type: VV5FS4-01□	Non plug-in type: VV5FS4-10
Wiring	With terminal block With multi-connector With D-sub connector	DIN terminal Grommet terminal
Applicable valve model	VFS4□00-□F	VFS4□10-□D, VFS4□10-□E
Porting specifications Rc	Common SUP/Common EXH	
	2(B), 4(A) port 1(P), 3(R2), 5(R1) port	Side: 3/8, 1/2, Bottom: 3/8 (Option) P: 1/2, EXH: 1, 1 1/2
Stations	2 to 10 <sup>(1)</sup>	
Applicable exhaust cleaners	AMC610-10 (Connecting port size R 1), AMC810-14 (Connecting port size R 1 1/2) <sup>(2)</sup>	

Note 1) With multi-connector, or with D-sub connector: 8 stations max.  
Note 2) Stations of 5 or more and high frequency of operation should be used with AMC810-14. Exhaust cleaners AMC610-10 and AMC810-14 are not attached.

### How to Order

**VV5FS4 - 10 - 06 1 - 03 - CD**

Series VFS4000  
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

**Connector mounting direction**

Symbol	With connector	Applicable base
Nil	None	01T, 10
D	D side mounting	01C, 01F
U	U side mounting	01C, 01F

**Stations**

02	2 stations
⋮	⋮
10	10 stations

Base type 01T, 10: 2 to 10 stations  
Base type 01C, 01F: 2 to 8 stations

**Exhaust cleaner mounting direction**

Symbol	Exhaust cleaner mounting direction
CD	D side D side mounting
CU	U side U side mounting

\* Please indicate exhaust cleaner size or port size.

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

**Port size**

Symbol	P	A, B
03	Rc 1/2	Rc 3/8
04	Rc 1/2	Rc 1/2
M		Mixed

\* For bottom ported, Rc 3/8 is only available.

**Symbol**

Symbol	Passage		Porting specifications (A, B)
	P	R1, R2	
1	Common	Common	Side
2			Bottom*

\* Option

### ⚠ Caution

When using an exhaust cleaner, mount it downwards.



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

### How to Order Manifold Assembly [Example]

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

#### <Example>

- Plug-in type with terminal block (6 stations)
  - (Manifold base) VV5FS4-01T-061-03-CD ..... 1
  - (2 position single) \* VFS4100-5FZ ..... 3
  - (2 position double) \* VFS4200-5FZ ..... 2
  - (Blanking plate) \* VVFS4000-10A ..... 1
  - (Exhaust cleaner) AMC610-10 ..... 1
- Non plug-in type (6 stations)
  - (Manifold base) VV5FS4-10-061-04-CU ..... 1
  - (2 position single) \* VFS4110-5E ..... 3
  - (2 position double) \* VFS4210-5E ..... 2
  - (Blanking plate) \* VVFS4000-10A ..... 1
  - (Exhaust cleaner) AMC810-14 ..... 1

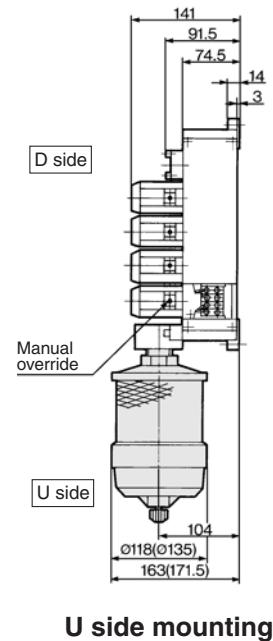
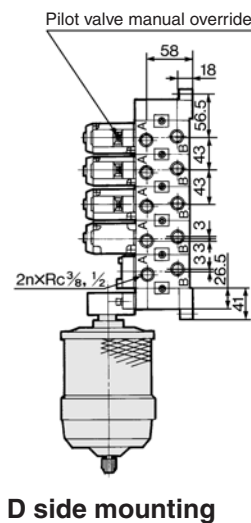
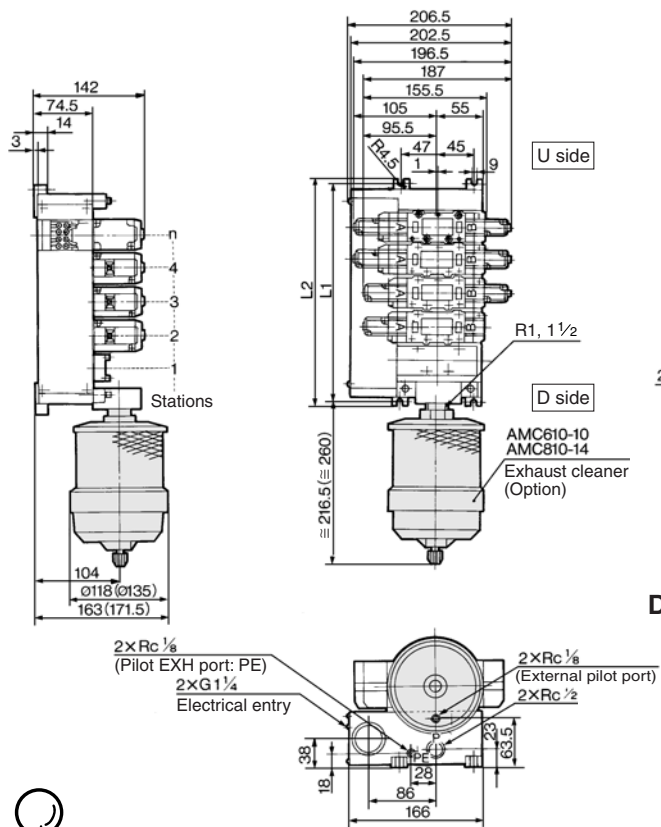
→ The asterisk denotes the symbol for assembly. Prefix it to the part numbers of the solenoid valve.

SJ  
SY  
SV  
SYJ  
SZ  
VP4  
S0700  
VQ  
VQ4  
VQ5  
VQC  
VQZ  
SQ  
VFS  
VFR  
VQ7

# Series VFS4000

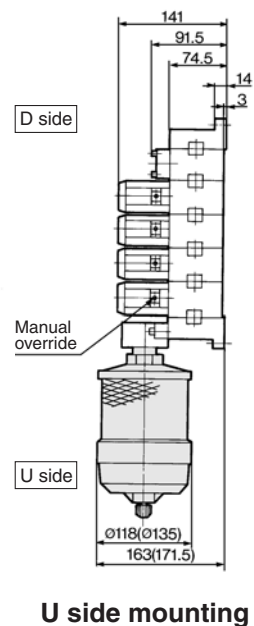
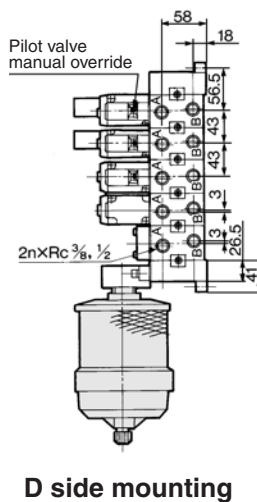
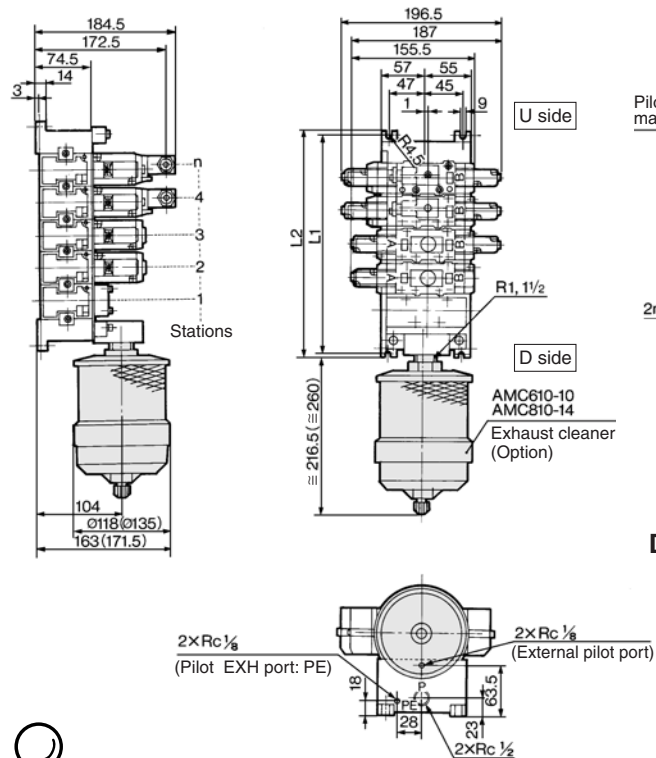
## Manifold with Exhaust Cleaner — Plug-in type, Non plug-in type

Plug-in type: VV5FS4-01T-Station 1-Port size -<sup>CD</sup><sub>CU</sub>



( ): AMC810

Non plug-in type: VV5FS4-10-Station 1-Port size -<sup>CD</sup><sub>CU</sub>



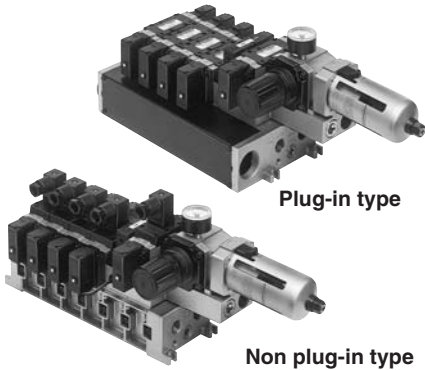
( ): AMC810

n: Stations

Stations	2	3	4	5	6	7	8	9	10	Formula
L <sub>1</sub>	156	199	242	285	328	371	414	457	500	L <sub>1</sub> = 43 x n + 70
L <sub>2</sub>	168	211	254	297	340	383	426	469	512	L <sub>2</sub> = 43 x n + 82

## Manifold with Control Unit

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



### ⚠ Caution

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

### Manifold Specifications

Manifold	Plug-in type: VV5FS4-01□	Non plug-in type: VV5FS4-10
Wiring	With terminal block With multi-connector With D-sub connector	DIN terminal Grommet terminal
Applicable valve model	VFS4□00-□F	VFS4□10-□D, VFS4□10-□E
Porting specifications Rc (PT)	Common SUP, Common EXH	
	2(B), 4(A) port	Side: 3/8, 1/2, Bottom: 3/8
	1(P), 3(R2), 5(R1) port	Side: 1/2
Stations	2 to 10*	



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

### Control Unit Specifications

Air filter (With auto-drain/With manual drain)	
Filtration degree	5 μm
Regulator	
Set pressure (Outlet pressure)	0.05 to 0.85 MPa
Pressure switch <sup>(1)</sup>	
Set pressure range: OFF	0.1 to 0.6 MPa
Differential	0.08 MPa or less
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
Air release valve (Single only)	
Operating pressure range	0.1 to 1.0 MPa

### Control Unit/Option

Air release valve spacer <sup>(2)</sup>	<Plug-in type> VVFS4000-24A-1R (D side mounting)	
	<Non plug-in type> VVFS4000-24A-2R (D side mounting)	
Pressure switch	IS1000P-2-1	
Blanking plate <sup>(3)</sup>	Filter regulator	MP2-3
	Pressure switch	MP3-2
	Release valve	VVFS4000-24A-10
Filter element	11104-5B	



Note 1) Voltage: 24 VDC to 100 VAC  
Inner voltage drop: 4 V

Note 2) Combination of a valve VFS41□□ (single) and a release valve spacer can be used as an air release valve.

Note 3) The non plug-in type cannot be mounted afterwards.

### How to Order

**VV5FS4 - 01C D - 08 1 - 03 - AP**

Series VFS4000 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

Connector mounting direction

Symbol	With connector	Applicable base
Nil	None	01T, 10
D	D side mounting	01C, 01F
U	U side mounting	01C, 01F

Stations

02	2 stations
⋮	⋮
10*	10 stations

\* Base type 01T, 10: 2 to 10 stations  
Base type 01C, 01F: 2 to 8 stations

Symbol

Symbol	Passage		Porting specifications (A, B)
	P	R1, R2	
1	Common	Common	Side
2	Common	Common	Bottom*

\* Option

Port size

Symbol	P, R1, R2	A, B
03	Rc 1/2	Rc 3/8
04		Rc 1/2
M		Mixed

\* For bottom ported, Rc 3/8 is only available.

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

Air release valve coil rating

Nil	None (F, G type only)
1	100 VAC, 50/60 Hz
5	24 VDC
9	Other

Control unit type

Symbol	Nil	A	AP	M	MP	F	G	C	E
Control equipment									
Air filter with auto-drain		●	●			●			
Air filter with manual drain				●	●		●		
Regulator		●	●	●	●	●	●		
Air release valve		●	●	●	●			●	●
Pressure switch			●		●				
Blanking plate (Air release valve)						●	●		
Blanking plate (Filter, Regulator)								●	
Blanking plate (Pressure switch)		●	●		●	●	●		
Number of manifold blocks required for mounting (stations)	2	2	2	2	2	2	2	2	1

### How to Order Manifold Assembly [Example]

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

#### <Example>

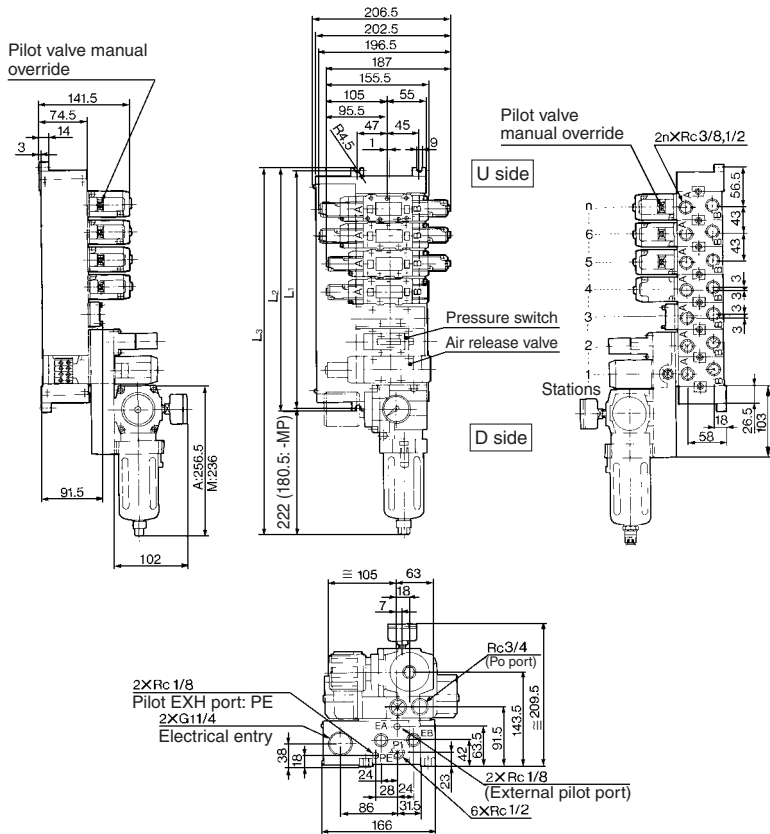
- Plug-in type with terminal block: In order to mount control unit, it requires 2 stations.  
(Manifold base) VV5FS4-01T-081-03-AP5 ..... 1  
(2 position single) \* VFS4100-5FZ ..... 4  
(2 position double) \* VFS4200-5FZ ..... 2
- Non plug-in type: In order to mount control unit, it requires 2 stations.  
(Manifold base) VV5FS4-10-061-03-A ..... 1  
(2 position single) \* VFS4110-5D ..... 4

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

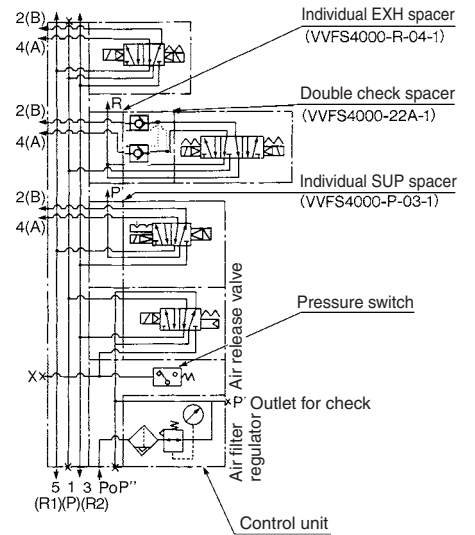
# Series VFS4000

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

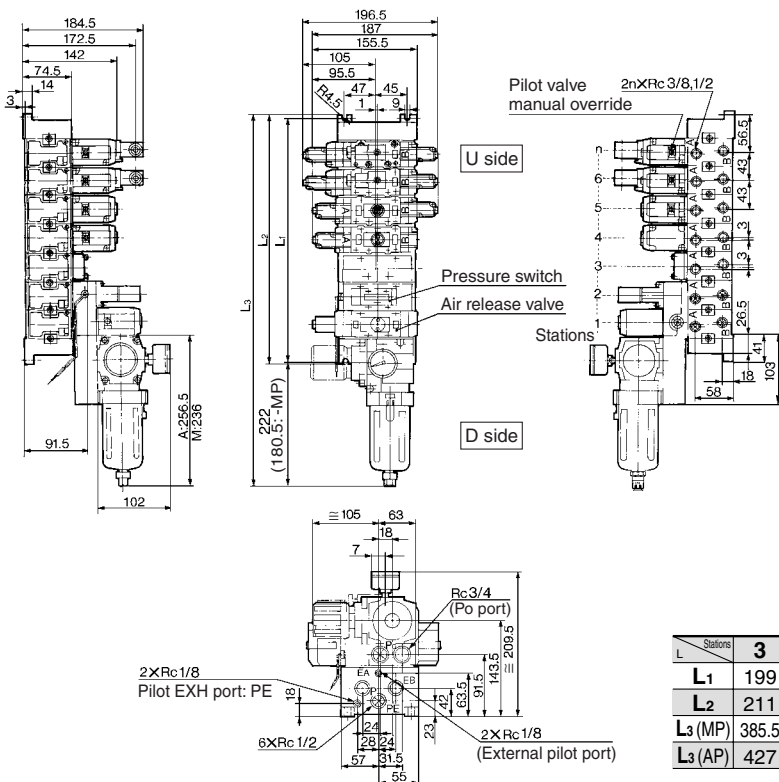
Plug-in type: VV5FS4-01T-Station 1-Port size -AP Voltage for release valve



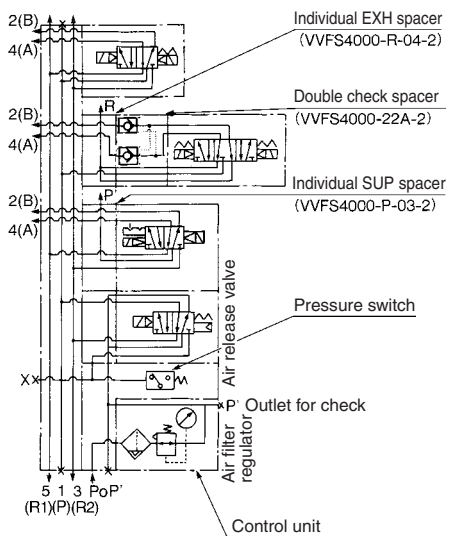
### Example for manifold



Non plug-in type: VV5FS4-10-Station 1-Port size -AP Voltage for release valve



### Example for manifold



n: Stations

L	Stations	3	4	5	6	7	8	9	10	Formula
L <sub>1</sub>		199	242	285	328	371	414	457	500	L <sub>1</sub> = 43 x n + 70
L <sub>2</sub>		211	254	297	340	383	426	469	512	L <sub>2</sub> = 43 x n + 82
L <sub>3</sub> (MP)		385.5	428.5	471.5	514.5	557.5	600.5	643.5	686.5	L <sub>3</sub> = 43 x n + 256.5
L <sub>3</sub> (AP)		427	470	513	556	599	642	685	728	L <sub>3</sub> = 43 x n + 298



# Made to Order

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

## How to Order

### How to Order Manifold

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

Plug-in type  
Serial transmission kit

SI unit mounting position

<b>D</b>	D side mounting
<b>U</b>	U side mounting

Stations

<b>2</b>	2 stations
<b>:</b>	:
<b>10</b>	10 stations

Thread type

<b>Nil</b>	Rc
<b>N</b>	NPT
<b>T</b>	NPTF
<b>F</b>	G

Port size

Symbol	P, R1, R2	A, B
<b>03</b>		Rc 3/8
<b>04</b>	Rc 1/2	Rc 1/2
<b>M</b>		Mixed

\* For bottom ported: Rc 1/8 only

Note 1) Max. 10 stations. Add 1 station for serial unit mounting.  
Note 2) Max. 10 Stations: For single and double mixed wiring. (No. of valves: 9)  
Max. 9 stations: For standard double wiring (No. of valves: 8)

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

Combination symbol

Symbol	Port specification		Piping specification A, B
	P	R1, R2	
<b>1</b>	Common	Common	Side
<b>2*</b>			Bottom

\* Option

### Applicable models

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

Refer to pages 1653 to 1655 for the details of the EX123/124 integrated type (for output) serial transmission system.

### Correspondence of SI unit output numbers and solenoid valve coils

#### <Wiring Example 1> Double wiring (Standard)

SI unit output no.	D side								SI unit
	1	2	3	4	5	6	7	8	
	Double	Double	Single	Single	Single	Double	Single	Single	
	AB	AB	AB	AB	AB	AB	AB	AB	
	01	23	45	67	89	1011	1213	1415	

#### <Wiring Example 2> Single/Double mixed wiring (Option)

SI unit output no.	D side									SI unit
	1	2	3	4	5	6	7	8	9	
	Double	Double	Single	Single	Single	Double	Single	Double	Single	
	AB	AB	A	A	A	AB	A	AB	A	
	01	23	4	5	6	78	9	1011	11	

\* Mixed wiring is available as an option. Use the manifold specification sheet to specify this.

### How to Order Valves

**VFS4 [ ] 00 [ ] - 5 F [ ] [ ]**

Symbol

<b>1</b>	2 position single
<b>2</b>	2 position double
<b>3</b>	3 position closed center
<b>4</b>	3 position exhaust center
<b>5</b>	3 position pressure center
<b>6</b>	3 position double check

Pilot type

<b>Nil</b>	Internal pilot
<b>R</b>	External pilot

24 VDC

Pilot valve manual override

<b>Nil</b>	Non-locking push type (Flush)
<b>A</b>	Non-locking push type (Extended)
<b>B</b>	Locking type (Tool required)
<b>C</b>	Locking type (Lever)

Option

<b>Nil</b>	None
<b>Z</b>	With light/surge voltage suppressor

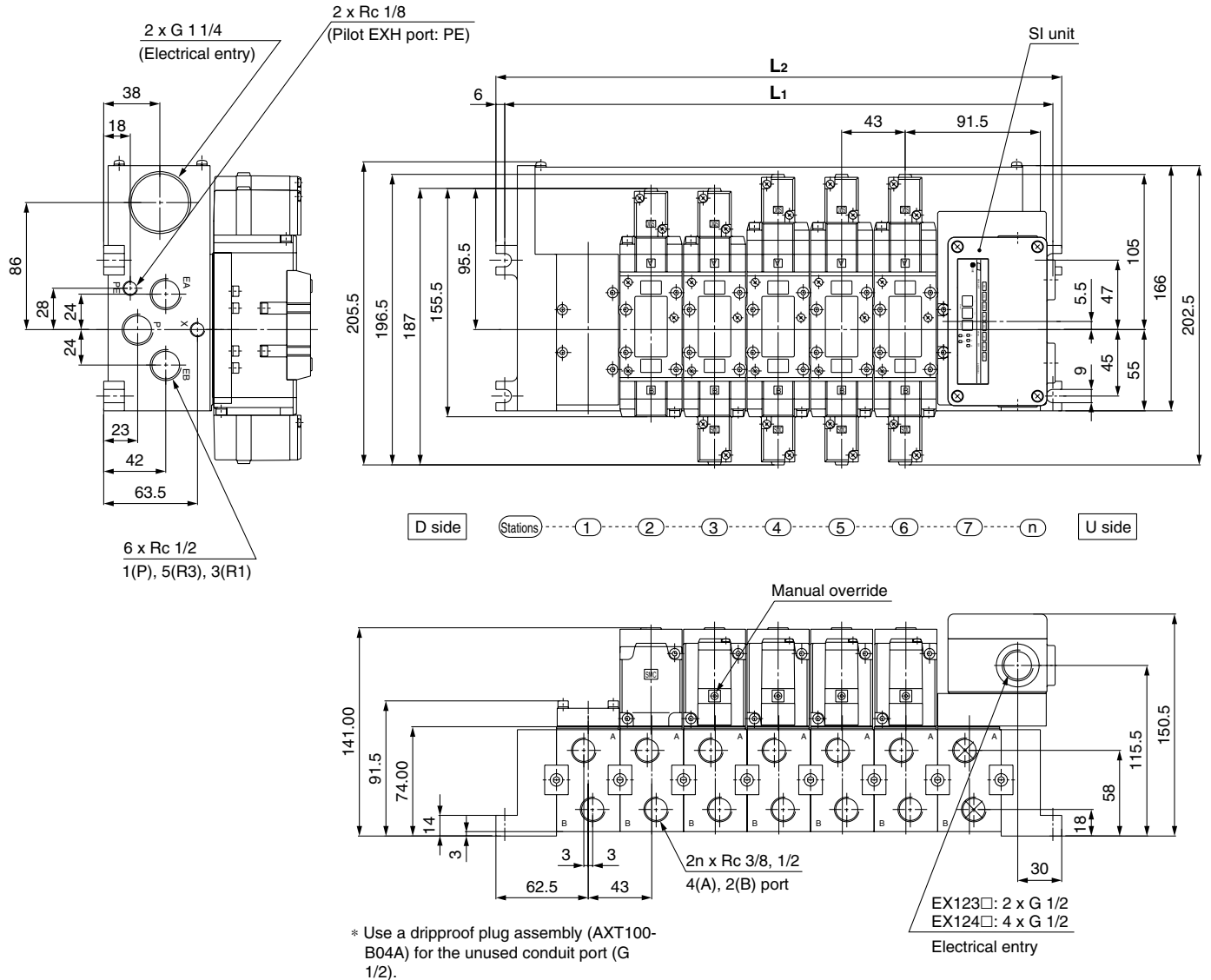
Coil rated voltage

<b>Nil</b>	None
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# 5 Port Pilot Operated Solenoid Valve Metal Seal, Plug-in/Non Plug-in **Series VFS4000**

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

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



### Dimensions

Formula  $L_1 = 43n + 70$   $L_2 = 43n + 82$   
n: Stations (Max. 10 stations)

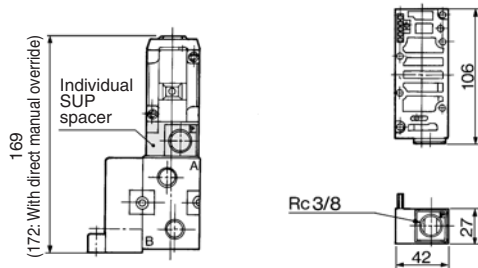
L \ n	2	3	4	5	6	7	8	9	10
<b>L<sub>1</sub></b>	156	199	242	285	328	371	414	457	500
<b>L<sub>2</sub></b>	168	211	254	297	340	383	426	469	512

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

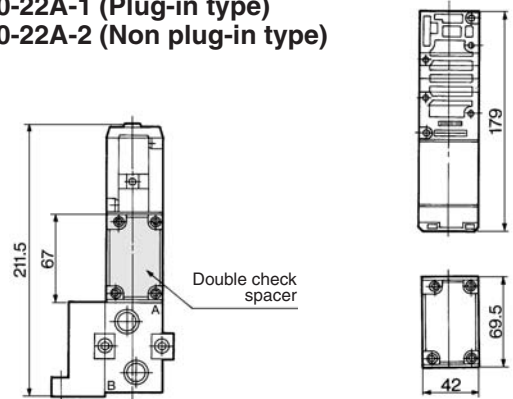
- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS**
- VFR
- VQ7

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

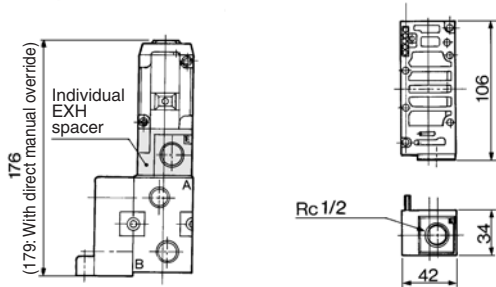
**Individual SUP spacer:**  
VVFS4000-P-03-1 (Plug-in type)  
VVFS4000-P-03-2 (Non plug-in type)



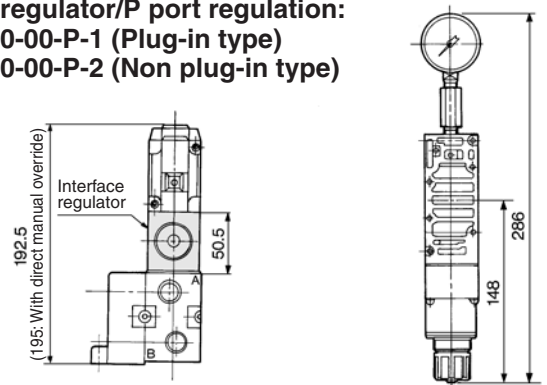
**Double check spacer:**  
VVFS4000-22A-1 (Plug-in type)  
VVFS4000-22A-2 (Non plug-in type)



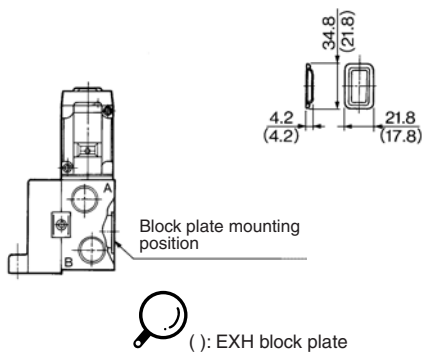
**Individual EXH spacer:**  
VVFS4000-R-04-1 (Plug-in type)  
VVFS4000-R-04-2 (Non plug-in type)



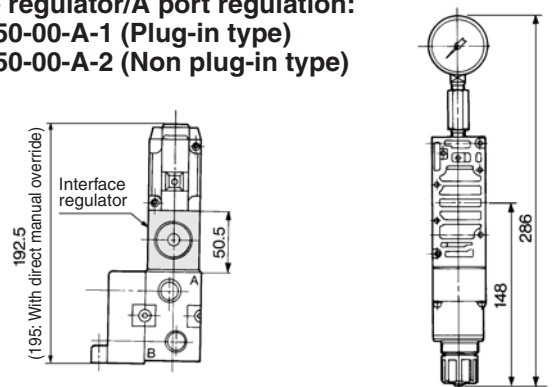
**Interface regulator/P port regulation:**  
ARBF4050-00-P-1 (Plug-in type)  
ARBF4050-00-P-2 (Non plug-in type)



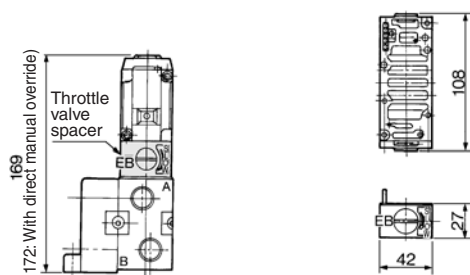
**SUP block plate: AXT634-10A**  
**EXH block plate: AXT634-11A**



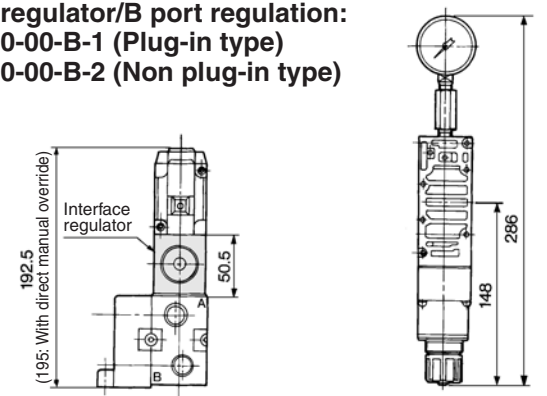
**Interface regulator/A port regulation:**  
ARBF4050-00-A-1 (Plug-in type)  
ARBF4050-00-A-2 (Non plug-in type)



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

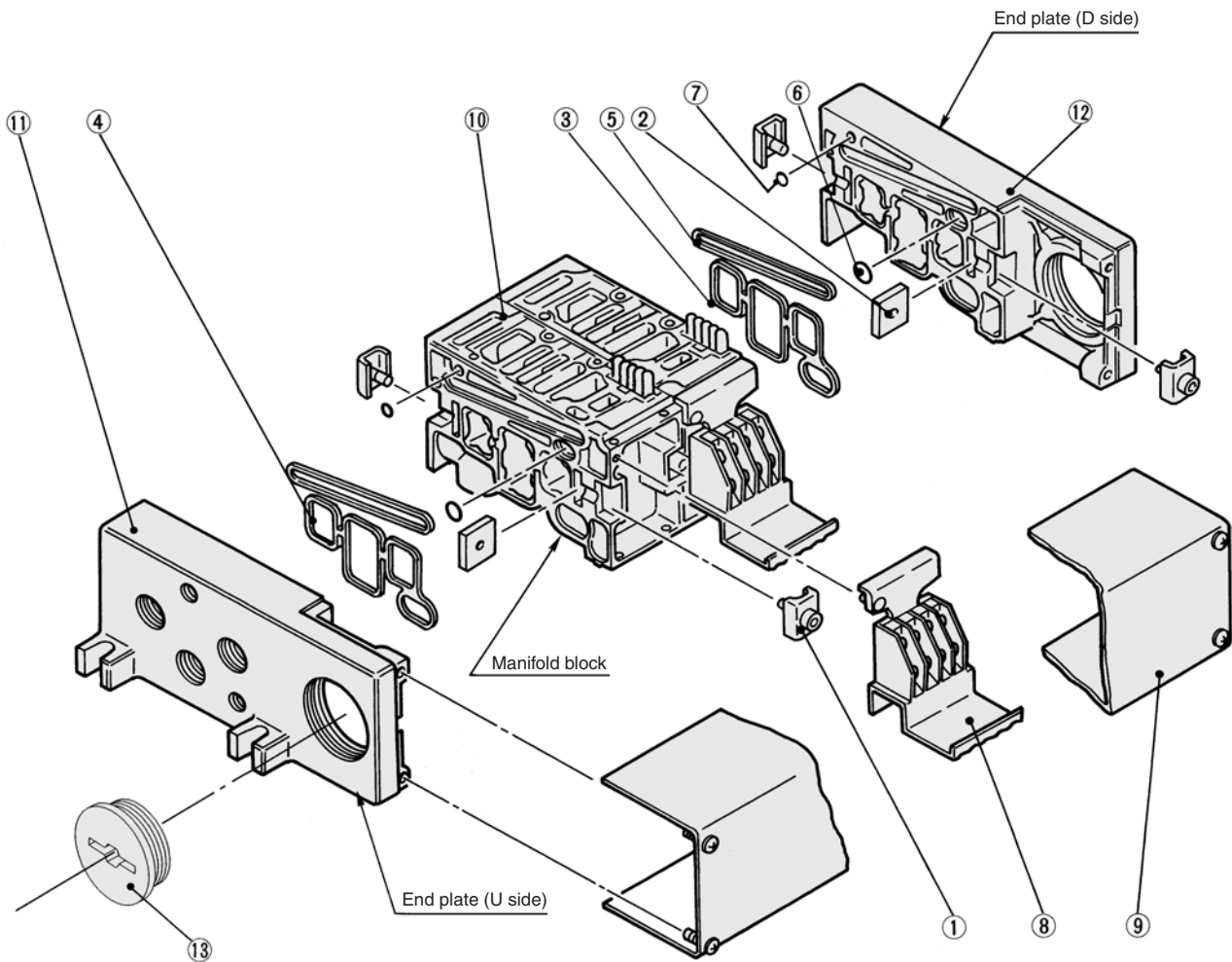


**Interface regulator/B port regulation:**  
ARBF4050-00-B-1 (Plug-in type)  
ARBF4050-00-B-2 (Non plug-in type)



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

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



- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS**
- VFR
- VQ7

### Replacement Parts

No.	Description	Material	Part no.
1	Connection fitting A	Steel plate	VVF4000-5-1A
2	Connection fitting B	Steel plate	VVF4000-5-2
3	Gasket	NBR	VVF4000-7 (End plate)
4	Gasket	NBR	VVF4000-7-1 (Manifold block)
5	Gasket	NBR	VVF4000-8
6	O-ring	NBR	AS568-011
7	O-ring	NBR	P-3
8	Terminal assembly	—	VVF4000-6A
9	Junction cover assembly	For 01T	VVF4000-4A- <small>[Stations]</small>
		For 01SU	AZ738-30A- <small>[Stations]</small>
13	Rubber plug	NBR	AXT336-9

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

### Replacement Parts: Sub Assembly



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

No.	Description	Assembly part no.	Component parts	Applicable manifold base
10	Manifold block assembly	VVF4000-1A-1- <small>03</small> / <small>04</small>	Manifold block ⑩, Terminal ⑧, Metal joint ①, ②, Gasket ④, Receptacle assembly	Plug-in type
		VVF4000-1A-2- <small>03</small> / <small>04</small>	Manifold block ⑩, Metal joint ①, ②, Gasket ④	Non plug-in type
11	End plate (U side) assembly	VVF4000-2A-1	End plate (U) ⑪, Metal joint ①, ②	Plug-in type
		VVF4000-2A-2	End plate (U) ⑪, Metal joint ①, ②	Non plug-in type
12	End plate (D side) assembly	VVF4000-3A-1	End plate (D) ⑫, Metal joint ①, ②, Gasket ③, ⑤, O-ring ⑥, ⑦	Plug-in type
		VVF4000-3A-2	End plate (D) ⑫, Metal joint ①, ②, Gasket ③, ⑤, O-ring ⑤, ⑥	Non plug-in type



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

## Series VFS5000



### Model

Type of actuation	Model		Port size Rc	Flow characteristics						Max. operating cycle (cpm) <sup>(1)</sup>	Response time (ms) <sup>(2)</sup>	Mass (kg) <sup>(3)</sup>	
	Plug-in	Non plug-in		1 → 4/2 (P → A/B)			4/2 → 5/3 (A/B → R1/R2)						
				C [dm <sup>3</sup> /(s·bar)]	b	Cv	C [dm <sup>3</sup> /(s·bar)]	b	Cv				
2 position	Single	VFS5100	VFS5110	3/8	15	0.30	3.7	15	0.30	4.1	600	45 or less	0.88
				1/2	16	0.15	3.7	19	0.15	4.5			
				3/4	17	0.15	3.9	20	0.13	4.7			
	Double	VFS5200	VFS5210	3/8	15	0.30	3.7	15	0.30	4.1	600	25 or less	1.06
				1/2	16	0.15	3.7	19	0.15	4.5			
				3/4	17	0.15	3.9	20	0.13	4.7			
3 position	Closed center	VFS5300	VFS5310	3/8	14	0.25	4.0	14	0.24	4.1	300	55 or less	1.16
				1/2	16	0.25	4.1	16	0.24	4.1			
				3/4	16	0.25	4.1	16	0.23	4.1			
	Exhaust center	VFS5400	VFS5410	3/8	14	0.32	3.8	14	0.25	3.5	300	55 or less	1.14
				1/2	16	0.17	3.8	16	0.18	4.1			
				3/4	17	0.20	4.2	17	0.13	4.1			
	Pressure center	VFS5500	VFS5510	3/8	14	0.30	3.7	14	0.31	3.8	300	55 or less	1.14
				1/2	16	0.23	3.9	16	0.22	4.1			
				3/4	18	0.25	4.6	17	0.22	4.3			
	Double check	VFS5600	VFS5610	3/8	9.0	—	—	9.0	—	—	180	60 or less	1.99
				1/2	9.0	—	—	9.0	—	—			
				3/4	9.0	—	—	9.0	—	—			



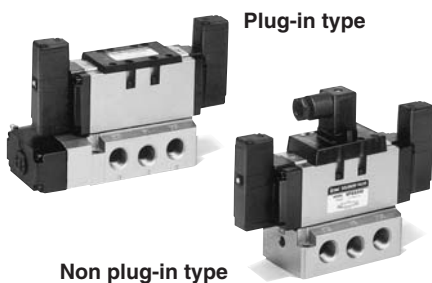
Note 1) Based on JIS B 8375 (once per 30 days) for the minimum operating frequency. Note 2) Based on JIS B8375-1981. (The value at supply pressure 0.5 MPa.)  
 Note 3) The figures in the above list are without sub-plate. In the case of with plug-in sub-plate and, with non plug-in sub-plate add Rc 3/8, 1/2—0.744 kg, Rc 3/4—0.966 kg and Rc 3/8, 1/2—0.577 kg, Rc 3/4—0.823 kg respectively.  
 Note 4) "Note 1)" and "Note 2)" are with controlled clean air.

Compact yet provides a large flow capacity  
 3/4: C: 20 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



### JIS Symbol

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

### Standard Specifications

Valve specifications	Fluid		
		Fluid	Air/Inert gas
	Maximum operating pressure	1.0 MPa	
	Minimum operating pressure	0.1 MPa	
	Proof pressure	1.5 MPa	
	Ambient and fluid temperature	-10 to 60°C <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 E: Dustproof (Level 0), Type F: Dripproof (Level 2), Type D: Splashproof (Level 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 (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 0920. Note 5) Based on JIS C 4003.

### Option Specifications


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




Note) Operating pressure: 0 to 1.0 MPa  
 Pilot pressure: 0.1 to 1.0 MPa

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

## How to Order



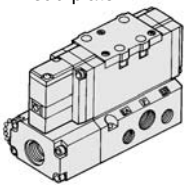
**Plug-in**



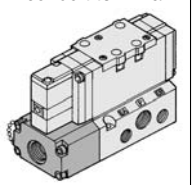
**Non plug-in**

**Body type**

**O:** Plug-in type sub-plate



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



**Porting specifications**

Nil	Side ported
B*	Bottom ported

\* In the case of external pilot (Option), bottom piping is not available.

**Port size**

Nil	Without sub-plate
03	Rc 3/8
04	Rc 1/2
06	Rc 3/4

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

**Option**

Nil	None
Z	With light/surge voltage suppressor
P*	Non-rotating DIN terminal
ZP*	Light/Surge Voltage Suppressor Non-rotating DIN terminal

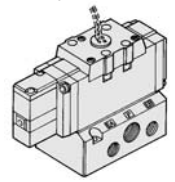
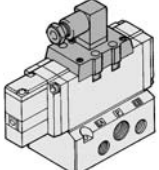
\* Type "P", "ZP" is available for DIN type only.

**Symbol**

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

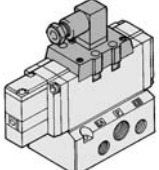
**Electrical entry**

E:	Grommet terminal	D:	DIN terminal
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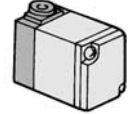



**Pilot valve Manual override**

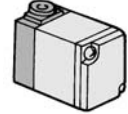
**Nil:** Non-locking push type (Flush)




**A\*:** Non-locking push type (Extended)



**B\*:** Locking type (Tool required)



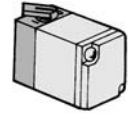
**C\*:** Locking type (Lever)



\* Option

**Body type**

**1:** Non plug-in type 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 type**

Nil	Internal pilot
R*	External pilot

\* Option

**Body option**

0	Standard
1*	Direct manual override

\* Option

**How to Order Pilot Valve Assembly**

SF4 - 1 F - 30

**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

**Manual override**

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

\* Option

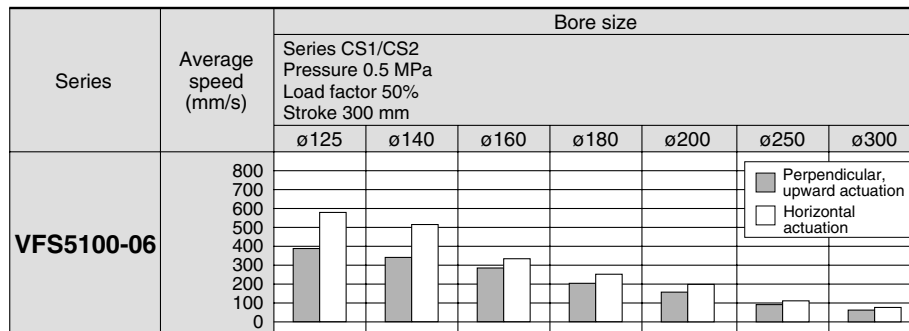
\*\* Refer to page 1224 for voltage conversion.

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

# Series VFS5000

## Cylinder Speed Chart

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



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

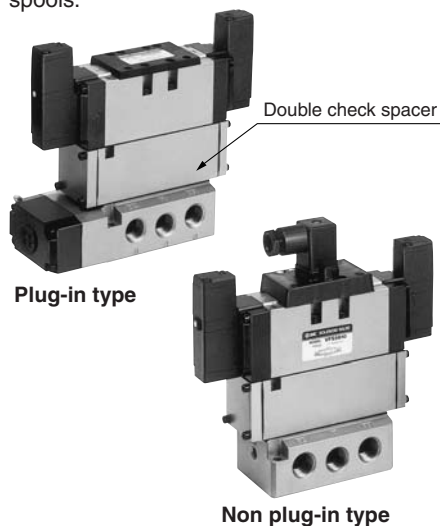
## Conditions

		Series CS1
VFS5100-06	Tube bore x Length	SGP20A x 1 m
	Speed controller	AS500-06
	Silencer	AN500-06

## Double Check Spacer/Specifications

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

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



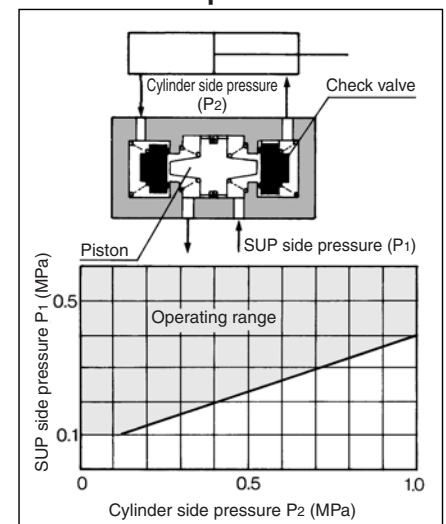
### Specifications

Double check spacer part no.	Plug-in type	Non plug-in type
	VVFS5000-22A-1	VVFS5000-22A-2
Applicable valve model	VFS5400-□F	VFS5410-□D VFS5410-□E

### ⚠ Caution

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

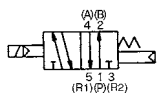
### Check Valve Operation



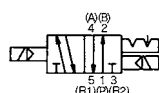
- The combination of VFS51□0, VFS52□0 and a double check spacer can be used as prevention of falling at the stroke end but cannot hold the intermediate position of the cylinder.

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

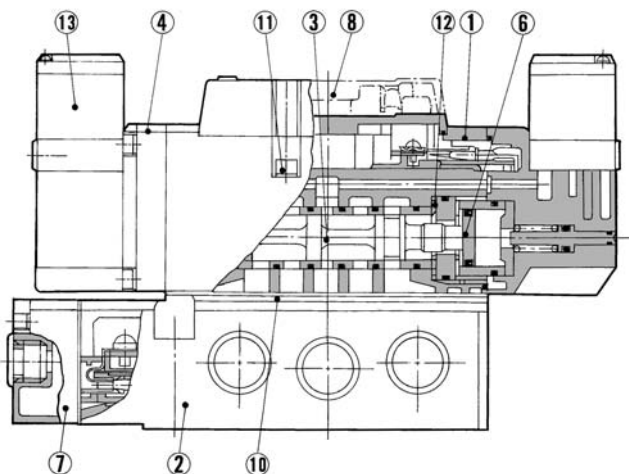
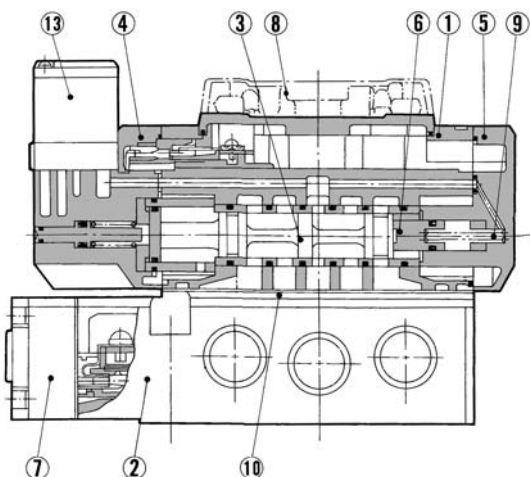
## Construction



2 position single

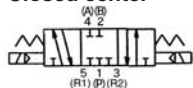


2 position double



3 position closed center/exhaust center/pressure center

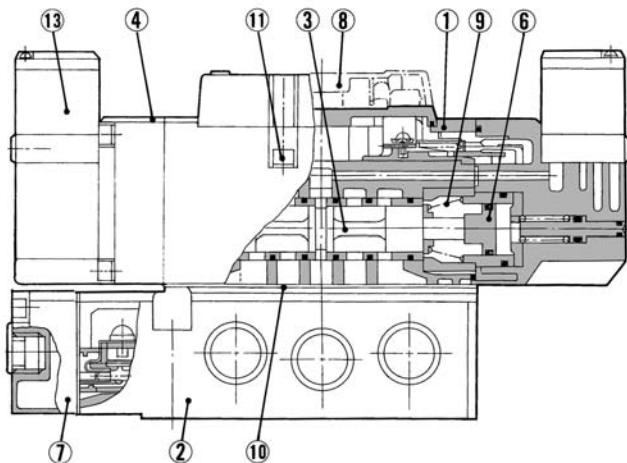
Closed center



Exhaust center



Pressure center



### Component Parts

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

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

### Sub-plate Assembly Part No.

Plug-in	VFS5000-P- <sup>03</sup> / <sub>04</sub> / <sub>06</sub>
Non plug-in	VFS5000-S- <sup>03</sup> / <sub>04</sub> / <sub>06</sub>



\* Mounting bolt and gasket are not included.

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

Plug-in	VFS5000-P-R <sup>03</sup> / <sub>04</sub> / <sub>06</sub>
Non plug-in	VFS5000-S-R <sup>03</sup> / <sub>04</sub> / <sub>06</sub>

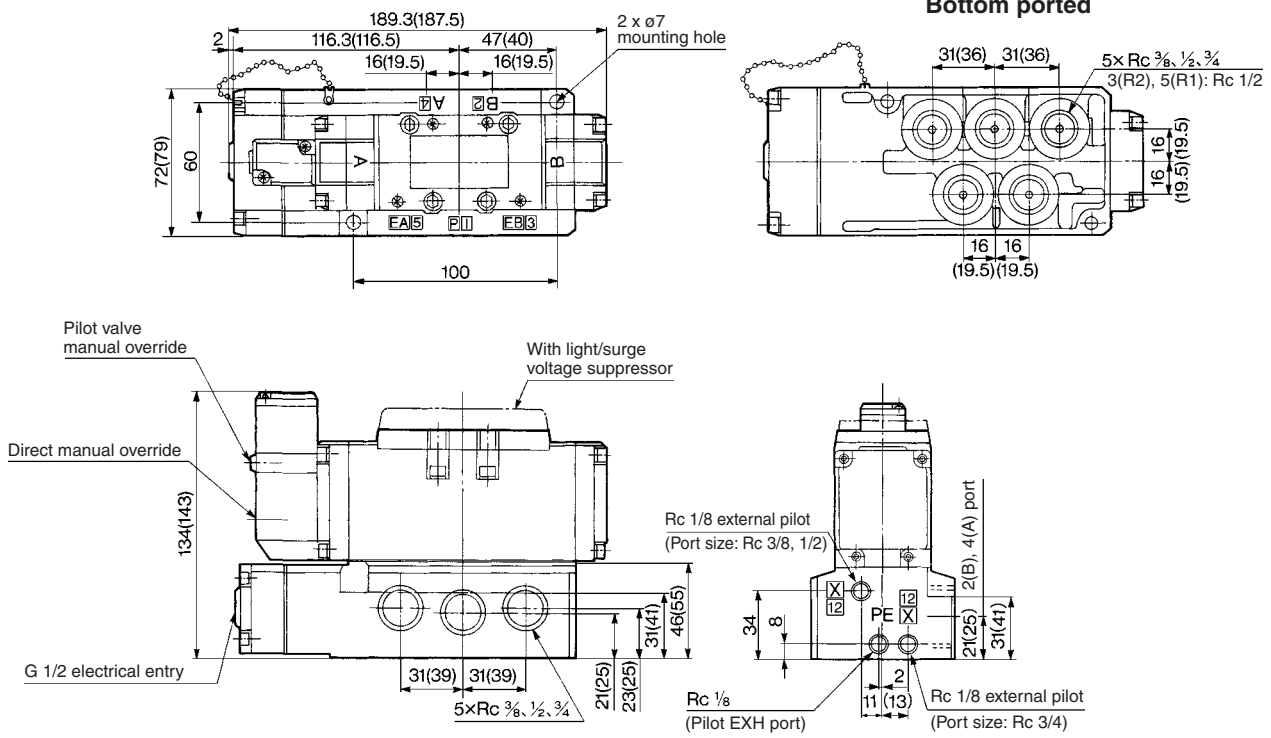
Part no. for mounting bolt and gasket	BG-VFS5000
---------------------------------------	------------

SJ  
SY  
SV  
SYJ  
SZ  
VP4  
S0700  
VQ  
VQ4  
VQ5  
VQC  
VQZ  
SQ  
VFS  
VFR  
VQ7

# Series VFS5000

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

### 2 position single: VFS5100-□F



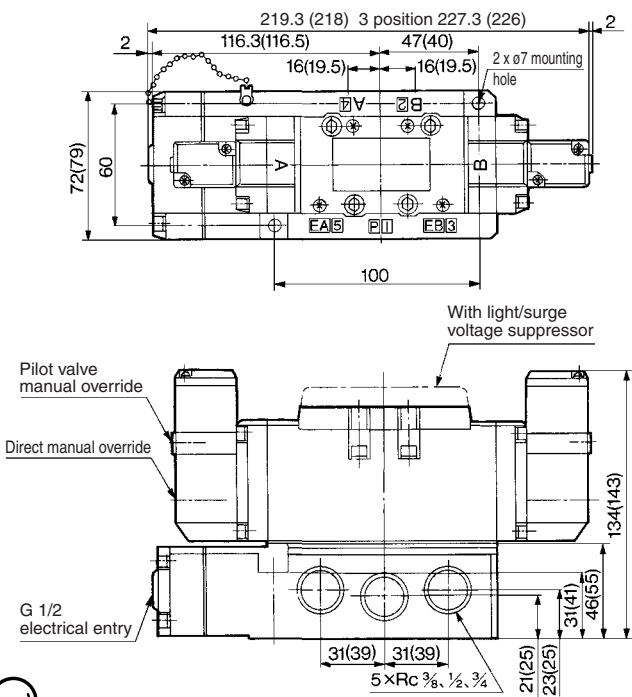
( ): Rc 3/4

### 2 position double: VFS5200-□F

### 3 position closed center: VFS5300-□F

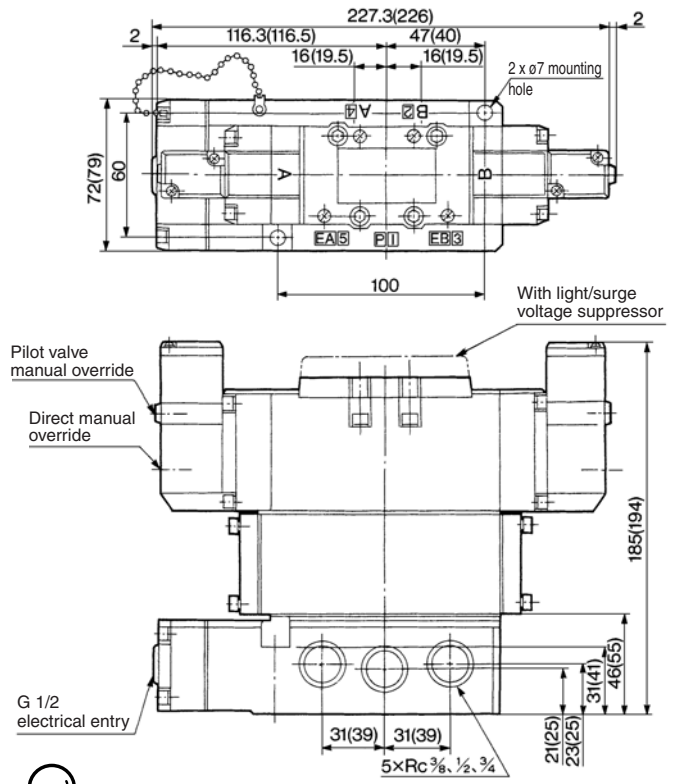
### 3 position exhaust center: VFS5400-□F

### 3 position pressure center: VFS5500-□F



( ): Rc 3/4

### 3 position double check: VFS5600-□F

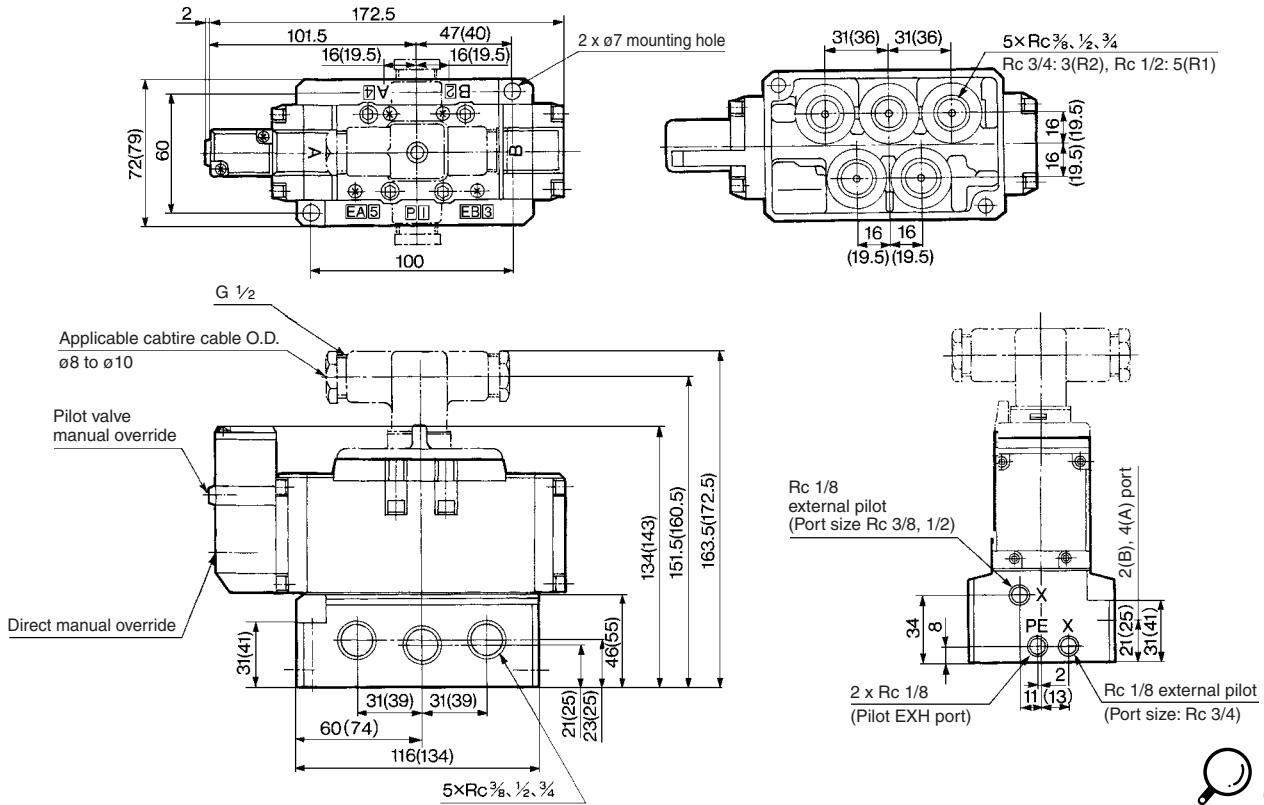


( ): Rc 3/4

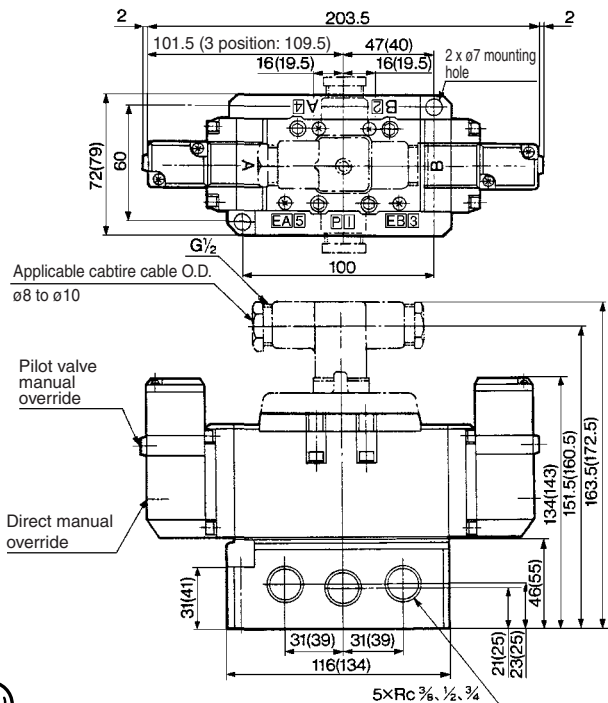
# 5 Port Pilot Operated Solenoid Valve Metal Seal, Plug-in/Non Plug-in **Series VFS5000**

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

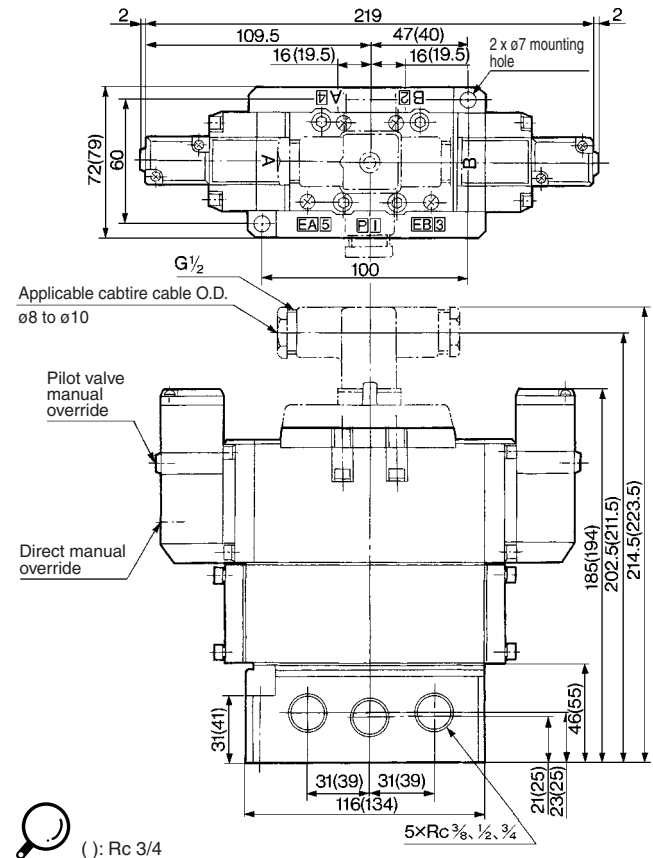
**2 position single: VFS5110-□E, VFS5110-□D**



**2 position double: VFS5210-□E, VFS5210-□D**  
**3 position closed center: VFS5310-□E, VFS5310-□D**  
**3 position exhaust center: VFS5410-□E, VFS5410-□D**  
**3 position pressure center: VFS5510-□E, VFS5510-□D**



**3 position double check: VFS5610-□E, VFS5610-□D**



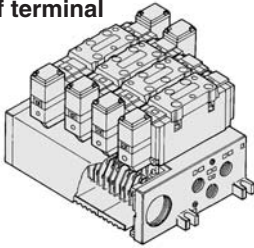
- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

# Series VFS5000

## Manifold Specifications

### Plug-in Type: With Terminal Block

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



**VV5FS5-01T-06 1-04**

Series VFS5000 Manifold Plug-in type with terminal block

**Stations**

02	2 stations
∴	∴
10	10 stations

**Port size**

Symbol	P, R1, R2	A, B
04	Rc 3/4	Rc 1/2
06	Rc 3/4	Rc 3/4
M		Mixed

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

**Symbol**

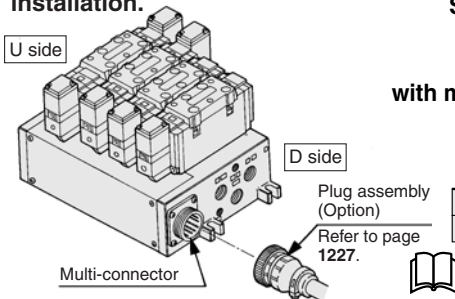
Symbol	Passage		Porting specifications (A, B)
	P	R1, R2	
1	Common	Common	Side
2			Bottom*

\* Option

**Port size** (magnifying glass icon): \* For bottom ported, Rc 1/2 is only available.

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

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



**VV5FS5-01CD-05 2-04**

Series VFS5000 Manifold Plug-in type with multi-connector

**Stations**

02	2 stations
∴	∴
08*	8 stations

\* Max. 8 stations

**Port size**

Symbol	P, R1, R2	A, B
04	Rc 3/4	Rc 1/2
06	Rc 3/4	Rc 3/4
M		Mixed

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

**Connector mounting direction**

D	D side mounting
U	U side mounting

**Symbol**

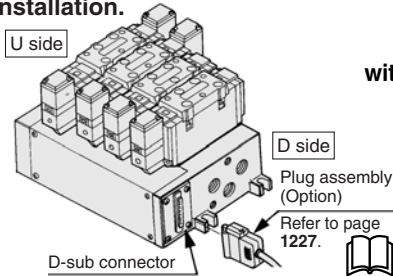
Symbol	Passage		Porting specifications (A, B)
	P	R1, R2	
1	Common	Common	Side
2			Bottom*

\* Option

**Port size** (magnifying glass icon): \* For bottom ported, Rc 1/2 is only available.

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

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



**VV5FS5-01FD-06 1-04**

Series VFS5000 Manifold Plug-in type with D-sub connector

**Stations**

02	2 stations
∴	∴
08*	8 stations

\* Max. 8 stations

**Port size**

Symbol	P, R1, R2	A, B
04	Rc 3/4	Rc 1/2
06	Rc 3/4	Rc 3/4
M		Mixed

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

**Connector mounting direction**

D	D side mounting
U	U side mounting

**Symbol**

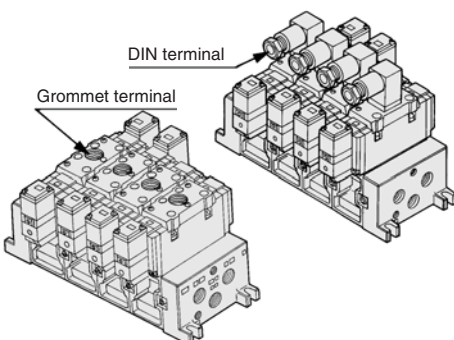
Symbol	Passage		Porting specifications (A, B)
	P	R1, R2	
1	Common	Common	Side
2			Bottom*

\* Option

**Port size** (magnifying glass icon): \* For bottom ported, Rc 1/2 is only available.

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

- Wiring for every valve.



**VV5FS5-10-05 2-04**

Series VFS5000 Manifold Non plug-in type

**Stations**

02	2 stations
∴	∴
10	10 stations

**Port size**

Symbol	P, R1, R2	A, B
04	Rc 3/4	Rc 1/2
06	Rc 3/4	Rc 3/4
M		Mixed

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

**Symbol**

Symbol	Passage		Porting specifications (A, B)
	P	R1, R2	
1	Common	Common	Side
2			Bottom*

\* Option

**Port size** (magnifying glass icon): \* For bottom ported, Rc 1/2 is only available.

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

## Manifold Specifications

### How to Order Manifold Assembly

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

#### <Example>

- Plug-in type with terminal block: 6 stations  
(Manifold base) VV5FS5-01T-061-04 .....1  
(2 position single) VFS5100-5FZ ..... 3  
(2 position double) VFS5200-5FZ ..... 2  
(Blanking plate) VVFS5000-10A .....1
- Non plug-in type: 6 stations  
(Manifold base) VV5FS5-10-061-04 .....1  
(2 position single) VFS5110-5D .....5  
(3 position exhaust center) VFS5410-5D .....1  
(Individual EXH center) VVFS5000-R-04-2 .....1

Base model	Wiring	Porting specifications	Port size Rc		Stations	Applicable valve model
		A, B port	P, R1, R2	A, B		
Plug-in type VV5FS5-01□	• With terminal block • With multi-connector • With D-sub connector	Side/ Bottom	Rc 3/4	Rc 1/2, 3/4	2 to 10*	VFS5□00-□F
Non plug-in type VV5FS5-10	• DIN terminal • Grommet terminal					VFS5□10-□D VFS5□10-□E

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

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

Model	Passage/Stations	Station 1	Station 5	Station 10	
VV5FS5	1 → 4/2 (P → A/B)	C [dm <sup>3</sup> /(s·bar)]	6.0	6.0	6.0
		b	0.20	0.20	0.20
		Cv	1.4	1.4	1.4
	4/2 → 5/3 (A/B → R1/R2)	C [dm <sup>3</sup> /(s·bar)]	7.0	7.0	7.0
		b	0.20	0.20	0.20
		Cv	1.8	1.8	1.8

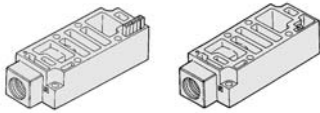
\* Port size: Rc 1/2, 3/4

## Manifold Option Parts Assembly

### Individual SUP spacer

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

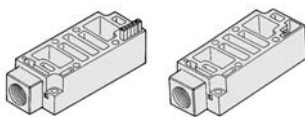
Body type	Plug-in type	Non plug-in type
Part no.	VVFS5000-P-04-1	VVFS5000-P-04-2



### Individual EXH spacer

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

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



### SUP block plate

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

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

### EXH block plate

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

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



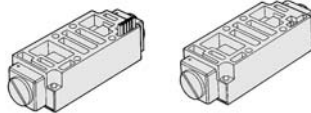
EXH block plate

SUP block plate

### Throttle valve spacer

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

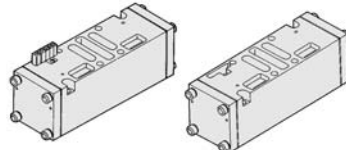
Body type	Plug-in type	Non plug-in type
Part no.	VVFS5000-20A-1	VVFS5000-20A-2



### Double check spacer

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

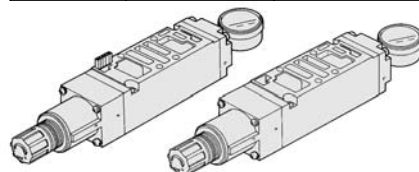
Body type	Plug-in type	Non plug-in type
Part no.	VVFS5000-22A-1	VVFS5000-22A-2



### Interface regulator

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

Body type	Plug-in type	Non plug-in type
P port regulation	ARBF5050-00-P-1	ARBF5050-00-P-2
A port regulation	ARBF5050-00-A-1	ARBF5050-00-A-2
B port regulation	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.

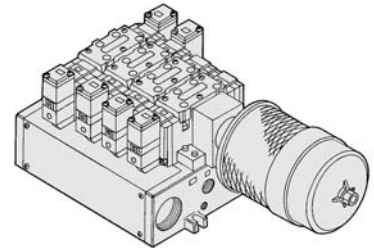
Body type	Plug-in type	Non plug-in type
Part no.	VVFS5000-10A	

## Manifold Option

### With exhaust cleaner

#### Plug-in type/Non plug-in type

- Valve exhaust noise dampening: 35 dB or more.
- Oil mist collection: Rate of collection 99.9% or more.
- Piping process reduced.



For details, refer to page 1212.

### Made to Order

#### Manifold with serial transmission kit Plug-in type

- Solenoid valve wiring process reduced considerably.



For details, refer to page 1214.

SJ

SY

SV

SJY

SZ

VP4

S0700

VQ

VQ4

VQ5

VQC

VQZ

SQ

VFS

VFR

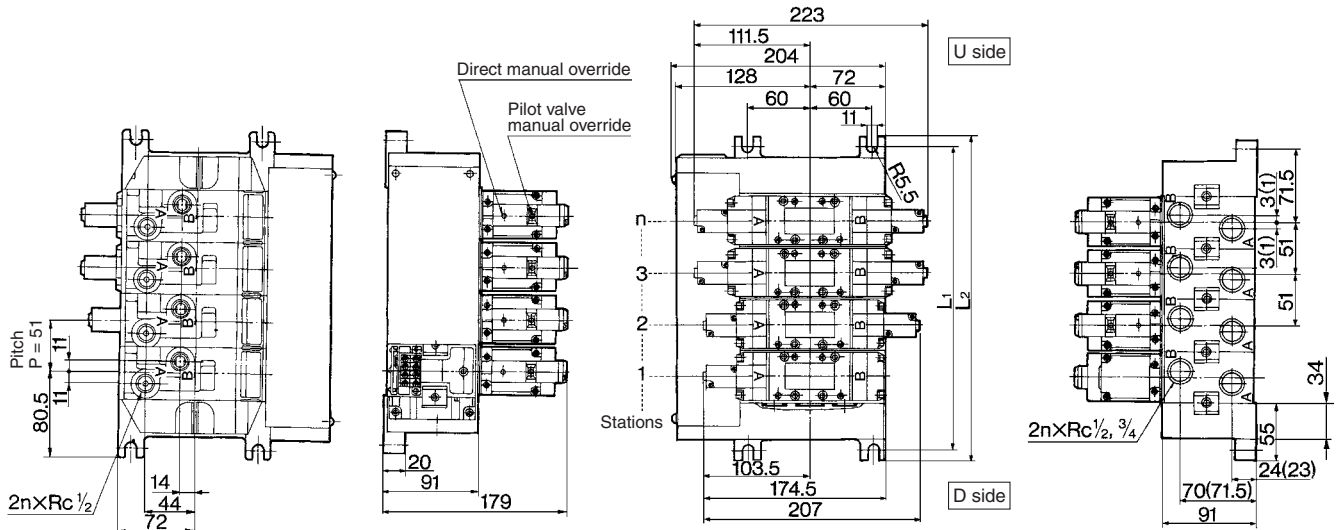
VQ7



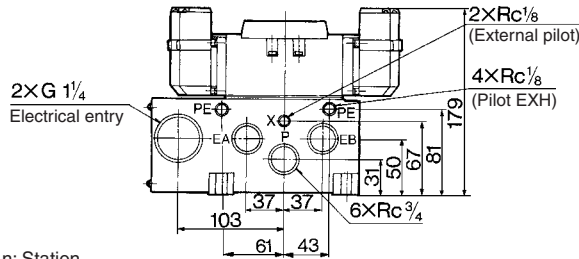
# Series VFS5000

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

### Plug-in type (With terminal block): VV5FS5-01T-Station 1-Port size



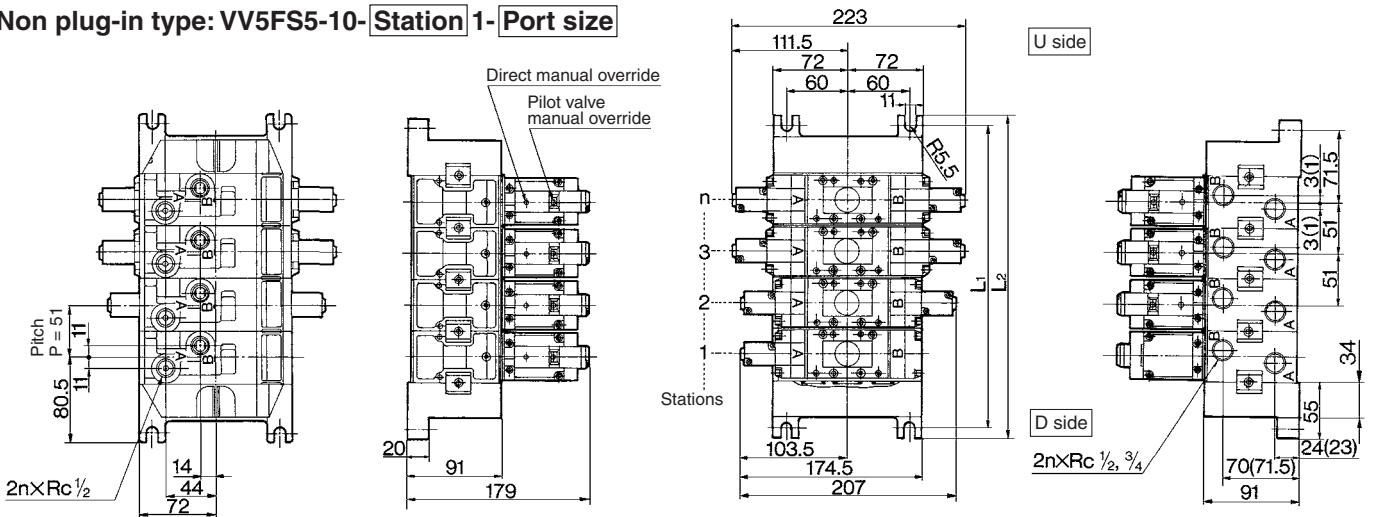
### Bottom ported: VV5FS5-01T-Station 2-Port size



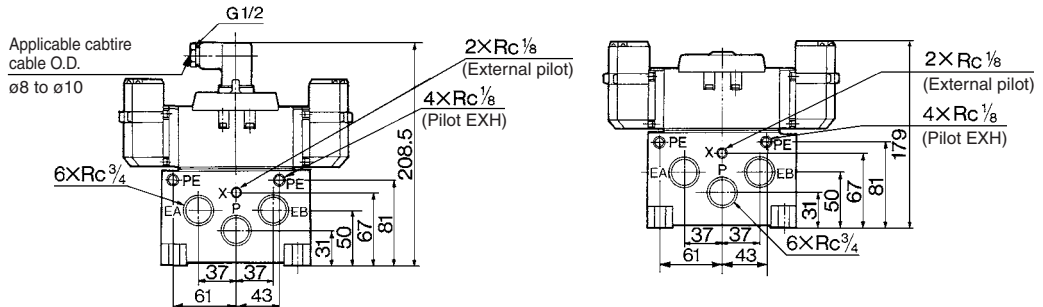
Formula for manifold weight  $M = 0.911n + 1.621$  (kg) n: Station

( ): 2(B)/4(A) port Rc 3/4

### Non plug-in type: VV5FS5-10-Station 1-Port size



### DIN terminal VV5FS5-10-Station 2-Port size



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

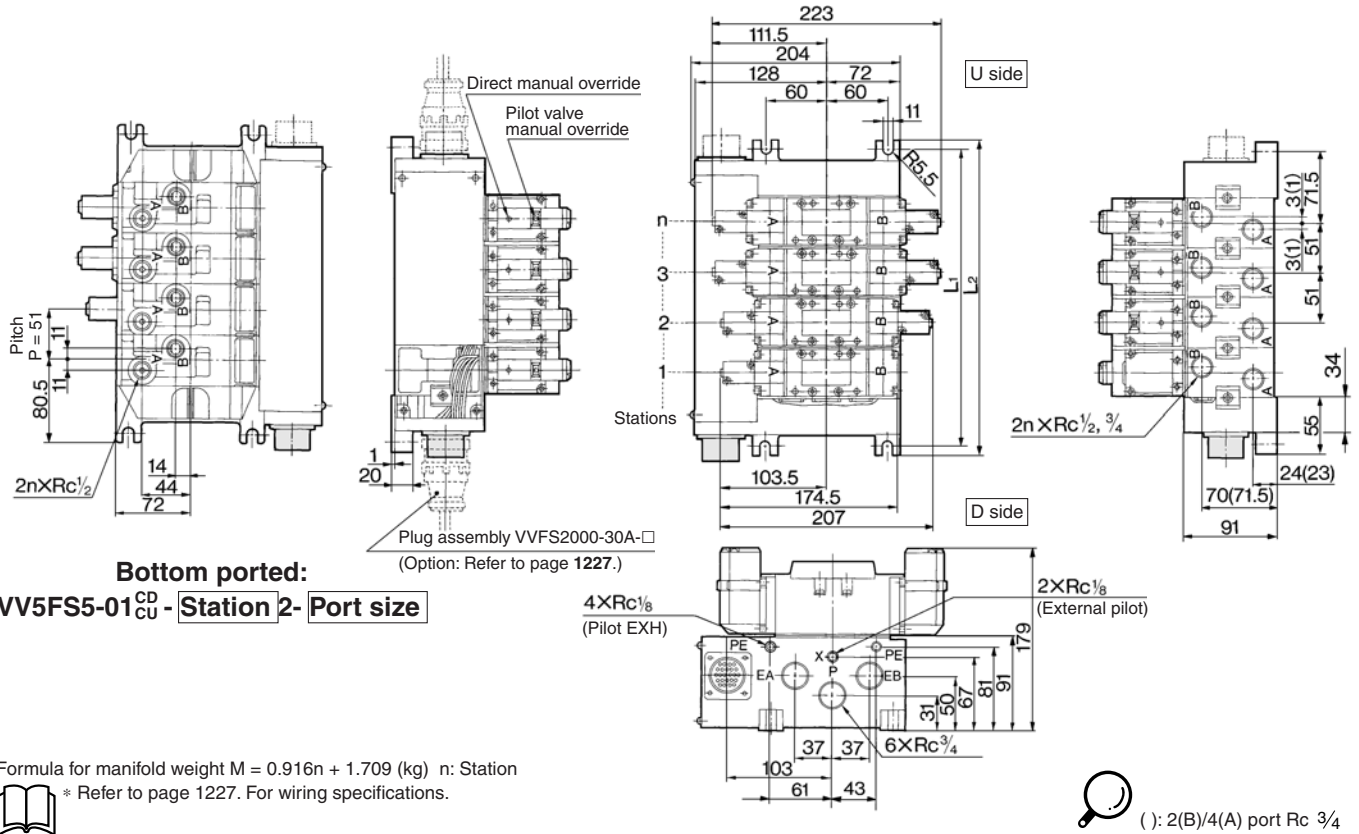
Stations	2	3	4	5	6	7	8	9	10	Formula
L <sub>1</sub>	194	245	296	347	398	449	500	551	602	L <sub>1</sub> = 51 x n + 92
L <sub>2</sub>	212	263	314	365	416	467	518	569	620	L <sub>2</sub> = 51 x n + 110

( ): 2(B)/4(A) port Rc 3/4

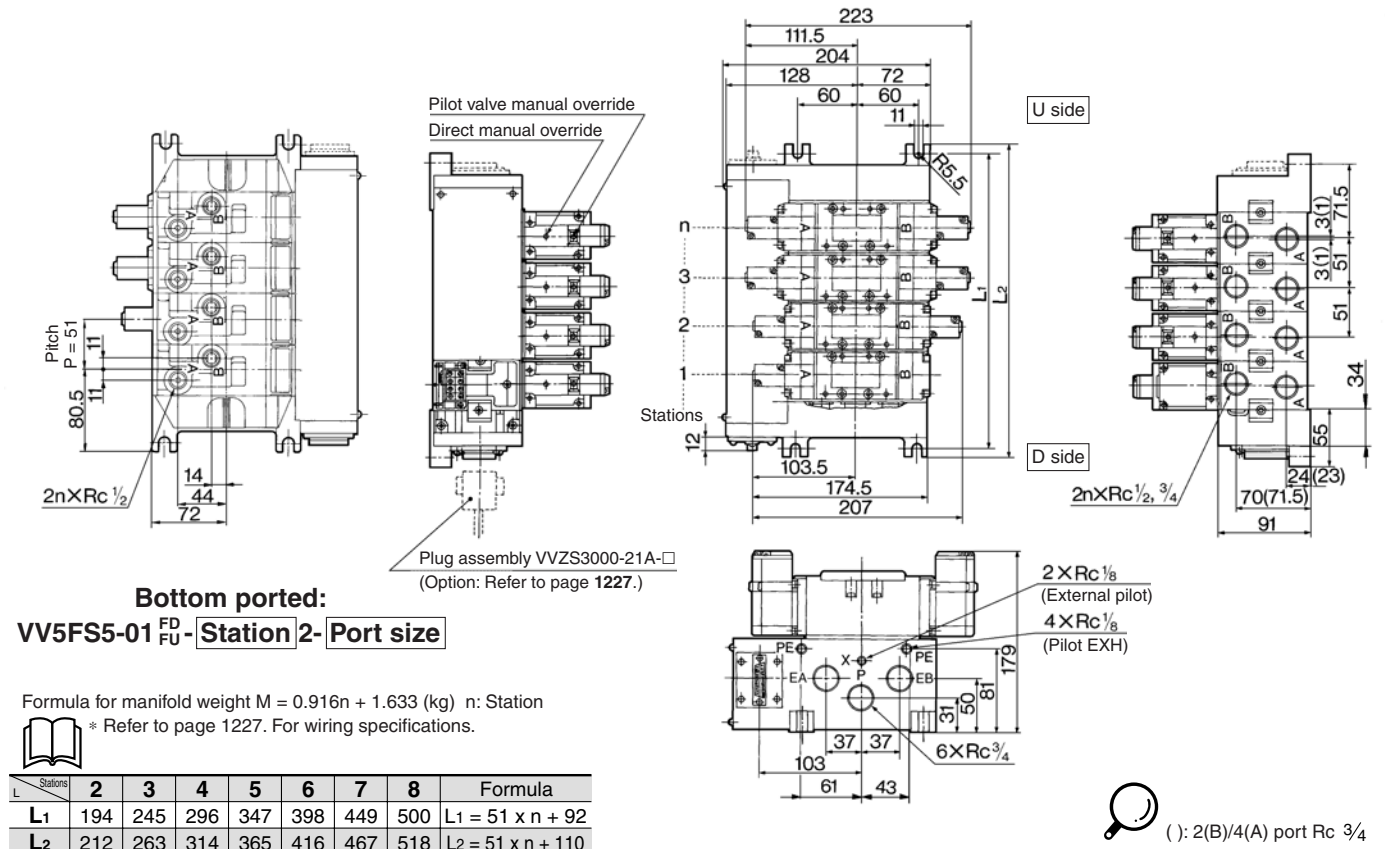
# 5 Port Pilot Operated Solenoid Valve Metal Seal, Plug-in/Non Plug-in *Series VFS5000*

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

Plug-in type with multi-connector: **VV5FS5-01CD-Station 1-Port size**, **VV5FS5-01CU-Station 1-Port size**



Plug-in type with D-sub connector: **VV5FS5-01FD-Station 1-Port size**, **VV5FS5-01FU-Station 1-Port size**



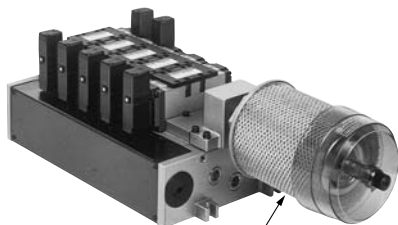
Stations	2	3	4	5	6	7	8	Formula
L <sub>1</sub>	194	245	296	347	398	449	500	L <sub>1</sub> = 51 x n + 92
L <sub>2</sub>	212	263	314	365	416	467	518	L <sub>2</sub> = 51 x n + 110

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

# Series VFS5000

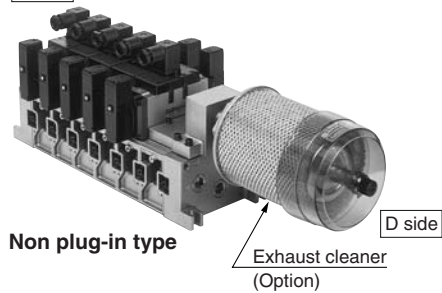
## Manifold with Exhaust Cleaner

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



Plug-in type

U side



Non plug-in type

### Manifold Specifications

Manifold	Plug-in type: VV5FS5-01□	Non plug-in type: VV5FS5-10
Wiring	With terminal blocks With multi-connector With D-sub connector	DIN terminal Grommet terminal
Applicable valve model	VFS5□00-□F	VFS5□10-□D, VFS5□10-□E
Porting specifications Rc	Common SUP/Common EXH	
	2(B), 4(A) port 1(P), 3(R2), 5(R1)	Side: 1/2, 3/4, Bottom: 1/2 (Option) P: 3/4, EXH: 1 1/2
Stations	2 to 10 <sup>(1)</sup>	
Applicable exhaust cleaners	AMC810-14 (Connecting port size R 1 1/2) <sup>(2)</sup>	



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

### How to Order

VV5FS5 - 10 - 06 1 - 04 - CD

Series VFS5000  
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

Connector mounting direction

Symbol	With connector	Applicable base
Nil	None	01T, 10
D	D side mounting	01C, 01F
U	U side mounting	01C, 01F

Stations

02	2 stations
⋮	⋮
10	10 stations

Base type 01T, 10: 2 to 10 stations  
Base type 01C, 01F: 2 to 8 stations

Exhaust cleaner  
mounting direction

Symbol	Exhaust cleaner mounting direction
CD	D side D side mounting
CU	U side U side mounting

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

Port size

Symbol	P	A, B
04	Rc	Rc 1/2
06	3/4	Rc 3/4
M		Mixed

\* For bottom ported, Rc 1/2 is only available.

Symbol

Symbol	Passage		Porting specifications (A, B)
	P	R1, R2	
1	Common	Common	Side
2			Bottom*

\* Option

### Caution

When using an exhaust cleaner, mount it downwards.



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

### How to Order Manifold Assembly [Example]

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

<Example>

- Plug-in type with terminal block (6 stations)
  - (Manifold base) VV5FS5-01T-061-04-CD ..... 1
  - (2 position single) \* VFS5100-5FZ ..... 3
  - (2 position double) \* VFS5200-5FZ ..... 2
  - (Blanking plate) \* VVFS5000-10A ..... 1
  - (Exhaust cleaner) AMC810-14 ..... 1

- Non plug-in type (6 stations)
  - (Manifold base) VV5FS5-10-061-04-CU ..... 1
  - (2 position single) \* VFS5110-5E ..... 3
  - (2 position double) \* VFS5210-5E ..... 2
  - (Blanking plate) \* VVFS5000-10A ..... 1
  - (Exhaust cleaner) AMC810-14 ..... 1

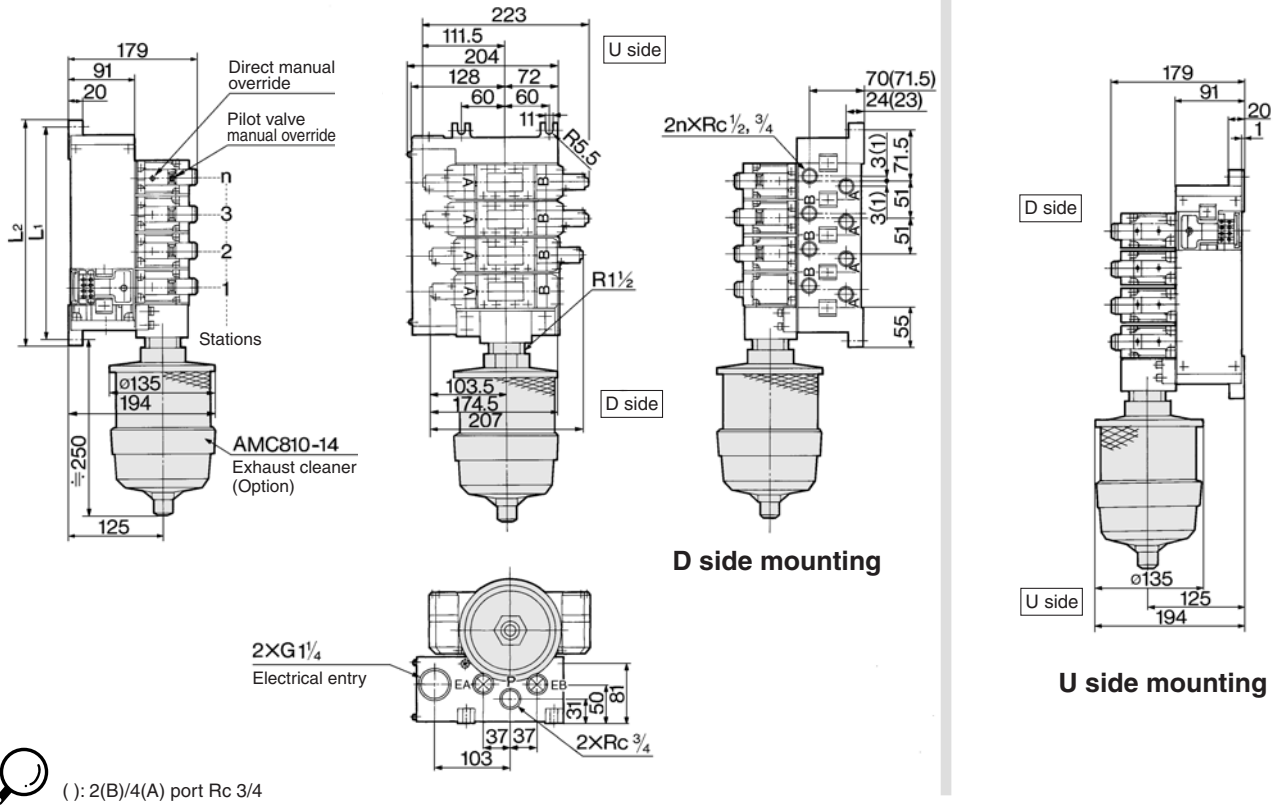
→ The asterisk denotes the symbol for assembly. Prefix it to the part numbers of the solenoid valve.

# 5 Port Pilot Operated Solenoid Valve *Series VFS5000*

Metal Seal, Plug-in/Non Plug-in

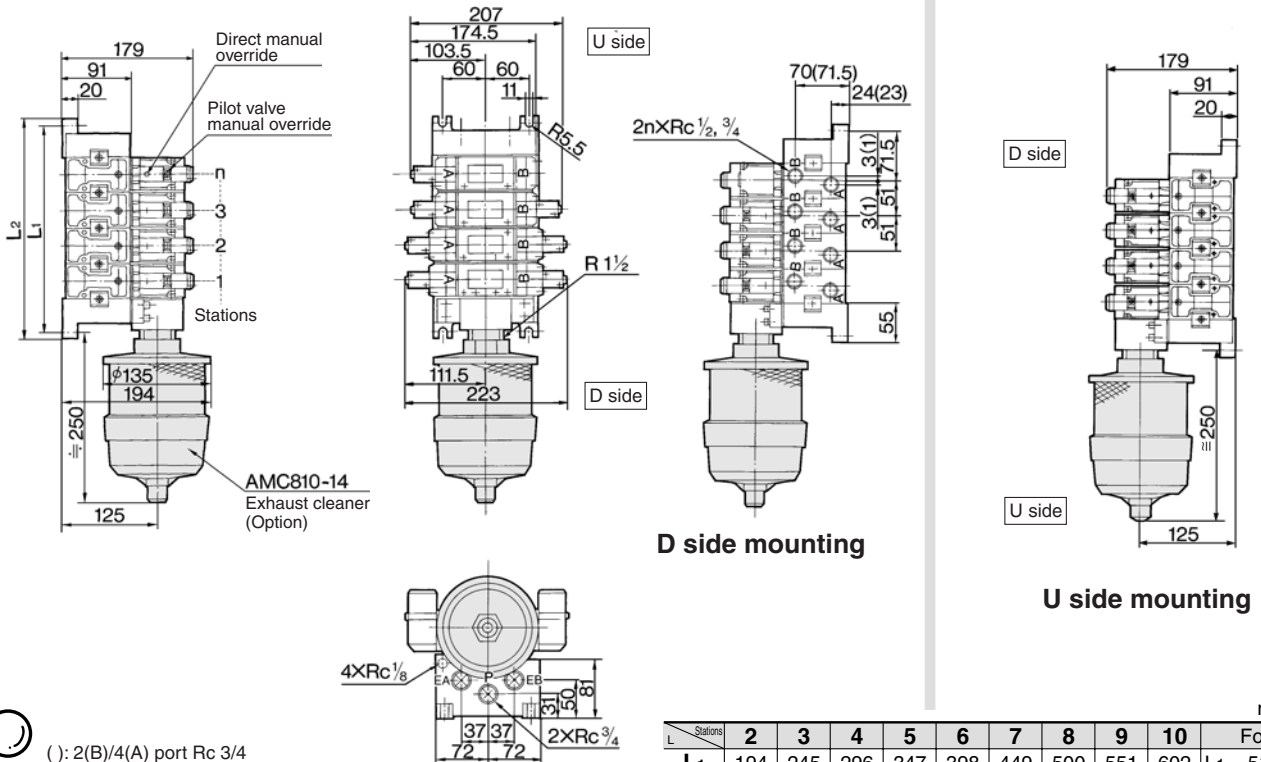
## Manifold with Exhaust Cleaner — Plug-in type, Non plug-in type

Plug-in type: VV5FS5-01T-Station 1- Port size -<sup>CD</sup><sub>CU</sub>



( ): 2(B)/4(A) port Rc 3/4

Non plug-in type: VV5FS5-10-Station 1- Port size -<sup>CD</sup><sub>CU</sub>



( ): 2(B)/4(A) port Rc 3/4

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

		n: Stations									
		Formula									
L <sub>1</sub>	Stations	2	3	4	5	6	7	8	9	10	L <sub>1</sub> = 51 x n + 92
L <sub>2</sub>		212	263	314	365	416	467	518	569	620	L <sub>2</sub> = 51 x n + 110



# Made to Order

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

## How to Order

### How to Order Manifold

**VV5FS5 - 01S U V - 08 1 - 04 [ ] - X199**

Plug-in type  
Serial transmission kit

SI unit mounting position

<b>D</b>	D side mounting
<b>U</b>	U side mounting

Stations

<b>2</b>	2 stations
<b>:</b>	:
<b>10</b>	10 stations

Thread type

<b>Nil</b>	Rc
<b>N</b>	NPT
<b>T</b>	NPTF
<b>F</b>	G

Port size

Symbol	P, R1, R2	A, B
<b>04</b>	Rc 3/4	Rc 1/2
<b>06</b>		Rc 3/4
<b>M</b>		Mixed

\* For bottom ported: Rc 1/8 only

Note 1) Max. 10 stations. Add 1 station for serial unit mounting.  
Note 2) Max. 10 Stations: For single and double mixed wiring. (No. of valves: 9)  
Max. 9 stations: For standard double wiring (No. of valves: 8)

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

Combination symbol

Symbol	Port specification		Piping specification A, B
	P	R1, R2	
<b>1</b>	Common	Common	Side
<b>2*</b>			Bottom

\* Option

Refer to pages 1653 to 1655 for the details of the EX123/124 integrated type (for output) serial transmission system.

### Applicable models

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

### Correspondence of SI unit output numbers and solenoid valve coils

#### <Wiring Example 1> Double wiring (Standard)

SI unit output no.	D side								U side
	1	2	3	4	5	6	7	8	9
	Double	Double	Single	Single	Single	Double	Single	Single	SI unit
	AB	AB	AB	AB	AB	AB	AB	AB	
	01	23	45	67	89	1011	1213	1415	

#### <Wiring Example 2> Single/Double mixed wiring (Option)

SI unit output no.	D side									U side
	1	2	3	4	5	6	7	8	9	10
	Double	Double	Single	Single	Single	Double	Single	Double	Single	SI unit
	AB	AB	A	A	A	AB	A	AB	A	
	01	23	4	5	6	78	9	1011	11	

\* Mixed wiring is available as an option. Use the manifold specification sheet to specify this.

### How to Order Valves

**VFS5 [ ] 00 [ ] - 5 F [ ] [ ]**

Symbol

<b>1</b>	2 position single
<b>2</b>	2 position double
<b>3</b>	3 position closed center
<b>4</b>	3 position exhaust center
<b>5</b>	3 position pressure center
<b>6</b>	3 position double check

Pilot type

<b>Nil</b>	Internal pilot
<b>R</b>	External pilot

24 VDC

Pilot valve manual override

<b>Nil</b>	Non-locking push type (Flush)
<b>A</b>	Non-locking push type (Extended)
<b>B</b>	Locking type (Tool required)
<b>C</b>	Locking type (Lever)

Option

<b>Nil</b>	None
<b>Z</b>	With light/surge voltage suppressor

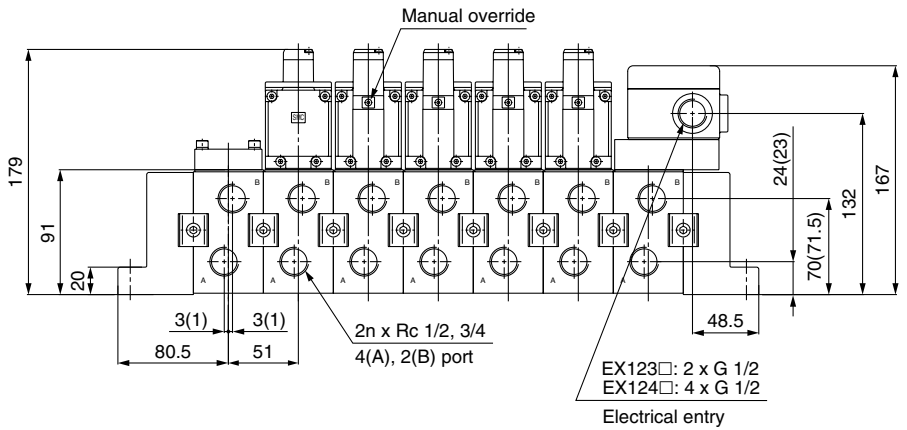
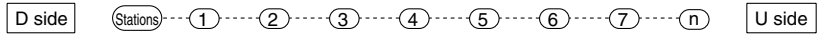
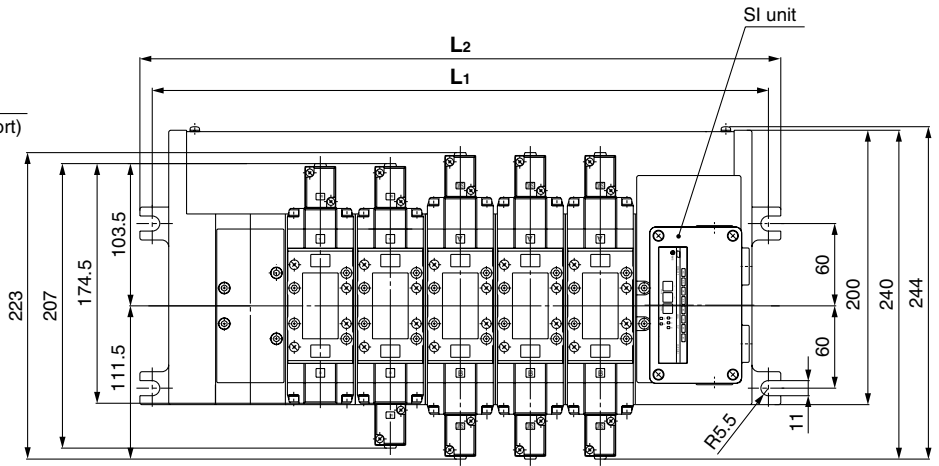
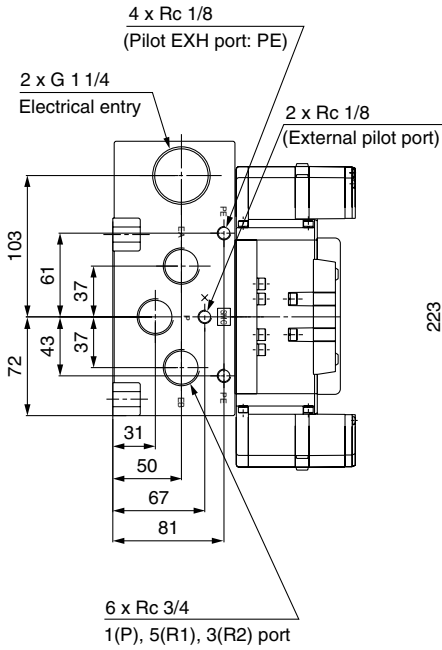
Coil rated voltage

<b>Nil</b>	None
------------	------

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

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

**VVFS5-01S** Mounting position Model - Stations Symbol - Port size Thread -X199



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

( ) : 2(B)/4(B) port Rc 3/4

### Dimensions

Formula  $L_1 = 51n + 92$   $L_2 = 51n + 110$   
n: Stations (Max. 10 stations)

L	n	2	3	4	5	6	7	8	9	10
<b>L<sub>1</sub></b>		194	245	296	347	398	449	500	551	602
<b>L<sub>2</sub></b>		212	263	314	365	416	467	518	569	620

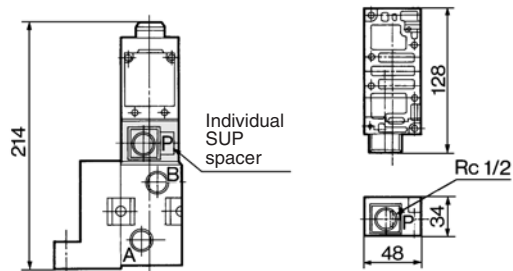
Note) Actual number of manifold base stations: Add 1 SI unit mounting station to the number of valve stations.

- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS**
- VFR
- VQ7

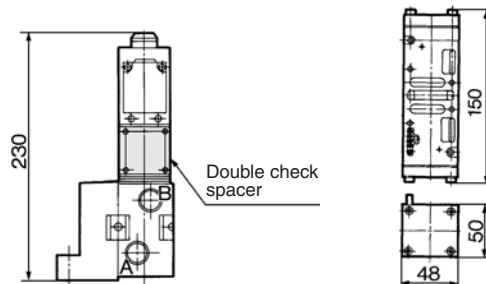
# Series VFS5000

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

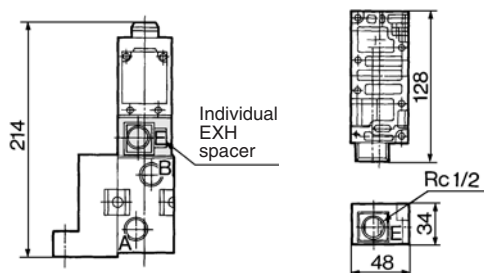
Individual SUP spacer:  
 VVFS5000-P-04-1 (Plug-in type)  
 VVFS5000-P-04-2 (Non plug-in type)



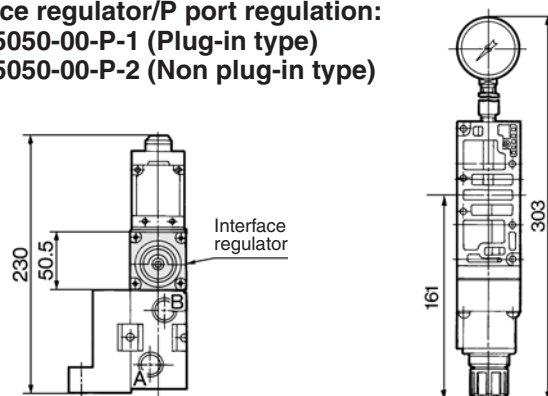
Double check spacer:  
 VVFS5000-22A-1 (Plug-in type)  
 VVFS5000-22A-2 (Non plug-in type)



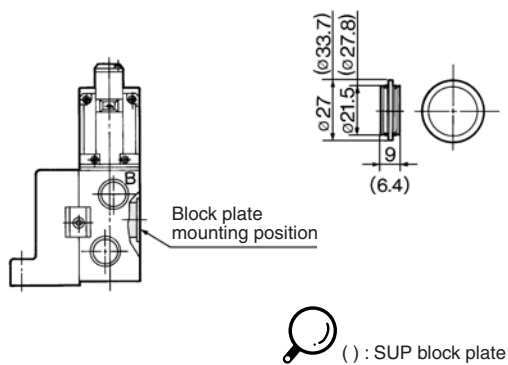
Individual EXH spacer:  
 VVFS5000-R-04-1 (Plug-in type)  
 VVFS5000-R-04-2 (Non plug-in type)



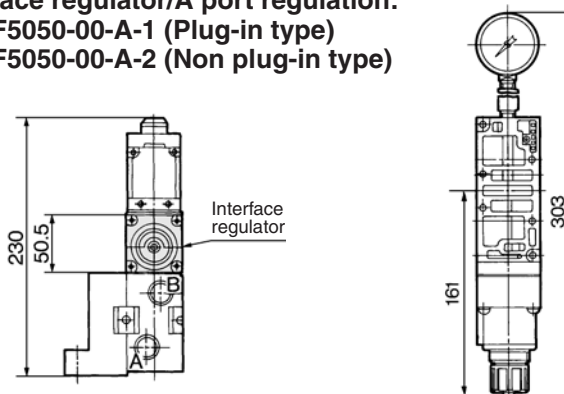
Interface regulator/P port regulation:  
 ARBF5050-00-P-1 (Plug-in type)  
 ARBF5050-00-P-2 (Non plug-in type)



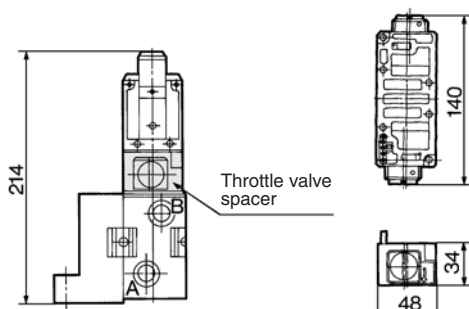
SUP block plate: AXT628-12A  
 EXH block plate: AXT512-14-1A



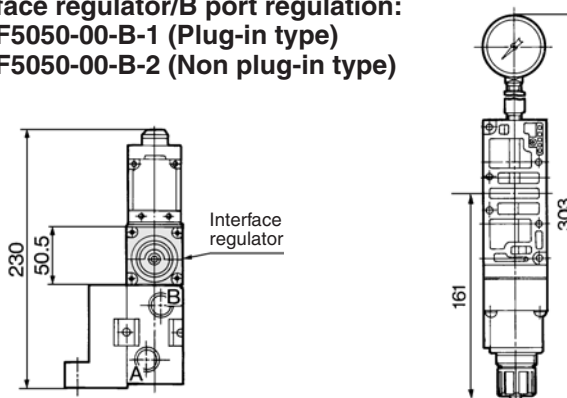
Interface regulator/A port regulation:  
 ARBF5050-00-A-1 (Plug-in type)  
 ARBF5050-00-A-2 (Non plug-in type)



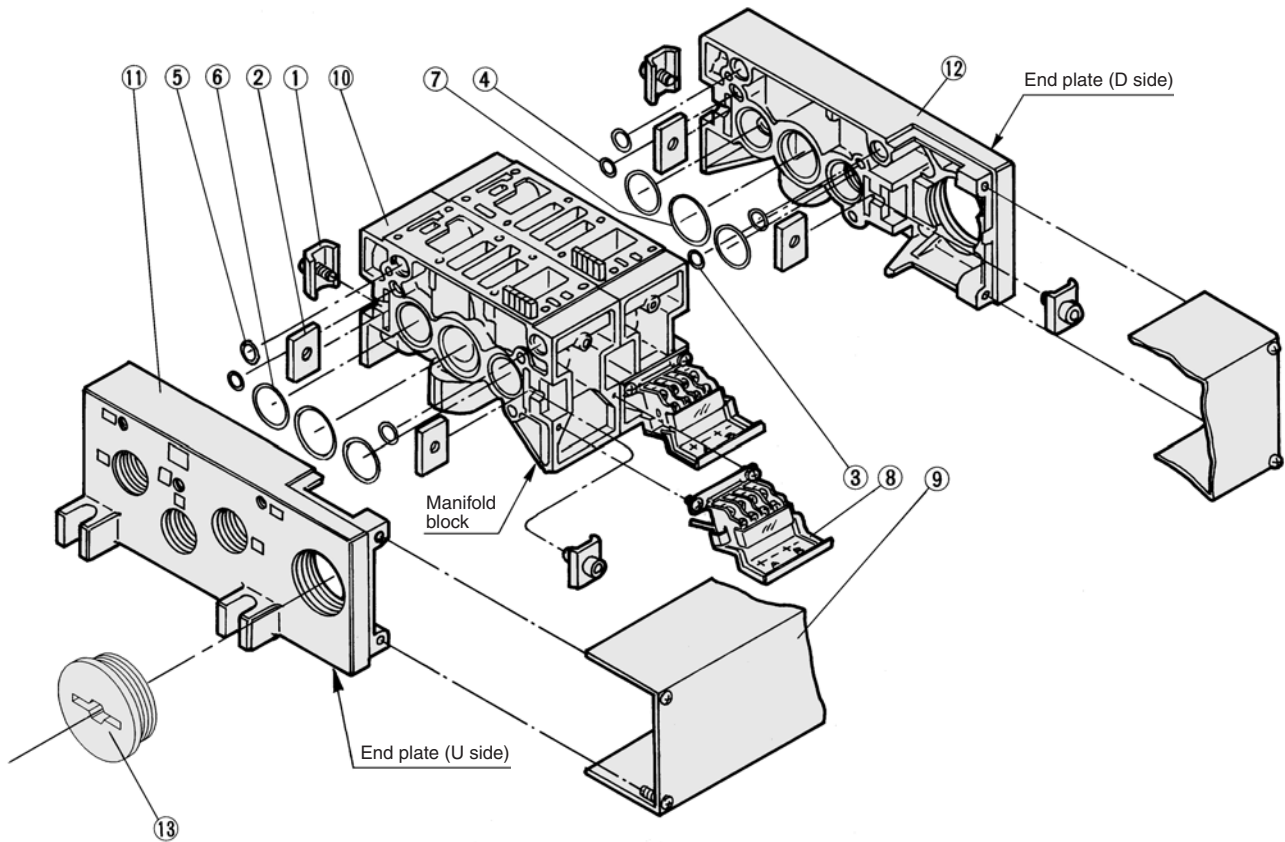
Throttle valve spacer:  
 VVFS5000-20A-1 (Plug-in type)  
 VVFS5000-20A-2 (Non plug-in type)



Interface regulator/B port regulation:  
 ARBF5050-00-B-1 (Plug-in type)  
 ARBF5050-00-B-2 (Non plug-in type)



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



- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS**
- VFR
- VQ7

**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	AS568-006
4	O-ring	NBR	AS568-010
5	O-ring	NBR	AS568-013
6	O-ring	NBR	AS568-022
7	O-ring	NBR	AS568-026
8	Terminal assembly	—	AXT628-5-1A
9	Junction cover assembly	For 01T	VVFS5000-4A- <small>[Stations]</small>
		For 01SU	AZ738-31A- <small>[Stations]</small>
13	Rubber plug	NBR	AXT336-9

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

**Replacement Parts: Sub Assembly**

No.	Description	Assembly part no.	Component parts	Applicable manifold base
10	Manifold block assembly	VVFS5000-1A-1- <small>04</small> / <small>06</small>	Manifold block ⑩, Metal joint ①, ②, Terminal ⑧, O-ring ③, ④, ⑤, ⑥, ⑦, Receptacle assembly	Plug-in type
		VVFS5000-1A-2- <small>04</small> / <small>06</small>	Manifold block ⑩, Metal joint ①, ②, O-ring ③, ④, ⑤, ⑥, ⑦	Non plug-in type
11	End plate (U side) assembly	VVFS5000-2A-1	End plate (U) ⑪, Metal joint ①, ②	Plug-in type
		VVFS5000-2A-2	End plate (U) ⑪, Metal joint ①, ②	Non plug-in type
12	End plate (D side) assembly	VVFS5000-3A-1	End plate (D) ⑫, Metal joint ①, ②, O-ring ③, ④, ⑤, ⑥, ⑦	Plug-in type
		VVFS5000-3A-2	End plate (D) ⑫, Metal joint ①, ②, O-ring ③, ④, ⑤, ⑥, ⑦	Non plug-in type



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



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

## Series VFS6000



### Model

Type of actuation	Model		Port size Rc	Flow characteristics						Max. operating cycle (cpm) <sup>(1)</sup>	Response time (ms) <sup>(2)</sup>	Mass (kg) <sup>(3)</sup>	
	Plug-in	Non plug-in		1 → 4/2 (P → A/B)			4/2 → 5/3 (A/B → R1/R2)						
				C [dm <sup>3</sup> /(s·bar)]	b	Cv	C [dm <sup>3</sup> /(s·bar)]	b	Cv				
2 position	Single	VFS6100	VFS6110	3/4	29	0.10	6.8	38	0.10	9.0	180	160 or less	2.5
				1	29	0.10	6.8	38	0.10	9.0	180	60 or less	2.75
	Double	VFS6200	VFS6210	3/4	29	0.10	6.8	38	0.10	9.0	180	60 or less	2.75
				1	29	0.10	6.8	38	0.10	9.0	180	60 or less	2.75



- Note 1) Based on JIS B 8375-1981 (once per 30 days) for the min. operating frequency.  
 Note 2) According to JIS B 8375-1981. (The value at supply pressure 0.5 MPa.)  
 Note 3) The figures in the above list are for without sub-plate. In case of with sub-plate, add 1.65 kg for Rc 3/4 and 1.5 kg for RC 1 respectively.  
 Note 4) "Note 1)" and "Note 2)" are with controlled clean air.  
 Note 5) The flow characteristics is for the port size Rc 4/3.

Compact yet provides a large flow capacity  
**3/4: C: 38 dm<sup>3</sup>/(s·bar)**

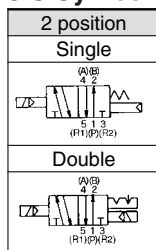
Low power consumption: 1.8 W DC

Easy maintenance

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



### JIS Symbol



### Standard Specifications

Valve specifications	Fluid		Air/Inert gas
	Maximum operating pressure		1.0 MPa
	Minimum operating pressure		0.1 MPa
	Proof pressure		1.5 MPa
	Ambient and fluid temperature		-10 to 60°C <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 E: Dustproof (Level 0), Type F: Dripproof (Level 2), Type D: Splashproof (Level 4) <sup>(4)</sup>
	Electricity specifications	Coil rated voltage	
Allowable voltage fluctuation		-15 to +10% of rated voltage	
Coil insulation type		Class B or equivalent (130°C) <sup>(5)</sup>	
Apparent power (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 0920. Note 5) Based on JIS C 4003.

### Option Specifications


Pilot type	External pilot <sup>Note)</sup>
Manual override	Direct manual override
Coil rated voltage	110 to 120, 220, 240 VAC (50 Hz/60 Hz) 12, 100 VDC
Porting specifications	Bottom ported
Option	With light/surge voltage suppressor, Non-rotating DIN terminal




- Note) Operating pressure: 0 to 1.0 MPa  
 Pilot pressure: 0.1 to 1.0 MPa

# 5 Port Pilot Operated Solenoid Valve Metal Seal, Plug-in/Non Plug-in *Series VFS6000*

## How to Order



**Plug-in**



**Non plug-in**

**Body type**

O: Plug-in type sub-plate

F: Plug-in type conduit terminal

**Electrical entry**

F: Plug-in type conduit terminal

**Porting specifications**

Nil	Side ported
-----	-------------

**Port size**

Nil	Without sub-plate
06	Rc 3/4
10	Rc 1

**Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

\* Option

**Symbol**

1: 2 position single

2: 2 position double

**Body type**

1: Non plug-in type sub-plate

**Body Option**

0	Standard
1*	Direct manual override

\* Option

**Option**

Nil	None
Z	With light/surge voltage suppressor

**Electrical entry**

E: Grommet terminal

D: DIN terminal

**Coil rated voltage**

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

\* Option

**Pilot type**

Nil	Internal pilot
R*	External pilot

\* Option

**Plug-in**

VFS6 1 0 0 - 5 F Z - 10

**Non plug-in**

VFS6 1 1 0 - 5 D Z - 10


- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

## How to Order Pilot Valve Assembly

SF4 - 1 F - 22

**Coil rated voltage**

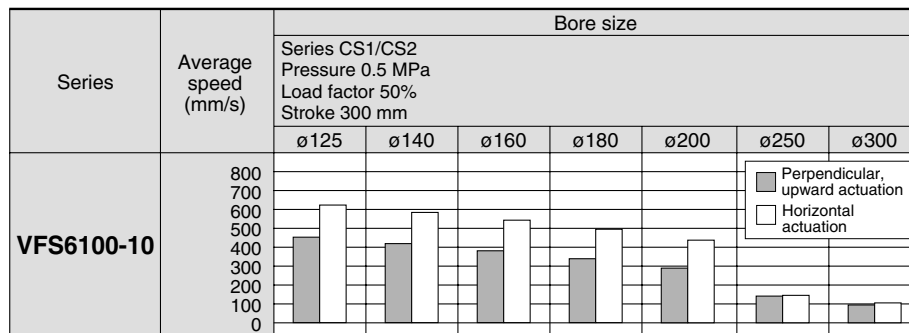
1	100 VAC, 50/60 Hz
2	200 VAC, 50/60 Hz
3*	110 to 120 VAC, 50/60 Hz
4*	220 VAC, 50/60 Hz
5	24 VDC
6*	12 VDC
7*	240 VAC, 50/60 Hz
9*	Other

\* Option  
 \* Refer to page 1224 for voltage conversion.

# Series VFS6000

## Cylinder Speed Chart

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

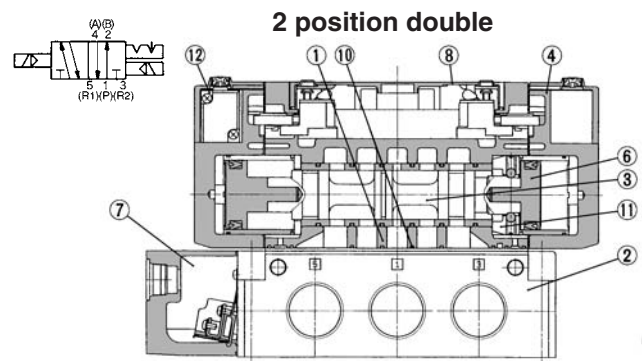
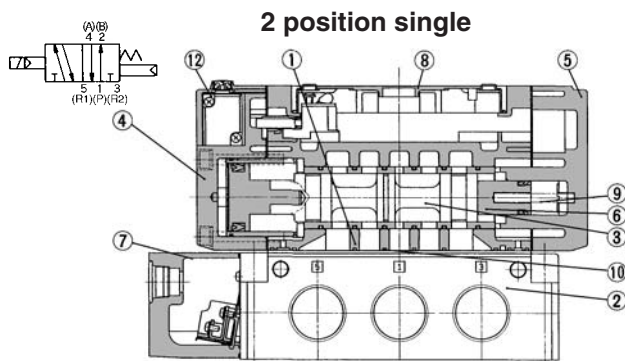


- \* It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
- \* The average velocity of the cylinder is what the stroke is divided by the total stroke time.
- \* Load factor: ((Load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

### Conditions

		Series CS1/CS2
VFS6100-10	Tube bore x Length	SGP25A x 1 m
	Speed controller	AS600-10
	Silencer	AN600-10

### Construction



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum die-casted	Platinum silver
2	Sub-plate	Aluminum die-casted	Platinum silver
3	Spool/Sleeve	Stainless steel	—
4	Adapter plate	Aluminum die-casted	Black
5	End plate	Aluminum die-casted	Black
6	Piston	Resin	—
7	Junction cover	Resin	—
8	Light cover	Resin	—
9	Return spring	Stainless steel	—
10	Gasket	NBR	—
11	Detent assembly	—	—
12	Pilot valve assembly	—	—

\* Refer to "How to Order Pilot Valve Assembly" on page 1219.

### Sub-plate Assembly Part No.

Plug-in	VFS6000-P- <sup>06</sup> / <sub>10</sub>
Non plug-in	VFS6000-S- <sup>06</sup> / <sub>10</sub>

\* Mounting bolt and gasket are not included.

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

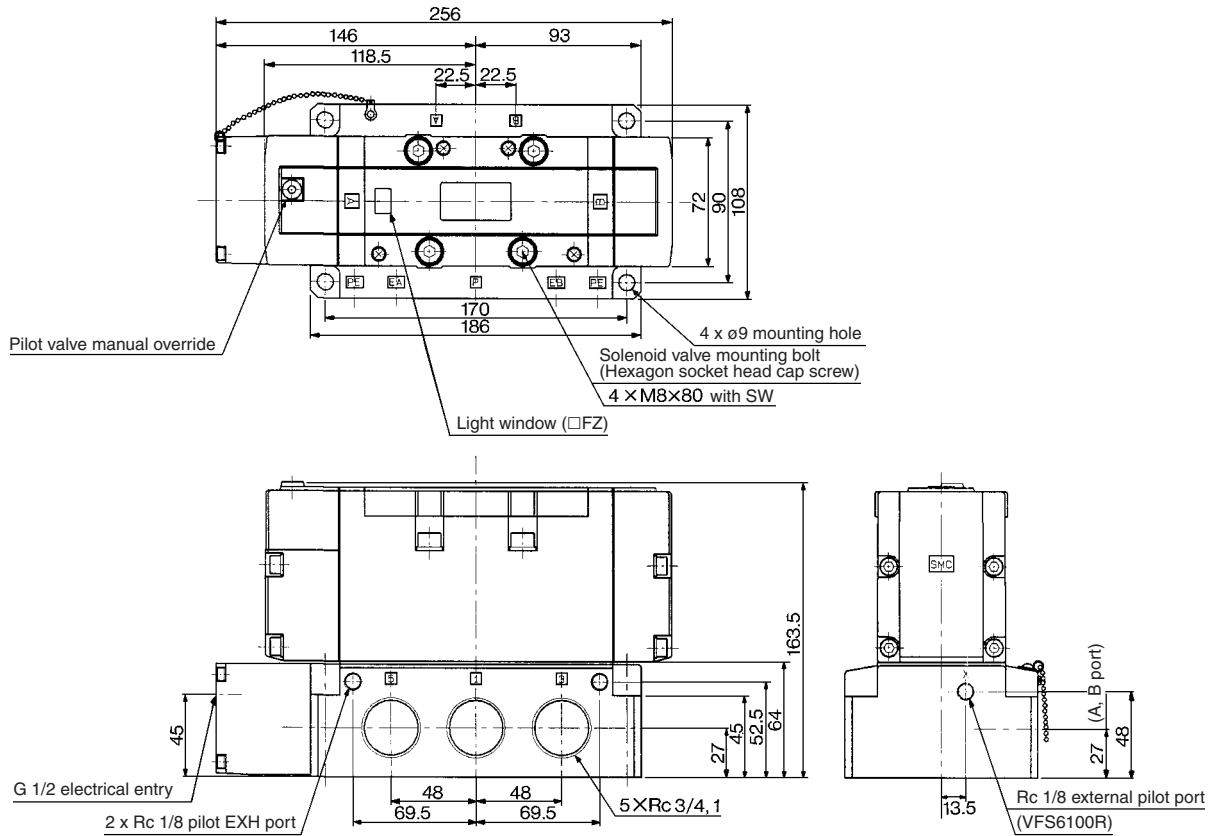
Plug-in	VFS6000-P-R <sup>01</sup> / <sub>02</sub>
Non plug-in	VFS6000-S-R <sup>01</sup> / <sub>02</sub>

Part no. for mounting bolt and gasket	BG-VFS6000
---------------------------------------	------------

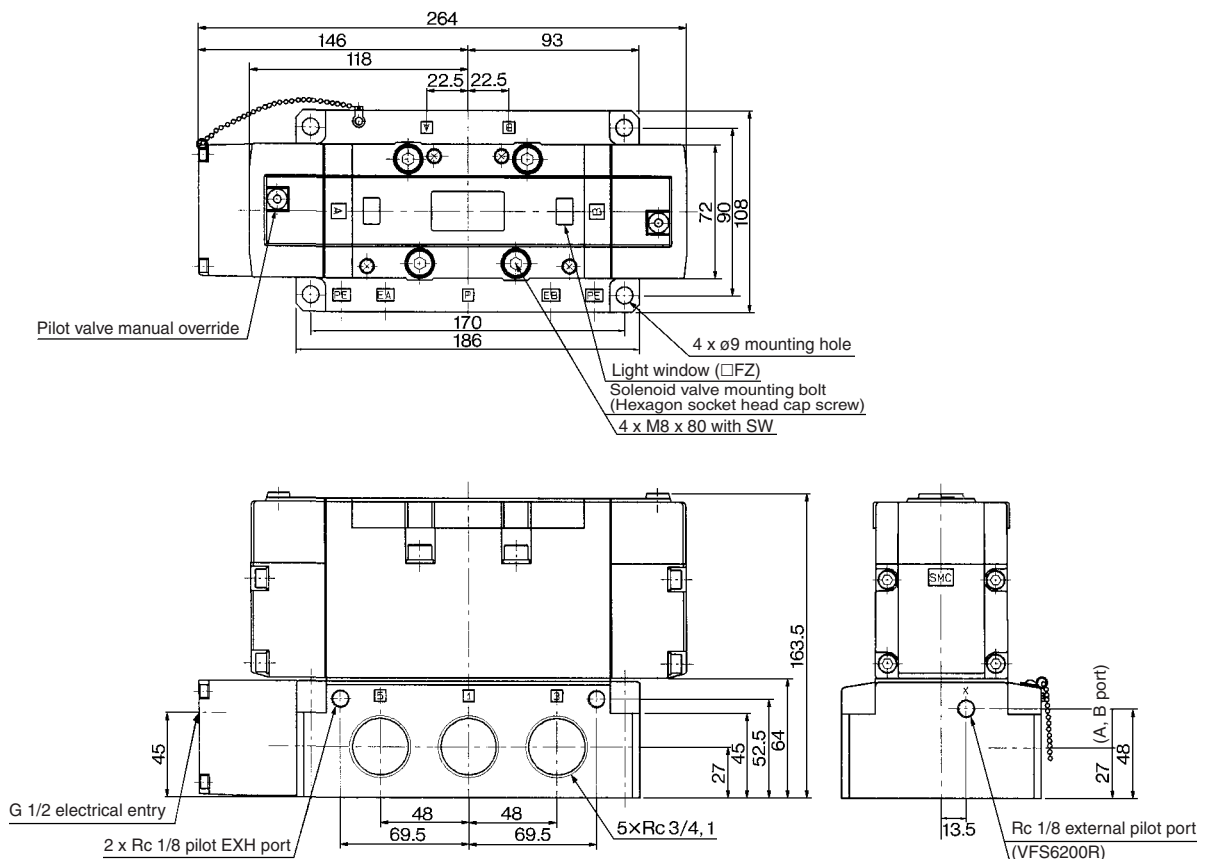
# 5 Port Pilot Operated Solenoid Valve Metal Seal, Plug-in/Non Plug-in *Series VFS6000*

## Plug-in — 2 Position single/Double

### 2 position single: VFS6100-□F



### 2 position double: VFS6200-□F

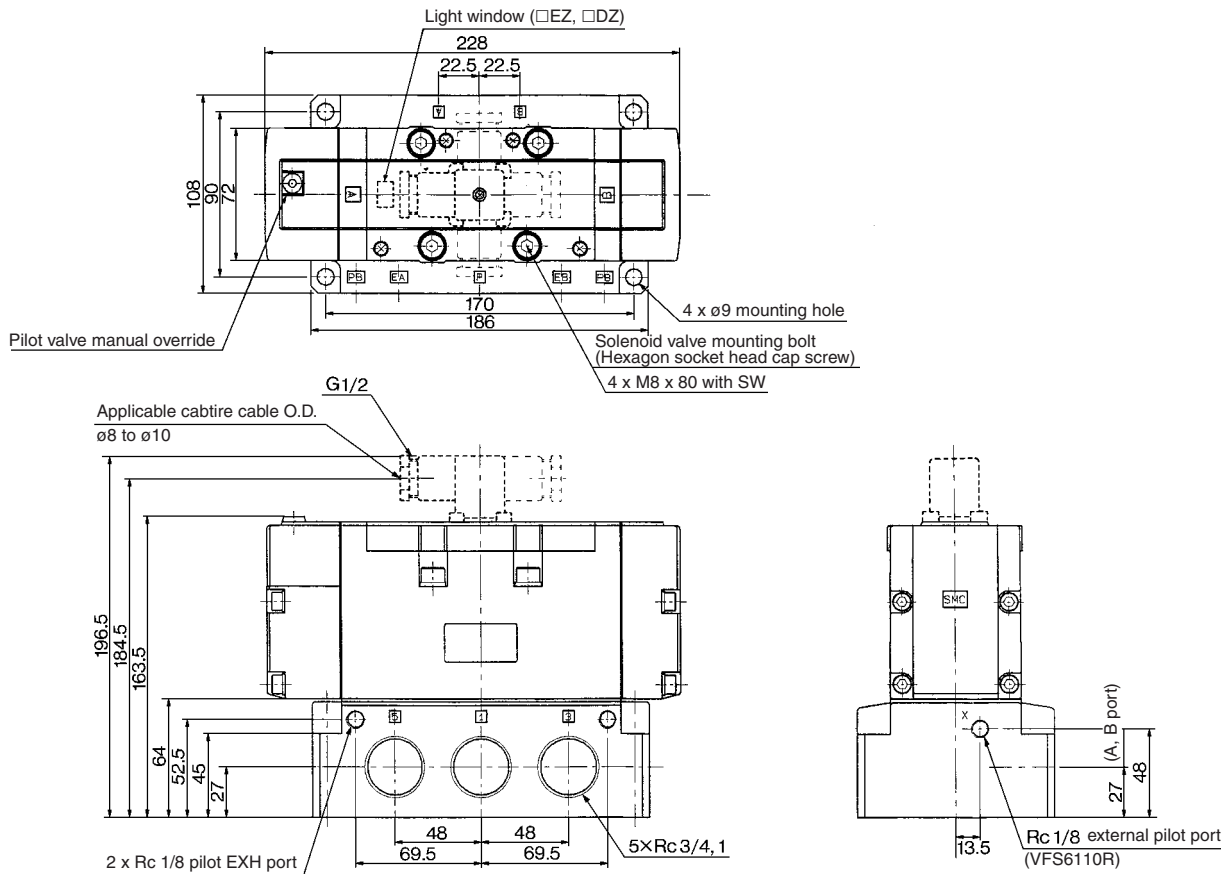


- SJ
- SY
- SV
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

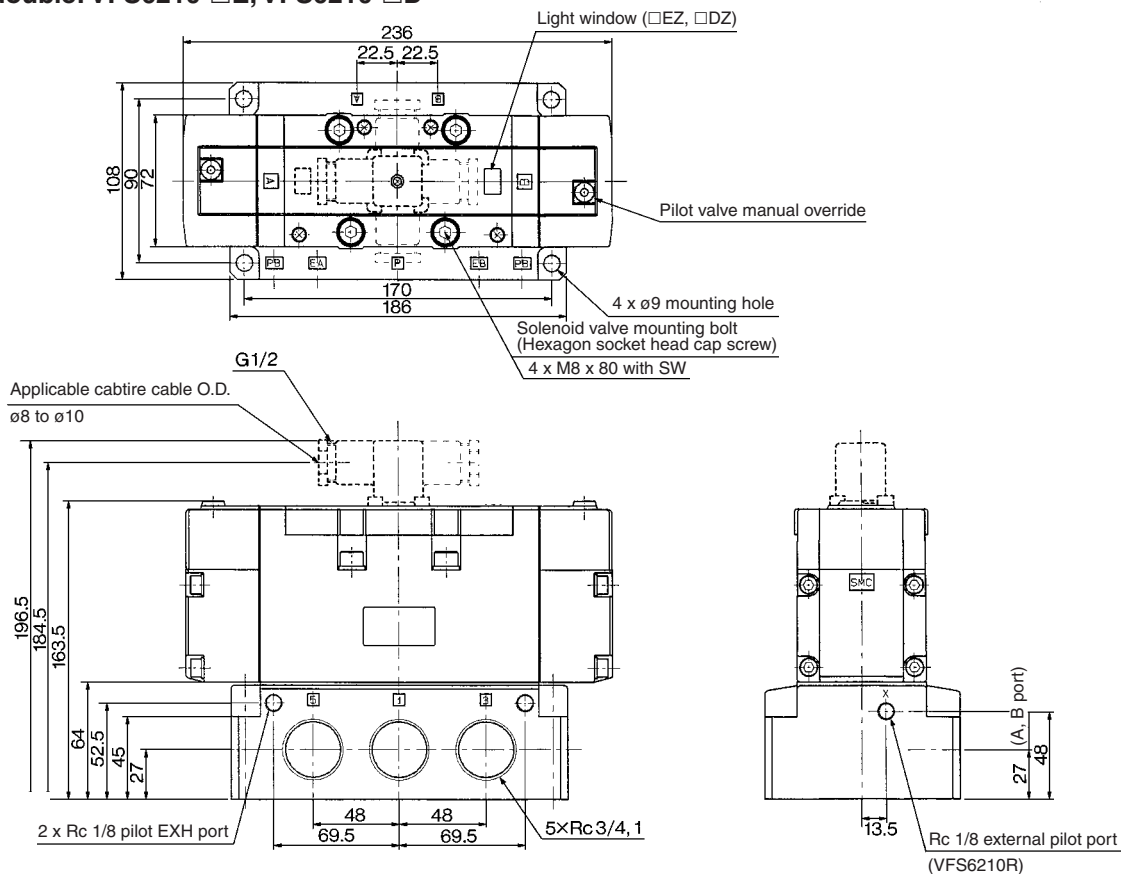
# Series VFS6000

## Non Plug-in — 2 Position single/Double

2 position single: VFS6110-□E, VFS6110-□D



2 position double: VFS6210-□E, VFS6210-□D





# Series VFS Specific Product Precautions 1

Be sure to read before handling.

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

## Caution

### Light/Surge Voltage Suppressor, Electrical Entry

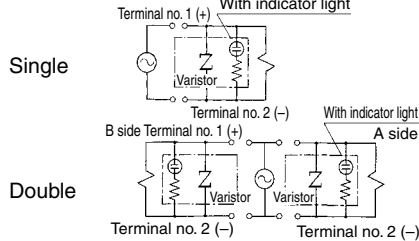
### Single unit

#### Body Ported

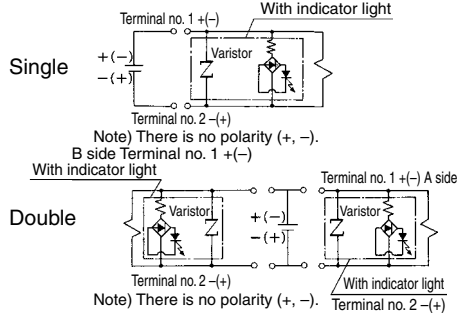
#### Series VFS1000/2000/3000

#### Light/Surge Voltage Suppressor

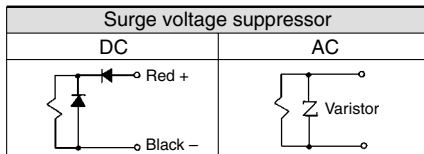
##### AC and 100 VDC



##### 24 VDC or less

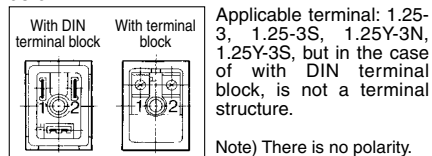


- Type G: Lead wire comes directly from the solenoid part. Connect it with the power source. Grommet with DC voltage surge voltage suppressor has polarity. Connect red lead wire to + (positive) side and black to - (negative) side.



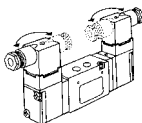
#### Wiring

In the case of DIN terminal and terminal block (with indicator light/surge voltage suppressor), the interior wiring is shown below.



#### Changing Direction of DIN Terminal/Cable Entry

To change direction of DIN terminal retaining screw, pull off outer cover, rotate connector board through 180°. Replace cover and tighten screw.



#### Changing Direction of Electrical Entry and Manual Override

Loosen the set screw (M3-2 pcs.), take out pilot operator, turn solenoid valve 180° degrees to change the direction of lead wire and manual override. (Possible on Series VFS1000 only.)



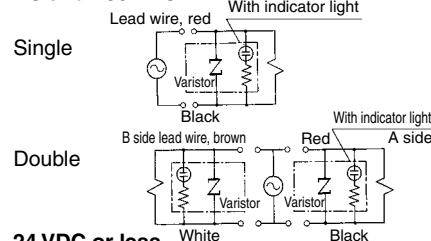
#### Base Mounted

#### Series VFS2000

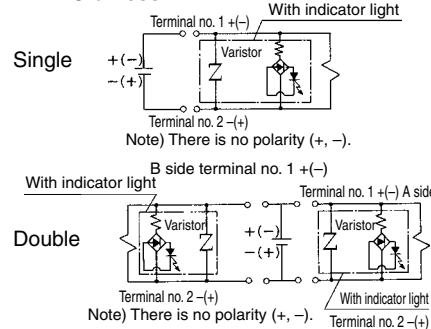
#### Light/Surge Voltage Suppressor

- In the case of surge voltage suppressor, surge voltage absorption device ZNR is attached to AC power.

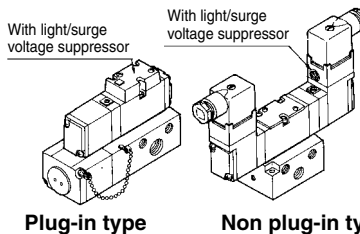
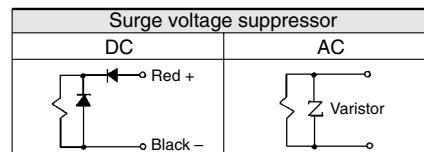
##### AC and 100 VDC



##### 24 VDC or less



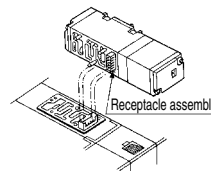
- Type G: Use lead wire from solenoid to connect with power side. Grommet with DC voltage surge voltage suppressor has polarity. Connect red lead wire to + (positive) side and black to - (negative) side.



#### How to Exchange

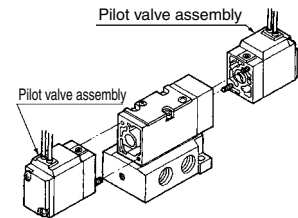
##### Solenoid valve

- Loosen 3 set screws (hexagonal socket head cap screw M3 x 31) and pull solenoid valve out vertically, otherwise it may cause damage to the solenoid valve. Never remove a valve at an angle.
- When mounting solenoid valve onto the base, plug pin assembly (base side) into receptacle assembly (body-side) vertically.



#### Exchange of pilot valve (Voltage exchange)

- When changing rated voltage and electrical entry etc., pilot valve assembly can be changed. But in case of a plug-in type with light/surge voltage suppressor, pilot valve assembly cannot be changed for changing rated voltage.



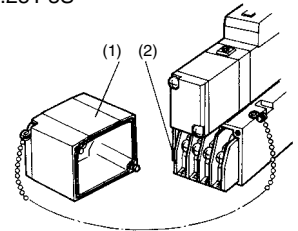
#### Electrical Connection

##### Single unit/Plug-in type sub-plate: T Conduit terminal (With terminal block)

- If the junction cover (1) of the sub-plate is removed, you can see the plug-in type terminal block (2) (part no. NVF2000-27A-1) mounted inside the sub-plate. The following markings are on the terminal block board. Connect with corresponding power side.

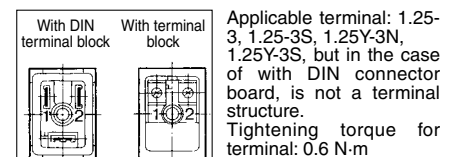
Description	Solenoid A side	Solenoid B side
Terminal block marking	A	B

- There is no polarity.
- When ground wiring and COM wiring are required, please specify separately.
- Applicable terminal: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S



##### Single unit/Non plug-in type sub-plate: G, E, T, D

- Type G: Use lead wire from solenoid to connect with power side.
- Type E, T, D: In the case of a DIN terminal and terminal block (with light/surge voltage suppressor), the interior wiring is shown below. Connect with corresponding power side.



Note) There is no polarity.

#### Changing Direction of DIN Terminal/Cable Entry

- Change of the electrical entry of DIN type connector cable: Unscrew retaining screw, pull off outer cover, rotate connector board through 180°. Replace cover and tighten screw. Applicable cable: O.D.  $\phi 6$  to  $\phi 8$ .

SJ  
SY  
SV  
SYJ  
SZ  
VP4  
S0700  
VQ  
VQ4  
VQ5  
VQC  
VQZ  
SQ  
VFS  
VFR  
VQ7



# Series VFS Specific Product Precautions 2

Be sure to read before handling.

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

## ⚠ Caution

### Light/Surge Voltage Suppressor, Electrical Entry

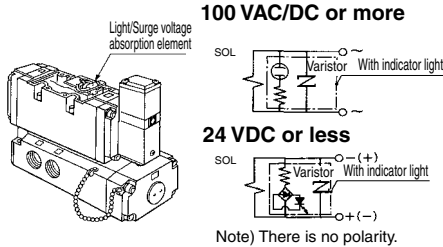
### Single unit

#### Base Mounted

#### Series VFS3000/4000/5000/6000

#### Light/Surge Voltage Suppressor

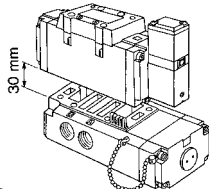
In the case of surge voltage suppressor, surge voltage absorption element is attached to terminal block on body area.



#### How to Exchange

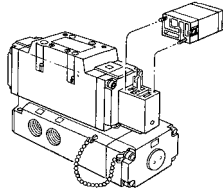
##### Solenoid valve

- Loosen set screw and take solenoid valve out vertically, otherwise it may cause damage to the solenoid valve. Never remove a valve at an angle.
- When mounting solenoid valve onto the base, plug pin assembly (base side) into receptacle assembly (body side) vertically.

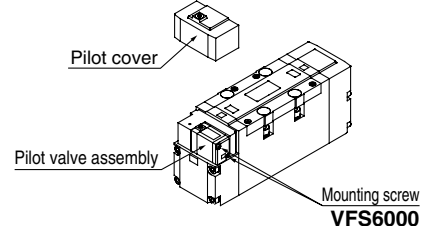


##### Pilot valve

- When changing the rated voltage, electrical entry, etc., pilot valve assembly can be exchanged easily since this is plug-in type. Then, when changing the rated voltage with indicator light/surge voltage suppressor, change of indicator light/surge voltage suppressor substrate is also needed. So, order together with pilot valve assembly.



#### VFS3000/4000/5000



#### Light/Surge Voltage Suppressor Substrate Part No.

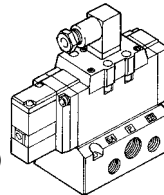
VFS3000		VFS3000-10A-□
VFS4000	100V or more	VF4000-9A-□
	24V or less	VF4000-9B-□
VFS5000	100V or more	AXT627-7A-□
	24V or less	AXT627-7B-□
VFS6000	100V or more	VF4000-9A-□
	24V or less	VF4000-9B-□

□: Coil rated voltage Symbol: Refer to below.  
 1: 100 to 120 V 6: 12 V  
 2: 200 to 220 V 7: 240 V  
 5: 24 V

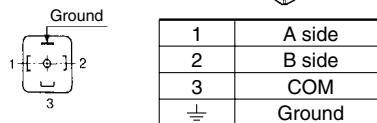
#### Lead Wire Connection

##### DIN terminal block type

- Male pin terminal of DIN terminal block board of solenoid valve and wires as shown below. Connect to corresponding terminal block on the connector.

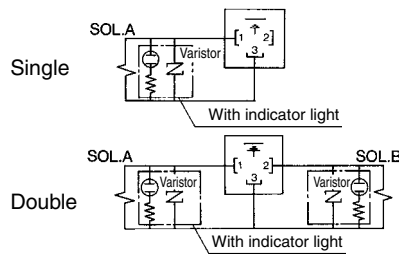


##### DIN terminal (Wiring)

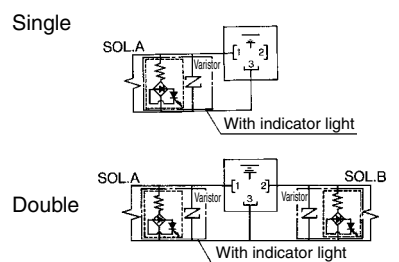


- There is no polarity.

##### 100 VAC/DC or more



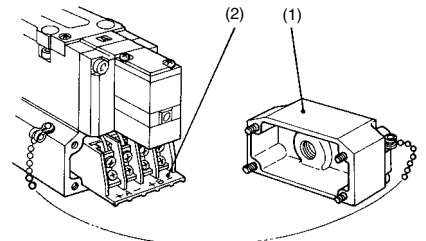
##### 24 VDC or less



- Heavy-duty cord  
Applicable cable O. D.:  $\phi 8$  to  $\phi 10$
- Applicable terminal  
Applicable terminal on block board: 3 (kinds)  
1.25Y-3L, 1.25-3.5S, 1.25-4M
- Connector/Clamping torque  
Set screw 0.6 N·m  
Terminal screw 0.6 N·m
- Incorrect common (DIN terminal no. 3) causes damage on power side circuit.

##### Plug-in type (With terminal)

- If the junction cover (1) of the sub-plate is removed, you can see the plug-in type terminal block (2) mounted inside the sub-plate.



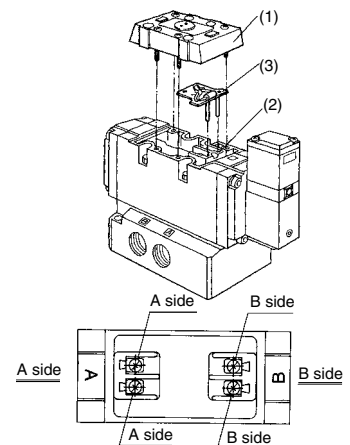
- The following markings are on the terminal block. Connect with corresponding power side.

	Solenoid A side	Solenoid B side
Terminal block marking	A +-	B +-

- Applicable terminal:  
VFS3000: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S  
VFS4000: 1.25-3.5M, 1.25Y-3L, 1.25Y-3M  
VFS5000: 1.25-4, 1.25-4M  
VFS6000: 1.25-3.5M, 1.25Y-3L, 1.25-3M
- There is no polarity.
- Tightening torque for terminal: 0.6 N·m

##### Non plug-in type (With terminal)

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



- Applicable terminal:  
VFS3000: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S  
VFS4000/5000/6000: 1.25-3.5M, 1.25Y-3L, 1.25Y-3M
- There is no polarity.
- Tightening torque for terminal: 0.6 N·m



# Series VFS Specific Product Precautions 3

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

### Maintenance

1. A lot of carbon powder and oil waste from air sources (mostly from compressor) entering into the valve sometimes can lead to increased sliding resistance at the switching spool and cause valve malfunction.

In the worst case, spool can adhere to the valve. Therefore, supply air should be kept clean.

Also, if it is left for a long time exposed to an inferior quality of air under SUP pressure applied, carbon powders and oil wastes in the compressed air will be accumulated in the clearance of the spool and sleeve and can cause the spool to adhere to the valve.

The remedy for this case is to check the compressor lubrication oil and find out the least oxidizing compressor lubrication oil.

Meanwhile, a high filtration Mist Separator (Series AM) installed on the back of regular filter (Series AF) can prevent foreign particles from entering into the valve.

Besides, as lubricant for compressors, Faircoal A-80 (Nippon Mitsubishi Oil Corp.), Dafney CSS55, CS49 (Idemitsu Kosan Co., Ltd), etc. are commercially available on the market.

2. When disassembling and re-assembling, please ensure that all components are in proper positions. Prevent gaskets from slipping, and clamp bolts down equally.

Use torques listed below when mounting pilot valve assemblies and solenoid valve bodies.

### Pilot Valve Assembly: SF4-□-□

Holding screw	Proper tightening torque (N·m)
M3	0.45 to 0.6

### Solenoid Valve Body

Holding screw	Proper tightening torque (N·m)
M3	0.8 to 1.2
M4	1.4 to 2.5
M5	2.8 to 5

### How to Calculate the Flow Rate

Refer to front matters 44 to 47 for How to Calculate the Flow Rate.

## Interface Regulator Specifications

Interface regulator <sup>(3)</sup>	ARBF2000	ARBF3050	ARBF4050	ARBF5050							
Applicable solenoid valve series	VFS2000	VFS3000	VFS4000	VFS5000							
Regulating port	P	A B P	A B P	A B P							
Proof pressure	1.5 MPa										
Maximum operating pressure	1.0 MPa										
Set pressure range <sup>(1)</sup>	0.05 to 0.83 MPa	0.1 to 0.83 MPa									
Ambient and fluid temperature	-5 to 60°C (No freezing)										
Port size for connection of pressure gauge	M5 x 0.8	Rc 1/8									
Weight (kg)	0.16	0.46	0.72	0.83							
Effective area at supply side (mm <sup>2</sup> ) <sup>(2)</sup> S at P <sub>1</sub> = 0.7 MPa, P <sub>2</sub> = 0.5 MPa	P → A	5.5	21	18.5	11	35	31	26	44	38	32
	P → B	5.1	18.5	22	12	31	31	24	38	40	31
Effective area at exhaust side (mm <sup>2</sup> ) <sup>(2)</sup> S at P <sub>2</sub> = 0.5 MPa	A → EA	12	40		55		90				
	B → EB	11	36		45		77				

Note 1) Set within the operating pressure range of solenoid valve.

Note 2) Synthesized effective area with solenoid valve 2 position single type.

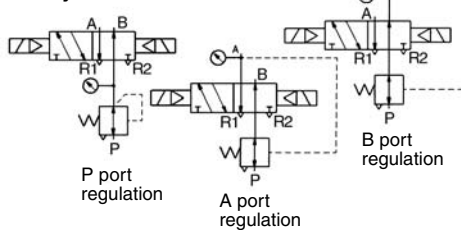
Note 3) • Operate an interface regulator only by applying pressure from the "P" port of the base, except when using it as a reverse pressure valve.

- To combine a pressure center valve and the A and B port pressure reduction of an interface regulator, use the ARBF3000, 4000, or 5000 model.
- To combine a reverse pressure valve and an interface regulator, use the ARBF3000, 4000, or 5000 model. Furthermore, the P port pressure reduction cannot be used for the reverse pressure valve.
- When combining a double check valve and an interface regulator, use a manifold or sub-plate as a basis, and stack them in the following order; the perfect spacer → the interface regulator → the valve.
- When a closed center valve is combined with the interface regulator's A, B port regulation, note that it cannot be used for intermediate stops of a cylinder because there is leakage from relief port on the regulator.

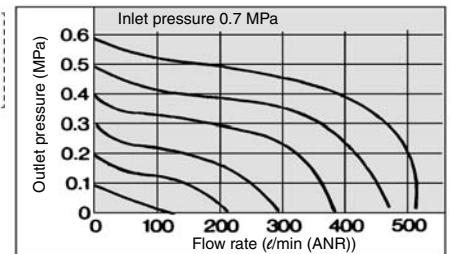
### Flow Characteristics (P → A)

(Conditions: Inlet pressure 0.7 MPa, when 2 position solenoid valve is mounted.)

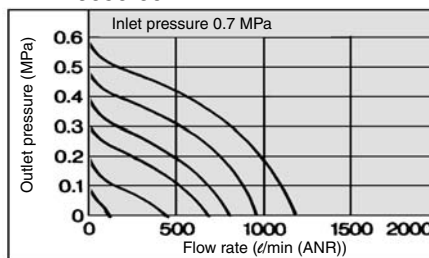
#### JIS Symbol



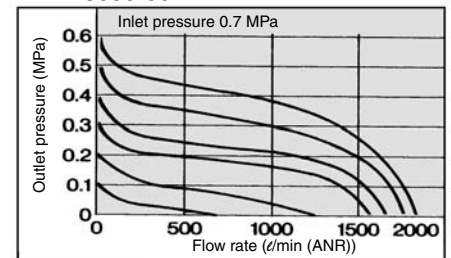
#### ARBF2000-00-P



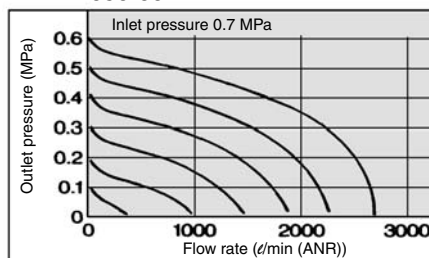
#### ARBF3050-00-P



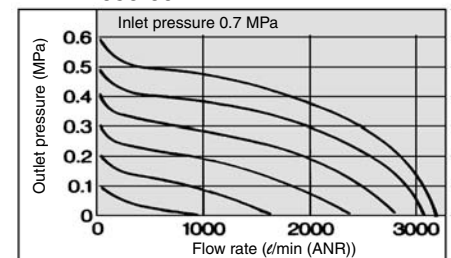
#### ARBF3050-00-A



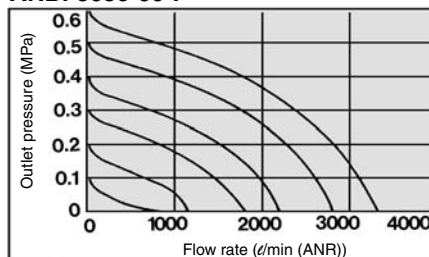
#### ARBF4050-00-P



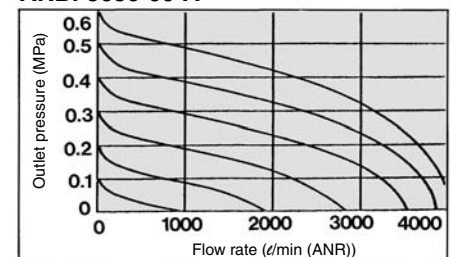
#### ARBF4050-00-A



#### ARBF5050-00-P



#### ARBF5050-00-A



SJ  
SY  
SV  
SYJ  
SZ  
VP4  
S0700  
VQ  
VQ4  
VQ5  
VQC  
VQZ  
SQ  
VFS  
VFR  
VQ7





# Series VFS Specific Product Precautions 4

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

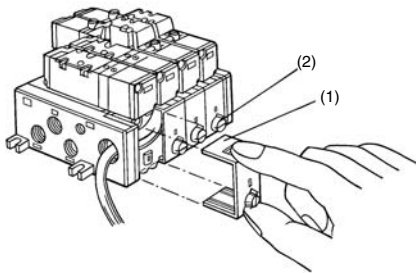
#### Type 01 Insert Plug with Lead Wire

**Series VFS2000** (Insert plug with lead wire is not available for Series VF3000, 4000, and 5000.)

##### How to remove junction cover (Type 01)

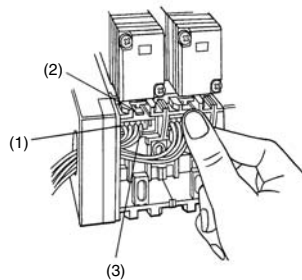
Turn the knob (2) of junction cover (1) on the manifold block side by hand or slotted screwdriver to the C → O direction (counterclockwise) 90°. While holding the knob and upper part of junction cover, pull outward to remove junction cover.

When reassembling, do the opposite.



##### How to Use Insert Plug

- When removing insert plug (1) from manifold base, push the lever area (2) of inset plug downward with thumb and pull it together with the lead wire (3) outward.



##### Wiring

The insert plug (1) is attached to the manifold block and lead wire is plugged in with valve side as shown in the following list.

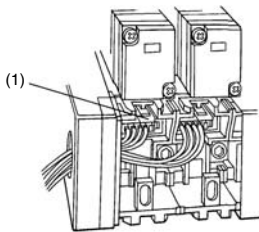
(Single solenoid: AXT624-52A-S-1)  
(Double solenoid: AXT624-52A-D-1)

Connect with corresponding power side.

Power supply	Valve model	Solenoid A	Solenoid B
AC	Single solenoid	Red, Black	—
DC	Double solenoid	Red, Black	Brown, White

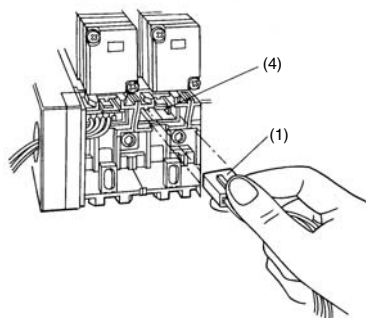
\* There is no polarity.

\* Lead wire length is 1 m.



- When placing the inset plug (1) into the manifold base, push the lever area of inset plug with thumb and plug it in its place in the receptacle housing (4) horizontally.

After plugging, pull lead wire out a little bit to ensure that insert plug is secure.



#### Type 01 with Terminal Block

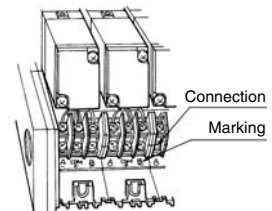
##### Series VFS2000

- Remove junction cover of manifold, exposing terminal block attached to the manifold block. Lead wires from solenoid valve are connected with the terminals on upper side of terminal block. (On the terminal block, lead wire is connected with both A and B sides of solenoid valve in accordance with the corresponding markings A and B on the block.) Connect each lead wire of power side corresponding to respective solenoid valve on the lower terminal block.

VFS2000 has the marking + COM on the block board, but – COM specification is also available.

Model	Terminal block marking	A	COM	B
VFS2100		A side	COM	
VFS2200		A side	COM	B side
VFS2300		A side	COM	B side

- Applicable terminal: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S
- Plugging COM bridge (part no. AXT625-73: 5 stations) in between each + COM on the block board will make the specifications of all the stations + COM and enables you to understand the wiring process.
- There is no polarity.
- Tightening torque for terminal: 0.6 N·m



##### Series VFS3000

Model	Terminal block marking	A	COM	B
VFS3100		A side	COM	
VFS3200		A side	COM	B side
VFS3300		A side	COM	B side

- Applicable terminal: 1.25-3.5M, 1.25Y-3L, 1.25-3M
- There is no polarity.
- VFS 3000 has the marking + COM on the block board, but – COM specification is also available.
- Tightening torque for terminal: 0.6 N·m

##### Series VFS4000/5000

Model	Terminal block marking	A +	A -	B +	B -
VFS4100		A side	A side		
VFS4200		A side	A side	B side	B side
VFS4300		A side	A side	B side	B side
VFS5300		A side	A side	B side	B side

- Applicable terminal: 1.25-3.5M, 1.25Y-3L, 1.25Y-3M
- There is no polarity.
- Tightening torque for terminal: 0.6 N·m



# Series VFS Specific Product Precautions 5

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

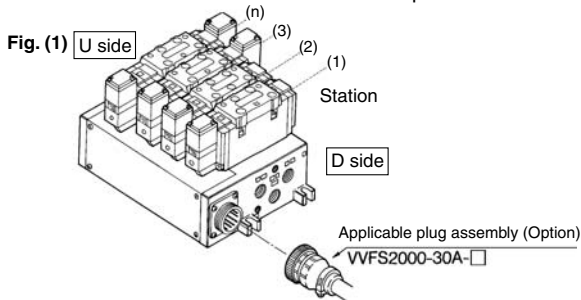
### Lead Wire Connection Manifold/Plug-in

#### Type 01C Circular Connector

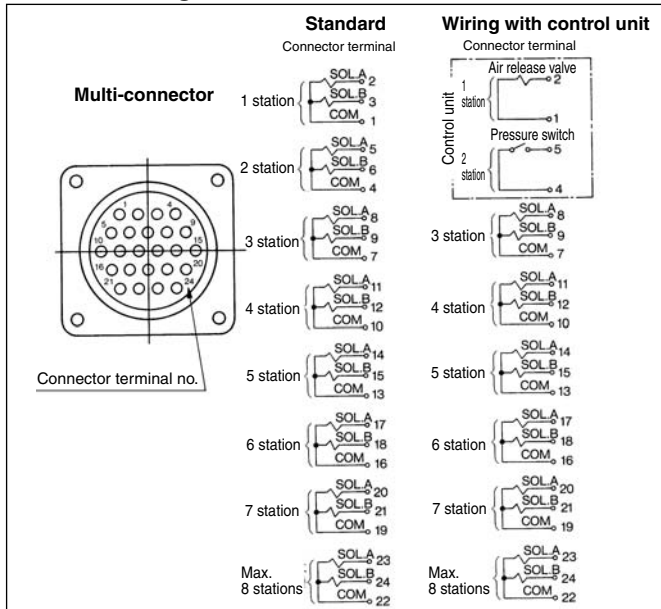
##### Series VFS2000/3000/4000/5000

###### • Wire connection specifications

Lead wire for both solenoid A and B sides in manifold are connected to connector terminal as COM specifications.



#### Internal Wiring of Manifold



Note 1) Maximum stations are 8.

Note 2) There is no polarity.

Note 3) Indication of stations are one station from D side regardless of the connector mounting side, D or U.

#### Applicable Plug Assembly (Option)

Assembly part no.	Cable length	Component parts
VVFS2000-30A-1	1.5 m	Plug 206837-1 1 pc. Cable clamp 206138-1 1 pc. Socket 66101-2 24 pcs. Cable VCTF 24 cores x 0.75 mm <sup>2</sup> made by Tyco Electronics AMP K.K.
VVFS2000-30A-2	3 m	
VVFS2000-30A-3	5 m	
VVFS2000-30A-4 *	7 m	
VVFS2000-30A-5 *	10 m	
VVFS2000-30A-6 *	15 m	
VVFS2000-30A-7 *	20 m	

\* Option

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

Terminal no.	1	2	3	4	5	6	7	8	9	10	11	12
Lead wire color	Orange	Orange	Black	Black	Green	Green	Red	Red	Blue	Blue	Yellow	Yellow
Dot marking	—	Yes	—	Yes	—	Yes	—	Yes	—	Yes	—	Yes

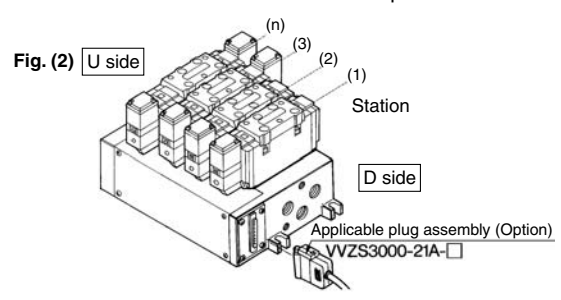
Terminal no.	13	14	15	16	17	18	19	20	21	22	23	24
Lead wire color	Brown	Brown	White	White	Pink	Pink	Gray	Gray	Sky blue	Sky blue	Light green	Light green
Dot marking	—	Yes	—	Yes	—	Yes	—	Yes	—	Yes	—	Yes

#### Type 01F D-sub Connector

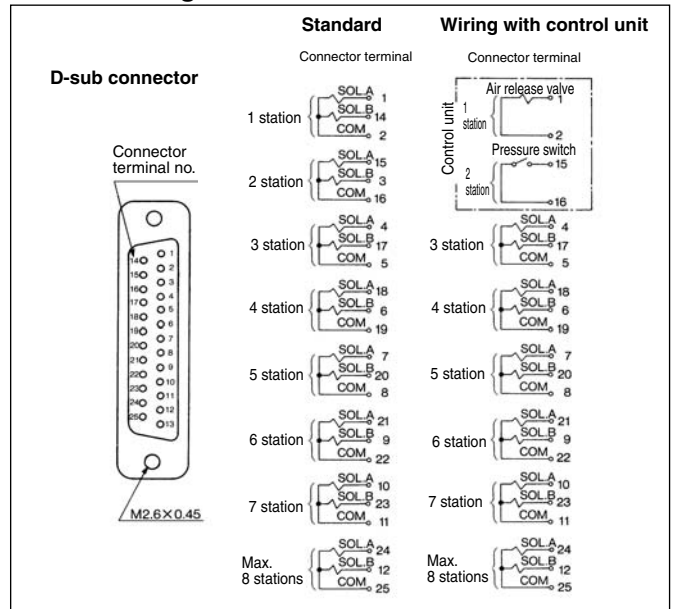
##### Series VFS2000/3000/4000/5000

###### • Wire connection specifications

Lead wire for both solenoid A and B sides in manifold are connected to connector terminal as COM specifications.



#### Internal Wiring of Manifold



Note 1) Maximum stations are 8.

Note 2) There is no polarity.

Note 3) Indication of stations are one station from D side regardless of the connector mounting side, D or U.

#### Applicable Plug Assembly (Option)

Assembly part no.	Cable length	Component parts
VVZS3000-21A-1	1.5 m	Plug: MIL standard D type connector 25 terminals Cable: 25 cores wire x 0.3 mm <sup>2</sup>
VVZS3000-21A-2	3 m	
VVZS3000-21A-3	5 m	
VVZS3000-21A-4 *	8 m	
VVZS3000-21A-5 *	10 m	
VVZS3000-21A-6 *	15 m	
VVZS3000-21A-7 *	30 m	
VVZS3000-21A-8 *	20 m	

\* Option

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

Terminal no.	1	2	3	4	5	6	7	8	9	10	11	12	13
Lead wire color	Black	Brown	Red	Orange	Yellow	Pink	Blue	Purple	Gray	White	White	Yellow	Orange
Dot marking	—	—	—	—	—	—	—	White	Black	Black	Red	Red	Red

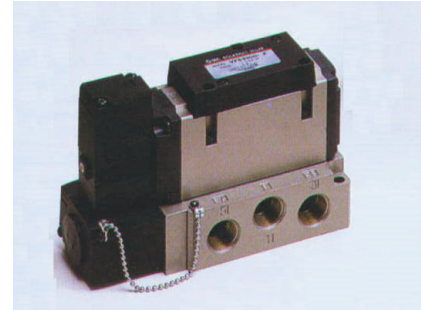
Terminal no.	14	15	16	17	18	19	20	21	22	23	24	25
Lead wire color	Yellow	Pink	Blue	Purple	Gray	Orange	Red	Brown	Pink	Gray	Black	White
Dot marking	Black	Black	White	—	—	Black	White	White	Red	Red	White	—

SJ  
SY  
SV  
SYJ  
SZ  
VP4  
S0700  
VQ  
VQ4  
VQ5  
VQC  
VQZ  
SQ  
VFS  
VFR  
VQ7

SERIES NVFS 2000, 3000, 4000, 5000, 6000  
5 PORT PILOT OPERATED  
BASE-MOUNTED / PLUG-IN TYPE

- ✓ Large Flow Capacity
- ✓ Low Power Consumption
- ✓ Long Life
- ✓ Ease Maintenance
- ✓ Many Variations Available

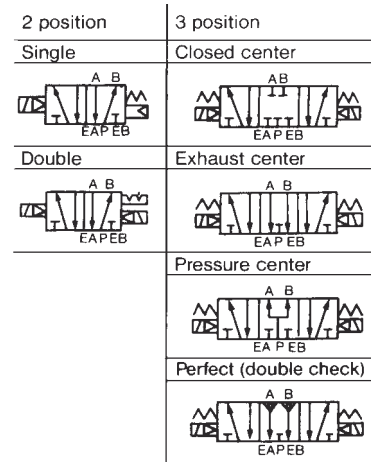
For further information, consult SMC Customer Service



MODEL  
NVFS2000

Position	Number Of Solenoid	Type Plug-In	Port Size (NPTF)	Cv Factor	Response Time (ms)
2 Position	Single	NVFS2100	1/8	0.7	15 or less
			1/4	0.83	
	Double	NVFS2200	1/8	0.7	13 or less
			1/4	0.83	
3 Position	Closed Center	NVFS2300	1/8	0.65	20 or less
			1/4	0.67	
	Exhaust Center	NVFS2400	1/8	0.65	20 or less
			1/4	0.67	
	Pressure Center	NVFS2500	1/8	0.65	20 or less
			1/4	0.67	
Perfect (Double Check)	NVFS2600	1/8	0.4	25 or less	
		1/4	0.4		

SYMBOLS



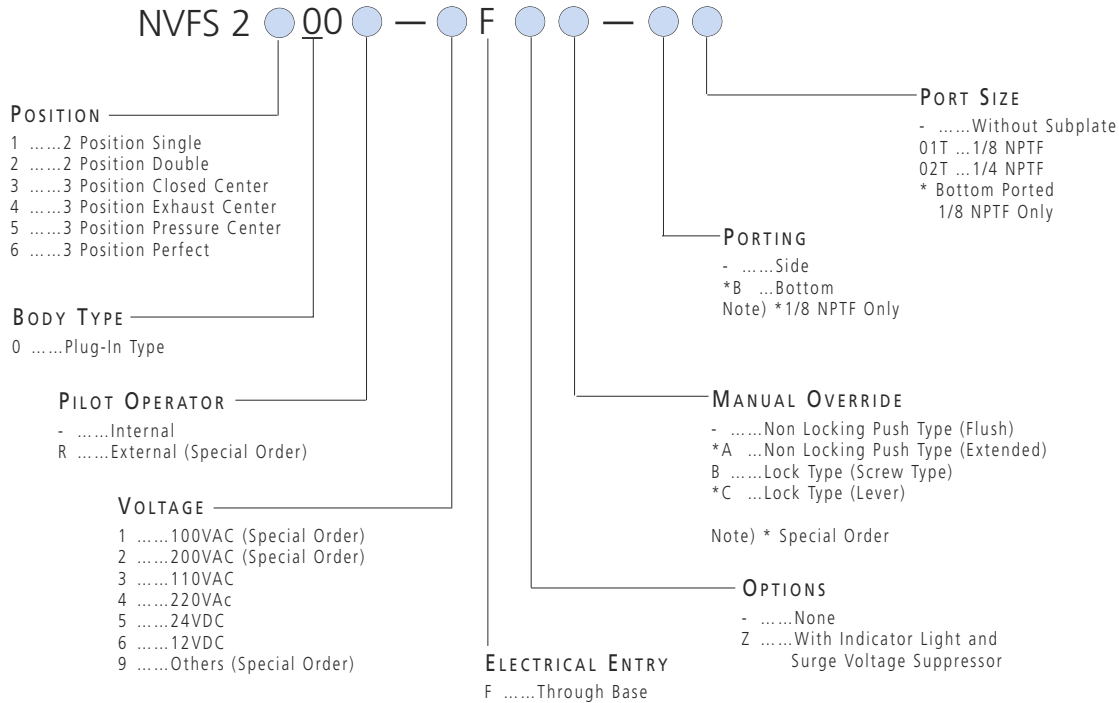
TECHNICAL SPECIFICATIONS  
STANDARD

	Fluid	Air and Inert Gas
Valve	Max Operating Pressure	150 PSI (1MPa)
	Min Operating Pressure	2 Position: 15 PSI (0.1MPa)
		3 Position: 22 PSI (0.15MPa)
	Ambient & Fluid Temperature	14~140°F (-10~60°C)
	Lubrication	Not Required
	Pilot Operator Manual Override	Non Locking Push Type (Flush)
	Protection Construction	Dust Proof
Electrical	Rated Voltage	AC: 110VAC50/60Hz, 220V50/60Hz, 24V50/60Hz
		DC: 12V, 24V
	Allowable Voltage Range	-15 ~ 10% Rated Voltage
	Coil Insulation	Class B or Equivalent
	Apparent Power AC (Power Consumption)	InRush: 5.0VA/60Hz, 5.6VA/50Hz
		Holding: 2.3VA(1.5W)/60Hz, 3.4VA(2.1W)/50Hz
	Power Consumption DC	1.8W
Electrical Entry	Plug In	Conduit Terminal (Base Access)

TECHNICAL SPECIFICATIONS  
OPTIONAL

Pilot Type		External Pilot Type
Manual Override	Pilot Operator	Non Locking Push Type (Extended), Lock Type (Tool), Lock Type (Lever)
Voltage	AC	100V50/60Hz, 200V50/60Hz
	DC	6V, 48V, 100V
Porting		Bottom Ported Subplate
Option		W/Indicator Light & Surge Voltage Suppressor

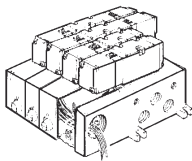
## HOW TO ORDER NVFS2000



## HOW TO ORDER MANIFOLD

### 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.



**NVV5FS2-01-06 1-01T**

**Series NVFS2000  
Manifold valve**

**Plug-in Type  
Connector with  
Lead wire**  
(AXT624-52A-D1-3)

**Stations**

- 02 | 2 stations
- ⋮ | ⋮
- 15 | 15 stations

Symbol	P, EA, EB	A, B
01T	1/8NPTF	1/8NPTF
02T	1/4NPTF	1/4NPTF

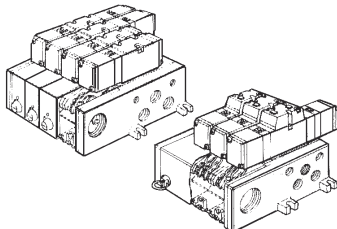
Symbol	Port specifications		Porting Specifications (A,B)
	P	EA, EB	
1	Common	Common	Side
*2†			Bottom
	Mixed		

\*Special Order  
† Bottom porting specification with  
"-02T" is 1/8" P,A,B bottom and 1/4" A,B side.

Unit type conduit cover: AXT625-28-3A  
Unit type conduit retainer: AXT625-87

### 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.



**NVV5FS2-01T 1-08 1-02T**

**Series NVFS2000  
Manifold valve**

**Plug-in type  
With terminal block**

**Junction cover/  
classification**

- Unit type individual station cover
- 1 One-pc. type cover

Note: Individual cover part no. above.

**Stations**

- 02 | 2 stations
- ⋮ | ⋮
- 15 | 15 stations

Symbol	Port specifications		Porting Specifications (A,B)
	P	EA, EB	
1	Common	Common	Side
*2†			Bottom
	Mixed		

Symbol	P, EA, EB	A, B
01T	1/8NPTF	1/8NPTF
02T	1/4NPTF	1/4NPTF

\*Special Order  
† Bottom porting specification with  
"-02T" is 1/8" P,A,B bottom and 1/4" A,B side

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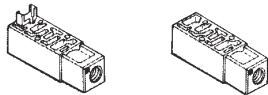
MANIFOLD / OPTION PARTS ASSEMBLY

**Manifold /Option Parts Ass'y**

**SUP Relocation spacer**

An individual SUP spacer on manifold block can form individual P port for the valve.

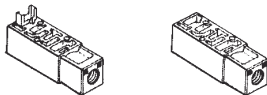
Body type	Plug-in type
Part No. 1/8NPTF	NVFS2000-P-01T-1
1/4NPTF	NVFS2000-P-02T-1



**EXH Relocation spacer**

An individual EXH spacer on manifold block can form individual EXH port for the valve.

Body type	Plug-in type
Part No. 1/8NPTF	NVFS2000-R-01T-1
1/4NPTF	NVFS2000-R-02T-1



**SUP gallery block disc**

When supplying manifold with more than one pressure, insert block disc in between stations subjected to different pressures.

Body type	Plug-in type
Part No.	AXT625-12A

**EXH gallery block disc**

When valve exhaust affects the other stations on the circuit or when externally piloted, dual pressure valve is used on a standard manifold, insert EXH block disc(s) in between stations to isolate valve exhaust.

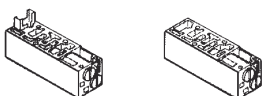
Body type	Plug-in type
Part No.	AXT625-12A



**Interface speed control**

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

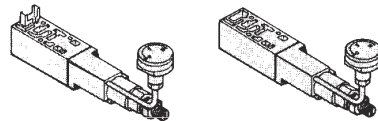
Body type	Plug-in type
Part No.	NVFS2000-20A-1 NVFS2000-20A-2



**Interface regulator**

Spacer type regulator on manifold block controls supply pressure to the valve. With standard gauge.

Body type	Plug-in type
Pressure Regulation P	NARBF2000-00-P-1

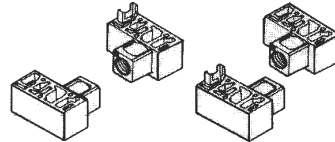


**Air Shutoff valve spacer**

The concurrent use of air shutoff valve spacer with NVFS2100 controls supply of air pressure to the manifold (3-way dump valve). Specify location in **first (L)** or **last (R)** station of manifold.

Body type	Plug-in type
Part No.	NVFS2000-24A-1 L R

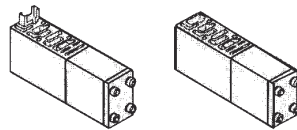
Note) L: U side mount R: D side mount



**Double Check "Perfect" spacer**

The concurrent use of perfect spacer with built-in double check valve can stop the cylinder at mid-position and hold for extended time without being affected by the air leakage across spool seals.

Body type	Plug-in type
Part No.	NVFS2000-22A-1



**Blank plate**

When disassembling valve for maintenance purposes or when spare manifold stations are required, install Blank plate on the manifold block.

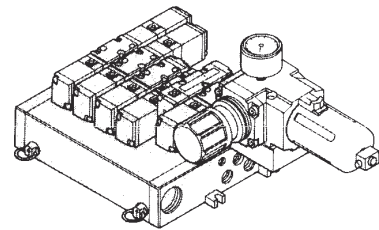
Body type	Plug-in type
Part No.	VVFS2000-10A

**Manifold /Option**

**Control Unit**

Plug-in type.

- Filter/Regulator, Pressure switch, and Air shutoff valve all combine to form one unit.
- Piping work eliminated.



For more information, Please refer to catalog N233

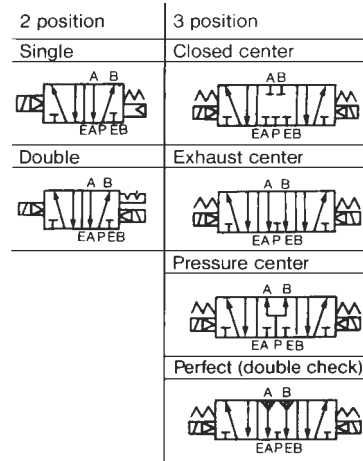


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### MODEL NVFS3000

Position	Number Of Solenoid	Type Plug-In	Port Size (NPTF)	Cv Factor	Response Time (ms)
2 Position	Single	NVFS3100	1/4	1.8	20 or less
			3/8	2	
3 Position	Double	NVFS3200	1/4	1.8	15 or less
			3/8	2	
	Closed Center	NVFS3300	1/4	1.8	40 or less
			3/8	2	
	Exhaust Center	NVFS3400	1/4	1.8	40 or less
			3/8	2	
Pressure Center	NVFS3500	1/4	1.8	40 or less	
		3/8	2		
Perfect (Double Check)	NVFS3600	1/4	1.1	50 or less	
		3/8	1.2		

### SYMBOLS



### TECHNICAL SPECIFICATIONS STANDARD

	Fluid	Air and Inert Gas	
Valve	Max Operating Pressure	150 PSI (1MPa)	
	Min Operating Pressure	22 PSI (0.15MPa)	
	Ambient & Fluid Temperature	14~140°F (-10~60°C)	
	Lubrication	Not Required	
	Pilot Operator Manual Override	Non Locking Push Type (Flush)	
Protection Construction		Dust Proof	
Electrical	Rated Voltage	AC 110VAC50/60Hz, 220V50/60Hz, 24V50/60Hz	
		DC 12V, 24V	
	Allowable Voltage Range	-15 ~ 10% Rated Voltage	
	Coil Insulation	Class B or Equivalent	
	Apparent Power AC (Power Consumption)	InRush	5.0VA/60Hz, 5.6VA/50Hz
		Holding	2.3VA(1.5W)/60Hz, 3.4VA(2.1W)/50Hz
	Power Consumption DC	1.8W	
Electrical Entry	Plug In	Conduit Terminal (Base Access)	

### TECHNICAL SPECIFICATIONS OPTIONAL

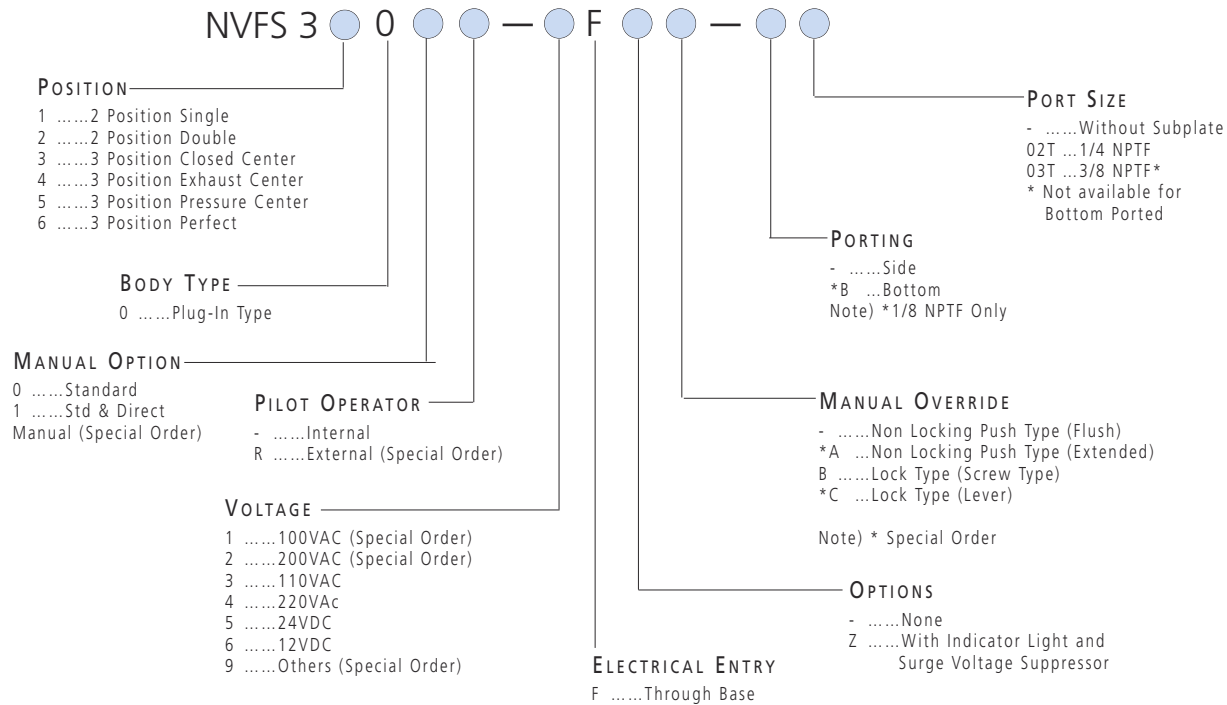
Pilot Type	External Pilot Type	
Manual Override	Main Valve	Direct Manual Override Type
	Pilot Operator	Non Locking Push Type (Extended), Lock Type (Tool), Lock Type (Lever)
Voltage	AC	100V50/60Hz, 200V50/60Hz
	DC	6V, 48V, 100V
Porting	Bottom Ported Subplate	
Option	W/Indicator Light & Surge Voltage Suppressor	

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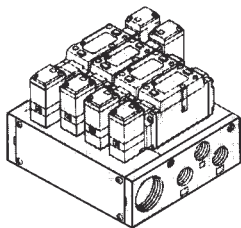
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NVFS3000



HOW TO  
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MANIFOLD

**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.



**NV5FS3-01T-061-02T**

Series NVFS3000  
Manifold valve

Plug-in type  
With terminal block

**Stations**

02	2 stations
⋮	⋮
10	10 stations

● Port size

Symbol	A, B
02T	1/4NPTF
03T	3/8NPTF
* Bottom ported 1/4NPTF only.	

● Porting Symbol

Symbol	Port specifications		Porting Specifications (A,B)
	P	EA, EB	
1	Common	Common	Side
*2			Bottom (Option)
Mixed			

\* Special Order.



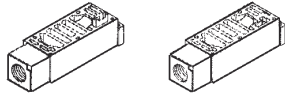
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## Manifold/Option Parts

### SUP Relocation spacer

An individual SUP spacer on manifold block can form individual P port for the valve.

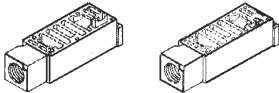
Body type	Plug-in type
Part No.	NVFS3000-P-03T-1



### EXH Relocation spacer

An individual EXH spacer on the manifold block can form individual R port for the valve.

Body type	Plug-in type
Part No.	NVFS3000-R-03T-1



### SUP gallery block disc

When supplying manifold with more than one pressure, insert block disc in between stations subjected to different pressures.

Body type	Plug-in type
Part No.	AXT636-1A

### EXH gallery block disc

When valve exhaust affects the other stations on the circuit or when externally piloted, dual pressure valve is used on a standard manifold, insert EXH block disc(s) in between stations to separate valve exhaust.

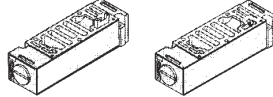
Body type	Plug-in type
Part No.	AXT636-1A



### Interface Speed Control

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

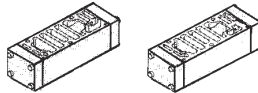
Body type	Plug-in type
Part No.	NVFS3000-20A-1



### Double Check "Perfect" spacer

The concurrent use of perfect spacer with built-in double check valve can stop the cylinder at mid-position and hold for extended time without being affected by normal air leakage across spool seals.

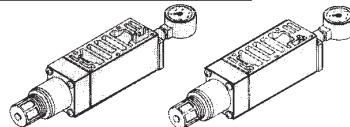
Body type	Plug-in type
Part No.	NVFS3000-22A-1



### Interface regulator

Spacer type regulating valve on manifold block can regulate the pressure to the valve.

Body type	Plug-in type
Pressure regulation P	NARBF3000-NO-P-1
Pressure regulation A	NARBF3000-NO-A-1
Pressure regulation B	NARBF3000-NO-B-1



### Blank plate

When disassembling valve for maintenance purposes or when spare manifold stations are required, install Blank plate on the manifold block.

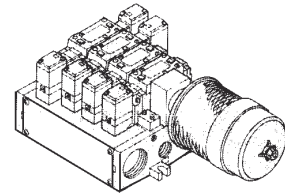
Body type	Plug-in type
Part No.	VVFS3000-10 A

## Manifold Options

### Exhaust Cleaner Unit

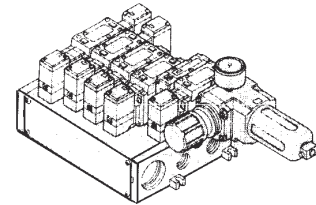
Plug-in type

- Valve exhaust noise damping: 35dB or more.
- Oil mist collection: Rate of collection 99.9% or more.
- Piping process reduced.



### Control Unit

- Filter/Regulator, Pressure switch, and Air shutoff valve all combine to form one unit.
- Piping work eliminated.



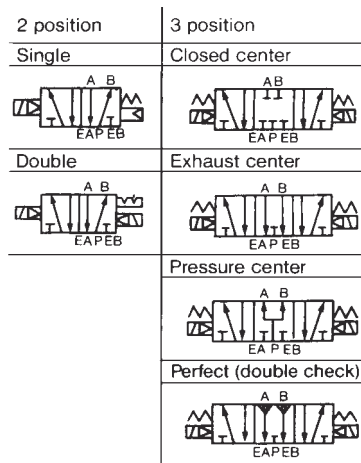
For more information, refer to catalog N233



## MODEL NVFS4000

Position	Number Of Solenoid	Type Plug-In	Port Size (NPTF)	Cv Factor	Response Time (ms)
2 Position	Single	NVFS4100	3/8	3.3	40 or less
			1/2	6	
	Double	NVFS4200	3/8	3.3	15 or less
			1/2	3.6	
3 Position	Closed Center	NVFS4300	3/8	2.8	50 or less
			1/2	3	
	Exhaust Center	NVFS4400	3/8	2.8	50 or less
			1/2	3	
	Pressure Center	NVFS4500	3/8	3.2	50 or less
			1/2	3.4	
Perfect (Double Check)	NVFS4600	3/8	1.7	55 or less	
			1/2	1.8	

## SYMBOLS



## TECHNICAL SPECIFICATIONS STANDARD

	Fluid	Air and Inert Gas	
Valve	Max Operating Pressure	150 PSI (1MPa)	
	Min Operating Pressure	2 Position	15 PSI (0.1MPa)
		3 Position	22 PSI (0.15MPa)
	Ambient & Fluid Temperature	Note 1) 14~140°F (-10~60°C)	
	Lubrication	Note 2) Not Required	
	Pilot Operator Manual Override	Non Locking Push Type (Flush)	
	Protection Construction	Dust Proof	
Electrical	Rated Voltage	AC	110VAC50/60Hz, 220V50/60Hz, 24V50/60Hz
		DC	12V, 24V
	Allowable Voltage Range	-15 ~ 10% Rated Voltage	
	Coil Insulation	Class B or Equivalent	
	Apparent Power AC (Power Consumption)	InRush	5.0VA/60Hz, 5.6VA/50Hz
		Holding	2.3VA(1.5W)/60Hz, 3.4VA(2.1W)/50Hz
	Power Consumption DC	1.8W	
Electrical Entry	Plug In	Conduit Terminal (Base Access)	

Note 1) Use Dry Air at Low Temperature

Note 2) Use Turbine Oil No 1 (ISOVG32), if lubricated

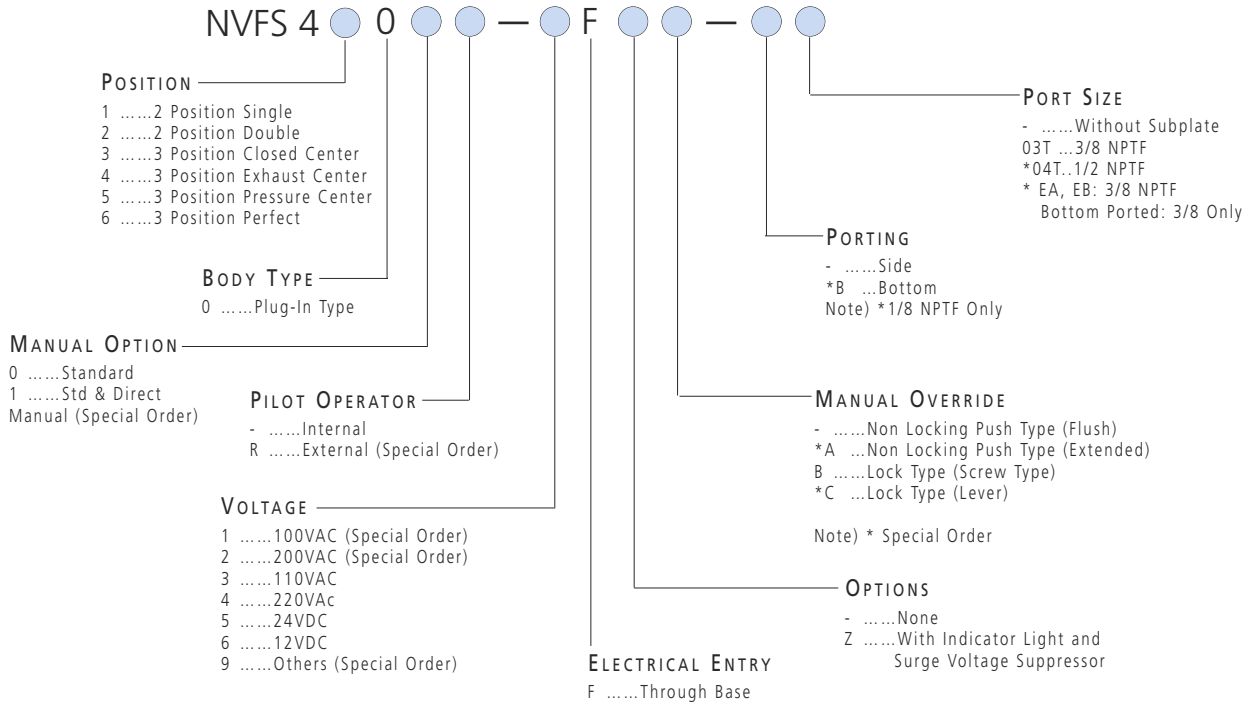
## TECHNICAL SPECIFICATIONS OPTIONAL

Pilot Type		External Pilot Type
Manual Override	Main Valve	Direct Manual Override Type
	Pilot Operator	Non Locking Push Type (Extended), Lock Type (Tool), Lock Type (Lever)
Voltage	AC	100V50/60Hz, 200V50/60Hz
	DC	6V, 48V, 100V
Porting	Bottom Ported Subplate	
Option	W/Indicator Light & Surge Voltage Suppressor	



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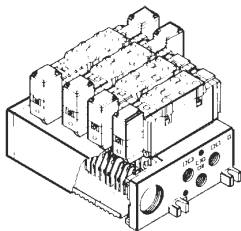
**HOW TO  
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NVFS4000**



**HOW TO  
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MANIFOLD**

### 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.



**NVV5FS4-01T-061-03T**

Series NVFS4000  
Manifold valve

Plug-in type  
With terminal block

**Stations**

02	2 stations
⋮	⋮
10	10 stations

● Port size

Suffix	P, EA, EB	A, B
03T	1/2 NPTF	3/8 NPTF
04T	1/2 NPTF	1/2 NPTF

\* Bottom ported 3/8NPTF only.

● Symbol

Suffix	Port specifications		Porting specifications (A,B)
	P	EA, EB	
1	Common	Common	Side
* 2	Common	Common	*Bottom
	Mixed		

\* Special order.

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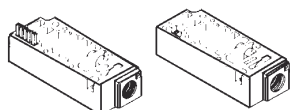
MANIFOLD / OPTION PARTS ASSEMBLY

## Manifold / Option Parts

### SUP Relocation spacer

An individual SUP spacer on manifold block can form individual P port for the valve.

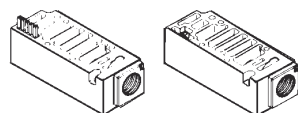
Body type	Plug-in type
Part No.	NVVFS4000-P-03T-1



### EXH Relocation spacer

An individual EXH spacer on manifold block can form individual R port for the valve.

Body type	Plug-in type
Part No.	NVVFS4000-R-04T-1



### SUP gallery block disc

When supplying manifold with more than one pressure, insert block disc in between stations subjected to different pressures.

Body type	Plug-in type
Part No.	AXT634-10A



SUP block disc

### 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.

Body type	Plug-in type
Parts No.	AXT634-11A

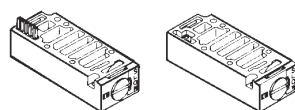


EXH block disc

### Interface speed control

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

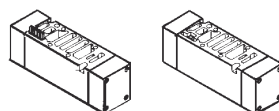
Body type	Plug-in type
Part No.	NVVFS4000-20A-1



### Double Check "Perfect" spacer

The concurrent use of perfect spacer with built-in double check valve can stop the cylinder at mid-position and hold for extended time without being affected by normal air leakage across the spool seals.

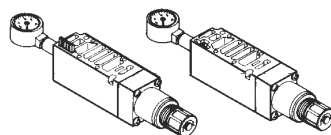
Body type	Plug-in type
Part No.	NVVFS4000-22A-1



### Interface regulator

Spacer type regulating valve on manifold block can regulate the pressure to the valve. With std. gauge.

Body type	Plug-in type
Pressure Regulation P	NARBF4000-NO-P-1
Pressure Regulation A	NARBF4000-NO-A-1
Pressure Regulation B	NARBF4000-NO-B-1



### Blank plate : VVFS4000-10A

When disassembling valve for maintenance purposes or when spare manifold stations are required, install Blank plate on the manifold block.

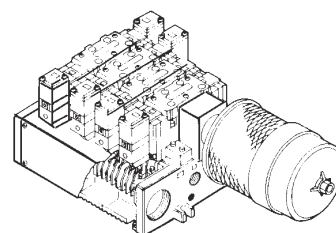
Body type	Plug-in type
Part No.	VVFS4000-10A

## Manifold Options

### With exhaust cleaner unit

Plug-in type

- Valve exhaust noise damping: 35db or more.
- Oil mist collection: Rate of collection 99.9% or more.
- Piping process reduced.

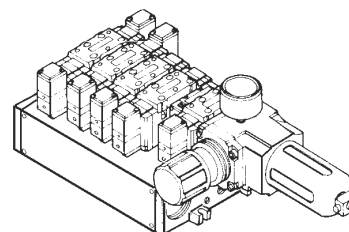


For more information,  
refer to catalog N233

### With Control Unit

Plug-in type

- Filter/Regulator, Pressure Switch, and Air shutoff valve all combine to form one unit.
- Piping work eliminated.



For more information,  
refer to catalog N233

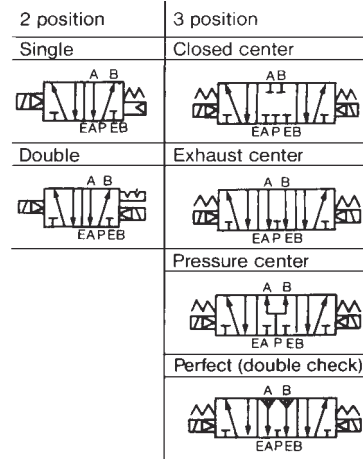


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## MODEL NVFS5000

Position	Number Of Solenoid	Type Plug-In	Port Size (NPTF)	Cv Factor	Response Time (ms)
2 Position	Single	NVFS5100	3/8	4.4	45 or less
			1/2	5.4	
			3/4	5.7	
2 Position	Double	NVFS5200	3/8	4.4	25 or less
			1/2	5.4	
			3/4	5.7	
3 Position	Closed Center	NVFS5300	3/8	3.7	55 or less
			1/2	4.6	
			3/4	4.8	
	Exhaust Center	NVFS5400	3/8	3.9	55 or less
			1/2	4.8	
			3/4	5	
Pressure Center	NVFS5500	3/8	3.9	55 or less	
		1/2	4.8		
		3/4	4.9		
Perfect (Double Check)	NVFS5600	3/8	2.2	60 or less	
		1/2	2.7		
		3/4	2.8		

## SYMBOLS



## TECHNICAL SPECIFICATIONS STANDARD

	Fluid	Air and Inert Gas
Valve	Max Operating Pressure	150 PSI (1MPa)
	Min Operating Pressure	15 PSI (0.15MPa)
	Ambient & Fluid Temperature	Note 1) 14~140°F (-10~60°C)
	Lubrication	Note 2) Not Required
	Pilot Operator Manual Override	Non Locking Push Type (Flush)
	Protection Construction	Dust Proof
Electrical	Rated Voltage	AC 110VAC50/60Hz, 220V50/60Hz, 24V50/60Hz
		DC 12V, 24V
	Allowable Voltage Range	-15 ~ 10% Rated Voltage
	Coil Insulation	Class B or Equivalent
	Apparent Power AC (Power Consumption)	InRush 5.0VA/60Hz, 5.6VA/50Hz
		Holding 2.3VA(1.5W)/60Hz, 3.4VA(2.1W)/50Hz
	Power Consumption DC	1.8W
Electrical Entry	Plug In	Conduit Terminal (Base Access)

## TECHNICAL SPECIFICATIONS OPTIONAL

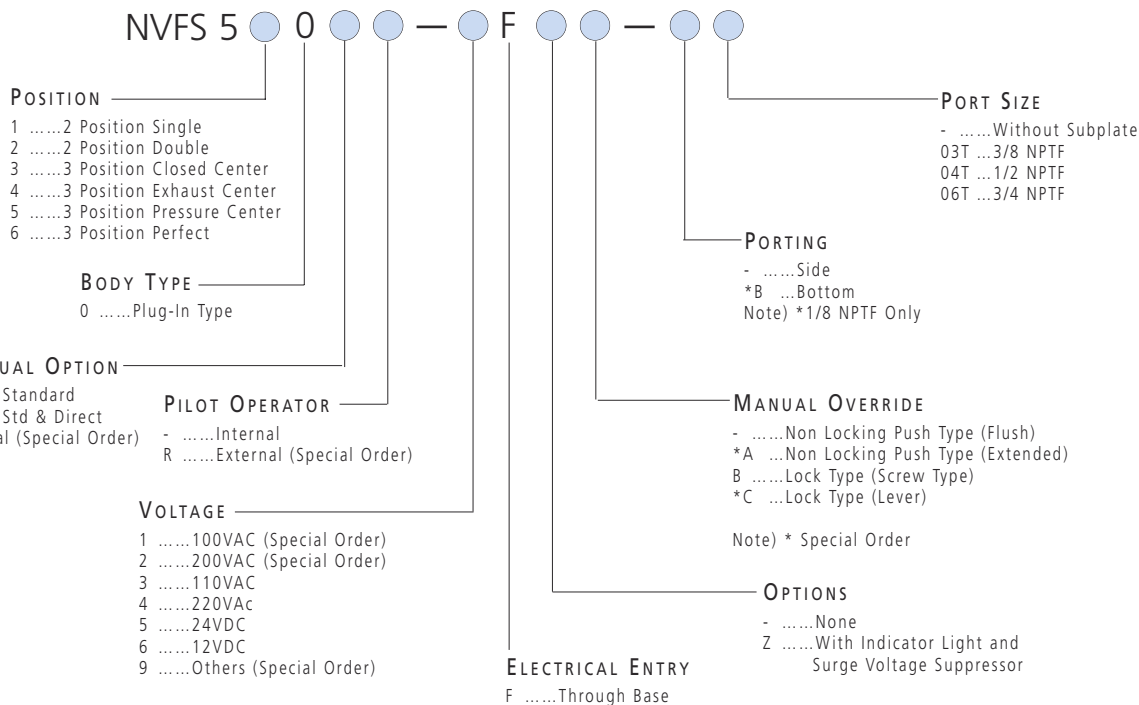
	Pilot Type	External Pilot Type
Manual Override	Main Valve	Direct Manual Override Type
	Pilot Operator	Non Locking Push Type (Extended), Lock Type (Tool), Lock Type (Lever)
Voltage	AC	100V50/60Hz, 200V50/60Hz
	DC	6V, 48V, 100V
Porting		Bottom Ported Subplate
Option		W/Indicator Light & Surge Voltage Suppressor

Note 1) Use Dry Air at Low Temperature

Note 2) Use Turbine Oil No 1 (ISOVG32), if lubricated



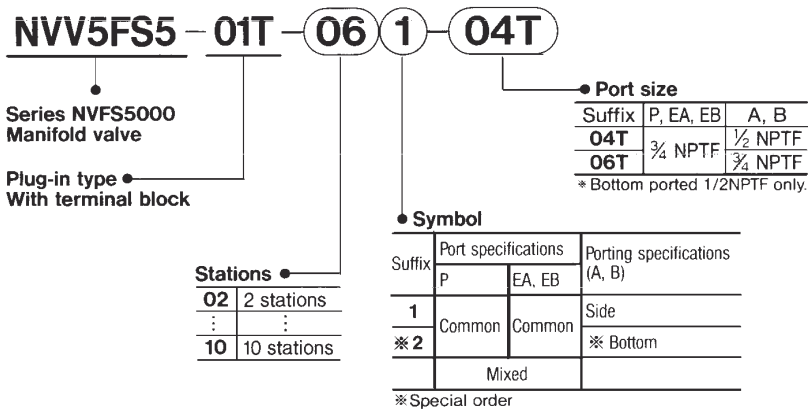
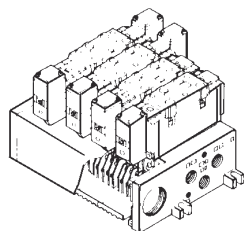
How To  
ORDER  
NVFS5000



How To  
ORDER  
MANIFOLD

### 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.



HOW TO  
ORDER

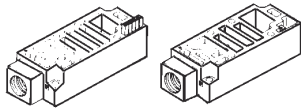
MANIFOLD / OPTION PARTS ASSEMBLY

## Manifold / Option Part's Ass'y

### SUP Relocation spacer

An individual SUP spacer on manifold block can form individual P port for the valve.

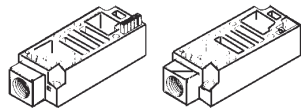
Body type	Plug-in type
Part No.	NVVFS5000-P-04T-1



### EXH Relocation spacer

An individual EXH spacer on manifold block can form individual R port for the valve.

Body type	Plug-in type
Part No.	NVVFS5000-R-04T-1



### SUP gallery block disc

When supplying manifold with more than one pressure, insert block disc in between stations subjected to different pressures.

Body type	Plug-in type
Part No.	AXT628-12A



SUP block disc

### EXH gallery block disc

When valve exhaust affects the other stations on the circuit or when externally piloted, dual pressure valve is used on a standard manifold, insert EXH block disc(s) in between stations to separate valve exhaust.

Body type	Plug-in type
Part No.	AXT512-14-1A

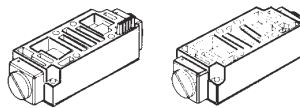


EXH block disc

### Interface speed control

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

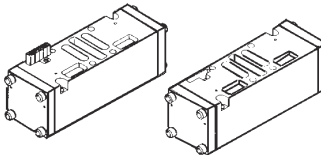
Body type	Plug-in type
Part No.	NVVFS5000-20A-1



### Double Check "Perfect" spacer

The concurrent use of perfect spacer with built-in double check valve can stop the cylinder at mid-position and hold for extended time without being affected by normal air leakage across the spool seals.

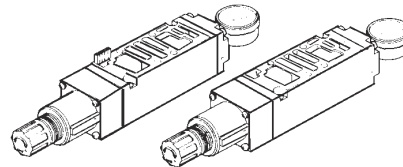
Body type	Plug-in type
Part No.	NVVFS5000-22A-1



### Interface regulator

Spacer type regulating valve on manifold block can regulate the pressure to the valve.

Body type	Plug-in type
Pressure Regulation P	NARBF5000-N0-P-1
Pressure Regulation A	NARBF5000-N0-A-1
Pressure Regulation B	NARBF5000-N0-B-1



### Blank plate

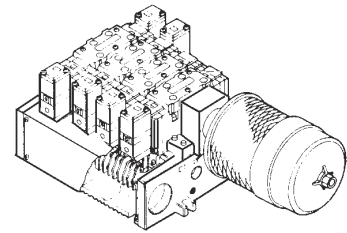
When disassembling valve for maintenance purposes or when spare manifold stations are required, install Blank plate on the manifold block.

Body type	Plug-in type
Part No.	VVFS5000-10A

## Manifold Options

### With Exhaust Cleaner Plug-in type

- Valve exhaust noise damping: 35dB or more.
- Oil mist collection: Rate of collection 99.9% or more.
- Piping process reduced.



For more information, Please refer to catalog N233

