5 Port Pilot Operated Solenoid Valve

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

Metal Seal

Series Variations

Series		Sonic conductance C [dm³/s·bar)] 4/2→5/3(A/B→R1/R2) Single	Sonic conductance C [dm³/s·bar)] 4/2→5/3(A/B→R1/R2) Double	Type of actuation	Voltage	Electrical entry	With light/surge voltage suppressor (Option)	Manual override
Body Ported	**VFS1000** (P.1114)	1.8	1.8	2 position single 2 position double 3 position closed center 3 position exhaust center 3 position pressure center	(Standard) 100 VAC, 50/60 Hz 200 VAC, 50/60 Hz 24 VDC (Option) 110 to 120 VAC, 50/60 Hz 220 VAC, 50/60 Hz 240 VAC, 50/60 Hz 12 VDC 100 VDC	Grommet (G) Grommet terminal (E) Conduit terminal (T) DIN terminal (D)	☐With light/surge voltage suppressor • Grommet terminal (EZ) • Conduit terminal (TZ) • DIN terminal (DZ) ☐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 (Flush) Non-locking push type (Extended) Locking type (Tool required) Locking type * (Lever)
	VFS2000 (P.1122)	3.4	3.4					
	VFS3000 (P.1130)	6.8	6.5					

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

Series		Sonic conductance C [dm³/s·bar)] 4/2→5/3(A/B→R1/R2) Single	Sonic conductance C [dm³/s·bar)] 4/2→5/3(A/B→R1/R2) Double	Type of actuation	Voltage	Electrical entry	With light/surge voltage suppressor (Option)	Manual override
Base Mounted	**VFS2000** 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 3 position pressure center 3 position double check	(Standard) 100 VAC, 50/60 Hz 200 VAC, 50/60 Hz 24 VDC (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) **Non plug-in** Grommet terminal (E) Grommet (G) Conduit terminal (T) DIN terminal (D)	☐With light/surge voltage suppressor • Plug-in type Conduit terminal (FZ) • Non plug-in type Grommet terminal (EZ) Conduit terminal (TZ) DIN terminal (DZ) ☐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) Locking type (Tool required) Locking type (Lever)
	VFS3000 Plug-in type Non plug-in type (P.1162)	5.8	5.4			**Plug-in** Conduit terminal (F) **Non plug-in** Grommet terminal (E) DIN terminal (D)	☐With light/surge voltage suppressor • Plug-in type Conduit terminal (FZ) • Non plug-in type Grommet terminal (EZ) DIN terminal (DZ)	
	VFS4000 Plug-in type Non plug-in type (P.1182)	12	11					
	VFS5000 Plug-in type Non plug-in type (P.1202)	20	17					
	VFS6000 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)		Non-locking push type (Flush)

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)

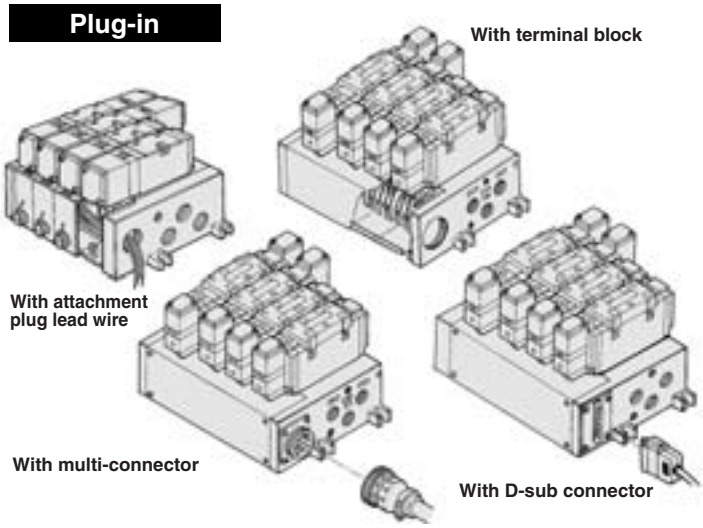
Pilot individual EXH

Pilot common EXH

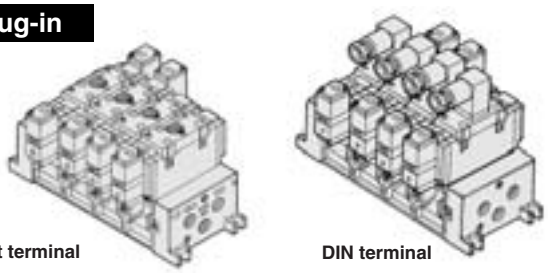
Stacking base
(Series VFS3000)

Pilot common EXH

Plug-in



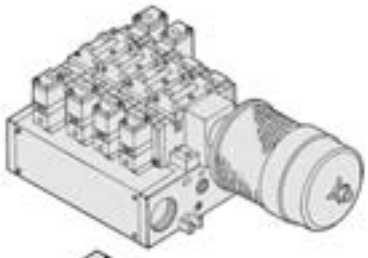
Non Plug-in



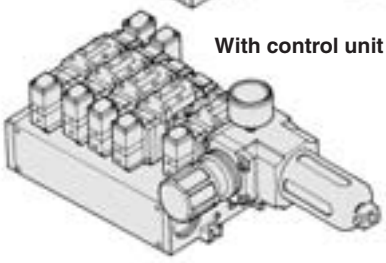
* Bottom piping is available as an option.

Manifold Option				Manifold Option Parts									
With exhaust cleaner	With control unit	Dripproof manifold (Equivalent to IP65)	Serial transmission kit manifold (EX123/4-type compatible)	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)	● Note) (P.1155)	● Note) (P.1158)	● (P.1148)	● (P.1148)	● (P.1148)	● (P.1148)	● (P.1148)	● (P.1148)	● (P.1148)	● (P.1148)	● (P.1148)	● (P.1148)
● (P.1173)	● (P.1175)		● Note) (P.1178)	● (P.1170)	● (P.1170)	● (P.1170)	● (P.1170)	● (P.1170)	● (P.1170)			● (P.1170)	● (P.1170)
● (P.1193)	● (P.1195)		● Note) (P.1198)	● (P.1190)	● (P.1190)	● (P.1190)	● (P.1190)	● (P.1190)	● (P.1190)			● (P.1190)	● (P.1190)
● (P.1212)			● Note) (P.1214)	● (P.1209)	● (P.1209)	● (P.1209)	● (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.1148)	● (P.1148)	● (P.1148)
● (P.1173)	● (P.1175)			● (P.1170)	● (P.1170)	● (P.1170)	● (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.1190)			● (P.1190)	● (P.1190)
● (P.1212)				● (P.1209)	● (P.1209)	● (P.1209)	● (P.1209)	● (P.1209)	● (P.1209)			● (P.1209)	● (P.1209)

With exhaust cleaner

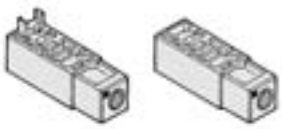


With control unit



Dripproof Manifold (Equivalent to IP65)
With serial transmission kit

Individual SUP spacer



Individual EXH spacer

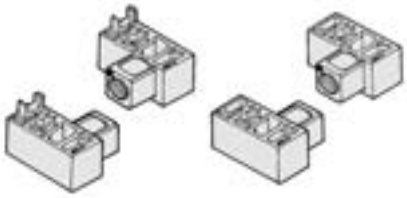
SUP/EXH block disk

Throttle valve spacer

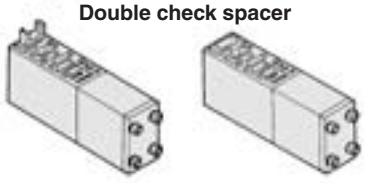
Interface regulator

Air shutoff valve spacer

Air release 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.[1] operating cycle (cpm)	Response[2] time (ms)	Mass[3] (kg)
					1→4/2 (P→A/B)			4/2→5/3 (A/B→R1/R2)					
					C [dm³/(s·bar)]	b	Cv	C [dm³/(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 dm³/(s·bar)

Low power consumption: 1.8 W DC

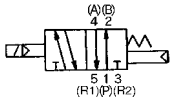
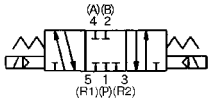
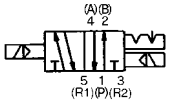
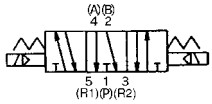
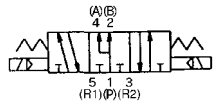
VFS1320-□D-01

VFS1120-□G-01-F

VFS1220-□E-01

VFS1120-□G-01

JIS Symbol

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

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 [1]
	Lubrication		Non-lube [2]
	Pilot valve manual override		Non-locking push type (Flush)
	Shock/Vibration resistance		150/50 m/s² [3]
	Enclosure		Dustproof (Degrees of protection 0) [4]
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) [5]
	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.

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 Note)
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

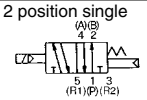
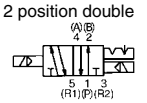
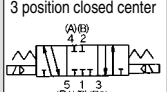
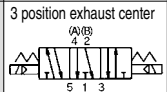
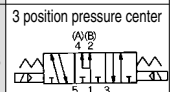
Body type	Applicable manifold base (Pilot EXH)
VFS1□20	Bar manifold (Individual EXH)
VFS1□30	Bar manifold (Common EXH base side)

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

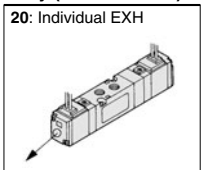
How to Order

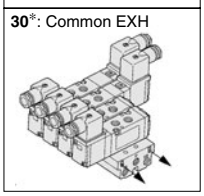
VFS1 [1] [20] – [1] [G] [ ] [ ] – [01] [ ] – [ ] – [ ]

Symbol

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

Body (Pilot exhaust)

20: Individual EXH 

30*: Common EXH 

* Manifold only

Port size

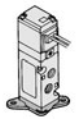
01	Rc 1/8

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Semi-standard

Option

F: With foot bracket 

* Mountable only for VFS1120.

CE-compliant

Nil	—
Q	CE-compliant

Manual override

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

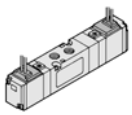
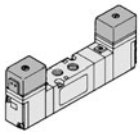
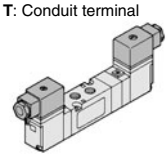
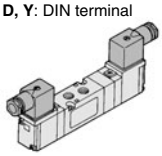
* Semi-standard

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)

* Semi-standard
For other rated voltages, please consult with SMC.

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

* Semi-standard
For other rated voltages, please consult with SMC.

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

* 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)

* Semi-standard

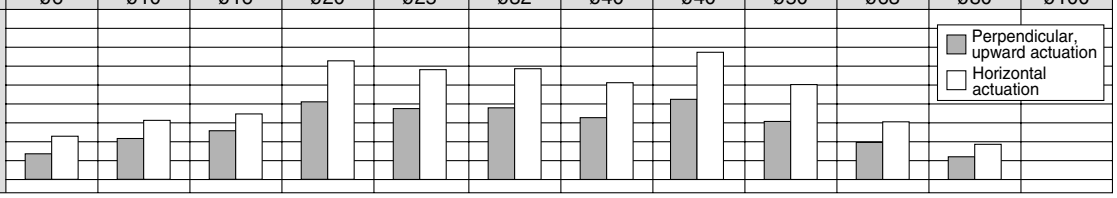
Applicable model

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

Cylinder Speed Chart

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

Body Ported

Series	Average speed (mm/s)	Bore size											
		Series CJ2 Pressure 0.5 MPa Load factor 50% Stroke 60 mm			Series CM2 Pressure 0.5 MPa Load factor 50% Stroke 300 mm				Series MB, CA2 Pressure 0.5 MPa Load factor 50% Stroke 500 mm				
		ø6	ø10	ø16	ø20	ø25	ø32	ø40	ø40	ø50	ø63	ø80	ø100
VFS1120-01	800 700 600 500 400 300 200 100 0												

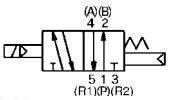
Conditions

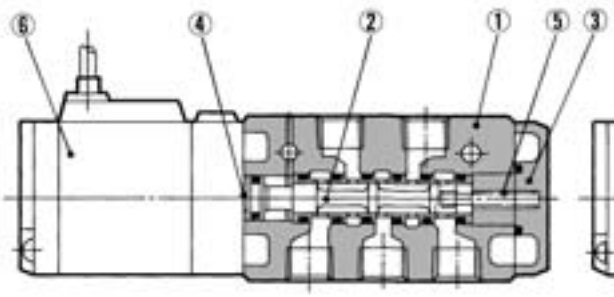
Body ported		Series CJ2	Series CM2	Series MB, CA2
VFS1120-01	Tube bore x Length	T0604 x 1 m	T0806 x 1 m	
	Speed controller	AS3001F-06	AS3001F-08	
	Silencer	AN101-01		

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

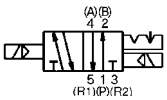
Construction

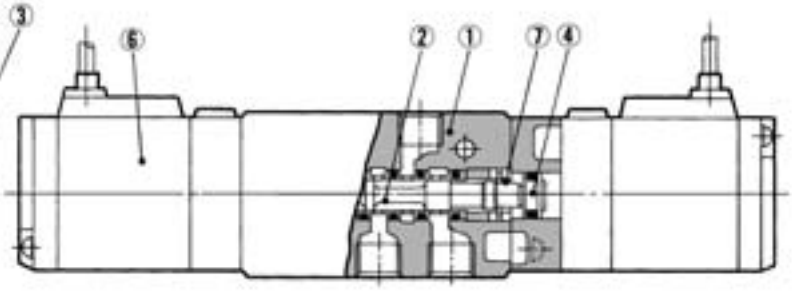
2 position single





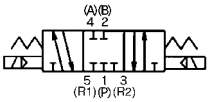
2 position double



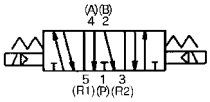


3 position closed center/exhaust center/pressure center

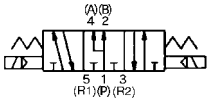
Closed center

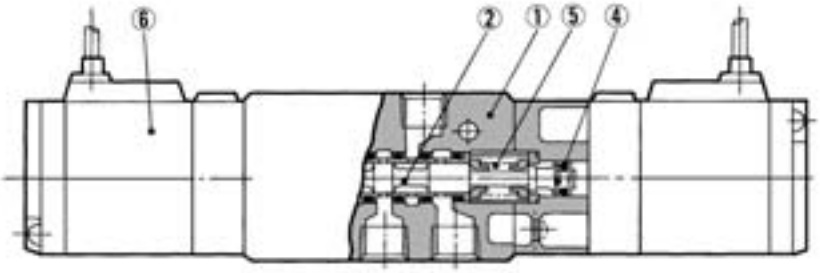


Exhaust center



Pressure center





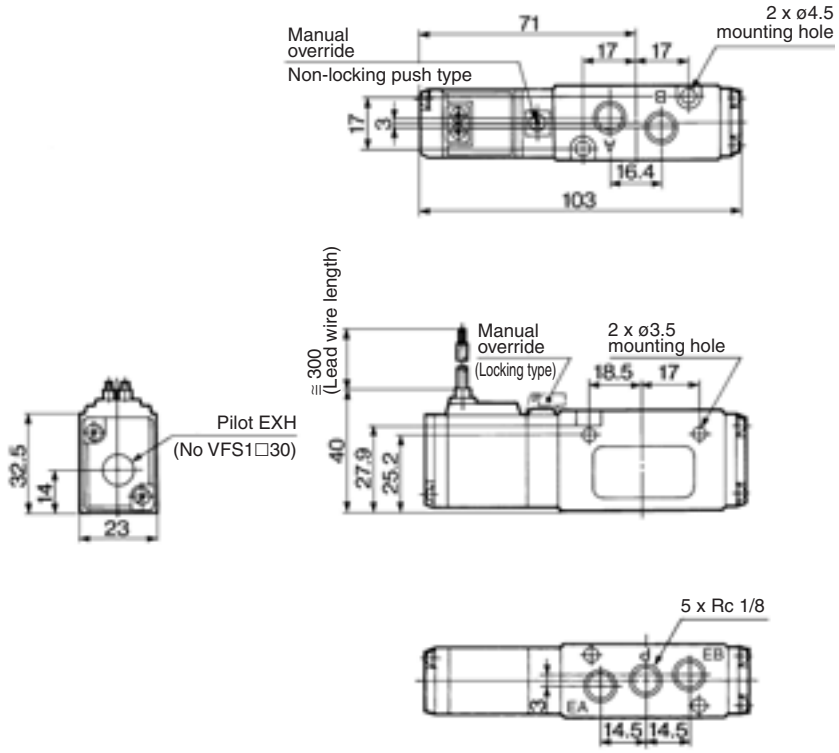
Component Parts

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

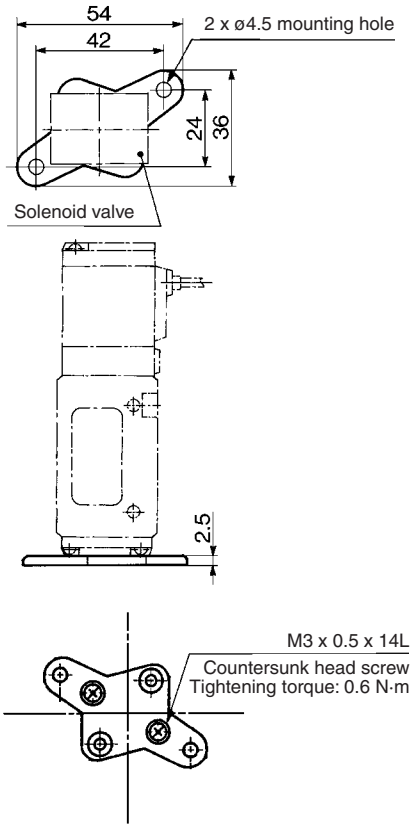
∗ Refer to “How to Order Pilot Valve Assembly” on page 1115.

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

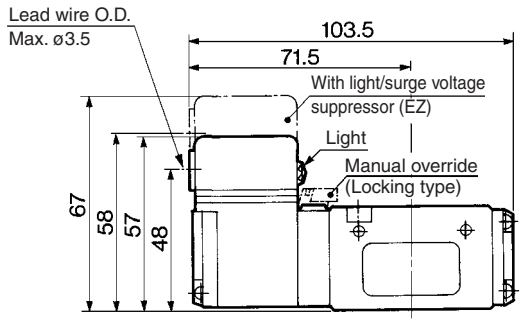
Grommet : VFS1120-□G



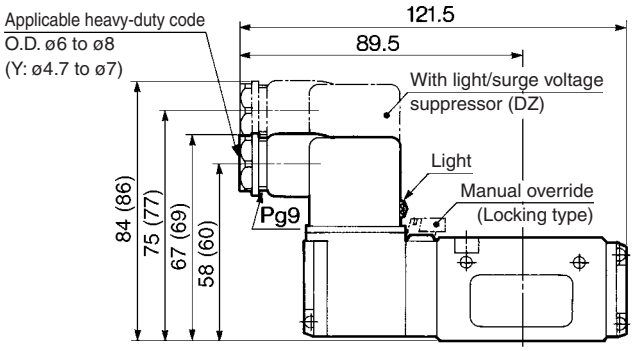
Foot bracket (F)
Part no. : AXT626-10A



Grommet terminal: VFS1120-□E/EZ

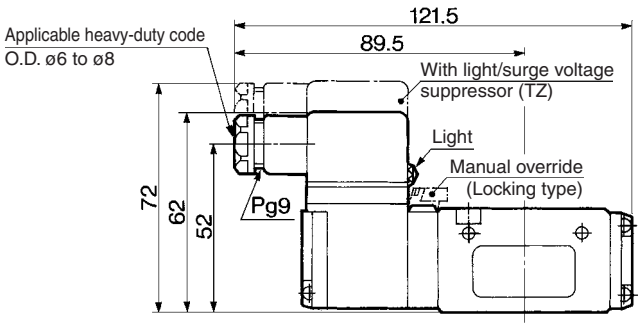


DIN terminal: VFS1120-□D/DZ/Y/YZ



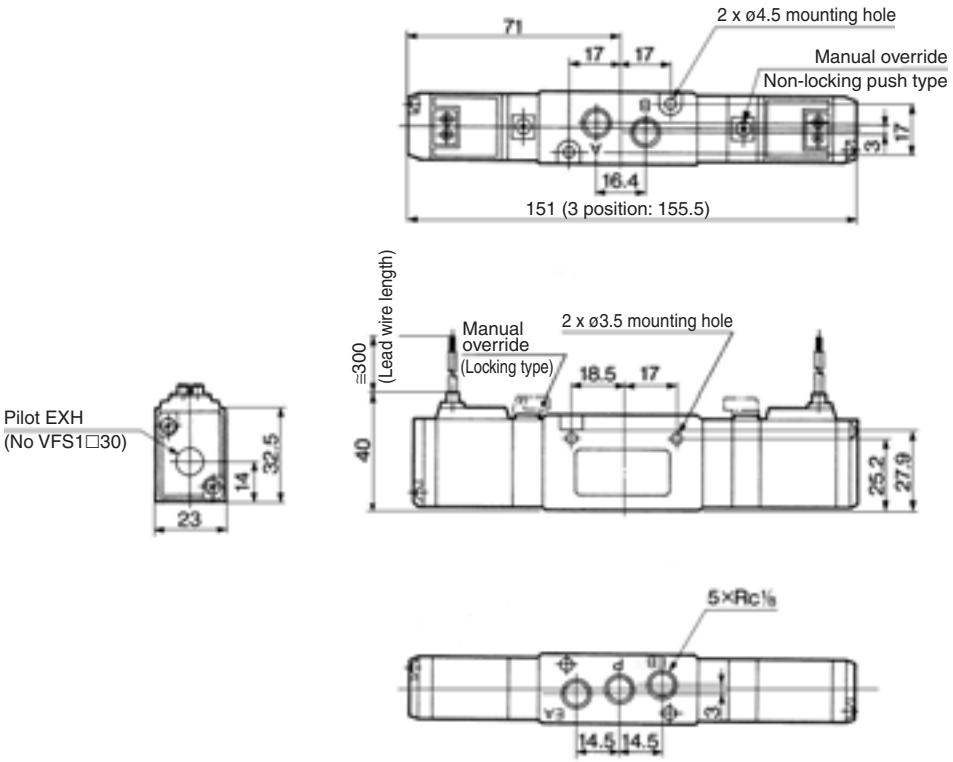
( ): Y, YZ

Conduit terminal: VFS1120-□T/TZ

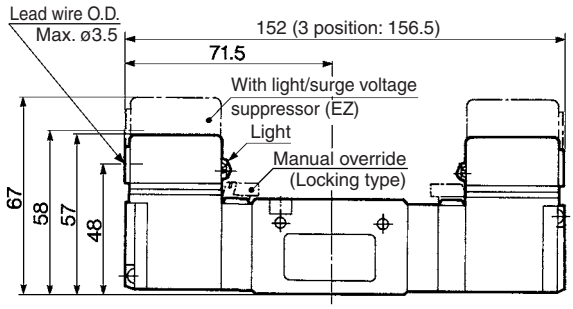


2 Position Double, 3 Position — Grommet, Grommet terminal, Conduit terminal, DIN terminal

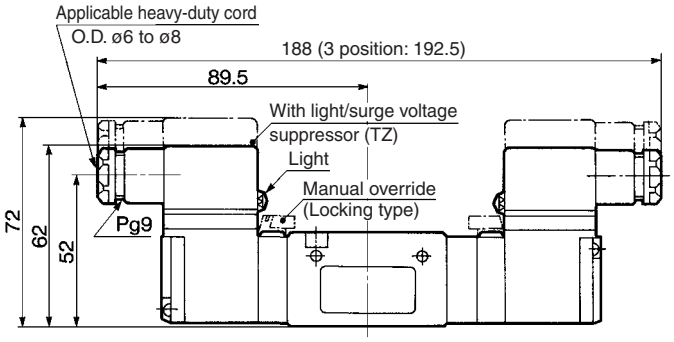
Grommet: VFS1220-□G, VFS1320-□G, VFS1420-□G, VFS1520-□G



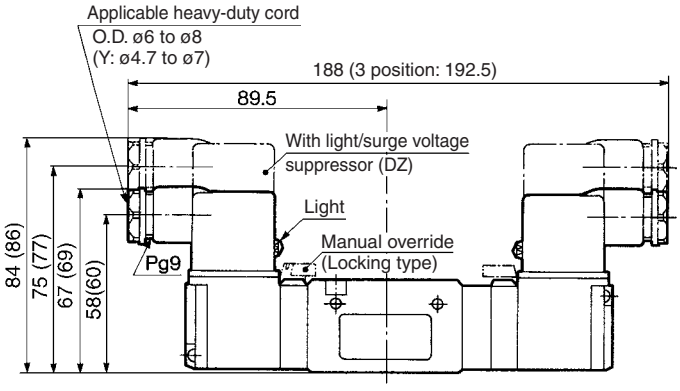
Grommet terminal: VFS1220-□E/EZ VFS1320-□E/EZ VFS1420-□E/EZ VFS1520-□E/EZ



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



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



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

Option

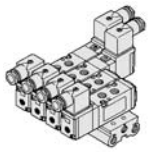
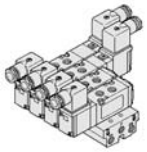
Blanking plate	VVFS1000-10A-1	With gasket, screw

How to Order Manifold Base

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

Series VFS1000 Manifold

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

Stations

02	2 stations
⋮	⋮
15	15 stations

Symbol

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

P, EA, EB port size

01	Rc 1/8

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

∗ Option

CE-compliant

Nil	—
Q	CE-compliant

How to Order Manifold Assembly [Example]

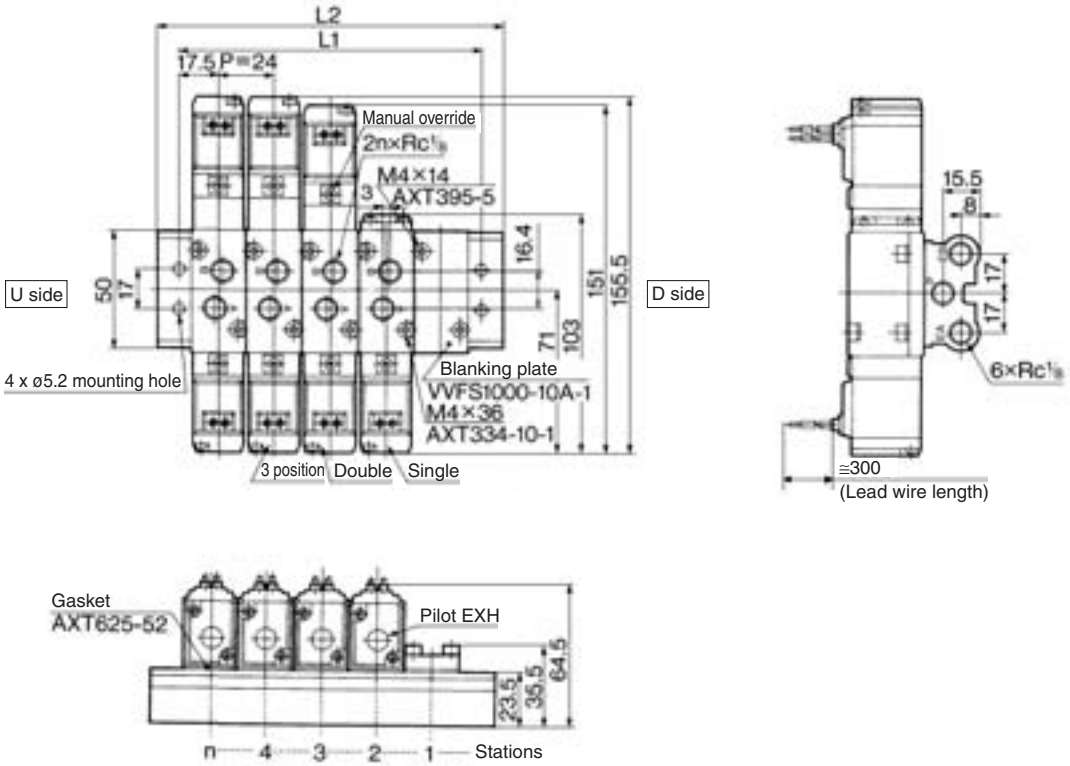
Add the valve and option part numbers in order starting from the first station on the D side.

<Example>
(Manifold base) **VV5FS1-20-061-01** ····· **1**
(2 position single) ∗ **VFS1120-1D-01** ····· **3**
(2 position double) ∗ **VFS1220-1D-01** ····· **2**
(Blanking plate) ∗ **VVFS1000-10A-1** ····· **1**

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

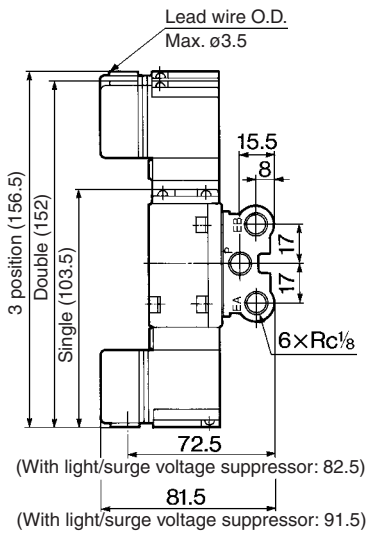
Type 20 Manifold — Pilot individual exhaust: VV5FS1-20-Station 1-01

Grommet: G

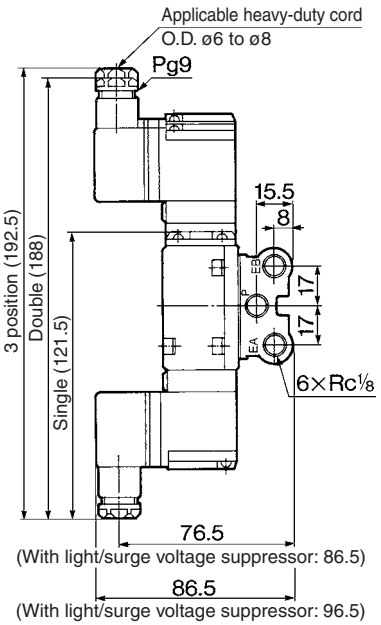


Formula for manifold weight M = 0.049n + 0.059 (kg) n: Station

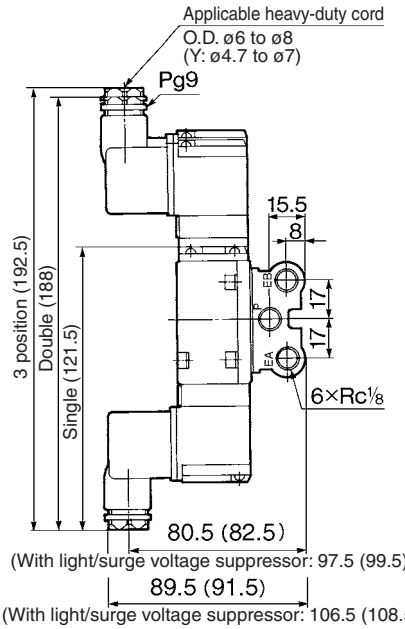
Grommet terminal: E/EZ



Conduit terminal: T/TZ



DIN terminal: D/DZ/Y/YZ



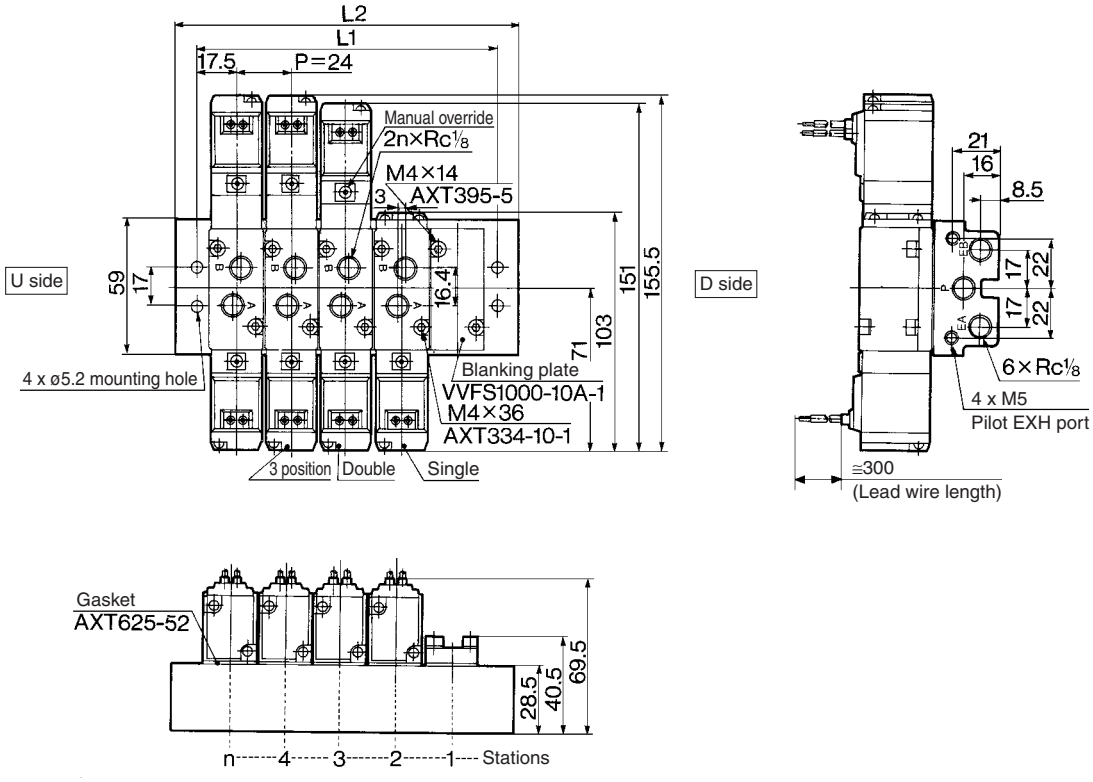
( ): Y, YZ

n: Station

Symbol / Stations	2	3	4	5	6	7	8	9	10	Formula
L_1	59	83	107	131	155	179	203	227	251	L1 = 24 x n + 11
L_2	77	101	125	149	173	197	221	245	269	L2 = 24 x n + 29

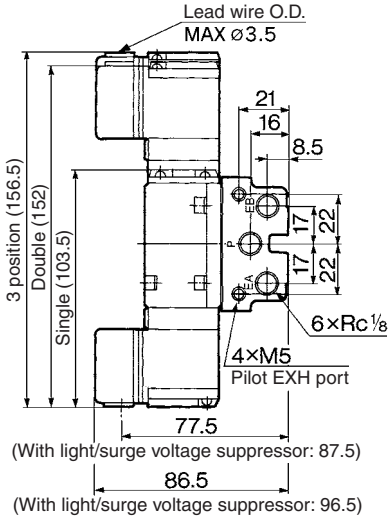
Type 30 Manifold — Pilot common exhaust: VV5FS1-30-Station 1-01

Grommet: G

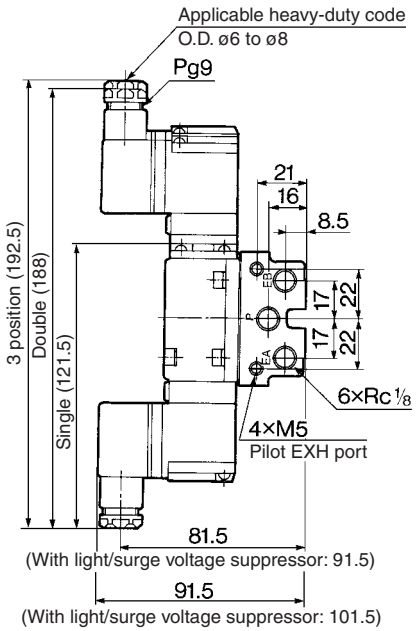


Formula for manifold weight M = 0.079n + 0.093 (kg) n: Station

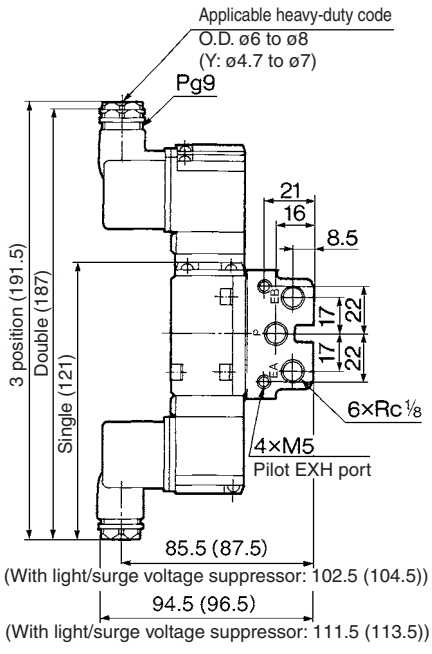
Grommet terminal: E/EZ



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
L_1	59	83	107	131	155	179	203	227	251	L1 = 24 x n + 11
L_2	77	101	125	149	173	197	221	245	269	L2 = 24 x n + 29

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

NRTL /C

(Details → P. 1137-1)

Model

Type of actuation		Model		Port size Rc	Flow characteristics 1→4/2 (P→A/B) C [dm³/(s·bar)]	b	Cv	Flow characteristics 4/2→5/3 (A/B→R1/R2) C [dm³/(s·bar)]	b	Cv	Max. operating cycle (cpm) (1)	Response time (ms) (2)	Mass (kg) (3)
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 dm³/(s·bar)

Low power consumption: 1.8 W DC

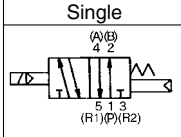
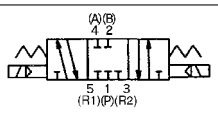
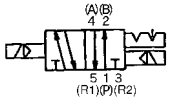
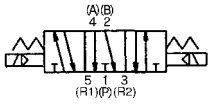
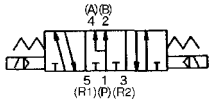
VFS2320-□T-02

VFS2120-□E-02-F

VFS2220-□E-02

VFS2120-□G-02

JIS Symbol

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

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 (1)
	Lubrication		Non-lube (2)
	Pilot valve manual override		Non-locking push type (Flush)
	Shock/Vibration resistance		150/50 m/s² (3)
	Enclosure		Dustproof (Degrees of protection 0) (4)
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) (5)
	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 (1)
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 (2)
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)

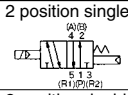
Note) VFS2□30: Manifold only. Cannot be used as a single unit.

How to Order

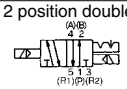
VFS2 1 20 □ – 1 G □ □ – 01 □ – □ – □

Symbol

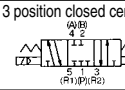
1: 2 position single



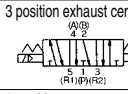
2: 2 position double



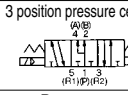
3: 3 position closed center



4: 3 position exhaust center



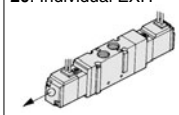
5: 3 position pressure center



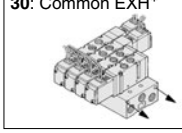
∗ Reverse pressure: Can be used by external pilot specifications.

Body (Pilot exhaust)

20: Individual EXH



30: Common EXH∗



∗ Manifold only

Pilot type

Nil	Internal pilot
R∗	External pilot

∗ Option: Individual external pilot (External pilot port: Body side)

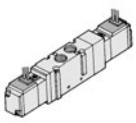
Coil rated voltage

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)

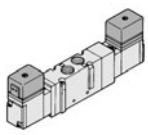
∗ Semi-standard
For other rated voltages, please consult with SMC.

Electrical entry

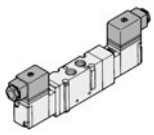
G: Grommet



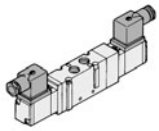
E: Grommet terminal



T: Conduit terminal



D, Y: DIN terminal



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.

Manual override

Nil: Non-locking push type (Flush)

A∗: Non-locking push type (Extended)

B∗: Locking type (Tool required)

∗ Semi-standard

Port size

01	Rc 1/8
02	Rc 1/4

Thread type

Nil	Rc
N∗	NPT
T∗	NPTF
F∗	G

∗ Semi-standard

Option

F: With foot bracket

∗ Mountable only for VFS2120.

CE-compliant

Nil	—
Q	CE-compliant

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

∗ Semi-standard
For other rated voltages, please consult with SMC.

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

∗ 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)

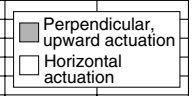
∗ Semi-standard

Cylinder Speed Chart

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

Body Ported

Series	Average speed (mm/s)	Bore size											
		Series CJ2 Pressure 0.5 MPa Load factor 50% Stroke 60 mm			Series CM2 Pressure 0.5 MPa Load factor 50% Stroke 300 mm				Series MB, CA2 Pressure 0.5 MPa Load factor 50% Stroke 500 mm				
		ø6	ø10	ø16	ø20	ø25	ø32	ø40	ø40	ø50	ø63	ø80	ø100
VFS2120-02	800 700 600 500 400 300 200 100 0												



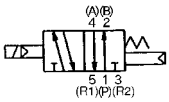
Conditions

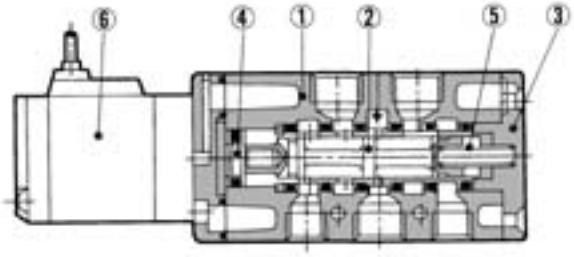
Body ported		Series CJ2	Series CM2	Series MB, CA2
VFS2120-02	Tube bore x Length	T0604 x 1 m	T1075 x 1 m	
	Speed controller	AS3001F-06	AS4001F-10	
	Silencer	AN110-01		

∗ 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%

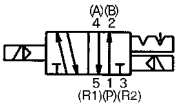
Construction

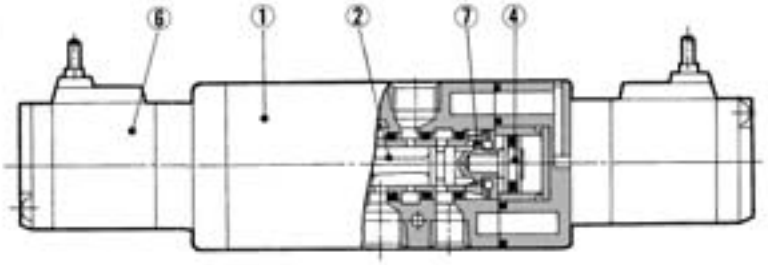
2 position single



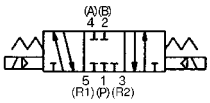


2 position double

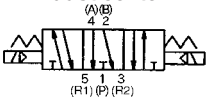




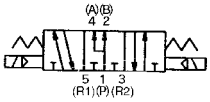
Closed center



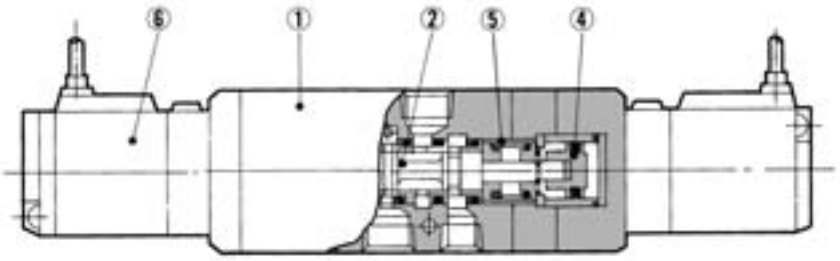
Exhaust center



Pressure center



3 position closed center/exhaust center/pressure center



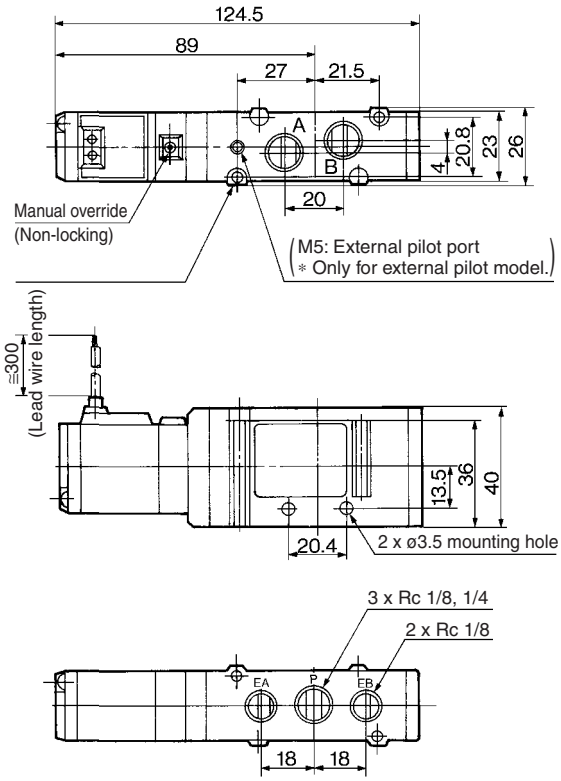
Component Parts

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**	—	—

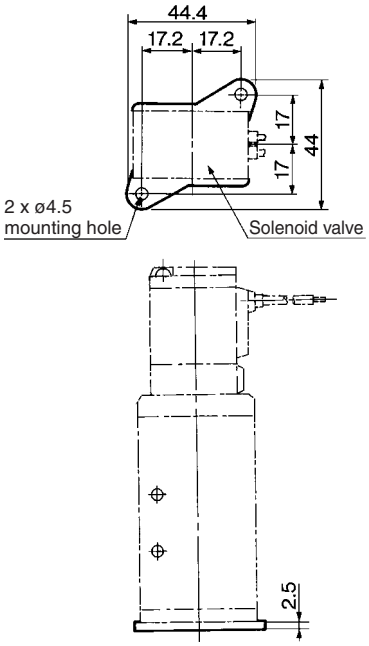
∗ Refer to “How to Order Pilot Valve Assembly” on page 1123.

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

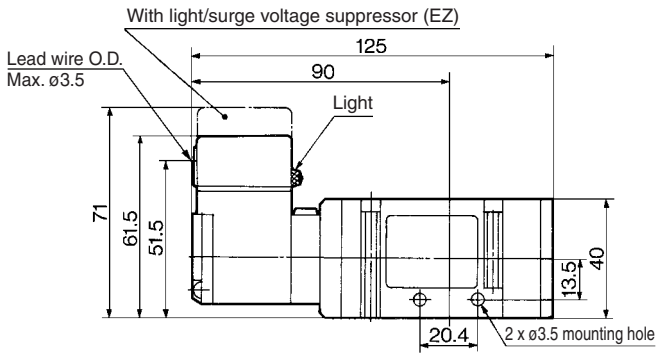
Grommet: VFS2120-□G



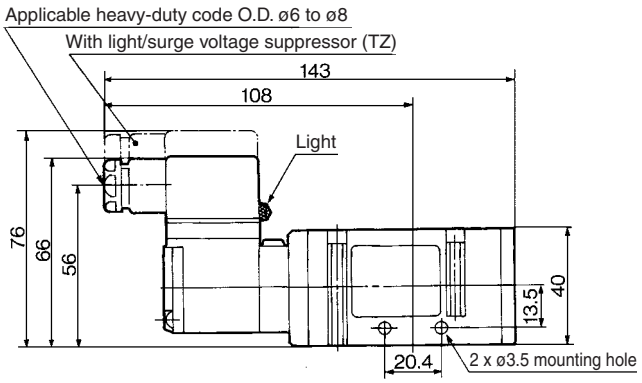
Foot bracket (F)
Part no.: VFN200-17A



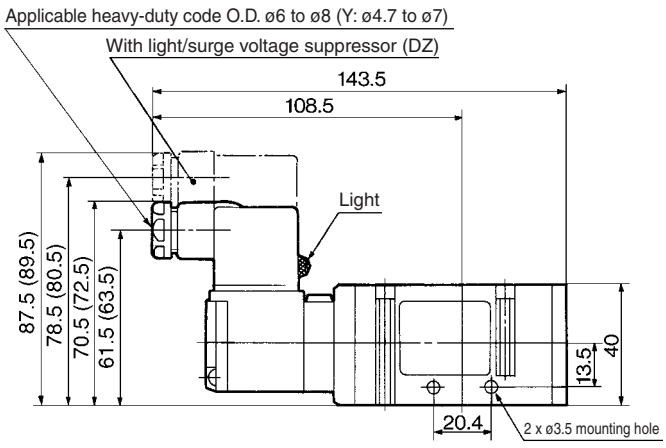
Grommet terminal: VFS2120-□E/EZ



Conduit terminal: VFS2120-□T/TZ



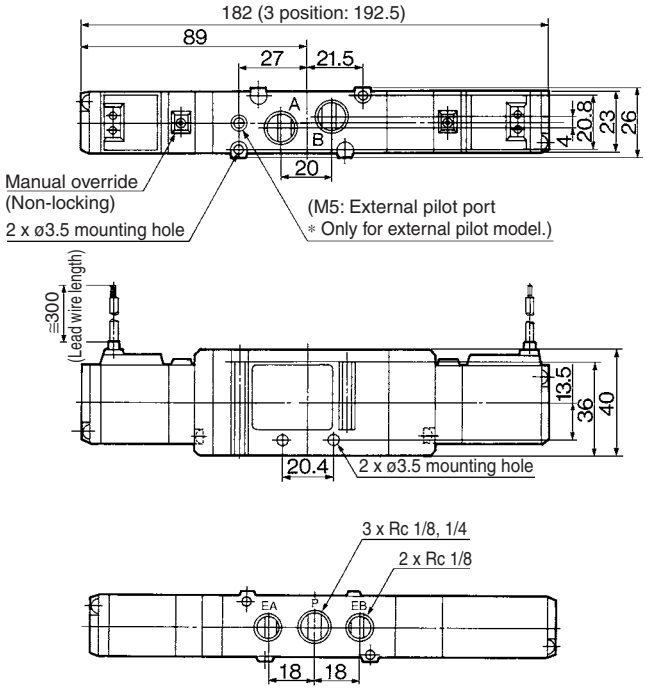
DIN terminal: VFS2120-□D/DZ/Y/YZ



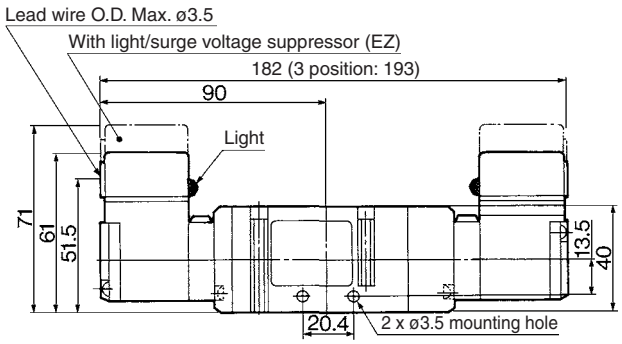
( ): Y, YZ

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

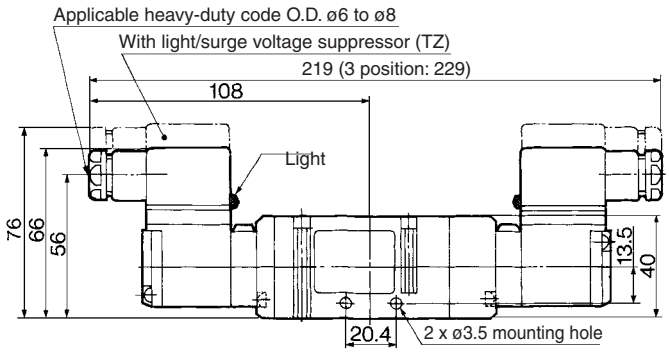
Grommet: VFS2220-□G, VFS2320-□G, VFS2420-□G, VFS2520-□G



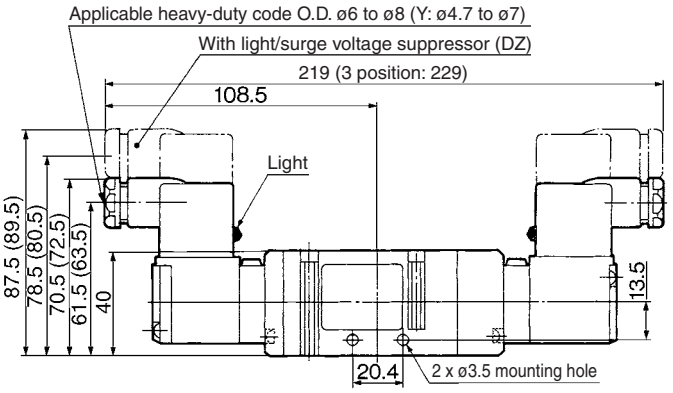
Grommet terminal: VFS2220-□E/EZ VFS2320-□E/EZ VFS2420-□E/EZ VFS2520-□E/EZ



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



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

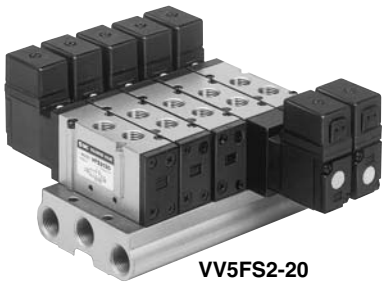


( ): Y, YZ

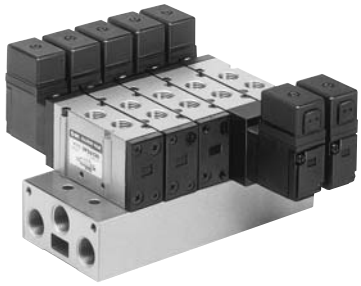
Series VFS2000
Manifold Specifications
Single Base Type

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

Option

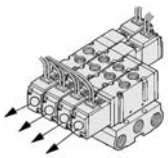
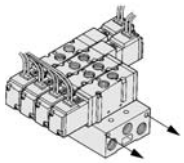
Blanking plate	VVFS2000-10A-1	With gasket, screw

How to Order Manifold Base

VV5FS2 - 20 - 05 1 - 03 □ - □

Series VFS2000 Manifold

Base model

Model	Pilot exhaust	Applicable valve model
20	Pilot individual EXH 	VFS2□20-□□-$^{01}_{02}$
30	Pilot common EXH 	VFS2□30-□□-$^{01}_{02}$ ∗VFS2□20-□□-$^{01}_{02}$ mountable

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

Nil	Rc
N*	NPT
T*	NPTF
F*	G

∗ Option

CE-compliant

Nil	—
Q	CE-compliant

How to Order Manifold Assembly [Example]

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

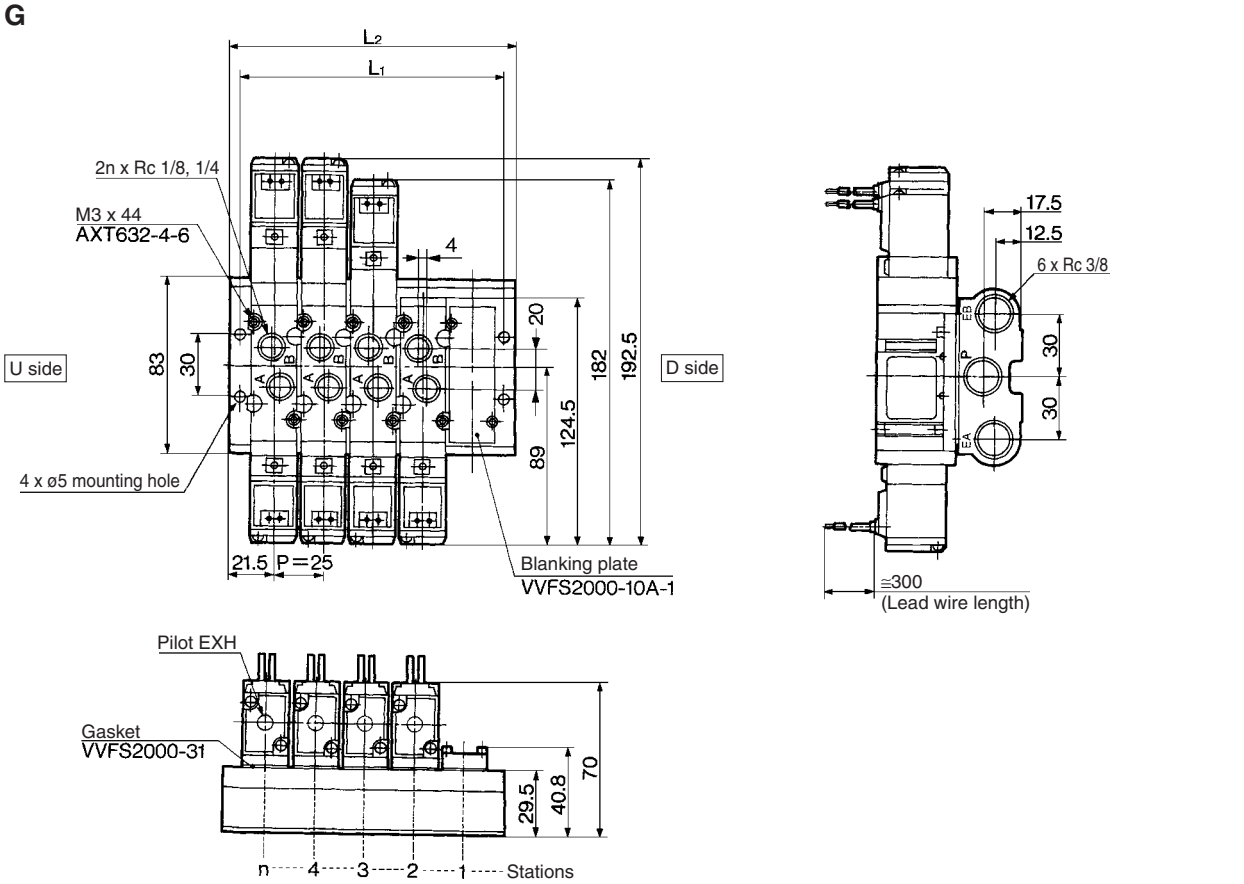
<Example>

(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.

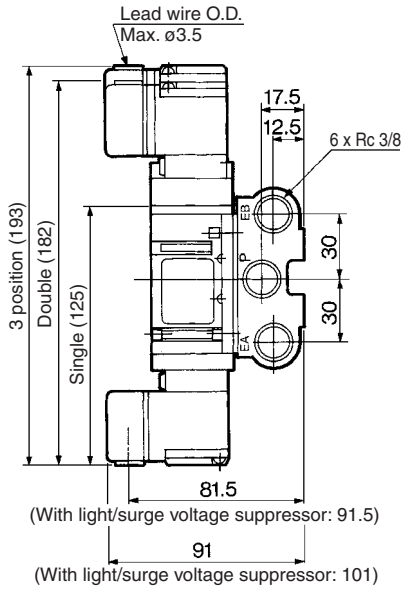
Type 20 Manifold — Pilot individual exhaust: VV5FS2-20- Station 1-03

Grommet: G

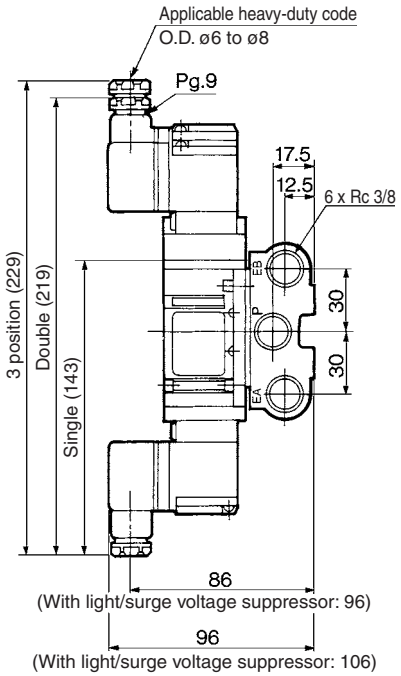


Formula for manifold weight M = 0.108n + 0.068 (kg) n: Station

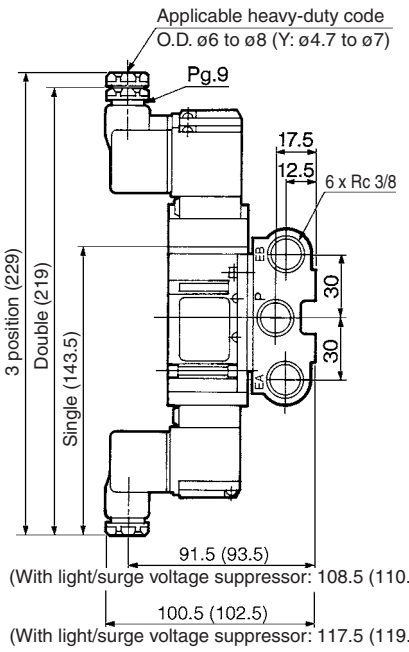
Grommet terminal: E/EZ



Conduit terminal: T/TZ



DIN terminal: D/DZ/Y/YZ



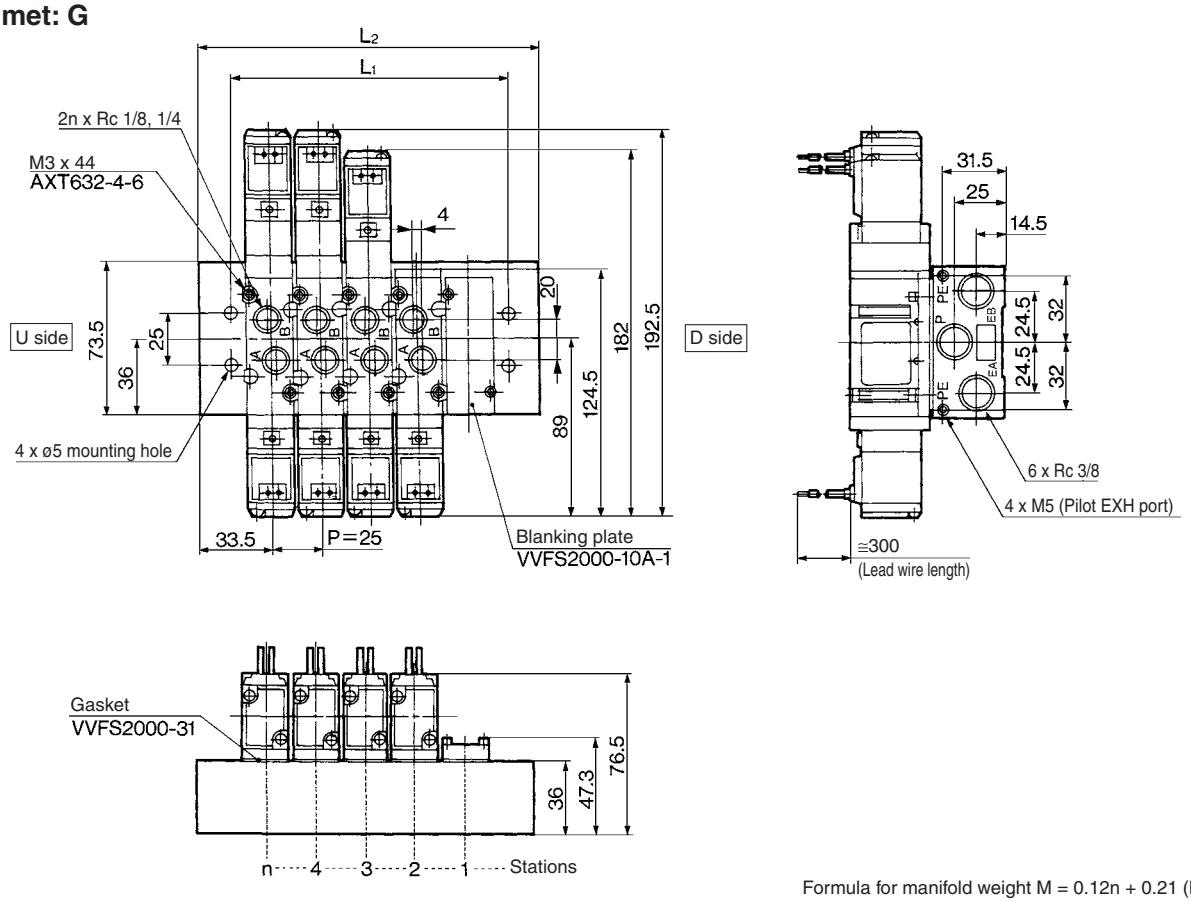
( ): Y, YZ

n: Station

L / Stations	2	3	4	5	6	7	8	9	10	Formula
L_1	58	83	108	133	158	183	208	233	258	$L_1 = 25 \times n + 8$
L_2	68	93	118	143	168	193	218	243	268	$L_2 = 25 \times n + 18$

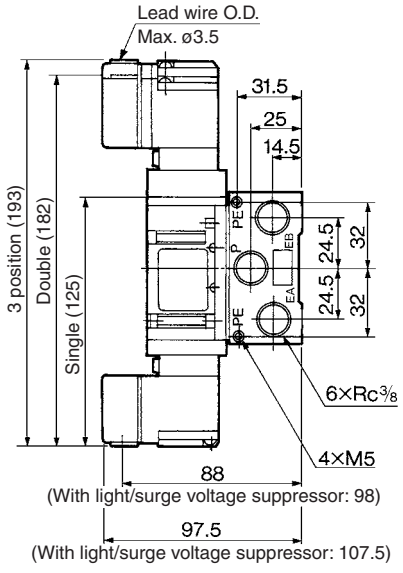
Type 30 Manifold — Pilot common exhaust: VV5FS2-30-Station 1-03

Grommet: G

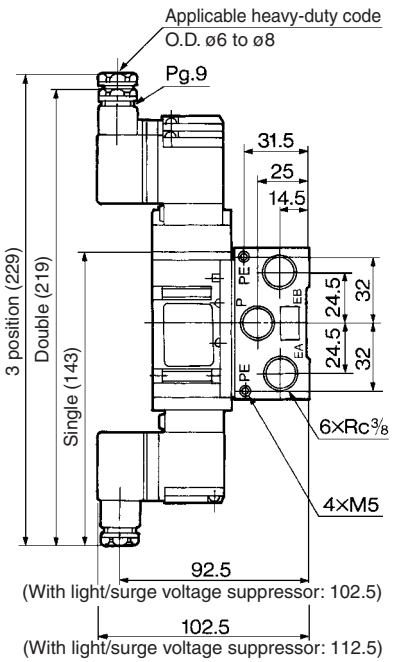


Formula for manifold weight M = 0.12n + 0.21 (kg) n: Station

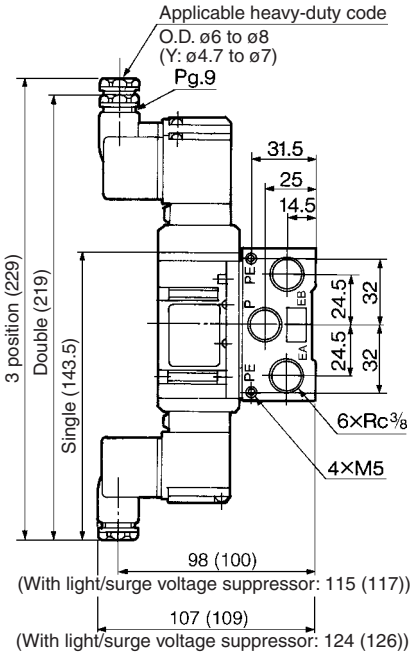
Grommet terminal: E/EZ



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
L1	62	87	112	137	162	187	212	237	262	L1 = 25 x n + 12
L2	92	117	142	167	192	217	242	267	292	L2 = 25 x n + 42

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

NRTL /C

(Details → P. 1137-2)

Model

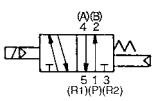
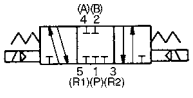
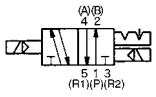
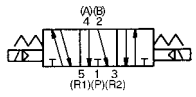
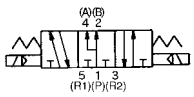
Type of actuation		Model		Port size Rc	Flow characteristics 1→4/2(P→A/B) C [dm³/(s·bar)]	b	Cv	Flow characteristics 4/2→5/3(A/B→R1/R2) C [dm3/(s·bar)]	b	Cv	Max.(1) operating cycle (cpm)	Response(2) time (ms)	Mass(3) (kg)
2 position	Single	VFS3120	VFS3130	1/4	5.0	0.20	1.1	6.8	0.30	1.7	1200	20 or less	0.33
				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 2) Based on JIS B 8375-1981. (The value at supply pressure 0.5 MPa.)
Note 3) In the case of grommet type.
Note 4) Factors of "Note1)" and "Note 2)" are achieved in controlled clean air.

Compact yet provides a large flow capacity 3/8: C: 6.8 dm³/(s·bar)

Low power consumption: 1.8 W DC

JIS Symbol

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

Standard Specifications

Valve specifications	Fluid		Air/Inert gas
	Maximum operating pressure		1.0 MPa
	Minimun operating pressure		0.1 MPa
	Proof pressure		1.5 MPa
	Ambient and fluid temperature		–10 to 60°C (1)
	Lubrication		Non-lube (2)
	Pilot valve manual override		Non-locking push type (Flush)
	Shock/Vibration resistance		150/50 m/s² (3)
	Enclosure		Dustproof (Degrees of protection 0) (4)
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) (5)
	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 (1)
Pilot valve manual override	Non-locking push type (Extended), Locking type (Tool reguired)
Coil rated voltage	110 to 120, 220, 240 VAC (50/60 Hz)
	12, 100 VDC
Option	With light/surge voltage suppressor (2)
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)

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

∗ Semi-standard. It will be an individual external pilot.
(External pilot port: Body side. For 30 type, common external pilot (on manifold side).)

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)

∗ Semi-standard
For other rated voltages, please consult with SMC.

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

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.

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

∗ Semi-standard

Port size

02	Rc 1/4
03	Rc 3/8

Thread type

Nil	Rc
N∗	NPT
T∗	NPTF
F∗	G

∗ Semi-standard

Option
F: With foot bracket

∗ Mountable only for VFS3120.

CE-compliant

Nil	—
Q	CE-compliant

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

∗ Semi-standard
For other rated voltages, please consult with SMC.

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)

∗ Semi-standard

Applicable model

14	A side pilot operator for VFS3$^{1}_{3}_{5}$20	Individual pilot exhaust
15	B side pilot operator for VFS3220	
16	B side pilot operator for VFS3$^{3}_{5}$20	
17	A side pilot operator for VFS3$^{1}_{3}_{5}$30	Common pilot exhaust
18	B side pilot operator for VFS3230	
19	B side pilot operator for VFS3$^{3}_{5}$30	

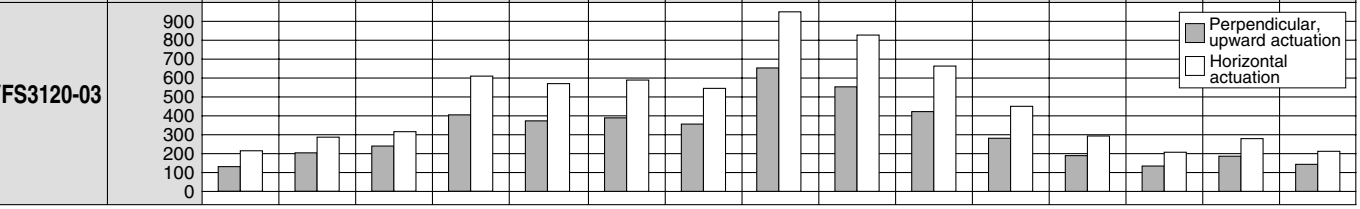
∗ Y: Conforming to DIN43650B standard
∗∗ DIN connector is not attached.

Cylinder Speed Chart

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

Body Ported

Series	Average speed (mm/s)	Bore size													
		Series CJ2 Pressure 0.5 MPa Load factor 50% Stroke 60 mm			Series CM2 Pressure 0.5 MPa Load factor 50% Stroke 300 mm				Series MB, CA2 Pressure 0.5 MPa Load factor 50% Stroke 500 mm					Series CS1/CS2 Pressure 0.5 MPa Load factor 50% Cylinder stroke 1000 mm		
		ø6	ø10	ø16	ø20	ø25	ø32	ø40	ø40	ø50	ø63	ø80	ø100	ø125	ø140	ø160
VFS3120-03	900 800 700 600 500 400 300 200 100 0															

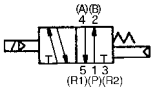


∗ It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
∗ The average velocity of the cylinder is the value that the stroke is divided by the total stroke time.
∗ Load factor: ((Load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

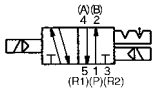
Conditions

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

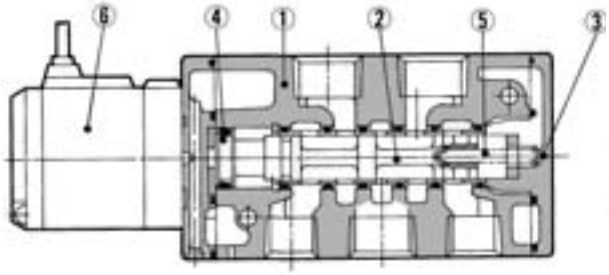
Construction

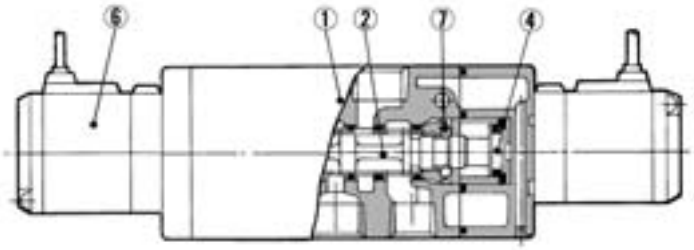


2 position single



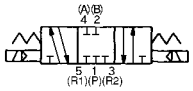
2 position double



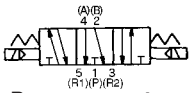


3 position closed center/exhaust center/pressure center

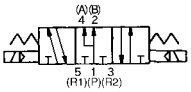
Closed center

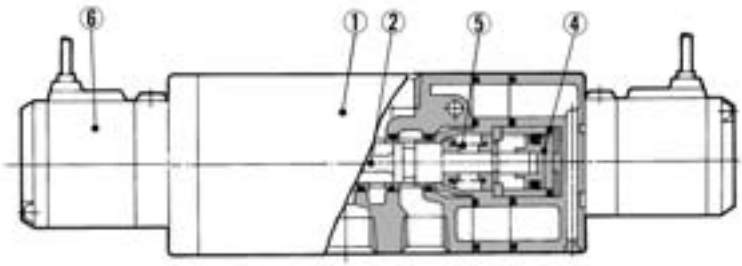


Exhaust center



Pressure center





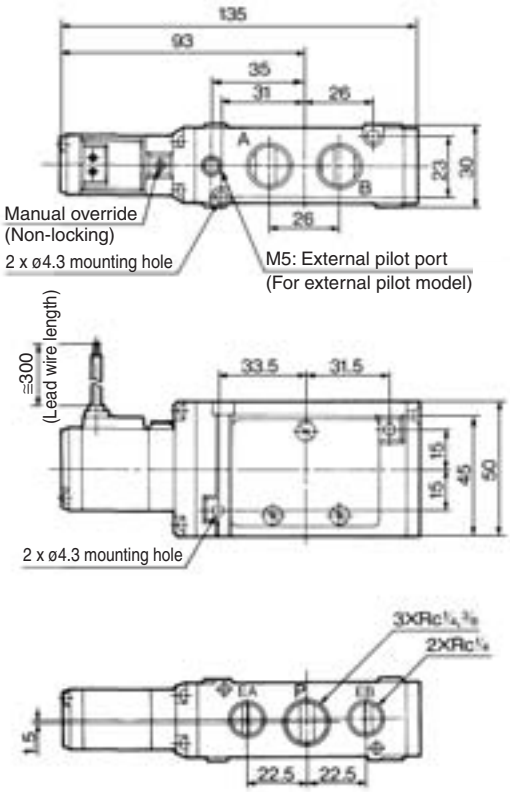
Component Parts

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

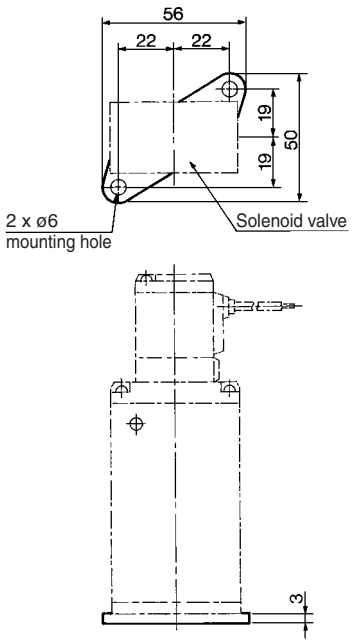
∗ Refer to “How to Order Pilot Valve Assembly” on page 1131.

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

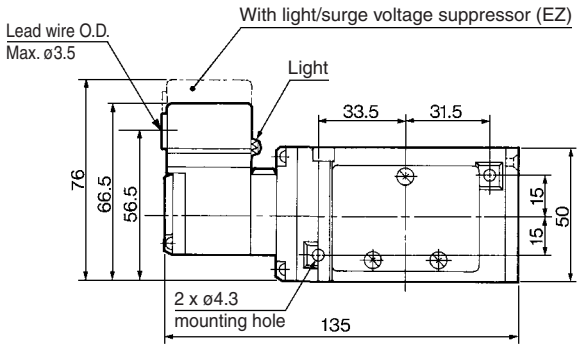
Grommet: VFS3120-□G



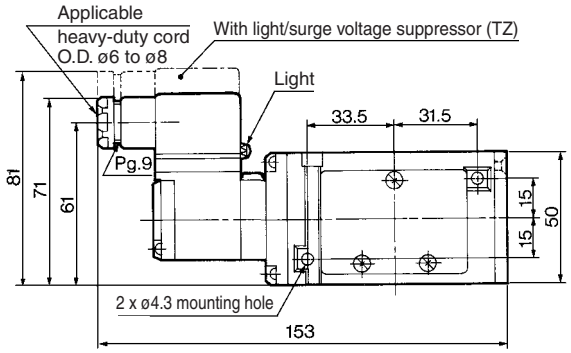
Foot bracket (F)
Part no.: VFS3000-52A



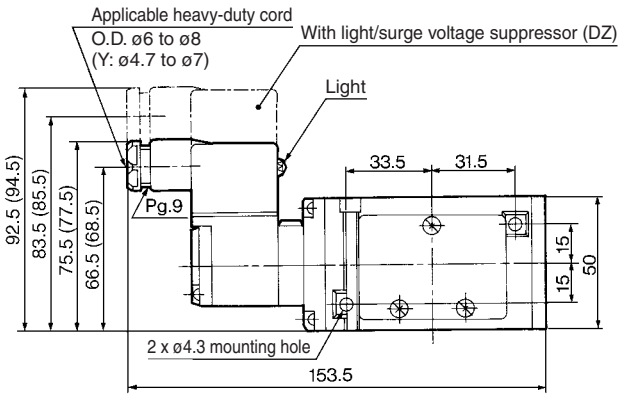
Grommet terminal: VFS3120-□E/EZ



Conduit terminal: VFS3120-□T/TZ



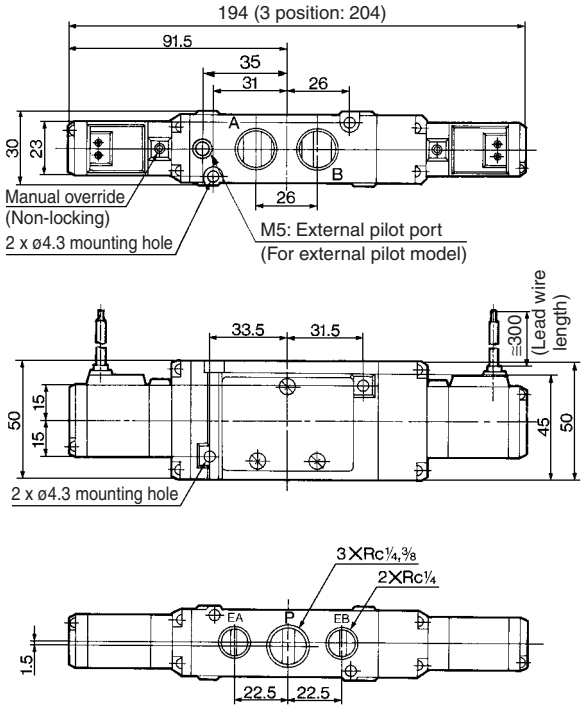
DIN terminal: VFS3120-□D/DZ/Y/YZ



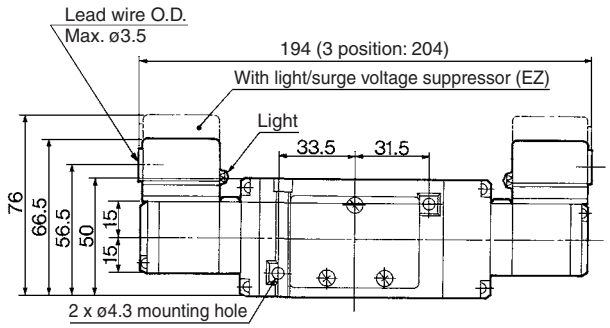
( ): Y, YZ

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

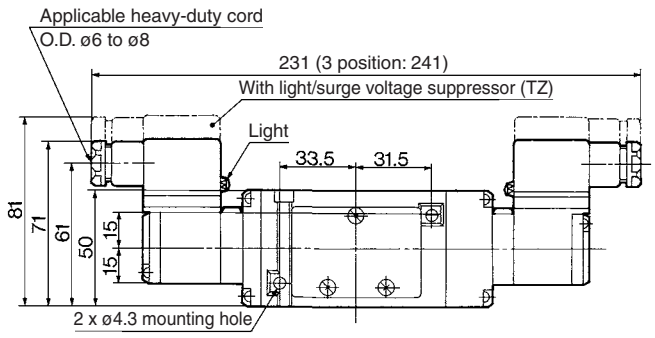
Grommet: VFS3220-□G, VFS3320-□G, VFS3420-□G, VFS3520-□G



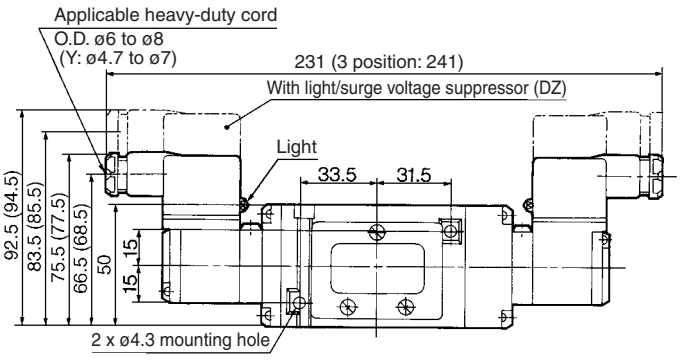
Grommet terminal: VFS3220-□E/EZ VFS3320-□E/EZ VFS3420-□E/EZ VFS3520-□E/EZ



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



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

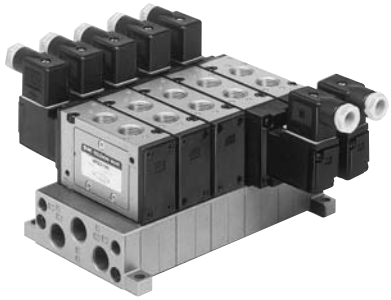


( ): Y, YZ

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

Specifications

Manifold base type	Stacking type
Stations	Max. 15 stations

Port Specifications

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

CE-compliant

Nil	—
Q	CE-compliant

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

P, EA, EB port size

03	Rc 3/8

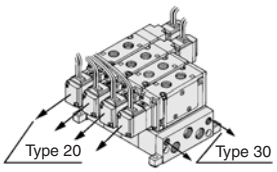
Symbol

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

Stations

02	2 stations
⋮	⋮
15	15 stations

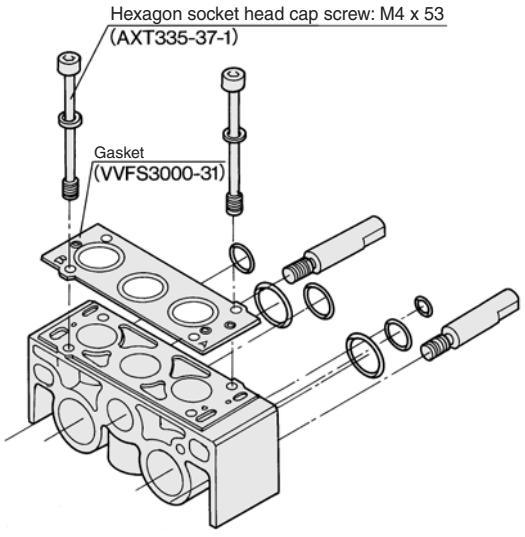
Base model

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.

Exploded View of Manifold

Manifold block assembly VVFS3000-1A-30



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

How to Order Manifold Assembly [Example]

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

<Example>

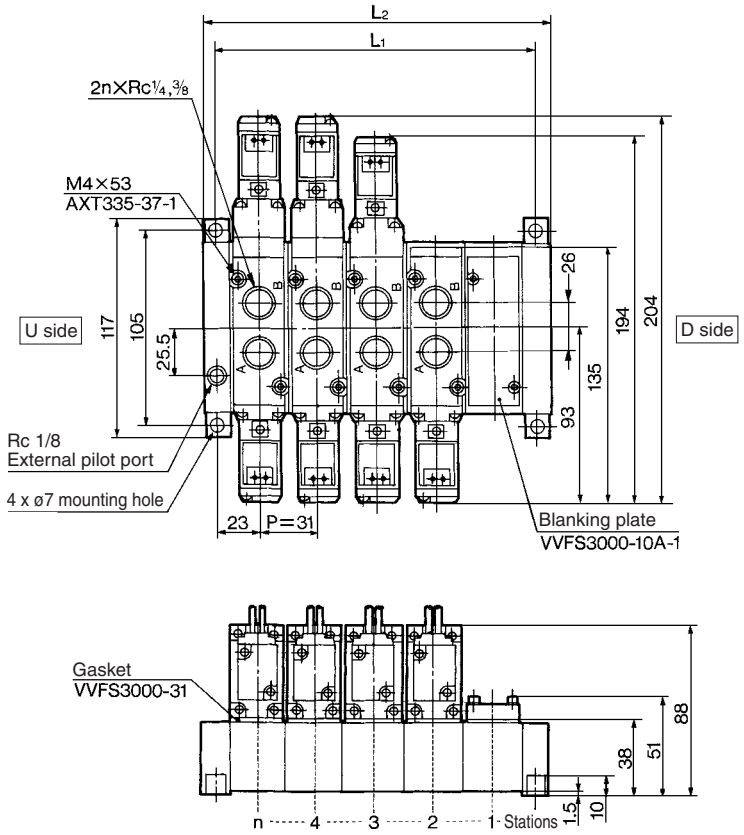
(Manifold base) **VV5FS3-31-061-03** ····· **1**
(2 position single) * **VFS3130-1D-02** ····· **3**
(2 position double) * **VFS3230-1D-02** ····· **2**
(Blanking plate) * **VVFS3000-10A-1** ····· **1**

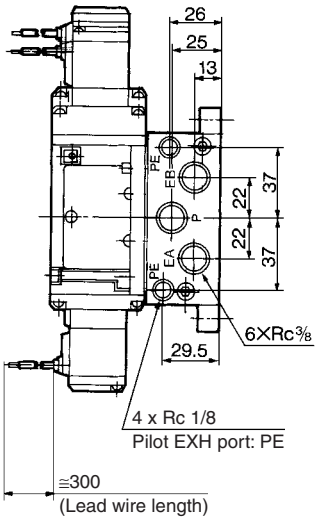
The asterisk denotes the symbol for assembly. Prefix it to the part numbers of the solenoid valve.

SMC

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

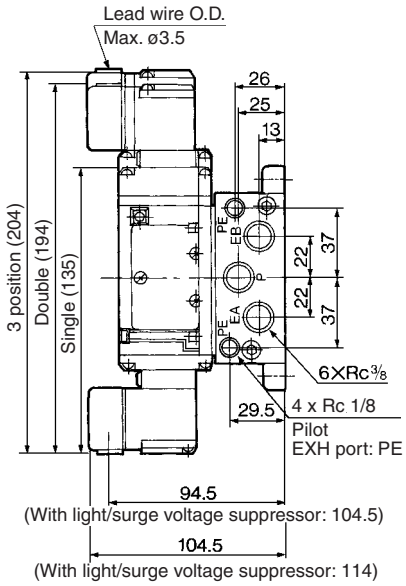
Grommet: G



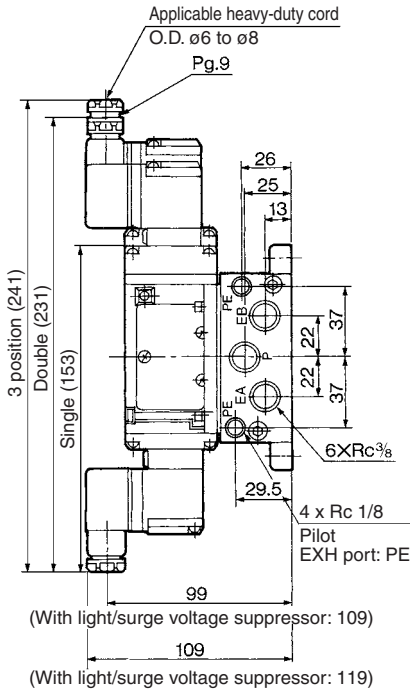


Formula for manifold weight M = 0.184n + 0.16 (kg) n: Station

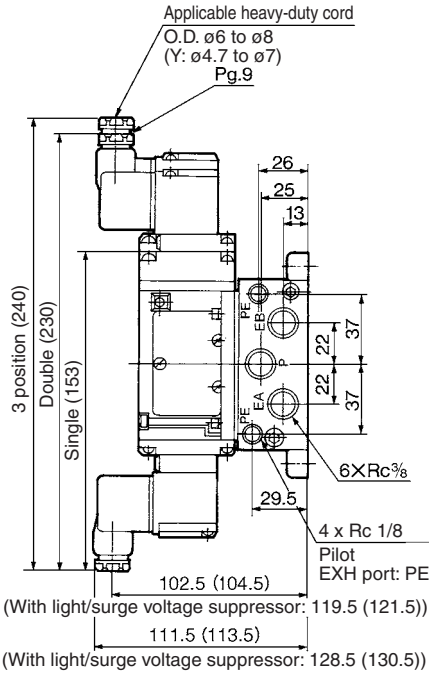
Grommet terminal: E/EZ



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	$L_2 = 31 \times n + 30$

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

NRTL /C

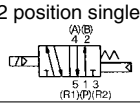
How to Order

30 – VFS2 [1] [20] [ ] – [1] [D] [ ] [ ] – [01] [ ] – [ ]

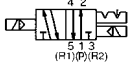
Conforming to CSA standard

Symbol

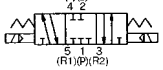
1: 2 position single



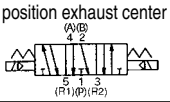
2: 2 position double



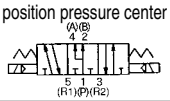
3: 3 position closed center



4: 3 position exhaust center



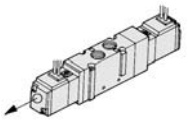
5: 3 position pressure center



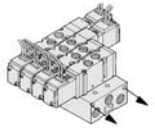
∗ Reverse pressure: Can be used by external pilot specifications.

Body (Pilot exhaust)

20: Individual EXH



30: Common EXH∗



∗ Manifold only

Pilot type

Nil	Internal pilot
R∗	External pilot

∗ Option: Individual external pilot (External pilot port: Body side)

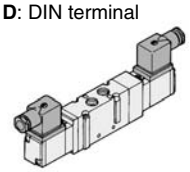
Coil rated voltage

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

∗ Option

Electrical entry

D: DIN terminal

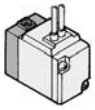


Light/Surge voltage suppressor

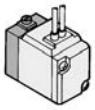
Nil	None
Z	With light/surge voltage suppressor

Manual override

Nil: Non-locking push type (Flush)



A∗: Non-locking push type (Extended)



B∗: Locking type (Tool required)

∗ Option

Port size

01	Rc 1/8
02	Rc 1/4

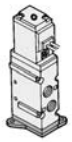
Thread type

Nil	Rc
N∗	NPT
T∗	NPTF
F∗	G

∗ Option

Option

F: With foot bracket



∗ Mountable only for VFS2120.

Refer to standard products for specifications and dimensions.

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

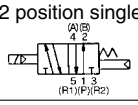
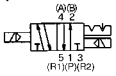
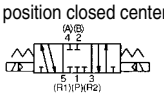
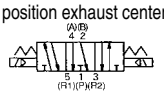
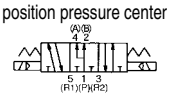
NRTL /C

How to Order

30 – VFS3 [1] [20] [ ] – [1] [D] [ ] [ ] – [02] [ ] – [ ]

Conforming to CSA standard

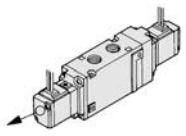
Symbol

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

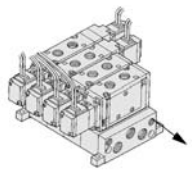
∗ Reverse pressure: Can be used by external pilot specifications.

Body (Pilot exhaust)

20: Individual EXH



30: Common EXH∗



∗ Manifold only

Pilot type

Nil	Internal pilot
R∗	External pilot

∗ Option: Individual external pilot (External pilot port: Body side. For 30 type, common external pilot (on manifold side).)

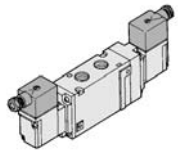
Coil rated voltage

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

∗ Option

Electrical entry

D: DIN terminal

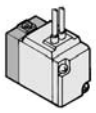


Light/Surge voltage suppressor

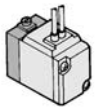
Nil	None
Z	With light/surge voltage suppressor

Manual override

Nil: Non-locking push type (Flush)



A∗: Non-locking push type (Extended)



B∗: Locking type (Tool required)

∗ Option

Port size

02	Rc1/4
03	Rc3/8

Thread type

Nil	Rc
N∗	NPT
T∗	NPTF
F∗	G

∗ Option

Option

F: With foot bracket

∗ Mountable only for VFS3120.

Refer to standard products for specifications and dimensions.

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

NRTL /C

(Details → P. 1222-1)

Model

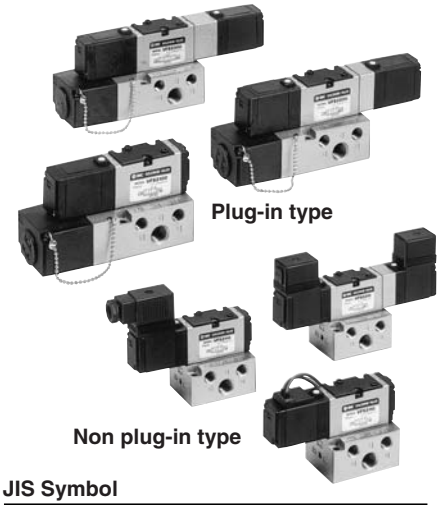
Type of actuation		Model: Plug-in	Model: Non plug-in	Port size Rc	Flow characteristics: 1→4/2(P→A/B) C [dm³/(s·bar)]	b	Cv	Flow characteristics: 4/2→5/3(A/B→R1/R2) C [dm³/(s·bar)]	b	Cv	Max.(1) operating cycle (cpm)	Response time (ms)(2)	Mass (kg)(3)
2 position	Single	**VFS2100**	**VFS2110**	1/8	2.4	0.16	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 dm³/(s·bar)

Low power consumption: 1.8 W DC

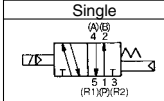
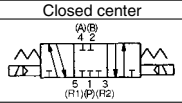
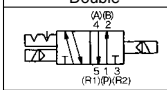
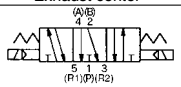
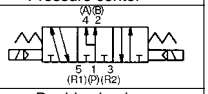
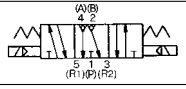
Easy maintenance
2 types of sub-plates:
Plug-in and non plug-in



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
	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 (1)
	Lubrication		Non-lube (2)
	Pilot valve manual override		Non-locking push type (Flush)
	Shock/Vibration resistance		150/50 m/s² (3)
	Enclosure		Type G, E: Dustproof (Class 0), Type F, T, D: Splashproof (Class 4) (4)
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) (5)
	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 Note)
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 [dm³/(s·bar)]
Standard type	31.0	0.2	2.2
Compact type	25.5	0.13	2.8

* 2 position single Rc 1/4

SMC

How to Order

With attachment plug lead wire

With terminal block

Porting specifications

Nil	Side ported
B*	Bottom ported

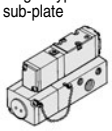
* Semi-standard

Option

Nil	None
Z	With light/surge voltage suppressor

Body type

O: Plug-in type sub-plate



Electrical entry

F: Plug-in type

Port size

Nil		Without sub-plate
01	Rc 1/8	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

* Semi-standard

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 □ – □

CE-compliant

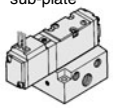
Nil	—
Q	CE-compliant

Symbol

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

Body type

1: Non plug-in type sub-plate



Pilot type

Nil	Internal pilot
R*	External pilot

* Semi-standard: 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

* Semi-standard
For other rated voltages, please consult with SMC.

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)




* Semi-standard

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.

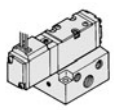
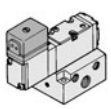
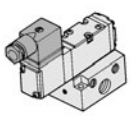
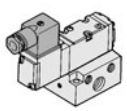
Option

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

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

Electrical entry

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

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

How to Order Pilot Valve Assembly

SF4 – 1 DZ □ – 20

Coil rated voltage

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

* Semi-standard
For other rated voltages, please consult with SMC.

Electrical entry, Light/Surge voltage suppressor

F	Plug-in	Plug-in
G	Grommet	Non plug-in
GS	Grommet with surge voltage suppressor	
D	DIN terminal	
DZ	DIN terminal with light/surge voltage suppressor	
DO	DIN terminal*	
DOZ	DIN terminal with light/surge voltage suppressor*	
Y	DIN terminal	
YZ	DIN terminal with light/surge voltage suppressor	
YO	DIN terminal*	Non plug-in
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.
*** Y: Conforming to DIN43650B standard

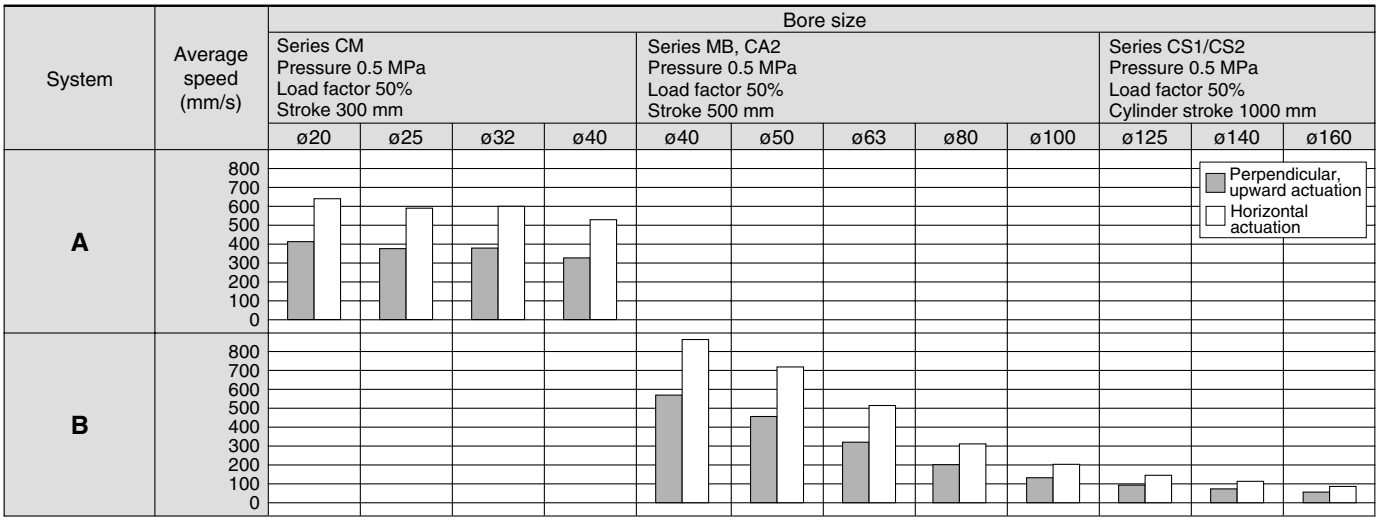
Manual override

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

* Semi-standard

Cylinder Speed Chart

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



System Components

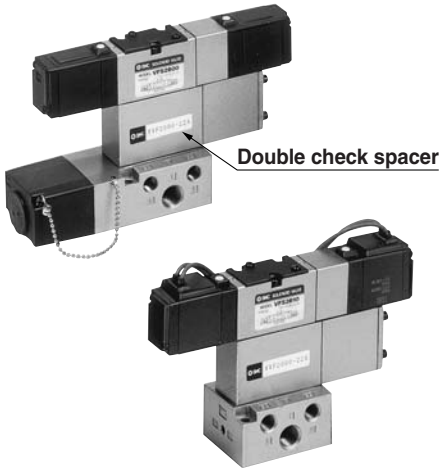
System	Solenoid valve	Speed controller	Silencer	Tube bore x Length
A	Series VFS2000 Rc 1/8	AS3000-02 (S = 12 mm²)	AN110-01 (S = 35 mm²)	T0604 x 1 m
B	Series VFS2000 Rc 1/4	AS4000-02 (S = 21 mm²)	AN110-01 (S = 35 mm²)	T1075 x 1 m

∗ 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.



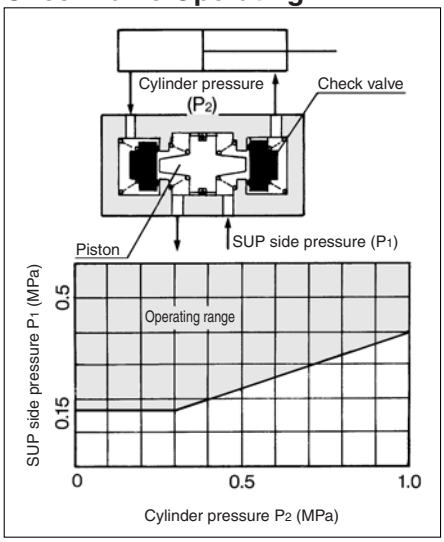
Specifications

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

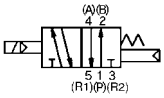
Check Valve Operating

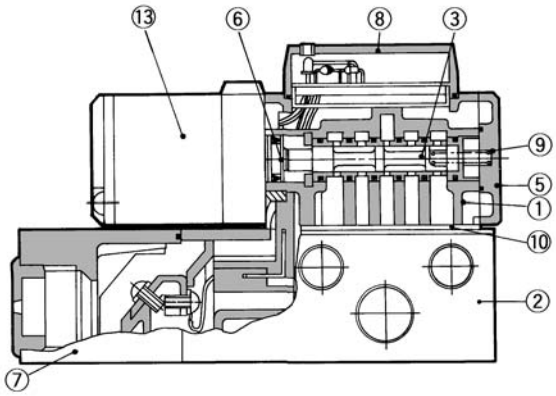


- The combination of VFS21$^{0}_{1}$0, VFS22$^{0}_{1}$0 and a double check spacer can be used as prevention of falling at the stroke end but cannot hold the intermediate position of the cylinder.

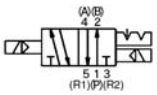
Construction

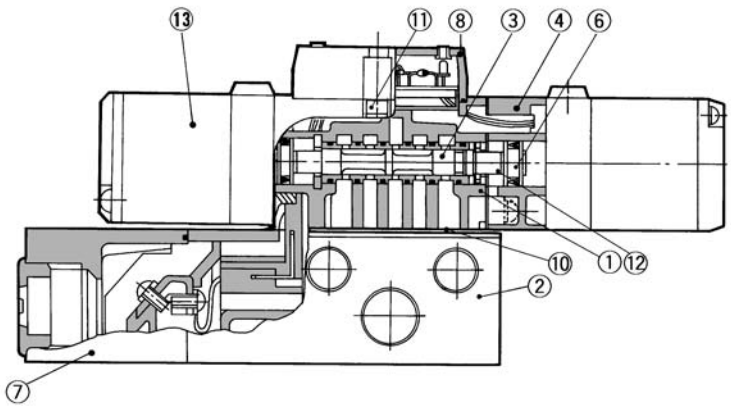
2 position single





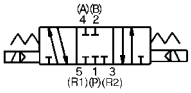
2 position double



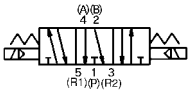


3 position closed center/exhaust center/pressure center

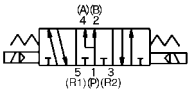
Closed center

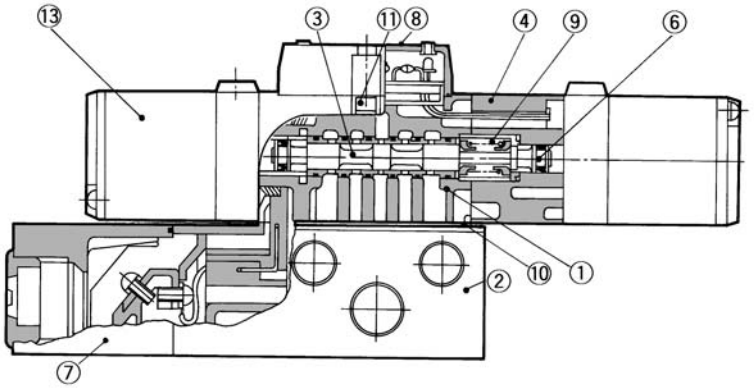


Exhaust center



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**	HNBR	—
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-$^{01}_{02}$
Non plug-in	VFS2000-LS-$^{01}_{02}$

∗ Mounting bolt and gasket are not included.

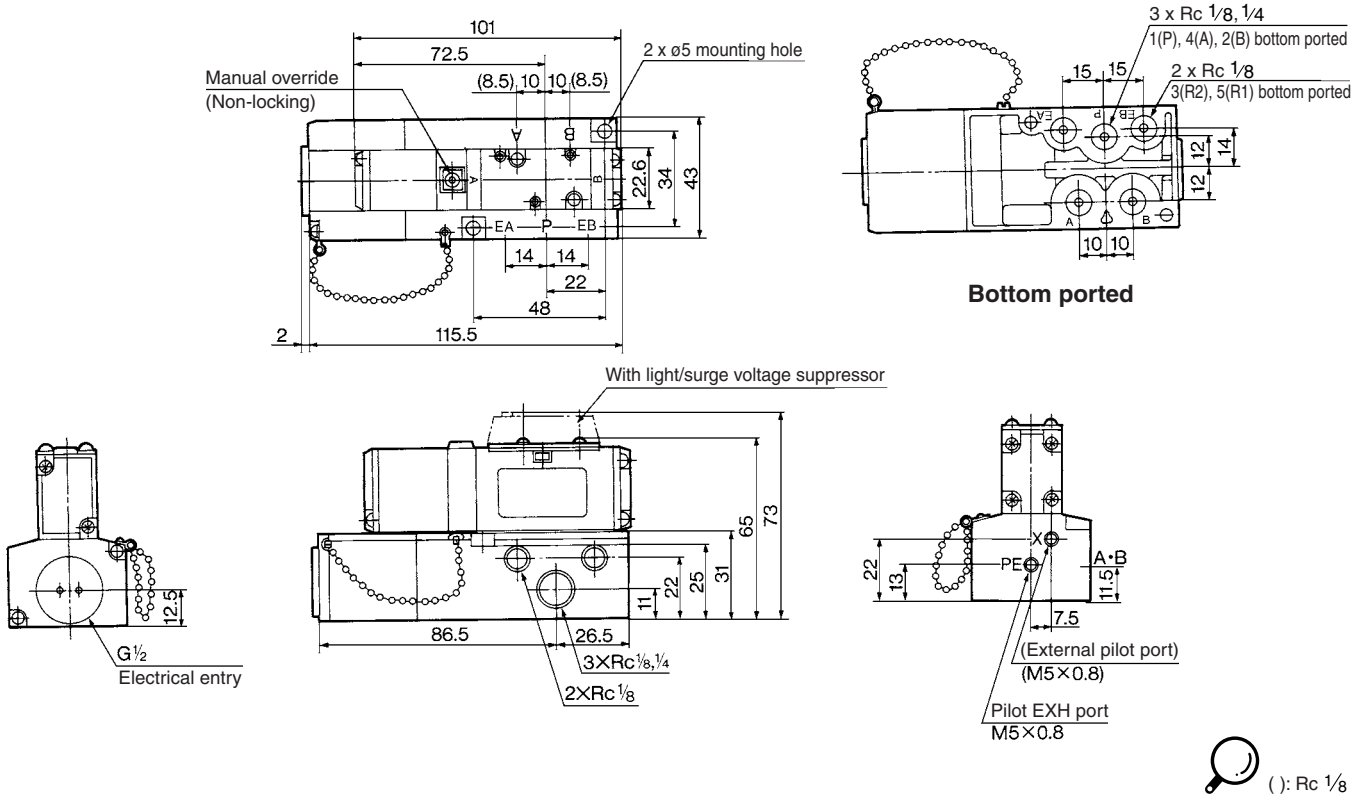
Sub-plate Assembly (For External Pilot) Part No.

Plug-in	VFS2000-LP-R$^{01}_{02}$
Non plug-in	VFS2000-LS-R$^{01}_{02}$

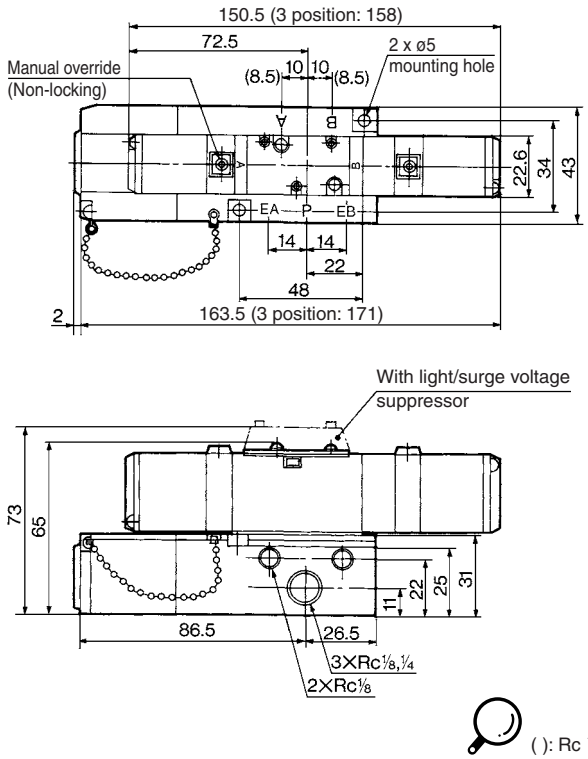
Part no. for mounting bolt and gasket
BG-VFS2000-1

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

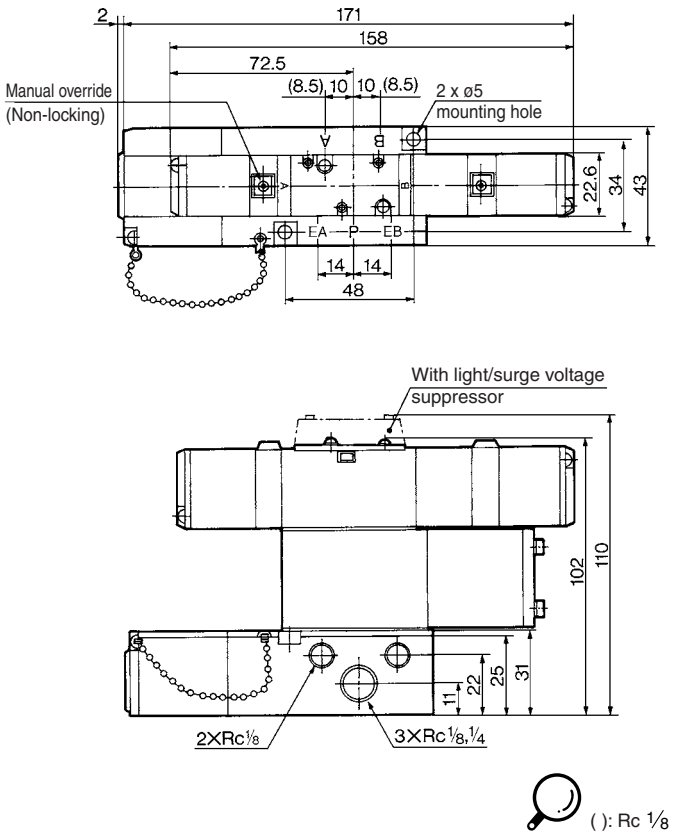
2 position single: VFS2100-□F-$^{01}_{02}$



2 position double: VFS2200-□F-$^{01}_{02}$
3 position closed center: VFS2300-□F-$^{01}_{02}$
3 position exhaust center: VFS2400-□F-$^{01}_{02}$
3 position pressure center: VFS2500-□F-$^{01}_{02}$

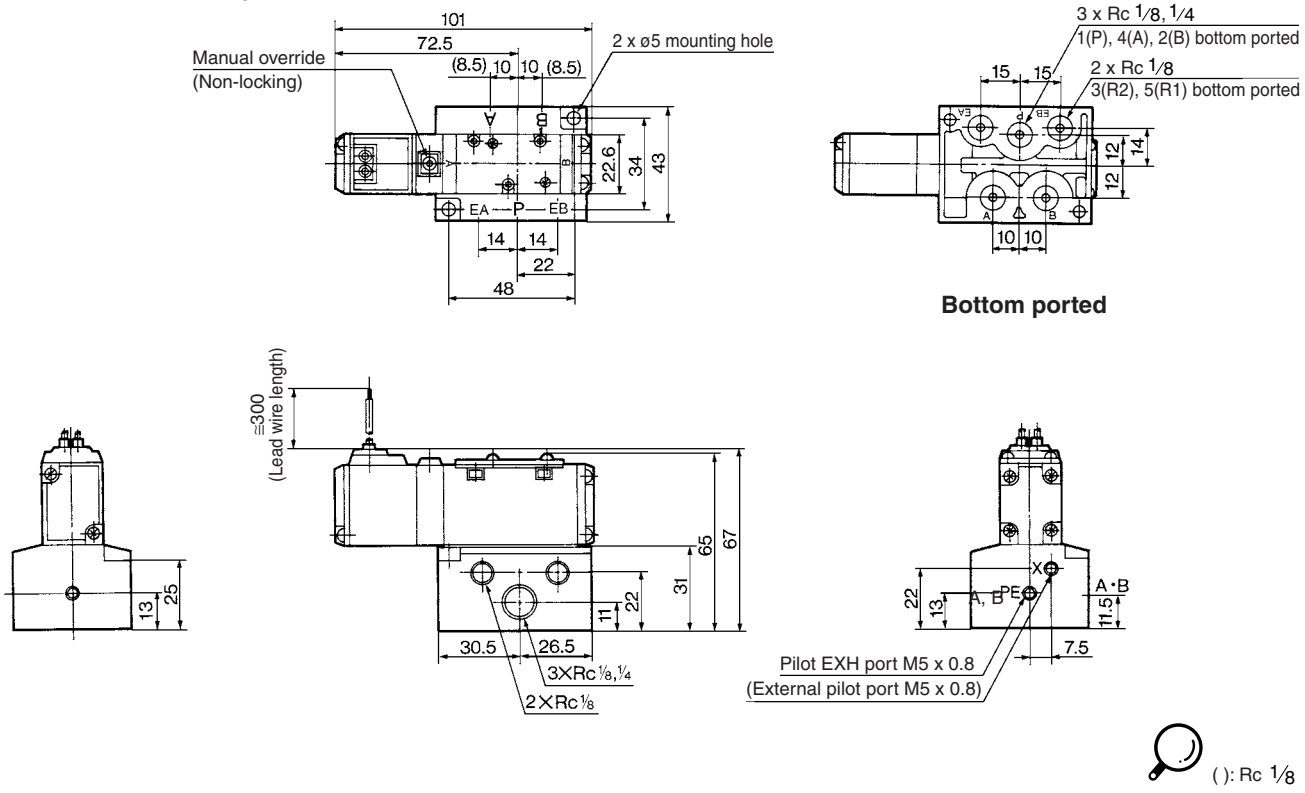


3 position double check: VFS2600-□F-$^{01}_{02}$



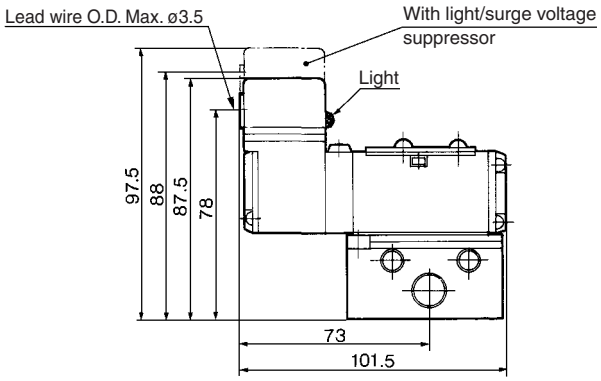
Non Plug-in — 2 Position single

Grommet: VFS2110-□G-$^{01}_{02}$

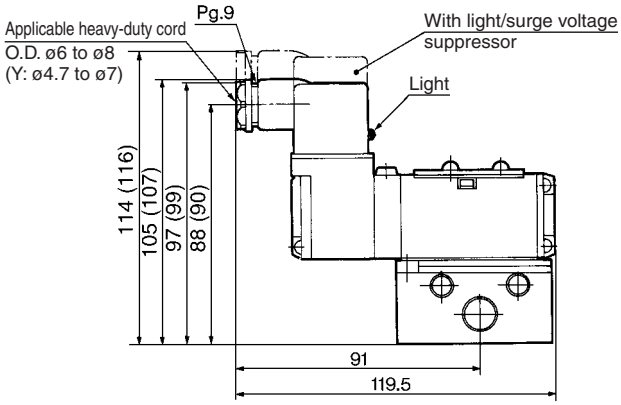


( ): Rc 1/8

Grommet terminal: VFS2110-□E-$^{01}_{02}$

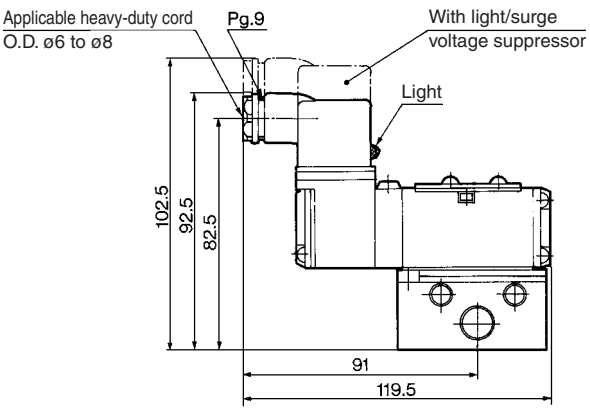


DIN terminal: VFS2110-□$^{D}_{Y}$-$^{01}_{02}$



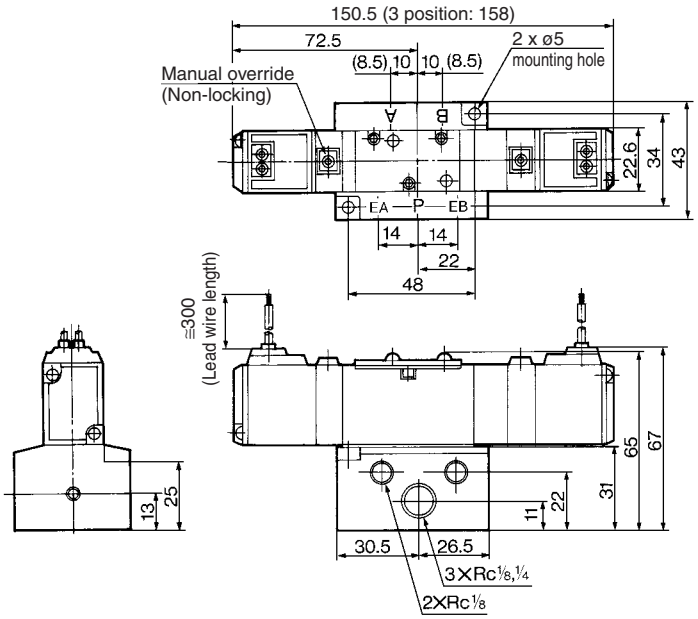
( ): Y, YZ

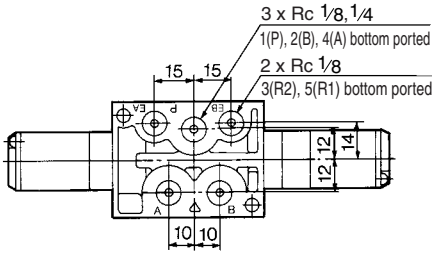
Conduit terminal: VFS2110-□T-$^{01}_{02}$



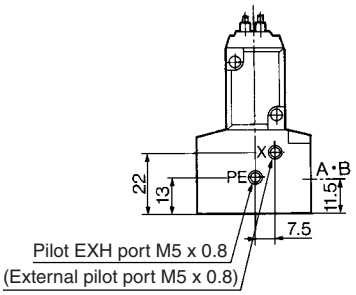
Non Plug-in — 2 Position double/3 Position closed center/Exhaust center/Pressure center

Grommet: Double VFS2210-□G-$^{01}_{02}$
Closed center VFS2310-□G-$^{01}_{02}$, Exhaust center VFS2410-□G-$^{01}_{02}$, Pressure center VFS2510-□G-$^{01}_{02}$



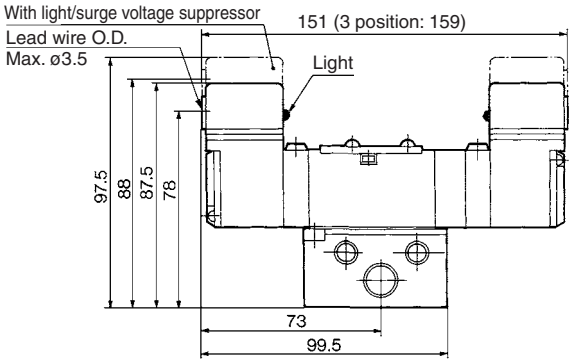


Bottom ported

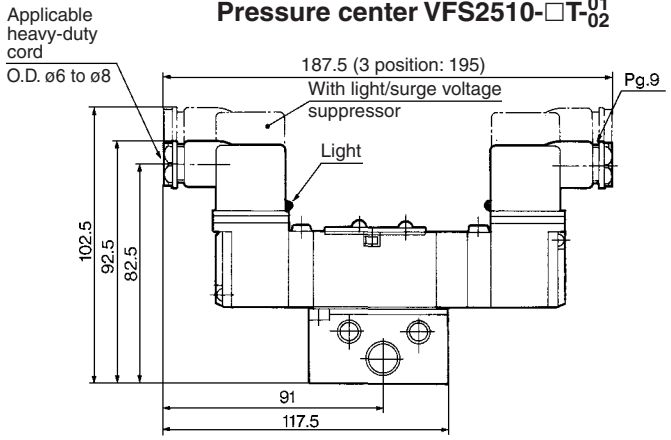


( ): Rc 1/8

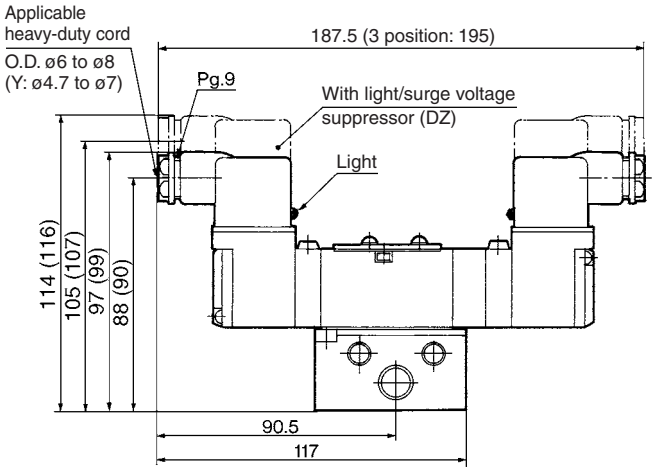
Grommet terminal: Double VFS2210-□E-$^{01}_{02}$
Closed center VFS2310-□E-$^{01}_{02}$
Exhaust center VFS2410-□E-$^{01}_{02}$
Pressure center VFS2510-□E-$^{01}_{02}$



Conduit terminal: Double VFS2210-□T-$^{01}_{02}$
Closed center VFS2310-□T-$^{01}_{02}$
Exhaust center VFS2410-□T-$^{01}_{02}$
Pressure center VFS2510-□T-$^{01}_{02}$



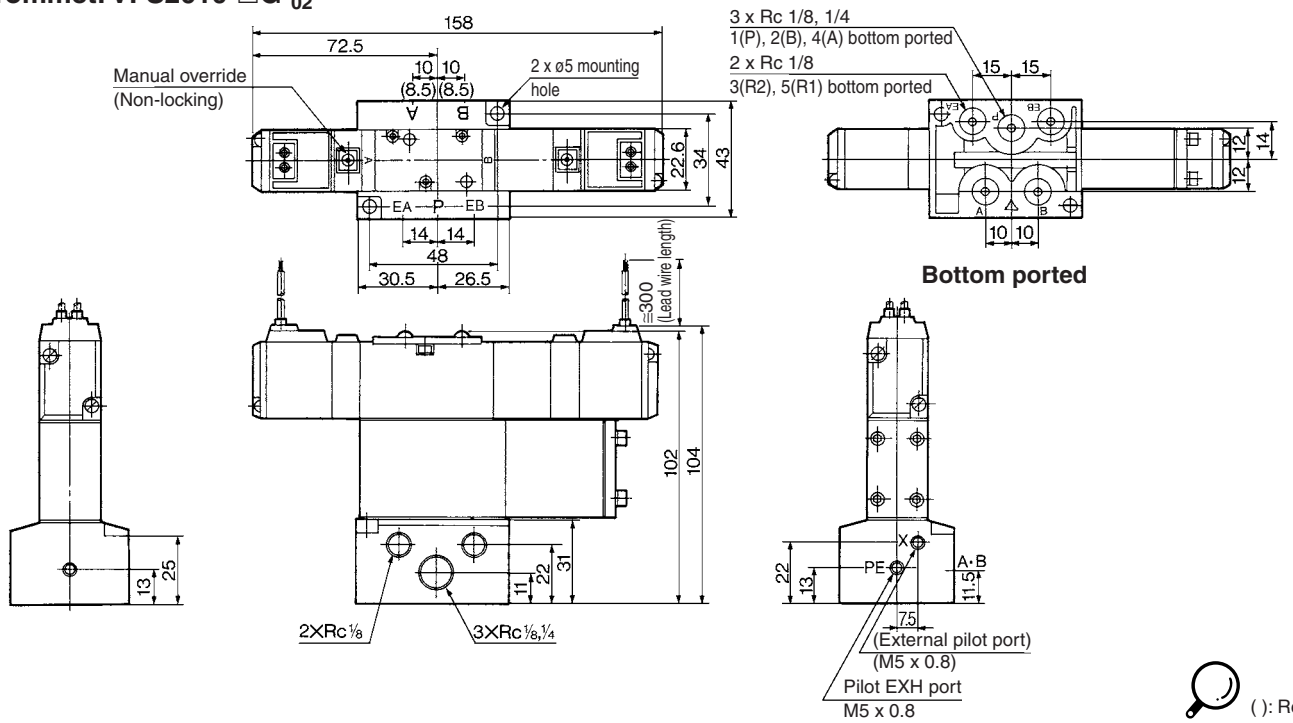
DIN terminal: Double VFS2210-□$^{D-01}_{Y-02}$
Closed center VFS2310-□$^{D-01}_{Y-02}$
Exhaust center VFS2410-□$^{D-01}_{Y-02}$
Pressure center VFS2510-□$^{D-01}_{Y-02}$



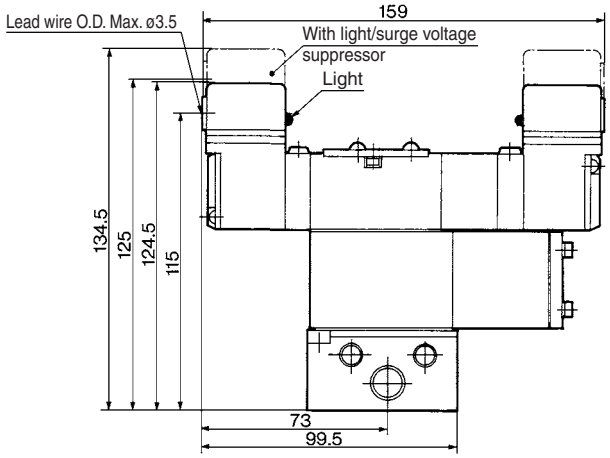
( ): Y, YZ

Non Plug-in — 3 Position double check

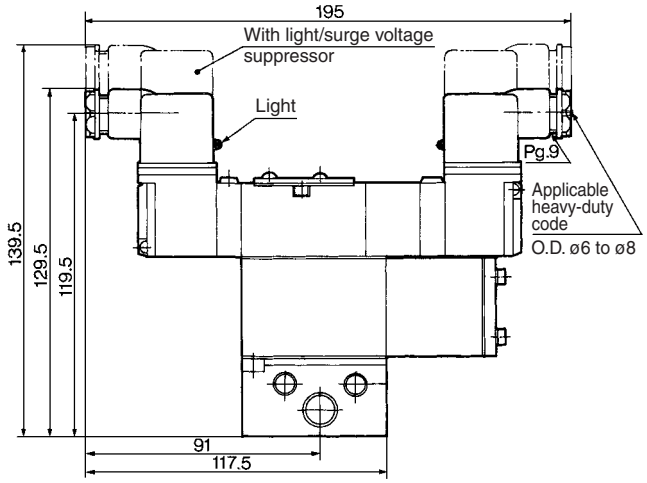
Grommet: VFS2610-□G-$^{01}_{02}$



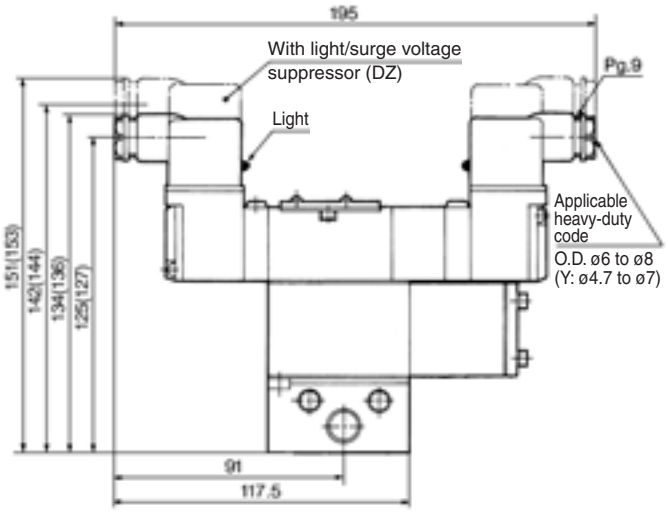
Grommet terminal: VFS2610-□E-$^{01}_{02}$



Conduit terminal: VFS2610-□T-$^{01}_{02}$



DIN terminal: VFS2610-□D-$^{01}_{02}$

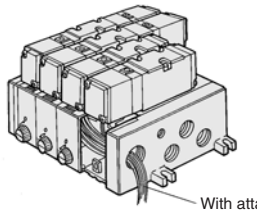


( ): Y, YZ

Series VFS2000
Manifold Specifications

Plug-in Type: With Attachment Plug Lead Wire

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



VV5FS2 - 01 - 06 1 - 01 ☐ - ☐

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

02	2 stations
⋮	⋮
16	16 stations

- **Symbol**

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

∗ Option

- **Port size**

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

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

- **Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

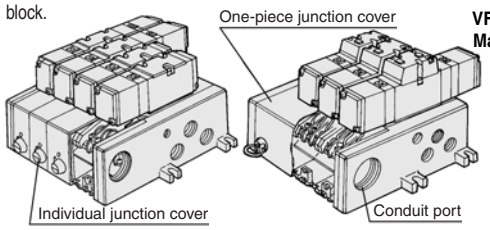
∗ Option

- **CE-compliant**

Nil	—
Q	CE-compliant

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.



VV5FS2 - 01T 1 - 08 1 - 02 ☐ - ☐

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

∗ Option

- **Port size**

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

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

- **Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

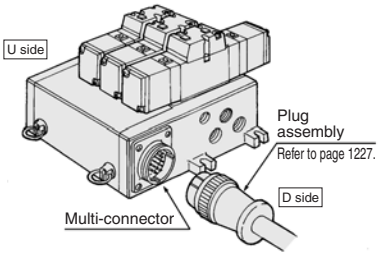
∗ Option

- **CE-compliant**

Nil	—
Q	CE-compliant

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.



VV5FS2 - 01C D 1 - 05 2 - 01 ☐ - ☐

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

∗ Option

- **Port size**

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

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

- **Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

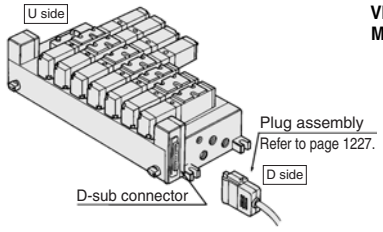
∗ Option

- **CE-compliant**

Nil	—
Q	CE-compliant

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.



VV5FS2 - 01F U 1 - 06 1 - 01 ☐ - ☐

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

∗ Option

- **Port size**

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

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

- **Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

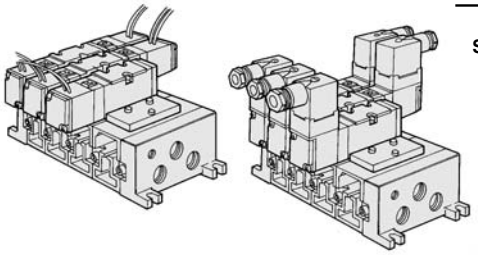
∗ Option

- **CE-compliant**

Nil	—
Q	CE-compliant

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

- Wiring for every valve



VV5FS2 - 10 - 05 2 - 01 ☐ - ☐

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

02	2 stations
⋮	⋮
16	16 stations

- **Symbol**

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

∗ Option

- **Port size**

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

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

- **Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

∗ Option

- **CE-compliant**

Nil	—
Q	CE-compliant

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".

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		
Plug-in type **VV5FS2-01□**	• With attachment plug lead wire • With terminal block • With multi-connector • With D-sub connector	Side/Bottom	1/4	1/8, 1/4	2 to 15* stations	VFS2□00-□F
Non plug-in type **VV5FS2-10**	• Grommet • Grommet terminal • Conduit terminal • DIN terminal					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)

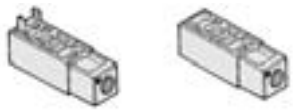
Model	Passage/Stations		Station 1	Station 5	Station 10
VVFS2	1→4/2 (P→A/B)	C [dm³/(s·bar)]	2.4	2.4	2.4
		b	0.14	0.14	0.14
		Cv	0.50	0.50	0.50
	4/2→5/3 (A/B→R1/R2)	C [dm³/(s·bar)]	2.5	2.5	2.5
		b	0.18	0.18	0.18
		Cv	0.60	0.60	0.60

* Port size Rc 1/4

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.

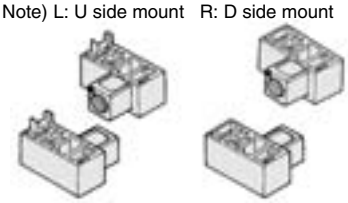
Body type	Plug-in type	Non plug-in type
Part no.	VVFS2000-21A-1	VVFS2000-21A-2

∗ Not mountable for standard type sub-plate.

Air release valve spacer
The concurrent use of air release valve spacer with VFS21□0 (single) can release air.

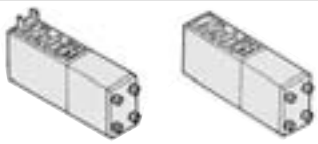
Body type	Plug-in type	Non plug-in type
Part no.	VVFS2000-24A-1 L/R	VVFS2000-24A-2 L/R

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



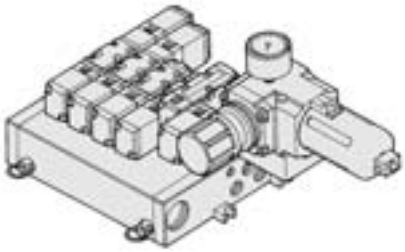
Blanking plate
It is used by attaching on the manifold block for being prepared for removing a valve for maintenance reasons or planning to mount a spare valve, etc.

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.

Dripproof Manifold
Plug-in type
- **Equivalent to IP65**

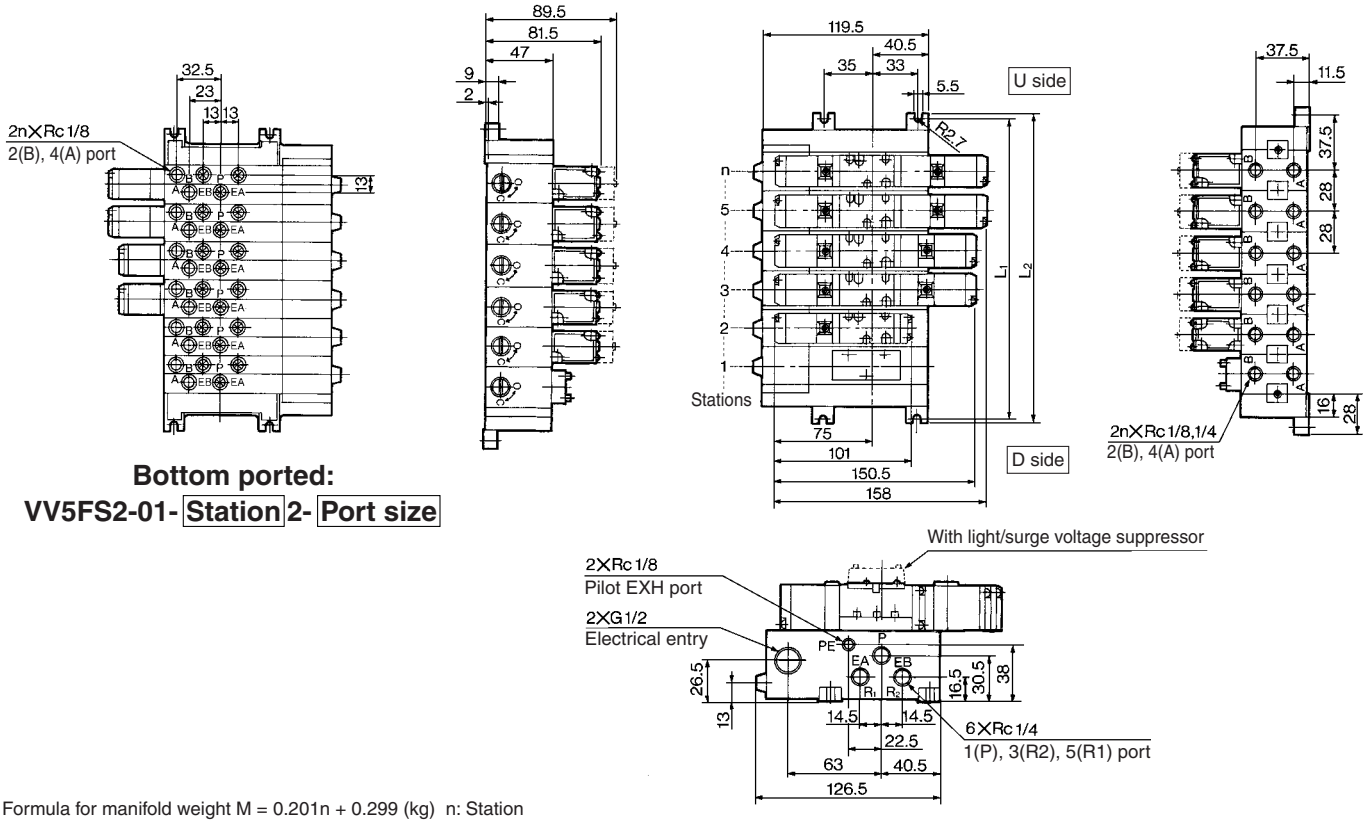
For details, refer to page 1155.

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

For details, refer to page 1158.

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

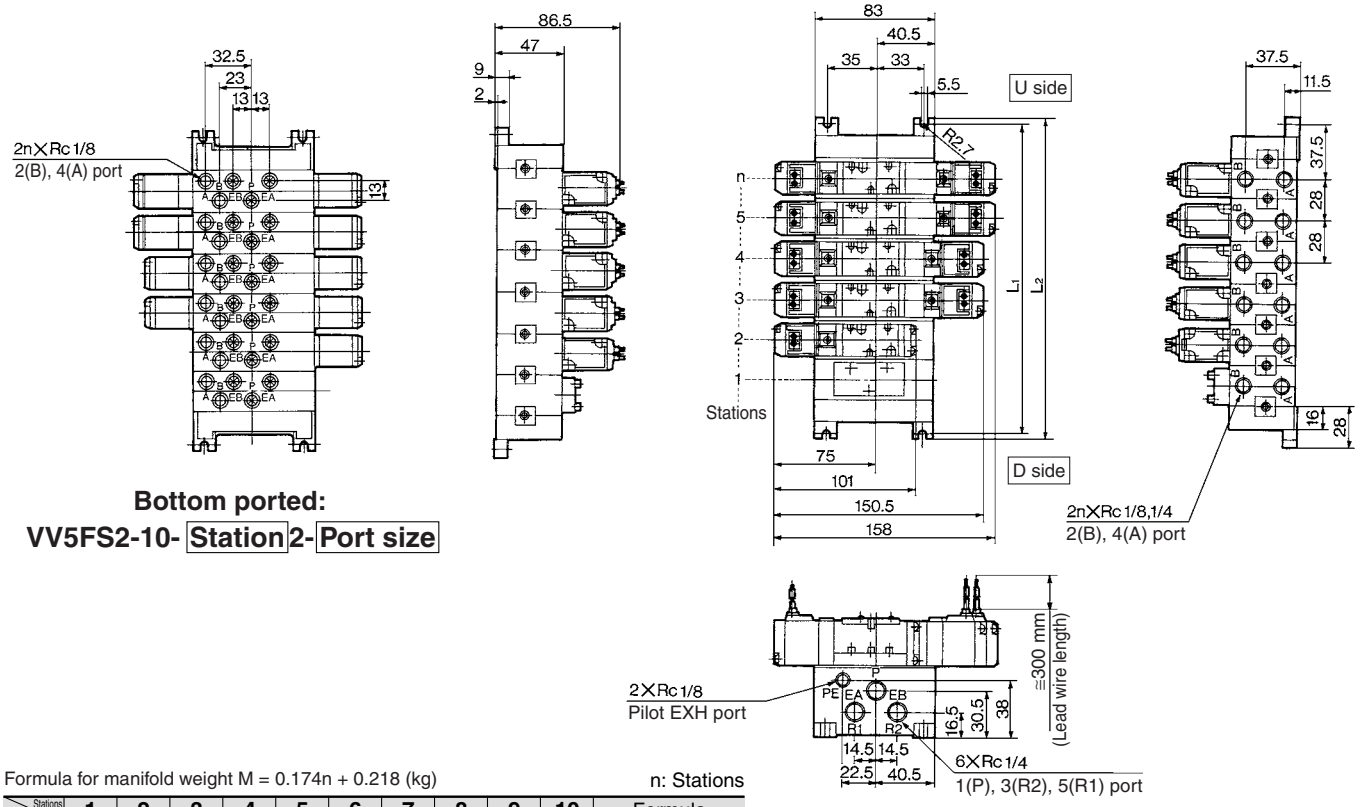
Plug-in type (Insert plug with lead wire): VV5FS2-01-Station 1-Port size



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

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

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



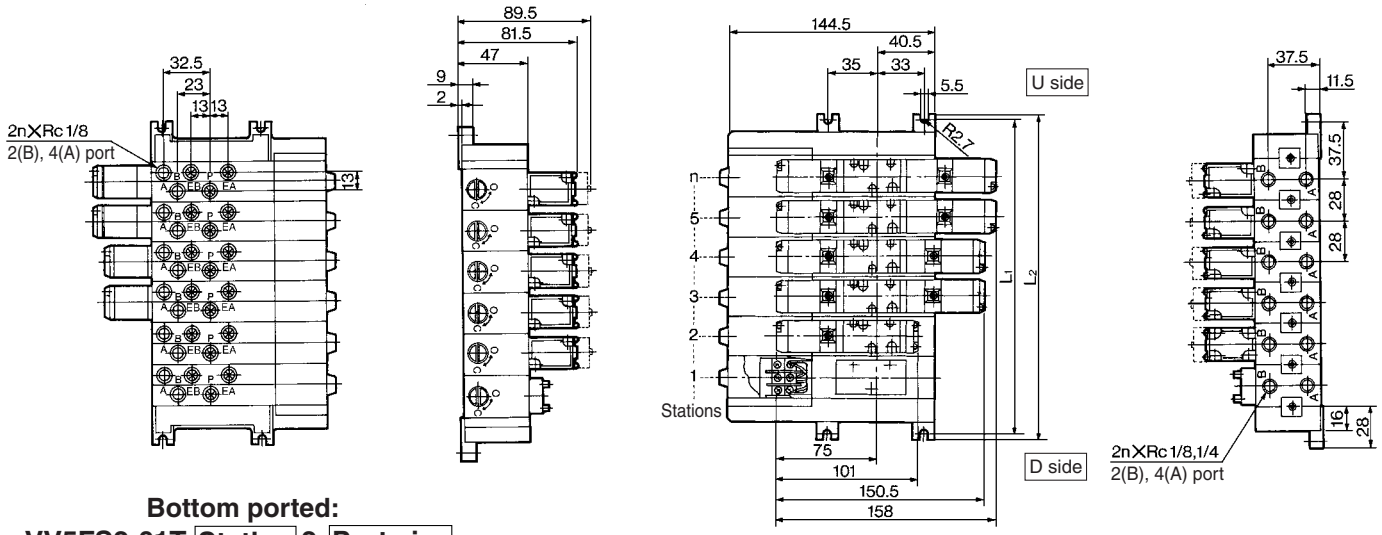
Bottom ported:
VV5FS2-10-Station 2-Port size

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

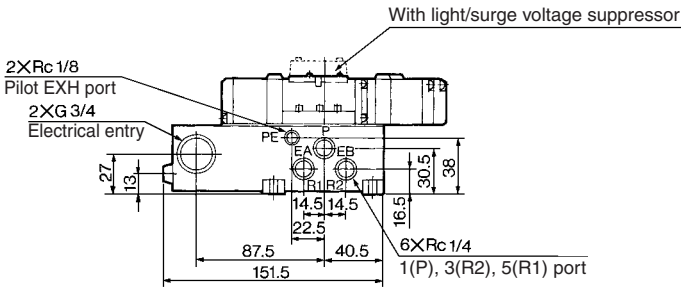
L / Stations	1	2	3	4	5	6	7	8	9	10	Formula
L1	75	103	131	159	187	215	243	271	299	327	L1 = 28 x n + 47
L2	84	112	140	168	196	224	252	280	308	336	L2 = 28 x n + 56

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

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

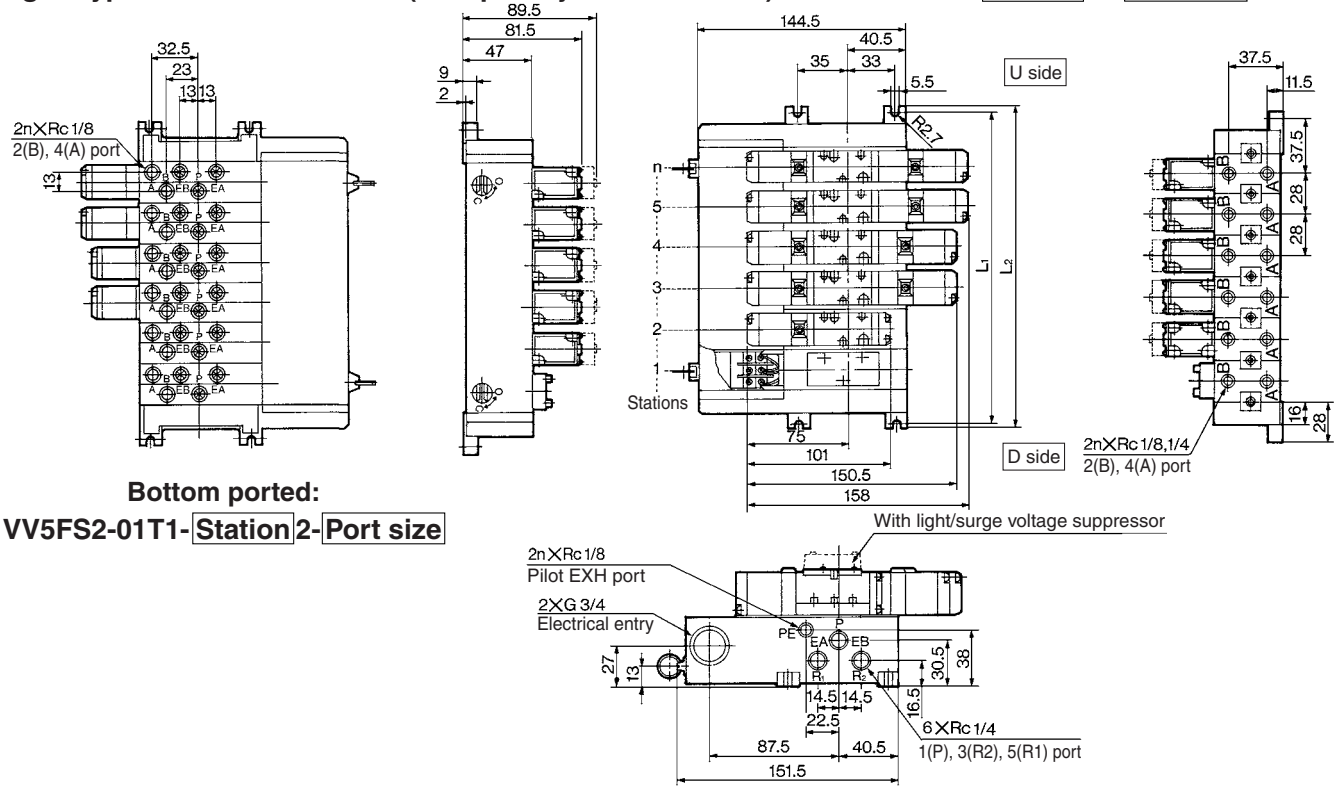


Bottom ported:
VV5FS2-01T-Station 2-Port size



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



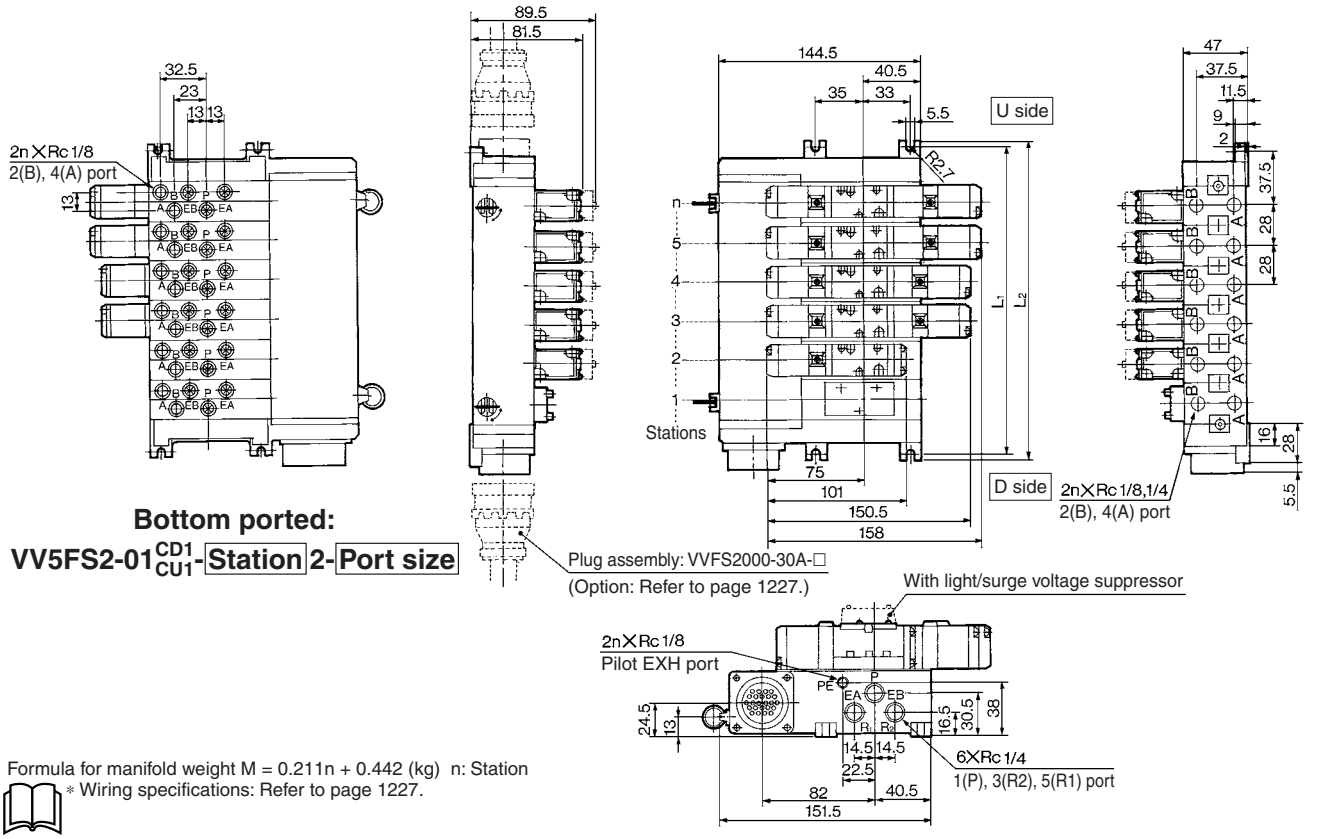
Bottom ported:
VV5FS2-01T1-Station 2-Port size

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

L \ Stations	1	2	3	4	5	6	7	8	9	10	Formula
L_1	75	103	131	159	187	215	243	271	299	327	$L_1 = 28 \times n + 47$
L_2	84	112	140	168	196	224	252	280	308	336	$L_2 = 28 \times n + 56$

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

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

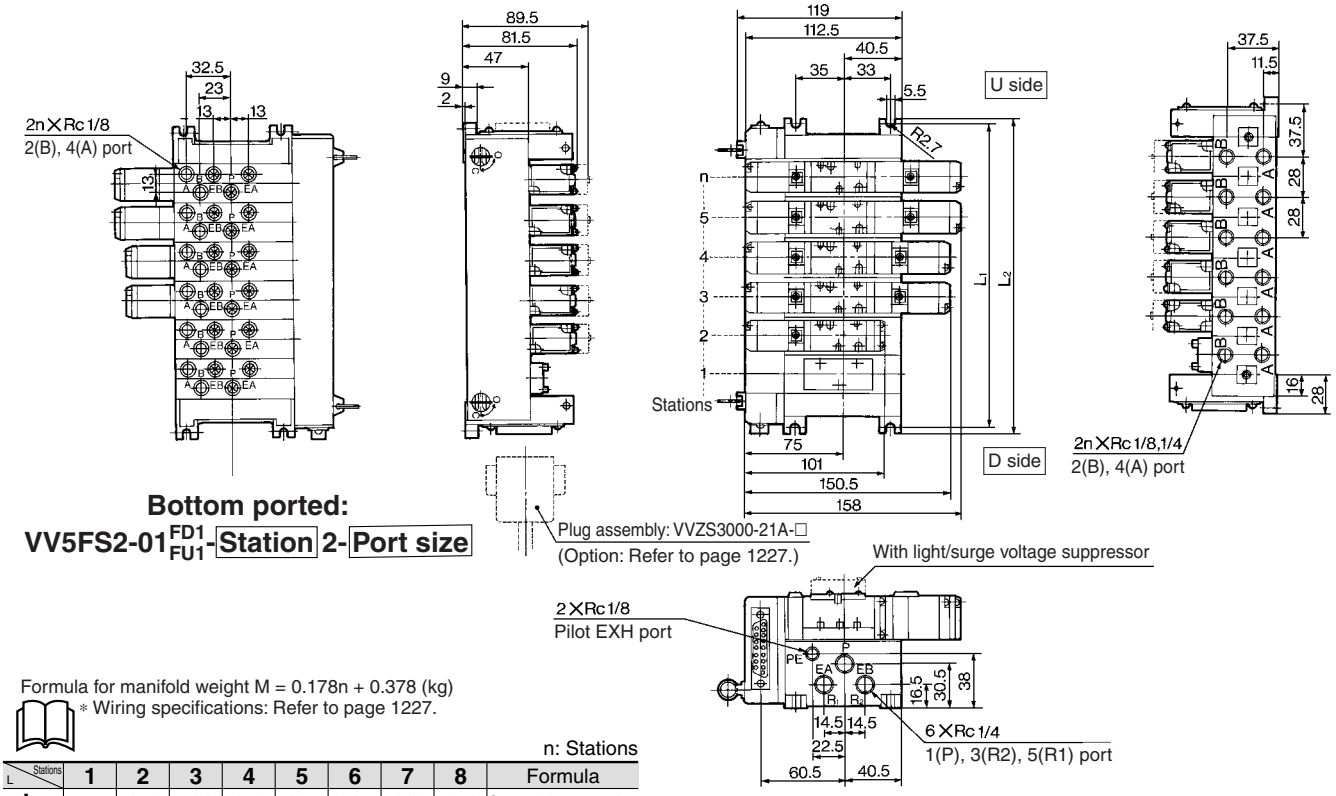


Bottom ported:
VV5FS2-01$^{CD1}_{CU1}$-Station 2-Port size

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



Bottom ported:
VV5FS2-01$^{FD1}_{FU1}$-Station 2-Port size

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

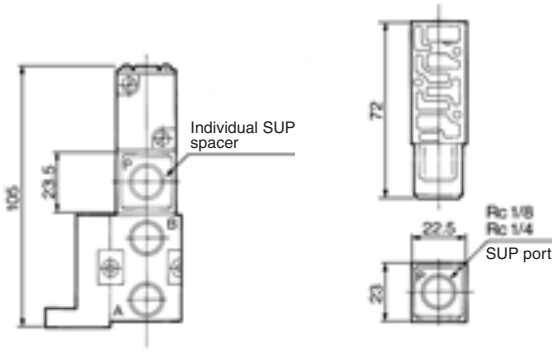
∗ Wiring specifications: Refer to page 1227.

n: Stations

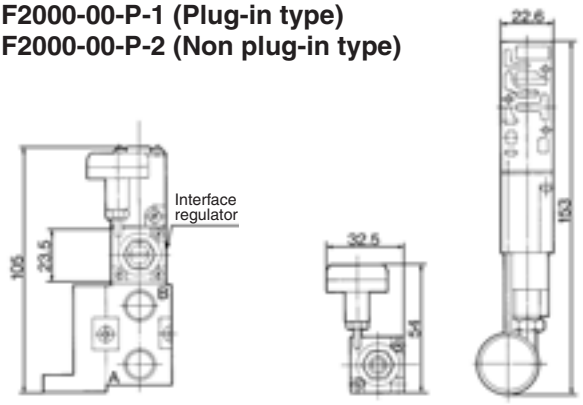
L \ Stations	1	2	3	4	5	6	7	8	Formula
L_1	75	103	131	159	187	215	243	271	L_1 = 28 x n + 47
L_2	84	112	140	168	196	224	252	280	L_2 = 28 x n + 56

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

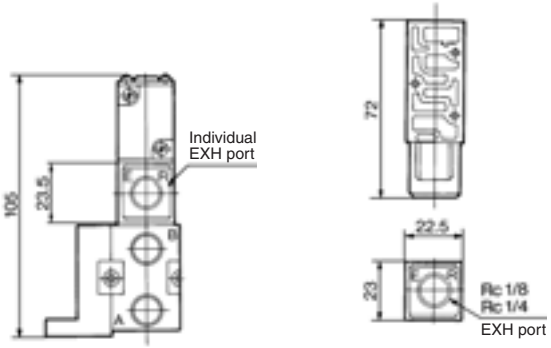
Individual SUP spacer:
VVFS2000-P-$^{01}_{02}$-1 (Plug-in type)
VVFS2000-P-$^{01}_{02}$-2 (Non plug-in type)



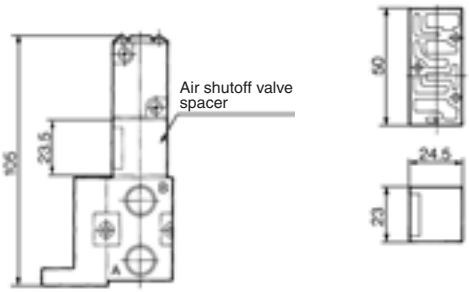
Interface regulator:
ARBF2000-00-P-1 (Plug-in type)
ARBF2000-00-P-2 (Non plug-in type)



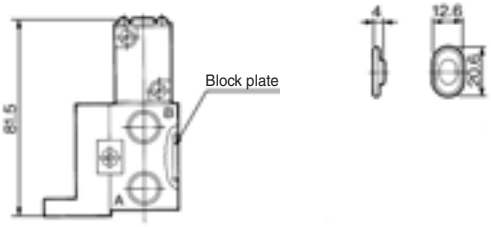
Individual EXH spacer:
VVFS2000-R-$^{01}_{02}$-1 (Plug-in type)
VVFS2000-R-$^{01}_{02}$-2 (Non plug-in type)



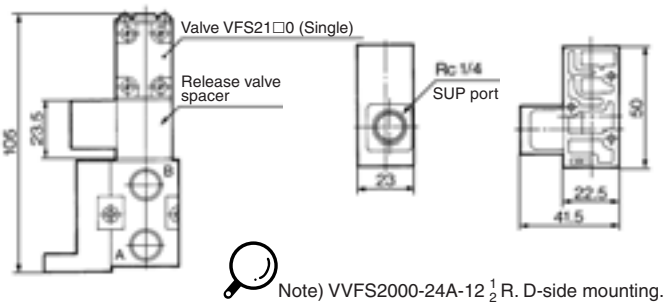
Air shutoff valve spacer:
VVFS2000-21A-1 (Plug-in type)
VVFS2000-21A-2 (Non plug-in type)



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

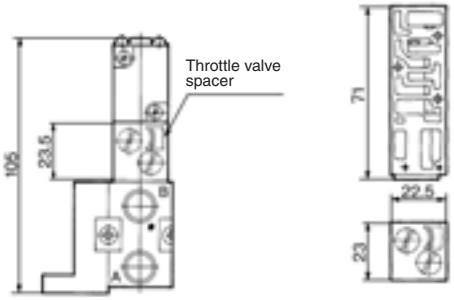


Release valve spacer:
VVFS2000-24A-1$^{R}_{L}$ (Plug-in type)
VVFS2000-24A-2$^{R}_{L}$ (Non plug-in type)

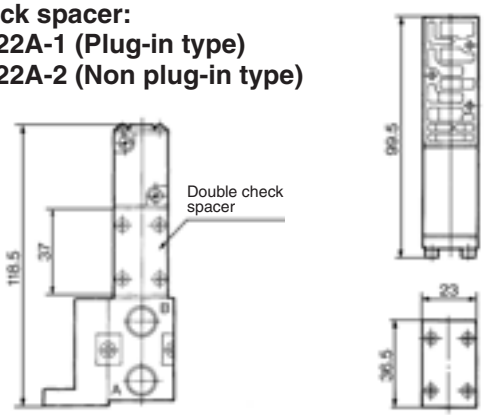


Note) VVFS2000-24A-12 $\frac{1}{2}$ R. D-side mounting.

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



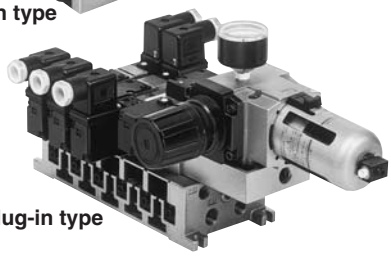
Double check spacer:
VVFS2000-22A-1 (Plug-in type)
VVFS2000-22A-2 (Non plug-in type)



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: Side: Rc 1/8, 1/4, Bottom: Rc 1/8 (Option)	
	1 (P), 3(R2), 5(R1) port: 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)	
Filtration degree	5 μm
Regulator	
Set pressure (Outlet pressure)	0.05 to 0.85 MPa
Pressure switch (1)	
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 (2)	<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 (3)	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	01C, 01F
U	U side mounting	

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

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

Port size

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

CE-compliant

Nil	—
Q	CE-compliant

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	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.

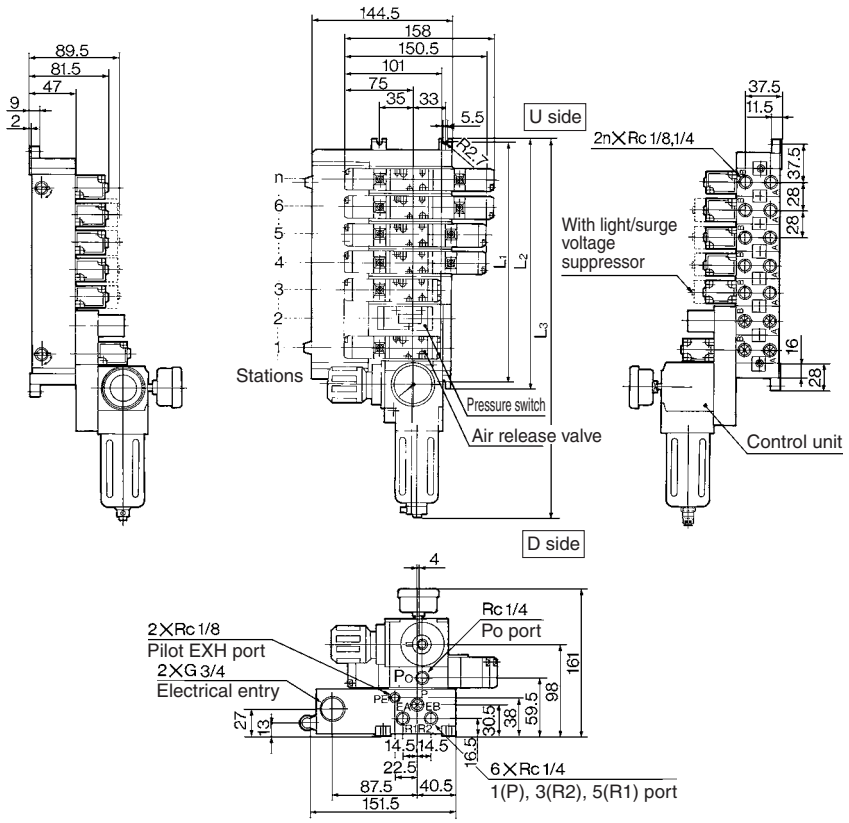
<Example>

- Plug-in type with terminal block
  (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.

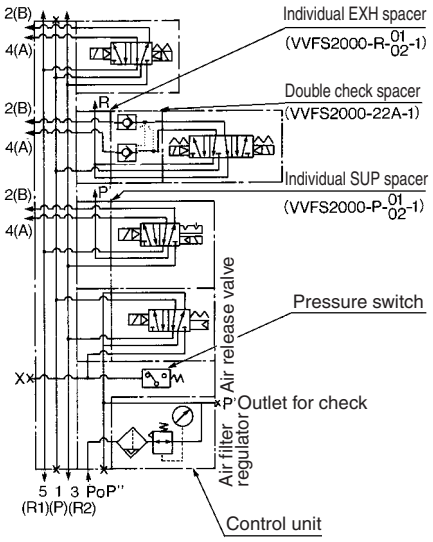
The asterisk denotes the symbol for assembly. Prefix it to the part numbers of the solenoid valve.

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

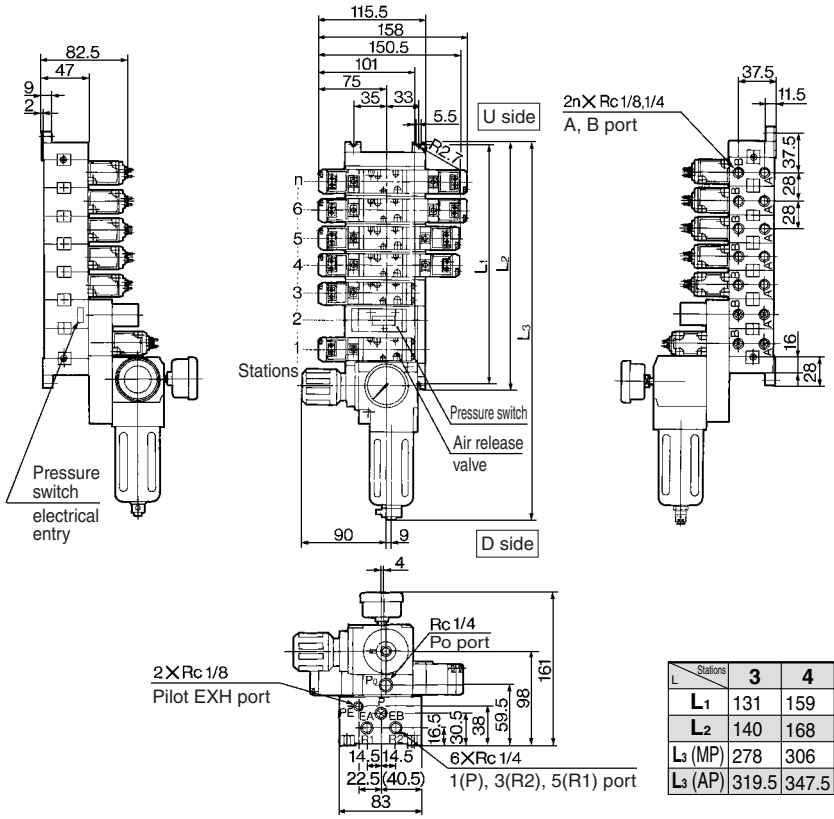
Plug-in type:
VV5FS2-01T- Station 1- Port size - Control unit Voltage for release valve



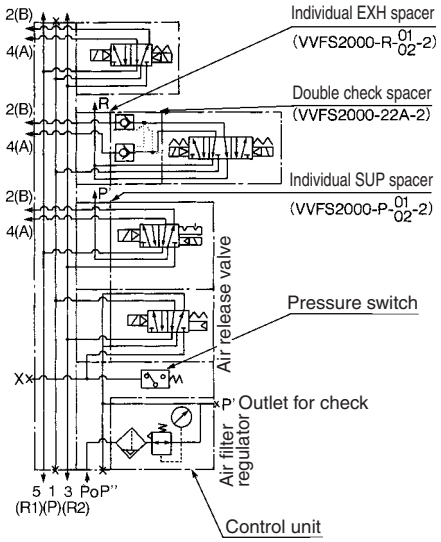
Example for manifold



Non plug-in type:
VV5FS2-10- 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
L1	131	159	187	215	243	271	299	327	L1 = 28 x n + 47
L2	140	168	196	224	252	280	308	336	L2 = 28 x n + 56
L3 (MP)	278	306	334	362	390	418	446	474	L3 = 28 x n + 194
L3 (AP)	319.5	347.5	375.5	403.5	431.5	459.5	487.5	515.5	L3 = 28 x n + 235.5

Dripproof Manifold (Equivalent to IP65)

Manifold Specifications

Manifold	VV5FS2-01WTB$^{U}_{D}$		VV5FS2-01W
Wiring	Common terminal box		Attachment plug lead wire
Applicable value model	VFS2□00-□F-X54		
Porting specifications Rc	Common SUP, Common EXH		
	2(B), 4(A) port	Side: Rc 1/8, 1/4, Bottom: Rc 1/8 (Option)	
	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)

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

Stations

02	2 stations
⋮	⋮
15	15 stations

Symbol

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

* Semi-standard

Port size

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

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

CE-compliant

Nil	—
Q	CE-compliant

How to order valves

VFS2 1 00 □ - 5 F □ □ - X54 - □

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

* Semi-standard

Coil rated voltage

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

* Semi-standard
For other rated voltages, please consult with SMC.

Option

Nil	None
Z	With light/surge voltage suppressor

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)

* Semi-standard

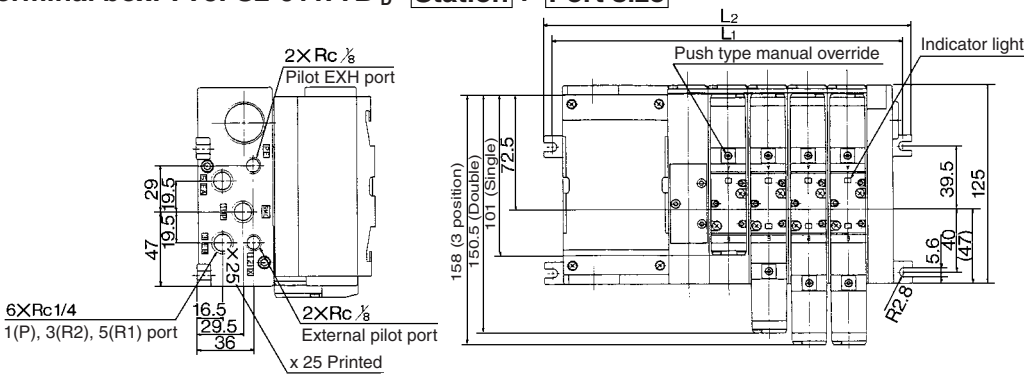
Dripproof

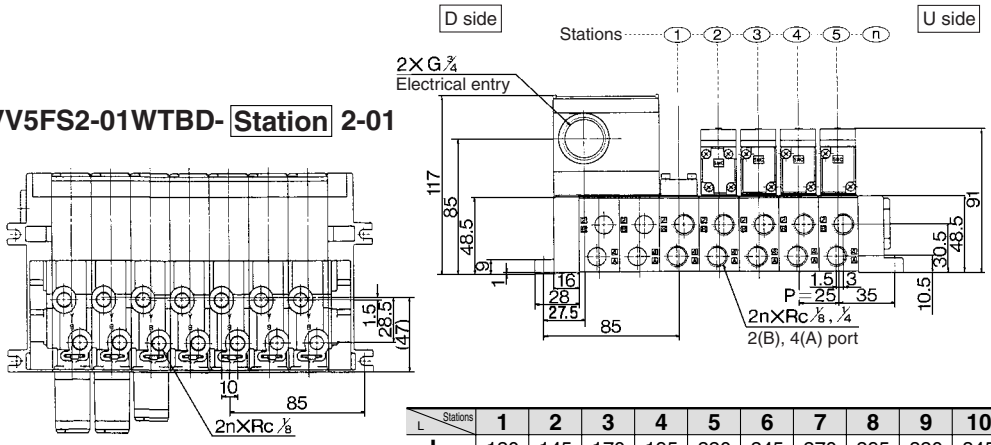
CE-compliant

Nil	—
Q	CE-compliant

Dripproof Manifold

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





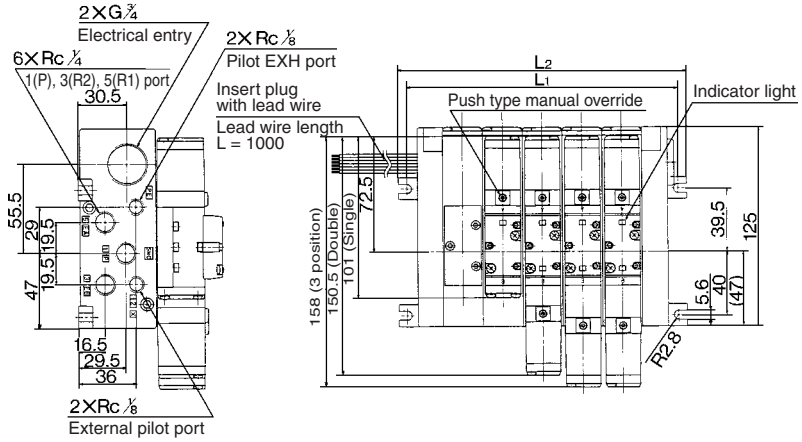
Bottom ported: VV5FS2-01WTBD- Station 2-01

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

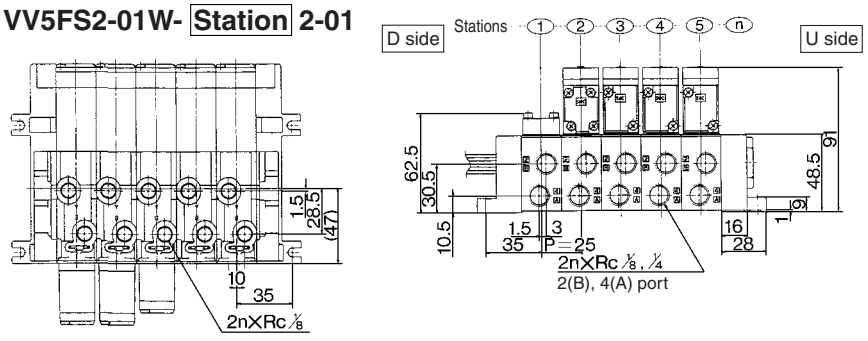
n: Stations

L \ Stations	1	2	3	4	5	6	7	8	9	10	Formula
L1	120	145	170	195	220	245	270	295	320	345	L1 = 25 x n + 95
L2	131	156	181	206	231	256	281	306	331	356	L2 = 25 x n + 106

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



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



n: Stations

L \ Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Formula
L1	70	95	120	145	170	195	220	245	270	295	320	345	370	395	420	L1 = 25n + 45
L2	81	106	131	156	181	206	231	256	281	306	331	356	381	406	431	L2 = 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
	P	R1, R2	A, B
1	Common	Common	Side
2∗			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 mounating 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	
	A B	A B	A B	A B	A B	A B	A B	A B		
	0 1	2 3	4 5	6 7	8 9	10 11	12 13	14 15		

<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	
	A B	A B	A	A	A	A B	A	A B	A	A		
	0 1	2 3	4	5	6	7 8	9	10 11	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

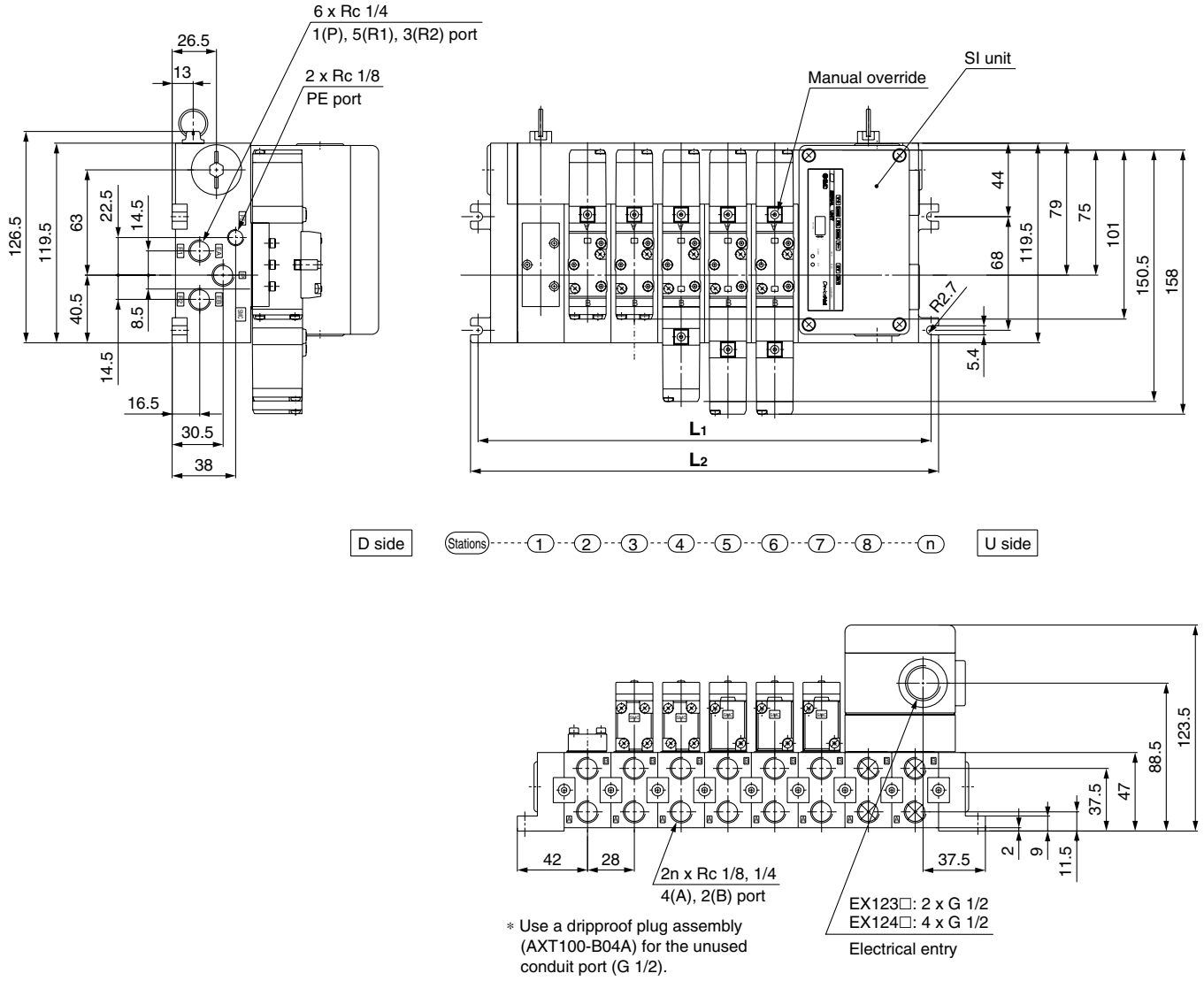
Nil	None
Z	With light/surge voltage suppressor

Coil rated voltage

Nil	None

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).

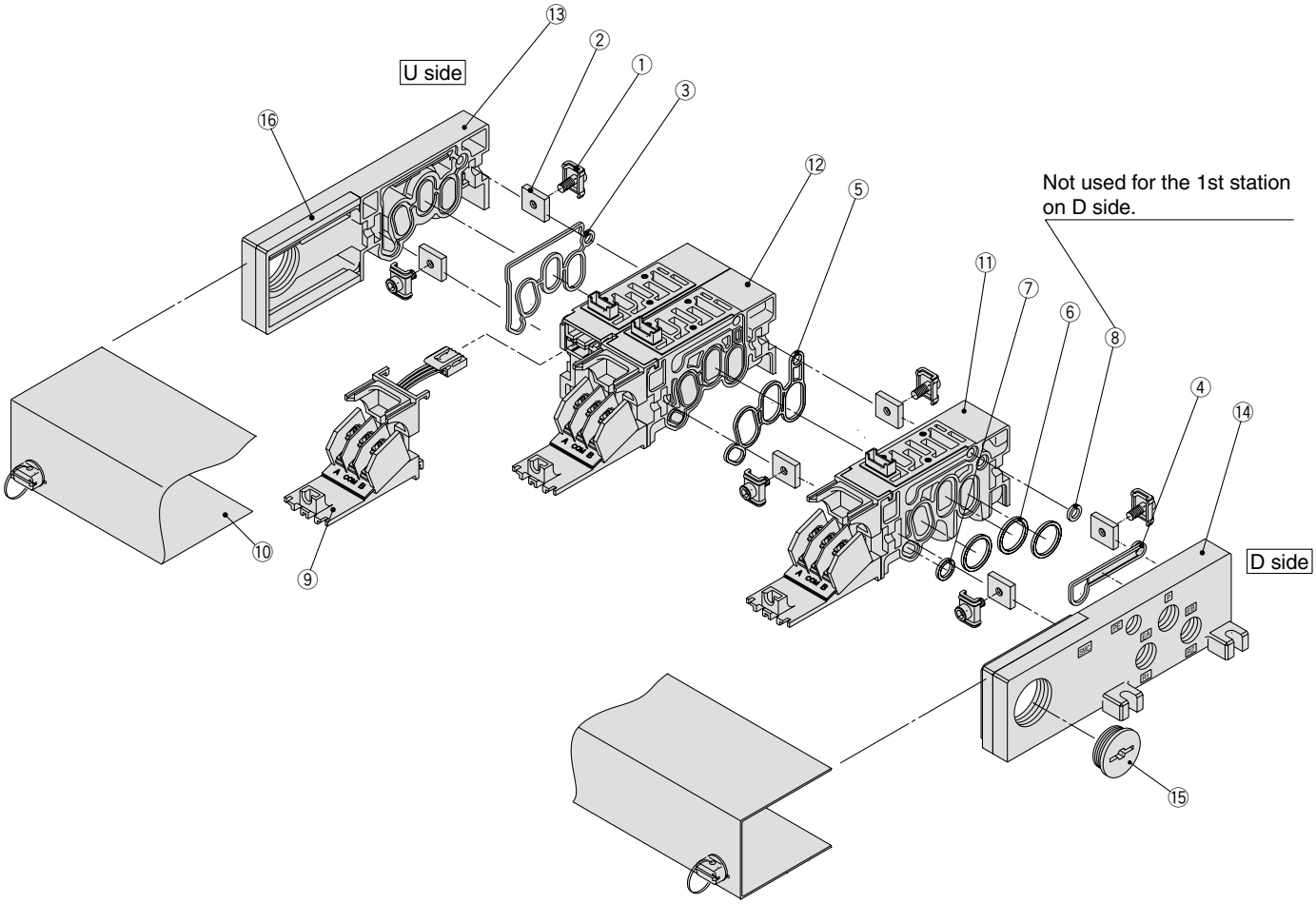
Dimensions

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

L \ n	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
L_1	131	159	187	215	243	271	299	327	355	383	411	439	467	495	523	551
L_2	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.

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



∗ Manifold Base/Construction: Plug-in type with terminal block (01T1).

- For increasing the manifold bases, please order the manifold block assembly number of the principle number assembly ⑪ and ⑫.
  For plug-in type: The manifold base with terminal stand (integrated with a junction cover) is required with the ⑩ junction cover assembly.
- Manifold base is consisted of the junction of 2 and 3 station bases.

Example) U side (n)----(6)----(5)----(4)----(3)----(2)----(1) D side

<5 stations (Odd number)>

2 stations	2 stations	1 station

<6 stations (Even number>

2 stations	2 stations	1 station	1 station

Replacement Parts

No.	Description	Material	Part no.	
1	**Connection fitting assembly**	Steel plate		AXT625-4-1A
2	**Connection fitting B**	Steel plate		AXT625-5
3	**Gasket A**	NBR		AXT625-17
4	**Gasket B**	NBR		AXT625-16
5	**Gasket**	HNBR		VVFS2000-32-1H
6	**O-ring**	NBR		18 x 15 x 1.5
7	**O-ring**	NBR		10.5 x 7.5 x 1.5
8	**O-ring**	NBR		8 x 5 x 1.5
9	**Adapter plate**	Resin	For 01	AXT625-6
	Adapter plate assembly	—	For 01T	AXT625-28-13A (Terminal section with adapter plate and lead wire assembly)
			For 01T1	
	Adapter plate	Resin	For 01C	AXT625-28-1
			For 01F	VVF2000-26-6
			For 01S□	AXT625-6
10	**Junction cover assembly**	—	For 01	AXT625-7A
			For 01T	AXT625-28-3A
			For 01T1	AXT625-28-7A-Stations
			For 01C	
			For 01F	VVF2000-26-5A-Stations
			For 01S□	AZ738-10A-Stations
15	**Rubber plug**	NBR	For 01	AXT333-12
			For 01T (1) / 01S□	AXT625-22
	Plug	—	For 01W	EXP22S
16	**Guard**	Resin	For 01 / 01T (1)	AXT625-28-4

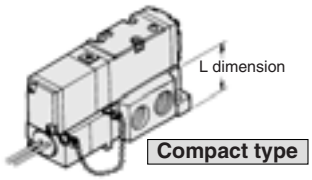
Replacement Parts: Sub Assembly

No.	Description	Part no.	Component parts	Applicable manifold base
11	**Manifold block assembly (for 1 station)**	AXT625-01A-$\frac{1}{2}$(-B) Note)	Manifold block ⑪, Metal joint ①, ②, O-ring ⑥, ⑦, ⑧, Junction cover ⑩, Adapter plate ⑨, Pin housing, Guide, Insert plug lead wire	Plug-in type With attachment plug lead wire
		AXT625-20A-$\frac{1}{2}$(-B) Note)	Manifold block ⑪, Metal joint ①, ②, O-ring ⑥, ⑦, ⑧, Junction cover ⑩, Adapter plate assembly (with terminal) ⑨, Pin housing, Guide	Plug-in type With terminal block
		AXT625-10A-$\frac{1}{2}$(-B) Note)	Manifold block ⑪, Metal joint ①, ②, O-ring ⑥, ⑦, ⑧	Non plug-in type
12	**Manifold block assembly (for 2 stations)**	AXT625-01A2-$\frac{1}{2}$ Note)	Manifold block ⑫, Metal joint ①, ②, Gasket ⑤, Junction cover ⑩, Adapter plate ⑨, Pin housing, Guide, Insert plug lead wire	Plug-in type With attachment plug lead wire
		AXT625-20A2-$\frac{1}{2}$ Note)	Manifold block ⑫, Metal joint ①, ②, Gasket ⑤, Junction cover ⑩, Adapter plate assembly (with terminal) ⑨, Pin housing, Guide	Plug-in type With terminal block
		AXT625-10A2-$\frac{1}{2}$ Note)	Manifold block ⑪, Metal joint ①, ②, Gasket ⑤	Non plug-in type
13	**End plate (U side) assembly**	AXT625-2A	End plate (U) ⑬, Metal joint ①, ②, Gasket A ③, Guard ⑯	Plug-in type With attachment plug lead wire
		AXT625-2A-20	End plate (U) ⑬, Metal joint ①, ②, Gasket A ③, Guard ⑯	Plug-in type With terminal block
		AXT625-2A-10	End plate (U) ⑬, Metal joint ①, ②, Gasket A ③	Non plug-in type
14	**End plate (D side) assembly**	AXT625-3A	End plate (D) ⑭, Metal joint ①, ②, Gasket B ④, Guard ⑯, Steel ball	Plug-in type With attachment plug lead wire
		AXT625-3A-20	End plate (D) ⑭, Metal joint ①, ②, Gasket B ④, Guard ⑯, Steel ball	Plug-in type With terminal block
		AXT625-3A-10	End plate (D) ⑭, Metal joint ①, ②, Gasket B ④, Steel ball	Non plug-in type

Note) 1: A, B port size Rc 1/8, 2: A, B port size Rc 1/4, (-B): A, B port bottom ported

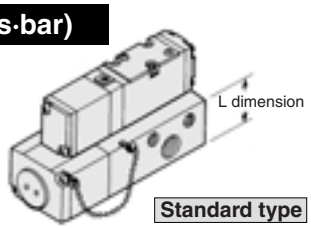
Light Compact Type Sub-plate/C: 2.8 dm³/(s·bar)

C: 2.2 dm³/(s·bar)



Compact type

C: 2.8 dm³/(s·bar)



Standard type

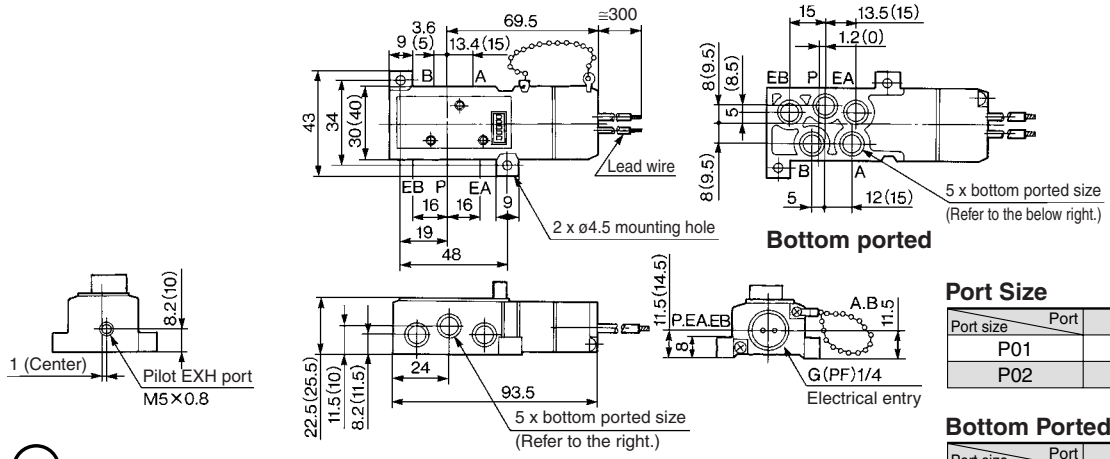
Sub-plate

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 P02

Port Size

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

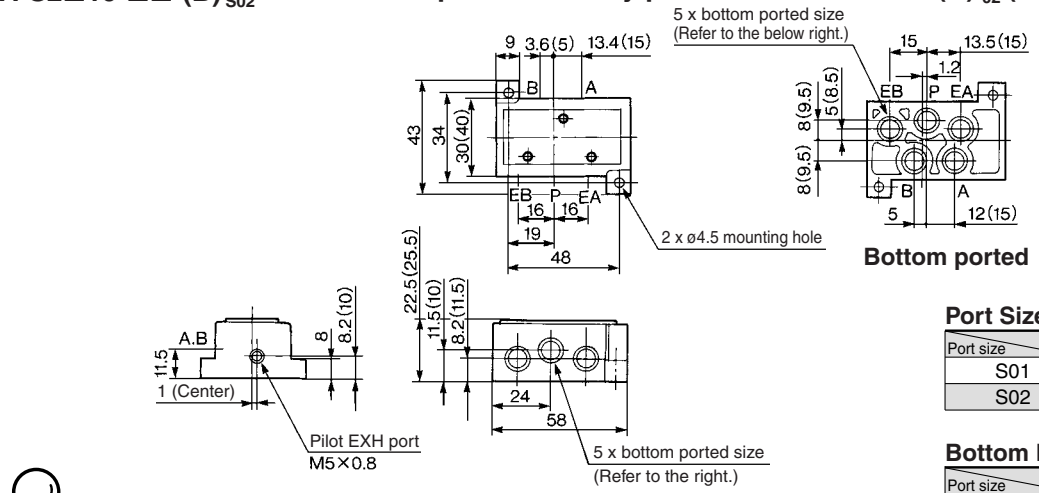
Bottom Ported Size

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

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 S02

Port Size

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

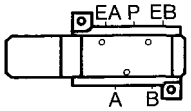
Bottom Ported Size

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

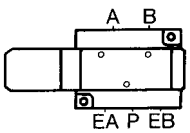
Precautions

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

VFS2□□0-□□-$^{P01/02}_{S01/02}$: 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.

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

NRTL /C

(Details → P. 1222-2)

Model

Type of actuation		Model: Plug-in	Model: Non plug-in	Port size Rc	Flow characteristics: 1→4/2 (P→A/B) C [dm³/(s·bar)]	b	Cv	Flow characteristics: 4/2→5/3 (A/B→R1/R2) C [dm³/(s·bar)]	b	Cv	Max.(1) operating cycle (cpm)	Response(2) time (ms)	Mass(3) (kg)
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.

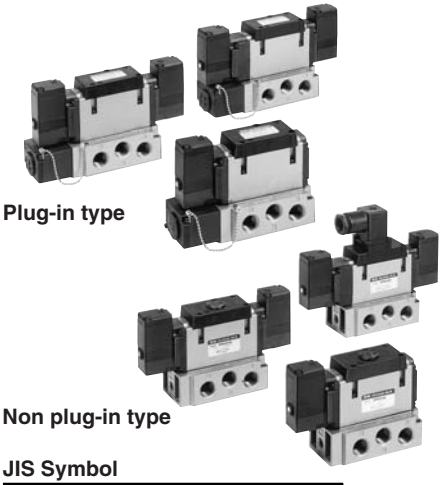
Compact yet provides a large flow capacity
3/8: C: 5.8 dm³/(s·bar)

Low power consumption: 1.8 W DC

Easy maintenance

2 types of sub-plates:

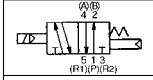
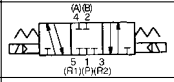
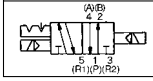
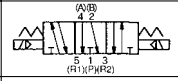
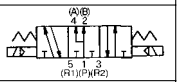
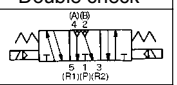
Plug-in and non plug-in



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 (1)
	Lubrication		Non-lube (2)
	Pilot valve manual override		Non-locking push type (Flush)
	Shock/Vibration resistance		150/50 m/s² (3)
	Enclosure		Type E: Dustproof (Level 0), Type F: Dripproof (Level 2), Type D: Splashproof (Level 4) (4)
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) (5)
	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

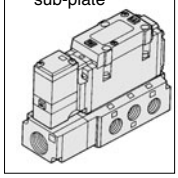
Pilot type		External pilot Note)
Manual override	**Main valve**	Direct manual override type
	Pilot valve	Non-locking push type (Extended), Locking type (Tool required), Locking type (Lever)
Coil rated voltage		110 to 120, 220, 240 VAC (50/60 Hz)
		12, 100 VDC
Porting specifications		Bottom ported
Option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

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

How to Order

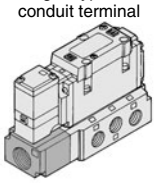
Body type

O: Plug-in type sub-plate



Electrical entry

F: Plug-in type conduit terminal



Porting specifications

Nil	Side ported
B*	Bottom ported

* Semi-standard

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

* Semi-standard

CE-compliant

Nil	—
Q	CE-compliant

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

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

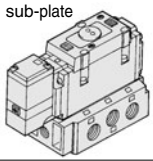
Symbol

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

* Semi-standard

Pilot type

Nil	Internal pilot
R*	External pilot

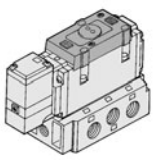
* Semi-standard

Option

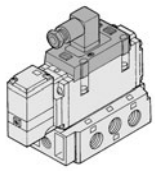
Nil	None
Z	With light/surge voltage suppressor

Electrical entry

E: Grommet terminal



D: DIN terminal



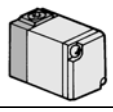
Coil rated voltage

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

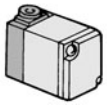
* Semi-standard
For other rated voltages, please consult with SMC.

Pilot valve Manual override

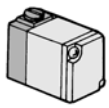
Nil: Non-locking push type (Flush)



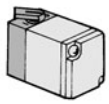
A*: Non-locking push type (Extended)



B*: Locking type (Tool required)



C*: Locking type (Lever)



* Semi-standard

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

* Semi-standard
For other rated voltages, please consult with SMC.

Manual override

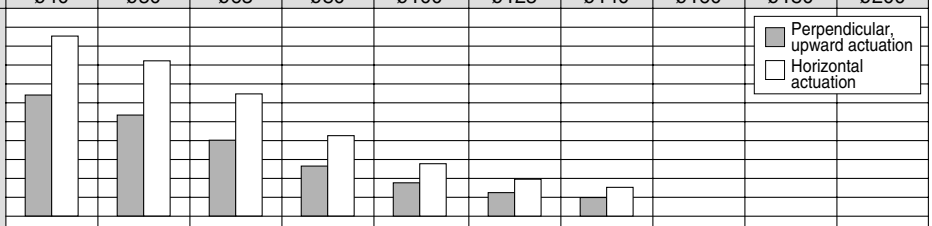
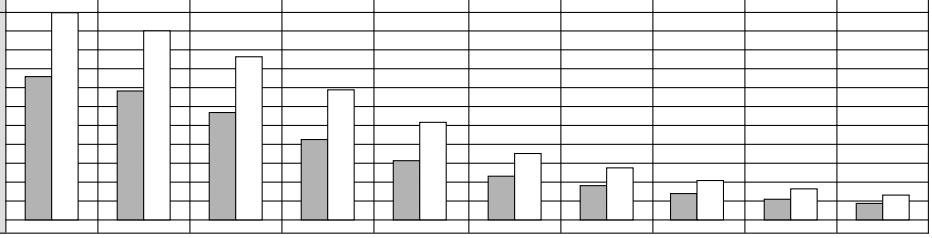
Symbol	Manual override
Nil	Non-locking push type (Flush)
A*	Non-locking push type (Extended)
B*	Locking type (Tool required)
C*	Locking type (Lever)

* Semi-standard

* Refer to page 1224 for voltage conversion.

Cylinder Speed Chart

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

System	Average speed (mm/s)	Bore size									
		Series MB, CA2 Pressure 0.5 MPa Load factor 50% Stroke 500 mm					Series CS1/CS2 Pressure 0.5 MPa Load factor 50% Cylinder stroke 1000 mm				
		ø40	ø50	ø63	ø80	ø100	ø125	ø140	ø160	ø180	ø200
A	1000 900 800 700 600 500 400 300 200 100 0										
B	1000 900 800 700 600 500 400 300 200 100 0										

System Components

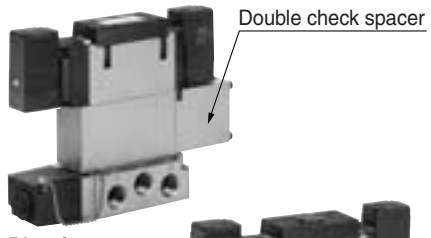
System	Solenoid valve	Speed controller	Silencer	SGP (Steel pipe) Port size x Length
A	Series VFS3000 Rc 1/4	AS4000-02 (S = 24 mm²)	AN200-02 (S = 35 mm²)	6A x 1 m
B	Series VFS3000 Rc 3/8	AS420-03 (S = 73 mm²)	AN300-03 (S = 60 mm²)	10A x 1 m

∗ 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.



Plug-in type

Non plug-in type

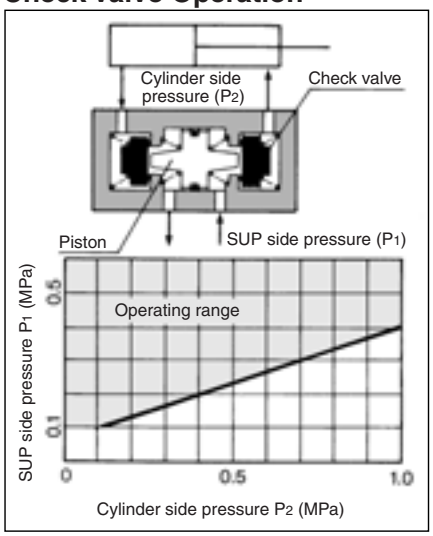
Specifications

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.

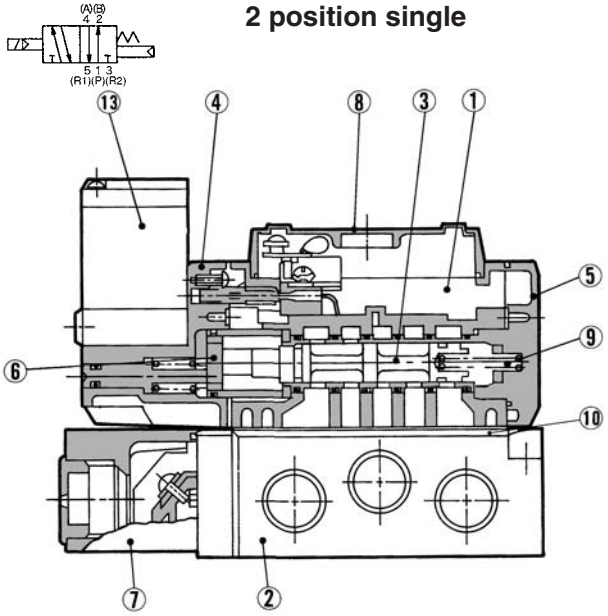
Check Valve Operation



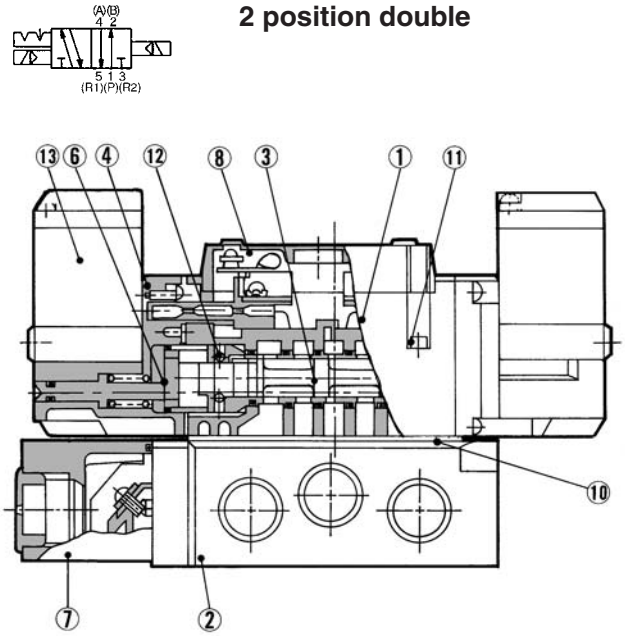
- The combination of VFS31$^{0}_{1}$0, VFS32$^{0}_{1}$0 and double check spacer can be used as prevention for falling at the stroke end but cannot hold the intermediate position of the cylinder.

Construction

2 position single

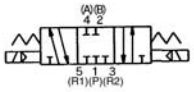


2 position double

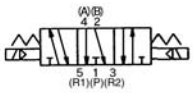


3 position closed center/exhaust center/pressure center

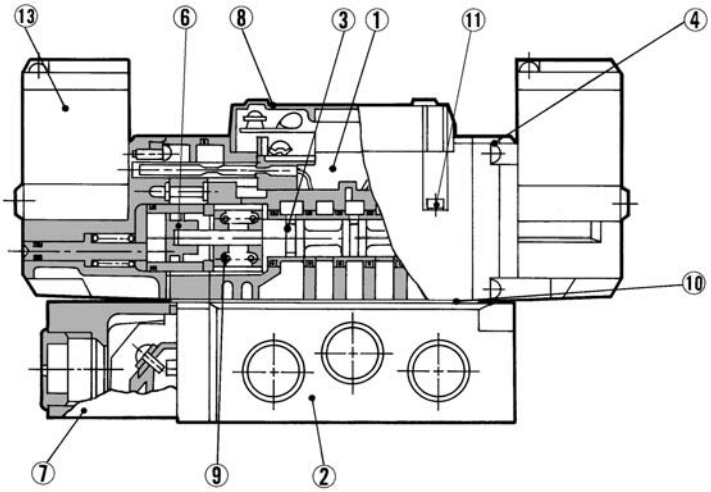
Closed center



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 1163.

Sub-plate Assembly Part No.

Plug-in	VFS3000-P-$^{02}_{03}$
Non plug-in	VFS3000-S-$^{02}_{03}$

∗ Mounting bolt and gasket are not included.

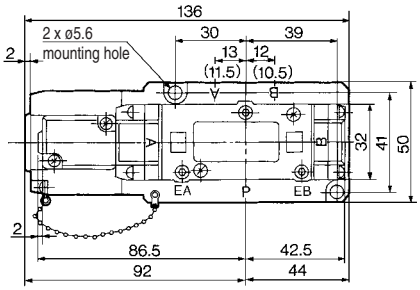
Sub-plate Assembly (For External Pilot) Part No.

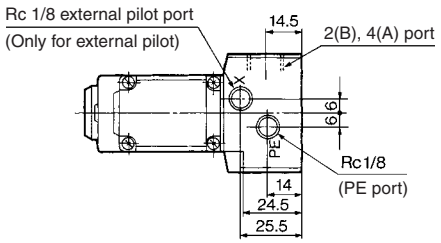
Plug-in	VFS3000-P-R$^{02}_{03}$
Non plug-in	VFS3000-S-R$^{02}_{03}$

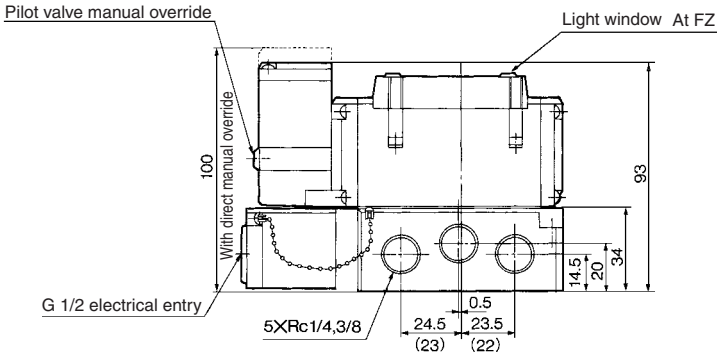
Part no. for mounting bolt and gasket
BG-VFS3000

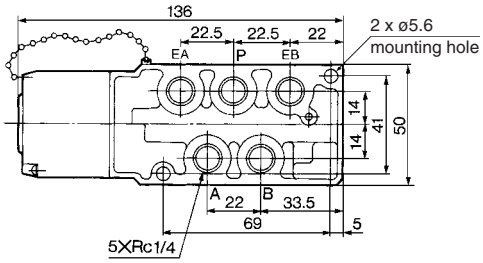
Plug-in — 2 Position single/3 Position closed center/Exhaust center/Pressure center/Double check

2 position single: VFS3100-□F





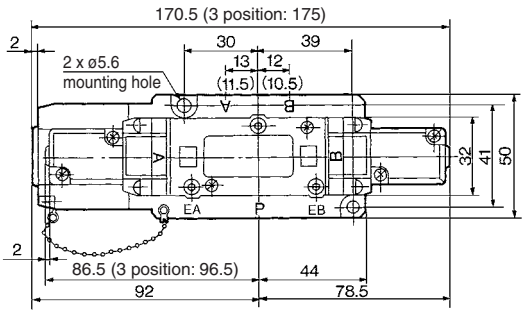


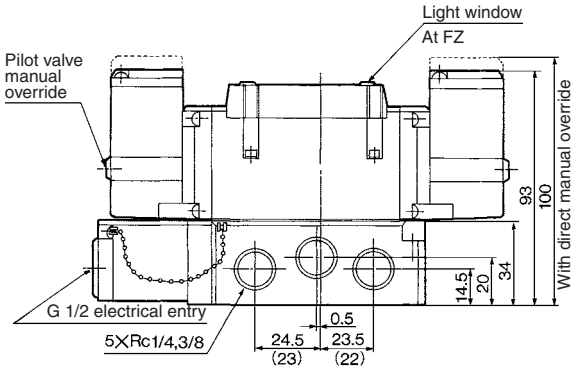


Bottom ported

( ): Rc 1/4

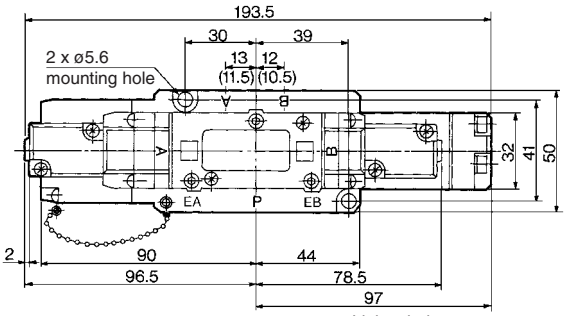
2 position double: VFS3200-□F
3 position closed center: VFS3300-□F
3 position exhaust center: VFS3400-□F
3 position pressure center: VFS3500-□F

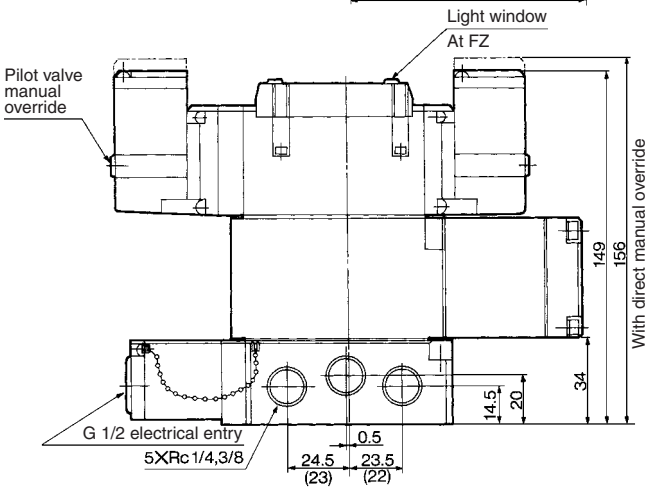




( ): Rc 1/4

3 position double check: VFS3600-□F

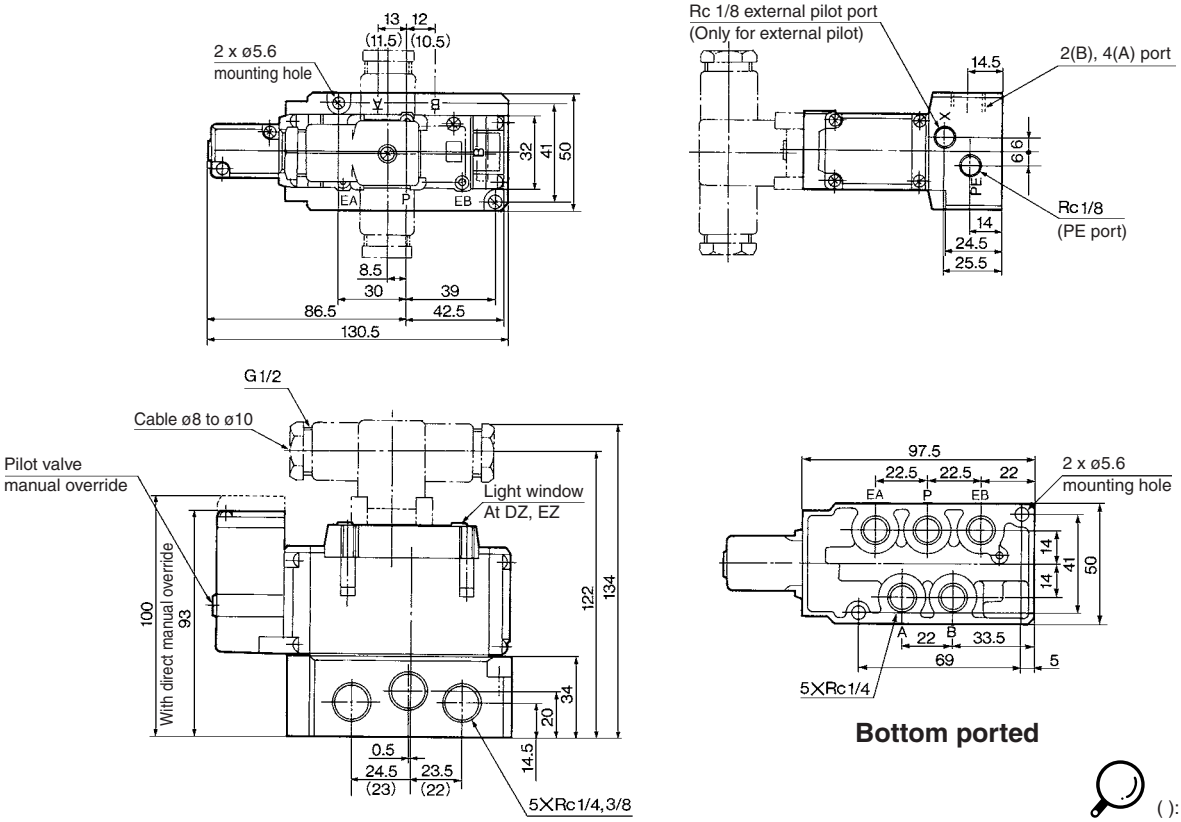




( ): Rc 1/4

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

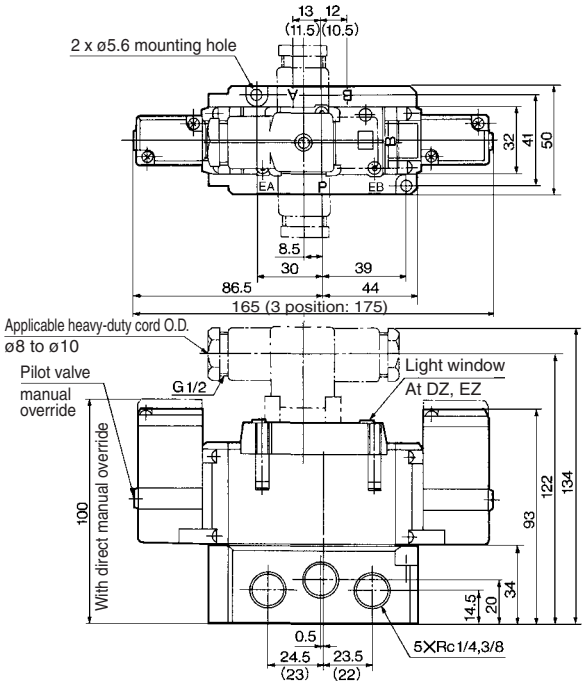
2 position single: VFS3110-□E, VFS3110-□D



Bottom ported

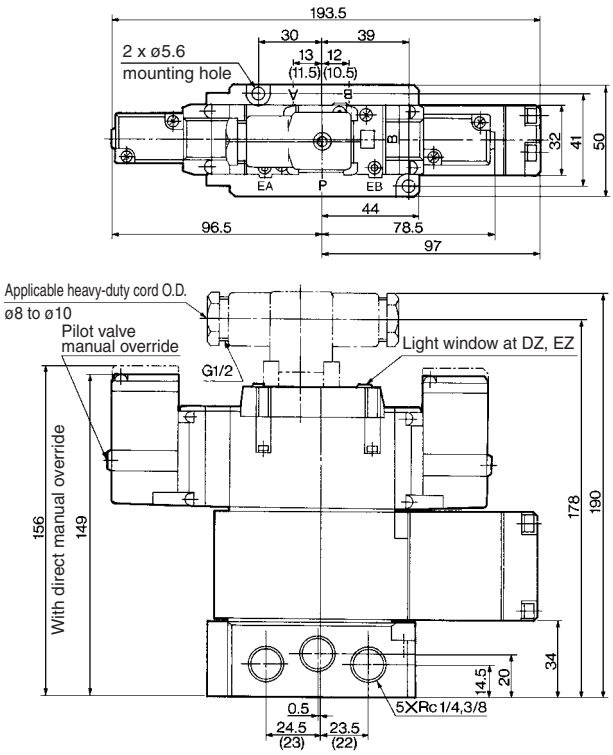
( ): Rc 1/4

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



( ): Rc 1/4

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

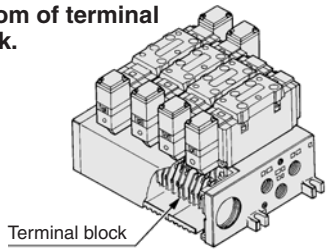


( ): Rc 1/4

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

- 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 1/2	Rc 1/4
03		Rc 3/8
M		Mixed

- Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

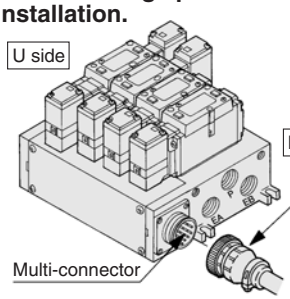
* Option

- CE-compliant

Nil	—
Q	CE-compliant

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

- 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 1/2	Rc 1/4
03		Rc 3/8
M		Mixed

- Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

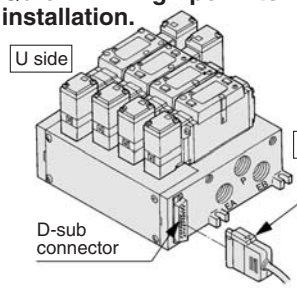
* Option

- CE-compliant

Nil	—
Q	CE-compliant

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

- 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 1/2	Rc 1/4
03		Rc 3/8
M		Mixed

- Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

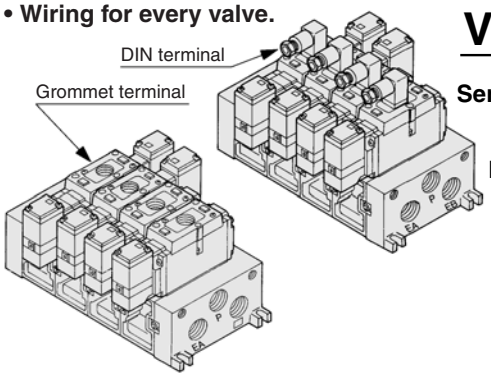
* Option

- CE-compliant

Nil	—
Q	CE-compliant

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

- 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 1/2	Rc 1/4
03		Rc 3/8
M		Mixed

- Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

- CE-compliant

Nil	—
Q	CE-compliant

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	Port size Rc		Stations	Applicable valve model
		A, B port	P, EA, EB	A, B		
Plug-in type **VV5FS3-01□**	• With terminal block • With multi-connector • With D-sub connector	Side/ Bottom	1/2 (1)	1/4, 3/8	2 to 10 (2)	VFS3□00-□F
Non plug-in type **VV5FS3-10**	• DIN terminal • Grommet terminal					VFS3□10-□D VFS3□10-□E

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 [dm³/(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 [dm³/(s·bar)]	7.0	7.0	7.0
		b	0.20	0.20	0.20
		Cv	1.8	1.8	1.8

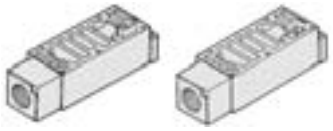
∗ Port size: Rc 3/8

Manifold Option Parts Assembly

Individual SUP spacer

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

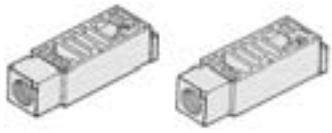
Body type	Plug-in type	Non plug-in type
Part no.	VVFS3000-P-03-1	VVFS3000-P-03-2



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

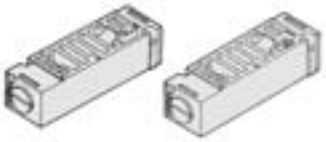
When valve exhaust affects the other stations on the circuit or when the reverse pressure valve is used to standard manifold valve, insert EXH block plate between stations to separate valve exhaust.

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.

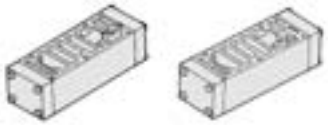
Body type	Plug-in type	Non plug-in type
Part no.	VVFS3000-20A-1	VVFS3000-20A-2



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.

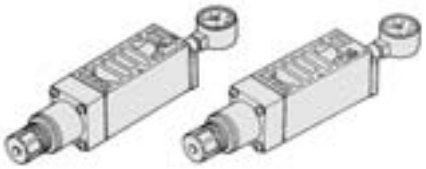
Body type	Plug-in type	Non plug-in type
Part no.	VVFS3000-22A-1	VVFS3000-22A-2



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.

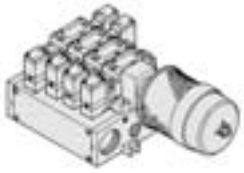
Body type	Plug-in type	Non plug-in type
Part no.	VVFS3000-10A	

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

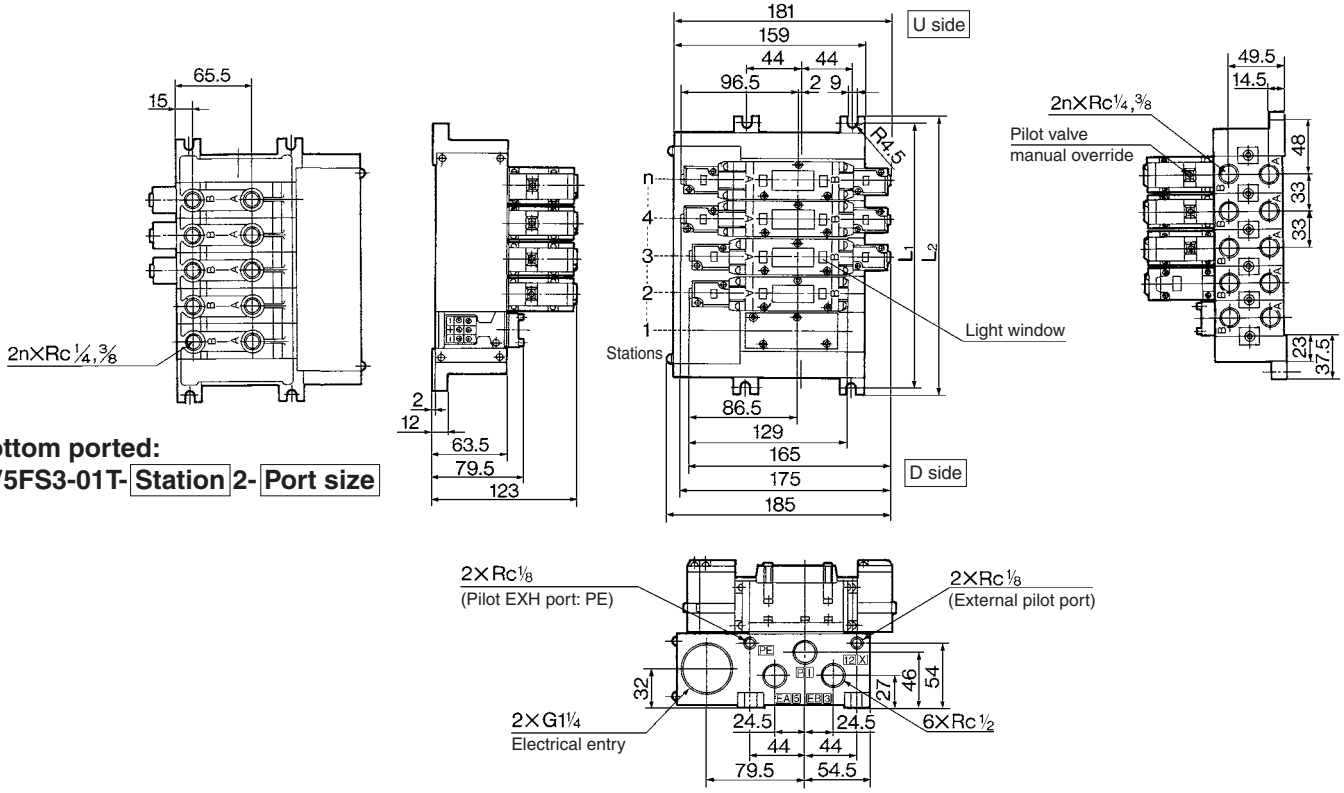
Plug-in type

- **Solenoid valve wiring process reduced considerably.**

For details, refer to page 1178.

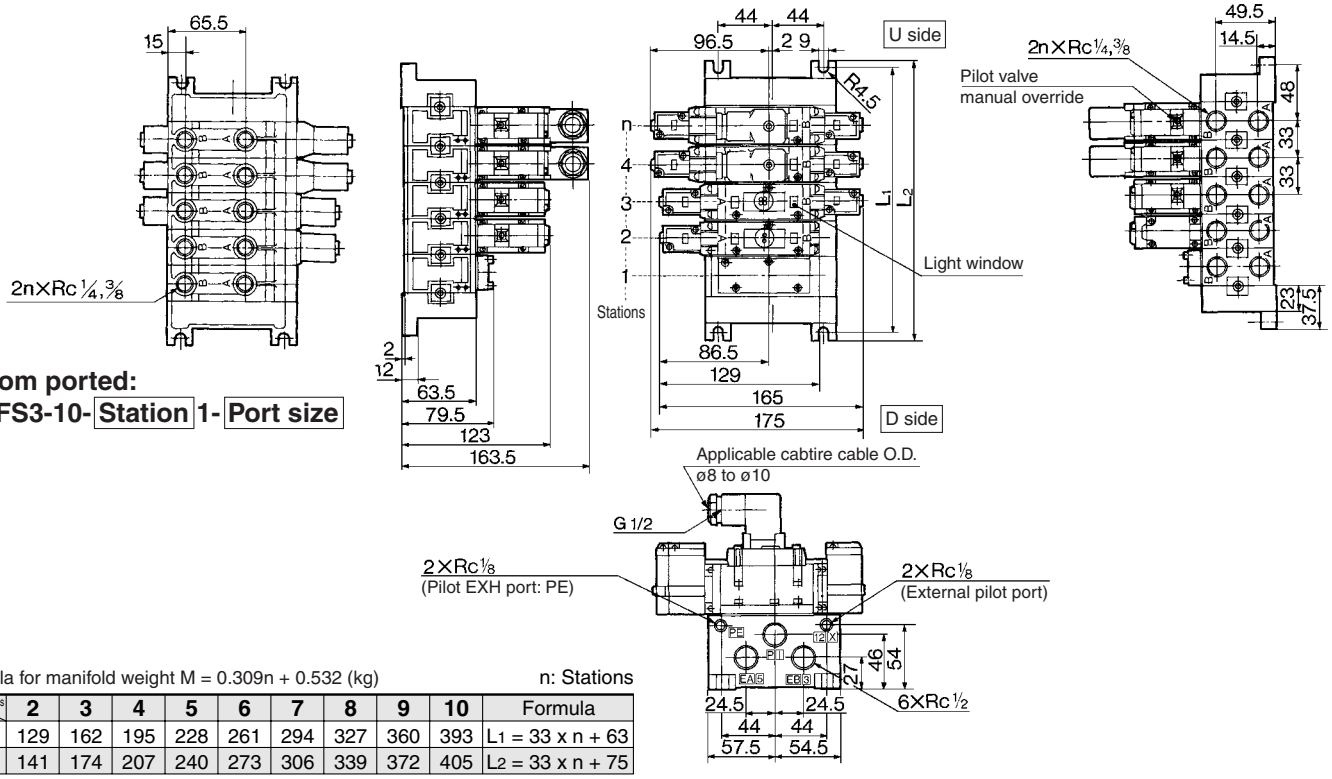
Manifold — Plug-in type, Non plug-in type

Plug-in type (With terminal block): VV5FS3-01T- Station 1- 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: VV5FS3-01T- Station 2- Port size

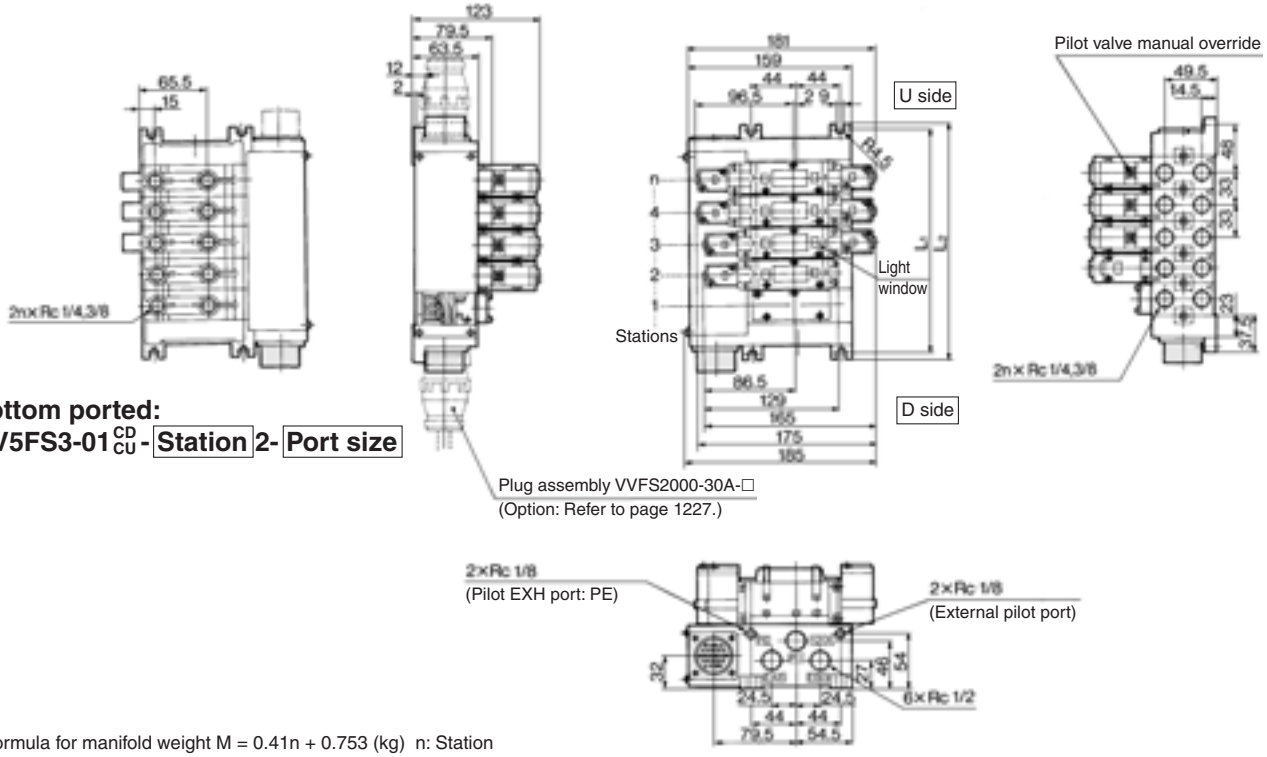
Bottom ported: VV5FS3-10- Station 1- Port size

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

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

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

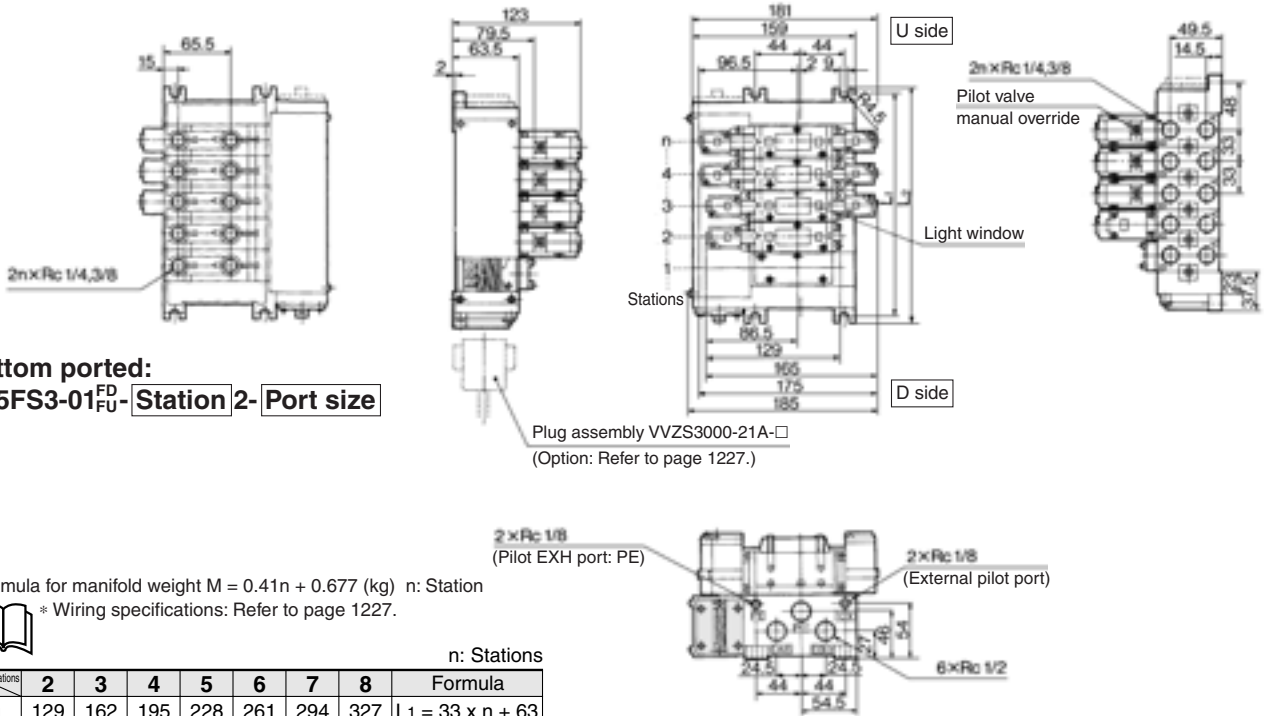


Bottom ported:
VV5FS3-01 $^{CD}_{CU}$ - Station 2- Port size

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 $^{FD}_{FU}$ - Station 2- Port size

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

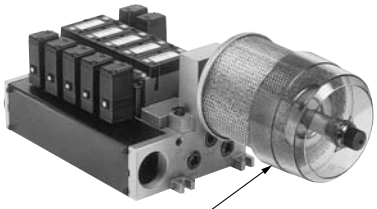
∗ Wiring specifications: Refer to page 1227.

n: Stations

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

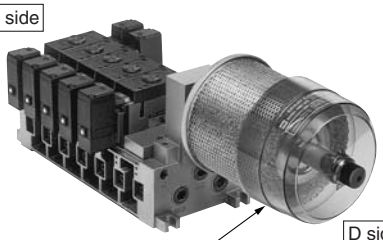
Manifold with Exhaust Cleaner

- **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	1/4, 3/8	
	1(P), 3(R2), 5(R1) port	P: 1/2, EXH: 1	
Stations	2 to 10 (1)		
Applicable exhaust cleaners	AMC610-10 (Connecting port size R 1) (2)		

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	

Stations

02	2 stations
⋮	⋮
10	10 stations

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

Symbol

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

* Option

Port size

Symbol	P	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

Exhaust cleaner mounting direction

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

CE-compliant

Nil	—
Q	CE-compliant

⚠ 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**

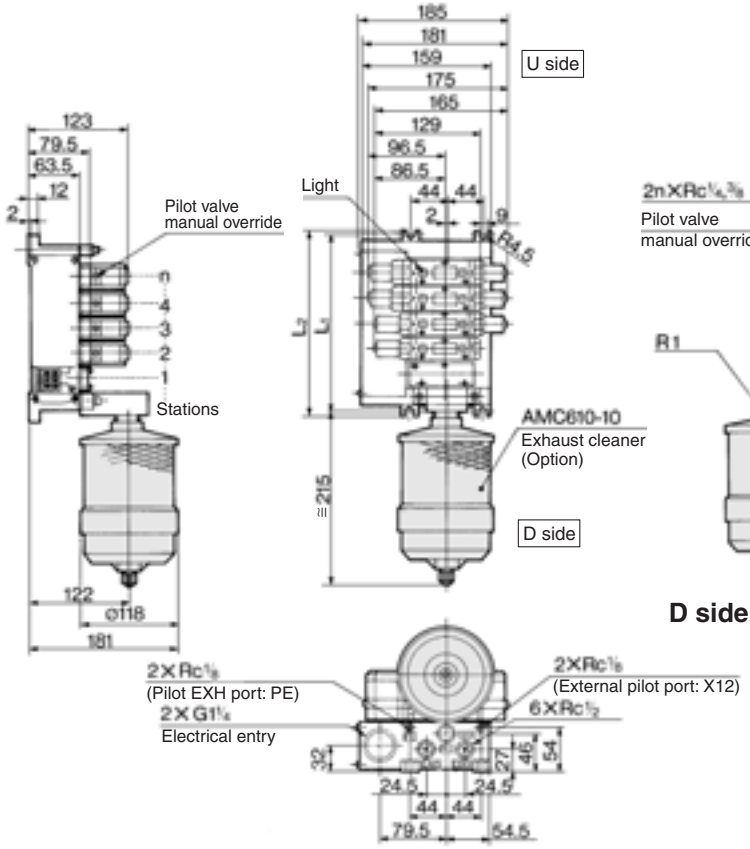
• Non plug-in type (6 stations)

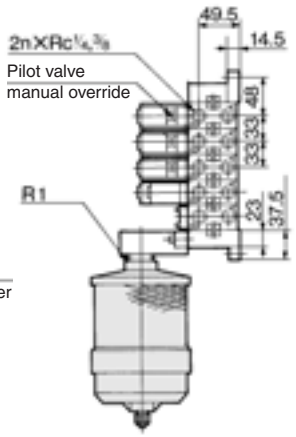
(Manifold base)		**VV5FS3-10-061-03-CU** ····· **1**
(2 position single)	*	**VFS3110-5E** ····· **3**
(2 position double)	*	**VFS3210-5E** ····· **2**
(Blanking plate)	*	**VVFS3000-10A** ····· **1**
(Exhaust cleaner)		**AMC610-10** ····· **1**

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

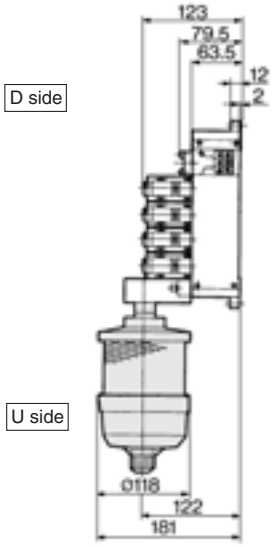
Manifold with Exhaust — Plug-in type, Non plug-in type

Plug-in type: VV5FS3-01T-[Station]1-[Port size]-$^{CD}_{CU}$



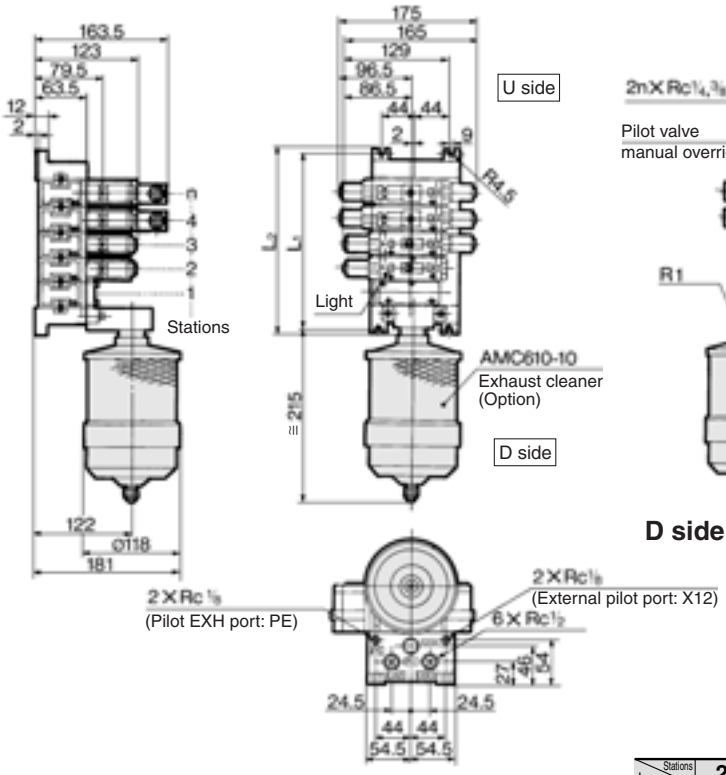


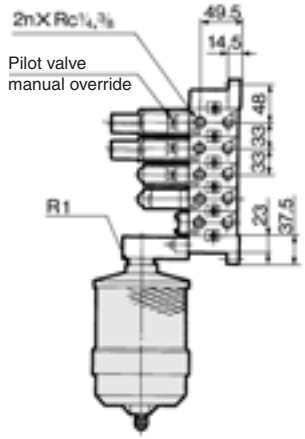
D side mounting



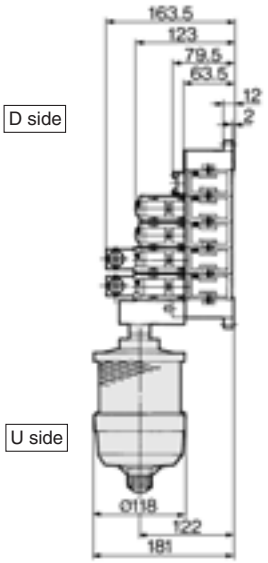
U side mounting

Non plug-in type: VV5FS3-10-[Station]1-[Port size]-$^{CD}_{CU}$





D side mounting



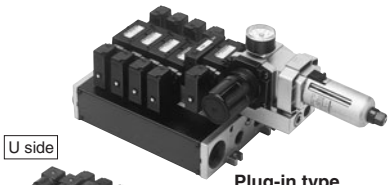
U side mounting

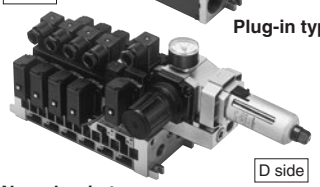
n: Stations

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

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.**





⚠ 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(1)	
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 (2)	<Plug-in type> VVFS3000-24A-1R (D side mounting)	
	<Non plug-in type> VVFS3000-24A-2R (D side mounting)	
Pressure switch (3)	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 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 P	Passage EA, EB	Porting specifications (A, B)
1	Common	Common	Side
2			Bottom*

* Semi-standard

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

* Semi-standard

Air release valve coil rating

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

For other rated voltages, please consult with SMC.

CE-compliant

Nil	—
Q	CE-compliant

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	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.

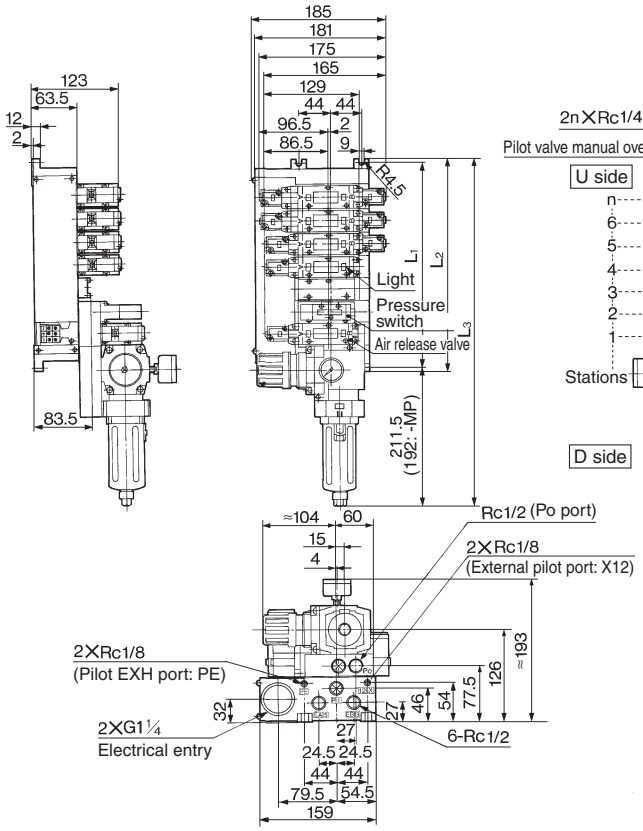
<Example>

- 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**

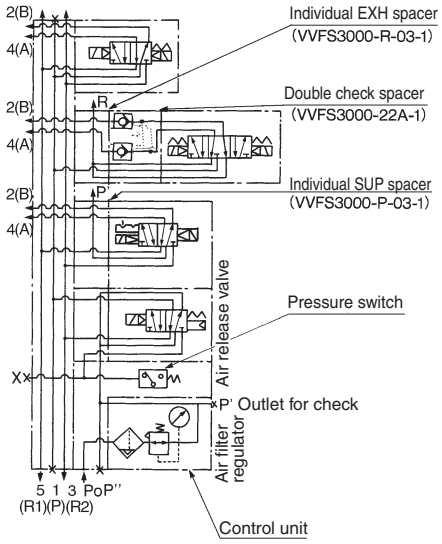
The asterisk denotes the symbol for assembly. Prefix it to the part numbers of the solenoid valve.

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

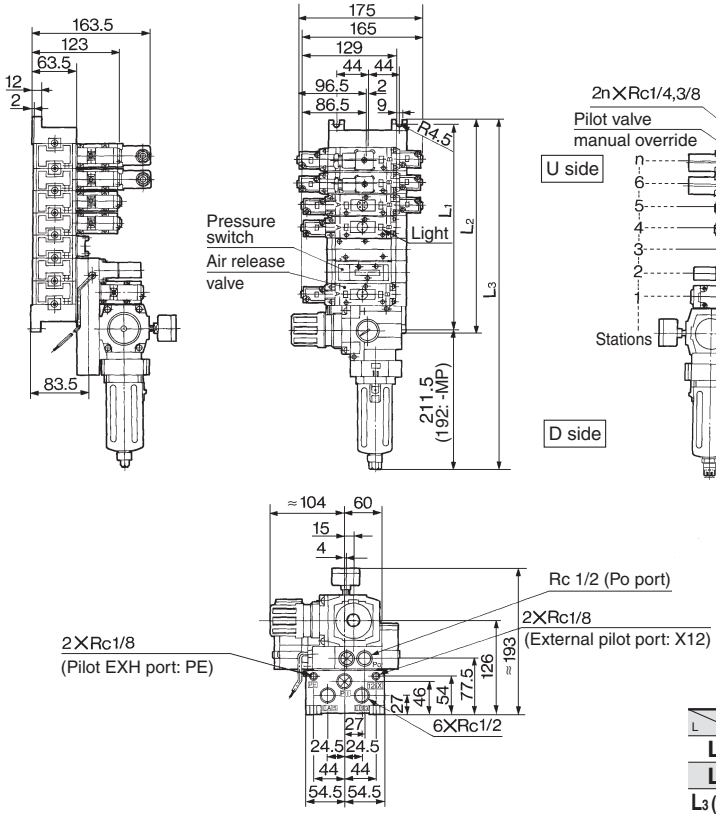
Plug-in type: VV5FS3-01T- Station 1- Port size -AP Voltage for release valve



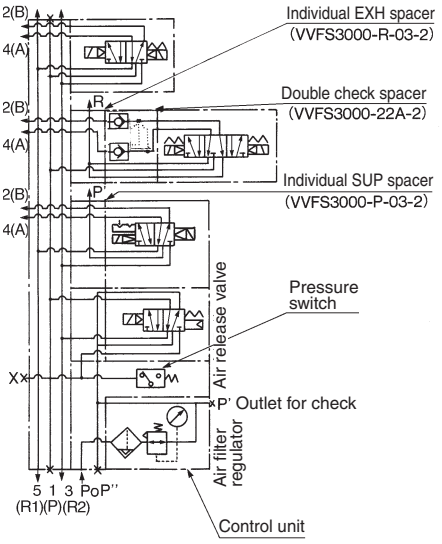
Example for manifold



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
L1	162	195	228	261	294	327	360	393	L1 = 33 x n + 63
L2	174	207	240	273	306	339	372	405	L2 = 33 x n + 75
L3 (MP)	360	393	426	459	492	525	558	591	L3 = 33 x n + 261
L3 (AP)	379.5	412.5	445.5	478.5	511.5	544.5	577.5	610.5	L3 = 33 x n + 280.5

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 mounating 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
	Double	Double	Single	Single	Single	Double	Single	Single	SI unit
	A B	A B	A B	A B	A B	A B	A B	A B	
	0 1	2 3	4 5	6 7	8 9	10 11	12 13	14 15	

<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
	Double	Double	Single	Single	Single	Double	Single	Double	Single	SI unit
	A B	A B	A	A	A	A B	A	A B	A	
	0 1	2 3	4	5	6	7 8	9	10 11	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

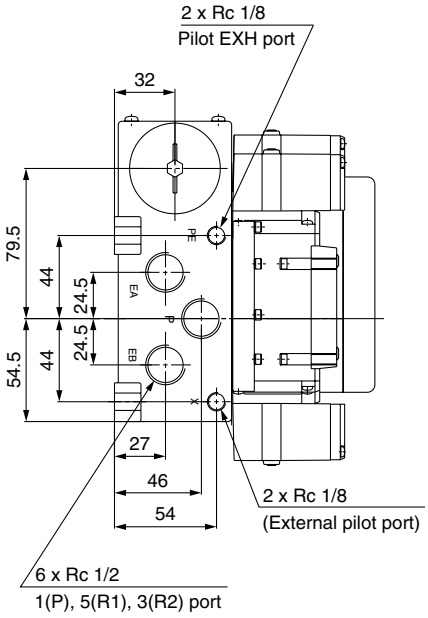
Nil	None
Z	With light/surge voltage suppressor

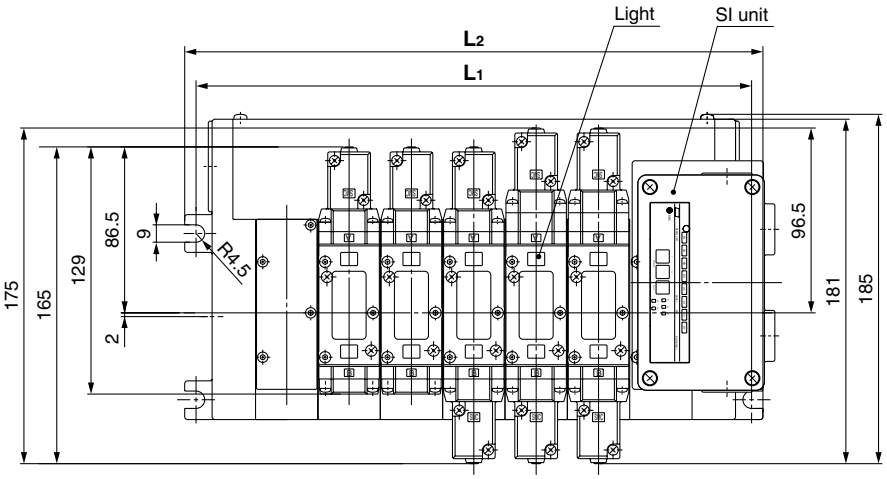
Coil rated voltage

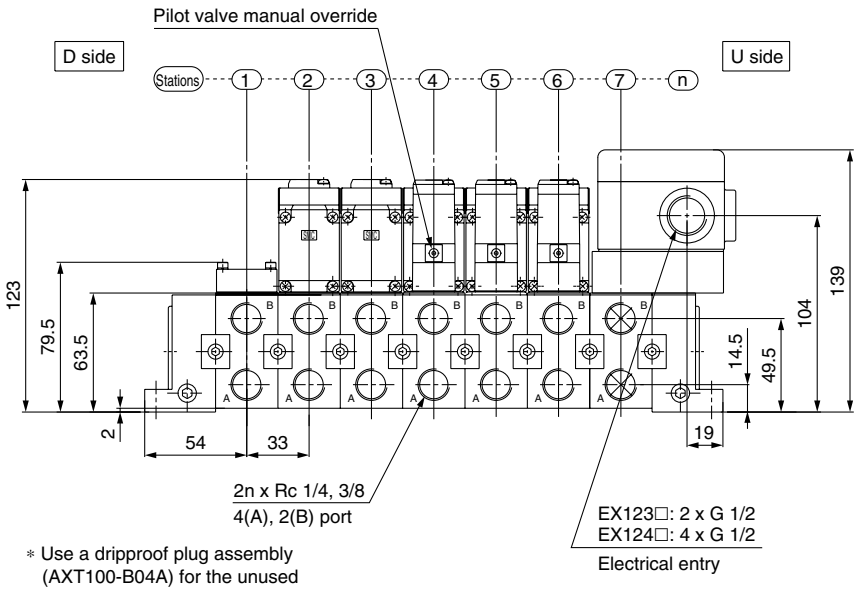
Nil	None

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).

Dimensions

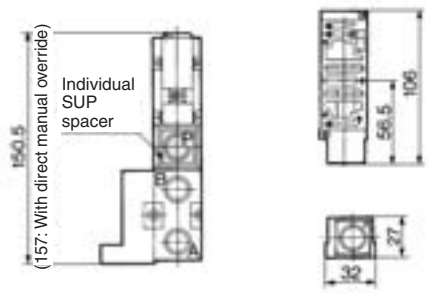
Formula $L_1 = 33n + 63$ $L_2 = 33n + 75$
n: Stations (Max. 17stations)

L \ n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
L_1	129	162	195	228	261	294	327	360	393	426	459	492	525	558	591	624
L_2	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.

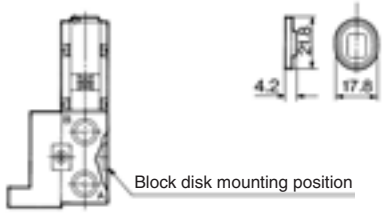
Manifold Option Parts — Plug-in type, Non plug-in type

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

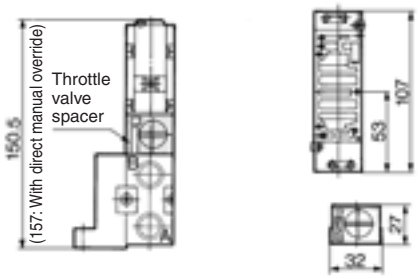


Individual EXH spacer:
VVFS3000-R-03-1 (Plug-in type)
VVFS3000-R-03-2 (Non plug-in type)

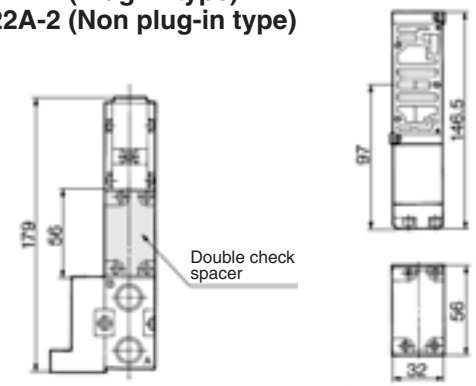
SUP/EXH block plate: AXT636-1A



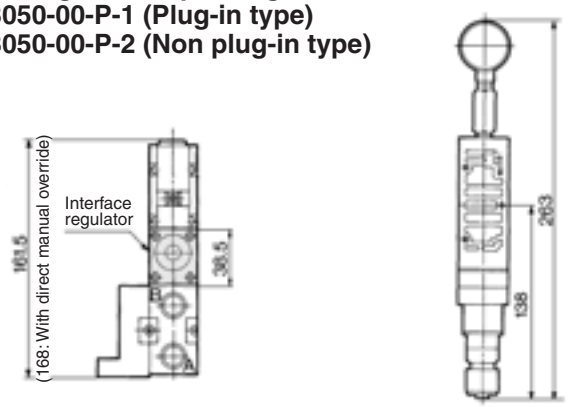
Throttle valve spacer:
VVFS3000-20A-1 (Plug-in type)
VVFS3000-20A-2 (Non plug-in type)



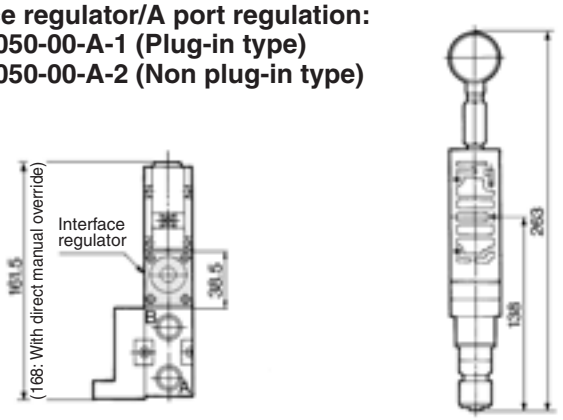
Double check spacer:
VVFS3000-22A-1 (Plug-in type)
VVFS3000-22A-2 (Non plug-in type)



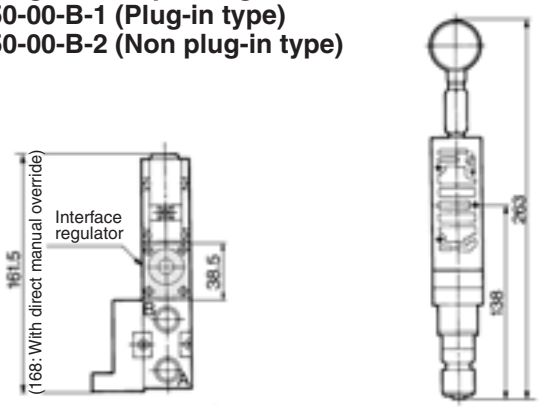
Interface regulator/P port regulation:
ARBF3050-00-P-1 (Plug-in type)
ARBF3050-00-P-2 (Non plug-in type)



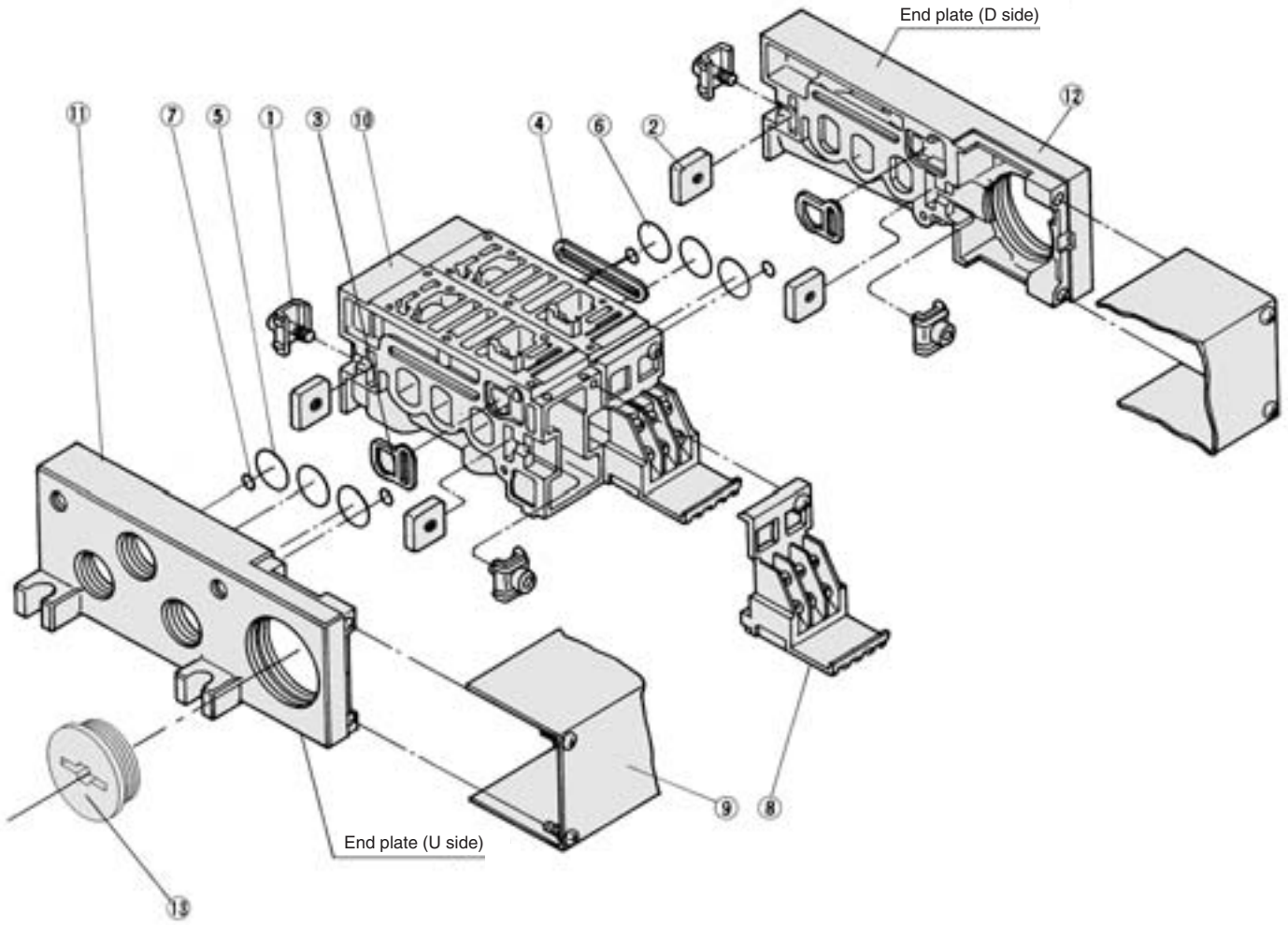
Interface regulator/A port regulation:
ARBF3050-00-A-1 (Plug-in type)
ARBF3050-00-A-2 (Non plug-in type)



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



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



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-Stations
		For 01S□	AZ738-22A-Stations
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-$^{02}_{03}$	Manifold block ⑩, Terminal ⑧, Metal joint ①, ②, Gasket ③, ④, O-ring ⑥, ⑦, Receptacle assembly	Plug-in type
		VVFS3000-1A-2-$^{02}_{03}$	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

NRTL /C

(Details → P. 1222-3)

Model

Type of actuation		Model: Plug-in	Model: Non plug-in	Port size	Flow characteristics (1): 1 → 4/2 (P → A/B) C [dm³/(s·bar)]	b	Cv	Flow characteristics (1): 4/2 → 5/3 (A/B → R1/R2) C [dm³/(s·bar)]	b	Cv	Max. (1) operating cycle (cpm)	Response (2) time (ms)	Mass (3)(4) (kg)
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 dm³/(s·bar)

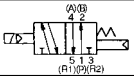
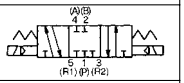
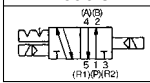
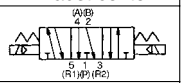
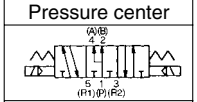
Low power consumption: 1.8 W DC

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
	
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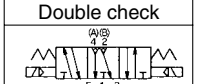
	

Standard Specifications

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 (1)
	Lubrication		Non-lube (2)
	Pilot valve manual override		Non-locking push type (Flush)
	Shock/Vibration resistance		150/50 m/s² (3)
	Enclosure		Type E: Dustproof (level 0), Type F: Dripproof (level 2), Type D: Splashproof (level 4) (4)
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) (5)
	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

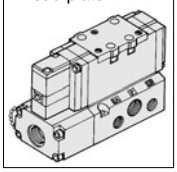
Pilot type		External pilot Note)
Manual override	**Main valve**	Direct manual override
	Pilot valve	Non-locking push type (Extended), Locking type (Tool required), Locking type (Lever)
Coil rated voltage		110 to 120, 220, 240 VAC, 50/60 Hz
		12, 100 VDC
Porting specifications		Bottom ported
Option		With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

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

How to Order

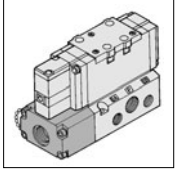
Body type

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 (Semi-standard), bottom piping is not available.

Port size

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

* EA, EB: Rc 3/8

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Semi-standard

CE-compliant

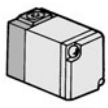
Nil	—
Q	CE-compliant

Plug-in **VFS4 2 0 0 □ – 5 F □ □ – □ 03 □ – □**

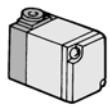
Non plug-in **VFS4 2 1 0 □ – 1 E □ □ – □ 03 □ – □**

Pilot valve Manual override

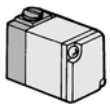
Nil: Non-locking push type (Flush)



A*: Non-locking push type (Extended)



B*: Locking type (Tool required)



C*: Locking type (Lever)

* Semi-standard

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.

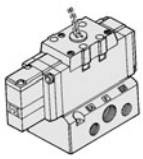
Symbol

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		

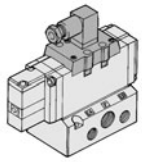
* Reverse pressure: Can be used by external pilot specifications.

Electrical entry

E: Grommet terminal



D: DIN terminal



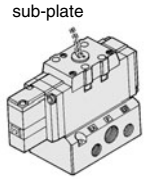
Coil rated voltage

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

* Semi-standard
For other rated voltages, please consult with SMC.

Body type

1: Non plug-in type sub-plate



Pilot type

Nil	Internal pilot
R*	External pilot

* Semi-standard

Body option

0	Standard
1*	Direct manual override

* Semi-standard

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

* Semi-standard
For other rated voltages, please consult with SMC.

** Refer to page 1224 for voltage conversion.

Manual override

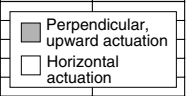
Nil	Non-locking push type (Flush)
A*	Non-locking push type (Extended)
B*	Locking type (Tool required)
C*	Locking type (Lever)

* Semi-standard

Cylinder Speed Chart

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

System	Average speed (mm/s)	Bore size										
		Series CA2 Pressure 0.5 MPa Load factor 50% Stroke 500 mm				Note) The CA1 series has been changed to the CA2 series.		Series CS1/CS2 Pressure 0.5 MPa Load factor 50% Cylinder stroke 1000 mm				
		ø50	ø63	ø80	ø100	ø125	ø140	ø160	ø180	ø200	ø250	ø300
A	1000 900 800 700 600 500 400 300 200 100 0											
B	1000 900 800 700 600 500 400 300 200 100 0											



System Components

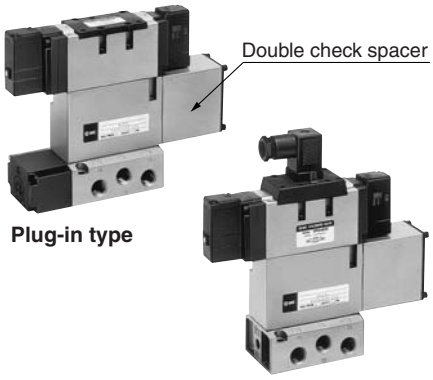
System	Solenoid valve	Speed controller	Silencer	SGP (Steel pipe) Port size x Length
A	Series VFS4000 Rc 3/8	AS420-03 (S = 73 mm²)	AN300-03 (S = 60 mm²)	10A x 1
B	Series VFS4000 Rc 1/2	AS420-04 (S = 97 mm²)	AN400-04 (S = 90 mm²)	15A x 1

∗ 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%

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.



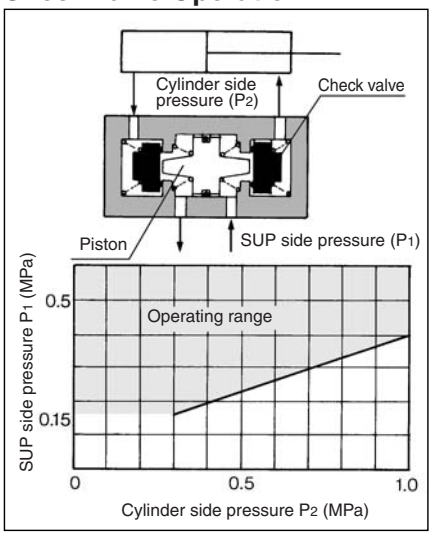
Specifications

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

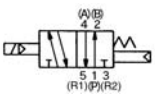
- In the case of 3 position double check valve (VFS46□0), check the leakage from piping and fittings in between valve and cylinder by means of synthetic detergent solutions, and ensure that there is no such leakage found there. Also check the leakage from cylinder seal and piston seal. If there is any 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

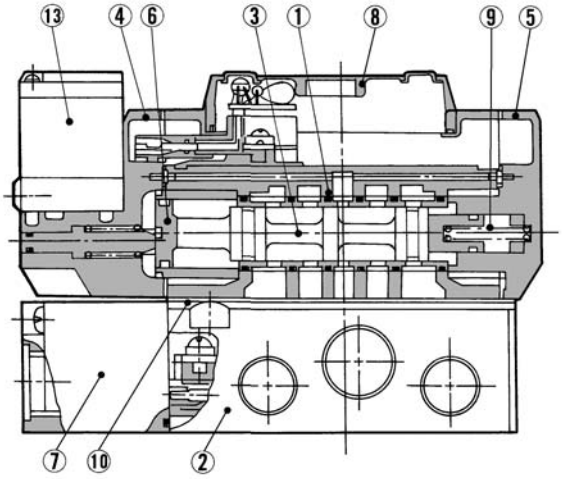


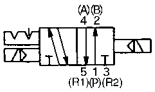
- The combination of VFS41$^{0}_{1}$0, VFS42$^{0}_{1}$0 and Double check spacer for prevention of falling at the stroke end but cannot hold the intermediate position of the cylinder.

Construction

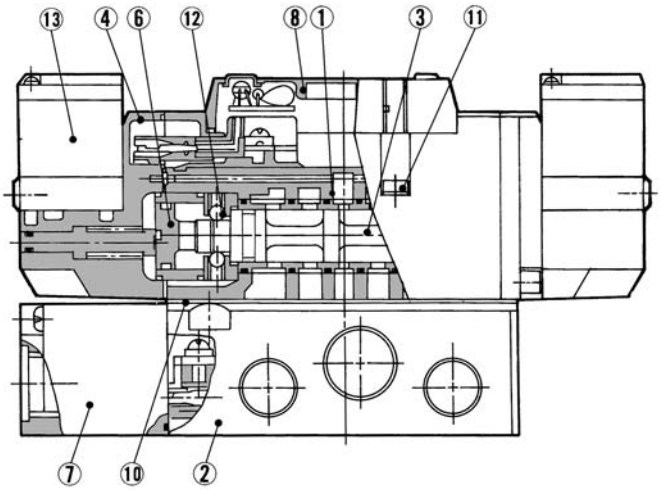


2 position single



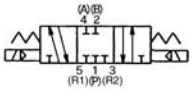


2 position double

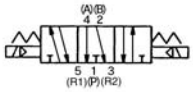


3 position closed center/exhaust center/pressure center

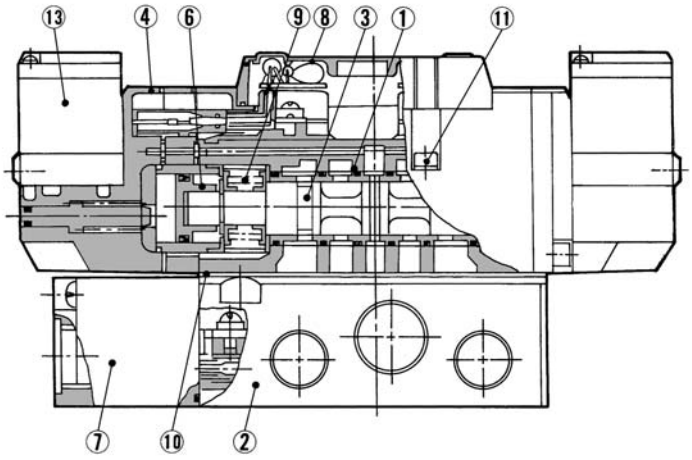
Closed center



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**	HNBR	—
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-$^{03}_{04}$
Non plug-in	VFS4000-S-$^{03}_{04}$

∗ Mounting bolt and gasket are not included.

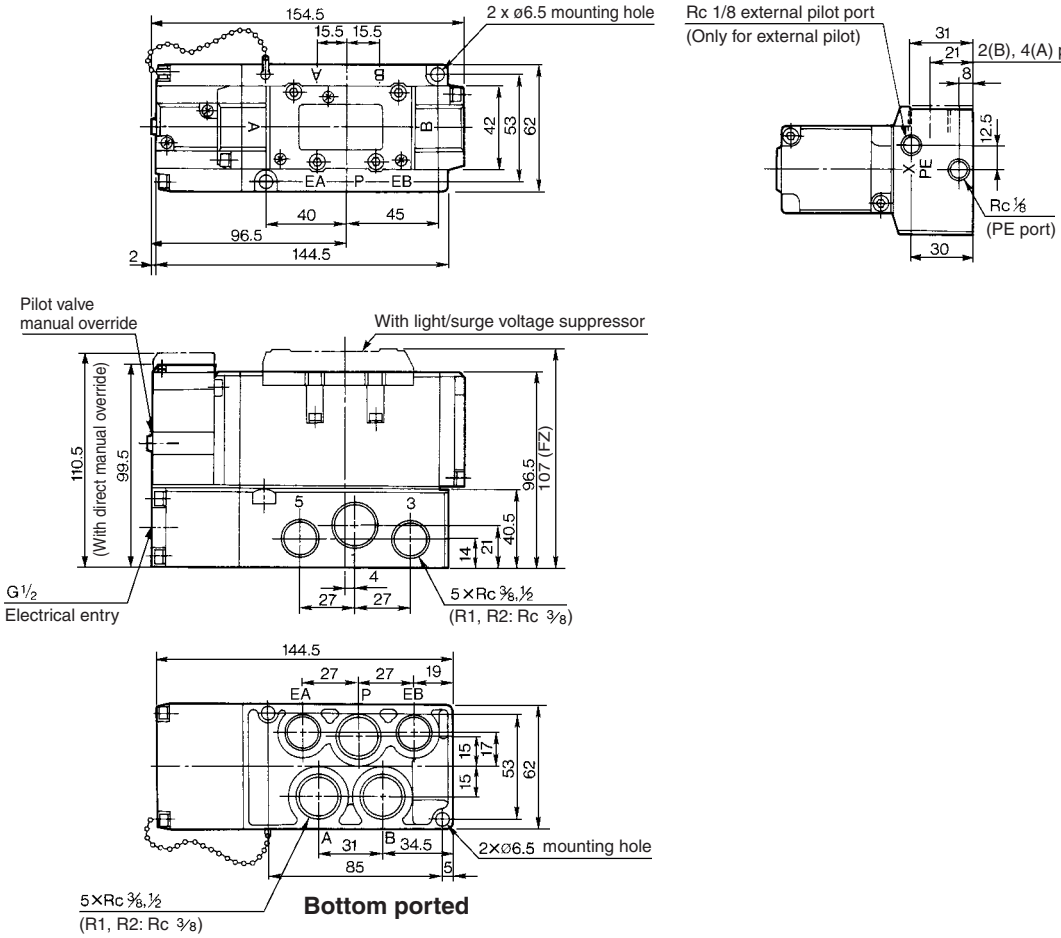
Sub-plate Assembly (For External Pilot) Part No.

Plug-in	VFS4000-P-R$^{03}_{04}$
Non plug-in	VFS4000-S-R$^{03}_{04}$

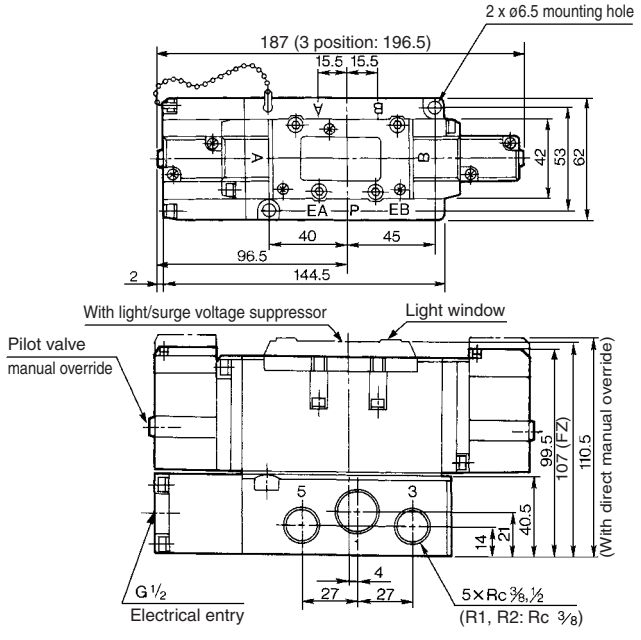
Part no. for mounting bolt and gasket
BG-VFS4000

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

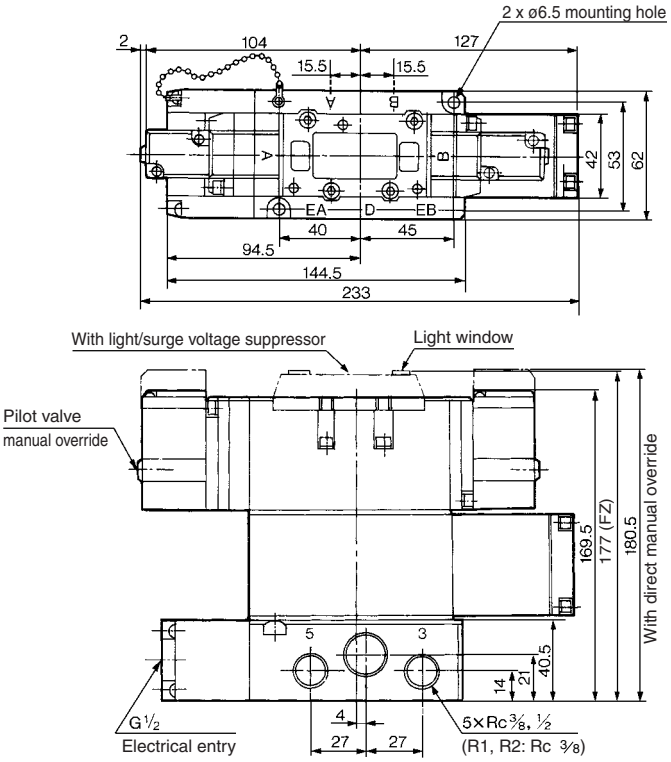
2 position single: VFS4100-□F



2 position double: VFS4200-□F
3 position closed center: VFS4300-□F
3 position exhaust center: VFS4400-□F
3 position pressure center: VFS4500-□F

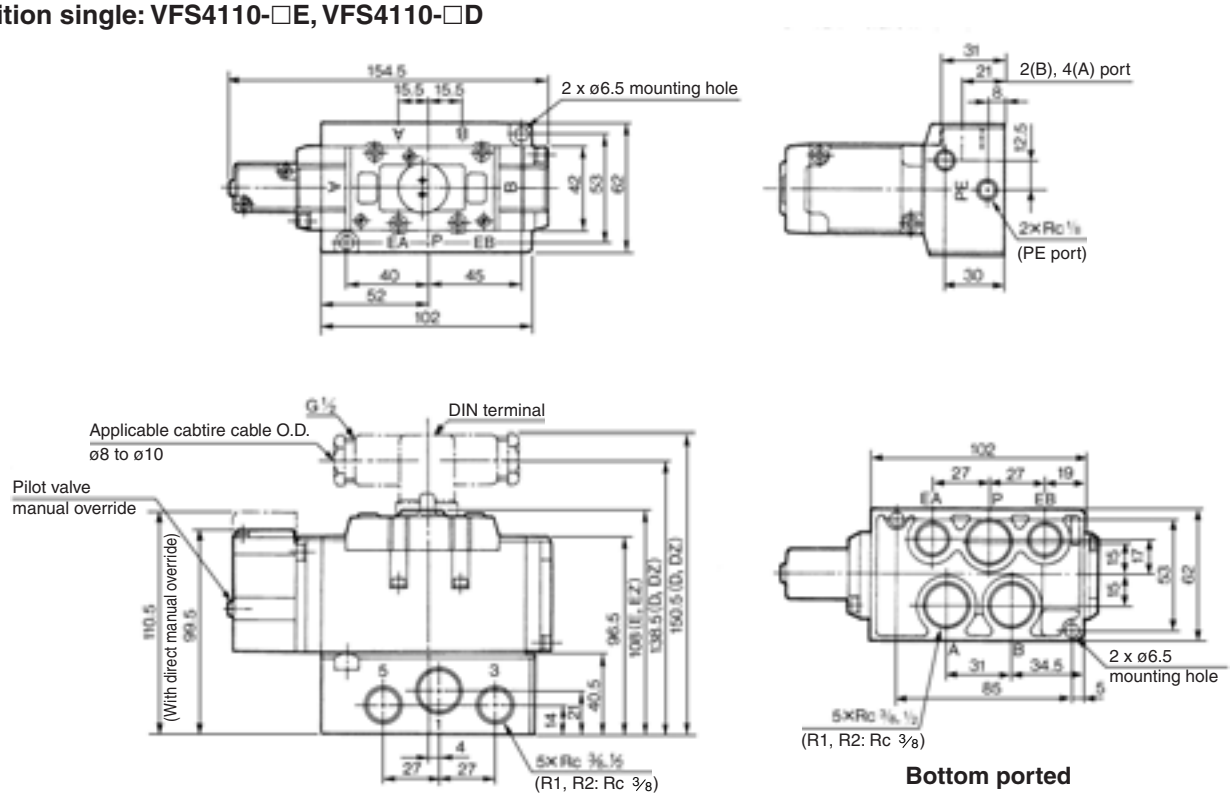


3 position double check: VFS4600-□F



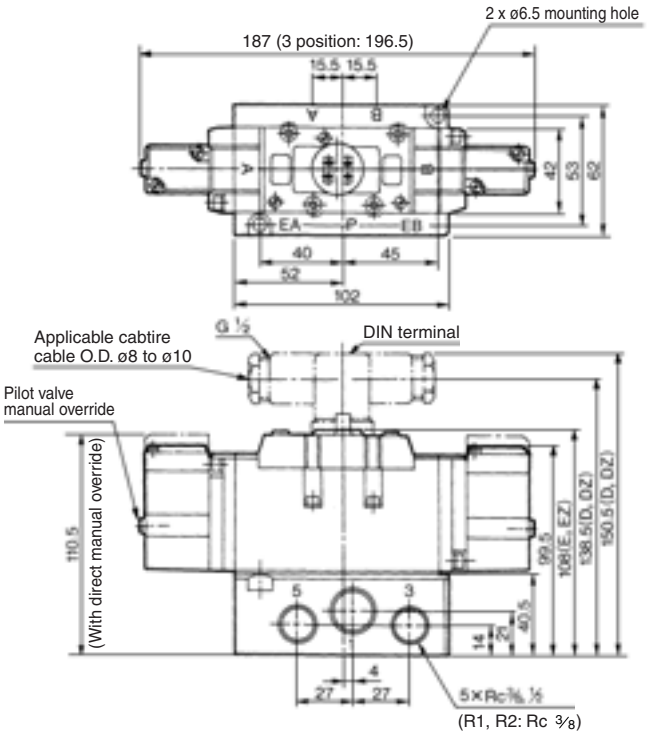
Non Plug-in — 2 Position single/Double/3 Position closed center/Exhaust center/Pressure center/Double check

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

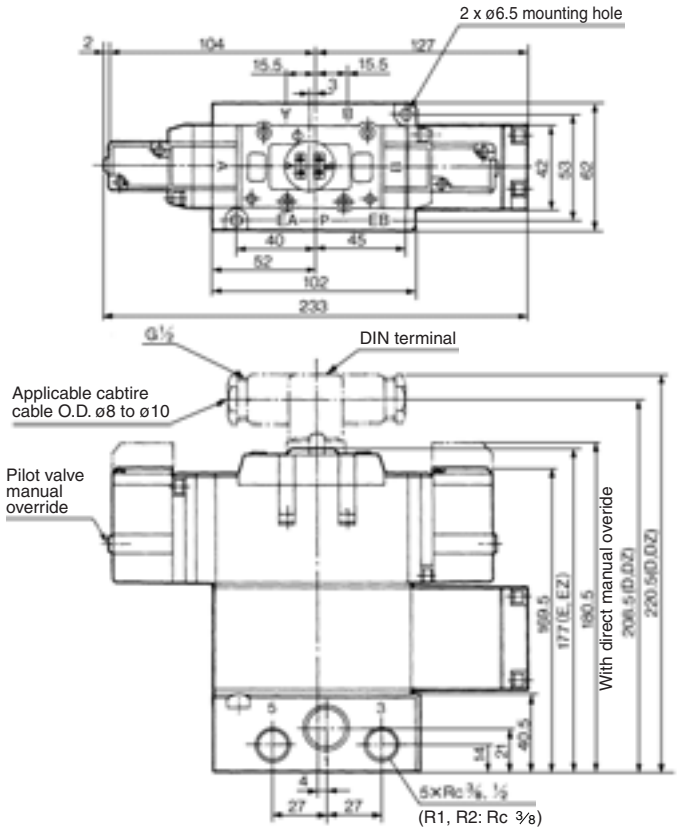


Bottom ported

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



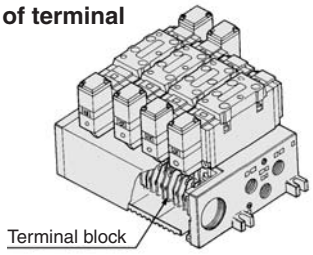
3 position double check: VFS4610-□E, VFS4610-□D



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 1/2	Rc 3/8
04		Rc 1/2
M		Mixed

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

CE-compliant

Nil	—
Q	CE-compliant

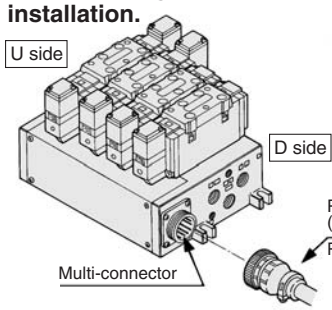
Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* 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.**



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

Series VFS4000 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

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 1/2	Rc 3/8
04		Rc 1/2
M		Mixed

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

CE-compliant

Nil	—
Q	CE-compliant

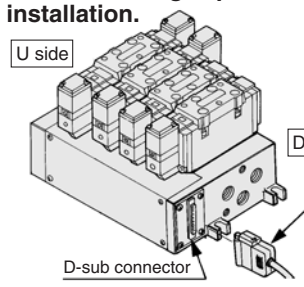
Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* 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.**



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

Series VFS4000 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

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 1/2	Rc 3/8
04		Rc 1/2
M		Mixed

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

CE-compliant

Nil	—
Q	CE-compliant

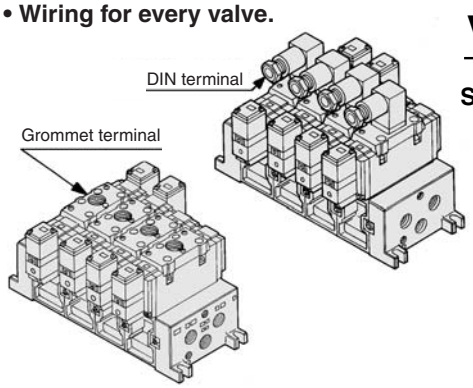
Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

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 1/2	Rc 3/8
04		Rc 1/2
M		Mixed

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

CE-compliant

Nil	—
Q	CE-compliant

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

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 **VV5FS4-01□**	• With terminal block • With multi-connector • With D-sub connector	Side/ Bottom	1/2	3/8, 1/2	2 to 10*	VFS4□00-□F
Non plug-in type **VV5FS4-10**	• DIN terminal • Grommet terminal					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 [dm³/(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 [dm³/(s·bar)]	11	11	11
		b	0.20	0.20	0.20
		Cv	2.9	2.9	2.9

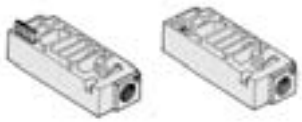
∗ Port size: Rc 1/2

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

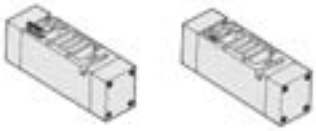
Needle valve set on the manifold block can control cylinder speed by throttling exhaust.

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.

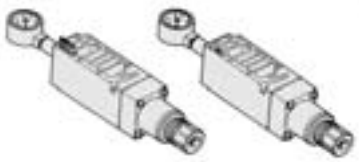
Body type	Plug-in type	Non plug-in type
Part no.	VVFS4000-22A-1	VVFS4000-22A-2



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.

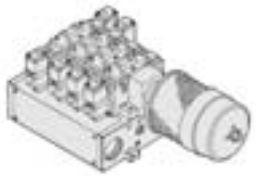
Body type	Plug-in type	Non plug-in type
Part no.	VVFS4000-10A	

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.**

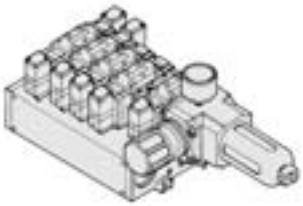


For details, refer to page 1193.

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

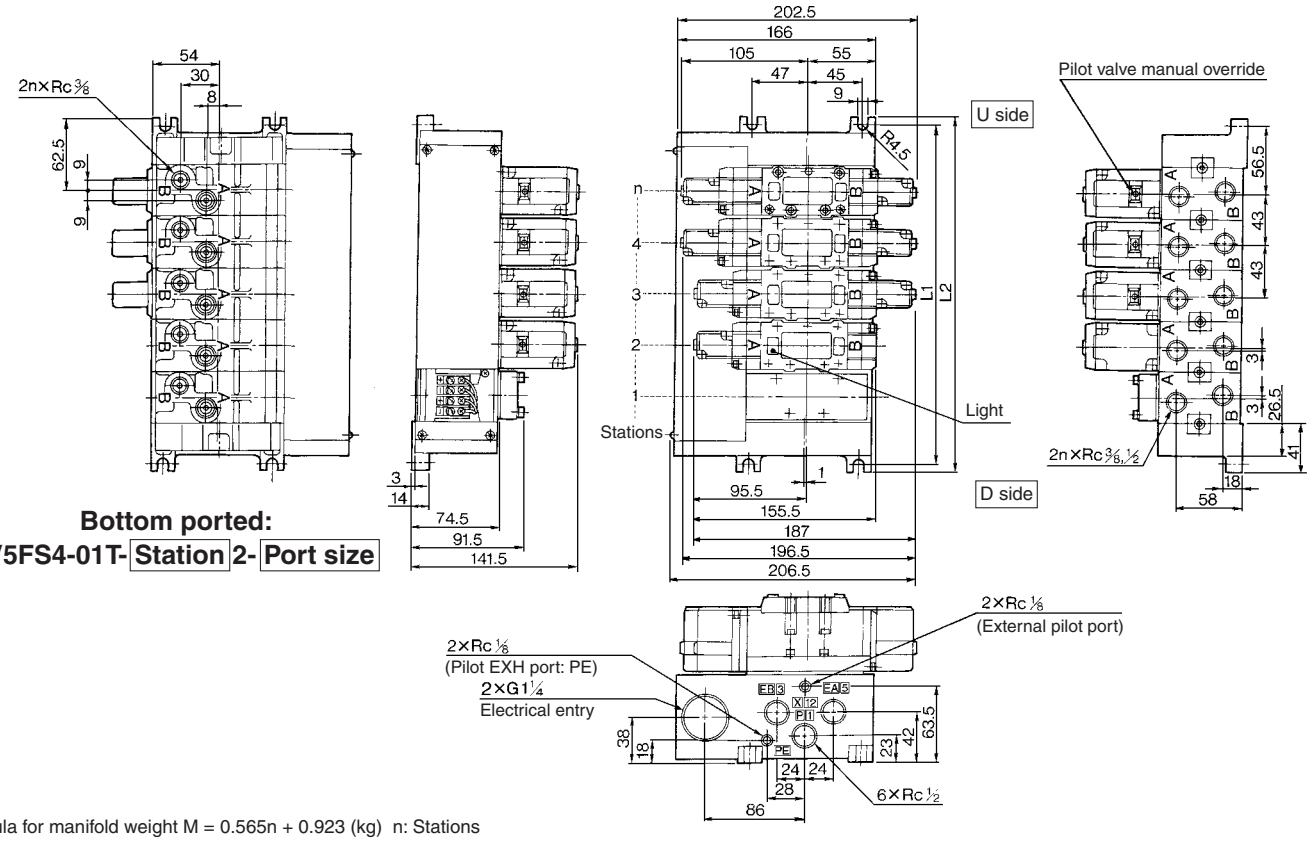
Plug-in type

- **Solenoid valve wiring process reduced considerably.**

For details, refer to page 1198.

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

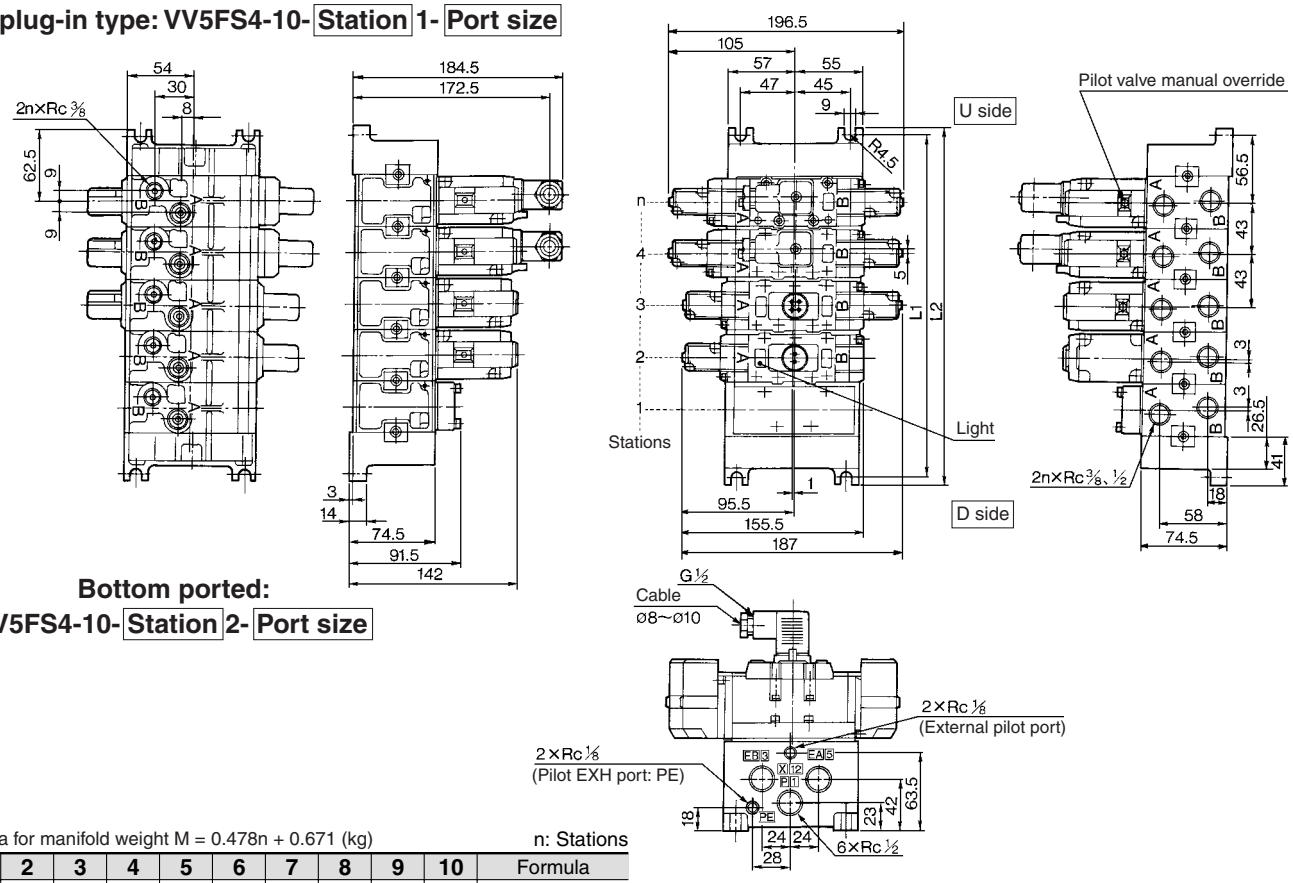
Plug-in type (With terminal block): VV5FS4-01T-[Station]1-[Port size]



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

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

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



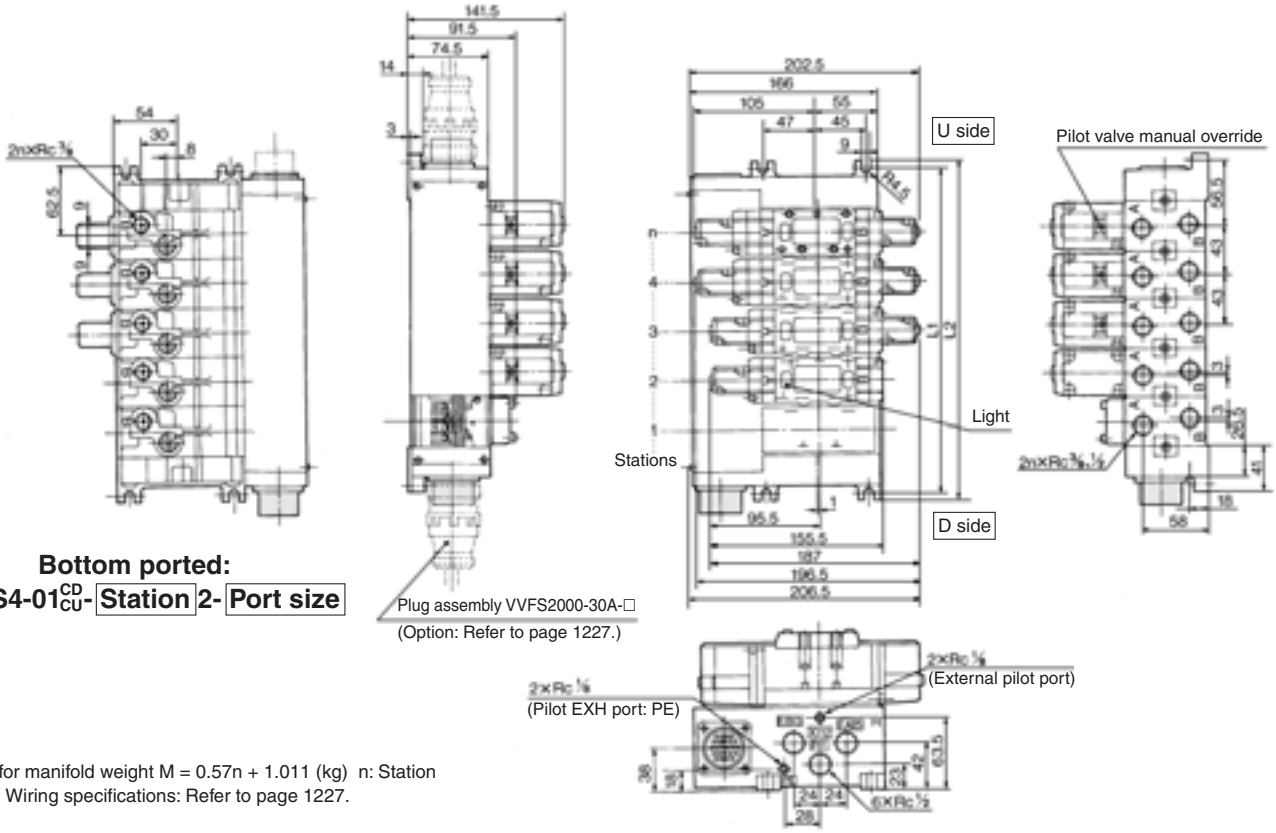
Bottom ported:
VV5FS4-10-[Station]2-[Port size]

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

L \ Stations	2	3	4	5	6	7	8	9	10	Formula
L_1	156	199	242	285	328	371	414	457	500	$L_1 = 43 \times n + 70$
L_2	168	211	254	297	340	383	426	469	512	$L_2 = 43 \times n + 82$

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

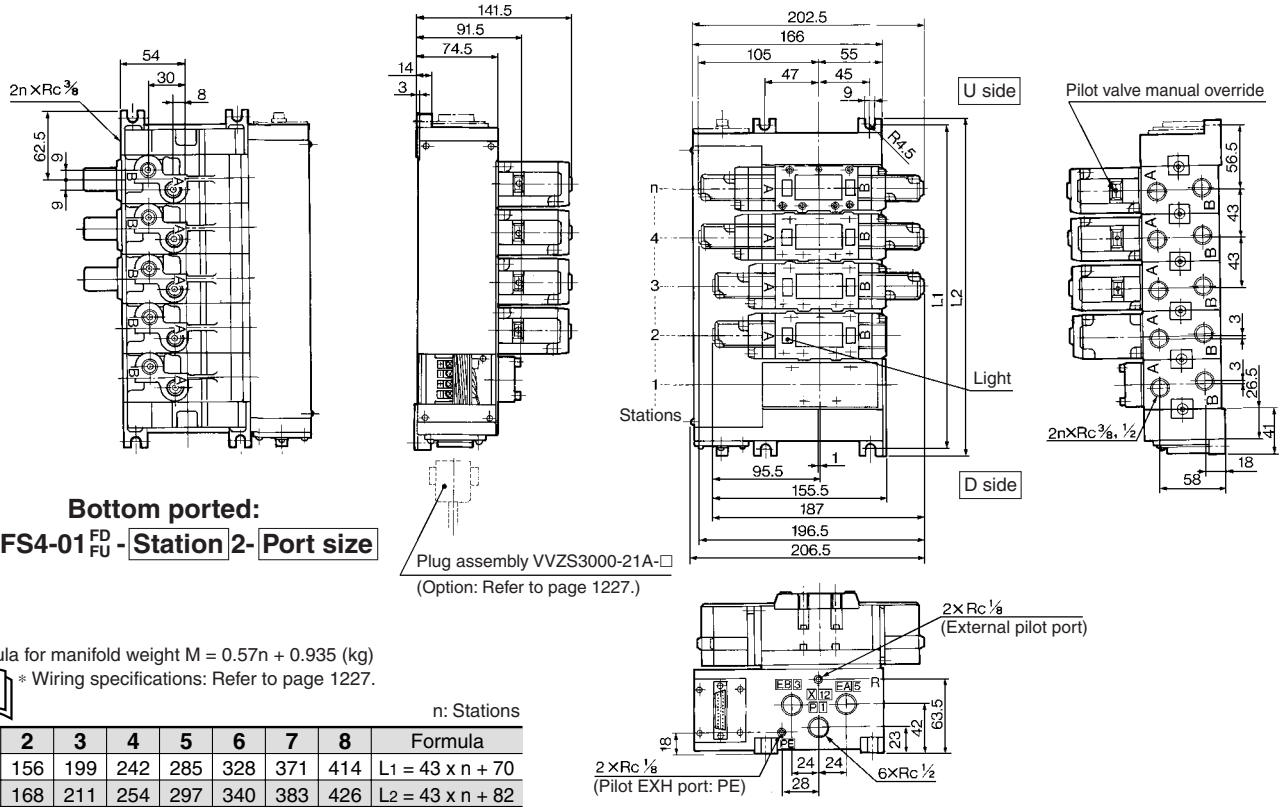


Bottom ported:
VV5FS4-01$^{CD}_{CU}$-Station 2-Port size

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



Bottom ported:
VV5FS4-01$^{FD}_{FU}$-Station 2-Port size

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

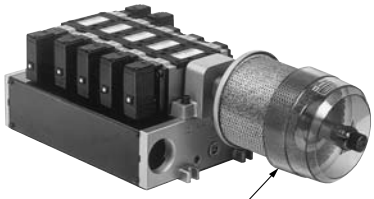
∗ Wiring specifications: Refer to page 1227.

n: Stations

L \ Stations	2	3	4	5	6	7	8	Formula
L_1	156	199	242	285	328	371	414	L_1 = 43 x n + 70
L_2	168	211	254	297	340	383	426	L_2 = 43 x n + 82

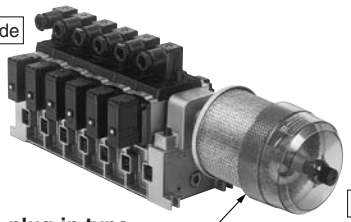
Manifold with Exhaust Cleaner

- **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.**



Plug-in type

Exhaust cleaner
(Option)



Non plug-in type

Exhaust cleaner
(Option)

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: Side: 3/8, 1/2, Bottom: 3/8 (Option)	
	1(P), 3(R2), 5(R1) port: P: 1/2, EXH: 1, 1 1/2	
Stations	2 to 10 (1)	
Applicable exhaust cleaners	AMC610-10 (Connecting port size R 1), AMC810-14 (Connecting port size R 1 1/2) (2)	

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	

Stations

02	2 stations
⋮	⋮
10	10 stations

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

Port size

Symbol	P	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

Symbol

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

∗ Option

CE-compliant

Nil	—
Q	CE-compliant

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.

⚠ 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**

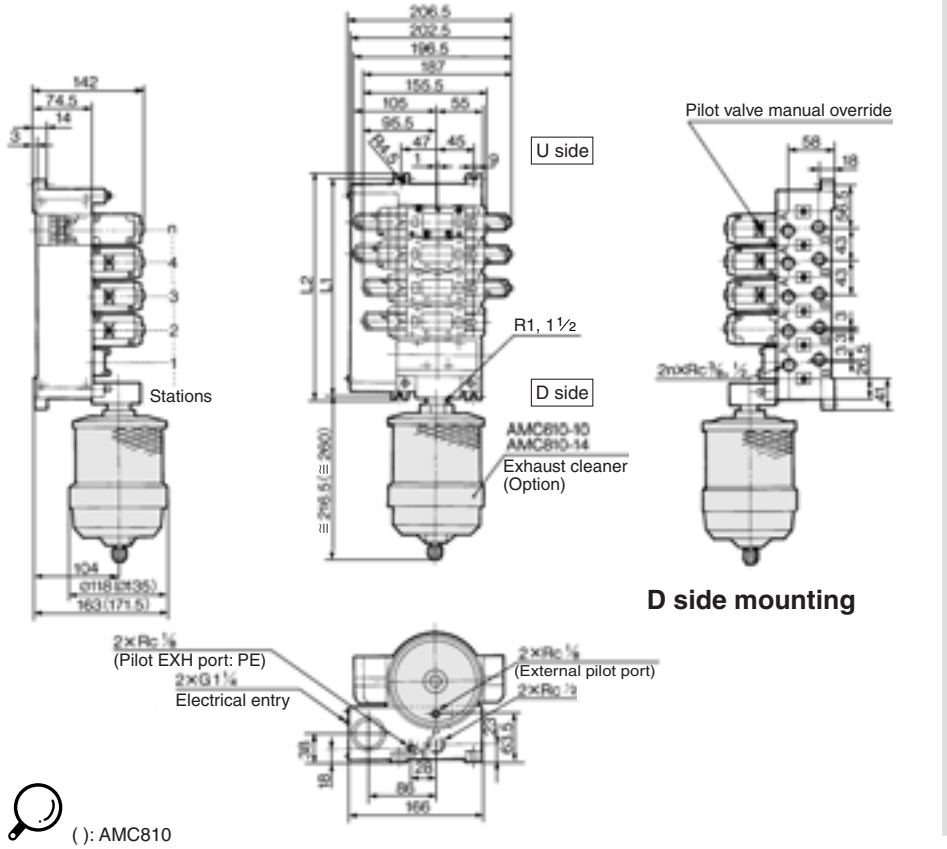
• Non plug-in type (6 stations)

(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**

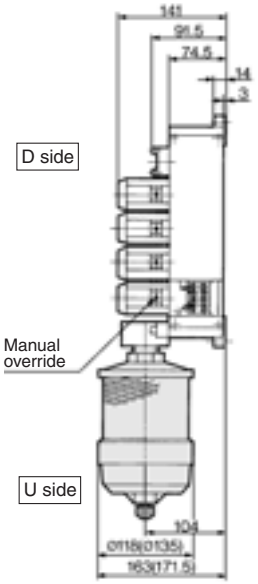
→ The asterisk denotes the symbol for assembly. Prefix it to the part numbers of the solenoid valve.

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

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



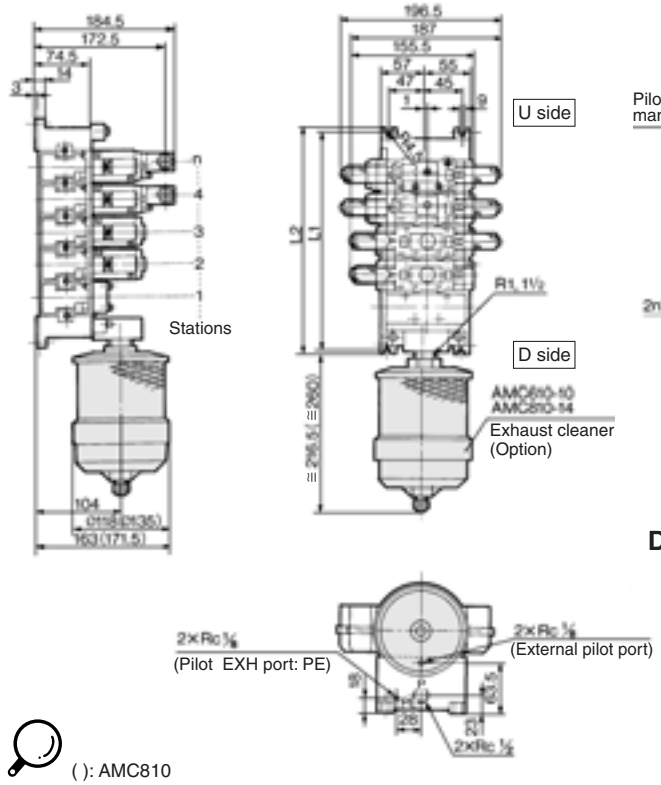
D side mounting



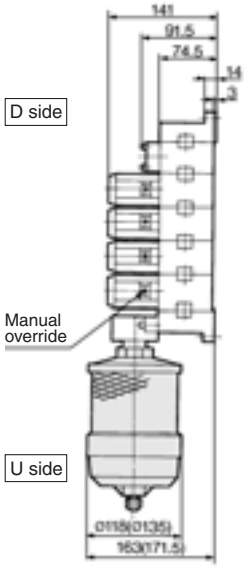
U side mounting

( ): AMC810

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



D side mounting



U side mounting

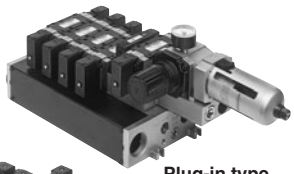
( ): AMC810

n: Stations

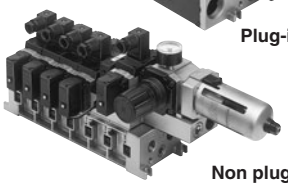
L / Stations	2	3	4	5	6	7	8	9	10	Formula
L1	156	199	242	285	328	371	414	457	500	L1 = 43 x n + 70
L2	168	211	254	297	340	383	426	469	512	L2 = 43 x n + 82

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.**



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: 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 (1)	
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 (2)	<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 (3)	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	

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

* Semi-standard

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

* Semi-standard

Air release valve coil rating

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

For other rated voltages, please consult with SMC.

CE-compliant

Nil	—
Q	CE-compliant

Control unit type

Symbol / Control equipment	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	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.

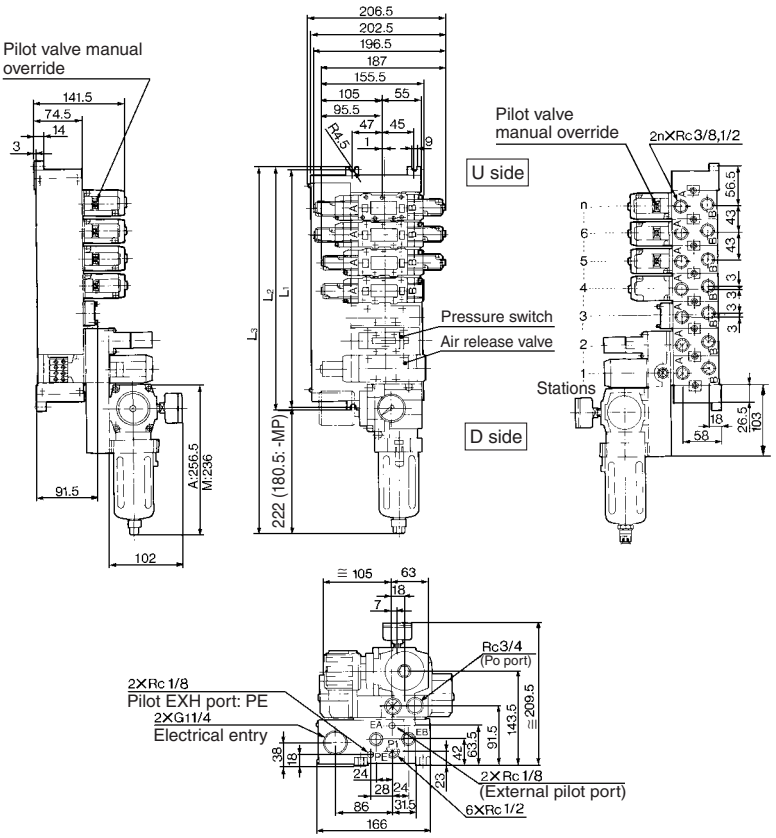
<Example>

- 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**

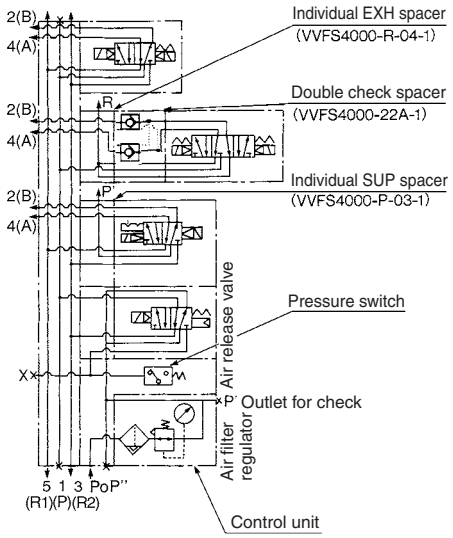
The asterisk denotes the symbol for assembly. Prefix it to the part numbers of the solenoid valve.

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

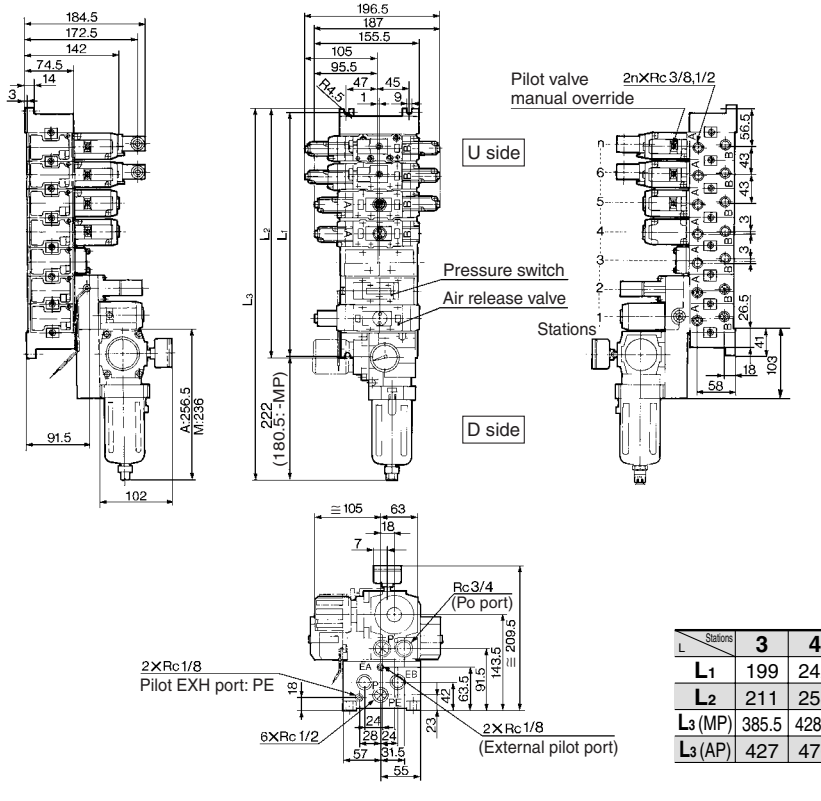
Plug-in type: VV5FS4-01T-[Station]1-[Port size]-AP[Voltage for release valve]



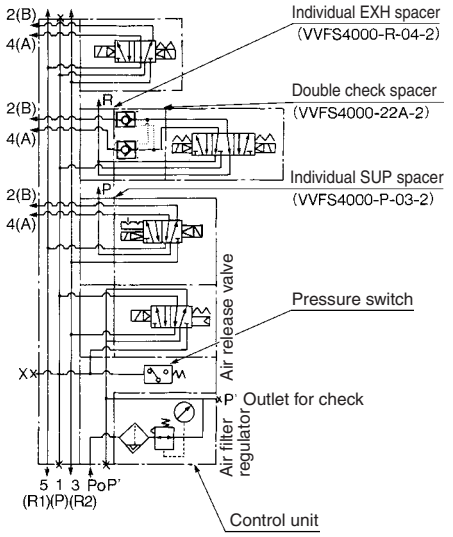
Example for manifold



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
L1	199	242	285	328	371	414	457	500	L1 = 43 x n + 70
L2	211	254	297	340	383	426	469	512	L2 = 43 x n + 82
L3 (MP)	385.5	428.5	471.5	514.5	557.5	600.5	643.5	686.5	L3 = 43 x n + 256.5
L3 (AP)	427	470	513	556	599	642	685	728	L3 = 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

D	D side mounting
U	U side mounting

Stations

2	2 stations
⋮	⋮
10	10 stations

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)

Thread type

Nil	Rc
N	NPT
T	NPTF
F	G

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 1/8 only

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

Combination symbol

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

∗ Option

Applicable models

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

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
	Double	Double	Single	Single	Single	Double	Single	Single	SI unit
	A B	A B	A B	A B	A B	A B	A B	A B	
	0 1	2 3	4 5	6 7	8 9	10 11	12 13	14 15	

<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
	Double	Double	Single	Single	Single	Double	Single	Double	Single	SI unit
	A B	A B	A	A	A	A B	A	A B	A	
	0 1	2 3	4	5	6	7 8	9	10 11	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

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

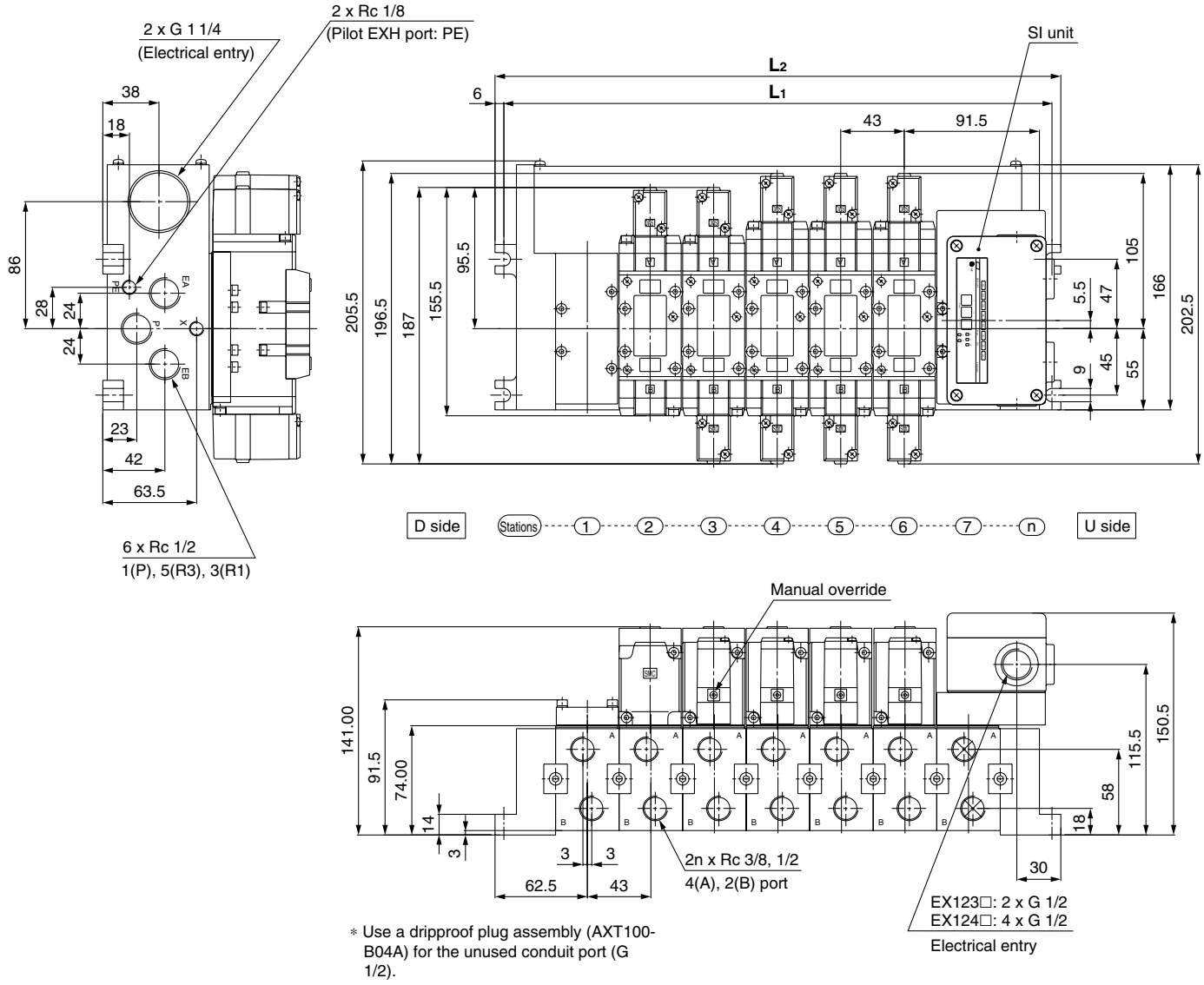
Nil	None
Z	With light/surge voltage suppressor

Coil rated voltage

Nil	None

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

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



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

Dimensions

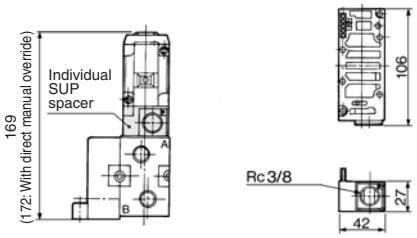
Formula $L_1 = 43n + 70$ $L_2 = 43n + 82$
n: Stations (Max. 10 stations)

L \ n	2	3	4	5	6	7	8	9	10
L_1	156	199	242	285	328	371	414	457	500
L_2	168	211	254	297	340	383	426	469	512

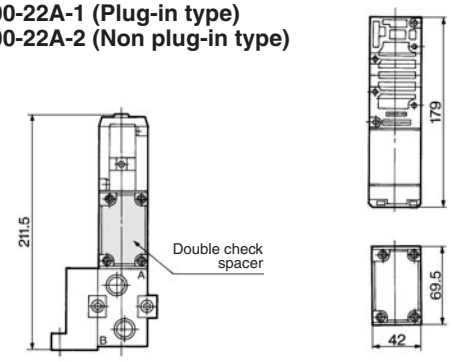
Note) Actual number of manifold base stations: Add 1 SI unit mounting station to the number of valve stations.

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

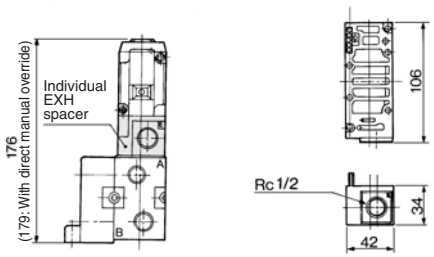
Individual SUP spacer:
VVFS4000-P-03-1 (Plug-in type)
VVFS4000-P-03-2 (Non plug-in type)



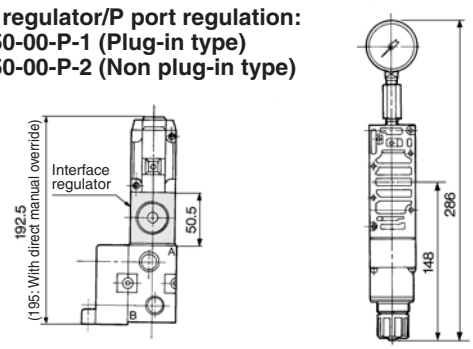
Double check spacer:
VVFS4000-22A-1 (Plug-in type)
VVFS4000-22A-2 (Non plug-in type)



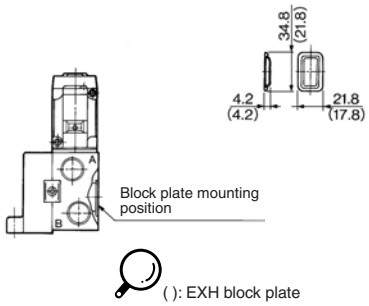
Individual EXH spacer:
VVFS4000-R-04-1 (Plug-in type)
VVFS4000-R-04-2 (Non plug-in type)



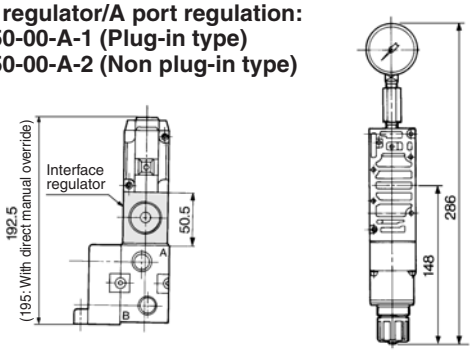
Interface regulator/P port regulation:
ARBF4050-00-P-1 (Plug-in type)
ARBF4050-00-P-2 (Non plug-in type)



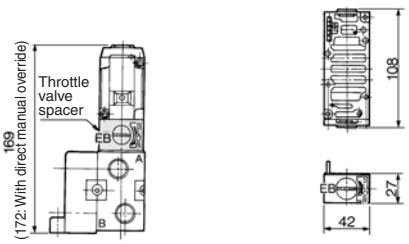
SUP block plate: AXT634-10A
EXH block plate: AXT634-11A



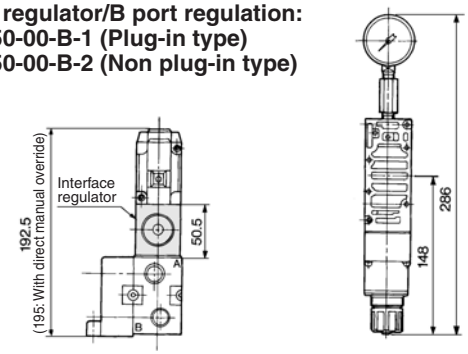
Interface regulator/A port regulation:
ARBF4050-00-A-1 (Plug-in type)
ARBF4050-00-A-2 (Non plug-in type)



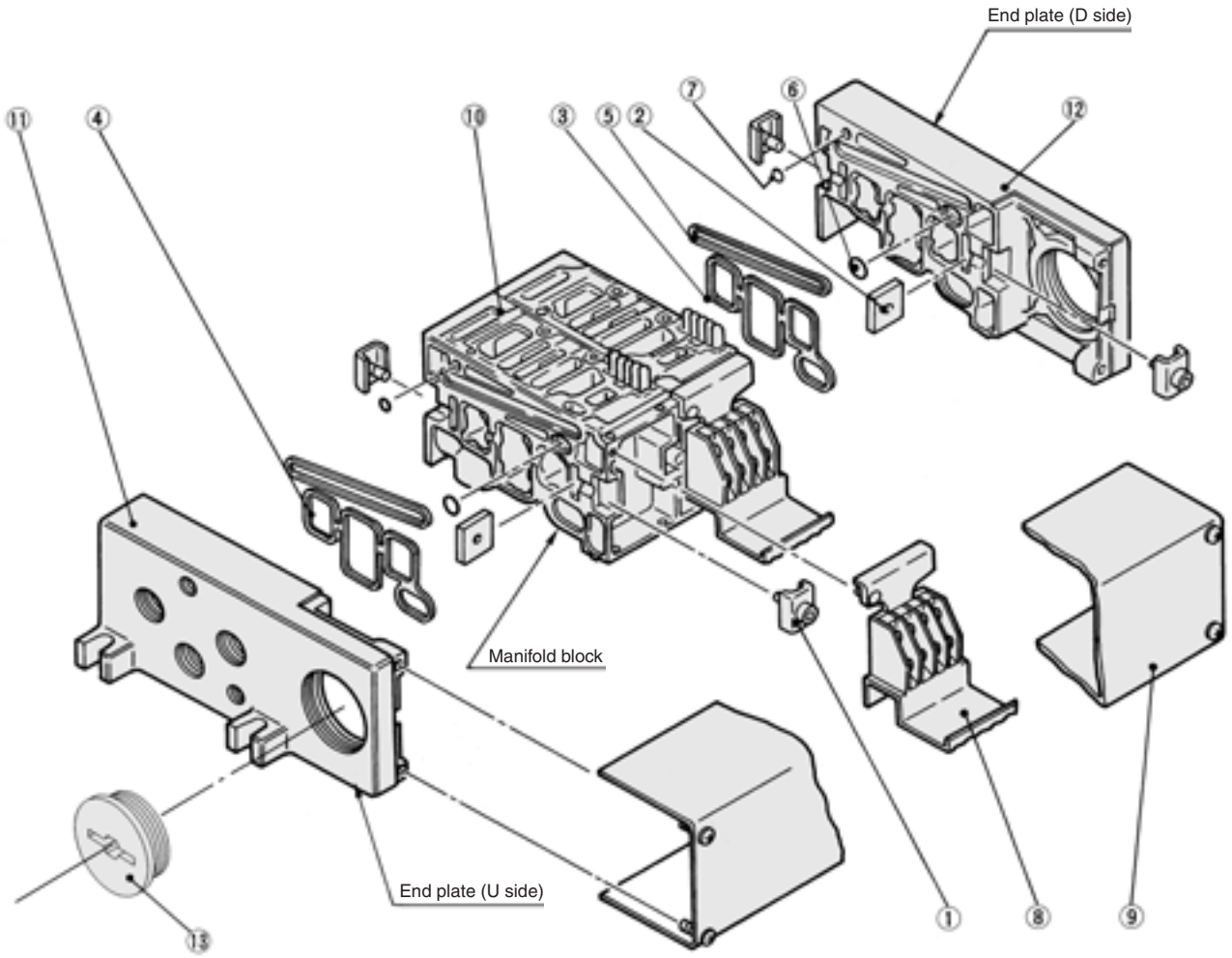
Throttle valve spacer:
VVFS4000-20A-1 (Plug-in type)
VVFS4000-20A-2 (Non plug-in type)



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



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



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- Stations
		For 01SU	AZ738-30A- Stations
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-$^{03}_{04}$	Manifold block ⑩, Terminal ⑧, Metal joint ①, ②, Gasket ④, Receptacle assembly	Plug-in type
		VVF4000-1A-2-$^{03}_{04}$	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

NRTL /C

(Details → P. 1222-4)

Model

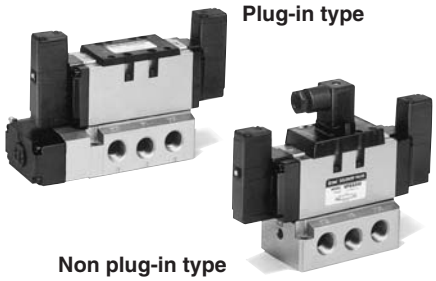
Type of actuation		Model		Port size Rc	Flow characteristics						Max.[1] operating cycle (cpm)	Response time[2] (ms)	Mass[3] (kg)
		Plug-in	Non plug-in		1 → 4/2 (P → A/B)			4/2 → 5/3 (A/B → R1/R2)					
					C [dm³/(s·bar)]	b	Cv	C [dm³/(s·bar)]	b	Cv			
2 position	Single	**VFS5100**	**VFS5110**	3/8	15	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.

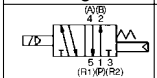
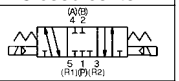
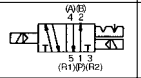
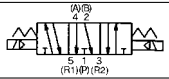
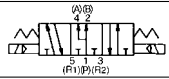
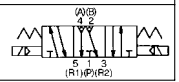
Compact yet provides a large flow capacity
3/4: C: 20 dm³/(s·bar)

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**		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 [1]
	Lubrication		Non-lube [2]
	Pilot valve manual override		Non-locking push type (Flush)
	Shock/Vibration resistance		150/50 m/s² [3]
	Enclosure		Type E: Dustproof (Level 0), Type F: Dripproof (Level 2), Type D: Splashproof (Level 4) [4]
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) [5]
	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 Note)
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

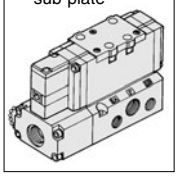
How to Order

Plug-in **VFS5 1 0 0 □ – 2 F □ □ – □ 04 □ – □**

Non plug-in **VFS5 1 1 0 □ – 5 D □ □ – □ 06 □ – □**

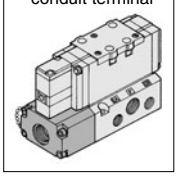
Body type

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 (Semi-standard), 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

* Semi-standard

CE-compliant

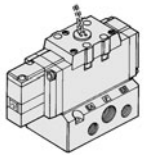
Nil	—
Q	CE-compliant

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		

Body type

1: Non plug-in type sub-plate



Body option

0	Standard
1*	Direct manual override

* Semi-standard

Pilot type

Nil	Internal pilot
R*	External pilot

* Semi-standard

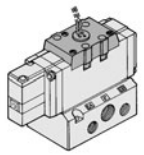
Option

Nil	None
Z	With light/surge voltage suppressor
P*	Non-rotating DIN terminal
ZP*	Light/Surge Voltage Suppressor Non-rotating DIN terminal

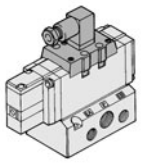
* Type "P", "ZP" is available for DIN type only.

Electrical entry

E: Grommet terminal



D: DIN terminal



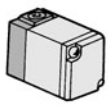
Coil rated voltage

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

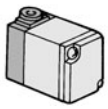
* Semi-standard
For other rated voltages, please consult with SMC.

Pilot valve Manual override

Nil: Non-locking push type (Flush)

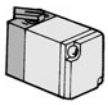


A*: Non-locking push type (Extended)



B*: Locking type (Tool required)

C*: Locking type (Lever)



* Semi-standard

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

* Semi-standard
For other rated voltages, please consult with SMC.

Manual override

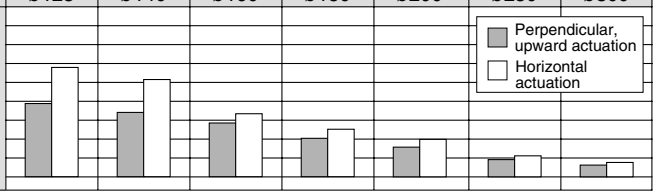
Nil	Non-locking push type (Flush)
A*	Non-locking push type (Extended)
B*	Locking type (Tool required)
C*	Locking type (Lever)

* Semi-standard

** Refer to page 1224 for voltage conversion.

Cylinder Speed Chart

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

Series	Average speed (mm/s)	Bore size: Series CS1/CS2, Pressure 0.5 MPa, Load factor 50%, Stroke 300 mm						
		ø125	ø140	ø160	ø180	ø200	ø250	ø300
VFS5100-06	800 700 600 500 400 300 200 100 0							

* 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%

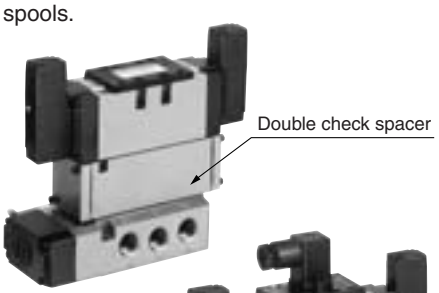
Conditions

		Series CS1
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.



Plug-in type

Non plug-in type

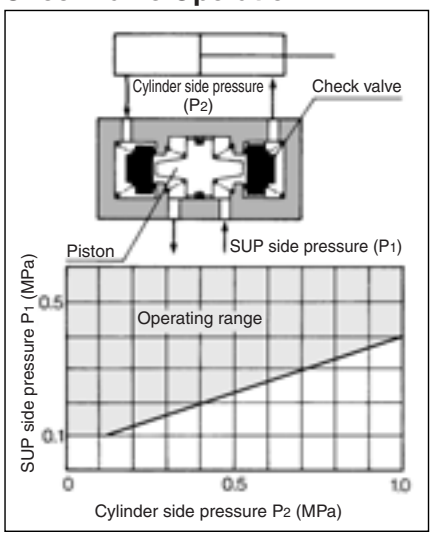
Specifications

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

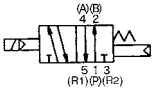
- In the case of 3 position double check valve (VFS56□0), check the leakage from piping and fittings in between valve and cylinder by means of synthetic detergent solutions, and ensure that there is no such leakage found there. Also check the leakage from cylinder seal and piston seal. If there is any 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

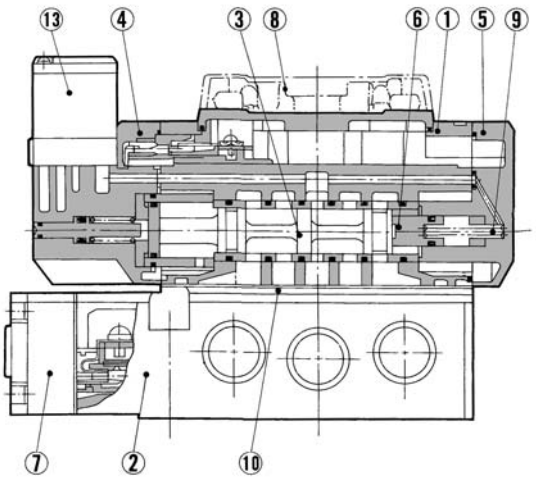


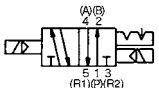
- The combination of VFS51$^{0}_{1}$0, VFS52$^{0}_{1}$0 and a double check spacer can be used as prevention of falling at the stroke end but cannot hold the intermediate position of the cylinder.

Construction

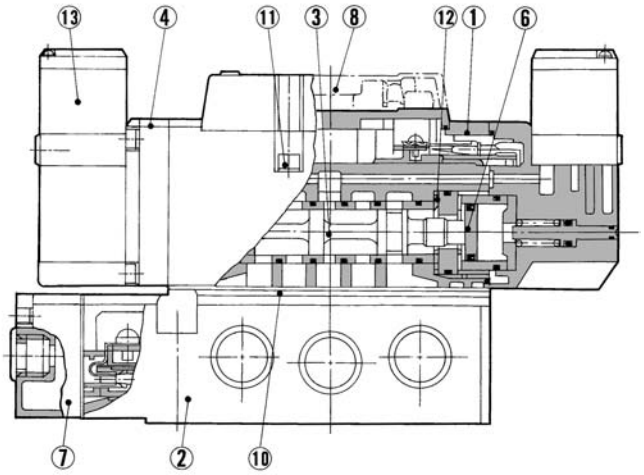


2 position single



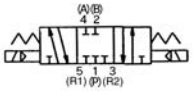


2 position double



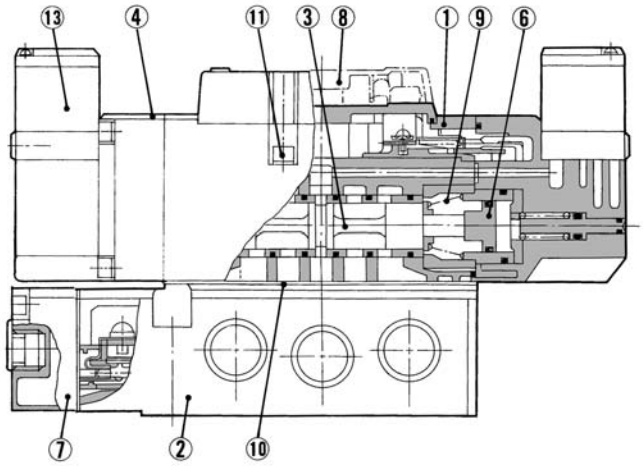
3 position closed center/exhaust center/pressure center

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-$^{03}_{04}_{06}$
Non plug-in	VFS5000-S-$^{03}_{04}_{06}$

∗ Mounting bolt and gasket are not included.

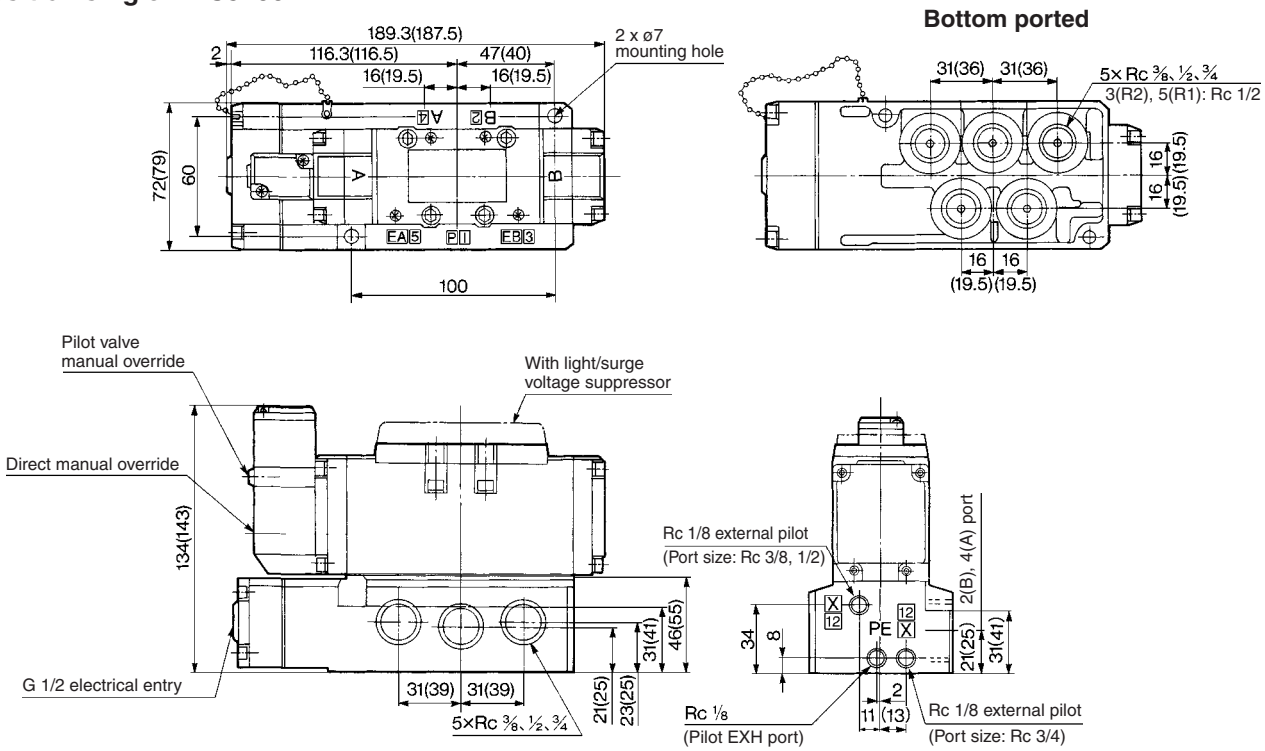
Sub-plate Assembly (For External Pilot) Part No.

Plug-in	VFS5000-P-R$^{03}_{04}_{06}$
Non plug-in	VFS5000-S-R$^{03}_{04}_{06}$

Part no. for mounting bolt and gasket
BG-VFS5000-1

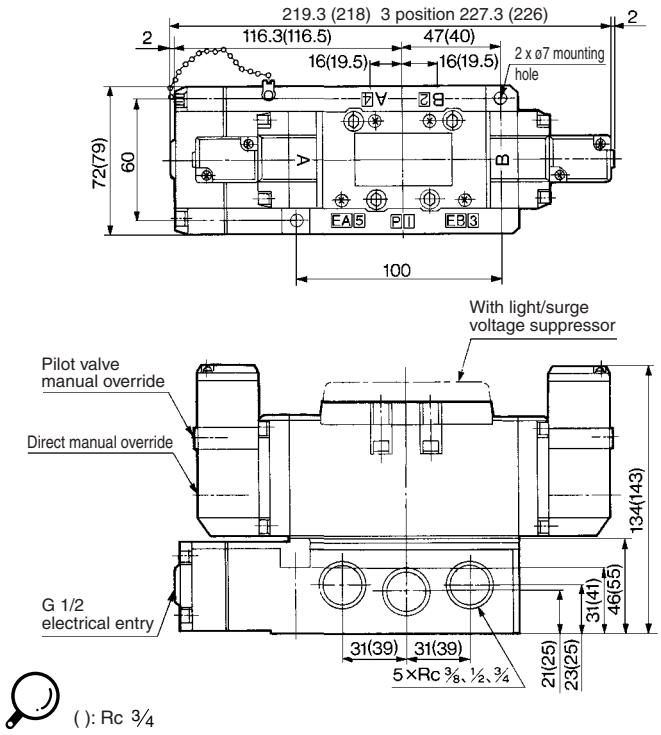
Plug-in — 2 Position single/Double/3 Position closed center/Exhaust center/Pressure center/Double check

2 position single: VFS5100-□F



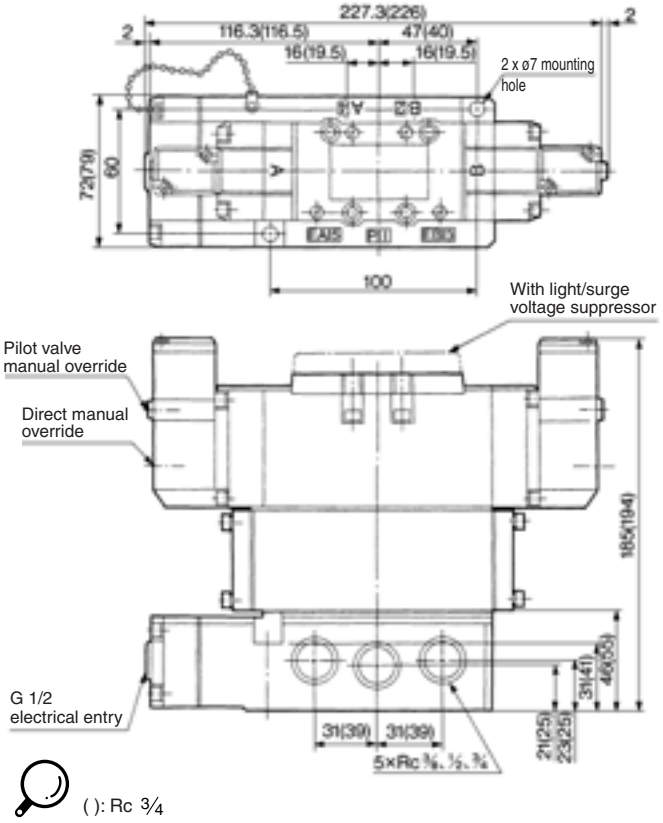
( ): Rc 3/4

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

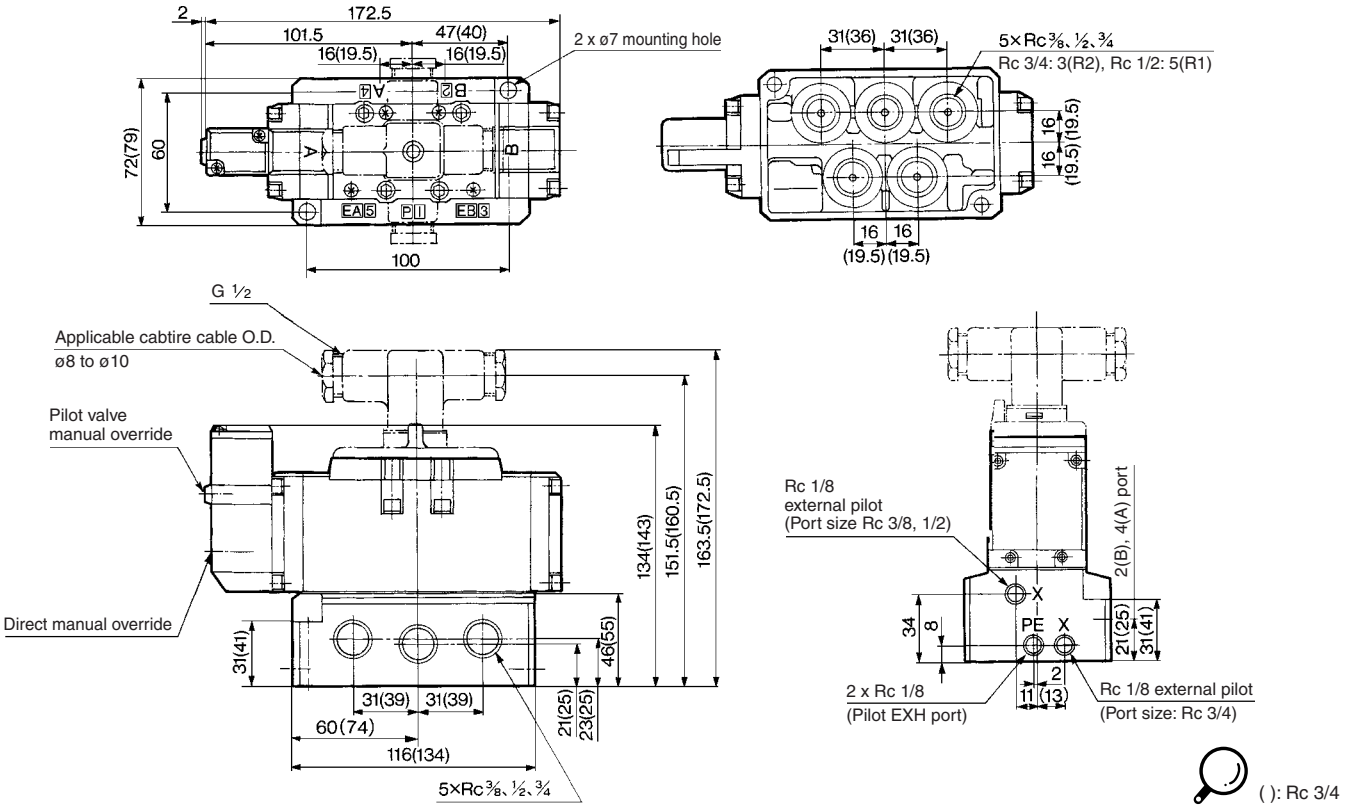
3 position double check: VFS5600-□F



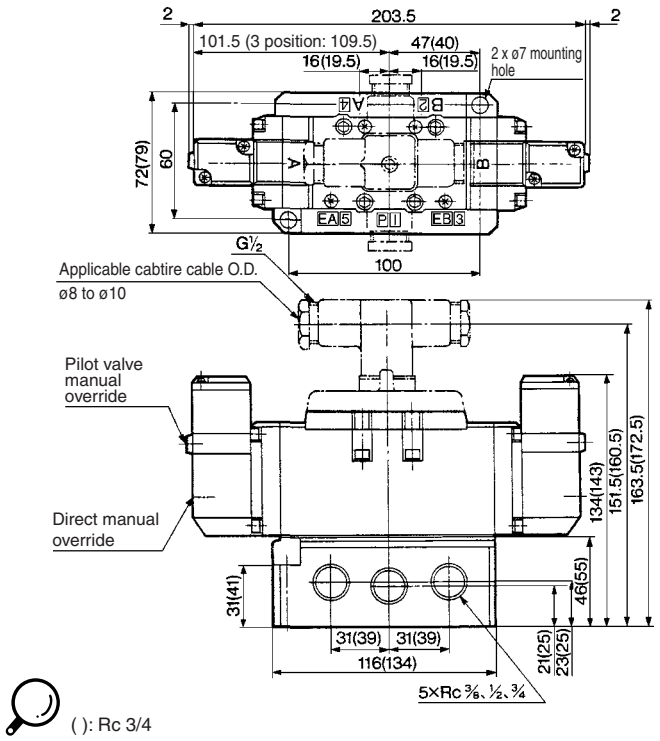
( ): Rc 3/4

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

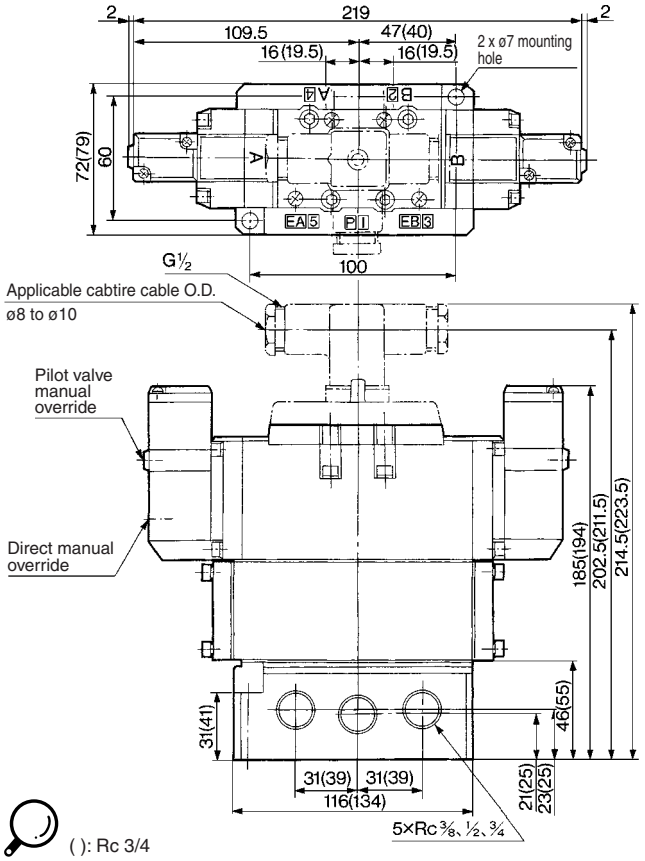
2 position single: VFS5110-□E, VFS5110-□D



2 position double: VFS5210-□E, VFS5210-□D
3 position closed center: VFS5310-□E, VFS5310-□D
3 position exhaust center: VFS5410-□E, VFS5410-□D
3 position pressure center: VFS5510-□E, VFS5510-□D



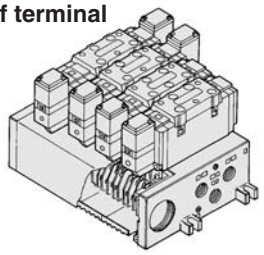
3 position double check: VFS5610-□E, VFS5610-□D



Series VFS5000
Manifold Specifications

Plug-in Type: With Terminal Block

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



VV5FS5 - 01T - [06] [1] - [04] [ ] - [ ]

- **Series VFS5000 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
04	Rc 3/4	Rc 1/2
06		Rc 3/4
M		Mixed

* For bottom ported, Rc 1/2 is only available.

- **CE-compliant**

Nil	—
Q	CE-compliant

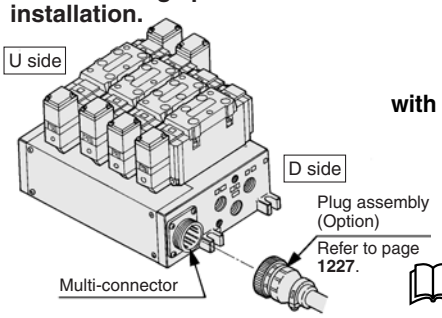
- **Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* 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.**



VV5FS5 - 01C [D] - [05] [2] - [04] [ ] - [ ]

- **Series VFS5000 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

- **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
04	Rc 3/4	Rc 1/2
06		Rc 3/4
M		Mixed

* For bottom ported, Rc 1/2 is only available.

- **CE-compliant**

Nil	—
Q	CE-compliant

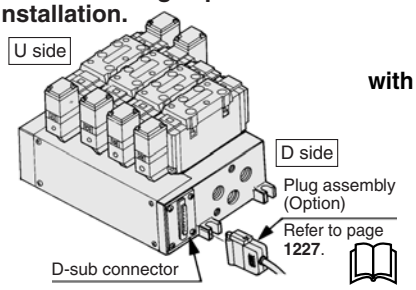
- **Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* 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.**



VV5FS5 - 01F [D] - [06] [1] - [04] [ ] - [ ]

- **Series VFS5000 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

- **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
04	Rc 3/4	Rc 1/2
06		Rc 3/4
M		Mixed

* For bottom ported, Rc 1/2 is only available.

- **CE-compliant**

Nil	—
Q	CE-compliant

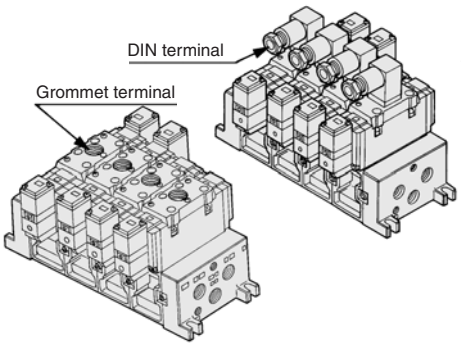
- **Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

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

- **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
04	Rc 3/4	Rc 1/2
06		Rc 3/4
M		Mixed

* For bottom ported, Rc 1/2 is only available.

- **CE-compliant**

Nil	—
Q	CE-compliant

- **Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

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

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 **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 [dm³/(s·bar)]	15.0	15.0	15.0
		b	0.20	0.20	0.20
		Cv	4.0	4.0	4.0
	4/2 → 5/3 (A/B → R1/R2)	C [dm³/(s·bar)]	16.0	16.0	16.0
		b	0.20	0.20	0.20
		Cv	4.2	4.2	4.2

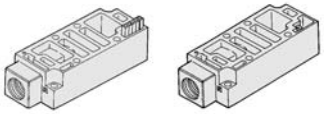
* Port size: Rc 1/2, 3/4

Manifold Option Parts Assembly

Individual SUP spacer

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

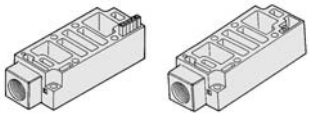
Body type	Plug-in type	Non plug-in type
Part no.	VVFS5000-P-04-1	VVFS5000-P-04-2



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.

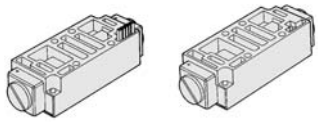
Body type	Plug-in type	Non plug-in type
Part no.	AXT512-14-1A	

EXH block plate **SUP block plate**

Throttle valve spacer

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

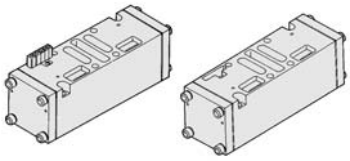
Body type	Plug-in type	Non plug-in type
Part no.	VVFS5000-20A-1	VVFS5000-20A-2



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.

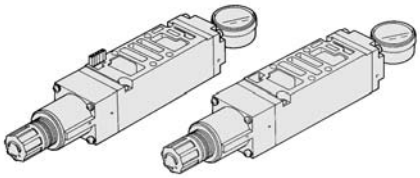
Body type	Plug-in type	Non plug-in type
Part no.	VVFS5000-22A-1	VVFS5000-22A-2



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.

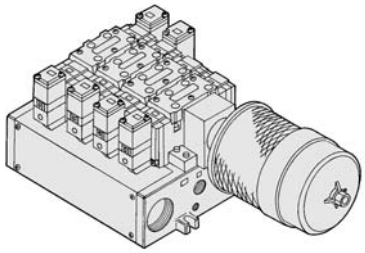
Body type	Plug-in type	Non plug-in type
Part no.	VVFS5000-10A	

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

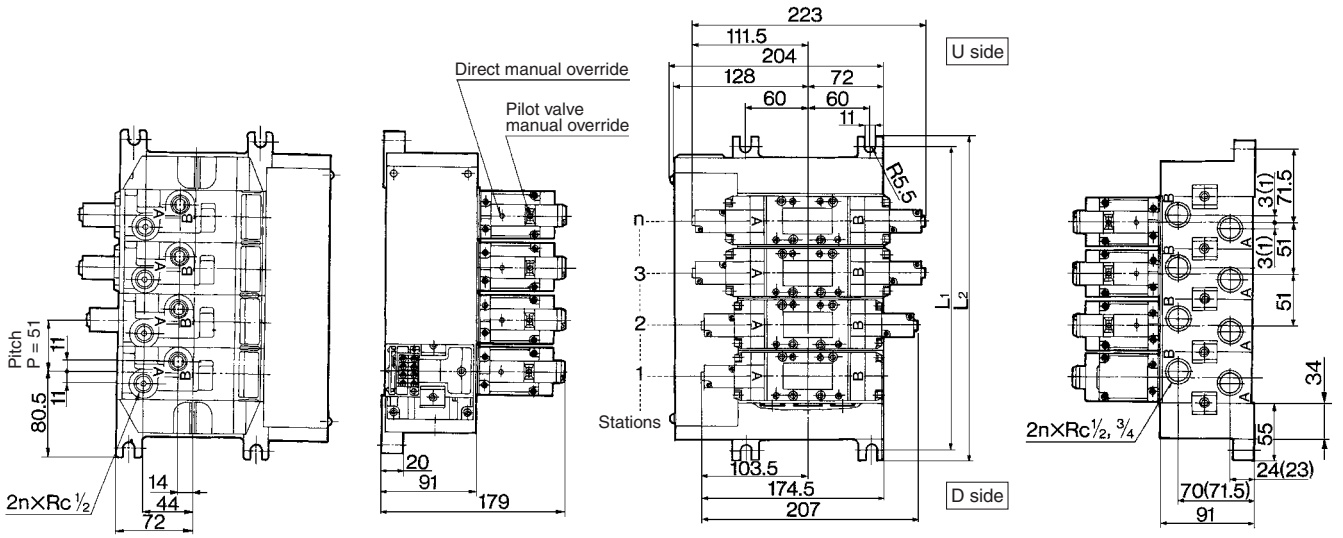
Plug-in type

- **Solenoid valve wiring process reduced considerably.**

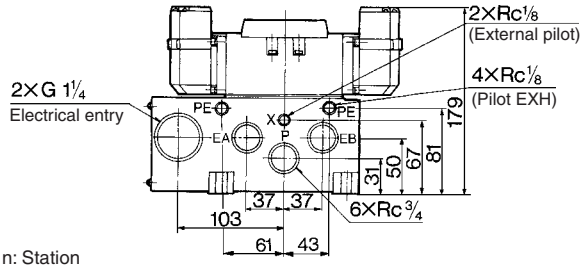
For details, refer to page 1214.

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

Plug-in type (With terminal block): VV5FS5-01T-Station 1-Port size



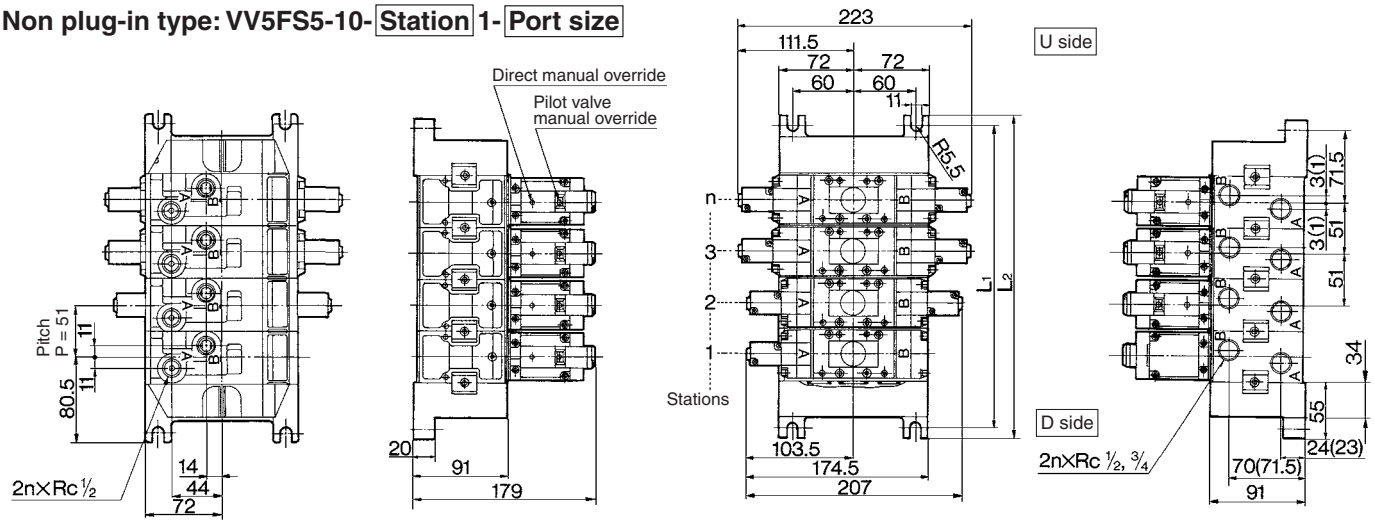
Bottom ported: VV5FS5-01T-Station 2-Port size



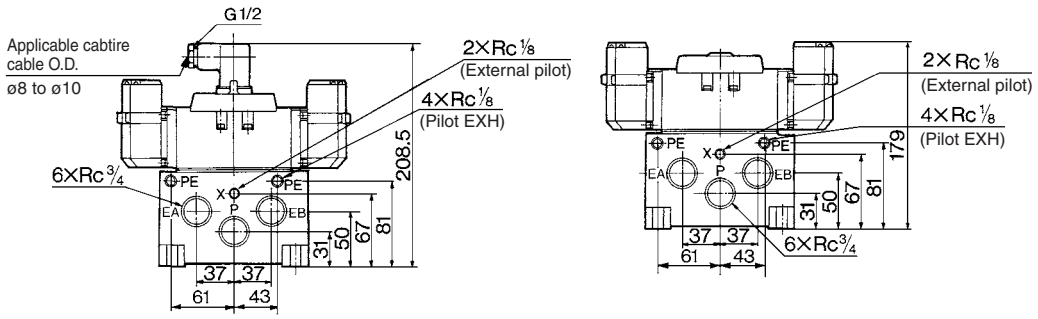
Formula for manifold weight M = 0.911n + 1.621 (kg) n: Station

( ): 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



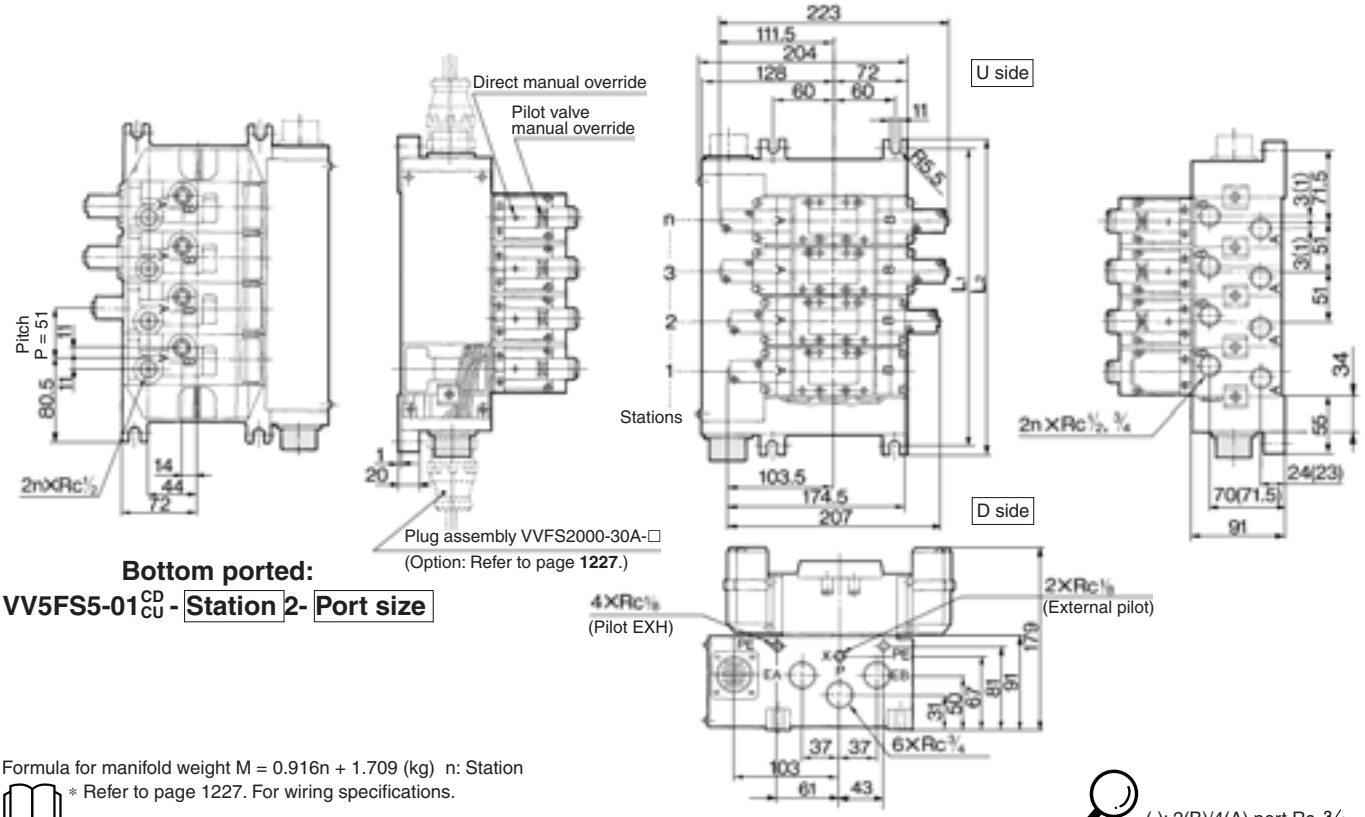
L \ Stations	2	3	4	5	6	7	8	9	10	Formula
L1	194	245	296	347	398	449	500	551	602	L1 = 51 x n + 92
L2	212	263	314	365	416	467	518	569	620	L2 = 51 x n + 110

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

( ): 2(B)/4(A) port Rc 3/4

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



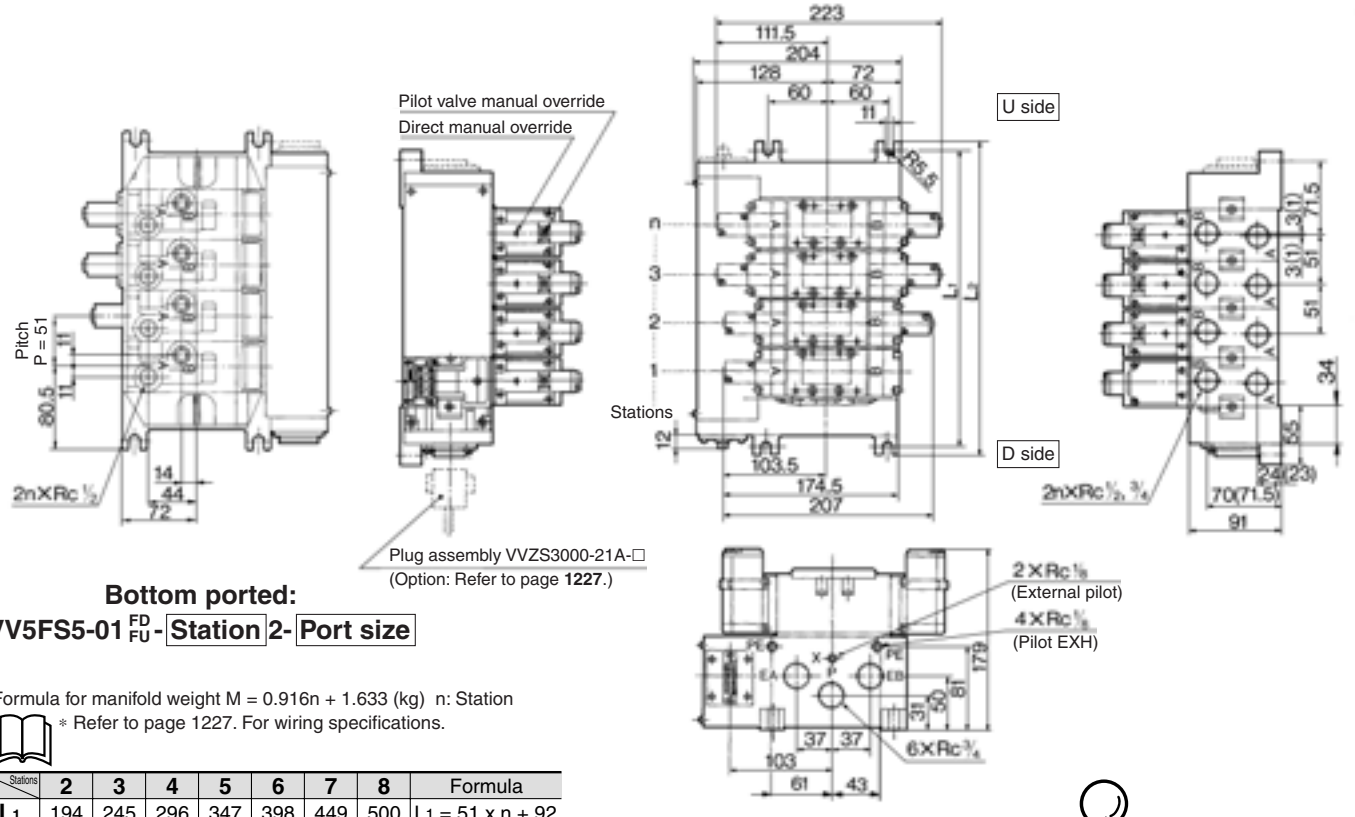
Bottom ported:
VV5FS5-01CD/CU - Station 2- Port size

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

∗ Refer to page 1227. For wiring specifications.

( ): 2(B)/4(A) port Rc 3/4

Plug-in type with D-sub connector: VV5FS5-01FD-Station 1-Port size, VV5FS5-01FU-Station 1-Port size



Bottom ported:
VV5FS5-01FD/FU - Station 2- Port size

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

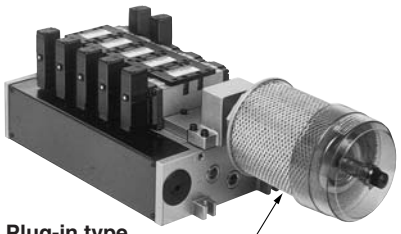
∗ Refer to page 1227. For wiring specifications.

L \ Stations	2	3	4	5	6	7	8	Formula
L1	194	245	296	347	398	449	500	L1 = 51 x n + 92
L2	212	263	314	365	416	467	518	L2 = 51 x n + 110

( ): 2(B)/4(A) port Rc 3/4

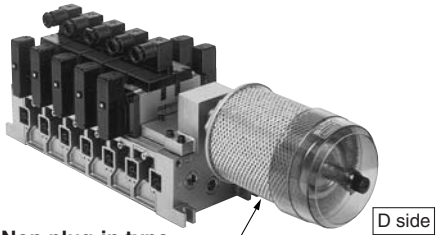
Manifold with Exhaust Cleaner

- **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	Side: 1/2, 3/4, Bottom: 1/2 (Option)	
	1(P), 3(R2), 5(R1)	P: 3/4, EXH: 1 1/2	
Stations	2 to 10 (1)		
Applicable exhaust cleaners	AMC810-14 (Connecting port size R 1 1/2) (2)		

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	

Stations

02	2 stations
⋮	⋮
10	10 stations

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

Port size

Symbol	P	A, B
04	Rc 3/4	Rc 1/2
06		Rc 3/4
M		Mixed

∗ For bottom ported, Rc 1/2 is only available.

Symbol

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

∗ Option

Thread type

Nil	Rc
N∗	NPT
T∗	NPTF
F∗	G

∗ Option

Exhaust cleaner mounting direction

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

CE-compliant

Nil	—
Q	CE-compliant

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.

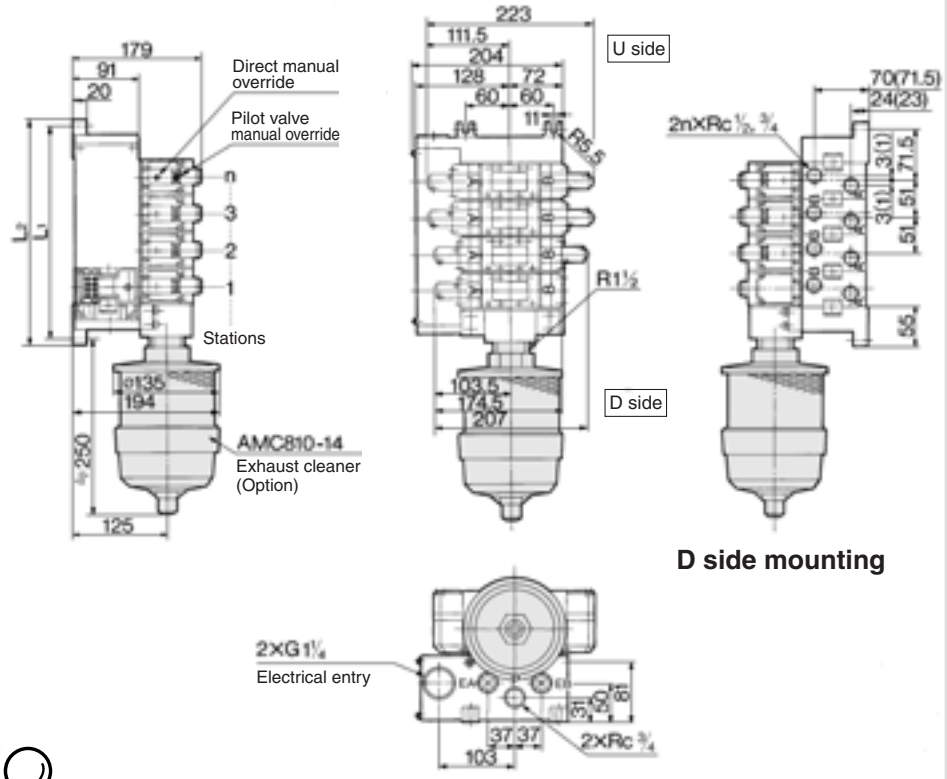
⚠ Caution

When using an exhaust cleaner, mount it downwards.

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

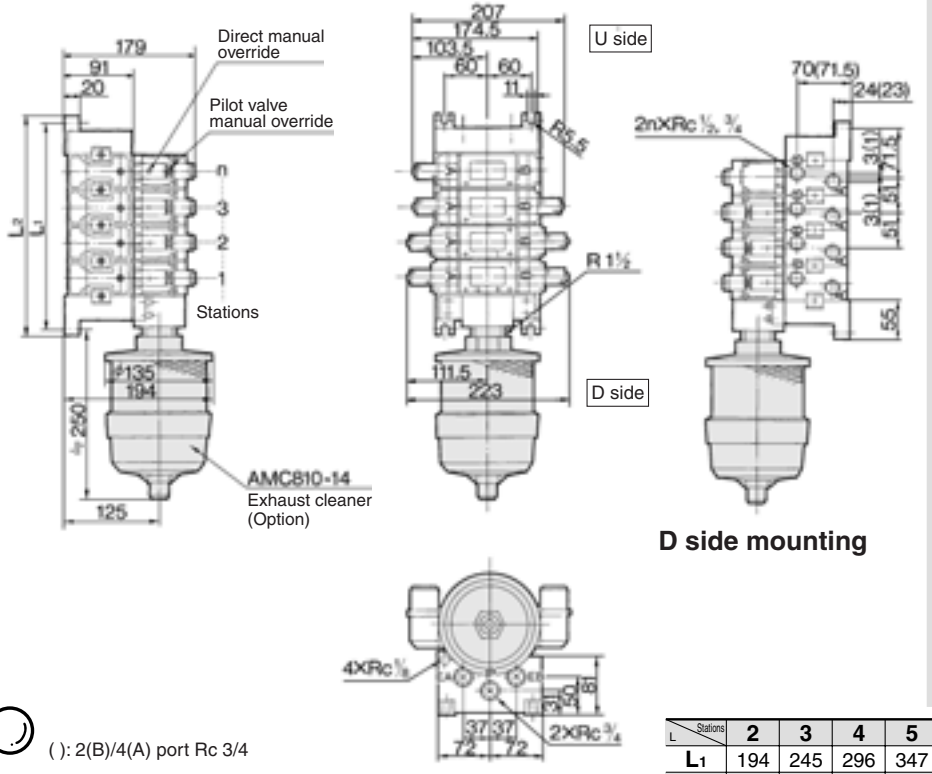
Manifold with Exhaust Cleaner — Plug-in type, Non plug-in type

Plug-in type: VV5FS5-01T-Station 1-Port size-$^{CD}_{CU}$



( ): 2(B)/4(A) port Rc 3/4

Non plug-in type: VV5FS5-10-Station 1-Port size-$^{CD}_{CU}$



( ): 2(B)/4(A) port Rc 3/4

n: Stations

L \ Stations	2	3	4	5	6	7	8	9	10	Formula
L1	194	245	296	347	398	449	500	551	602	L1 = 51 x n + 92
L2	212	263	314	365	416	467	518	569	620	L2 = 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

D	D side mounting
U	U side mounting

Stations

2	2 stations
⋮	⋮
10	10 stations

Thread type

Nil	Rc
N	NPT
T	NPTF
F	G

Port size

Symbol	P, R1, R2	A, B
04	Rc 3/4	Rc 1/2
06		Rc 3/4
M		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	
1	Common	Common	Side
2∗			Bottom

∗ Option

Applicable models

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

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
	Double	Double	Single	Single	Single	Double	Single	Single	SI unit
	A B	A B	A B	A B	A B	A B	A B	A B	
	0 1	2 3	4 5	6 7	8 9	10 11	12 13	14 15	

<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
	Double	Double	Single	Single	Single	Double	Single	Double	Single	SI unit
	A B	A B	A	A	A	A B	A	A B	A	
	0 1	2 3	4	5	6	7 8	9	10 11	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

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

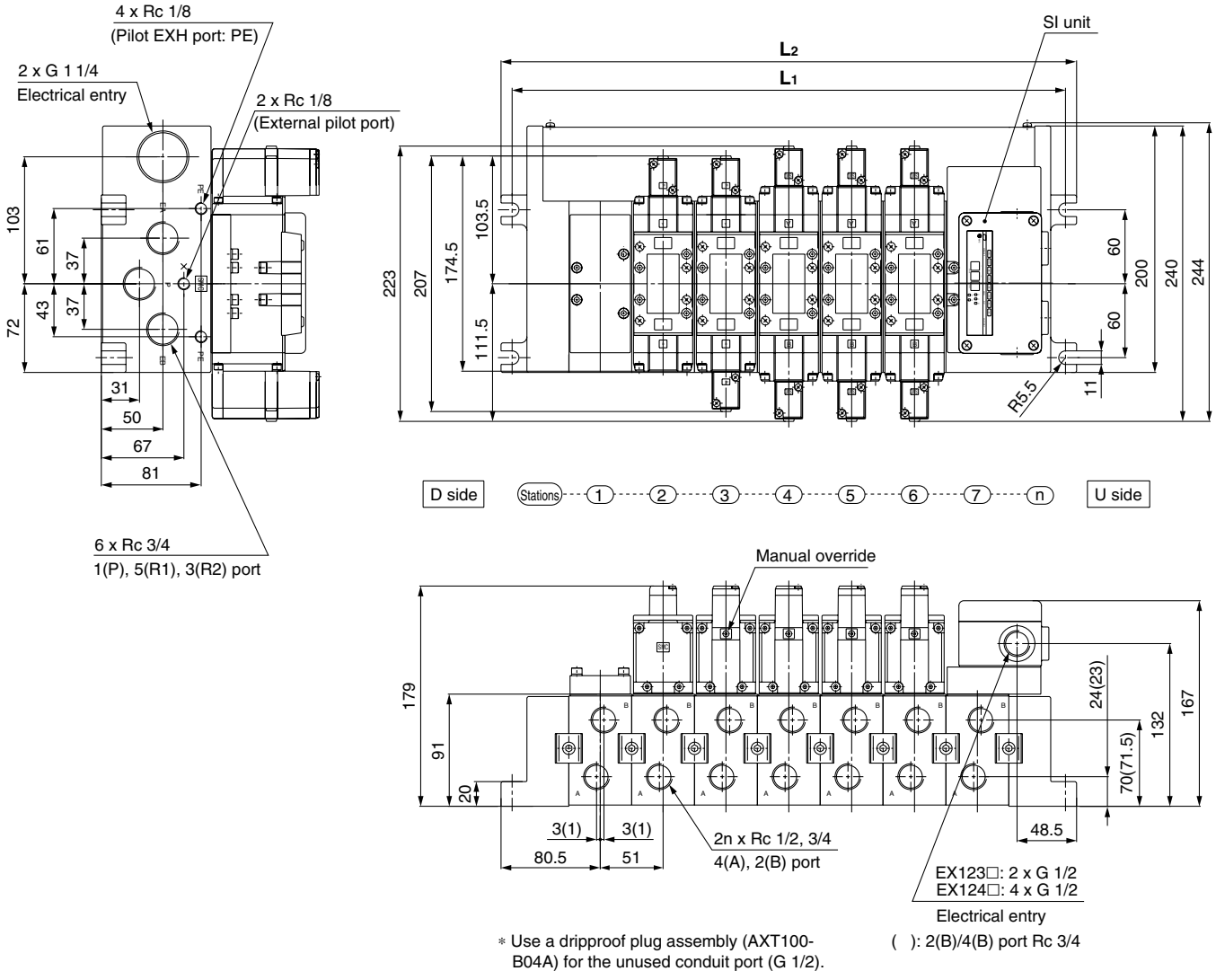
Nil	None
Z	With light/surge voltage suppressor

Coil rated voltage

Nil	None

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

VV5FS5-01S **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

Formula $L_1 = 51n + 92$ $L_2 = 51n + 110$
n: Stations (Max. 10 stations)

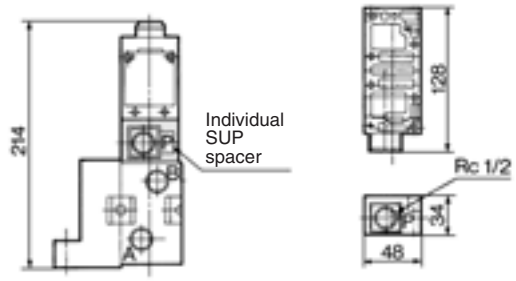
Dimensions

L \ n	2	3	4	5	6	7	8	9	10
L_1	194	245	296	347	398	449	500	551	602
L_2	212	263	314	365	416	467	518	569	620

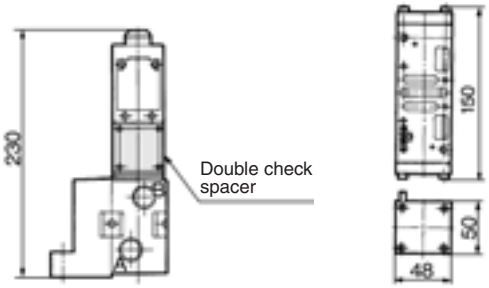
Note) Actual number of manifold base stations: Add 1 SI unit mounting station to the number of valve stations.

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

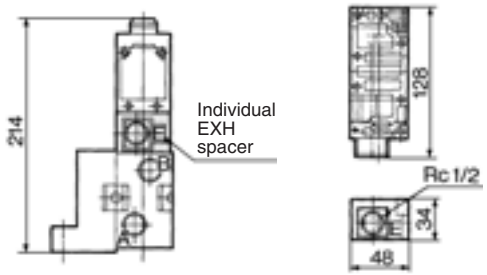
Individual SUP spacer:
VVFS5000-P-04-1 (Plug-in type)
VVFS5000-P-04-2 (Non plug-in type)



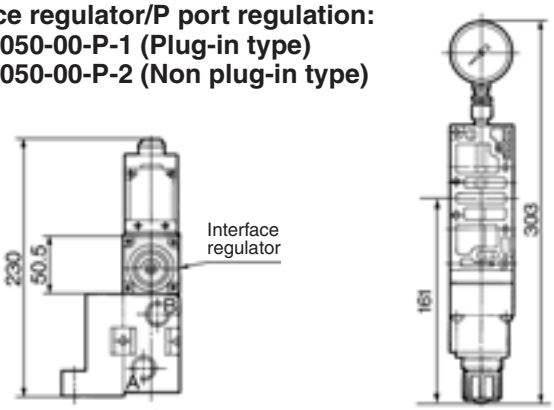
Double check spacer:
VVFS5000-22A-1 (Plug-in type)
VVFS5000-22A-2 (Non plug-in type)



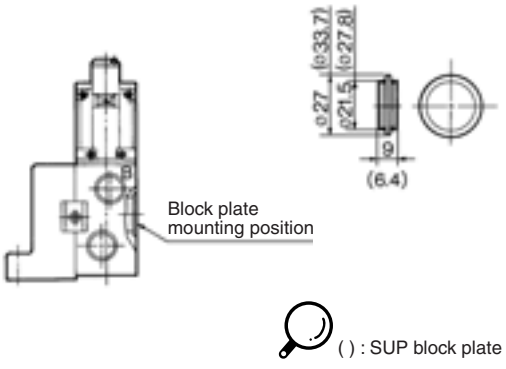
Individual EXH spacer:
VVFS5000-R-04-1 (Plug-in type)
VVFS5000-R-04-2 (Non plug-in type)



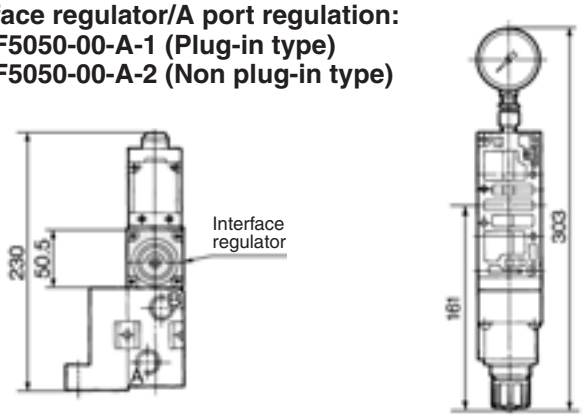
Interface regulator/P port regulation:
ARBF5050-00-P-1 (Plug-in type)
ARBF5050-00-P-2 (Non plug-in type)



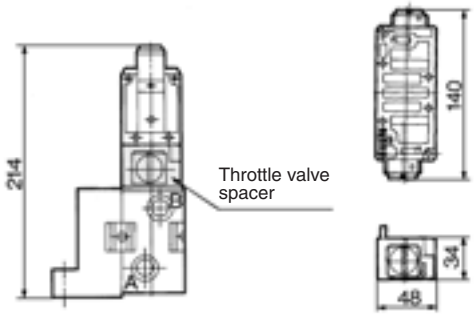
SUP block plate: AXT628-12A
EXH block plate: AXT512-14-1A



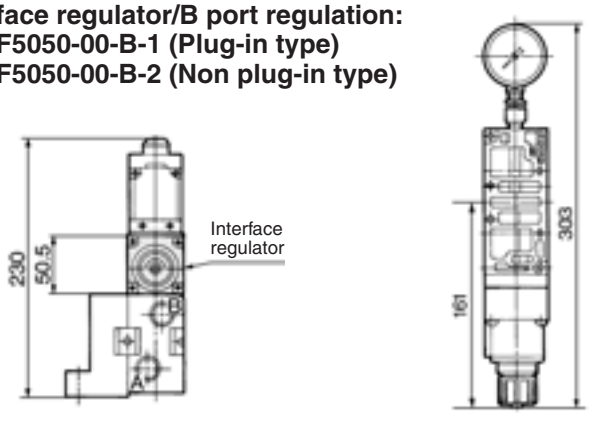
Interface regulator/A port regulation:
ARBF5050-00-A-1 (Plug-in type)
ARBF5050-00-A-2 (Non plug-in type)



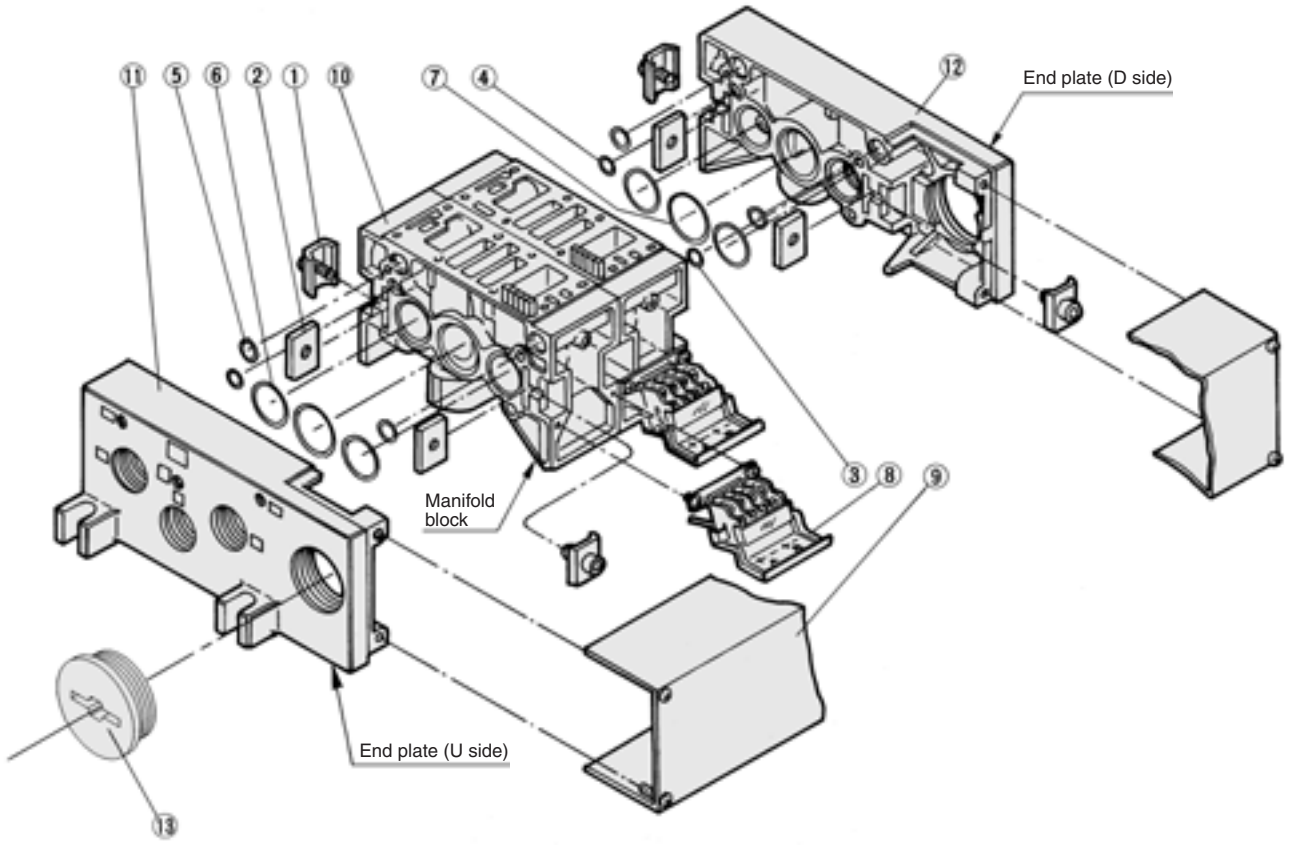
Throttle valve spacer:
VVFS5000-20A-1 (Plug-in type)
VVFS5000-20A-2 (Non plug-in type)



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



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- Stations
		For 01SU	AZ738-31A- Stations
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**	VVFS5000-1A-1-$^{04}_{06}$	Manifold block ⑩, Metal joint ①, ②, Terminal ⑧, O-ring ③, ④, ⑤, ⑥, ⑦, Receptacle assembly	Plug-in type
		VVFS5000-1A-2-$^{04}_{06}$	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

5 Port Pilot Operated Solenoid Valve
Metal Seal, Plug-in/Non Plug-in
Series VFS6000

NRTL /C

(Details → P. 1222-5)

Model

Type of actuation		Model		Port size Rc	Flow characteristics						Max.[1] operating cycle (cpm)	Response time[2] (ms)	Mass[3] (kg)
		Plug-in	Non plug-in		1 → 4/2 (P → A/B)			4/2 → 5/3 (A/B → R1/R2)					
					C [dm³/(s·bar)]	b	Cv	C [dm³/(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									
	Double	**VFS6200**	**VFS6210**	3/4	29	0.10	6.8	38	0.10	9.0	180	60 or less	2.75
				1									

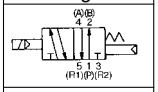
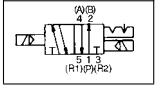
Note 1) Based on JIS B 8375-1981 (once per 30 days) for the min. operating frequency.
Note 2) According to JIS B 8375-1981. (The value at supply pressure 0.5 MPa.)
Note 3) The figures in the above list are for without sub-plate. In case of with sub-plate, add 1.65 kg for Rc 3/4 and 1.5 kg for RC 1 respectively.
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 dm³/(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
Single

Double


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 [1]
	Lubrication		Non-lube [2]
	Pilot valve manual override		Non-locking push type (Flush)
	Shock/Vibration resistance		150/50 m/s² [3]
	Enclosure		Type E: Dustproof (Level 0), Type F: Dripproof (Level 2), Type D: Splashproof (Level 4) [4]
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) [5]
	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 Note)
Manual override	**Main valve**	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

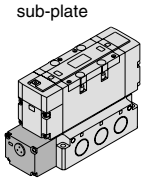
How to Order

Plug-in VFS6 [1] [0] [0] [ ] – [5] [F] [Z] – [ ] [10] [ ] – [ ]

Non plug-in VFS6 [1] [1] [0] [ ] – [5] [D] [Z] – [ ] [10] [ ] – [ ]

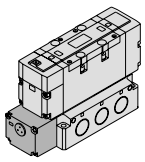
Body type

O: Plug-in type sub-plate



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

* Semi-standard

CE-compliant

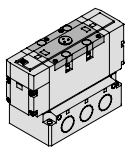
Nil	—
Q	CE-compliant

Option

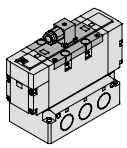
Nil	None
Z	With light/surge voltage suppressor

Electrical entry

E: Grommet terminal



D: DIN terminal

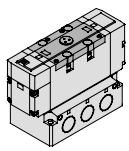


Symbol

1	2 position single
2	2 position double

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

* Semi-standard
For other rated voltages, please consult with SMC.

Body Option

0	Standard
1*	Direct manual override

* Semi-standard

Pilot type

Nil	Internal pilot
R*	External pilot

* Semi-standard

How to Order Pilot Valve Assembly

SF4 – [1] F – 22

Coil rated voltage

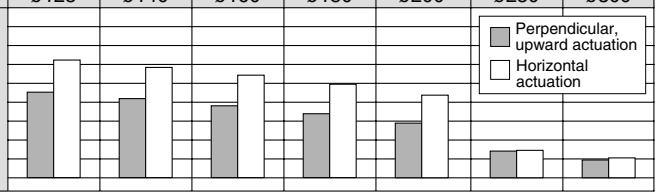
1	100 VAC, 50/60 Hz
2	200 VAC, 50/60 Hz
3*	110 to 120 VAC, 50/60 Hz
4*	220 VAC, 50/60 Hz
5	24 VDC
6*	12 VDC
7*	240 VAC, 50/60 Hz

* Semi-standard
For other rated voltages, please consult with SMC.

* Refer to page 1224 for voltage conversion.

Cylinder Speed Chart

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

Series	Average speed (mm/s)	Bore size: Series CS1/CS2, Pressure 0.5 MPa, Load factor 50%, Stroke 300 mm						
		ø125	ø140	ø160	ø180	ø200	ø250	ø300
VFS6100-10	800 700 600 500 400 300 200 100 0							

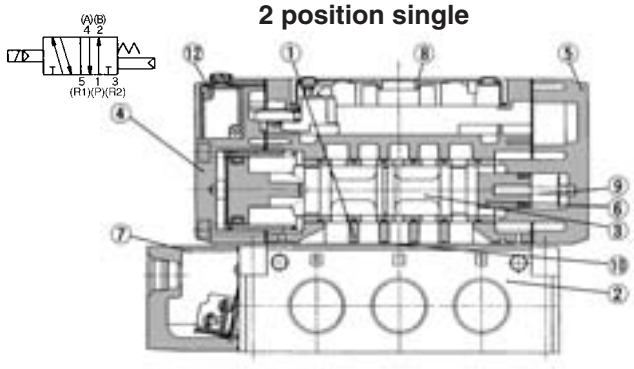
∗ It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
∗ The average velocity of the cylinder is what the stroke is divided by the total stroke time.
∗ Load factor: ((Load weight x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

Conditions

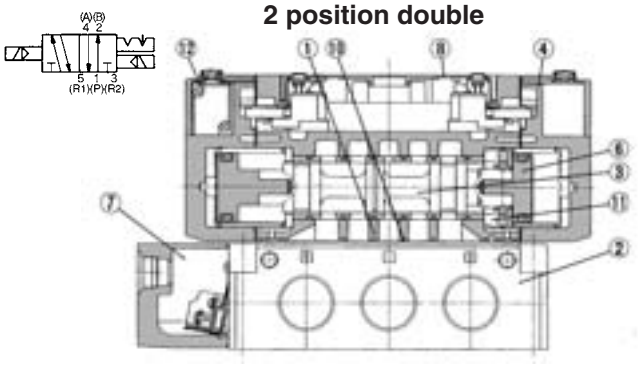
		Series CS1/CS2
VFS6100-10	Tube bore x Length	SGP25A x 1 m
	Speed controller	AS600-10
	Silencer	AN600-10

Construction

2 position single



2 position double



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-$^{06}_{10}$
Non plug-in	VFS6000-S-$^{06}_{10}$

∗ Mounting bolt and gasket are not included.

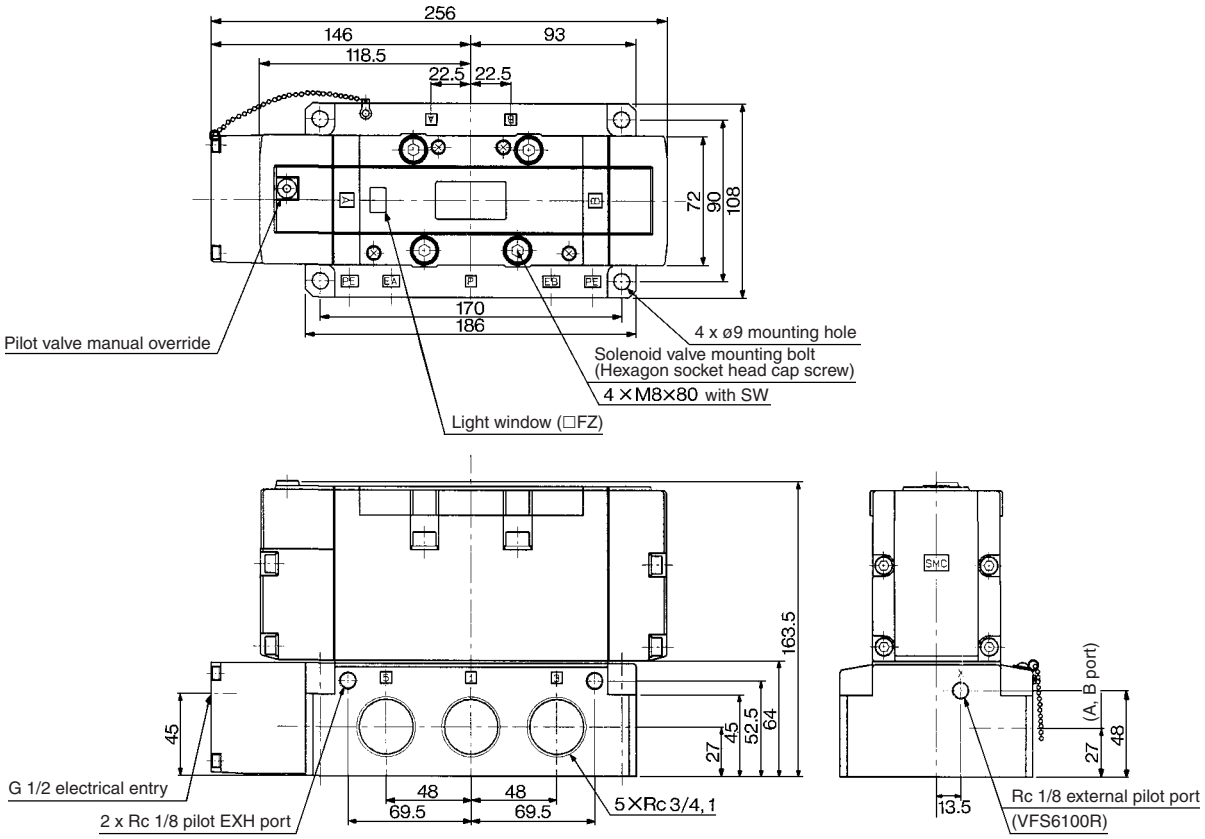
Sub-plate Assembly (For External Pilot) Part No.

Plug-in	VFS6000-P-R$^{01}_{02}$
Non plug-in	VFS6000-S-R$^{01}_{02}$

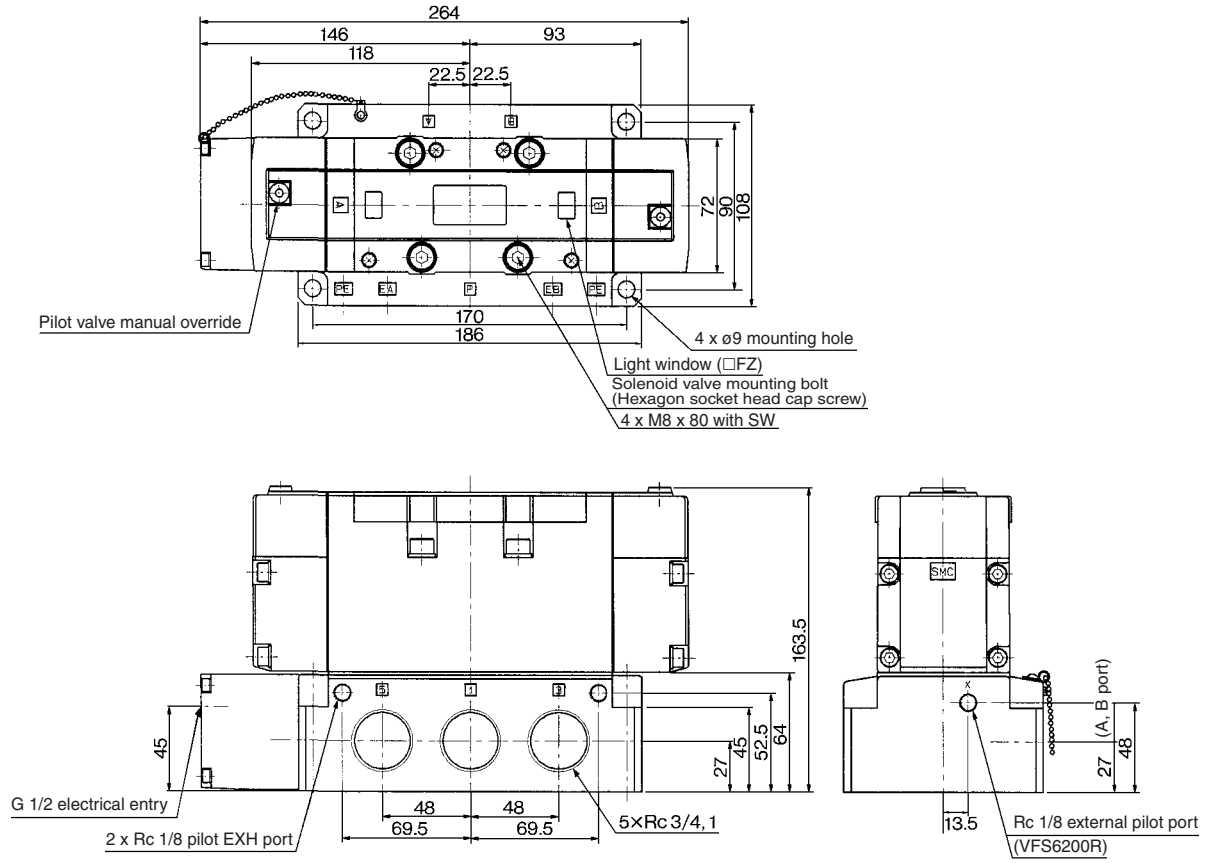
Part no. for mounting bolt and gasket
BG-VFS6000

Plug-in — 2 Position single/Double

2 position single: VFS6100-□F

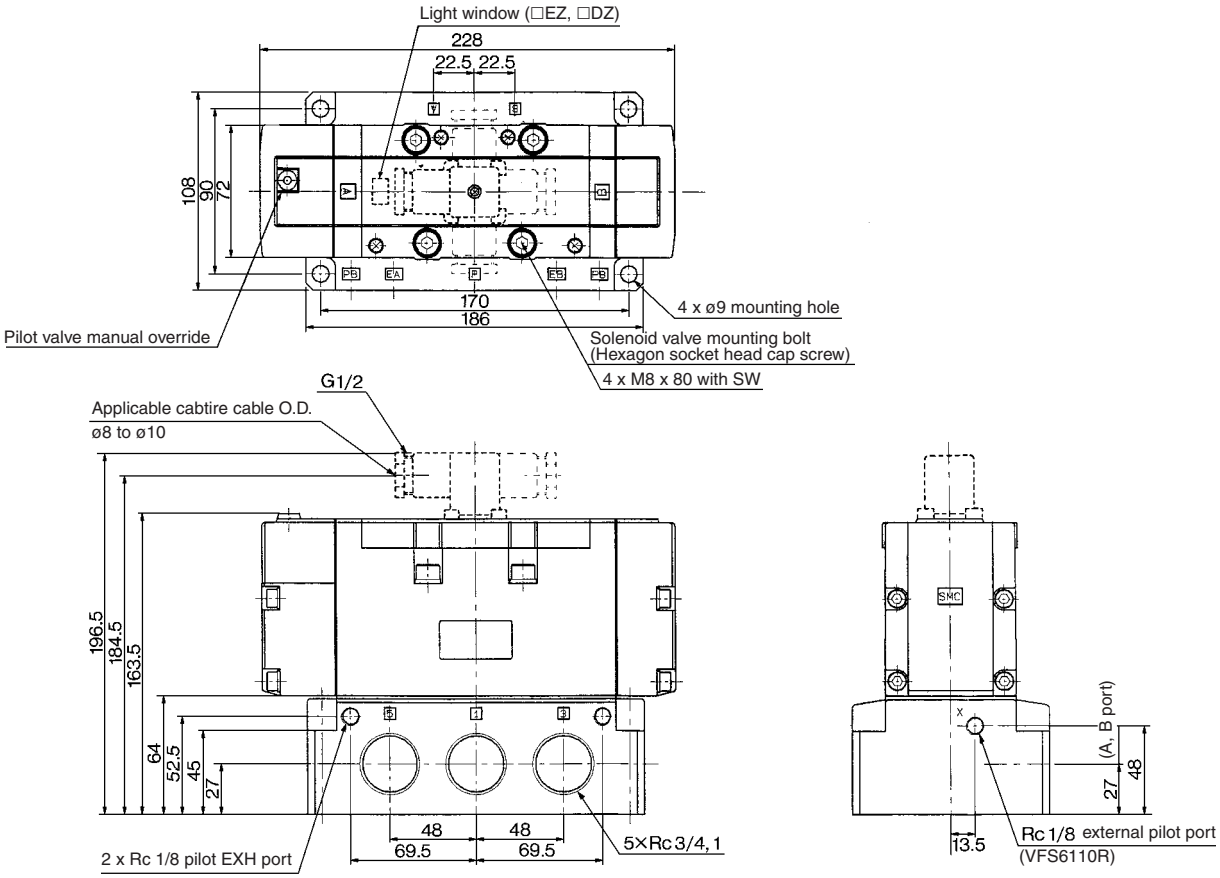


2 position double: VFS6200-□F

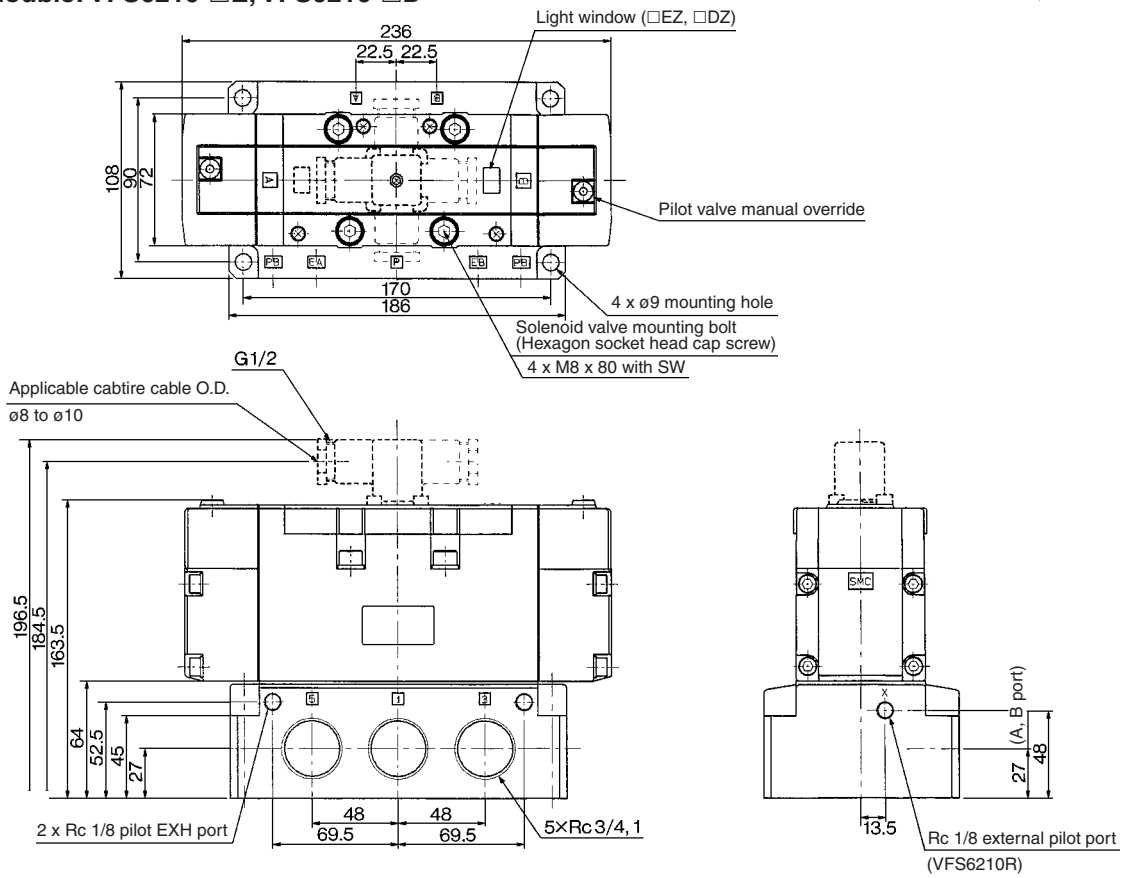


Non Plug-in — 2 Position single/Double

2 position single: VFS6110-□E, VFS6110-□D



2 position double: VFS6210-□E, VFS6210-□D



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

NRTL /C

How to Order

Non plug-in **30** – **VFS2** [2] **10** [ ] – [1] **D** [ ] [ ] – [ ] **02** [ ]

Conforming to CSA standard

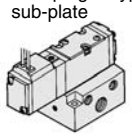
Symbol

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

∗ Combining double check spacer with external pilot will not work.

Body type

1: Non plug-in type sub-plate



Pilot type

Nil	Internal pilot
R*	External pilot

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

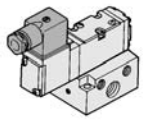
Coil rated voltage

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

∗ Option

Electrical entry

D: DIN terminal



Option

Nil	None
Z	With light/surge voltage suppressor

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

Porting specifications

Nil	Side ported
B*	Bottom ported

∗ Option

Port size

Nil		Without sub-plate
01	Rc 1/8	Non plug-in type, Standard type 
02	Rc 1/4	

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

∗ Option

Refer to standard products for specifications and dimensions.

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

NRTL /C

How to Order

Non plug-in **30 – VFS3 2 1 1 [ ] – 2 D [ ] [ ] – [ ] 02 [ ]**

Conforming to CSA standard

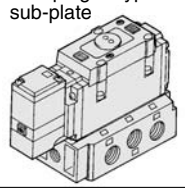
Symbol

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

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

Body type

1: Non plug-in type sub-plate



Body option

0	Standard
1*	Direct manual override

∗ Option

Pilot type

Nil	Internal pilot
R*	External pilot

∗ Option

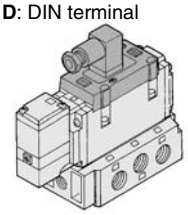
Coil rated voltage

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

∗ Option

Electrical entry

D: DIN terminal



Option

Nil	None
Z	With light/surge voltage suppressor

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.

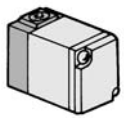
Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

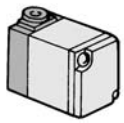
∗ Option

Pilot valve manual override

Nil: Non-locking push type (Flush)

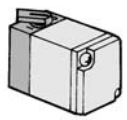


A*: Non-locking push type (Extended)



B*: Locking type (Tool required)

C*: Locking type (Lever)



∗ Option

Refer to standard products for specifications and dimensions.

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

NRTL /C

How to Order

Non plug-in **30 – VFS4 2 1 0 □ – 1 D □ □ – □ 03 □**

Conforming to CSA standard

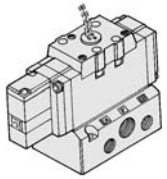
Symbol

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

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

Body type

1: Non plug-in type sub-plate



Body option

0	Standard
1∗	Direct manual override

∗ Option

Pilot type

Nil	Internal pilot
R∗	External pilot

∗ Option

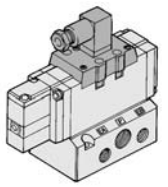
Coil rated voltage

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

∗ Option

Electrical entry

D: DIN terminal

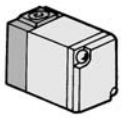


Option

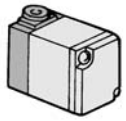
Nil	None
Z	With light/surge voltage suppressor

Pilot valve manual override

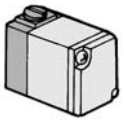
Nil: Non-locking push type (Flush)



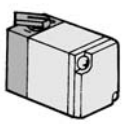
A∗: Non-locking push type (Extended)



B∗: Locking type (Tool required)



C∗: Locking type (Lever)



∗ Option

Thread type

Nil	Rc
N∗	NPT
T∗	NPTF
F∗	G

∗ Option

Port size

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

∗ EA, EB: Rc 3/8

Porting specifications

Nil	Side ported
B∗	Bottom ported

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

Refer to standard products for specifications and dimensions.

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

NRTL /C

How to Order

Non plug-in **30 – VFS5 [1] [1] [0] [ ] – [5] [D] [ ] [ ] – [ ] [06] [ ]**

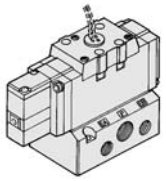
Conforming to CSA standard

Symbol

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

Body type

1: Non plug-in type sub-plate



Body option

0	Standard
1*	Direct manual override

* Option

Pilot type

Nil	Internal pilot
R*	External pilot

* Option

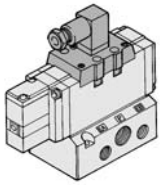
Coil rated voltage

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

* Option

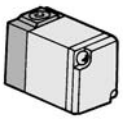
Electrical entry

D: DIN terminal

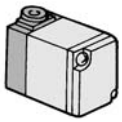


Pilot valve manual override

Nil: Non-locking push type (Flush)



A*: Non-locking push type (Extended)



B*: Locking type (Tool required)

C*: Locking type (Lever)

* Option

Option

Nil	None
Z	With light/surge voltage suppressor

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

Refer to standard products for specifications and dimensions.

5 Port Pilot Operated Solenoid Valve
Metal Seal, Non Plug-in
Series VFS6000

NRTL /C

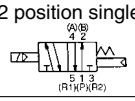
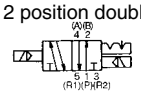
How to Order

Non plug-in

30 – VFS6 [1] [1] [0] [ ] – [5] [D] [Z] – [ ] [10] [ ]

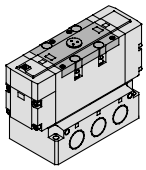
Conforming to CSA standard

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

Pilot type

Nil	Internal pilot
R*	External pilot

* Option

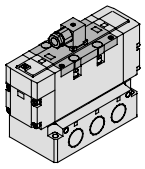
Coil rated voltage

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

* Option

Electrical entry

D: DIN terminal



Option

Nil	None
Z	With light/surge voltage suppressor

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

Refer to standard products for specifications and dimensions.

Series VFS
Specific Product Precautions 1

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

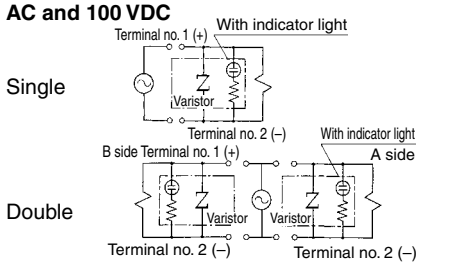
⚠ Caution

Light/Surge Voltage Suppressor, Electrical Entry — Single unit

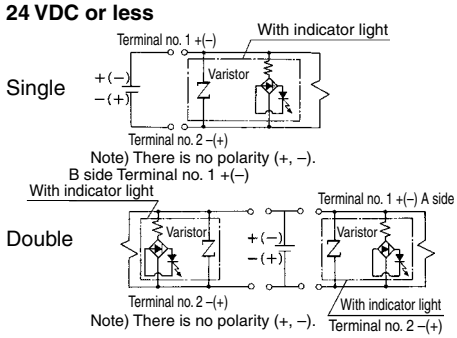
Body Ported — Series VFS1000/2000/3000

Light/Surge Voltage Suppressor

AC and 100 VDC



24 VDC or less

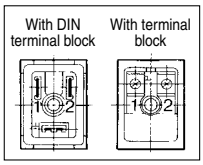


- Type G: Lead wire comes directly from the solenoid part. Connect it with the power source. Grommet with DC voltage surge voltage suppressor has polarity. Connect red lead wire to + (positive) side and black to – (negative) side.

Surge voltage suppressor	
DC	AC
Red + Black –	Varistor

Wiring

In the case of DIN terminal and terminal block (with indicator light/surge voltage suppressor), the interior wiring is shown below.

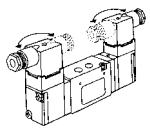


Applicable terminal: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S, but in the case of with DIN terminal block, is not a terminal structure.

Note) There is no polarity.

Changing Direction of 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

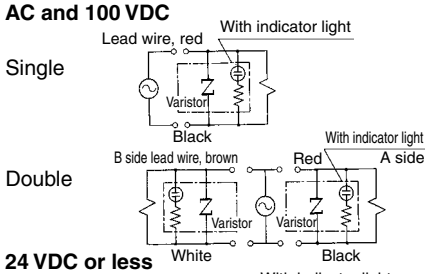
Loosen the set screw (M3–2 pcs.), take out pilot operator, turn solenoid valve 180° degrees to change the direction of lead wire and manual override. (Possible on Series VFS1000 only.)

Base Mounted — Series VFS2000

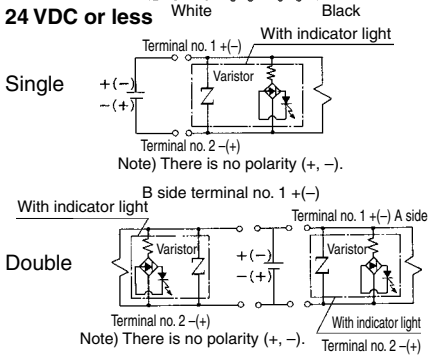
Light/Surge Voltage Suppressor

- In the case of surge voltage suppressor, surge voltage absorption device ZNR is attached to AC power.

AC and 100 VDC

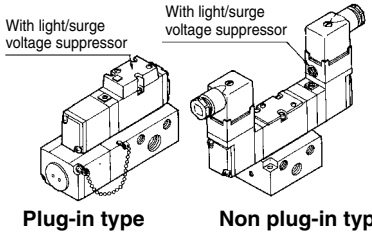


24 VDC or less



- 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.

Surge voltage suppressor	
DC	AC
Red + Black –	Varistor

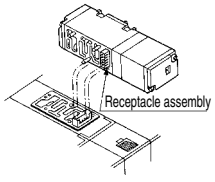


Plug-in type **Non plug-in type**

How to Exchange

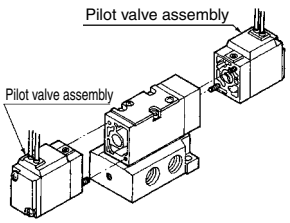
Solenoid valve

- 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.



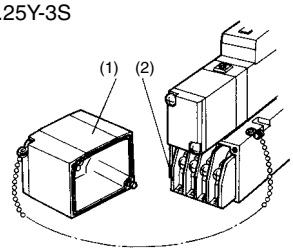
Electrical Connection

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.

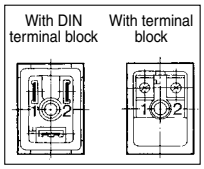
Description	Solenoid A side	Solenoid B side
Terminal block marking	A	B

- 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.



Applicable terminal: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S, but in the case of with DIN connector board, is not a terminal structure.
Tightening torque for terminal: 0.6 N·m

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. ø6 to ø8.

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.

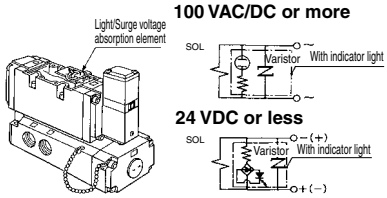
⚠ Caution

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.

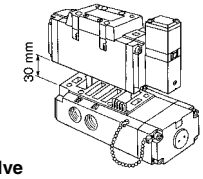


Note) There is no polarity.

How to Exchange

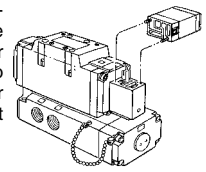
Solenoid valve

- 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.

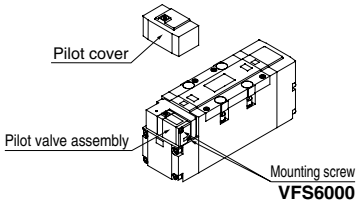


Pilot valve

- 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



VFS6000

Light/Surge Voltage Suppressor Substrate Part No.

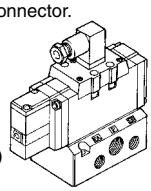
VFS3000		VFS3000-10A-□#1
VFS4000	100V or more	VF4000-9A-□#1
	24V or less	VF4000-9B-□#1
VFS5000	100V or more	AXT627-7A-□#1
	24V or less	AXT627-7B-□#1
VFS6000	100V or more	VF4000-9A-□#1
	24V or less	VF4000-9B-□#1

-□: 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.

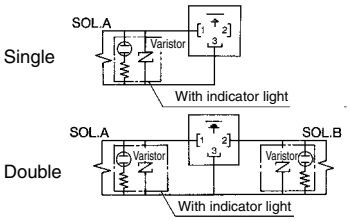


DIN terminal (Wiring)

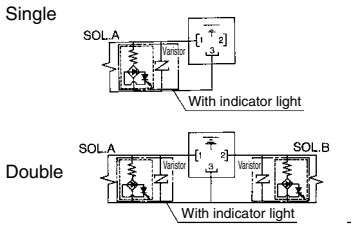
1	A side
2	B side
3	COM
⏚	Ground

- There is no polarity.

100 VAC/DC or more



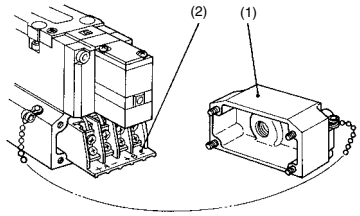
24 VDC or less



- Heavy-duty cord
  Applicable cable O. D.: ø8 to ø10
- 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.



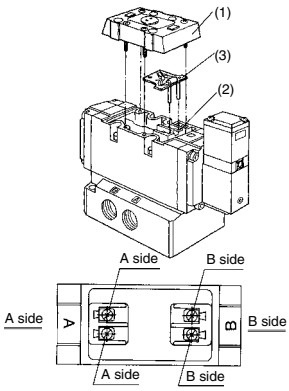
- The following markings are on the terminal block. Connect with corresponding power side.

	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

SMC

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

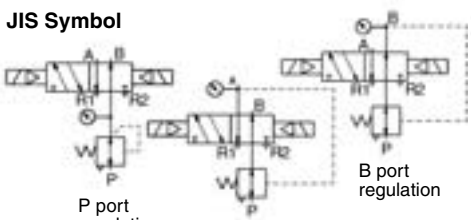
Interface regulator (3)		ARBF2000	ARBF3050			ARBF4050			ARBF5050		
Applicable solenoid valve series		VFS2000	VFS3000			VFS4000			VFS5000		
Regulating port		P	A	B	P	A	B	P	A	B	P
Proof pressure		1.5 MPa									
Maximum operating pressure		1.0 MPa									
Set pressure range (1)		0.05 to 0.83 MPa	0.1 to 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^2) (2) S at P_1 = 0.7 MPa, P_2 = 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^2) (2) S at P_2 = 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.

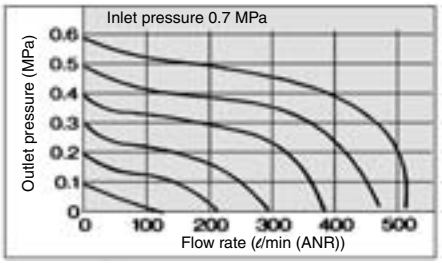
Flow Characteristics (P → A)

(Conditions: Inlet pressure 0.7 MPa. when 2 position solenoid valve is mounted.)

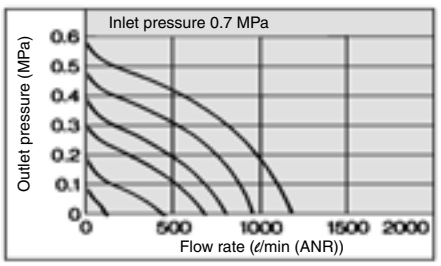
JIS Symbol



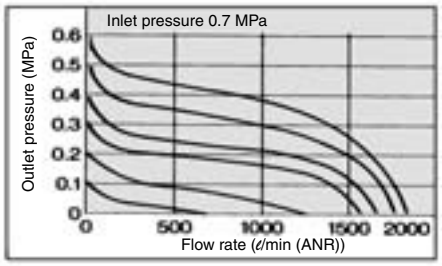
ARBF2000-00-P



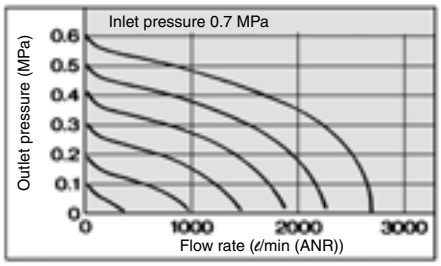
ARBF3050-00-P



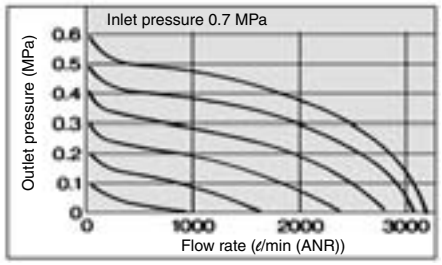
ARBF3050-00-A



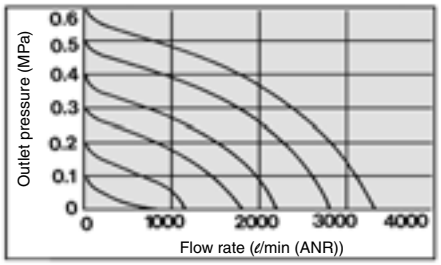
ARBF4050-00-P



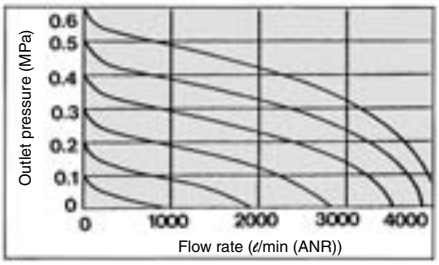
ARBF4050-00-A



ARBF5050-00-P



ARBF5050-00-A



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.

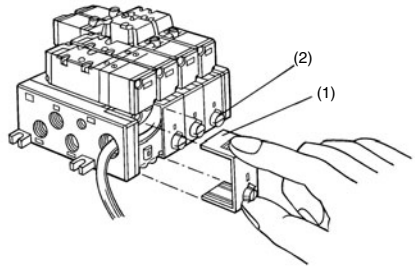
⚠ Caution

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.)

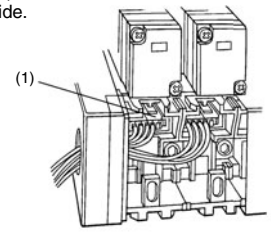
How to remove junction cover (Type 01)
Turn the knob (2) of junction cover (1) on the manifold block side by hand or slotted screwdriver to the C → O direction (counterclockwise) 90°. While holding the knob and upper part of junction cover, pull outward to remove junction cover.
When reassembling, do the opposite.



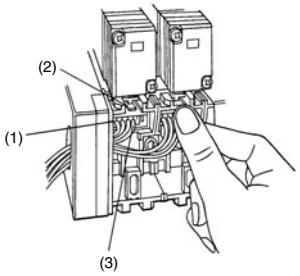
Wiring
The insert plug (1) is attached to the manifold block and lead wire is plugged in with valve side as shown in the following list.
(Single solenoid: AXT624-52A-S-1
Double solenoid: AXT624-52A-D-1)
Connect with corresponding power side.

Power supply	Valve model	Solenoid A	Solenoid B
AC DC	Single solenoid	Red, Black	—
	Double solenoid	Red, Black	Brown, White

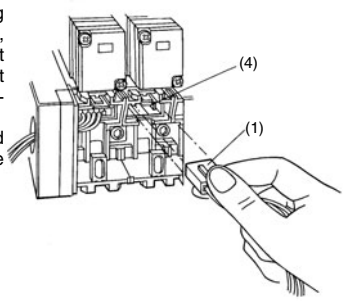
∗ There is no polarity.
∗ Lead wire length is 1 m.



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.



- 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.

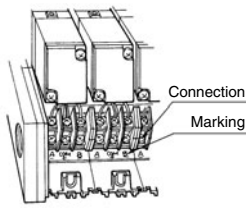


Type 01 with Terminal Block

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
VFS2$^{3}_{4}$00	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.
  (It is designed for 5 stations. So, cut the COM bridge according to the number of stations. Additionally, when it is used for 6 or more stations, combine the COM bridges and cut appropriately.)
- 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
VFS3$^{3}_{4}$00	A side	COM	B side

- Applicable terminal: 1.25-3.5M, 1.25Y-3L, 1.25-3M
- Plugging the lead wire assembly for all COM in between COM terminals on the block board will make the specifications of all the stations all COM. This rationalizes the wiring.
  Part no. of lead wire assembly for all COM (common to VFS3000, 4000, and 5000): AZ683-56A (Since it is designed for 20 terminals, the VFS3000 is applicable to up to 20 stations. Cut lead wires appropriately according to the number of stations.)
- 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 –
VFS$^{4}_{5}$100	A side	A side		
VFS$^{4}_{5}$200	A side	A side	B side	B side
VFS4$^{3}_{4}$00 **VFS5$^{3}_{4}$00**	A side	A side	B side	B side

- Applicable terminal: 1.25-3.5M, 1.25Y-3L, 1.25Y-3M
- Plugging the lead wire assembly for all COM in between COM terminals on the block board will make the specifications of all the stations all COM. This rationalizes the wiring.
  Part no. of lead wire assembly for all COM (common to VFS3000, 4000, and 5000): AZ683-56A (Since it is designed for 20 terminals, the VFS4000 and 5000 are applicable to up to 10 stations. Cut lead wires appropriately according to the number of stations.)
- There is no polarity.
- Tightening torque for terminal: 0.6 N·m

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

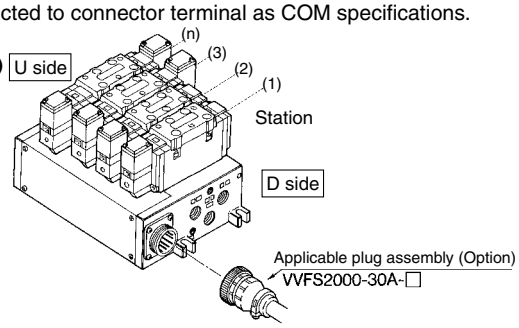
Lead Wire Connection — Manifold/Plug-in

Type 01C Circular Connector

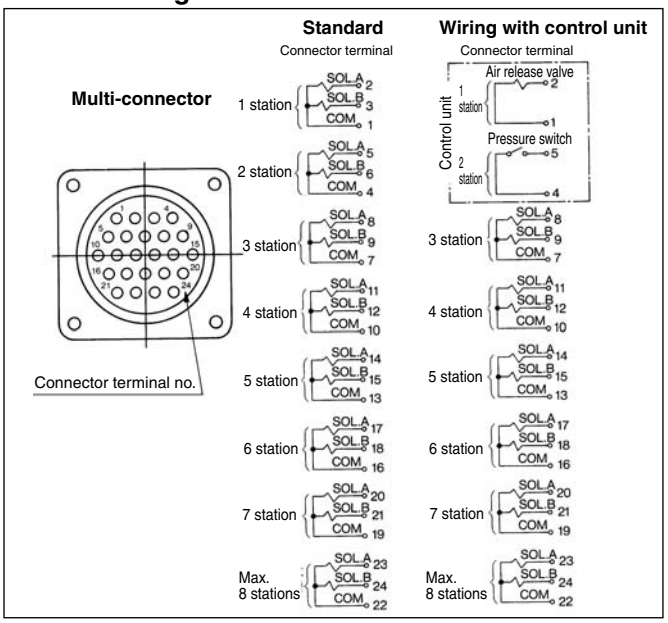
Series VFS2000/3000/4000/5000

• Wire connection specifications
Lead wire for both solenoid A and B sides in manifold are connected to connector terminal as COM specifications.

Fig. (1)



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 mm² 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

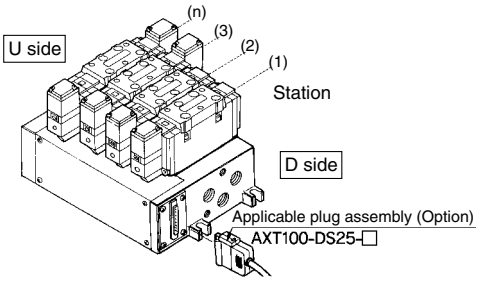
Terminal no.	13	14	15	16	17	18	19	20	21	22	23	24
Lead wire color	Brown	Brown	White	White	Pink	Pink	Gray	Gray	Sky blue	Sky blue	Light green	Light green
Dot marking	—	Yes	—	Yes	—	Yes	—	Yes	—	Yes	—	Yes

Type 01F D-sub Connector

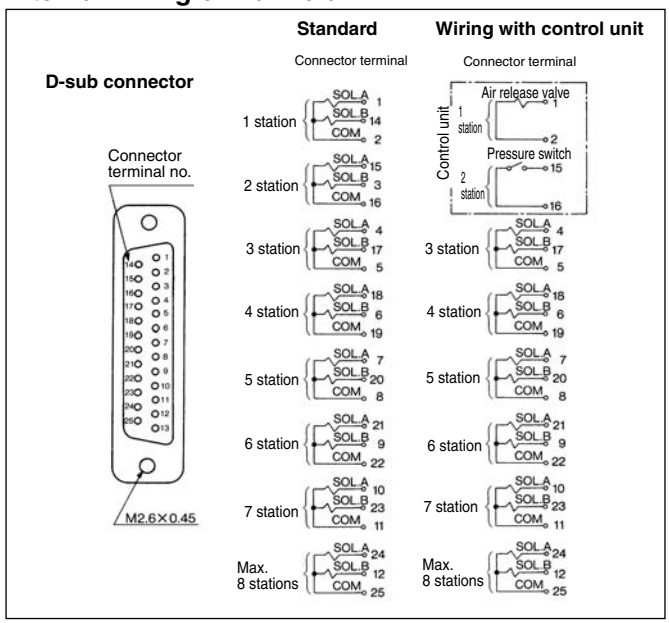
Series VFS2000/3000/4000/5000

• Wire connection specifications
Lead wire for both solenoid A and B sides in manifold are connected to connector terminal as COM specifications.

Fig. (2)



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
AXT100-DS25-015	1.5 m	Plug: MIL standard D type connector 25 terminals Cable: 25 cores wire x 0.3 mm²
AXT100-DS25-030	3 m	
AXT100-DS25-050	5 m	
AXT100-DS25-080	8 m	
AXT100-DS25-100	10 m	
AXT100-DS25-150	15 m	
AXT100-DS25-200	30 m	
AXT100-DS25-300	20 m	

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	—