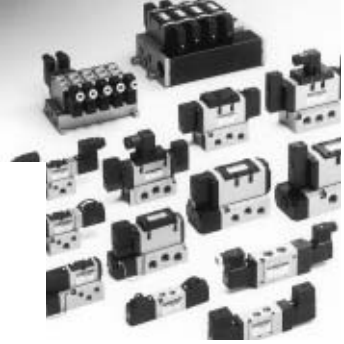


5 Port Pilot Operated Solenoid Valve
Metal Seal
Series VFS

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) 3 position	Type of actuation	Voltage	Electrical entry	With light/surge voltage suppressor (Option)	Manual override
Body Ported	***VFS1000***	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.	Non-locking push type (Flush) Non-locking push type (Extended) Locking type (Tool required) Locking type * (Lever)
	VFS2000	3.4	3.4					
	VFS3000	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) 3 position	Type of actuation	Voltage	Electrical entry	With light/surge voltage suppressor (Option)	Manual override
Base Mounted	***VFS2000*** Plug-in type Non plug-in type	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 (G) Grommet terminal (E) 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.	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	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	12	11					
	VFS5000 Plug-in type Non plug-in type	20	17					
	VFS6000 Plug-in type Non plug-in type	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)

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

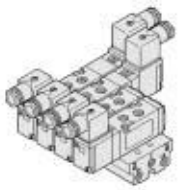
Manifold Variations

		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	●						
	VFS2000	●						
	VFS3000		●					
Base Mounted Plug-in Type	VFS2000			●	●	●	●	
	VFS3000				●	●	●	
	VFS4000				●	●	●	
	VFS5000				●	●	●	
Base Mounted Non Plug-in Type	VFS2000							●
	VFS3000							●
	VFS4000							●
	VFS5000							●

Bar Base
(Series VFS1000/2000)

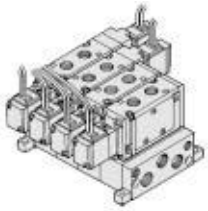
Pilot individual EXH

Pilot common EXH

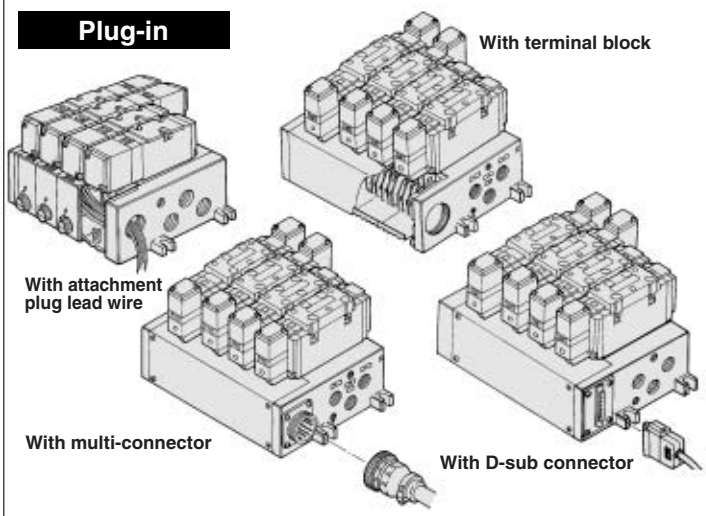


Stacking base
(Series VFS3000)

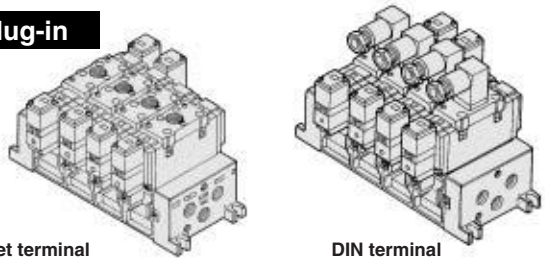
Pilot common EXH



Plug-in



Non Plug-in

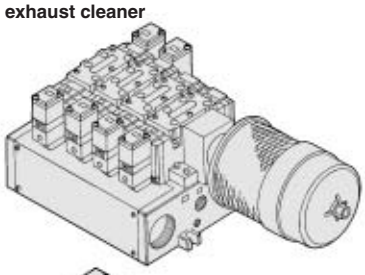


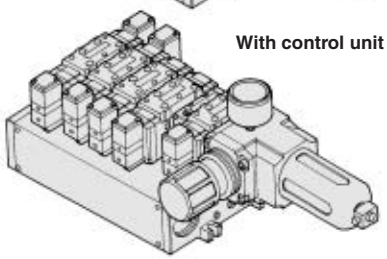
* Bottom piping is available as an option.

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

Manifold Option			Manifold Option Parts									
With exhaust cleaner	With control unit	With serial transmission unit	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
												●
												●
												●
	●	● Note)	●	●	●	●	●	●	●	●	●	●
●	●	● Note)	●	●	●	●	●	●		●	●	●
●	●	● Note)	●	●	●	●	●	●		●	●	●
●		● Note)	●	●	●	●	●	●			●	●
	●		●	●	●	●	●	●	●	●	●	●
●	●		●	●	●	●	●	●		●	●	●
●	●		●	●	●	●	●	●		●	●	●
●			●	●	●	●	●	●			●	●

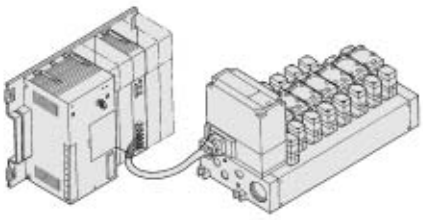
With exhaust cleaner



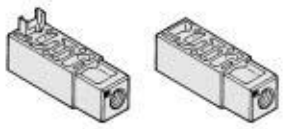


With control unit

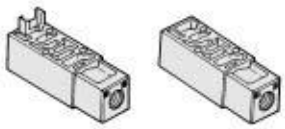
With serial transmission unit



Individual SUP spacer

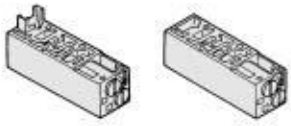


Individual EXH spacer

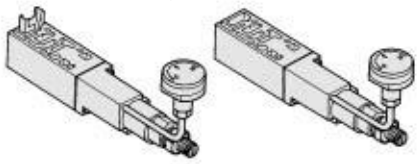


SUP/EXH block disk

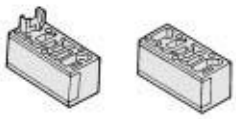
Throttle valve spacer



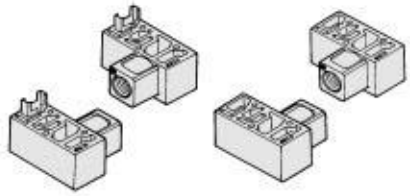
Interface regulator



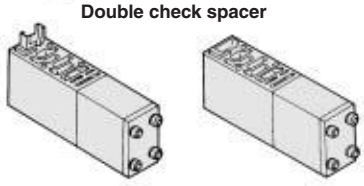
Air shutoff valve spacer



Air release valve spacer



Double check spacer



Note) Available

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

⚠ Precautions

Be sure to read before handling. For Safety Instructions and Solenoid Valve Precautions, refer to page 3-13-2.

⚠ Caution

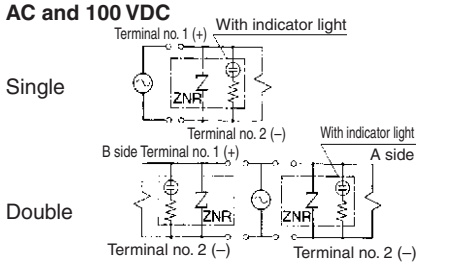
Light/Surge Voltage Suppressor, Electrical Entry | **Single unit**

Body Ported

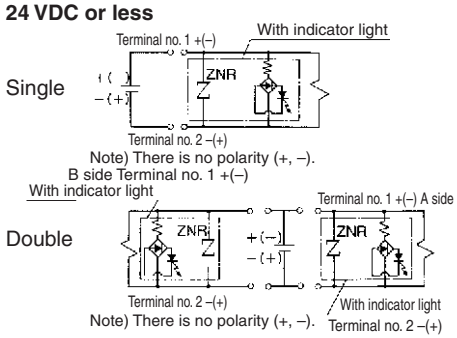
Series VFS1000/2000/3000

Light/Surge Voltage Suppressor

AC and 100 VDC



24 VDC or less

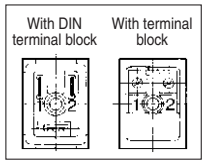


- Type G: Lead wire comes directly from the solenoid part. Connect it with the power source. Grommet with DC voltage surge voltage suppressor has polarity. Connect red lead wire to + (positive) side and black to – (negative) side.

Surge voltage suppressor	
DC	AC
Red + Black –	ZNR

Wiring

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

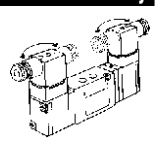


Applicable terminal: 1.25-3, 1.25-3S, 1.25Y-3N, 1.25Y-3S, but in the case of with DIN terminal block, is not a terminal structure.

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

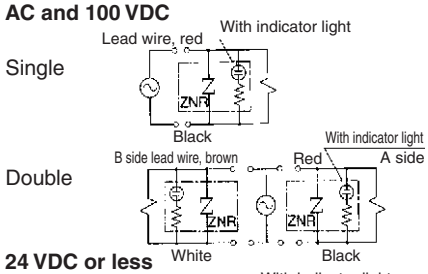
Loosen the set screw (M3–2 pcs.), take out pilot operator, turn solenoid valve 180° degrees to change the direction of lead wire and manual override. (Possible on Series VFS1000 only.)

Base Mounted | **Series VFS2000**

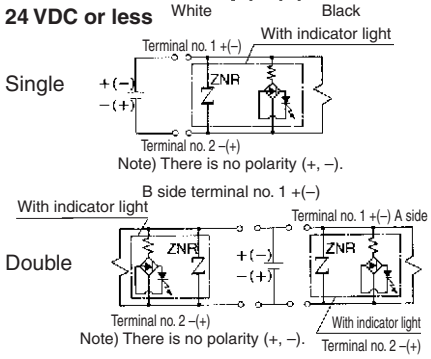
Light/Surge Voltage Suppressor

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

AC and 100 VDC

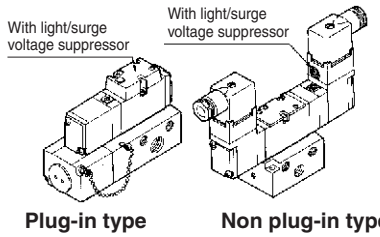


24 VDC or less



- 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 –	ZNR

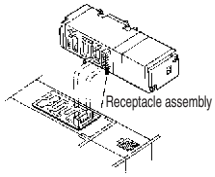


Plug-in type **Non plug-in type**

How to Exchange

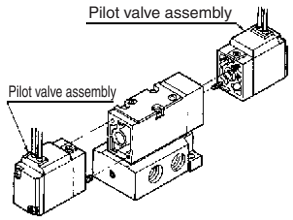
Solenoid valve

- 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 since this is a plug-in type.



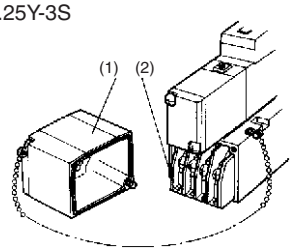
Electrical Connection

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.

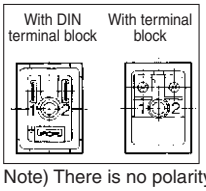
Description	Solenoid A side	Solenoid B side
Terminal block marking	A	B

- 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.

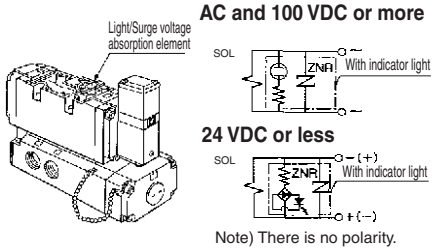
⚠ Caution

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.

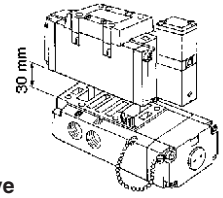


Note) There is no polarity.

How to Exchange

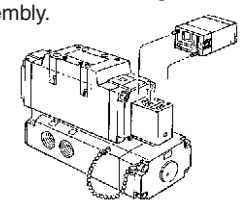
Solenoid valve

- 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.

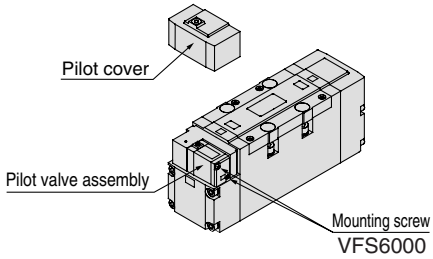


Pilot valve

- 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.

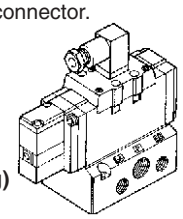
VFS3000	VFS3000-10A-□
VFS4000	VF4000-9A-□
VFS5000	AXT627-7A-□
VFS6000	VF4000-9A-□

-□: Coil rated voltage

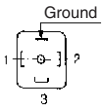
Lead Wire Connection

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.



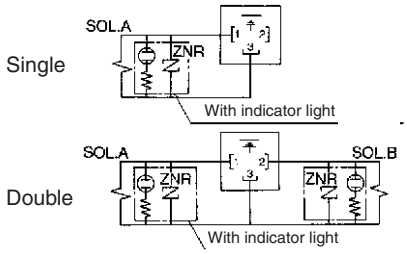
DIN terminal (Wiring)



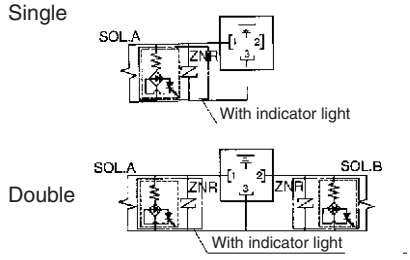
1	A side
2	B side
3	COM
⏚	Ground

- There is no polarity.

AC and 100 VDC or more



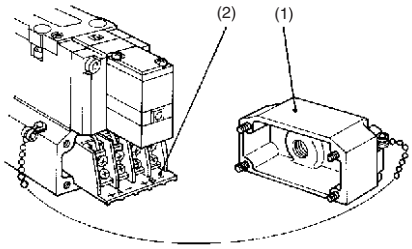
24 VDC or less



- 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.



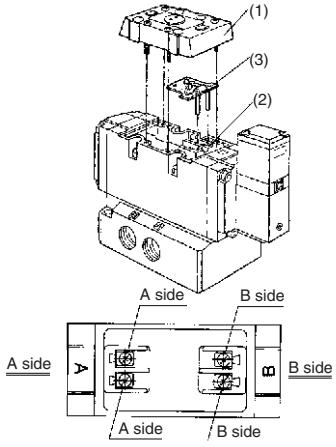
- The following markings are on the terminal block. Connect with corresponding power side.

	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

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

⚠ 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 CS55, CS49 (Idemitsu Kosan Co., Ltd), etc. are commercially available on the market.

2. When the foreign matters from air source adhere to the spool and sleeve, disassemble the adapter plate section and end plate section (return spring insert section). Then, take out the spool and sleeve from a valve and clean them with trichlene or freon solutions. When cleaning, prevent O-rings from touching cleaning solutions.

3. 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

For obtaining the flow rate, refer to page 3-1-10.

Interface Regulator Specifications

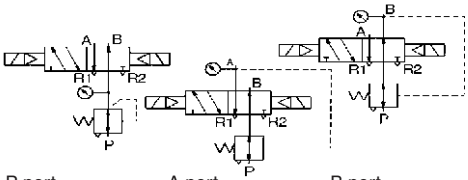
Interface regulator (3)		ARBF2000	ARBF3050			ARBF4050			ARBF5050		
Applicable solenoid valve series		VFS2000	VFS3000			VFS4000			VFS5000		
Regulating port		P	A	B	P	A	B	P	A	B	P
Proof pressure		1.5 MPa									
Maximum operating pressure		1.0 MPa									
Set pressure range (1)		0.05 to 0.83 MPa	0.1 to 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. The P port pressure reduction cannot be used.
• 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)

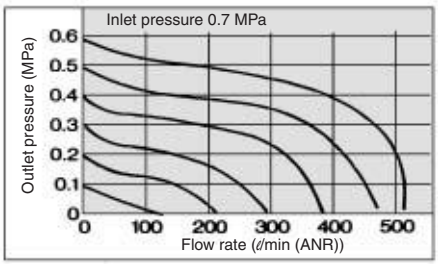
(Conditions: Inlet pressure 0.7 MPa. when 2 position solenoid valve is mounted.)

JIS Symbol

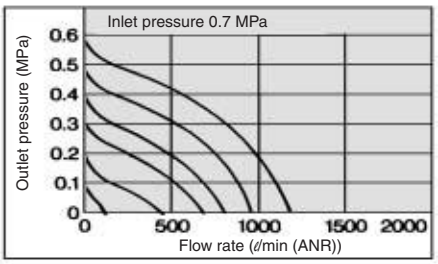


P port regulation | A port regulation | B port regulation

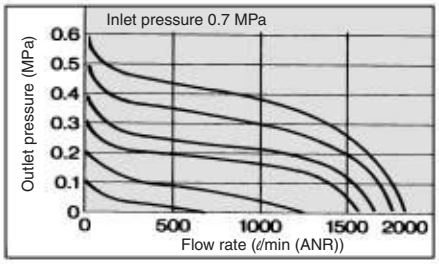
ARBF2000-00-P



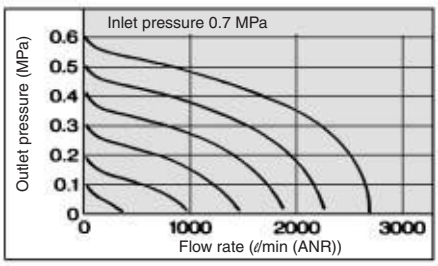
ARBF3050-00-P



ARBF3050-00-A



ARBF4050-00-P



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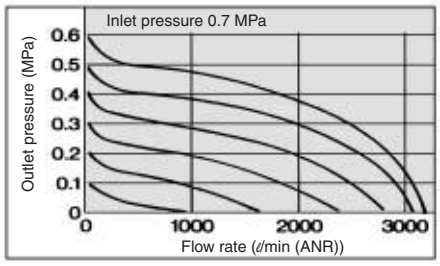

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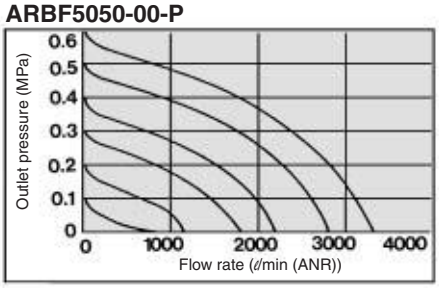
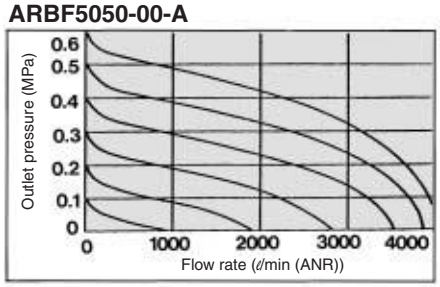


ARBF5050-00-A



⚠ Caution

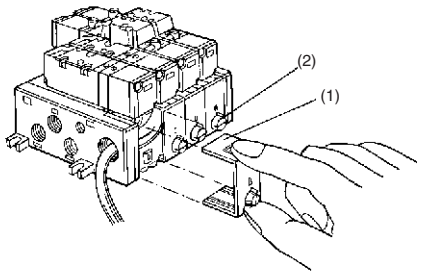
Lead Wire Connection | Manifold/Plug-in

Type 01 Insert Plug with Lead Wire

Series VFS2000

(Insert plug with lead wire is not available for Series VF3000, 4000, and 5000.)

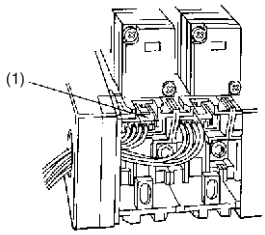
How to remove junction cover (Type 01)
Turn the knob (2) of junction cover (1) on the manifold block side by hand or slotted screwdriver to the C → O direction (counterclockwise) 90°. While holding the knob and upper part of junction cover, pull outward to remove junction cover.
When reassembling, do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

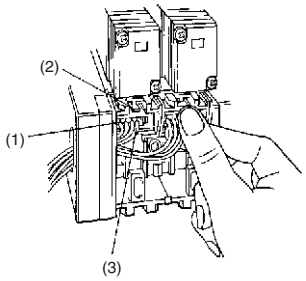
Power supply	Valve model	Solenoid A	Solenoid B
AC DC	Single solenoid	Red, Black	—
	Double solenoid	Red, Black	Brown, White

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

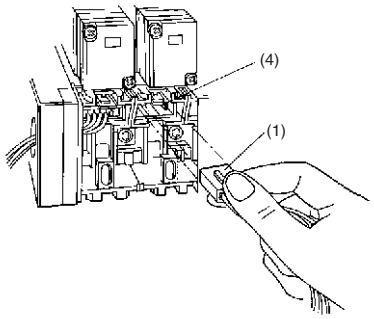


How to Use Insert Plug

- 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.



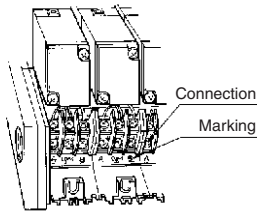
Type 01T with Terminal Block

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.
- 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
- 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
- There is no polarity.
- Tightening torque for terminal: 0.6 N·m

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

⚠ Caution

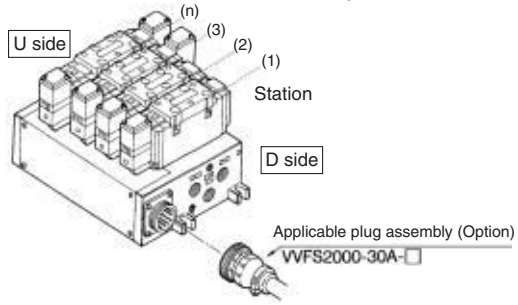
Lead Wire Connection | **Manifold/Plug-in**

Type 01C Circular Connector

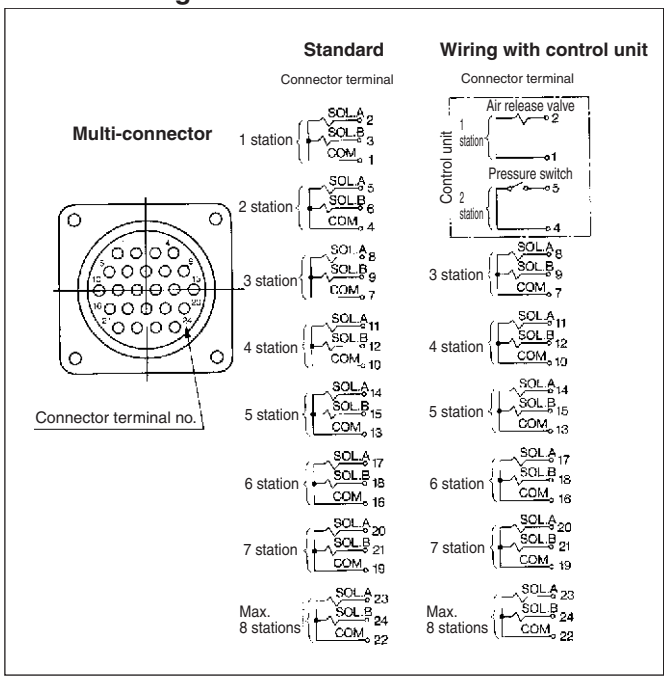
Series VFR2000/3000/4000/5000

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

Fig. (1) U side



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

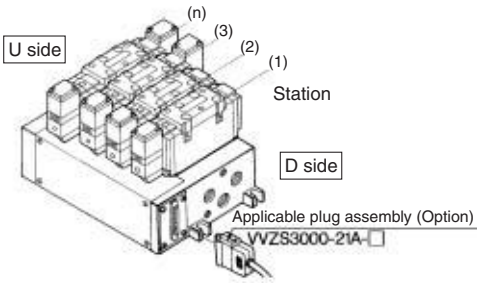
Terminal no.	13	14	15	16	17	18	19	20	21	22	23	24
Lead wire color	Brown	Brown	White	White	Pink	Pink	Gray	Gray	Unused	Unused	Light green	Light green
Dot marking	—	Yes	—	Yes	—	Yes	—	Yes	—	Yes	—	Yes

Type 01F D-sub Connector

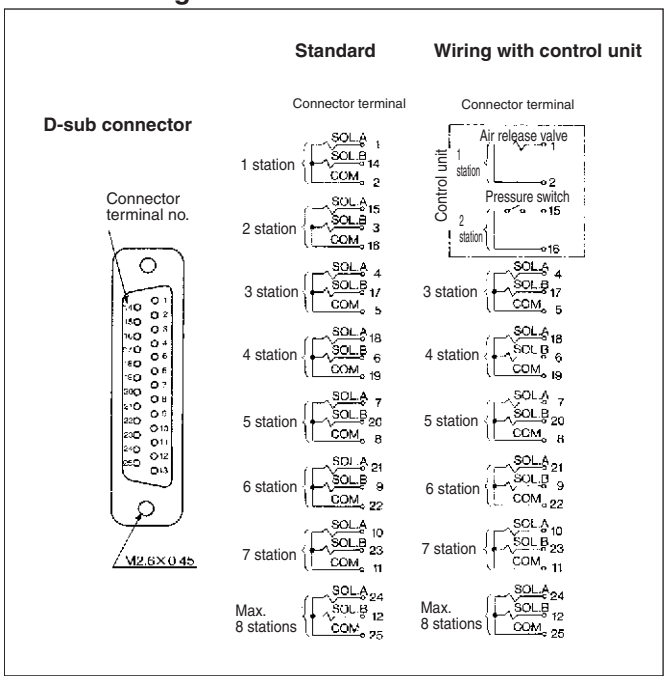
Series VFR2000/3000/4000/5000

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

Fig. (2) U side



Internal Wiring of Manifold



Note 1) Maximum stations are 8.
Note 2) There is no polarity.
Note 3) Indication of stations are one station from D side regardless of the connector mounting side, D or U.

Applicable Plug Assembly (Option)

Assembly part no.	Cable length	Component parts
VVZS3000-21A-1	1.5 m	Plug: ML standard D type connector 25 terminals Cable: 25 core wire, 0.3 mm²
VVZS3000-21A-2	3 m	
VVZS3000-21A-3	5 m	
VVZS3000-21A-4 *	8 m	
VVZS3000-21A-5 *	10 m	
VVZS3000-21A-6 *	15 m	
VVZS3000-21A-7 *	30 m	
VVZS3000-21A-8 *	20 m	

* Option

Cable Color List of Each Terminal No.

Terminal no.	1	2	3	4	5	6	7	8	9	10	11	12	13
Lead wire color	Black	Brown	Red	Orange	Yellow	Pink	Blue	Purple	Gray	White	White	Yellow	Orange
Dot marking	—	—	—	—	—	—	—	White	Black	Black	Red	Red	Red

Terminal no.	14	15	16	17	18	19	20	21	22	23	24	25
Lead wire color	Yellow	Pink	Blue	Purple	Gray	Orange	Red	Brown	Pink	Gray	Black	White
Dot marking	Black	Black	White	—	—	Black	White	White	Red	Red	White	—

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

Model

Type of actuation		Model: Plug-in	Model: Non plug-in	Port size	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)	Weight(3) (kg)
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
2 position	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
3 position	Exhaust center	**VFS1420**	**VFS1430**	1/8	1.7	0.18	0.38	1.9	0.19	0.44	600	20 or less	0.27
3 position	Pressure center	**VFS1520**	**VFS1530**	1/8	1.7	0.24	0.40	1.6	0.18	0.37	600	20 or less	0.27

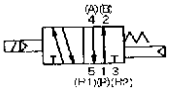
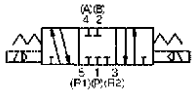
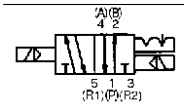
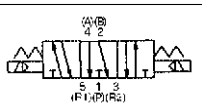
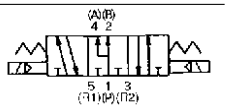
Note 1) Based on JIS B 8375 (once per 30 days) for the minimum operating frequency.
Note 2) According to JIS B 8375-1981. (The value at supply pressure 0.5 MPa.)
Note 3) In the case of grommet type
Note 4) "Note 1)" and "Note 2)" are with controlled clean air.

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)

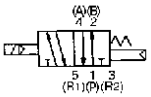
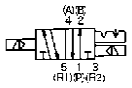
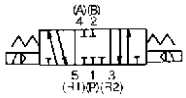
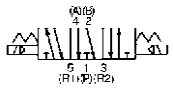
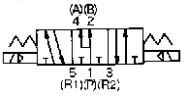
Note) VFS1□30: Manifold only. Cannot be used as a single unit.

Series VFS1000

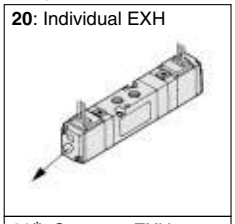
How to Order

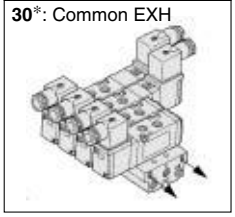
VFS1 [1] [20] — [1] [G] [ ] [ ] — [01] [ ] — [ ]

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

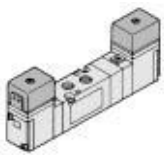
Coil rated voltage

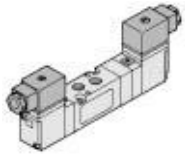
1	100 VAC (50/60 Hz)
2	200 VAC (50/60 Hz)
3*	110 to 120 VAC (50/60 Hz)
4*	220 VAC (50/60 Hz)
5	24 VDC
6*	12 VDC
7*	240 VAC (50/60 Hz)
9*	Other

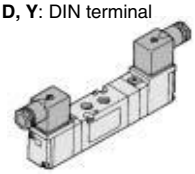
* Option

Electrical entry

G: Grommet 

E: Grommet terminal 

T: Conduit terminal 

D, Y: DIN terminal 

Light/Surge voltage suppressor

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

* Indicator light is not available for grommet type. With surge voltage suppressor is available for grommet type only.

Manual override

Nil: Non-locking push type (Flush) 

A*: Non-locking push type (Extended) 

B*: Locking type 

C*: Locking type (Lever) 

* Option

Port size

01	Rc 1/8

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

Option

F: With foot bracket 

* Mountable only for VFS1120.

How to Order Pilot Valve Assembly

SF4 — [1] [DZ] [ ] — [21]

Coil rated voltage

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

* Option

Electrical entry, Light/Surge voltage suppressor

G	Grommet
GS	Grommet with surge voltage suppressor
D	DIN terminal
DZ	DIN terminal with light/surge voltage suppressor
DO	DIN terminal **
DOZ	DIN terminal with light/surge voltage suppressor **
Y*	DIN terminal
YZ*	DIN terminal with light/surge voltage suppressor
YO*	DIN terminal **
YOZ*	DIN terminal with light/surge voltage suppressor **
T	Conduit terminal
TZ	Conduit terminal with light/surge voltage suppressor
E	Grommet terminal
EZ	Grommet terminal with light/surge voltage suppressor

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

Applicable model

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

Manual override

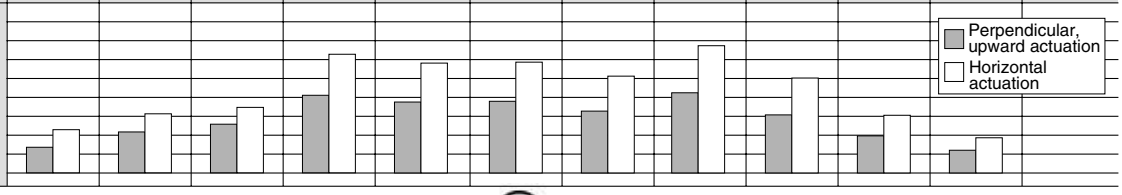
Nil	Non-locking push type (Flush)
A*	Non-locking push type (Extended)
B*	Locking type (Tool required)
C*	Locking type (Lever)

* Option

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/CA1 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												

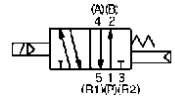
Conditions

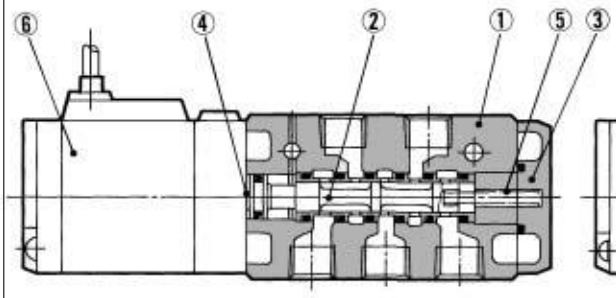
Body ported		Series CJ2	Series CM2	Series MB/CA1
VFS1120-01	Tube bore x Length	T0604 x 1 m	T0806 x 1 m	
	Speed controller	AS3001F-06	AS3001F-08	
	Silencer	AN101-01		

∗ 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 what the stroke is divided by the total stroke time.
∗ Load factor: ((Load weight x 9.8)/Theoretical force) x 100%

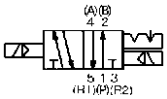
Construction

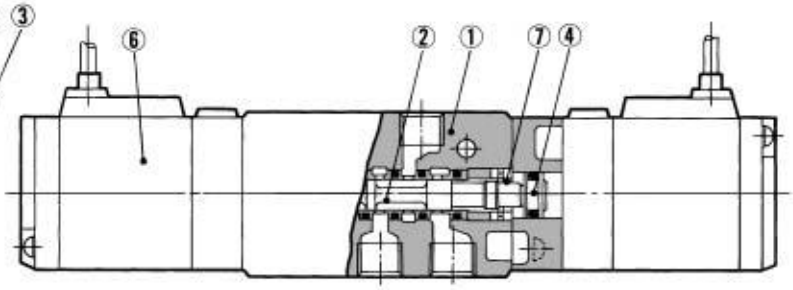
2 position single





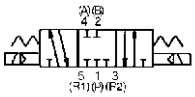
2 position double



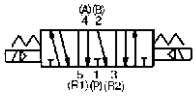


3 position closed center/exhaust center/pressure center

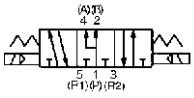
Closed center

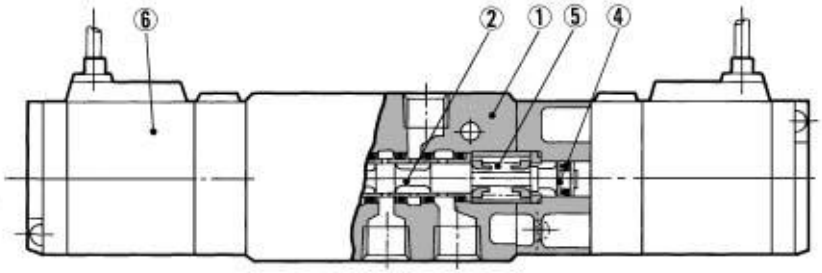


Exhaust center



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	—

Replacement Parts

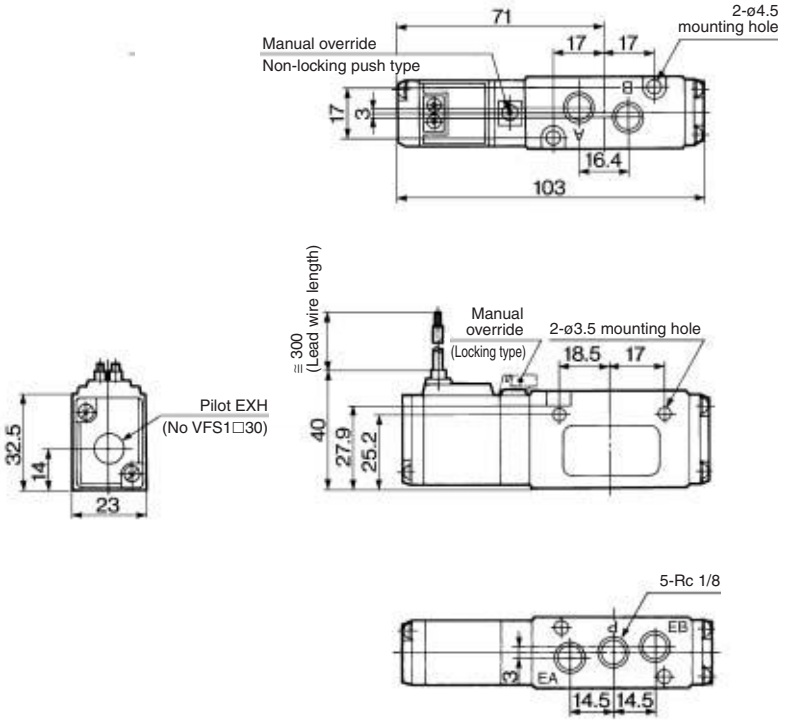
No.	Description	Material	Part no.		
			VFS1120	**VFS1220**	**VFS1320/1420/1520**
⑤	Return spring	Stainless steel	AXT626-6	—	AXT626-19
⑥	Pilot valve assembly	—	Refer to “How to Order Pilot Valve Assembly” on page 3-8-10.		
⑦	Detent assembly	—	—	AXT624-11A	—

VK
VZ
VF
VFR
VP4
VZS
VFS
VS4
VQ7
EVS
VFN

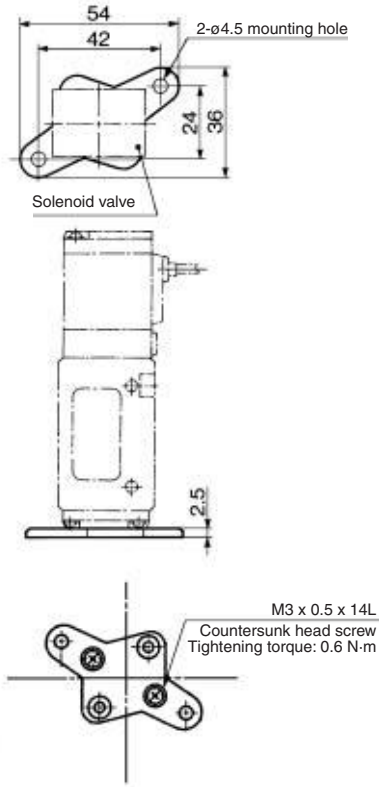
Series VFS1000

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

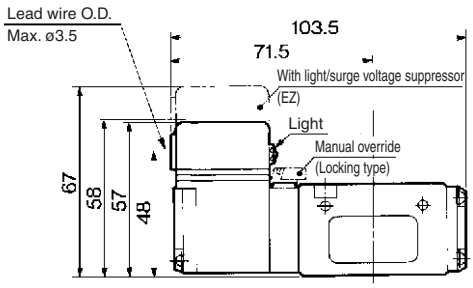
Grommet: VFS1120-□G



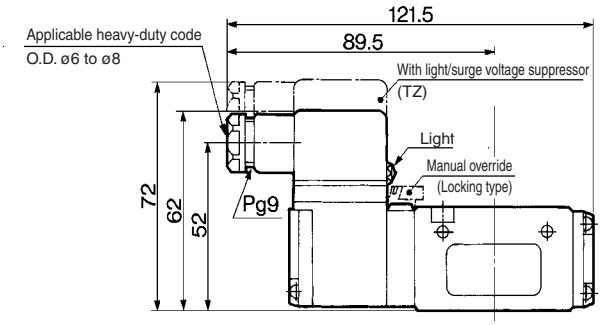
Foot bracket (F)
Part no.: AXT626-10A



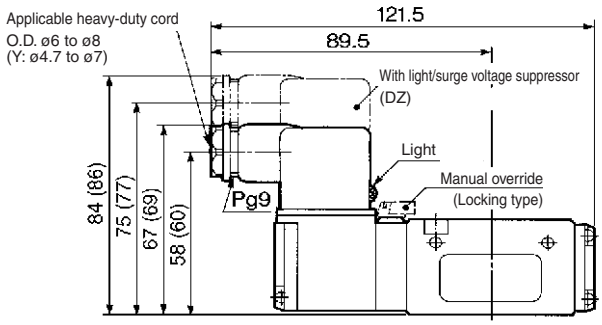
Grommet terminal: VFS1120-□E/EZ



Conduit terminal: VFS1120-□T/TZ



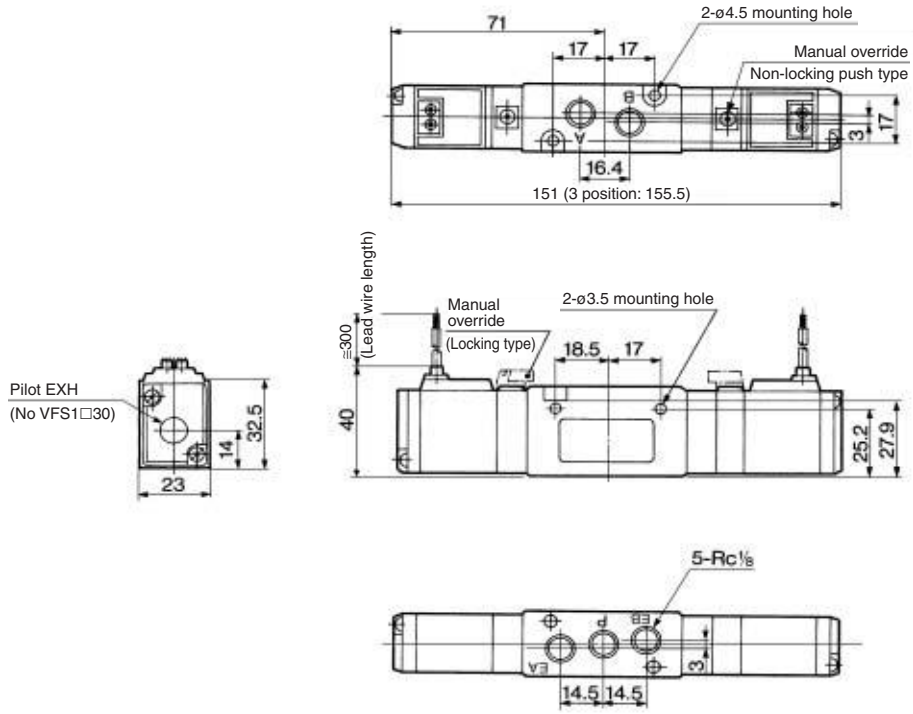
DIN terminal: VFS1120-□D/DZ/Y/YZ



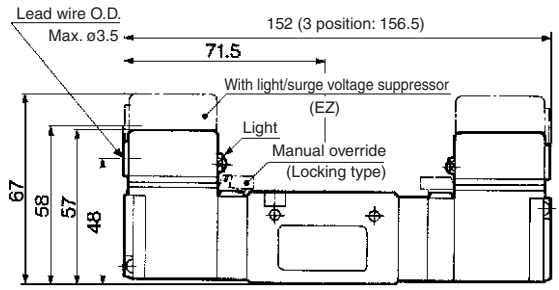
( ): Y, YZ

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

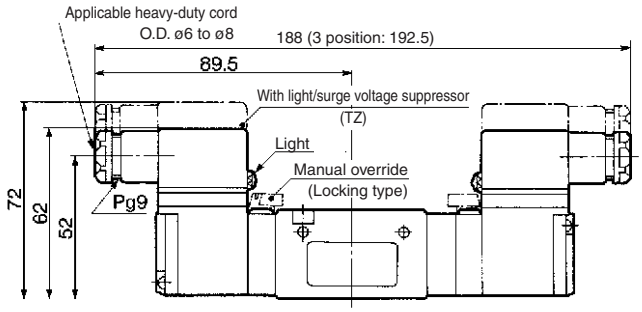
Grommet: VFS1220-□G, VFS1320-□G, VFS1420-□G, VFS1520-□G



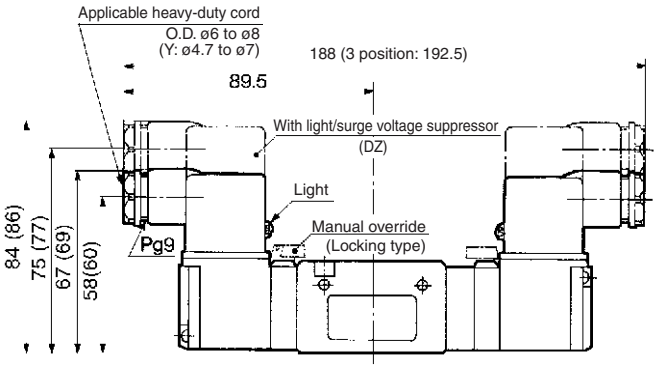
Grommet terminal: VFS1220-□E/EZ VFS1320-□E/EZ VFS1420-□E/EZ VFS1520-□E/EZ



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

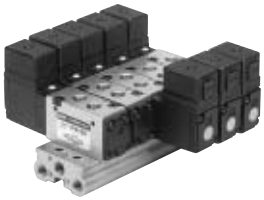


( ): Y, YZ

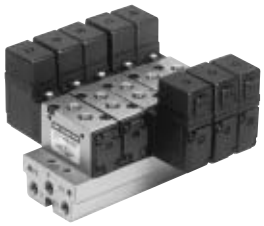
Series VFS1000
Manifold Specifications
Single Base Type

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

How to Order Manifold Assembly

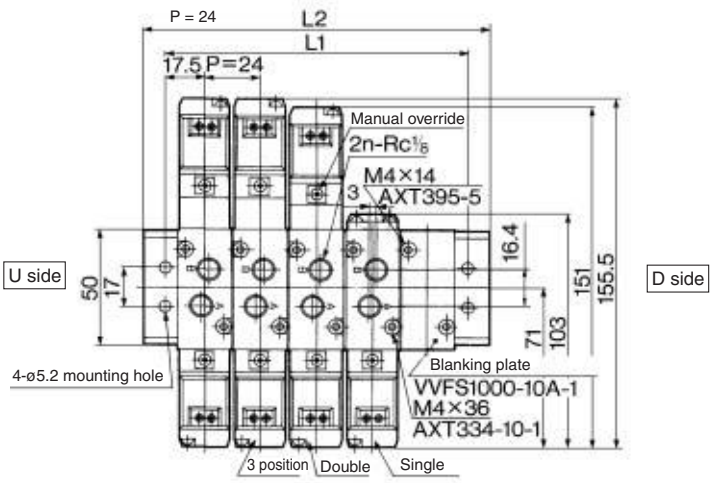
Instruct by specifying the valves and blanking plate to be mounted on the manifold along with the manifold base model no.

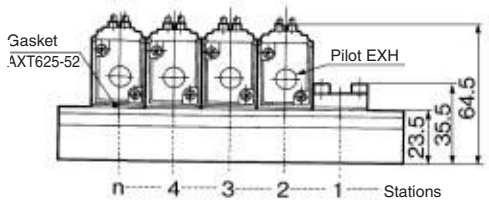
<Examble>

(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

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

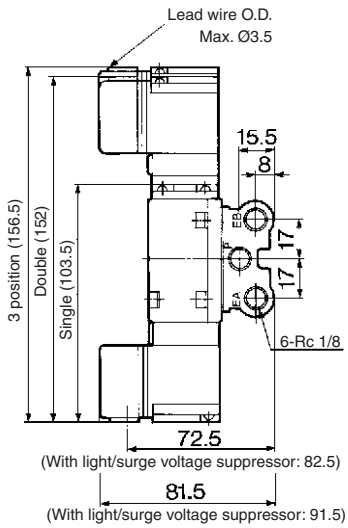
Grommet: G



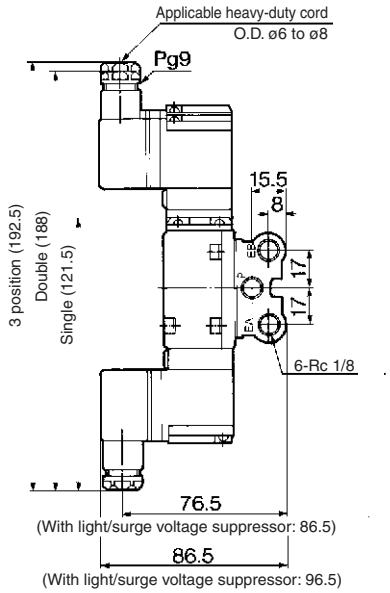


Formula for manifold weight M = 0.049n + 0.059 (kg) n: Station

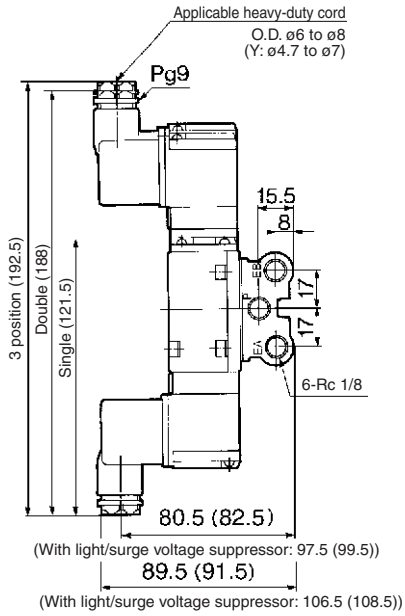
Grommet terminal: E/EZ



Conduit terminal: T/TZ



DIN terminal: D/DZ/Y/YZ



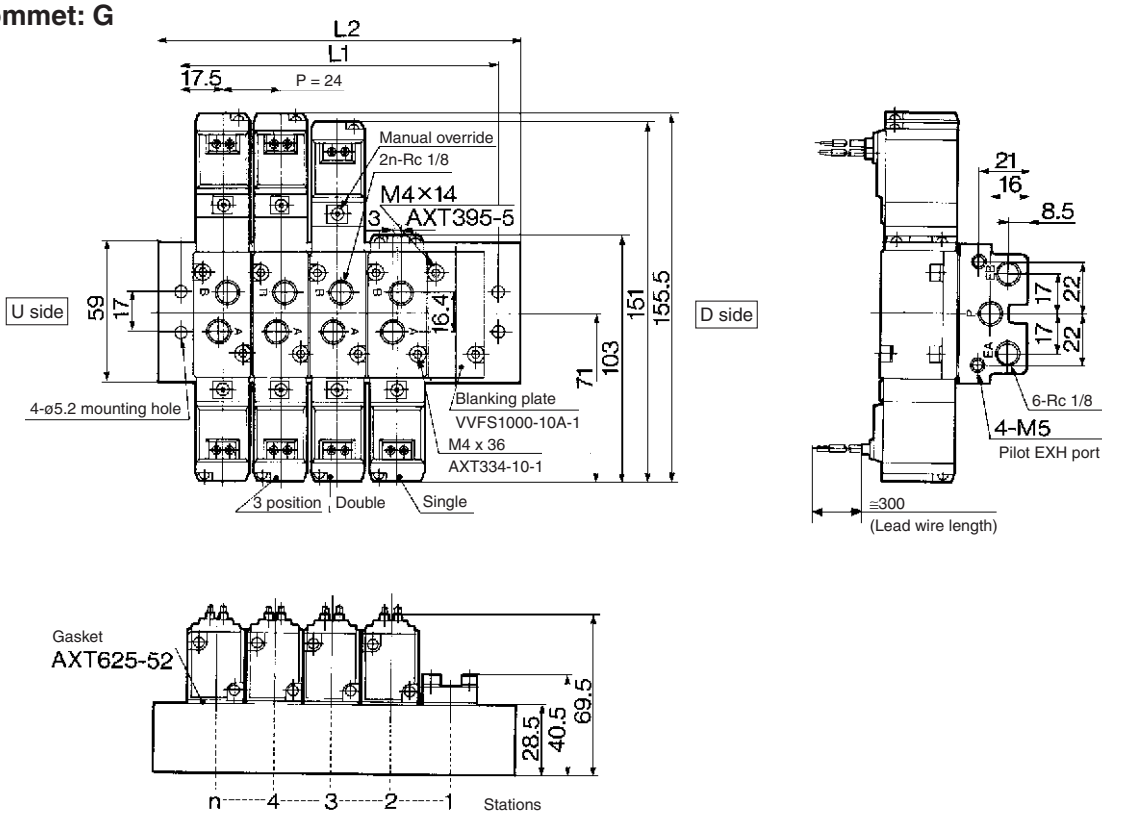
( ): Y, YZ

n: Station

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

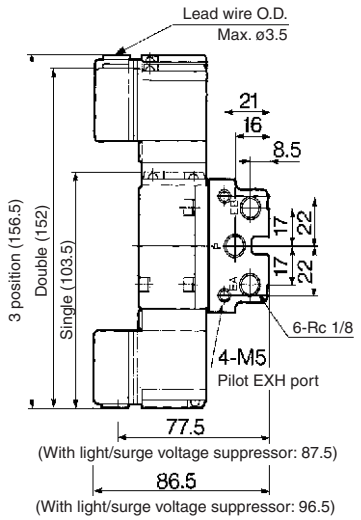
Type 30 Manifold Pilot common exhaust: VV5FS1-30-Station1-01

Grommet: G

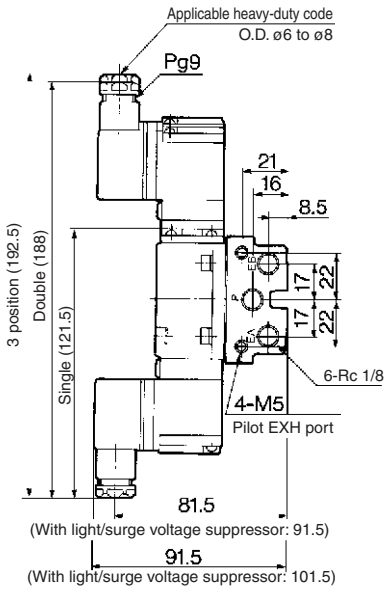


Formula for manifold weight M = 0.079n + 0.093 (kg) n: Station

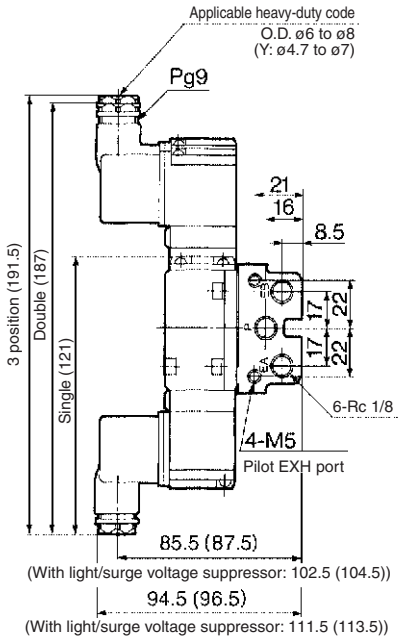
Grommet terminal: E/EZ



Conduit terminal: T/TZ



DIN terminal: D/DZ/Y/YZ



( ): Y, YZ

n: Station

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

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

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. operating cycle (cpm) (1)	Response time (ms) (2)	Weight (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			

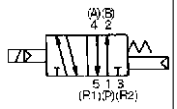
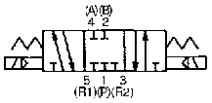
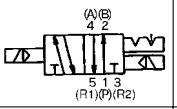
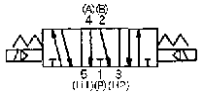
Note 1) Based on JIS B 8375 (once per 30 days) for the minimum operating frequency.
Note 2) According to JIS B 8375-1981. (The value at supply pressure 0.5 MPa.)
Note 3) In the case of grommet type Note 4) Factors of "Note 1)" and "Note 2)" are achieved in controlled clean air.

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) No light grommet but surge voltage suppressor (direct connecting lead wire) is installed.

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.

Series VFS2000

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)
9∗	Other

∗ Option

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

∗ Indicator light is not available for grommet type. With surge voltage suppressor is available for grommet type only.

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.

How to Order Pilot Valve Assembly

SF4 – [1] [DZ] [ ] – [12]

Coil rated voltage

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

∗ Option

Electrical entry, Light/Surge voltage suppressor

G	Grommet
GS	Grommet with surge voltage suppressor
D	DIN terminal
DZ	DIN terminal with light/surge voltage suppressor
DO	DIN terminal ∗∗
DOZ	DIN terminal with light/surge voltage suppressor ∗∗
Y∗	DIN terminal
YZ∗	DIN terminal with light/surge voltage suppressor
YO∗	DIN terminal ∗∗
YOZ∗	DIN terminal with light/surge voltage suppressor ∗∗
T	Conduit terminal
TZ	Conduit terminal with light/surge voltage suppressor
E	Grommet terminal
EZ	Grommet terminal with light/surge voltage suppressor

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

Applicable model

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

Manual override

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

∗ Option

Cylinder Speed Chart

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

Body Ported

Series	Averag 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/CA1 Note) 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												

Perpendicular, upward actuation
Horizontal actuation

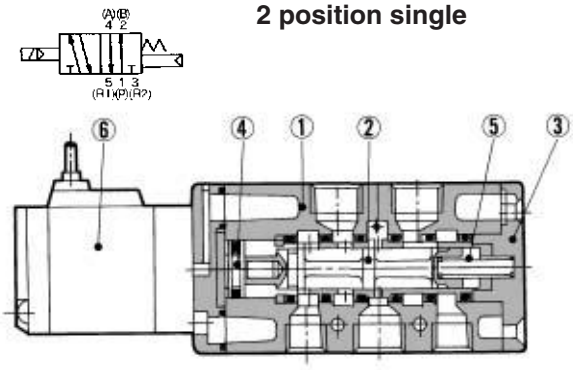
Conditions

Body ported		Series CJ2	Series CM2	Series MB/CA1 Note)
VFS2120-02	Tube bore x Length	T0604 x 1 m	T1075 x 1 m	
	Speed controller	AS3001F-06	AS4001F-10	
	Silencer	AN110-01		

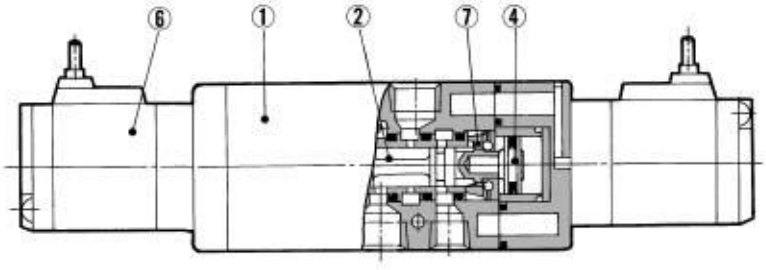
∗ It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
∗ The average velocity of the cylinder is what the stroke is divided by the total stroke time.
∗ Load factor: ((Load weight x 9.8)/Theoretical force) x 100%
Note) The Series CA1 has been changed to the Series CA2.

Construction

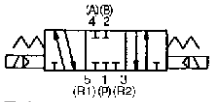
2 position single



2 position double

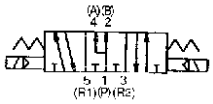


Closed center

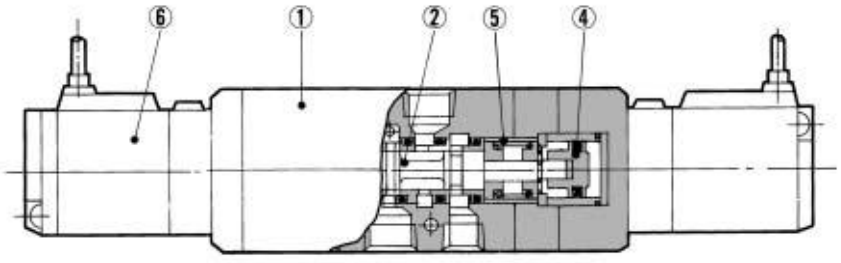


Exhaust center

Pressure center



3 position closed center/exhaust center/pressure center



Component Parts

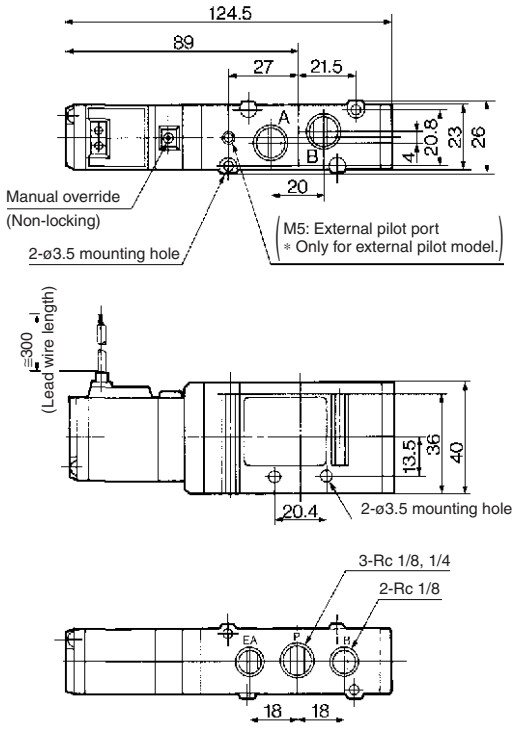
No.	Description	Material	Note
①	Body	Aluminum die-casted	Platinum silver
②	Spool/Sleeve	Stainless steel	—
③	End plate	Resin	—
④	Piston	Resin	—

Replacement Parts

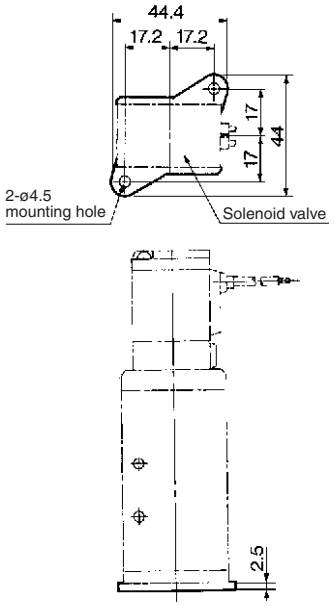
No.	Description	Material	Part no.		
			VFS2120	**VFS2220**	**VFS2320/2420/2520**
⑤	Return spring	Stainless steel	VFS2000-17-1	—	VFS2000-17-2
⑥	Pilot valve assembly	—	Refer to “How to Order Pilot Valve Assembly” on page 3-8-18.		
⑦	Detent assembly	—	—	VFN2000-8A	—

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

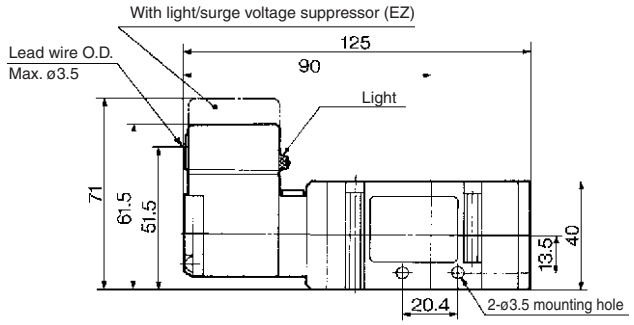
Grommet: VFS2120-□G



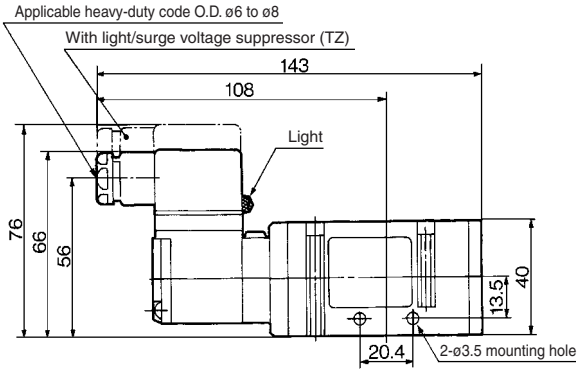
Foot bracket (F)
Part no.: VFN200-17A



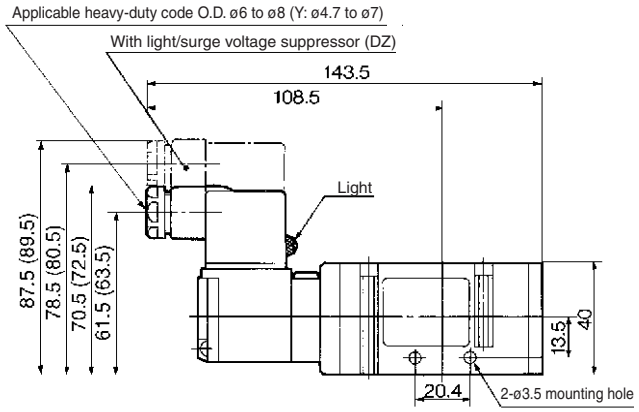
Grommet terminal: VFS2120-□E/EZ



Conduit terminal: VFS2120-□T/TZ



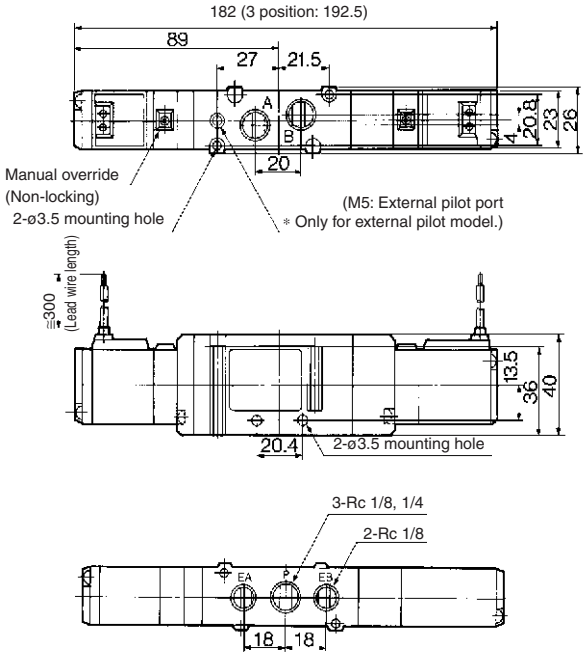
DIN terminal: VFS2120-□D/DZ/Y/YZ



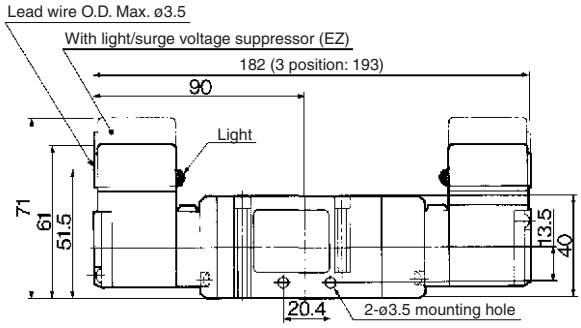
( ): Y, YZ

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

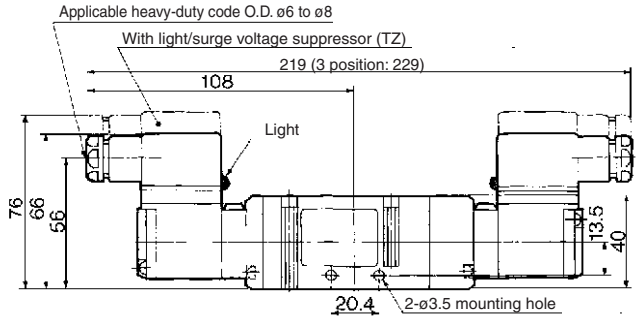
Grommet: VFS2220-□G, VFS2320-□G, VFS2420-□G, VFS2520-□G



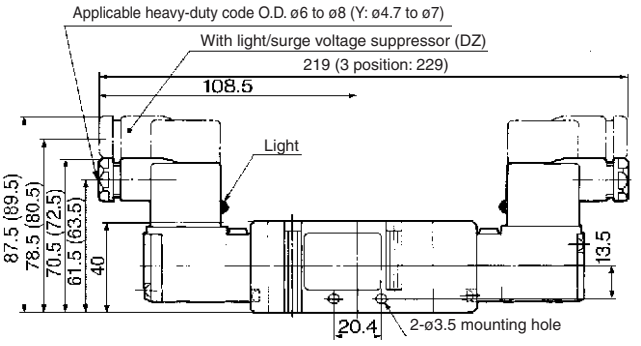
Grommet terminal: VFS2220-□E/EZ VFS2320-□E/EZ VFS2420-□E/EZ VFS2520-□E/EZ



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

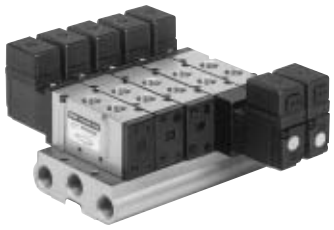


( ): Y, YZ

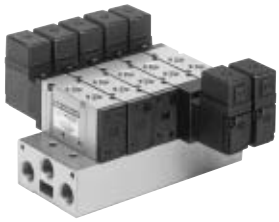
Series VFS2000
Manifold Specifications
Single Base Type

Keeps environmental air clean from pilot exhaust

Use of the VV5FS2-30 manifold can exhaust 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

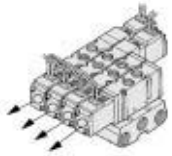
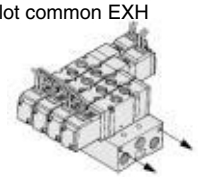
Blanking plate	VVFS2000-10A-1	With gasket, screw

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

How to Order Manifold Assembly

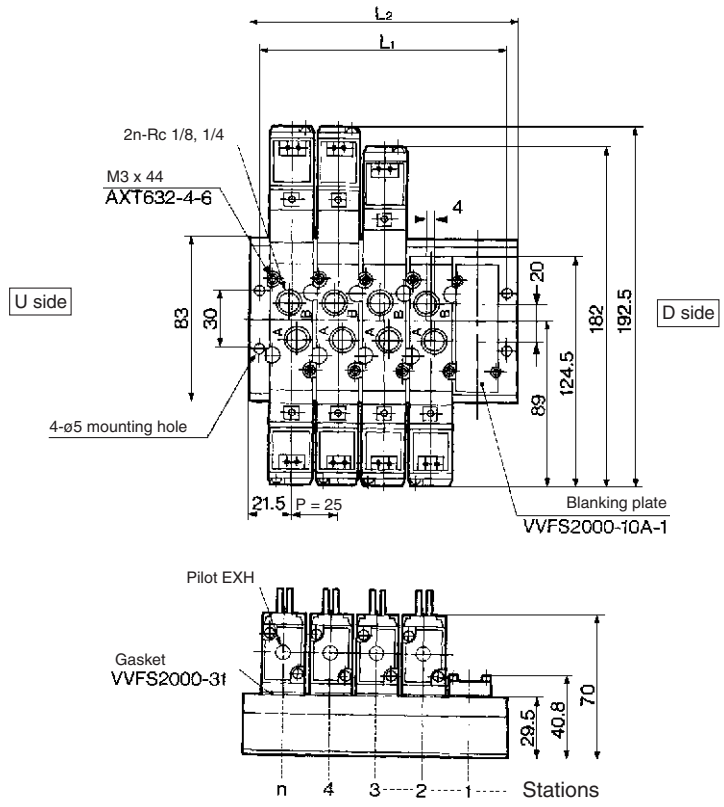
Instruct by specifying the valves and blanking plate to be mounted on the manifold along with the manifold base model no.

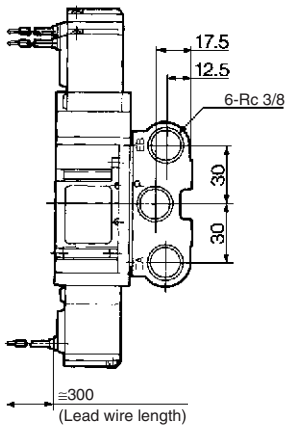
<Examble>

(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

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

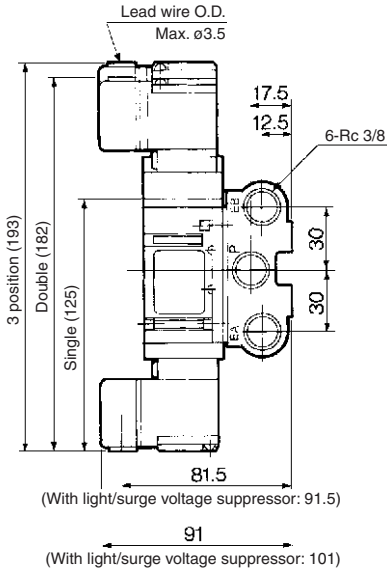
Grommet: G



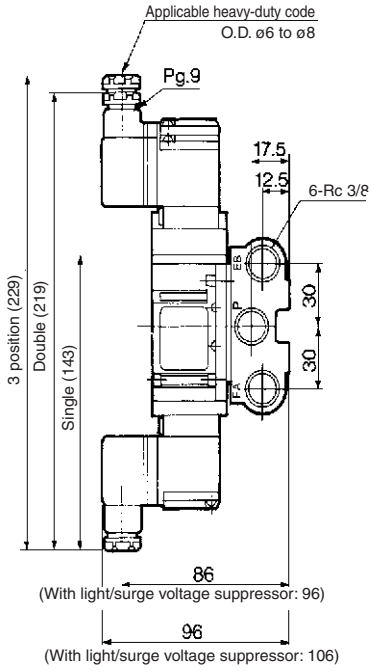


Formula for manifold weight M = 0.108n + 0.068 (kg) n: Station

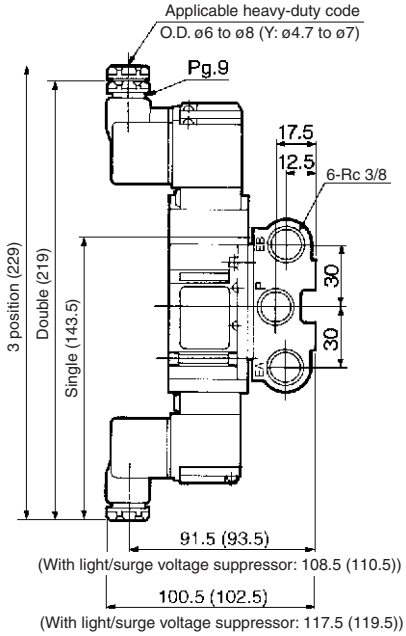
Grommet terminal: E/EZ



Conduit terminal: T/TZ



DIN terminal: D/DZ



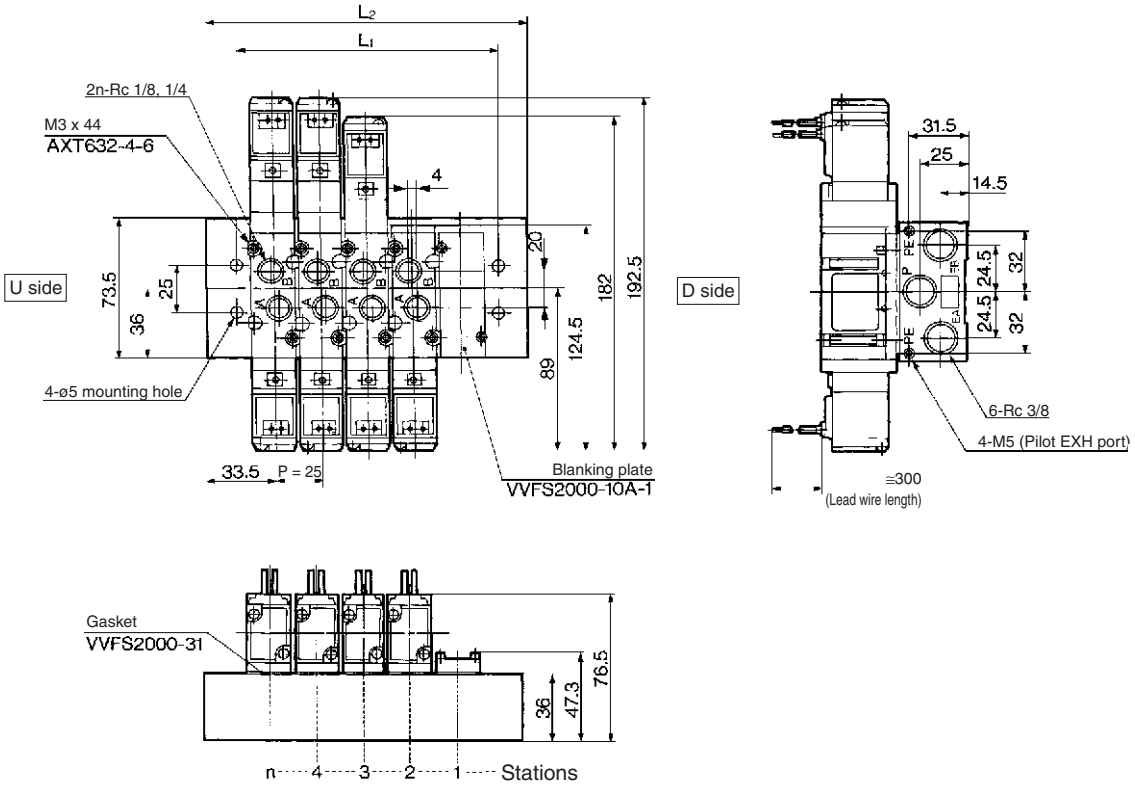
( ): Y, YZ

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	$L_2 = 25 \times n + 18$

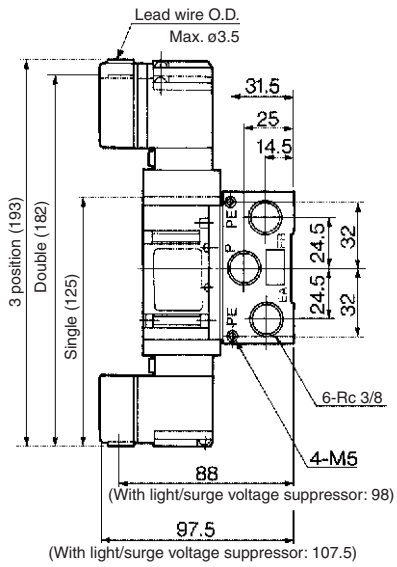
Type 30 Manifold Pilot common exhaust: VV5FS2-30-Station 1-03

Grommet: G

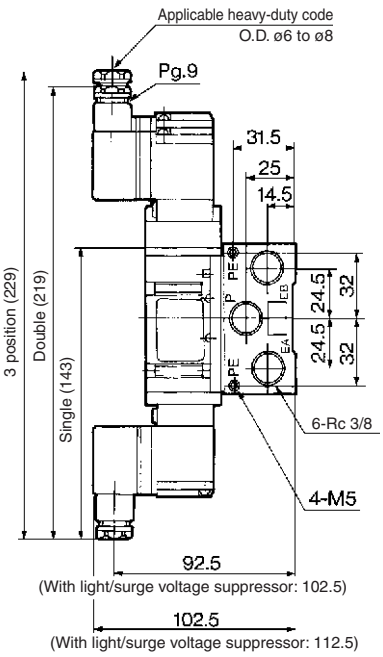


Formula for manifold weight M = 0.12n + 0.21 (kg) n: Station

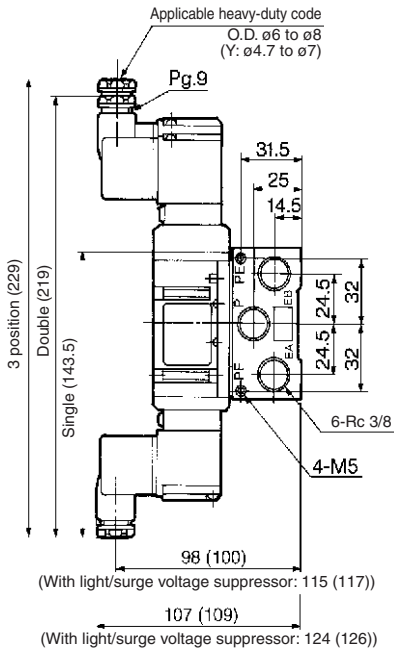
Grommet terminal: E/EZ



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
L_1	62	87	112	137	162	187	212	237	262	$L_1 = 25 \times n + 12$
L_2	92	117	142	167	192	217	242	267	292	$L_2 = 25 \times n + 42$

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

Model

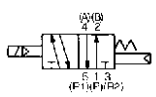
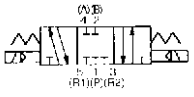
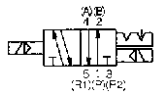
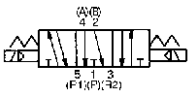
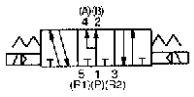
Type of actuation		Model: Plug-in	Model: Non plug-in	Port size Rc	Flow characteristics: 1 → 4/2 (P → A/B) C [dm³/(s·bar)]	b	Cv	Flow characteristics: 4/2 → 5/3 (A/B → R1/R2) C [dm³/(s·bar)]	b	Cv	Max.(1) operating cycle (cpm)	Response time(2) (ms)	Weight(3) (kg)
2 position	Single	**VFS3120**	**VFS3130**	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)

Series VFS3000

How to Order

VFS3 [1] [20] [ ] – [1] [G] [ ] [ ] – [02] [ ] – [ ]

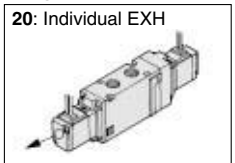
Symbol

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

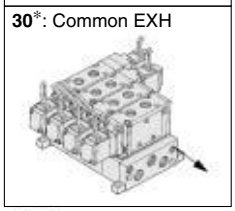
* Reverse pressure: Can be used by external pilot specifications.

Body (Pilot exhaust)

20: Individual EXH



30*: Common EXH



* Manifold only

Pilot type

Nil	Internal pilot
R*	External pilot

* Option. It will be an individual external pilot.

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

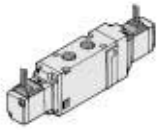
Coil rated voltage

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

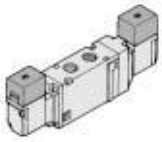
* Option

Electrical entry

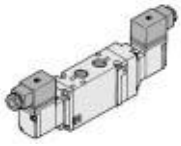
G: Grommet



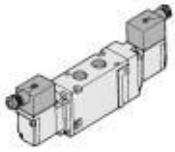
E: Grommet terminal



T: Conduit terminal



D-Y: DIN terminal



Light/Surge voltage suppressor

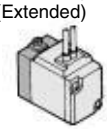
Nil	None
Z	With light/surge voltage suppressor
S*	With surge voltage suppressor

* Indicator light is not available for grommet type. W/ surge voltage suppressor is available for grommet type only.

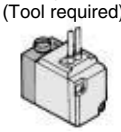
Manual override

Nil: Non-locking push type (Flush)

A*: Non-locking push type (Extended)



B*: Locking type (Tool required)



* Option

Port size

02	Rc 1/4
03	Rc 3/8

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

Option

F: With foot bracket

* Mountable only for VFS3120.

How to Order Pilot Valve Assembly

SF4 – [1] [DZ] [ ] – [21]

Coil rated voltage

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

* Option

Electrical entry, Light/Surge voltage suppressor

G	Grommet
GS	Grommet with surge voltage suppressor
D	DIN terminal
DZ	DIN terminal with light/surge voltage suppressor
DO	DIN terminal **
DOZ	DIN terminal with light/surge voltage suppressor **
Y*	DIN terminal
YZ*	DIN terminal with light/surge voltage suppressor
YO*	DIN terminal **
YOZ*	DIN terminal with light/surge voltage suppressor **
T	Conduit terminal
TZ	Conduit terminal with light/surge voltage suppressor
E	Grommet terminal
EZ	Grommet terminal with light/surge voltage suppressor

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

Applicable model

14	A side pilot operator for VFS3^{1,2,3,4,5}20	Individual pilot exhaust
15	B side pilot operator for VFS3220	
16	B side pilot operator for VFS3^{3,4,5}20	
17	A side pilot operator for VFS3^{1,2,3,4,5}30	Common pilot exhaust
18	B side pilot operator for VFS3230	
19	B side pilot operator for VFS3^{3,4,5}30	

Manual override

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

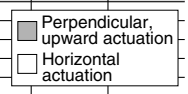
* Option

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 Pressure 0.5 MPa Load factor 50% Stroke 500 mm					Series CS1 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 what the stroke is divided by the total stroke time.
∗ Load factor: ((Load weight x 9.8)/Theoretical force) x 100%

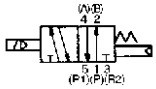
Conditions

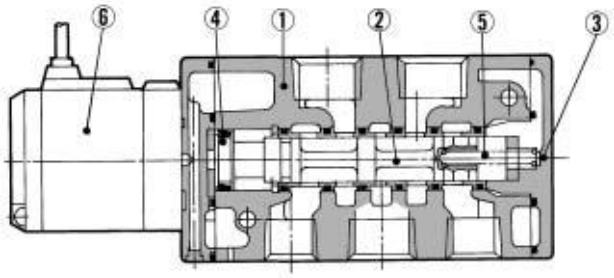
Body ported		Series CJ2	Series CM2	Series MB	Series CS1
VFS3120-03	Tube bore x Length	T0604 x 1 m	T1075 x 1 m	T1209 x 1 m	
	Speed controller	AS3001F-06	AS4001F-10	AS4001F-12	
	Silencer	AN200-02			AN202-02

Series VFS3000

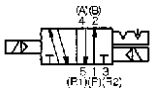
Construction

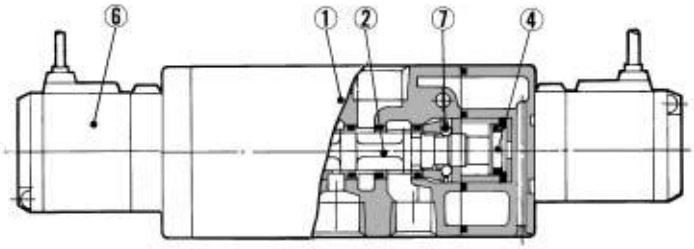
2 position





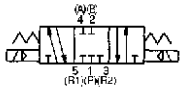
2 position double



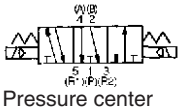


3 position closed center/exhaust center/pressure center

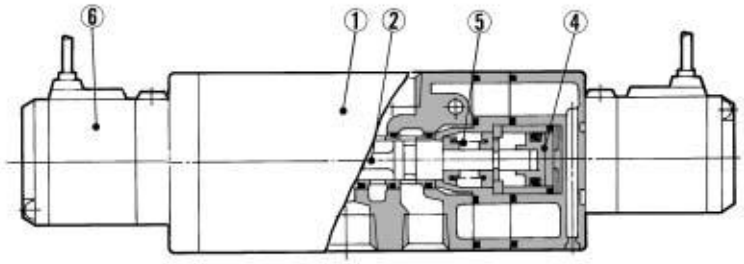
Closed center



Exhaust center



Pressure center



Component Parts

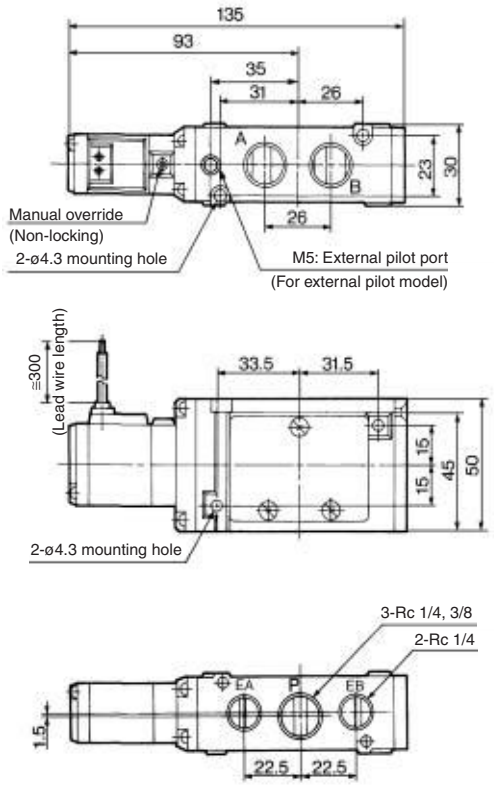
No.	Description	Material	Note
①	Body	Aluminum die-casted	Platinum silver
②	Spool/Sleeve	Stainless steel	—
③	End plate	Resin	Black
④	Piston	Resin	—

Replacement Parts

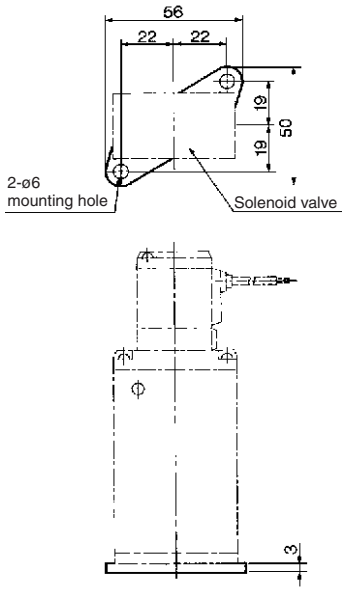
No.	Description	Material	Part no.		
			VFS3120	**VFS3220**	**VFS3320/3420/3520**
⑤	Return spring	Stainless steel	VFS3000-17-1	—	VFS3000-17-2
⑥	Pilot valve assembly	—	Refer to “How to Order Pilot Valve Assembly” on page 3-8-26.		
⑦	Detent assembly	—	—	VFS3000-9A	—

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

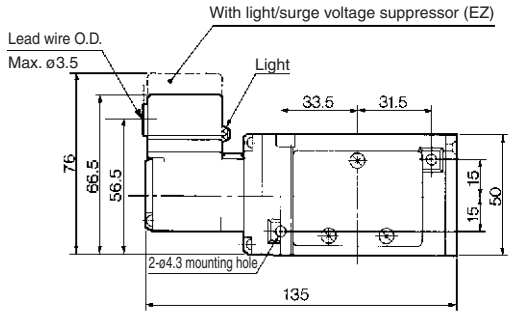
Grommet: VFS3120-□G



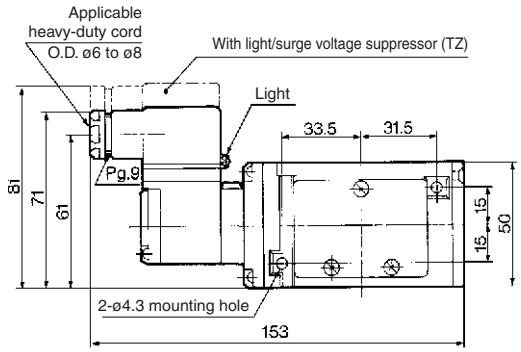
Foot bracket (F)
Part no.: VFS3000-52A



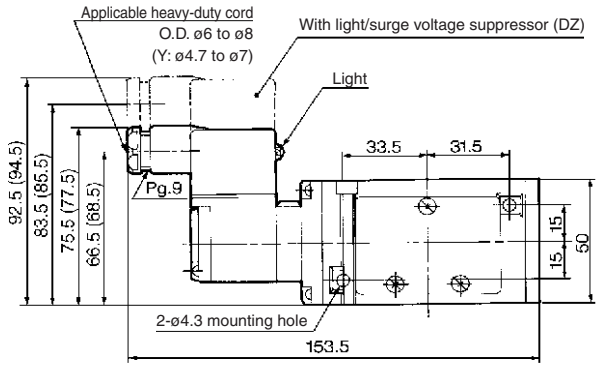
Grommet terminal: VFS3120-□E/EZ



Conduit terminal: VFS3120-□T/TZ



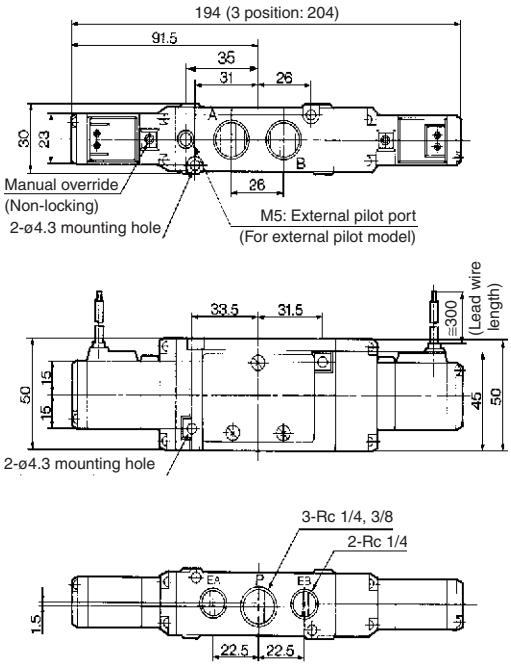
DIN terminal: VFS3120-□D/DZ/Y/YZ



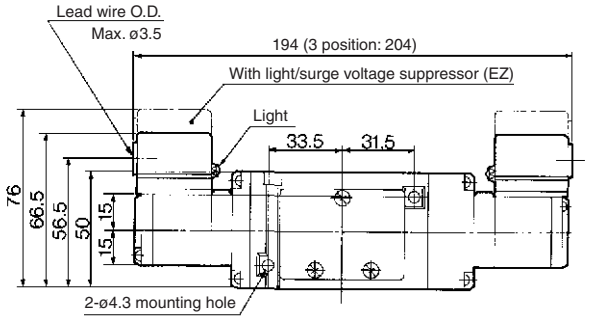
( ): Y, YZ

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

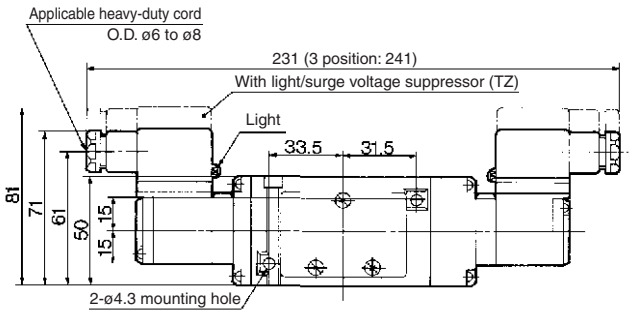
Grommet: VFS3220-□G, VFS3320-□G, VFS3420-□G, VFS3520-□G



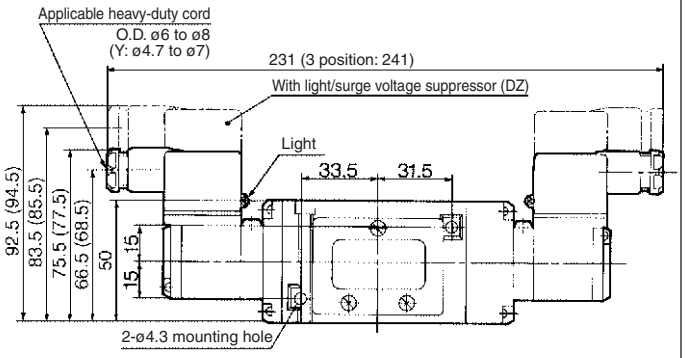
Grommet terminal: VFS3220-□E/EZ VFS3320-□E/EZ VFS3420-□E/EZ VFS3520-□E/EZ



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 disk	AXT636-10A	—
EXH block disk	AXT636-11A	—

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

How to Order Manifold Base

VV5FS3 − 31 − 05 1 − 03 □

Series VFS3000 Manifold

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

P, EA, EB port size
03-Rc 3/8

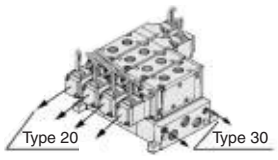
Symbol

	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

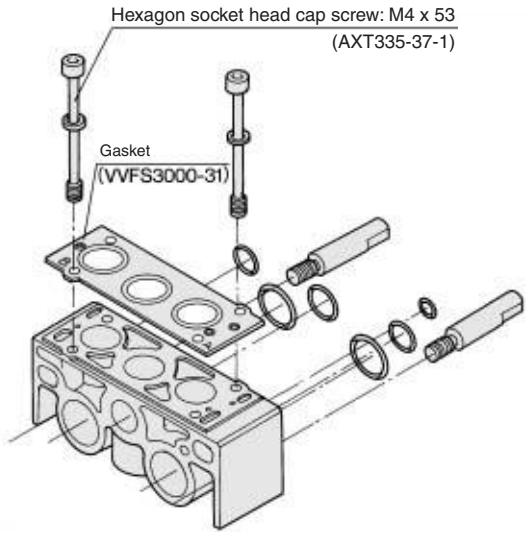
Base model

Model	Pilot exhaust	Applicable valve model
31	Pilot common EXH  Type 20 Type 30	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

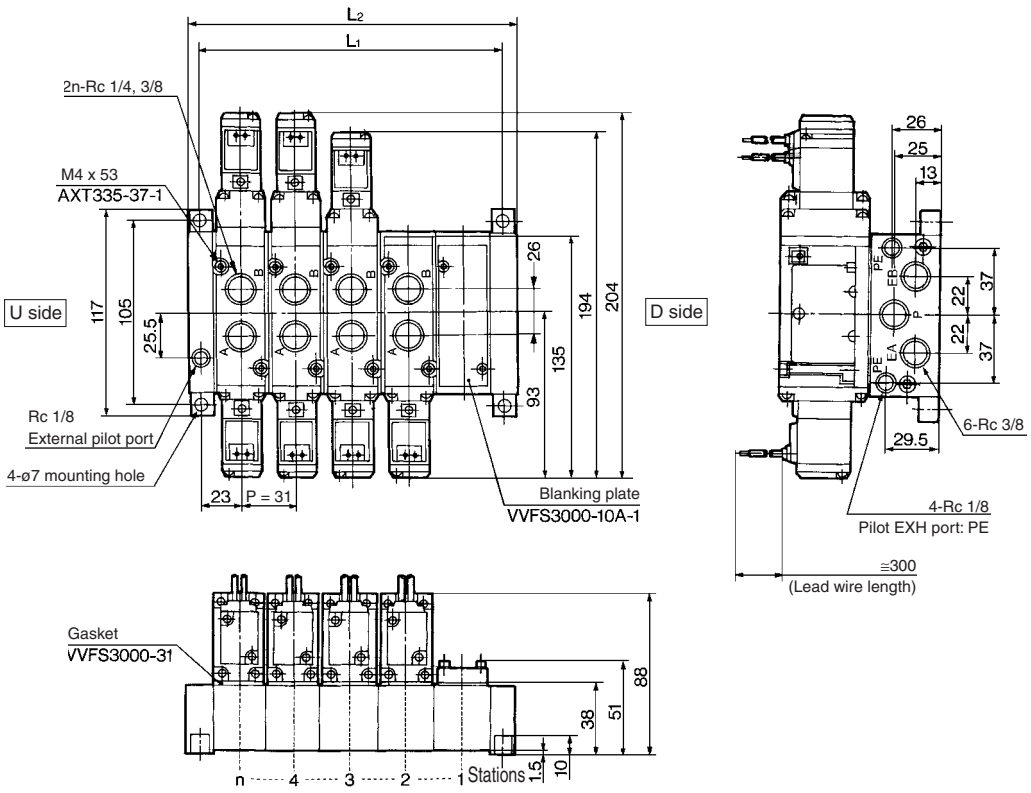
Instruct by specifying the valves and blanking plate to be mounted on the manifold along with the manifold base model no.

<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

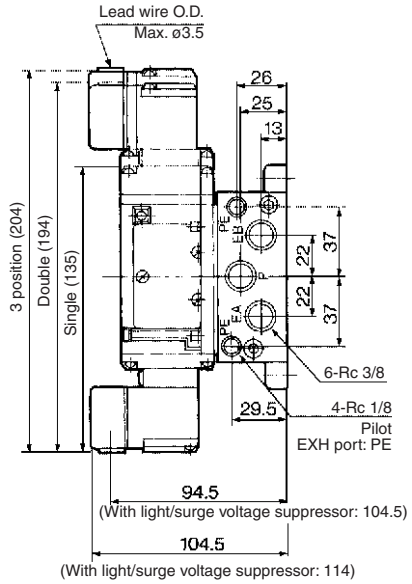
Type 31 Manifold Pilot common exhaust: VV5FS3-31-[Station]1-03

Grommet: G

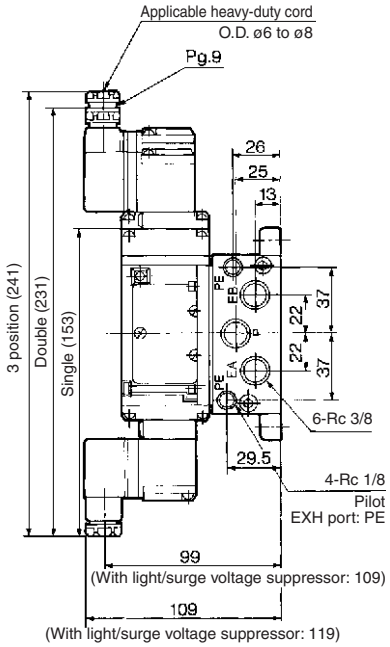


Formula for manifold weight M = 0.184n + 0.16 (kg) n: Station

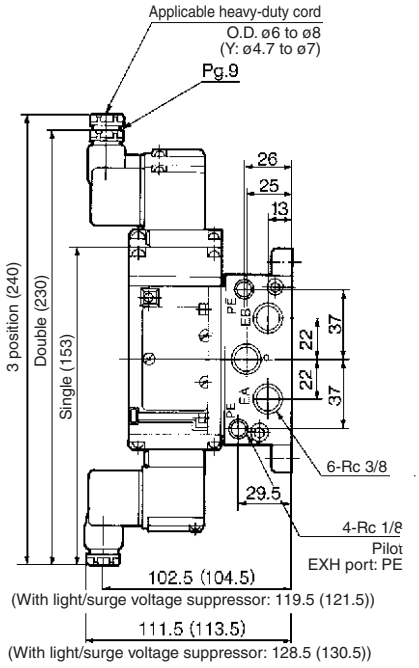
Grommet terminal: E/EZ



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	$L_2 = 31 \times n + 30$

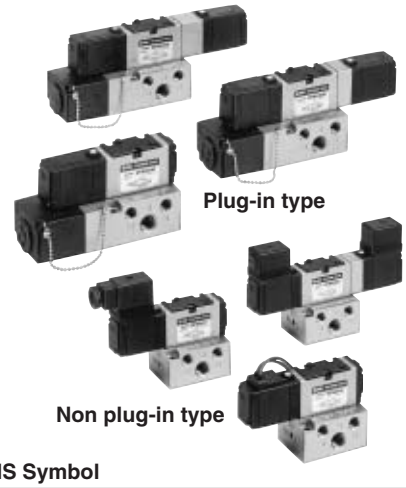
5 Port Pilot Operated Solenoid Valve
Metal Seal, Plug-in/Non Plug-in
Series VFS2000

Model

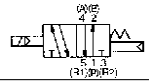
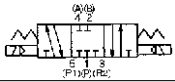
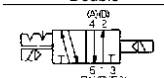
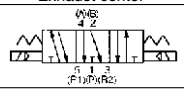
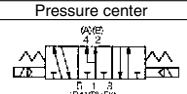
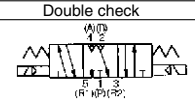
Type of actuation		Model: Plug-in	Model: Non plug-in	Port size Rc	Flow characteristics: 1 → 4/2 (P → A/B) C [dm³/(s·bar)]	b	Cv	Flow characteristics: 4/2 → 5/3 (A/B → R1/R2) C [dm³/(s·bar)]	b	Cv	Max.(1) operating cycle (cpm)	Response time(2) (ms)	Weight(3) (kg)
2 position	Single	**VFS2100**	**VFS2110**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



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 5-8-52.

Sub-plate	L (mm)	Weight (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

Series VFS2000

How to Order

With attachment plug lead wire

With terminal block

Porting specifications

Nil	Side ported
B*	Bottom ported

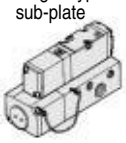
* Option

Option

Nil	None
Z	With light/surge voltage suppressor

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

* Option

Note) Please note Cv factor and piping port location of compact sub-plate is different from standard. Refer to page 3-8-52 for details.

Plug-in VFS2 2 00 □ — 5 F □ □ — □ 01 □

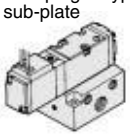
Non plug-in VFS2 2 10 □ — 1 E □ □ — □ 02 □

Symbol

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

Body type

1: Non plug-in type sub-plate



Pilot type

Nil	Internal pilot
R*	External pilot

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

Coil rated voltage

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

* Option

Pilot valve manual override

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

* Option

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	

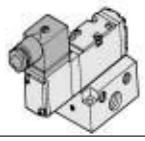
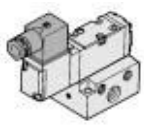
Note) Please note Cv factor and piping port location of compact sub-plate are different from standard. Refer to page 3-8-52 for details.

Option

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

* Indicator light is not available for grommet type. With surge voltage suppresor is avilable for grommet type only.

Electrical entry

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

How to Order Pilot Valve Assembly

SF4 — 1 DZ □ — 20

Coil rated voltage

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

* Option

Electrical entry, Light/Surge voltage suppressor

F	Plug-in	Plug-in
G	Grommet	Non plug-in
GS	Grommet with surge voltage suppressor	
D	DIN terminal	
DZ	DIN terminal with light/surge voltage suppressor	
DO	DIN terminal*	
DOZ	DIN terminal with light/surge voltage suppressor*	
Y	DIN terminal	
YZ	DIN terminal with light/surge voltage suppressor	
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 3-8-4 for voltage conversion.
*** Y: Conforming to DIN43650B standard

Manual override

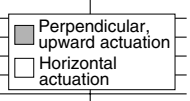
Nil	Non-locking push type (Flush)
A*	Non-locking push type (Extended)
B*	Locking type (Tool required)
C*	Locking type (Lever)

* Option

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 CM Pressure 0.5 MPa Load factor 50% Stroke 300 mm				Series MB Pressure 0.5 MPa Load factor 50% Stroke 500 mm					Series CS1 Pressure 0.5 MPa Load factor 50% Cylinder stroke 1000 mm		
		ø20	ø25	ø32	ø40	ø40	ø50	ø63	ø80	ø100	ø125	ø140	ø160
A	800 700 600 500 400 300 200 100 0												
B	800 700 600 500 400 300 200 100 0												



System Components

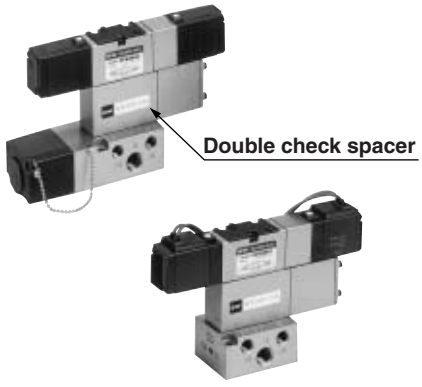
System	Solenoid valve	Speed controller	Silencer	Tube bore x Length
A	Series VFS2000 Rc 1/8	AS3000-02 (S = 12 mm²)	AN110-01 (S = 35 mm²)	T0604 x 1 m
B	Series VFS2000 Rc 1/4	AS4000-02 (S = 21 mm²)	AN110-01 (S = 35 mm²)	T1075 x 1 m

∗ 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 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

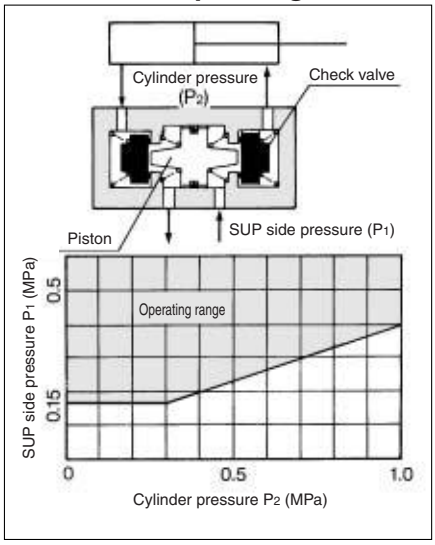
Double check spacer part no.	Plug-in type		Non plug-in type	
	VVFS2000-22A-1		VVFS2000-22A-2	
Applicable valve model	VFS2400-□F		VFS2410-□ G E T D	
Leakage∗ (cm²/min)	Solenoid one side energized	P	R1	210 or less
			R2	
	Solenoid both sides de-energized	P	R1	210 or less
			R2	
		A	R1	0
		B	R2	

∗Supply pressure: 0.5 MPa

⚠Caution

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

Check Valve Operating

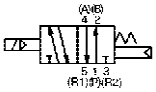


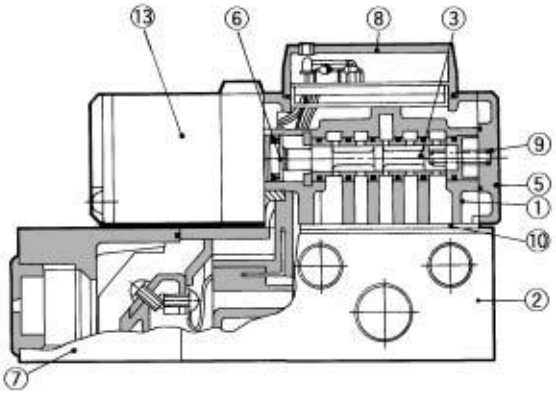
- The combination of VFS21$^{0}_{1}$0, VFS22$^{0}_{1}$0 and a double check spacer can be used as prevention of falling at the stroke end but cannot hold the intermediate position of the cylinder.

Series VFS2000

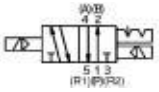
Construction

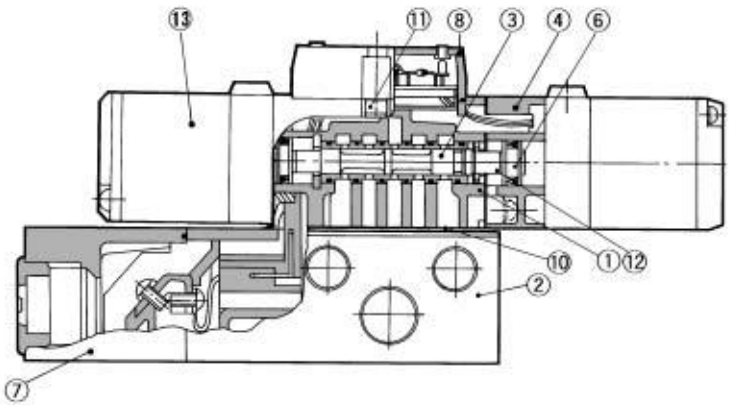
2 position single





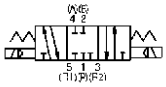
2 position double



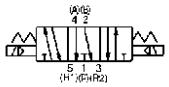


3 position closed center/exhaust center/pressure center

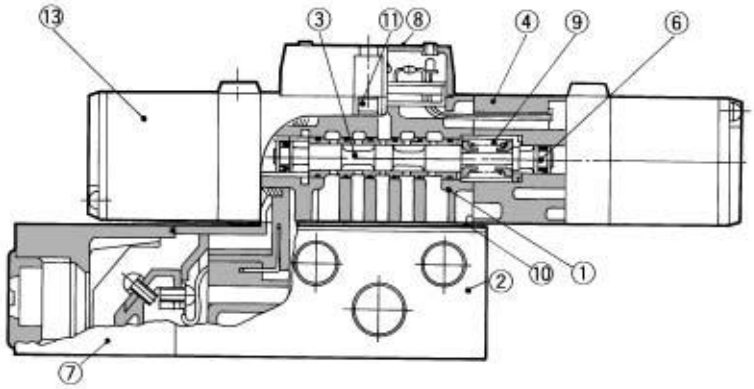
Closed center



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	Aluminum die-casted	Platinum silver
⑤	End plate	Resin	Black
⑥	Piston	Resin	—
⑦	Junction cover	Resin	—
⑧	Cover	Resin	—

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.

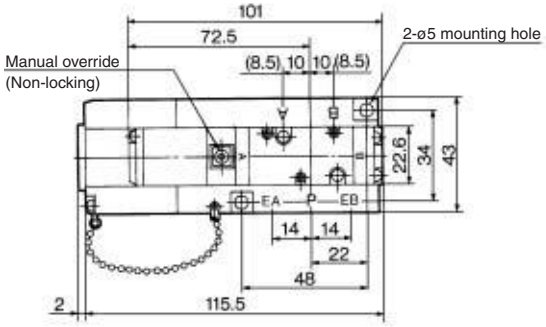
Part no. for mounting bolt and gasket
BG-VFS2000

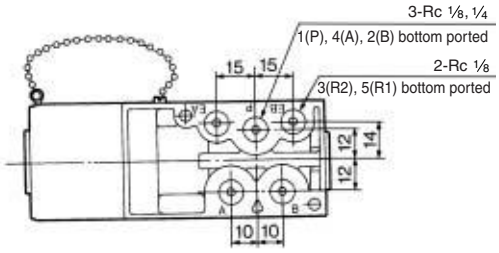
Replacement Parts

No.	Description	Material	Part no.		
			VFS21□□	**VFS22□□**	**VFS23□□/24□□/25□□**
⑨	Return spring	Stainless steel	NVF2000-48	—	AXT624-19-1
⑩	Gasket	NBR	AXT624-20-2	AXT624-20-2	AXT624-20-2
⑪	Hexagon socket head screw	Steel	AXT624-26	AXT624-26	AXT624-26
⑫	Detent assembly	—	—	AXT624-11A	—
⑬	Pilot valve assembly	—	Refer to “How to Order Pilot Valve Assembly” on page 3-8-34.		

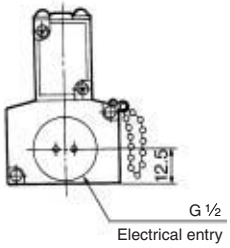
Plug-in **2 Position single/double, 3 position closed center/exhaust center/pressure center/double check**

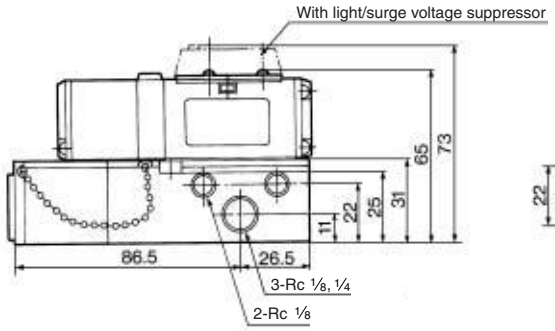
2 position single: VFS2100-□F-$^{01}_{02}$

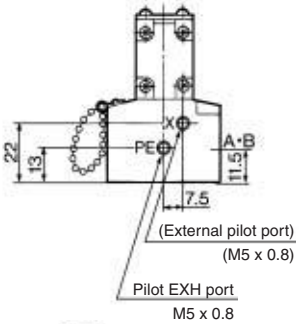




Bottom ported

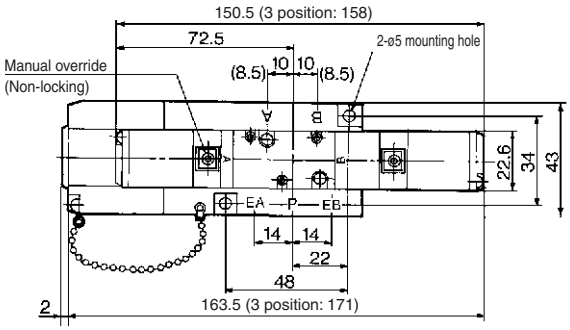


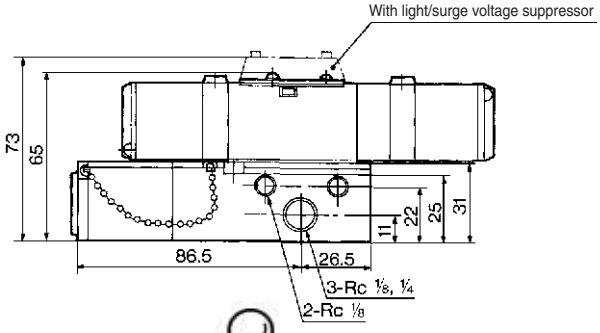





( ): Rc 1/8

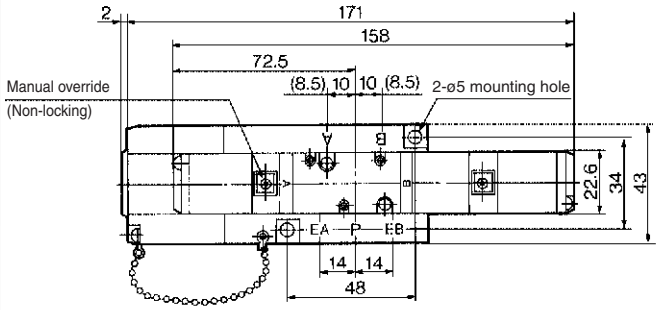
2 position double: VFS2200-□F-$^{01}_{02}$
3 position closed center: VFS2300-□F-$^{01}_{02}$
3 position exhaust center: VFS2400-□F-$^{01}_{02}$
3 position pressure center: VFS2500-□F-$^{01}_{02}$

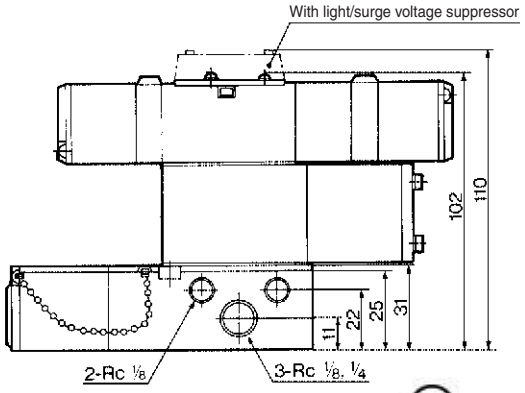





( ): Rc 1/8

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



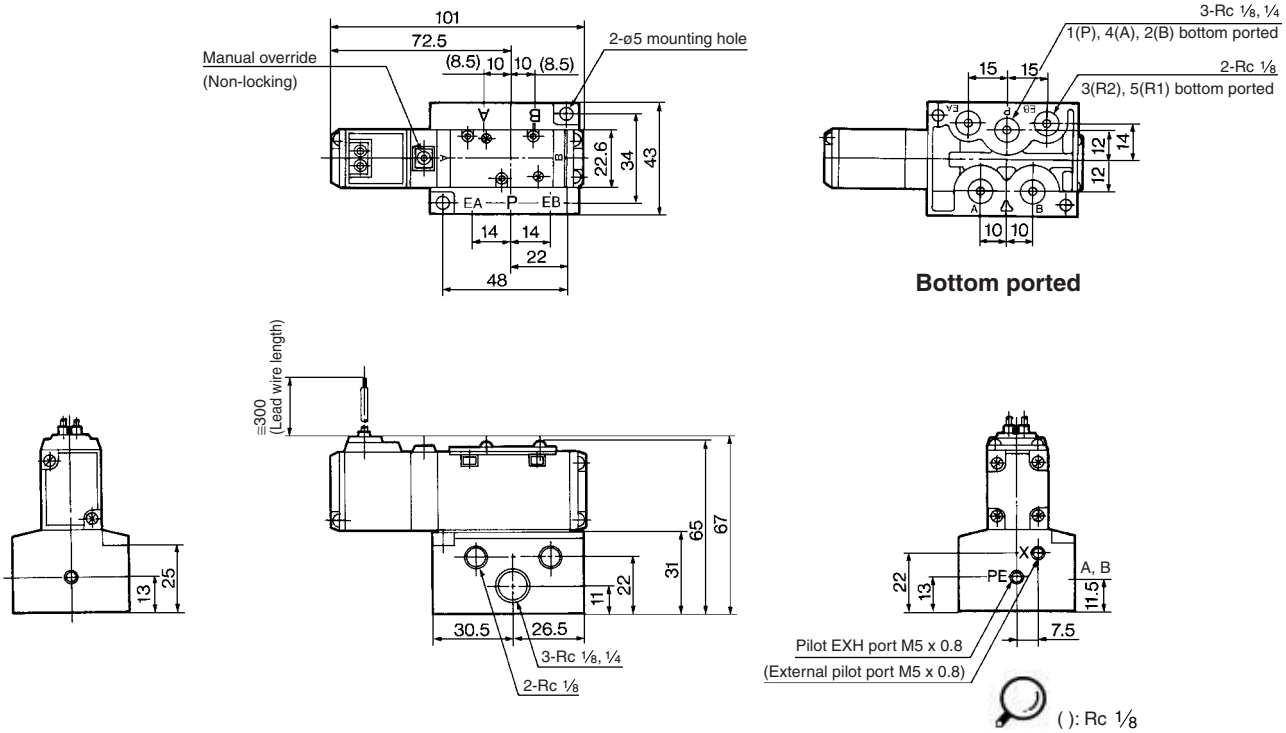



( ): Rc 1/8

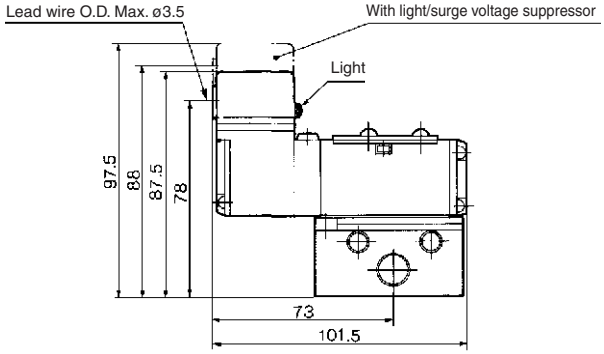
Series VFS2000

Non Plug-in 2 position single

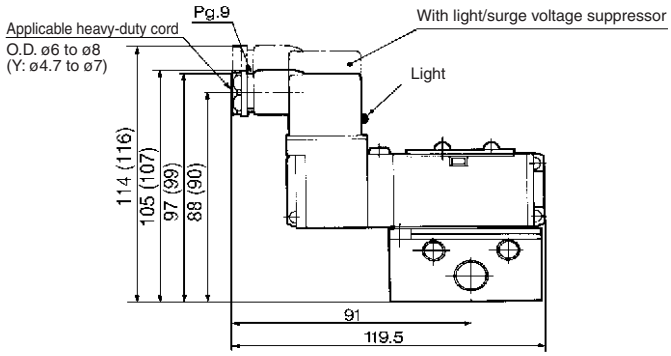
Grommet: VFS2110-□G-$^{01}_{02}$



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

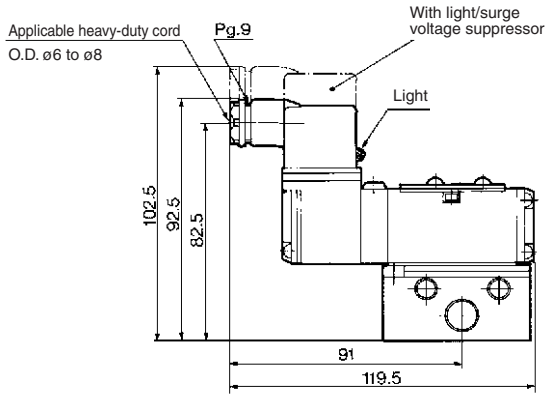


DIN terminal: VFS2110-□$^{D}_{Y}$-$^{01}_{02}$



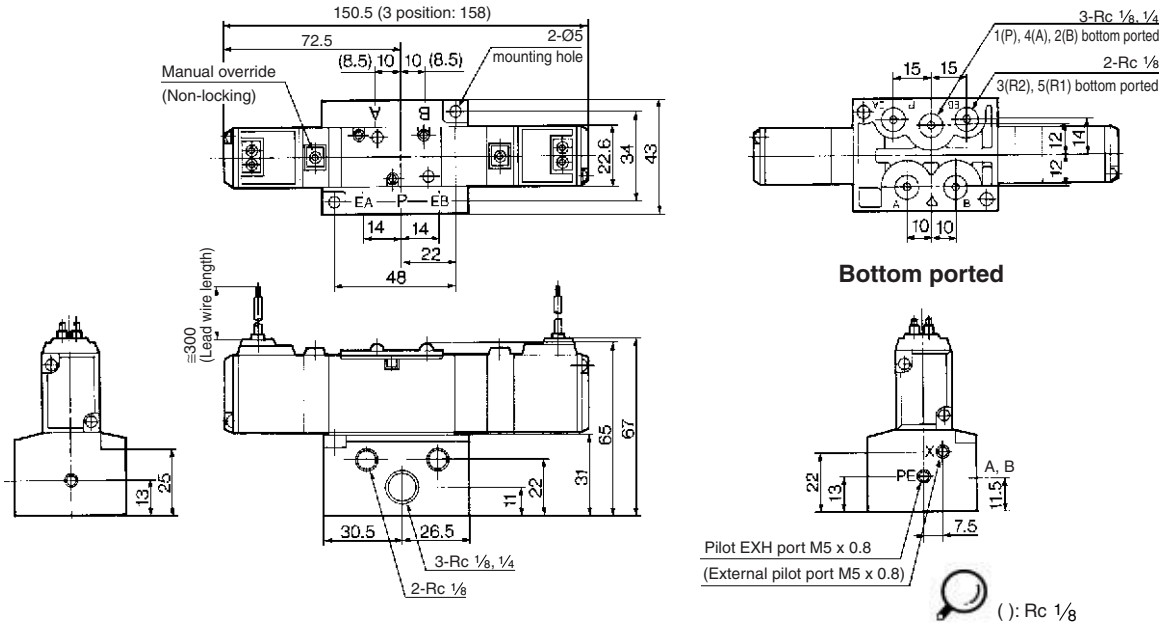
( ): Y, YZ

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

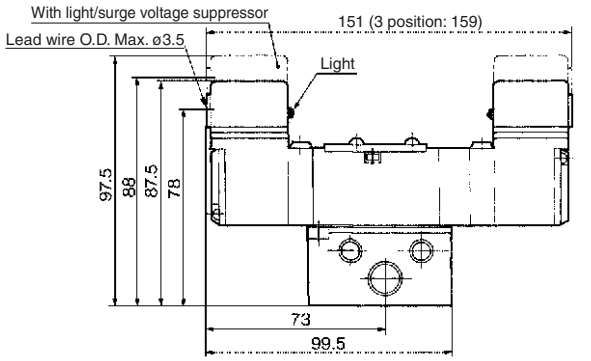


Non Plug-in 2 Position double, 3 position closed center/exhaust center/pressure center

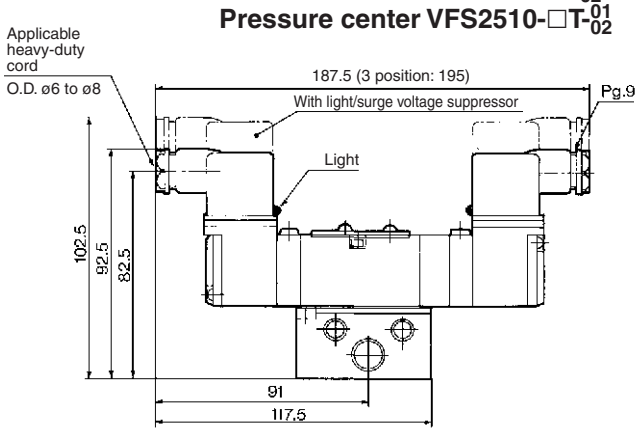
Grommet: Double VFS2210-□G-$^{01}_{02}$
Closed center VFS2310-□G-$^{01}_{02}$, Exhaust center VFS2410-□G-$^{01}_{02}$, Pressure center VFS2510-□G-$^{01}_{02}$



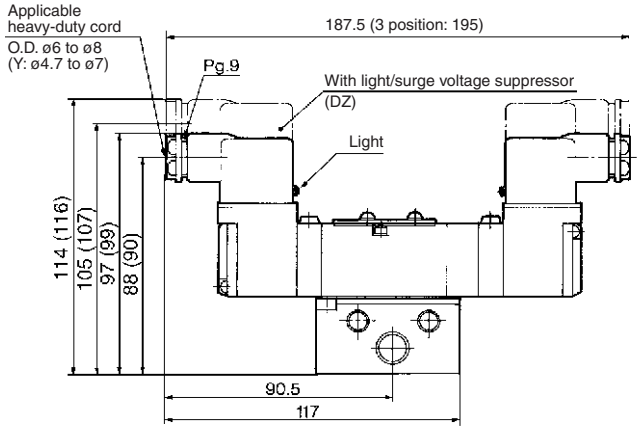
Grommet terminal: Double VFS2210-□E-$^{01}_{02}$
Closed center VFS2310-□E-$^{01}_{02}$
Exhaust center VFS2410-□E-$^{01}_{02}$
Pressure center VFS2510-□E-$^{01}_{02}$



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-$^{01}_{Y-02}$

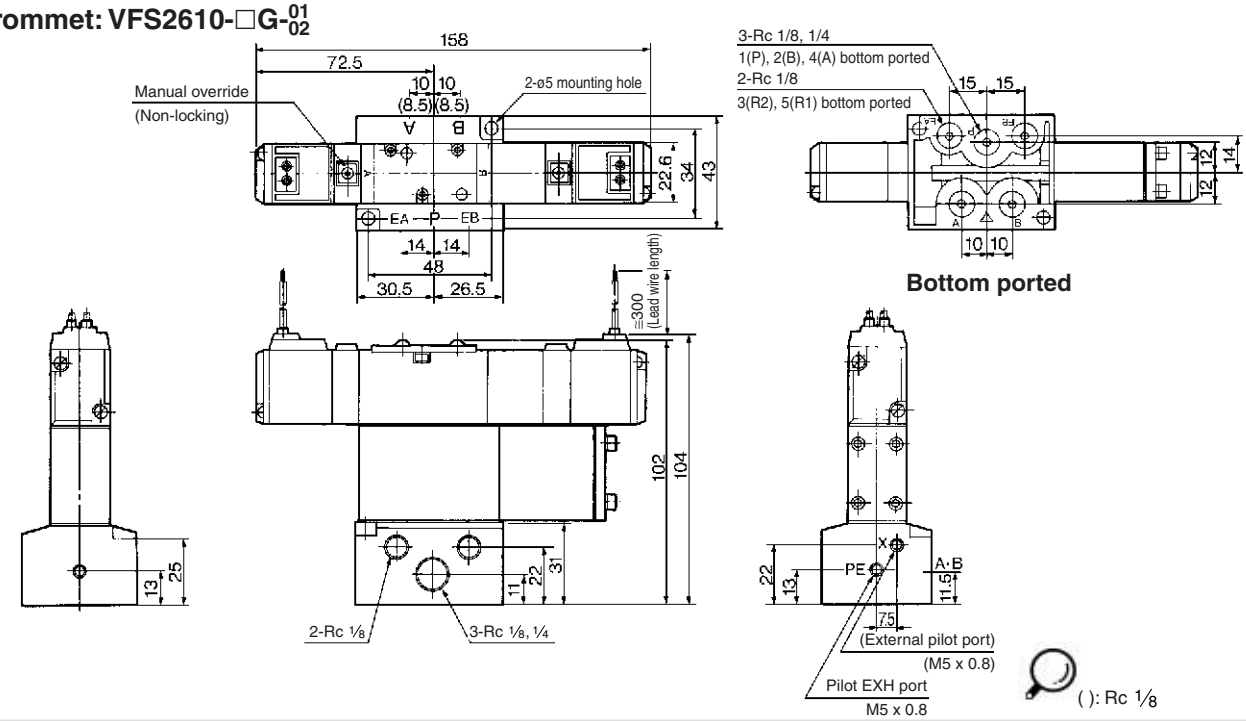


( ): Y, YZ

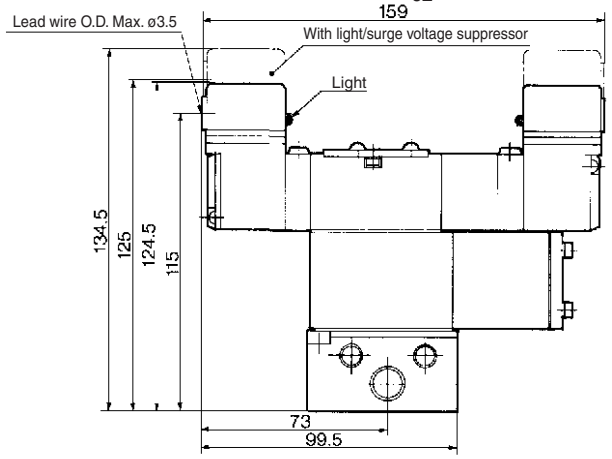
Series VFS2000

Non Plug-in 3 position double check

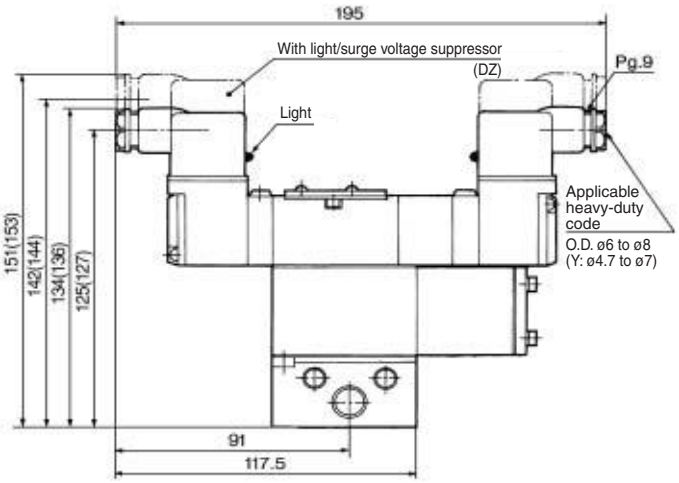
Grommet: VFS2610-□G-$^{01}_{02}$



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

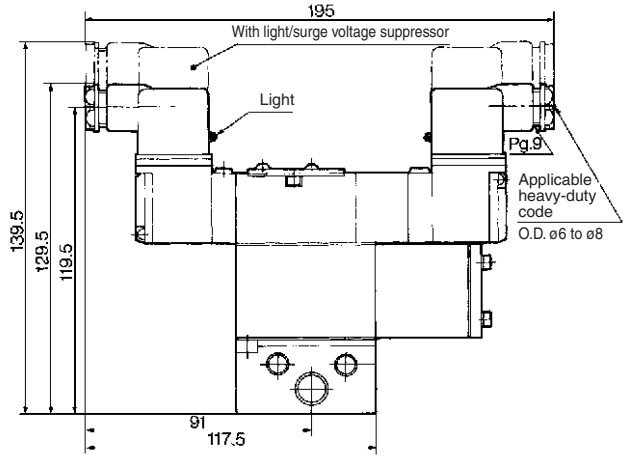


DIN terminal: VFS2610-□$^{D}_{Y}$-$^{01}_{02}$



( ): Y, YZ

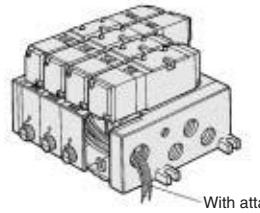
Conduit terminal: VFS2610-□T-$^{01}_{02}$



Series VFS2000
Manifold Specifications

Plug-in Type: With Attachment Plug Lead Wire

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


With attachment plug lead wire

VV5FS2 − 01 − 06 1 − 01

- VV5FS2: Series VFS2000 Manifold
- 01: Plug-in type, With attachment plug lead wire
- 06: Stations
- 1: Symbol
- 01: Port size
- Thread type

Stations

02	2 stations
⋮	⋮
15	15 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.

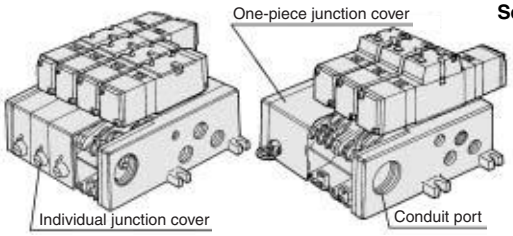
Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

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

- VV5FS2: Series VFS2000 Manifold
- 01T: Plug-in type, With terminal block
- 1: Junction cover
- 08: Stations
- 1: Symbol
- 02: Port size
- Thread type

Junction cover

Nil	Separate junction cover
1	One-piece junction cover

Stations

02	2 stations
⋮	⋮
15	15 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

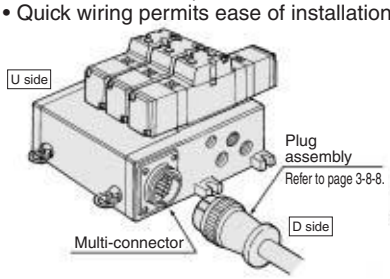
* For bottom ported, Rc 1/8 is only available.

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

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



VV5FS2 −01C D 1 − 05 2 − 01

- VV5FS2: Series VFS2000 Manifold
- 01C: Plug-in type, With multi-connector
- D: Connector mounting direction
- 1: Junction cover
- 05: Stations
- 2: Symbol
- 01: Port size
- Thread type

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.

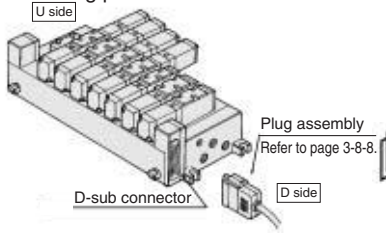
Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

Plug-in Type: With D-sub Connector (Wiring specifications: Refer to page 3-8-8.)

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



VV5FS2 −01F U 1 − 06 1 − 01

- VV5FS2: Series VFS2000 Manifold
- 01F: Plug-in type, With D-sub connector
- U: Connector mounting direction
- 1: Junction cover
- 06: Stations
- 1: Symbol
- 01: Port size
- Thread type

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.

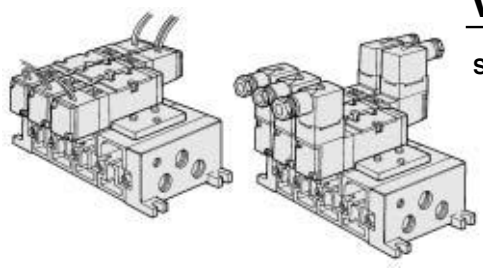
Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

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

- Wiring for every valve



VV5FS2 − 10 − 05 2 − 01

- VV5FS2: Series VFS2000 Manifold
- 10: Non plug-in type
- 05: Stations
- 2: Symbol
- 01: Port size
- Thread type

Stations

02	2 stations
⋮	⋮
15	15 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

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

Series VFS2000

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 circular 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

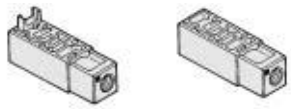
* Port size Rc 1/4

Manifold Option Parts Assembly

Individual SUP spacer

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

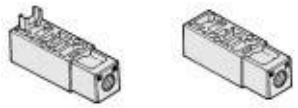
Body type		Plug-in type	Non plug-in type
Part no.	Rc 1/8	VVFS2000-P-01-1	VVFS2000-P-01-2
	Rc 1/4	VVFS2000-P-02-1	VVFS2000-P-02-2



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 disk

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

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

EXH block disk

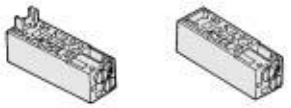
When valve exhaust affects the other stations on the circuit or when the reverse pressure valve is used to standard manifold valve, insert EXH block disk in between stations to separate valve exhaust.

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.

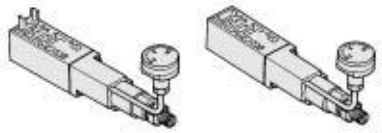
Body type	Plug-in type	Non plug-in type
Part no.	VVFS2000-20A-1	VVFS2000-20A-2



Interface regulator (P port regulation)

Interface regulator set on manifold block can regulate the pressure to each valve. Refer to "Flow Characteristics" on page 3-8-6.

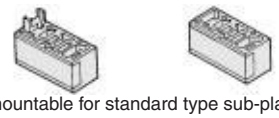
Body type	Plug-in type	Non plug-in type
P port regulation	ARBF2000-00-P-1	ARBF2000-00-P-2



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



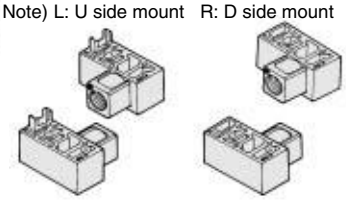
* Not mountable for standard type sub-plate.

Air release valve spacer

The concurrent use of air release valve spacer with VFS21□0 can release air.

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

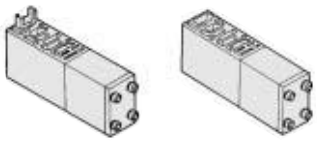
Note) L: U side mount R: D side mount



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

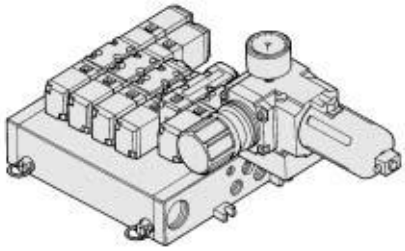
One pair of gasket and mounting thread is attached to every option parts assembly.

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.**

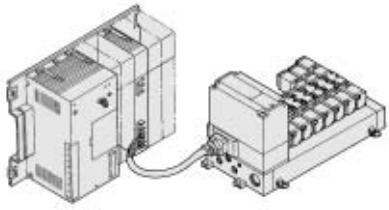


For details, refer to page 3-8-47.

With serial interface unit for serial transmission

Plug-in type

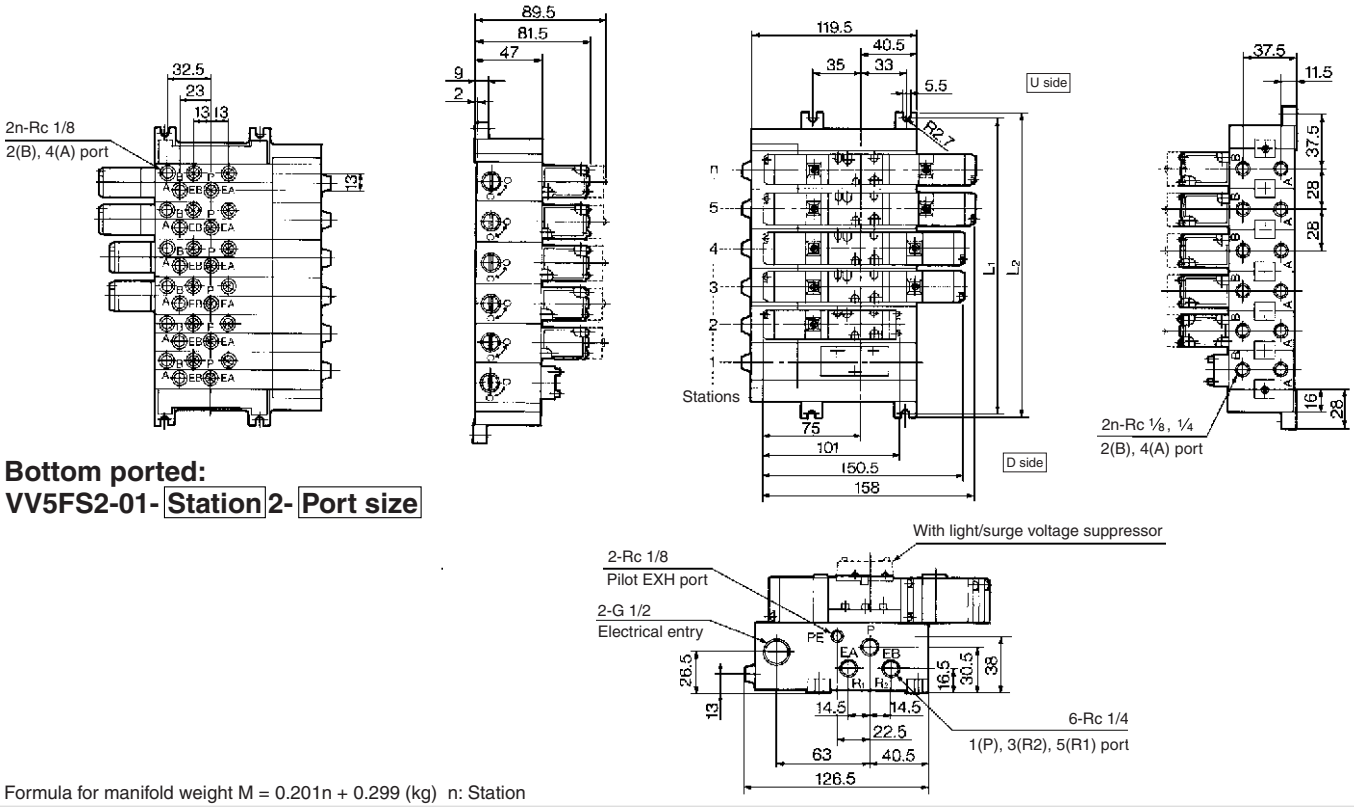
- **Solenoid valve wiring process reduced considerably.**
- **Disperse installation possible. Manifold solenoid valve: 8 stations max. 32 positions (512 solenoids).**
- **Maintenance and inspection are easy.**



For details, refer to "Serial Transmission" catalog separately.

Manifold Plug-in type, Non plug-in type

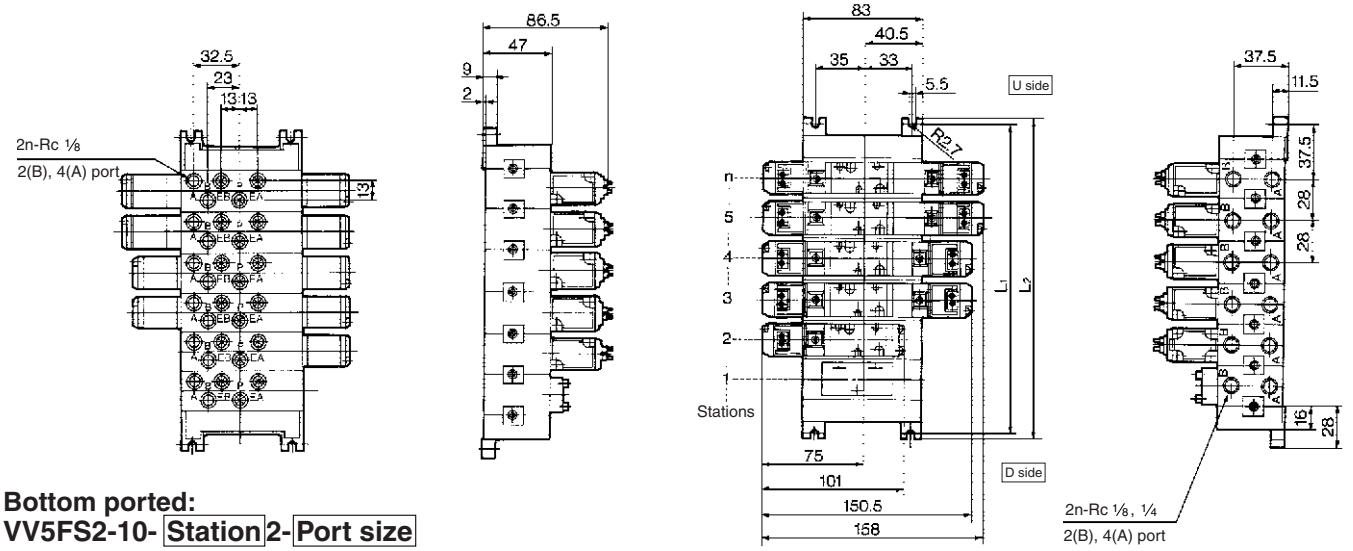
Plug-in type (Insert plug with lead wire): VV5FS2-01- Station 1- Port size



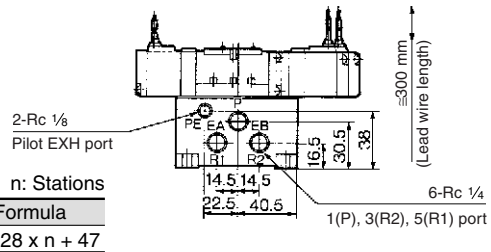
Bottom ported: VV5FS2-01- Station 2- Port size

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)

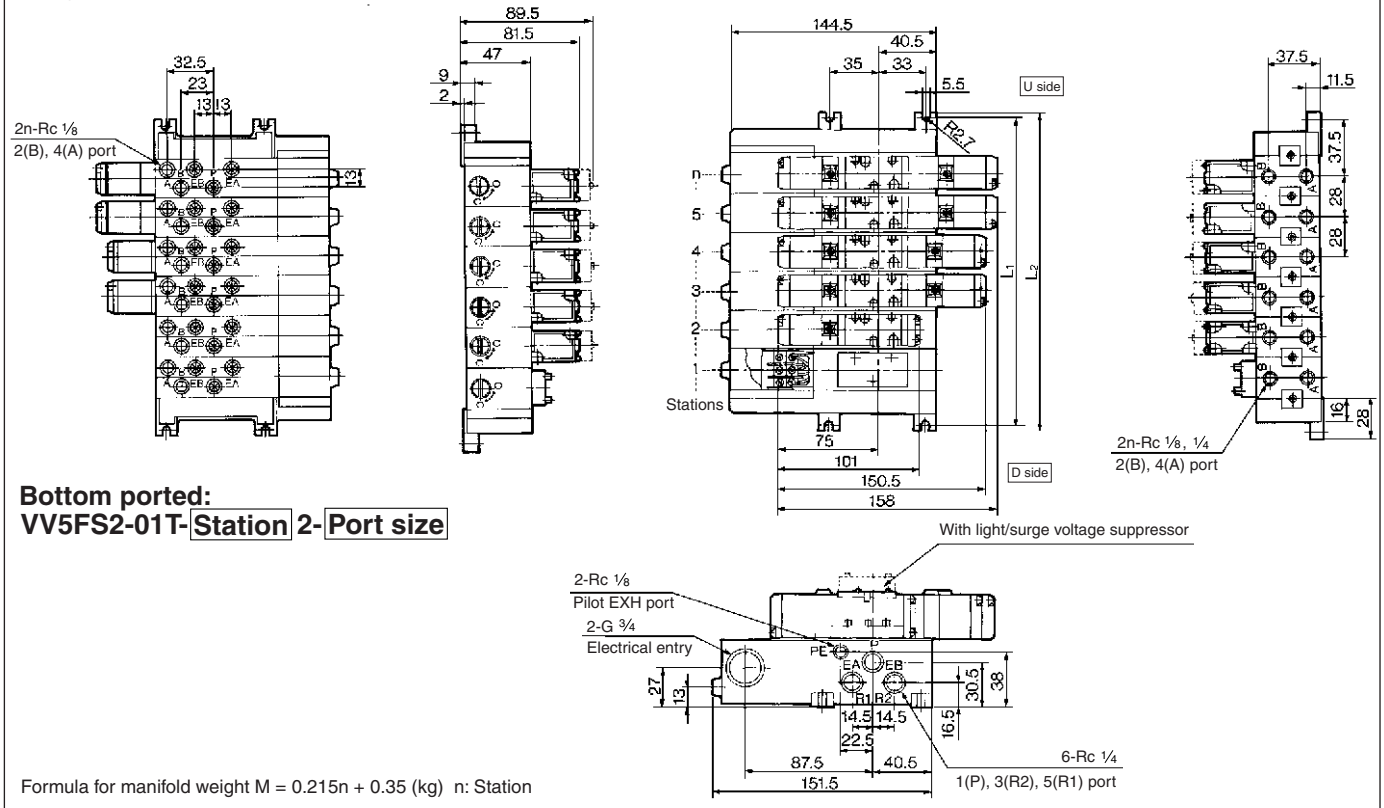
n: Stations

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

Series VFS2000

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

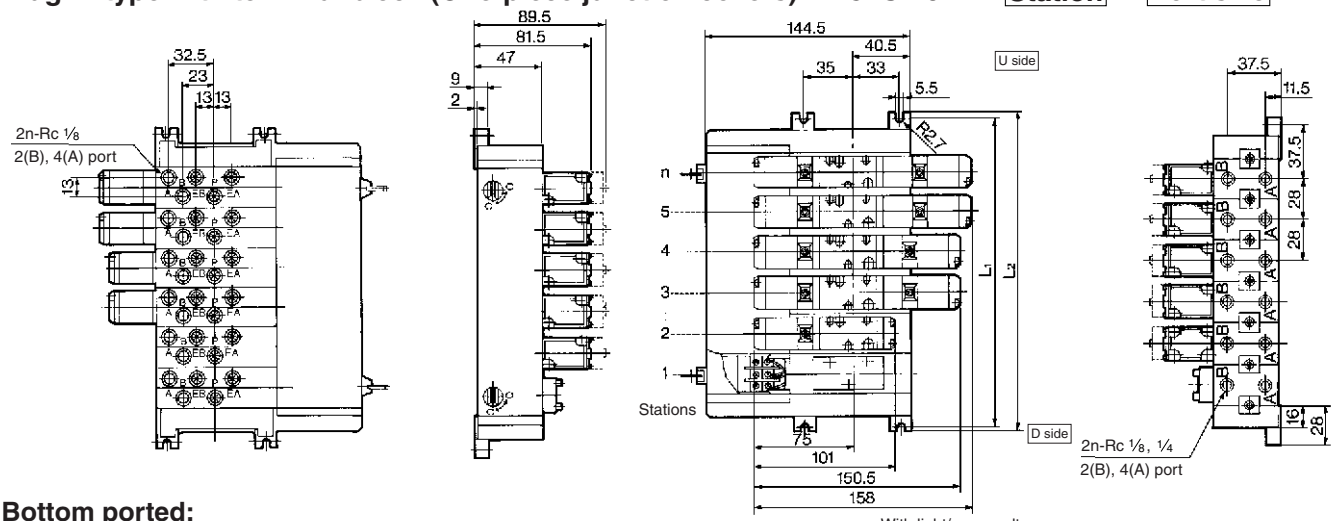
Plug-in type with terminal block (Individual junction covers): VV5FS2-01T- Station 1- Port size



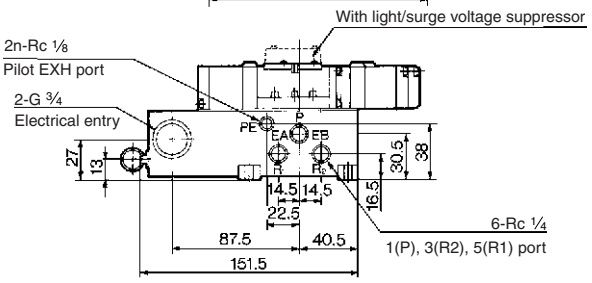
Bottom ported:
VV5FS2-01T- Station 2- Port size

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

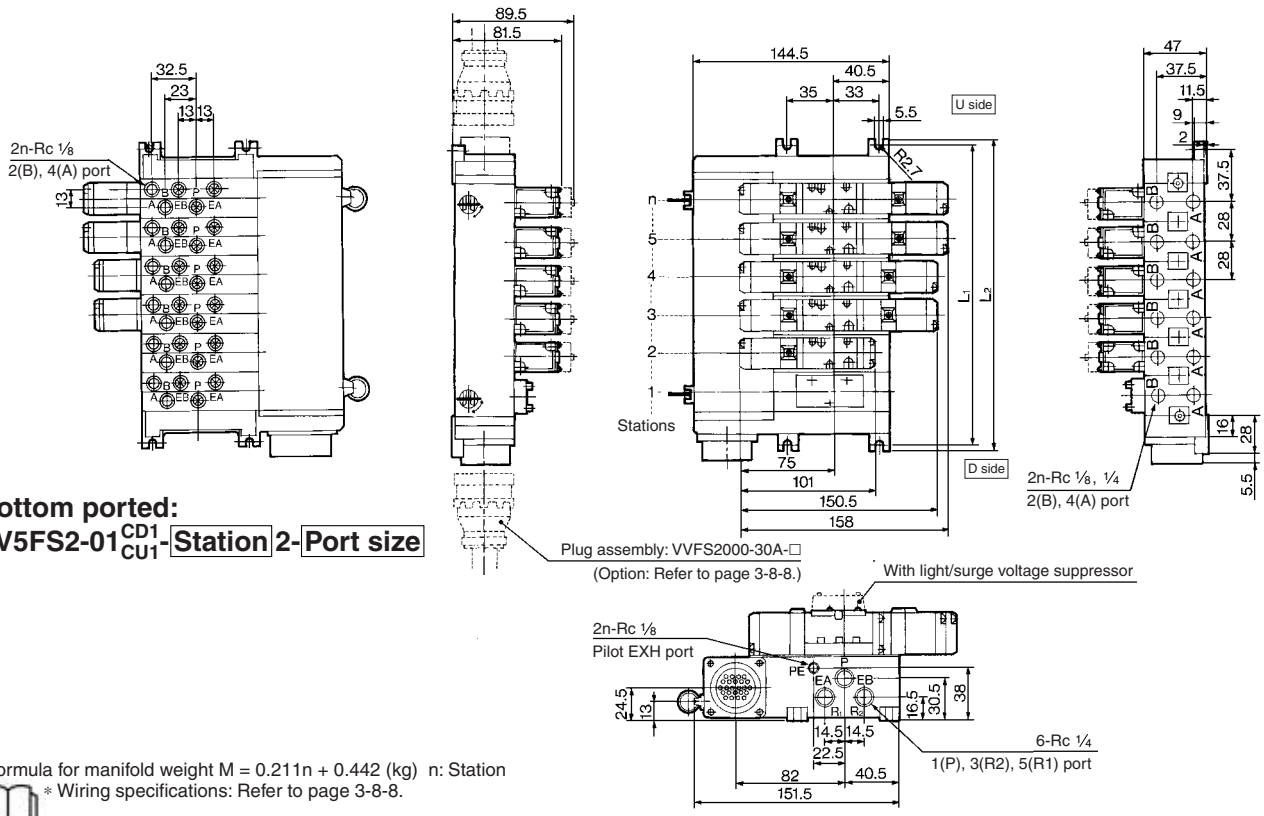


Formula for manifold weight M = 0.236n + 0.354 (kg) n: Station

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

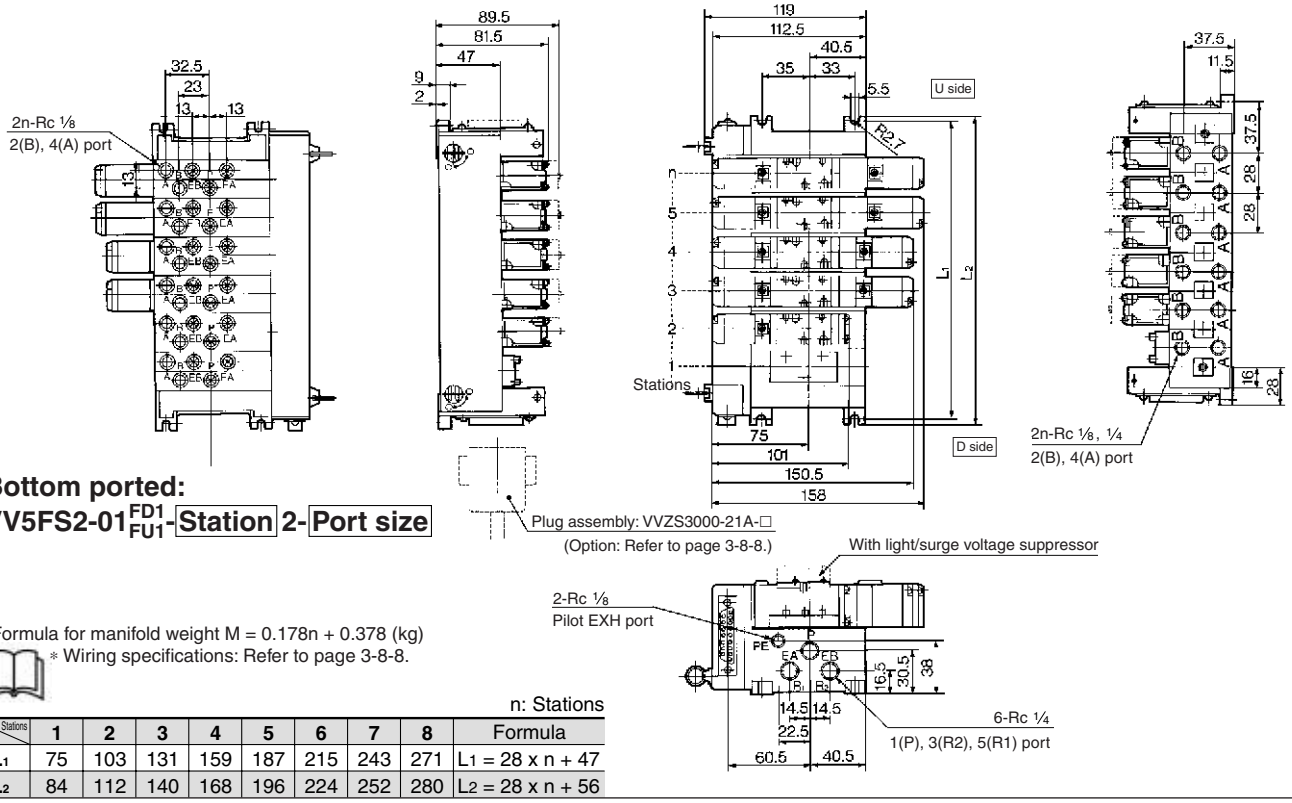
Plug-in with multi-connector: VV5FS2-01CD1-Station 1-Port size, VV5FS2-01CU1-Station 1-Port size



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 3-8-8.

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 3-8-8.

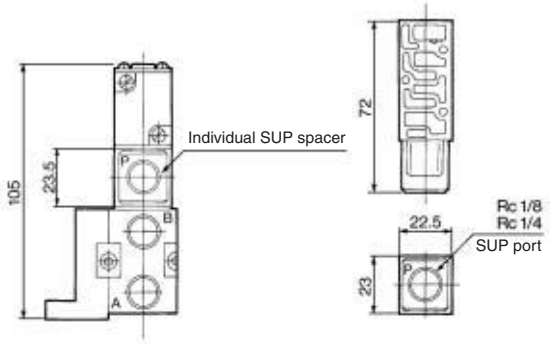
n: Stations

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

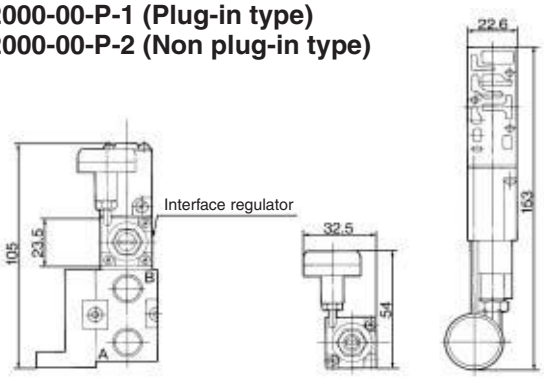
Series VFS2000

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

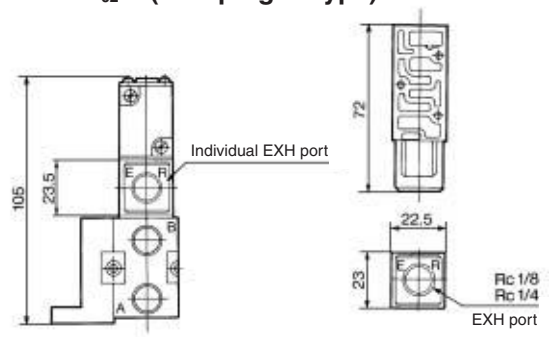
Individual SUP spacer:
VVFS2000-P-$^{01}_{02}$-1 (Plug-in type)
VVFS2000-P-$^{01}_{02}$-2 (Non plug-in type)



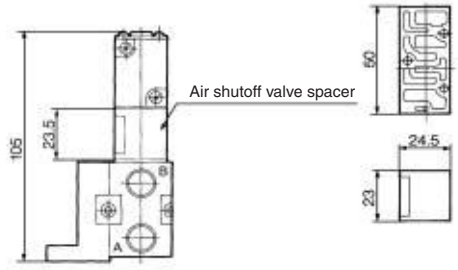
Interface regulator:
ARBF2000-00-P-1 (Plug-in type)
ARBF2000-00-P-2 (Non plug-in type)



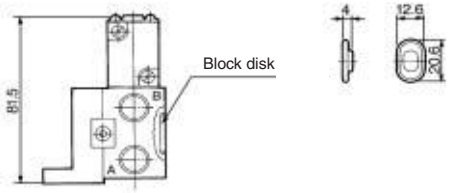
Individual EXH spacer:
VVFS2000-R-$^{01}_{02}$-1 (Plug-in type)
VVFS2000-R-$^{01}_{02}$-2 (Non plug-in type)



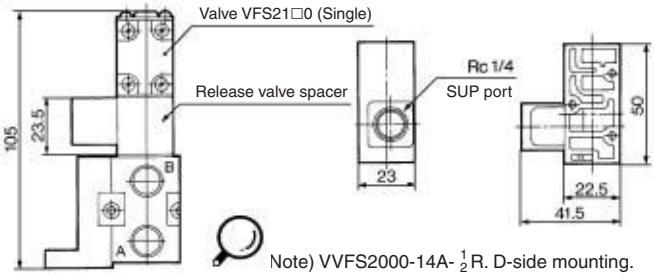
Air shutoff valve spacer:
VVFS2000-21A-1 (Plug-in type)
VVFS2000-21A-2 (Non plug-in type)



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

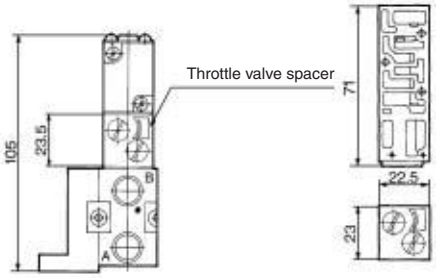


Release valve spacer:
VVFS2000-24A-1$^{R}_{L}$ (Plug-in type)
VVFS2000-24A-2$^{R}_{L}$ (Non plug-in type)

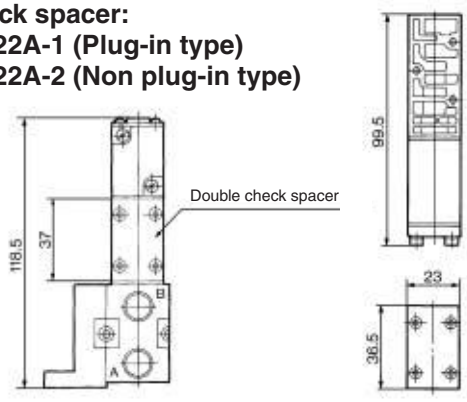


Note) VVFS2000-14A-$\frac{1}{2}$R. D-side mounting.

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



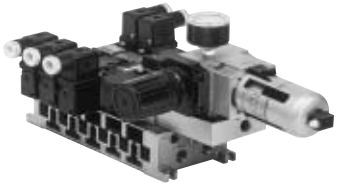
Double check spacer:
VVFS2000-22A-1 (Plug-in type)
VVFS2000-22A-2 (Non plug-in type)



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 3-8-42.
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

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

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

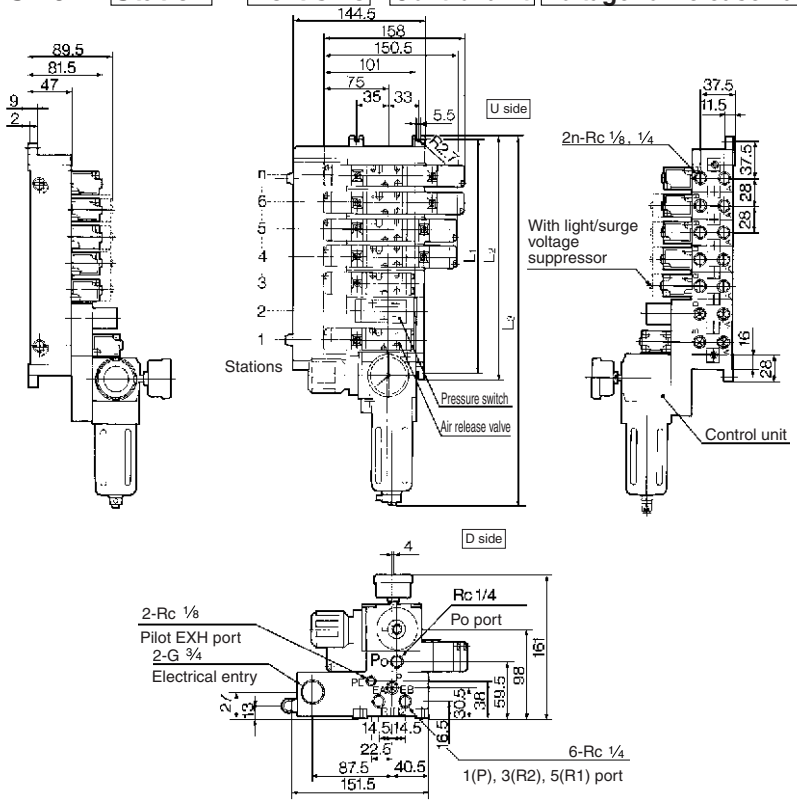
Control equipment \ Symbol	Nil	A	AP	M	MP	F	G	C	E
Air filter with auto-drain		●	●			●			
Air filter with manual drain				●	●		●		
Regulator		●	●	●	●	●	●		
Air release valve		●	●	●	●			●	●
Pressure switch			●		●				
Blanking plate (Air release valve)						●	●		
Blanking plate (Filter, Regulator)						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

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

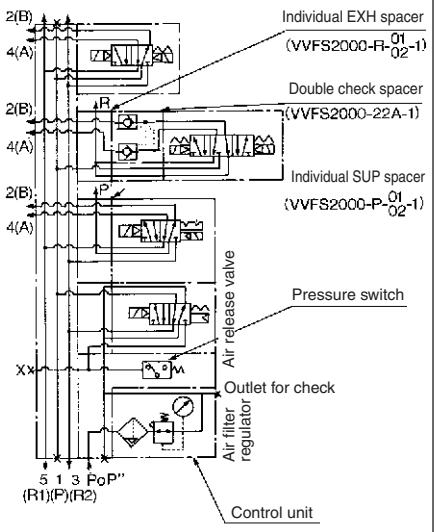
<Example>
- Plug-in type with terminal block
  (Manifold base) VV5FS2-01T1-091-02-MP5 ···· 1
  (2 position single) VFS2100-5FZ ····· 5
  (2 position double) VFS2200-5FZ ····· 2
  * 2 stations are needed to mount control unit.
- Non plug-in type
  (Manifold base) VV5FS2-10-071-01-M····· 1
  (2 position single) VFS2110-5D ····· 5
  * 2 stations are needed to mount control unit.

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

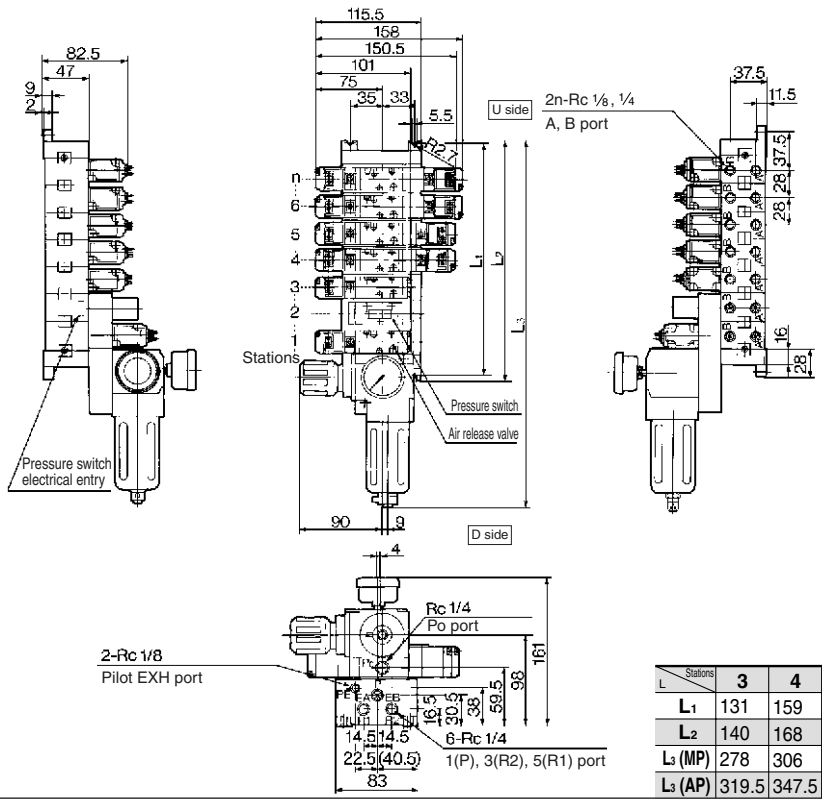
Plug-in type:
VV5FS2-01T- Station 1- Port size - Control unit Voltage for release valve



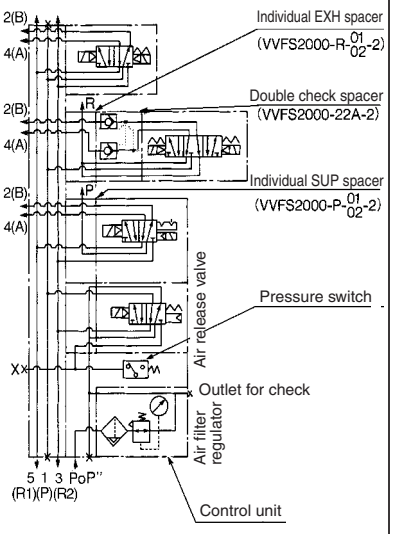
Example for manifold



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

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.

Symbol

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

∗ Option

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

∗ Option

Coil rated voltage

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

∗ Option

Option

Nil	None
Z	With light/surge voltage suppressor

Pilot valve manual override

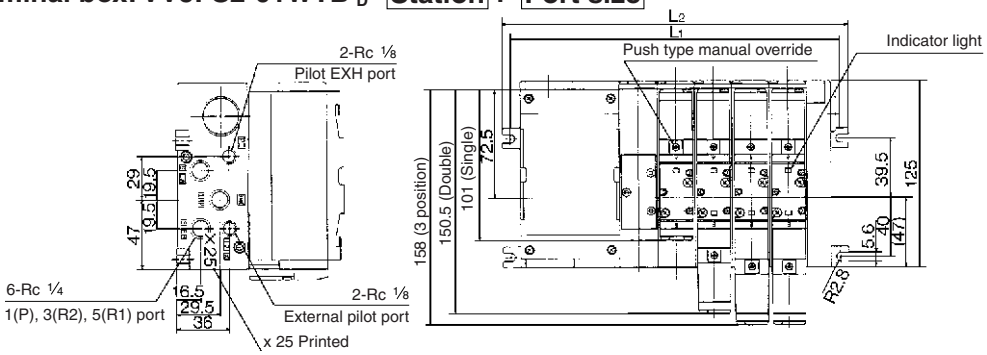
Nil	Non-locking push type (Flush)
A∗	Non-locking push type (Extended)
B∗	Locking type (Tool required)
C∗	Locking type (Lever)

∗ Option

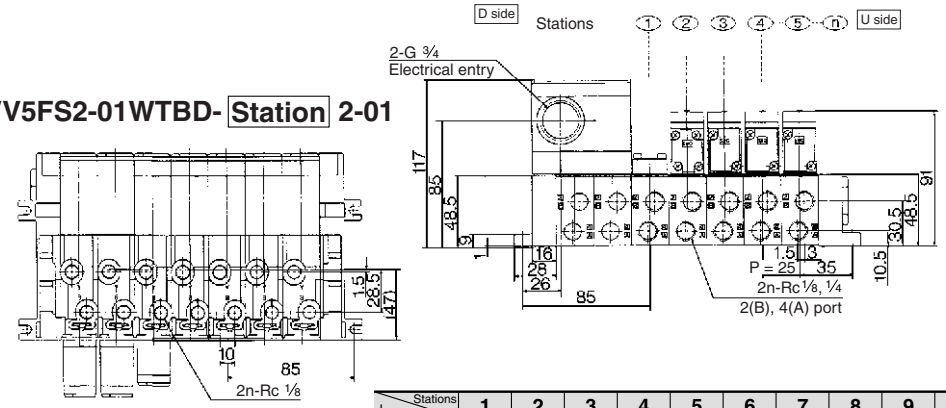
Dripproof

Dripproof Manifold

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



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

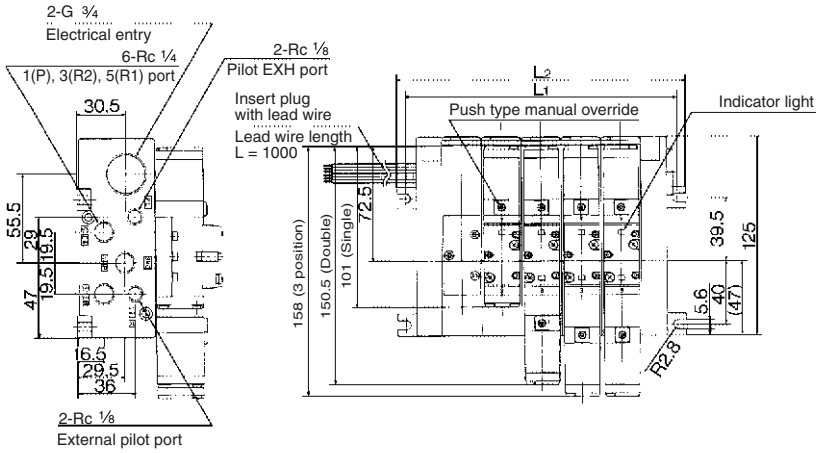


n: Stations

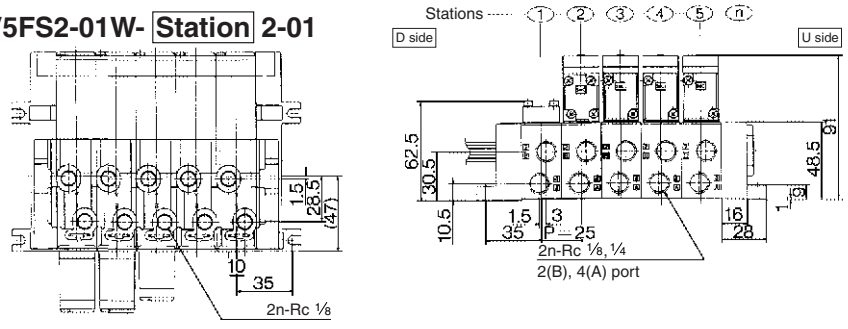
L \ Stations	1	2	3	4	5	6	7	8	9	10	Formula
L_1	120	145	170	195	220	245	270	295	320	345	$L_1 = 25 \times n + 95$
L_2	131	156	181	206	231	256	281	306	331	356	$L_2 = 25 \times n + 106$

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

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



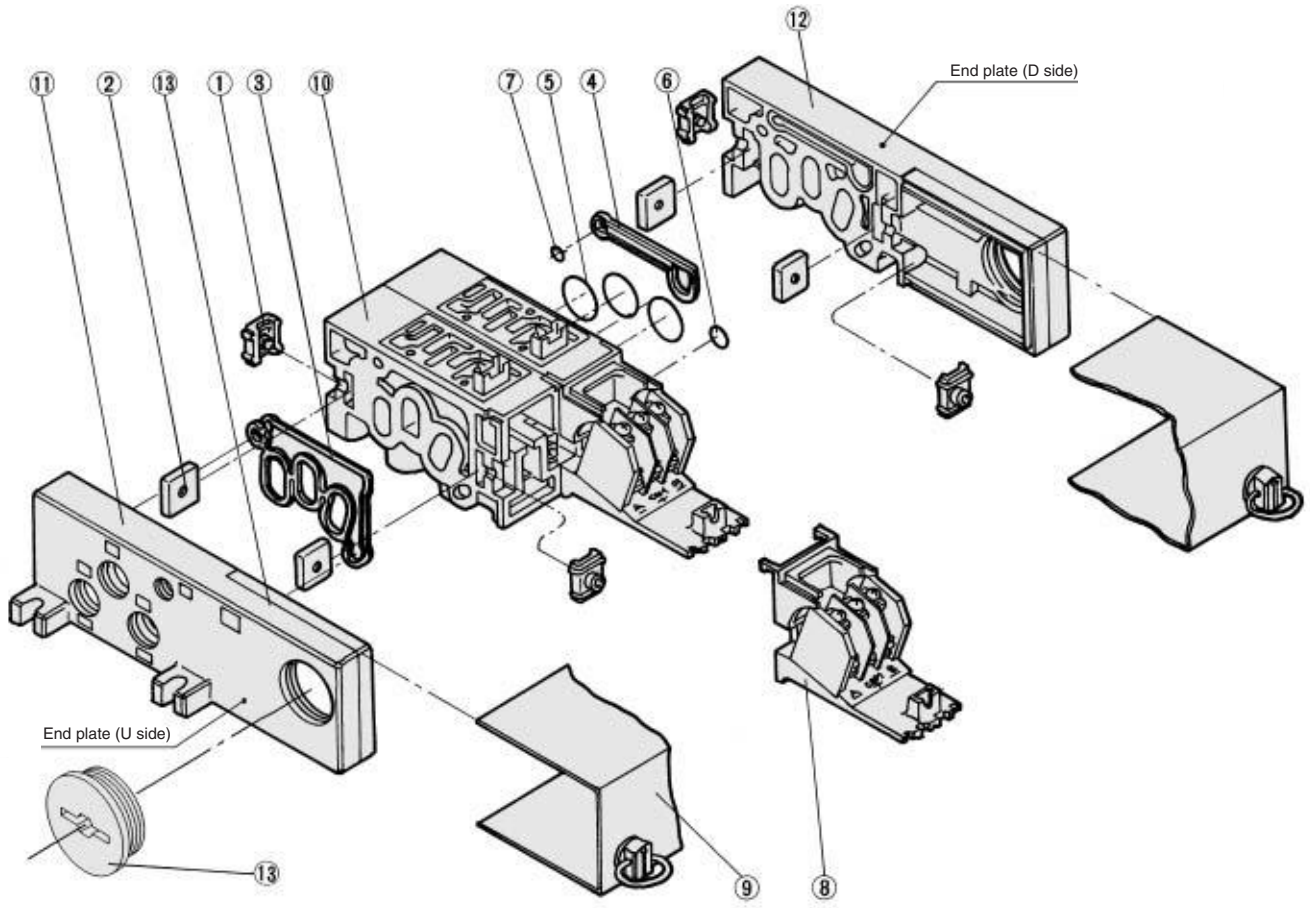
Bottom ported: VV5FS2-01W- Station 2-01



n: Stations

L \ Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Formula
L_1	70	95	120	145	170	195	220	245	270	295	320	345	370	395	420	$L_1 = 25n + 45$
L_2	81	106	131	156	181	206	231	256	281	306	331	356	381	406	431	$L_2 = 25n + 56$

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



Replacement Parts

No.	Description	Material		Part no.
①	Connection fitting A	Steel plate		AXT625-4-1
②	Connection fitting B	Steel plate		AXT625-5
③	Gasket A	NBR		AXT625-17
④	Gasket B	NBR		AXT625-16
⑤	O-ring	NBR		18 x 15 x 1.5
⑥	O-ring	NBR		10.5 x 7.5 x 1.5
⑦	O-ring	NBR		8 x 5 x 1.5
⑧	Adapter plate	Resin	For 01	AXT625-6
	Adapter plate assembly	—	For 01T	AXT625-28-1A (Terminal section with adapter plate)
			For 01T1	
	Adapter plate	Resin	For 01C	AXT625-28-1
			For 01F	VVF2000-26-6
			For 01SU	AXT625-6

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

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

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

Replacement Parts: Sub Assembly

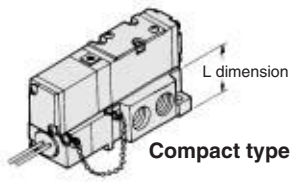
No.	Description	Assembly part no.	Component parts	Applicable manifold base
⑩	Manifold block assembly	AXT625-01A-$\frac{1}{2}$ Note)	Manifold block ⑩, Metal joint ①, ②. O-ring ⑤, ⑥, ⑦ Junction cover, Adapter plate, Pin housing, Guide, Insert plug lead wire	Plug-in type With attachment plug lead wire
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

Note) A, B ports: 1/8, 1/4

Series VFS2000

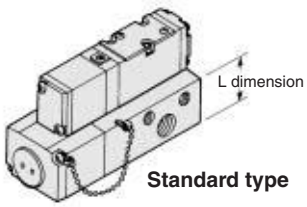
Light Compact Type Sub-plate/C: 2.8 dm³/(s·bar)

C: 2.2 dm³/(s·bar)



Compact type

C: 2.8 dm³/(s·bar)



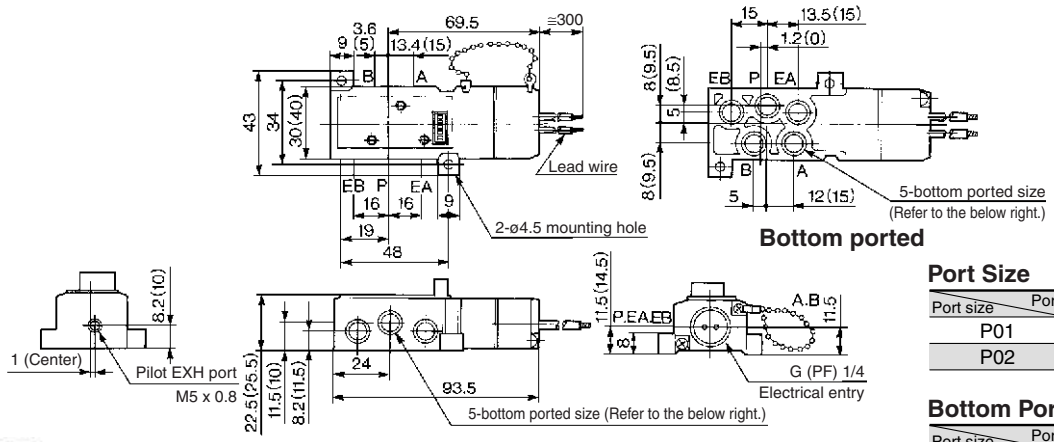
Standard type

Sub-plate

Type	L dimension (mm)	Weight (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

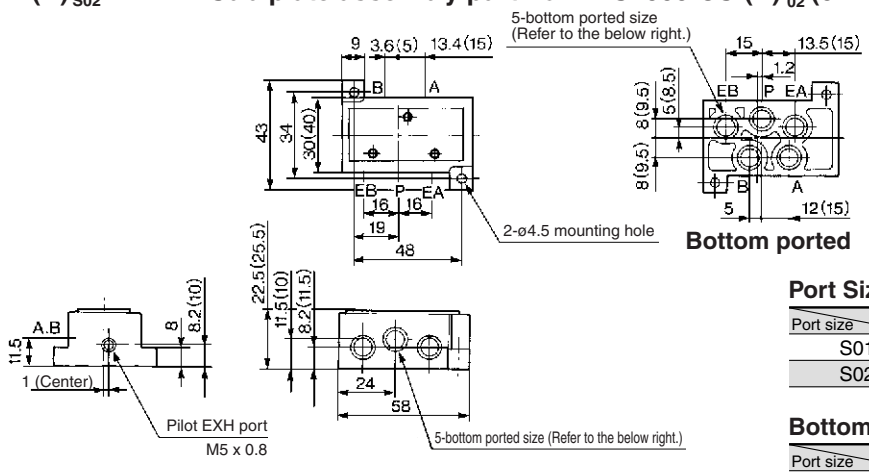
Port size \ Port	P, A, B	EA, EB
P01	Rc 1/8	Rc 1/8
P02	Rc 1/4	Rc 1/8

Bottom Ported Size

Port size \ Port	P, A, B	EA, EB
BP01	Rc 1/8	M5
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

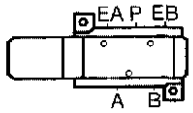
Port size \ Port	P, A, B	EA, EB
S01	Rc 1/8	Rc 1/8
S02	Rc 1/4	Rc 1/8

Bottom Ported Size

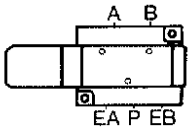
Port size \ Port	P, A, B	EA, EB
BS01	Rc 1/8	M5
BS02	Rc 1/8, 1/4	Rc 1/8

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

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(2) (ms)	Weight(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.

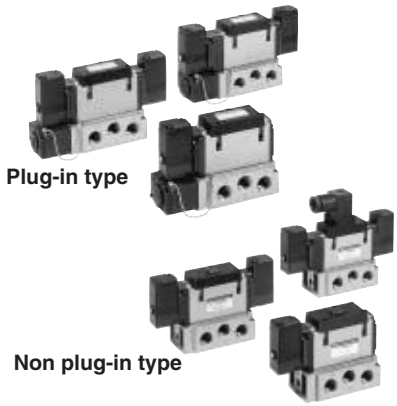
Compact yet provides a large flow capacity
3/8: C: 5.8 dm³/(s·bar)

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

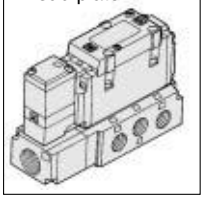
Note) Operating pressure: 0 to 1.0 MPa
Pilot pressure: 0.1 to 1.0 MPa

Series VFS3000

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

* Option

Port size

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

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

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

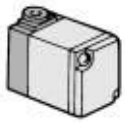
Plug-in VFS3 1 0 0 □ — 1 F □ □ — □ 02 □

Non plug-in VFS3 2 1 1 □ — 2 D □ □ — □ 02 □

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

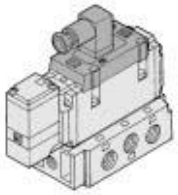
Option

Nil	None
Z	With light/surge voltage suppressor

Electrical entry

E: Grommet terminal

D: DIN terminal



Symbol

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

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

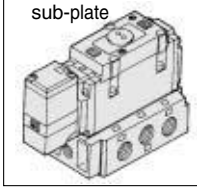
Coil rated voltage

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

* Option

Body type

1: Non plug-in type sub-plate



Pilot type

Nil	Internal pilot
R*	External pilot

* Option

Body Option

0	Standard
1*	Direct manual override

* Option

How to Order Pilot Valve Assembly

SF4 — 1 F □ — 30

Coil rated voltage

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

* Option

Manual override

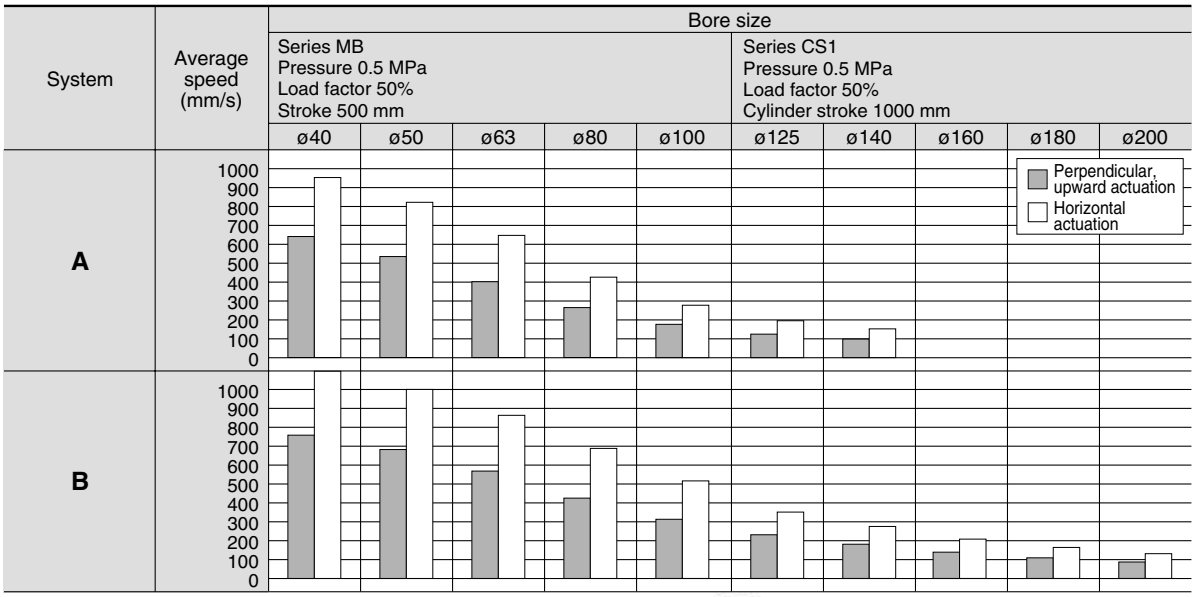
Symbol	Manual override
Nil	Non-locking push type (Flush)
A*	Non-locking push type (Extended)
B*	Locking type (Tool required)
C*	Locking type (Lever)

* Option

* Refer to page 3-8-5 for voltage conversion.

Cylinder Speed Chart

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



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

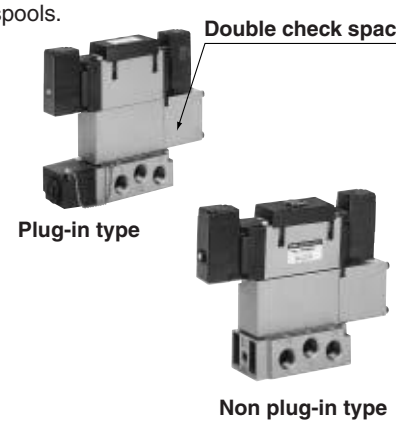
System Components

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

Double Check Spacer/Specifications

Can hold an intermediate cylinder position for an extended time

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



Specifications

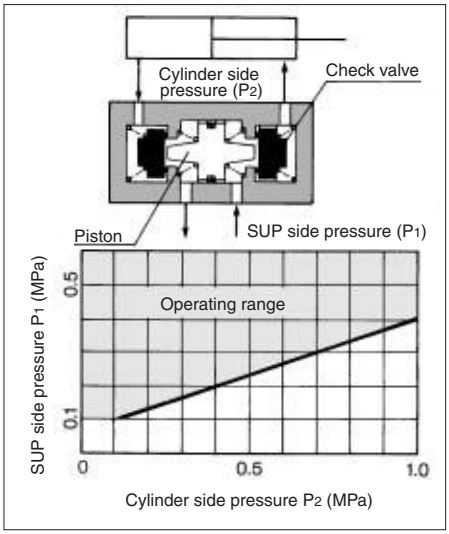
Double check spacer part no.	Plug-in type			Non plug-in type
	VVFS3000-22A-1			**VVFS3000-22A-2**
Applicable valve model	VFS3400-□F			VFS3410-□D VFS3410-□E
Leakage∗ (cm³/min)	Solenoid one side energized	P	EA	230 or less
			EB	
	Solenoid both sides de-energized	P	EA	230 or less
			EB	
		A	EA	0
		B	EB	

∗ Supply pressure: 0.5 MPa

⚠ 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

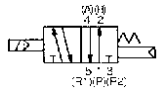


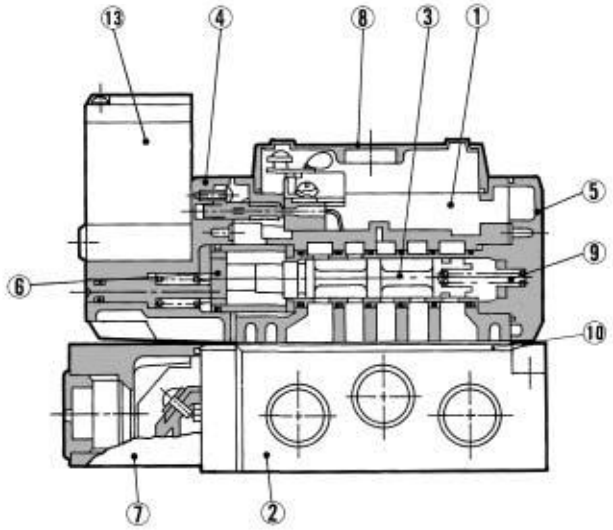
- The combination of VFS31$^{0}_{1}$0, VFS32$^{0}_{1}$0 and double check spacer can be used as prevention for falling at the stroke end but cannot hold the intermediate position of the cylinder.

Series VFS3000

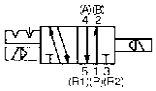
Construction

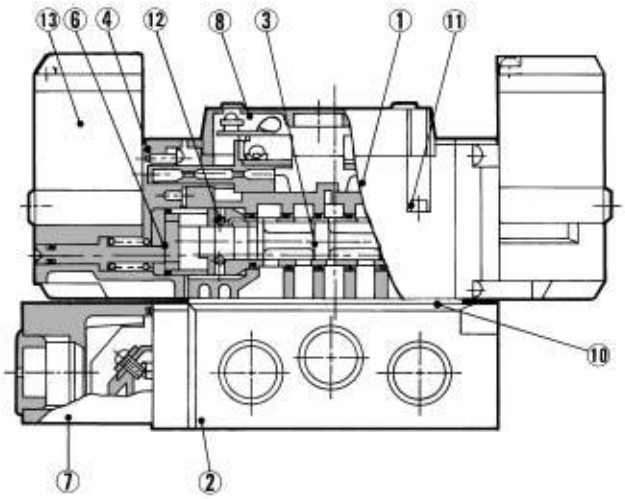
2 position single





2 position double



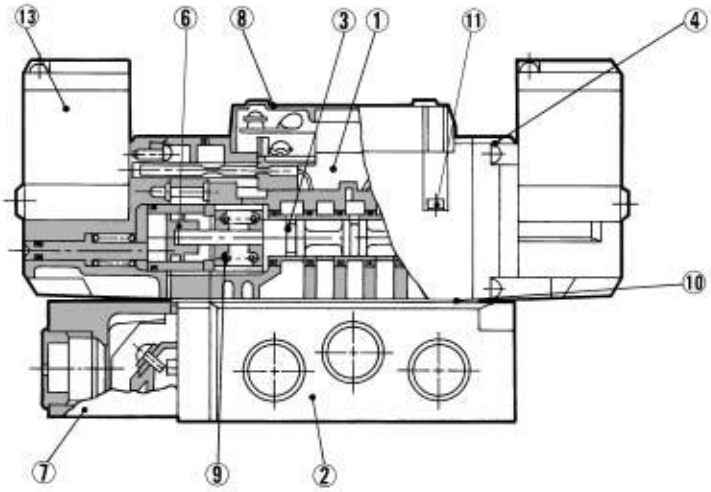


3 position closed center/exhaust center/pressure center

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	—

Sub-plate Part No.

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

∗ Mounting bolt and gasket are not included.

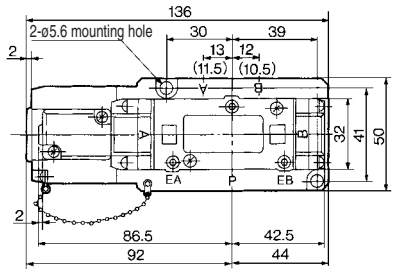
Part no. for mounting bolt and gasket
BG-VFS3000

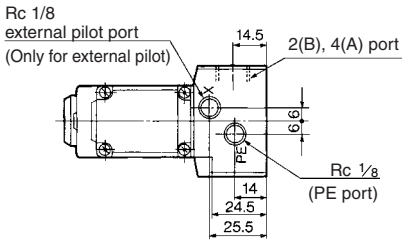
Replacement Parts

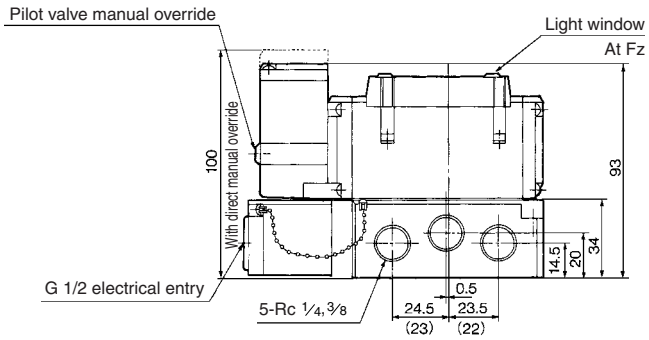
No.	Description	Material	Part no.		
			VFS31□□	**VFS32□□**	**VFS33□□/34□□/35□□**
⑨	Return spring	Stainless steel	VFS3000-17-1	—	VFS3000-17-2
⑩	Gasket	NBR	VFS3000-20	VFS3000-20	VFS3000-20
⑪	Hexagon socket head screw	Steel	M3 x 32	M3 x 32	M3 x 32
⑫	Detent assembly	—	—	VFS3000-9A	—
⑬	Pilot valve assembly	—	Refer to “How to Order Pilot Valve Assembly” on page 3-8-54.		

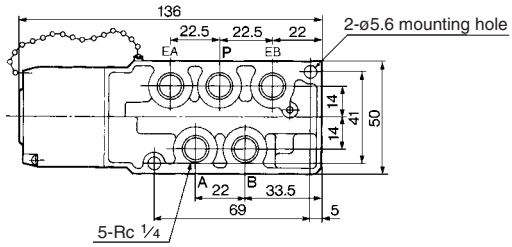
Plug-in 2 position single, 3 position closed center/exhaust center/pressure center/double check

2 position single: VFS3100-□F





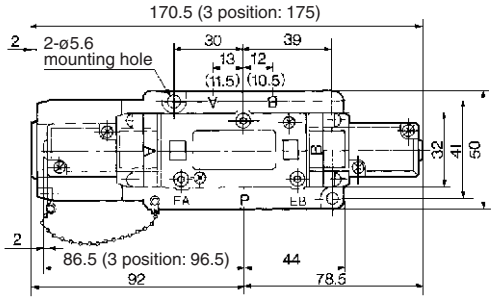


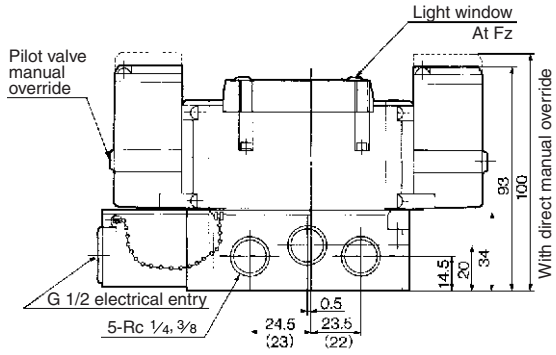


Bottom ported

( ): Rc 1/4

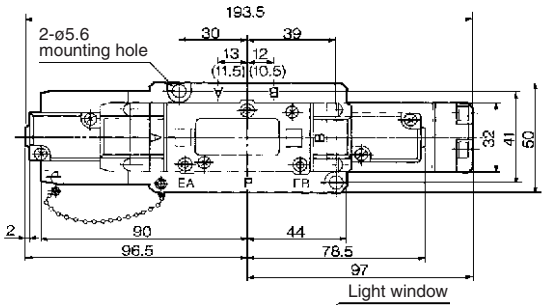
2 position double: VFS3200-□F
3 position closed center: VFS3300-□F
3 position exhaust center: VFS3400-□F
3 position pressure center: VFS3500-□F

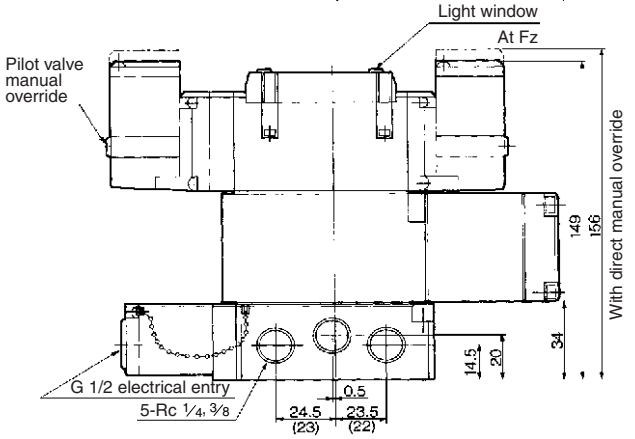




( ): Rc 1/4

3 position double check: VFS3600-□F

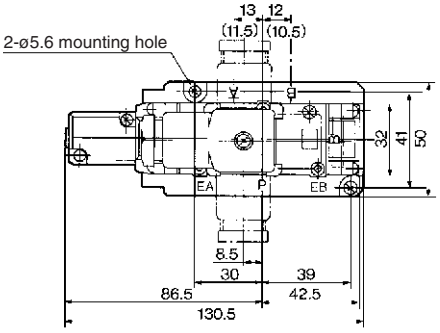


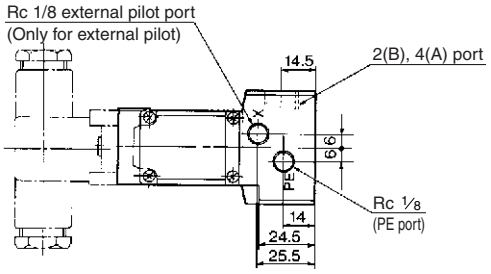


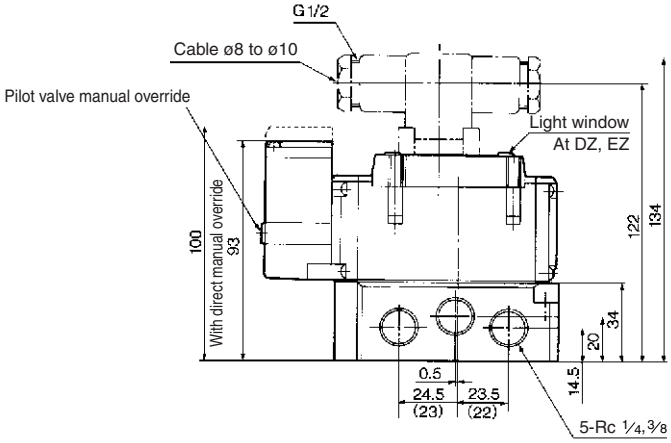
( ): Rc 1/4

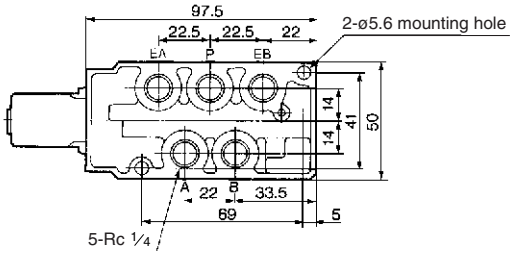
Non Plug-in 2 Position single/double, 3 position closed center/exhaust center/pressure center/double check

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





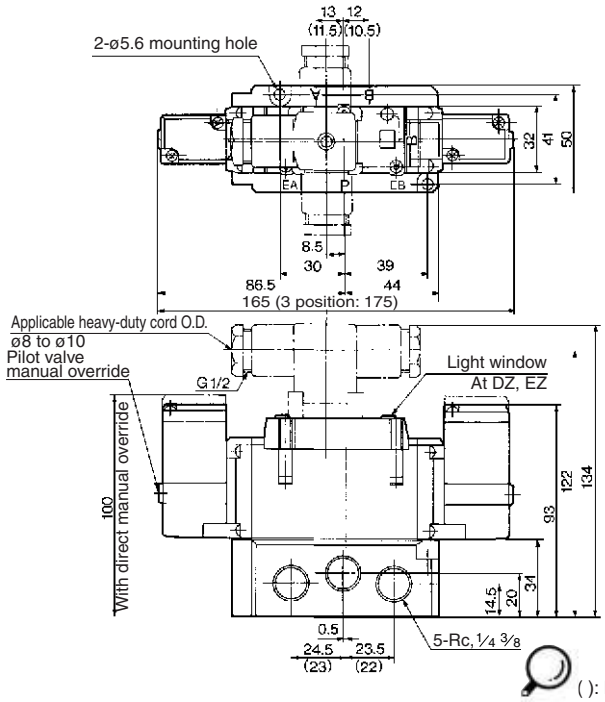




Bottom ported

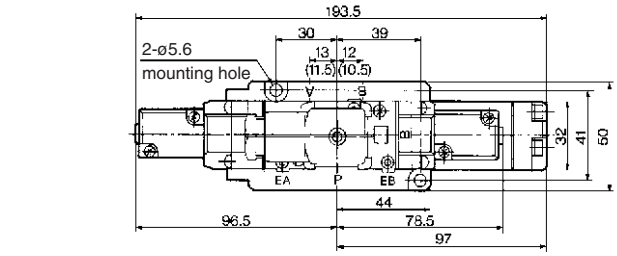
( ): Rc 1/4

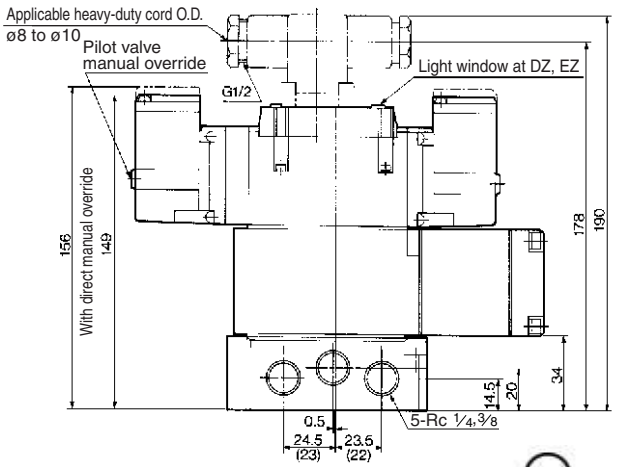
2 position double: VFS3210-□E, VFS3210-□D
3 position closed center: VFS3310-□E, VFS3310-□D
3 position exhaust center: VFS3410-□E, VFS3410-□D
3 position pressure center: VFS3510-□E, VFS3510-□D



( ): Rc 1/4

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



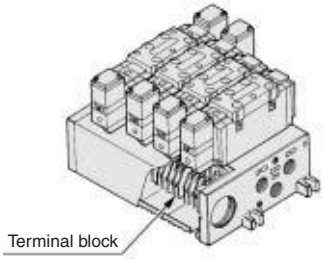


( ): Rc 1/4

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 □

- **VV5FS3**: Series VFS3000 Manifold
- **01T**: Plug-in type with terminal block
- **Stations**

02	2 stations
⋮	⋮
10	10 stations

- **Symbol**

Symbol	Passage P	Passage EA, EB	Porting specifications (A, B)
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

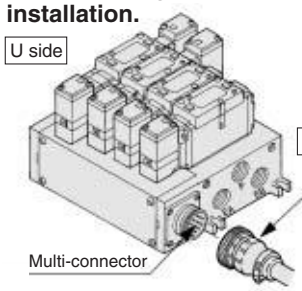
- **Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

∗ Option

Plug-in Type: With Multi-connector (Wiring specifications: Refer to page 3-8-8.)

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



VV5FS3 − 01C D − 05 2 − 02 □

- **VV5FS3**: Series VFS3000 Manifold
- **01C**: 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 P	Passage EA, EB	Porting specifications (A, B)
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

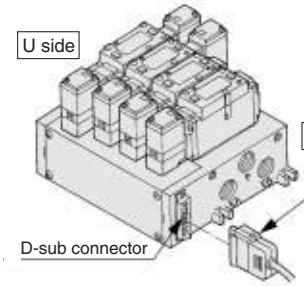
- **Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

∗ Option

Plug-in Type: With D-sub Connector (Wiring specifications: Refer to page 3-8-8.)

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



VV5FS3 − 01F D − 06 1 − 02 □

- **VV5FS3**: Series VFS3000 Manifold
- **01F**: 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 P	Passage EA, EB	Porting specifications (A, B)
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

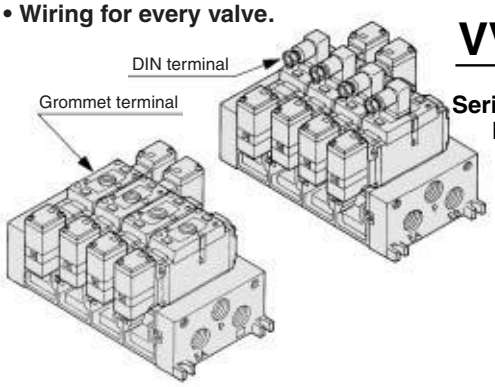
- **Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

∗ Option

Non Plug-in Type: Grommet Terminal, DIN Terminal

- **Wiring for every valve.**



VV5FS3 − 10 − 05 2 − 02 □

- **VV5FS3**: Series VFS3000 Manifold
- **10**: Non plug-in type
- **Stations**

02	2 stations
⋮	⋮
10	10 stations

- **Symbol**

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

∗ Option

- **Port size**

Symbol	P, EA, EB	A, B
02	Rc1/2	Rc 1/4
03		Rc 3/8
M		Mixed

- **Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

∗ Option

Series VFS3000

How to Order Manifold Assembly

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

<Example>
• Plug-in type with terminal block: 6 stations
(Manifold base) VV5FS3-01T-061-02 ····· 1
(2 position single) VFS3100-5FZ ····· 3
(2 position double) VFS3200-5FZ ····· 2
(Blanking plate) VVFS3000-10A ····· 1
<Example>
• Non plug-in type: 6 stations
(Manifold base) VV5FS3-10-061-03 ····· 1
(2 position single) VFS3110-5D ····· 5
(3 position exhaust center) VFS3410-5D ····· 1
(Individual EXH spacer) VVFS3000-R-03-2 ··· 1

Manifold Specifications

Base model	Wiring	Porting specifications	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

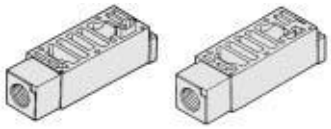
∗ Port size: Rc 3/8

Manifold Option Parts Assembly

Individual SUP spacer

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

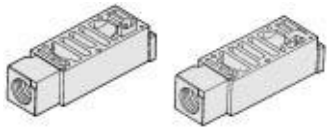
Body type	Plug-in type	Non plug-in type
Part no.	VVFS3000-P-03-1	VVFS3000-P-03-2



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 disk

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

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

∗ EXH block disk

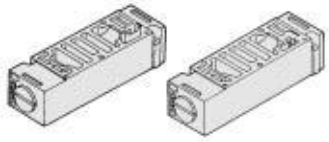
When valve exhaust affects the other stations on the circuit or when the reverse pressure valve is used to standard manifold valve, insert EXH block disk between stations to separate valve exhaust.

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.

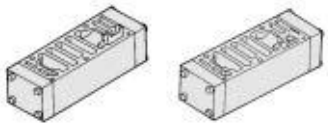
Body type	Plug-in type	Non plug-in type
Part no.	VVFS3000-20A-1	VVFS3000-20A-2



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.

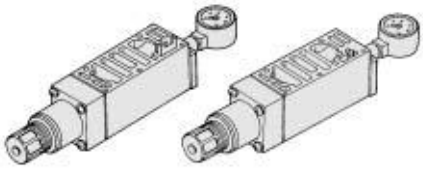
Body type	Plug-in type	Non plug-in type
Part no.	VVFS3000-22A-1	VVFS3000-22A-2



Interface regulator

Interface regulator set on manifold block can regulate the pressure to each valve. (Refer to page 3-8-6 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

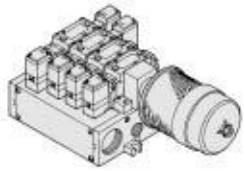
It is used by attaching on the manifold block for being prepared for removing a valve for maintenance reasons or planning to mount a spare valve, etc.

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

Manifold Option

With exhaust cleaner

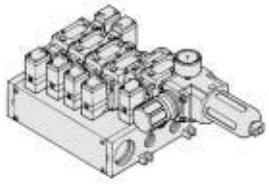
Plug-in type/Non Plug-in type
- **Valve exhaust noise dampening: 35 dB or more.**
- **Oil mist collection: Rate of collection 99.9% or more.**
- **Piping process reduced.**



For details, refer to page 3-8-63.

With control unit

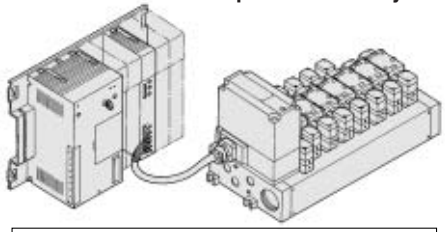
Plug-in type/Non Plug-in type
- **Filter, regulation valve, pressure switch and air release valve are all combined to form one unit.**
- **Piping processes are eliminated.**



For details, refer to page 3-8-65.

With serial interface unit for serial transmission

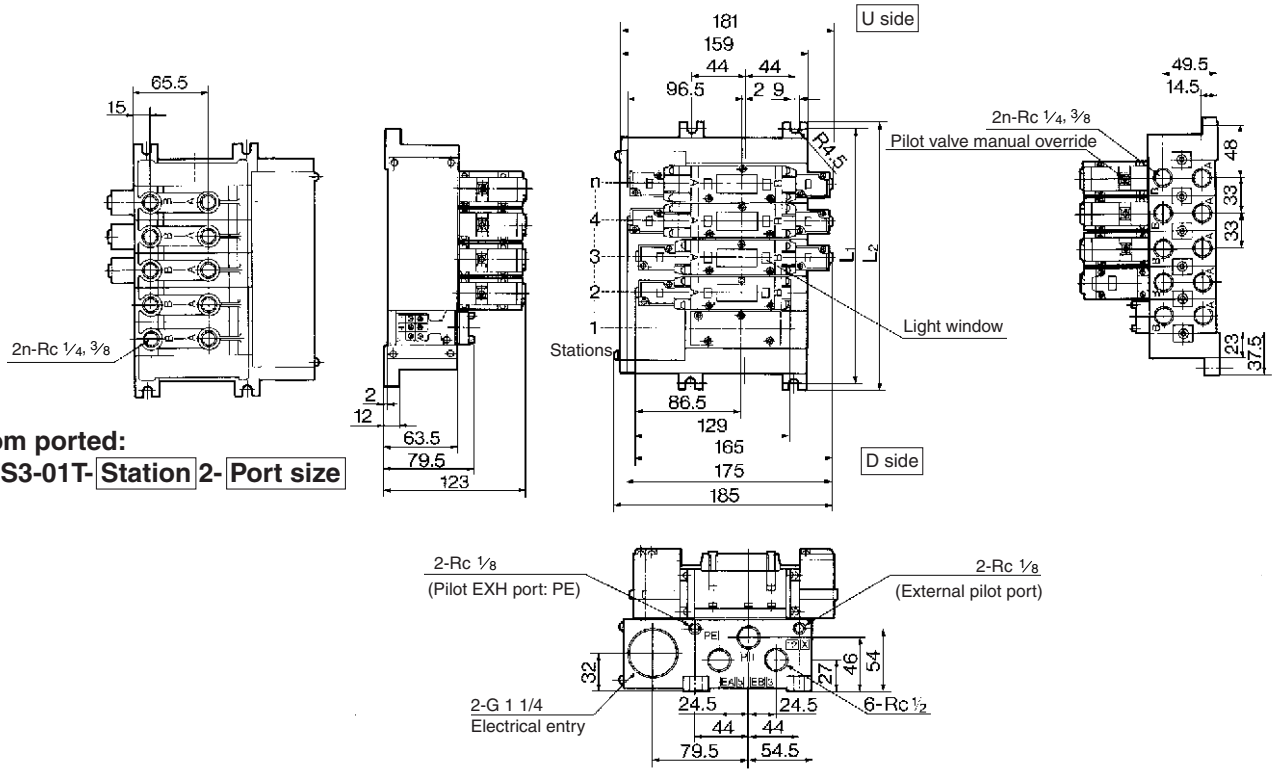
Plug-in type
- **Solenoid valve wiring process reduced considerably.**
- **Disperse installation possible. Manifold solenoid valve: 8 stations max. 32 positions (512 solenoids).**
- **Maintenance and inspection are easy.**



For details, refer to "Serial Transmission" catalog separately.

Manifold Plug-in type, Non plug-in type

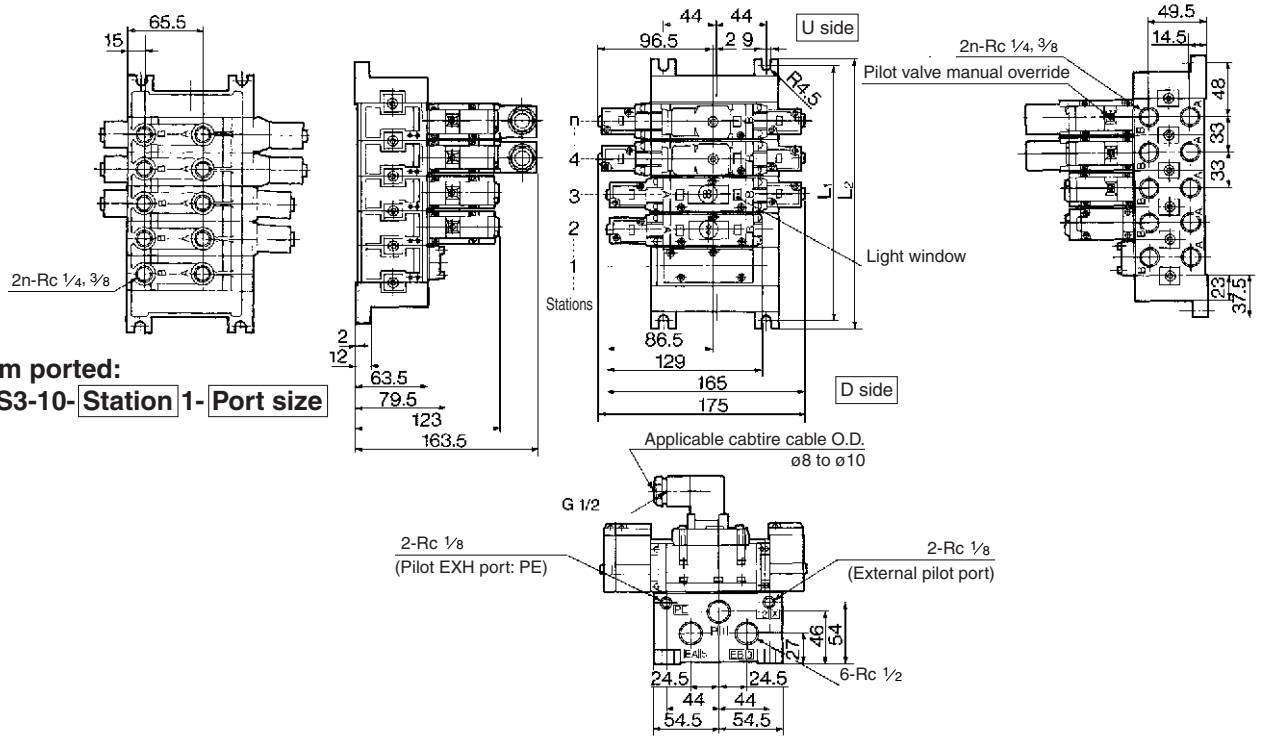
Plug-in type (With terminal block): VV5FS3-01T- Station 1- Port size



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

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

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



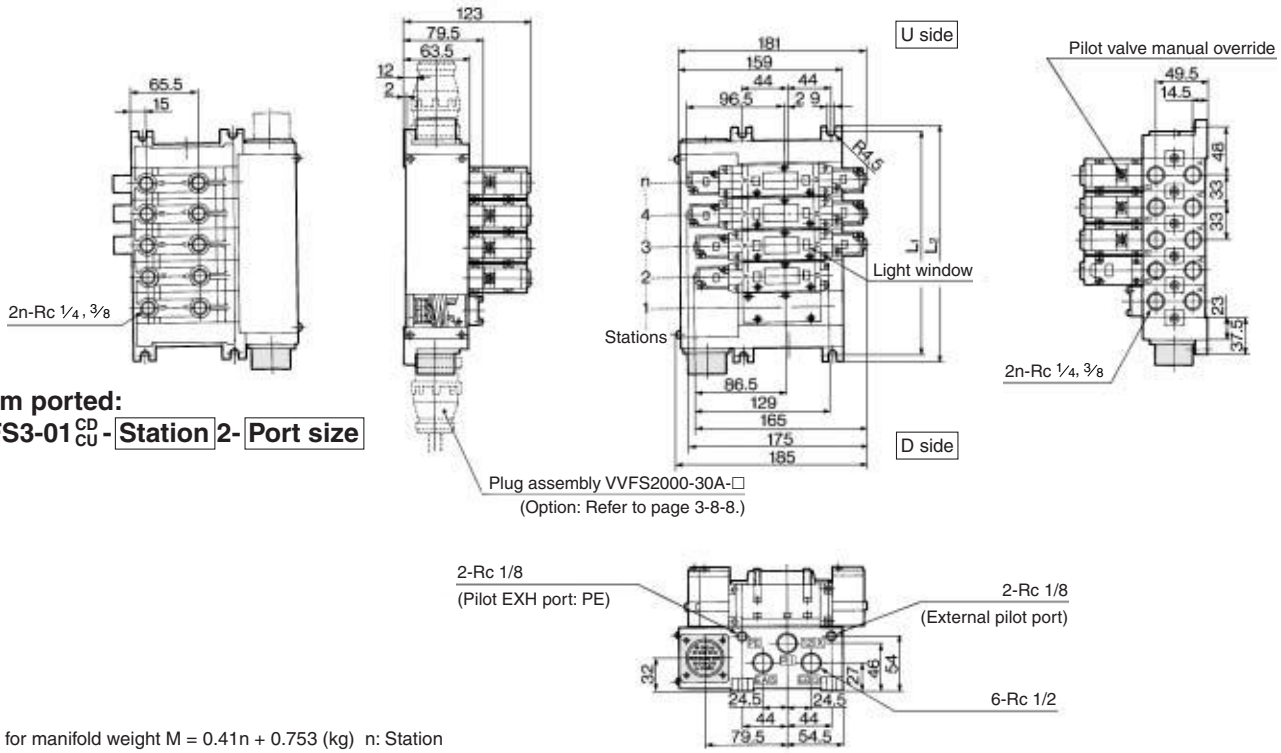
Bottom ported:
VV5FS3-10- Station 1- Port size

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

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

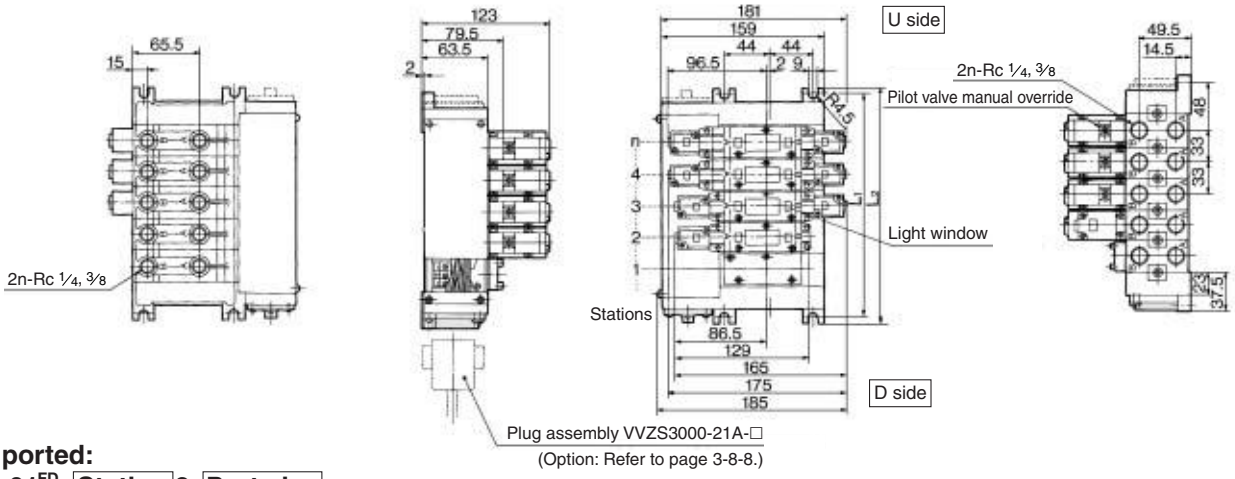


Bottom ported:
VV5FS3-01CD CU-Station 2-Port size

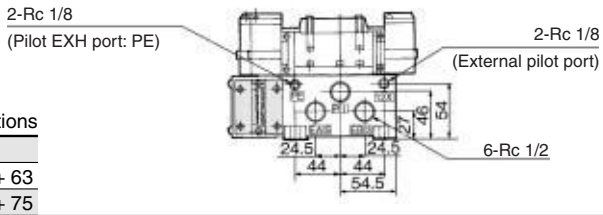
Formula for manifold weight M = 0.41n + 0.753 (kg) n: Station

* Wiring specifications: Refer to page 3-8-8.

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



Bottom ported:
VV5FS3-01FD FU-Station 2-Port size



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

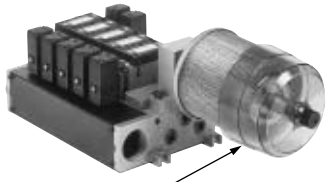
* Wiring specifications: Refer to page 3-8-8.

n: Stations

L \ Stations	2	3	4	5	6	7	8	Formula
L1	129	162	195	228	261	294	327	L1 = 33 x n + 63
L2	141	174	207	240	273	306	339	L2 = 33 x n + 75

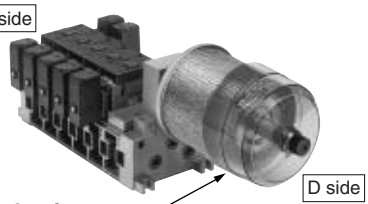
Manifold with Exhaust Cleaner

- **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	Rc 1/4, 3/8	
	1(P), 3(R2), 5(R1) port	P: Rc 1/2, EXH: Rc 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

⚠ Caution

When using an exhaust cleaner, mount it downwards.

* For details about exhaust cleaners, refer to Best Pneumatic Vol. 5.

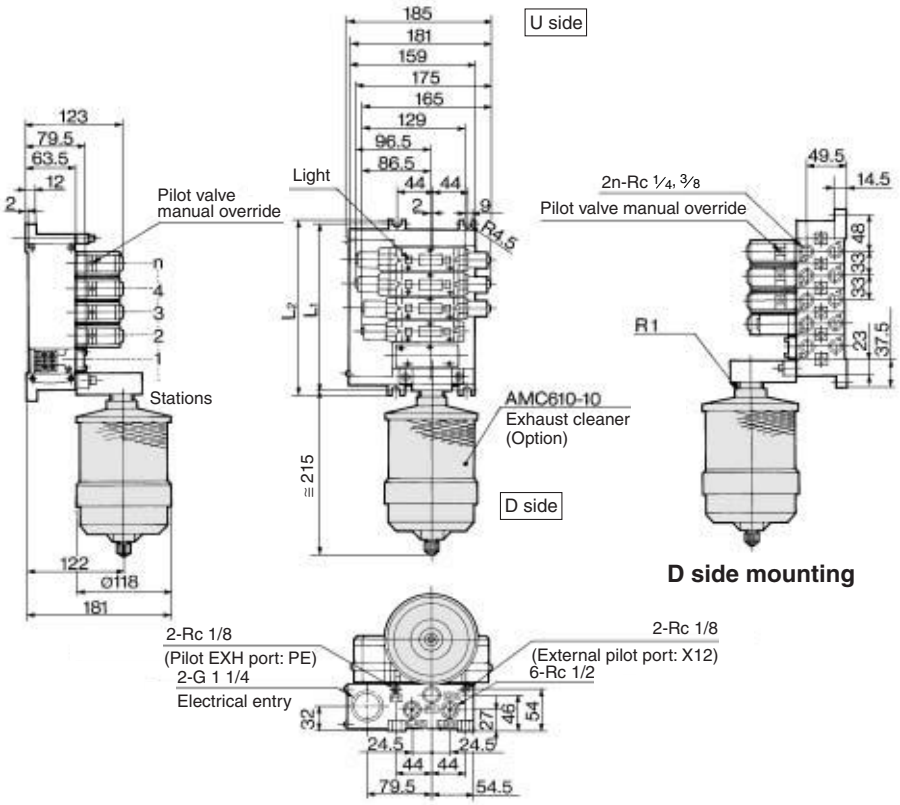
Please indicate manifold base type, corresponding valve, and option parts.

<Example>

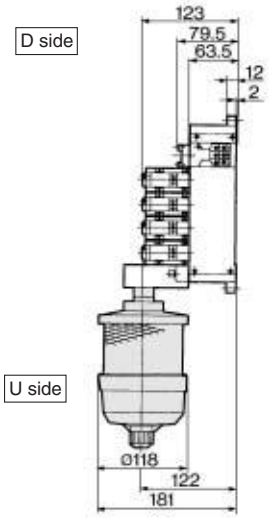
- Plug-in type with terminal block (6 stations)
  - (Manifold base) VV5FS3-01T-061-03-CD ····· 1
  - (2 position single) VFS3100-5FZ ····· 3
  - (2 position double) VFS3200-5FZ ····· 2
  - (Blanking plate) VVFS3000-10A ····· 1
  - (Exhaust cleaner) AMC610-10 ····· 1
- Non plug-in type (6 stations)
 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

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

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

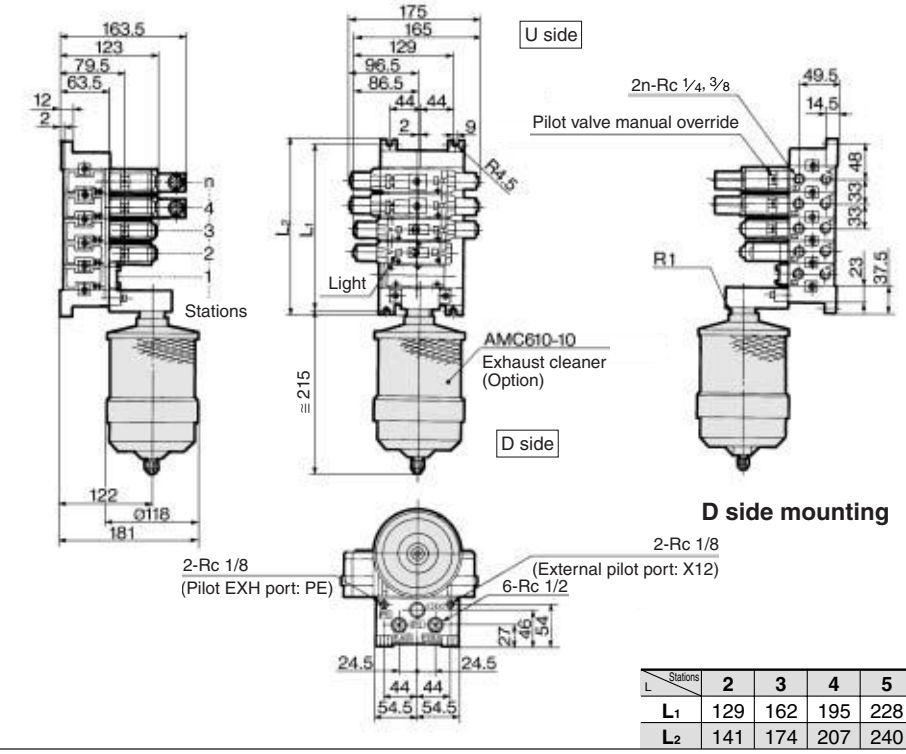


D side mounting

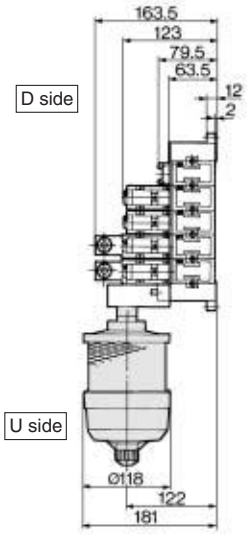


U side mounting

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



D side mounting



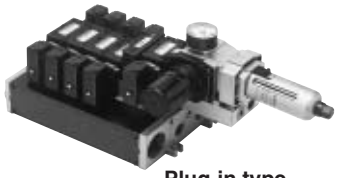
U side mounting

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	$L_2 = 33 \times n + 75$

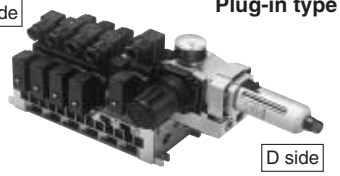
Manifold with Control Unit

- **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.**



Plug-in type

U side



D side

Non plug-in type

⚠ Caution

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

Manifold Specifications

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

VK
VZ
VF
VFR
VP4
VZS
VFS
VS4
VQ7
EVS
VFN

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*

* 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

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

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

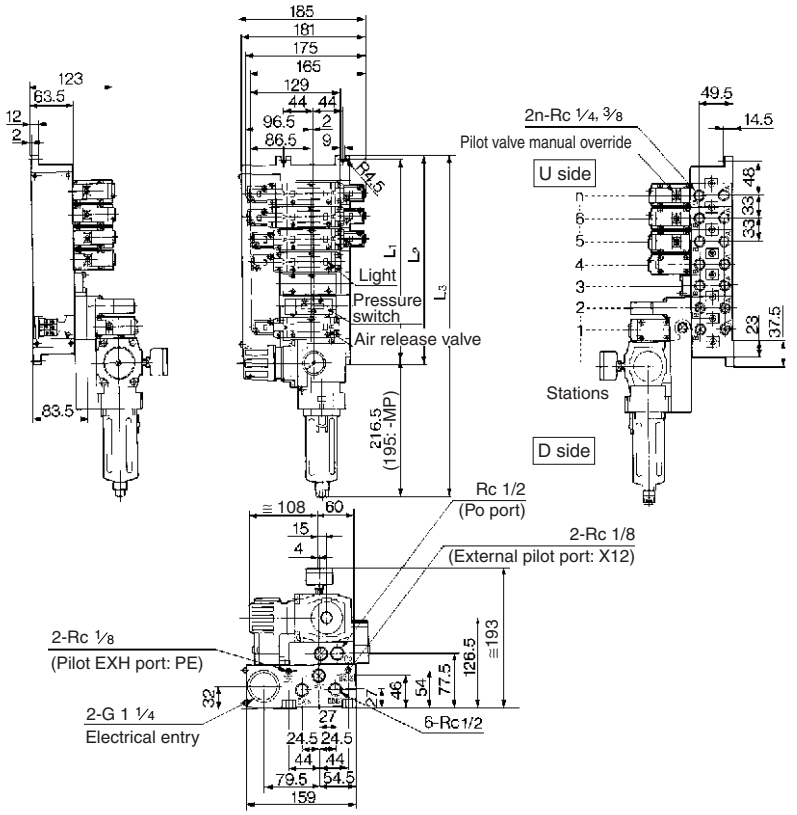
<Example>
- Plug-in type with terminal block — In order to mount control unit, it requires 2 stations.
  (Manifold base) VV5FS3-01T-081-03-AP5 ····· 1
  (2 position single) VFS3100-5FZ ····· 4
  (2 position double) VFS3200-5FZ ····· 2

<Example>
- 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

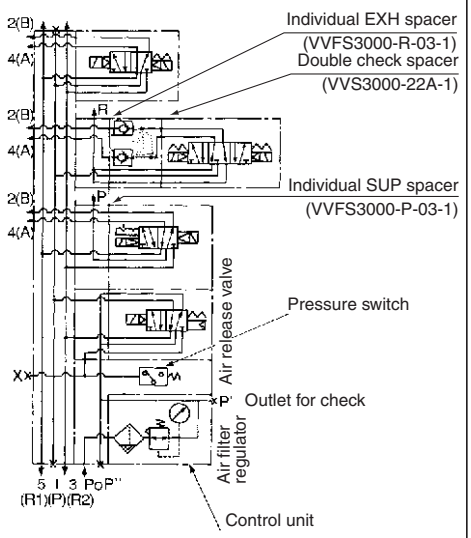
Manifold with Control Plug-in type, Non plug-in type

Plug-in type:

VV5FS3-01T- Station 1- Port size -AP Voltage for release valve

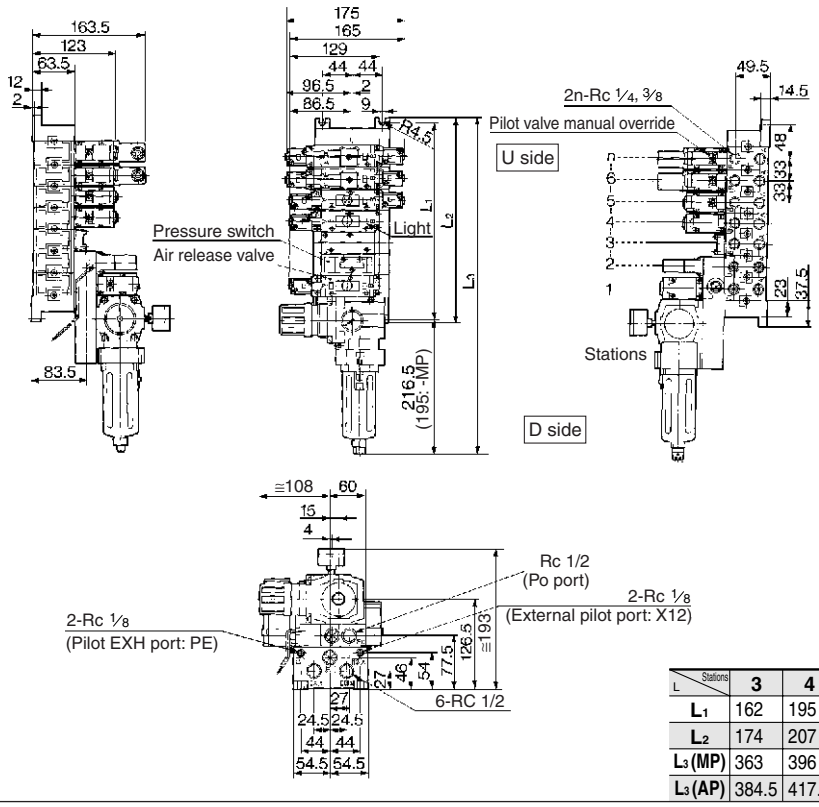


Example for manifold

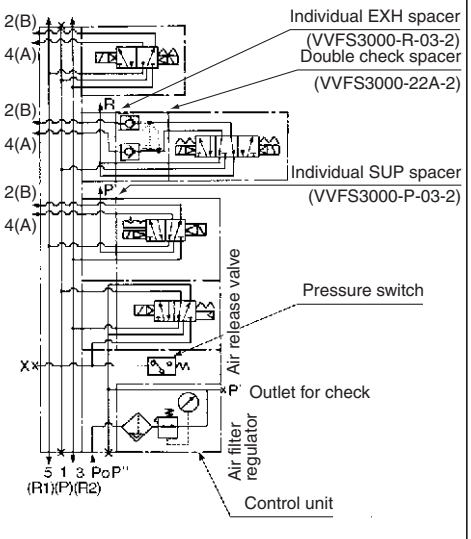


Non plug-in type:

VV5FS3-10- Station 1- Port size -AP Voltage for release valve



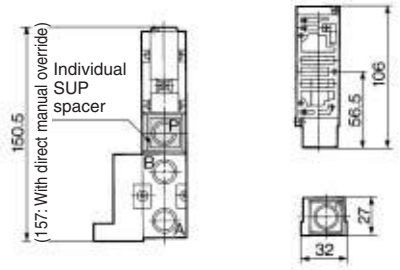
Example for manifold



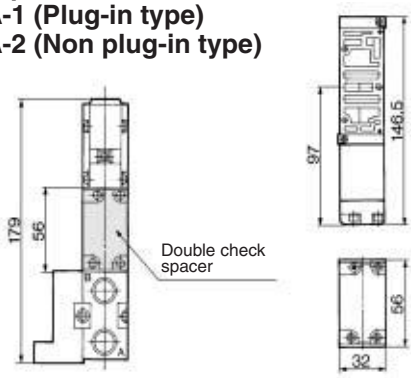
L \ Stations	3	4	5	6	7	8	9	10	Formula
L1	162	195	228	261	294	327	360	393	L1 = 33 x n + 63
L2	174	207	240	273	306	339	372	405	L2 = 33 x n + 75
L3 (MP)	363	396	429	462	495	528	561	594	L3 = 33 x n + 264
L3 (AP)	384.5	417.5	450.5	483.5	516.5	549.5	582.5	615.5	L3 = 33 x n + 285.5

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

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

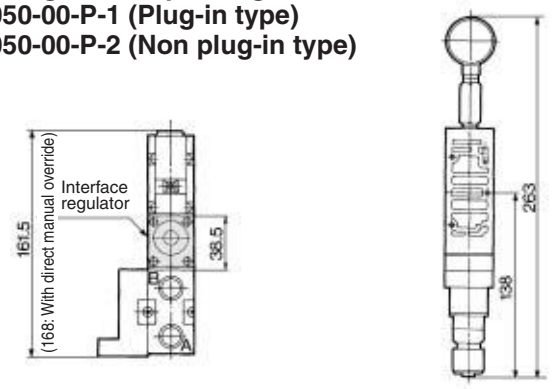


Double check spacer:
VVFS3000-22A-1 (Plug-in type)
VVFS3000-22A-2 (Non plug-in type)

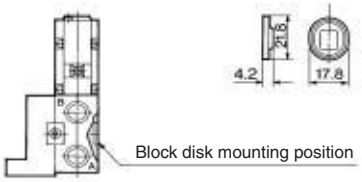


Individual EXH spacer:
VVFS3000-R-03-1 (Plug-in type)
VVFS3000-R-03-2 (Non plug-in type)

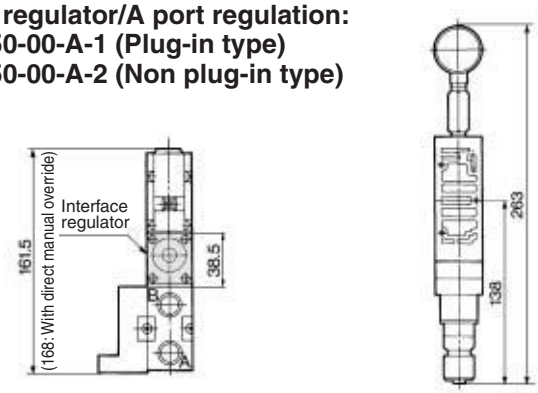
Interface regulator/P port regulation:
ARBF3050-00-P-1 (Plug-in type)
ARBF3050-00-P-2 (Non plug-in type)



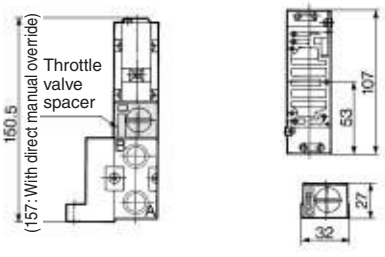
SUP/EXH block disk: AXT636-1A



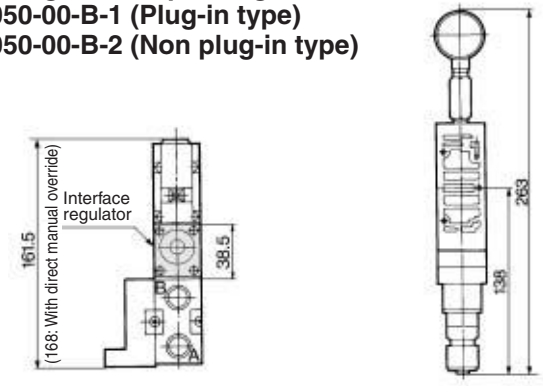
Interface regulator/A port regulation:
ARBF3050-00-A-1 (Plug-in type)
ARBF3050-00-A-2 (Non plug-in type)



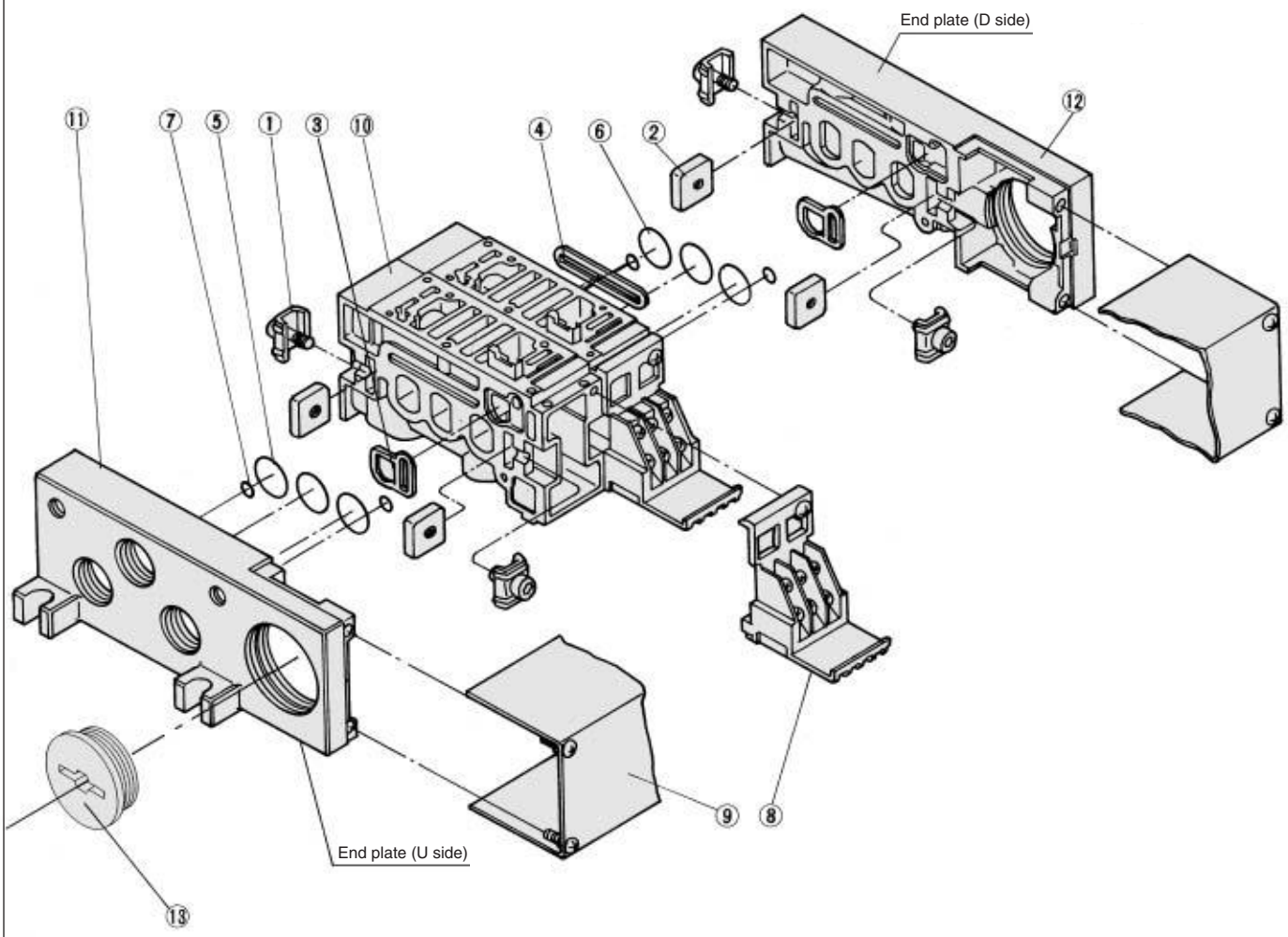
Throttle valve spacer:
VVFS3000-20A-1 (Plug-in type)
VVFS3000-20A-2 (Non plug-in type)



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



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



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 01SU	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

Model

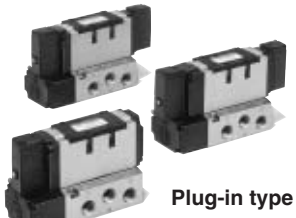
Type of actuation		Model: Plug-in	Model: Non plug-in	Port size	Flow characteristics (1): 1 → 4/2 (P → A/B) C [dm³/(s·bar)]	b	Cv	4/2 → 5/3 (A/B → R1/R2) C [dm³/(s·bar)]	b	Cv	Max. operating cycle (cpm) (1)	Response time (ms) (2)	Weight (kg) (3)(4)
2 position	Single	**VFS4100**	**VFS4110**	3/8	11	0.18	2.6	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	11	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

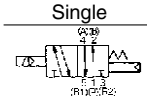
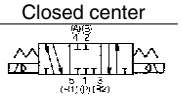
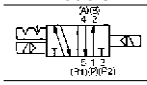
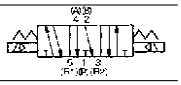
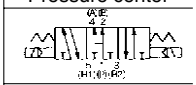
Easy maintenance
2 types of sub-plates:
Plug-in and non plug-in



Plug-in type

Non plug-in type

JIS Symbol

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

Standard Specifications

Valve specifications	Fluid		Air/Inert gas
	Maximum operating pressure		1.0 MPa
	Minimum operating pressure	2 position	0.1 MPa
		3 position	0.15 MPa
	Proof pressure		1.5 MPa
	Ambient and fluid temperature		–10 to 60°C (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

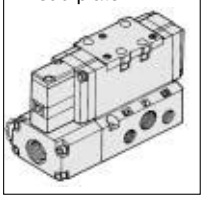
Note) Operating pressure: 0 to 1.0 MPa
Pilot pressure 2 position: 0.1 to 1.0 MPa, 3 position: 0.15 to 1.0 MPa

Series VFS4000

How to Order

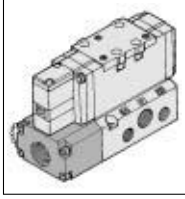
Body type

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 (Option), bottom piping is not available.

Port size

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

* EA, EB: Rc 3/8

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

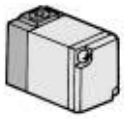
* Option

Plug-in VFS4 2 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)

* Option

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.

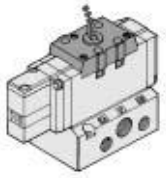
Symbol

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

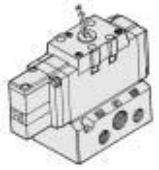
Coil rated voltage

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
9*	Other

* Option

Body type

1: Non plug-in type sub-plate



Pilot type

Nil	Internal pilot
R*	External pilot

* Option

Body option

0	Standard
1*	Direct manual override

* Option

How to Order Pilot Valve Assembly

SF4 — 1 F ☐ — 30

Coil rated voltage

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

* Option

Manual override

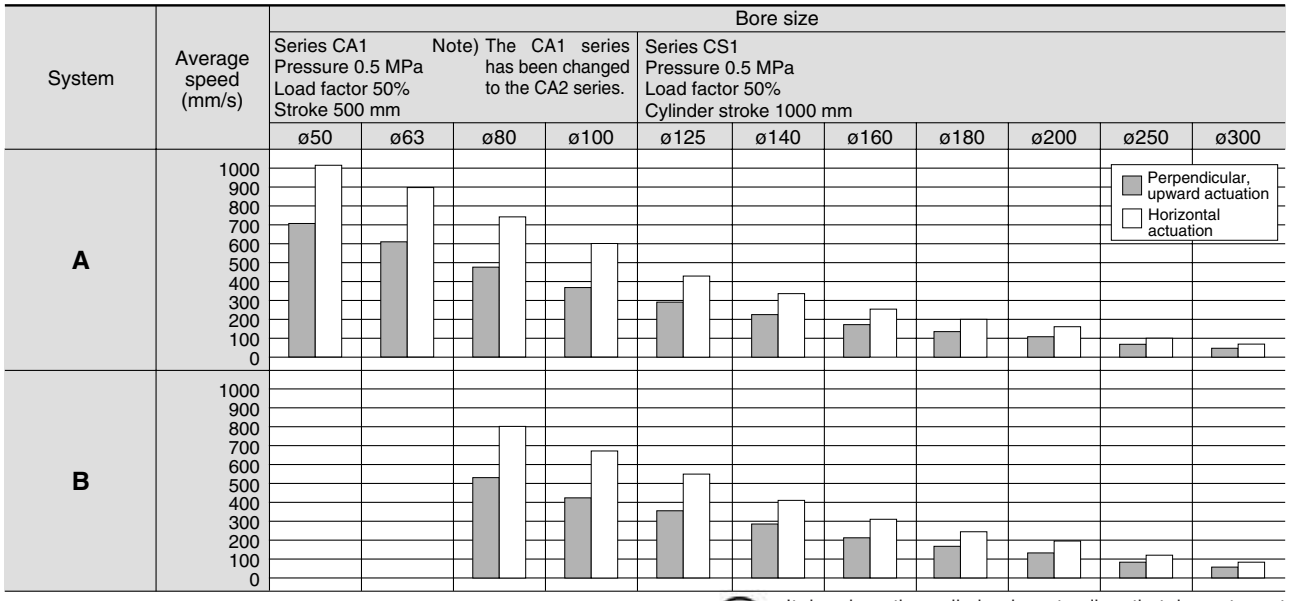
Nil	Non-locking push type (Flush)
A*	Non-locking push type (Extended)
B*	Locking type (Tool required)
C*	Locking type (Lever)

* Option

* Refer to page 3-8-5 for voltage conversion.

Cylinder Speed Chart

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



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

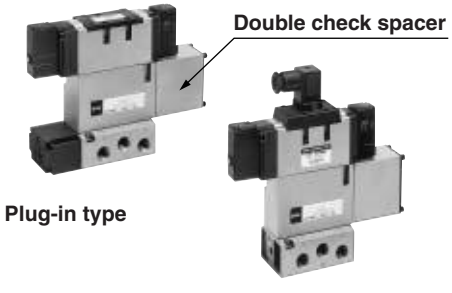
System Components

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

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

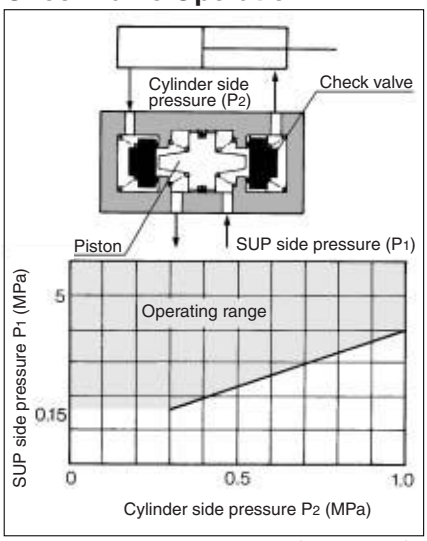
Double check spacer part no.	Plug-in type			Non plug-in type
	VVFS4000-22A-1			**VVFS4000-22A-2**
Applicable valve model	VFS4400-□F			VFS4410-□D VFS4410-□E
Leakage ∗ (cm³/min)	Solenoid one side energized	P	EA	230 or less
			EB	
	Solenoid both sides de-energized	P	EA	230 or less
			EB	
		A	EA	0
		B	EB	

∗ Supply pressure: 0.5 MPa

⚠ 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

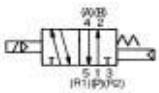


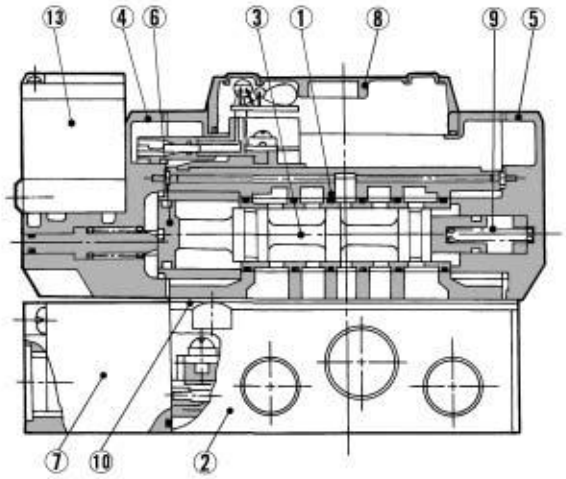
- The combination of VFS41$^{0}_{1}$0, VFS42$^{0}_{1}$0 and Double check spacer for prevention of falling at the stroke end but cannot hold the intermediate position of the cylinder.

Series VFS4000

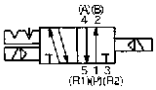
Construction

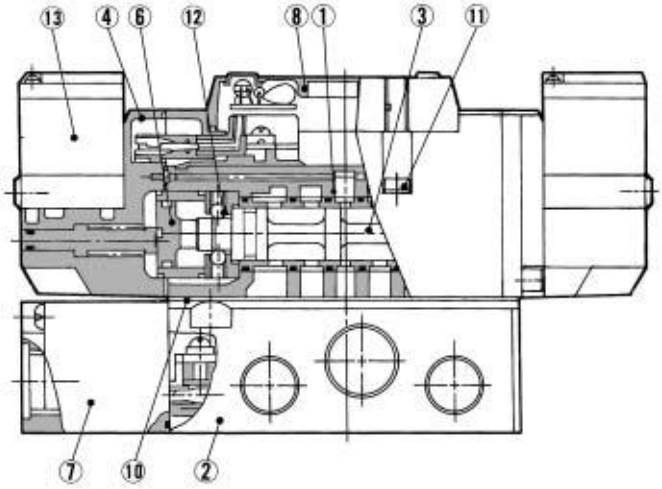
2 position single





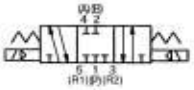
2 position double



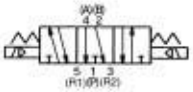


3 position closed center/exhaust center/pressure center

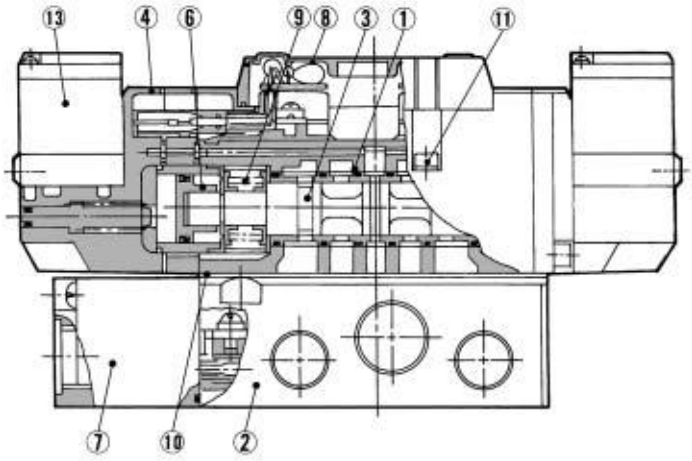
Closed center



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	Aluminum die-casted	Black
⑤	End plate	Aluminum die-casted	Black
⑥	Piston	Resin	—
⑦	Junction cover	Resin	—
⑧	Light cover	Resin	—

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.

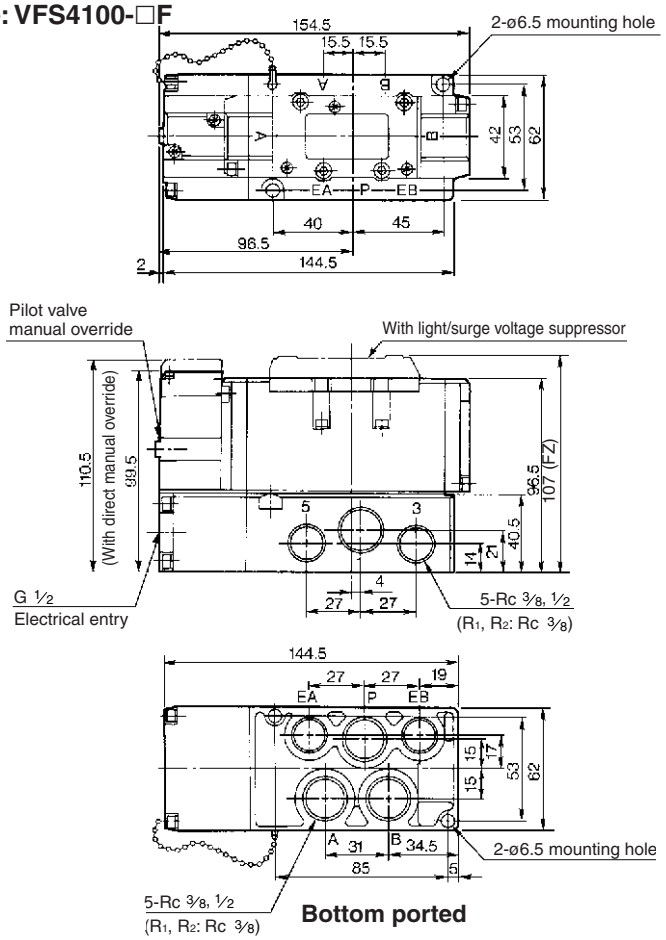
Part no. for mounting bolt and gasket
BG-VFS4000

Replacement Parts

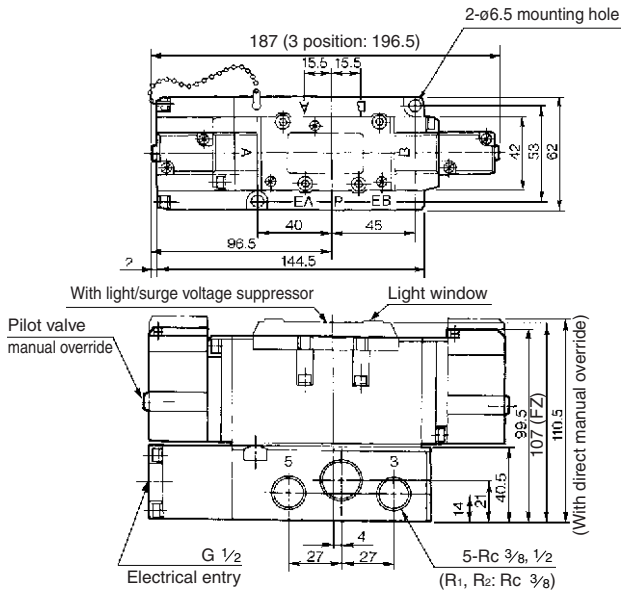
No.	Description	Material	Part no.		
			VFS41□□	**VFS42□□**	**VFS43□□/44□□/45□□**
⑨	Return spring	Stainless steel	VF4000-18-1	—	VF4000-18-2A
⑩	Gasket	NBR	VF4000-20-1	VF4000-20-1	VF4000-20-1
⑪	Hexagon socket head screw	Steel	M4 x 40	M4 x 40	M4 x 40
⑫	Detent assembly	—	—	VF4000-12A	—
⑬	Pilot valve assembly	—	Refer to “How to Order Pilot Valve Assembly” on page 3-8-70.		

Plug-in 2 position single/double, 3 position closed center/exhaust center/pressure center/double check

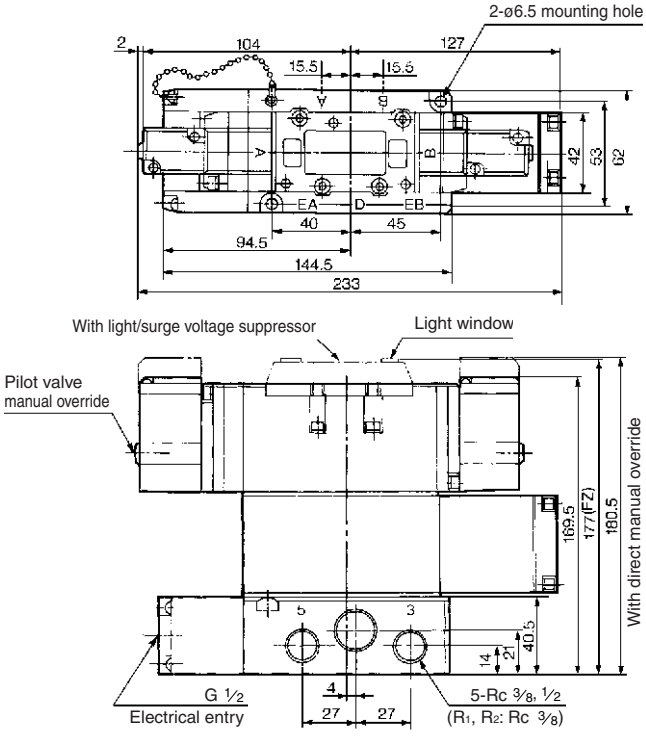
2 position single: VFS4100-□F



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

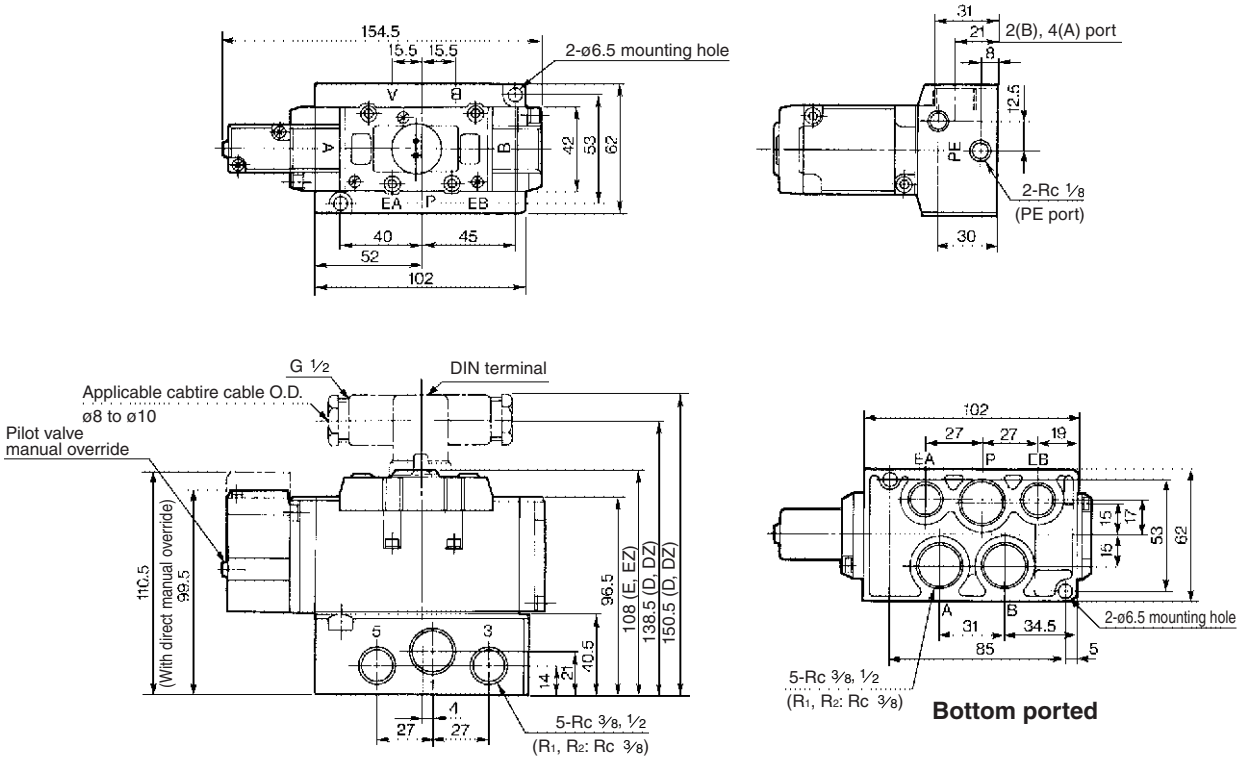


3 position double check: VFS4600-□F

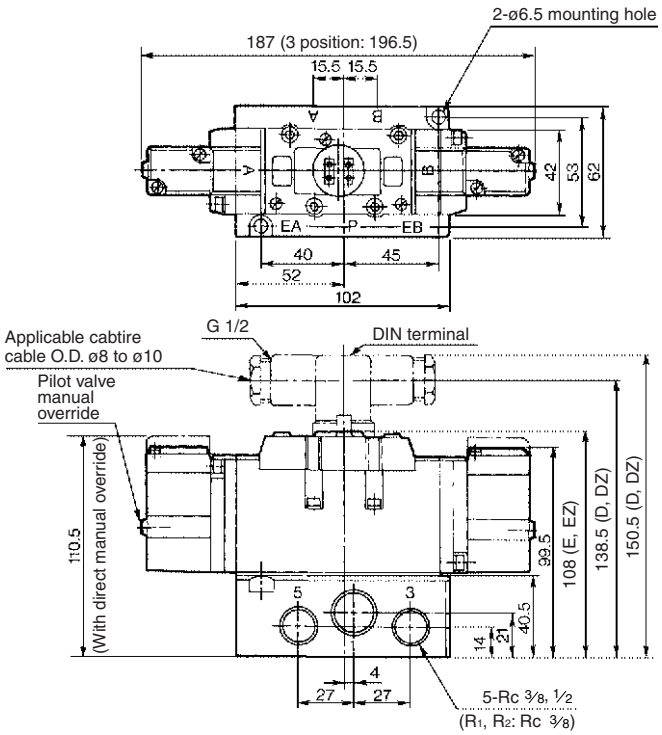


Non Plug-in 2 position single/double, 3 position closed center/exhaust center/pressure center/double check

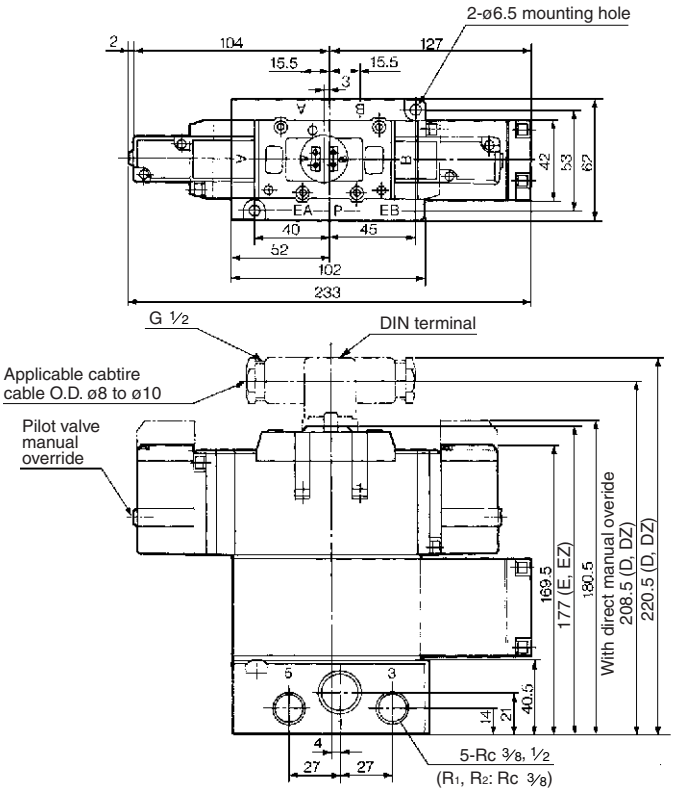
2 position single: VFS4110-□E, VFS4110-□D



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



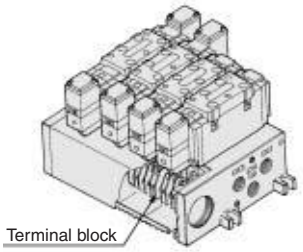
3 position double check: VFS4610-□E, VFS4610-□D



Series VFS4000
Manifold Specifications

Plug-in Type: With Terminal Block

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



VV5FS4 − 01T − 06 1 − 03 □

- **Series VFS4000 Manifold**
- **Plug-in type with terminal block**
- **Stations**

02	2 stations
⋮	⋮
10	10 stations

- **Symbol**

Symbol	Passage P	Passage R1, R2	Porting specifications (A, B)
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.

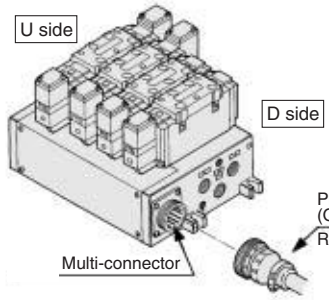
- **Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

Plug-in Type: With Multi-connector (Wiring specifications: Refer to page 3-8-8.)

- **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 P	Passage R1, R2	Porting specifications (A, B)
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.

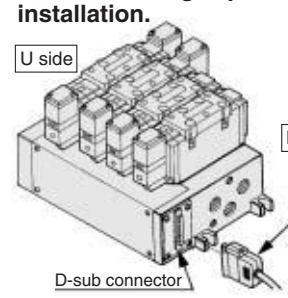
- **Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

Plug-in Type With: D-sub Connector (Wiring specifications: Refer to page 3-8-8.)

- **Wide range of interchangeability (MIL Spec DIN 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 P	Passage R1, R2	Porting specifications (A, B)
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.

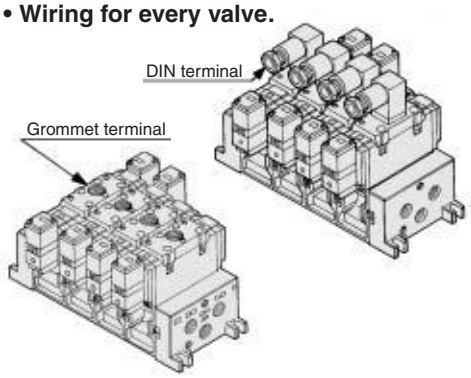
- **Thread type**

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 P	Passage R1, R2	Porting specifications (A, B)
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.

- **Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

Series VFS4000

How to Order Manifold Assembly

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

<Example>

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

Manifold Specifications

Base model	Wiring	Porting specifications	Port size Rc		Stations	Applicable valve model
		A, B port	P, EA, EB	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

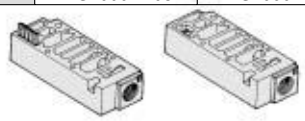
* Port size: Rc 1/2

Manifold Option Parts Assembly

Individual SUP spacer

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

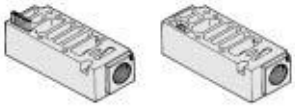
Body type	Plug-in type	Non plug-in type
Part no.	VVFS4000-P-03-1	VVFS4000-P-03-2



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 disk

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

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

* EXH block disk

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 disk in between stations to separate valve exhaust.

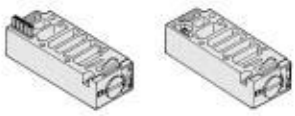
Body type	Plug-in type	Non plug-in type
Part no.	AXT634-11A	

EXH block disk SUP block disk

Throttle valve spacer

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

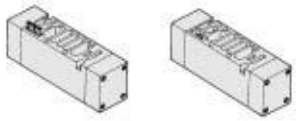
Body type	Plug-in type	Non plug-in type
Part no.	VVFS4000-20A-1	VVFS4000-20A-2



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.

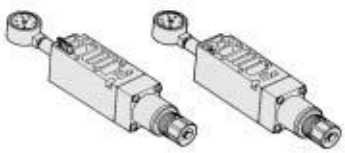
Body type	Plug-in type	Non plug-in type
Part no.	VVFS4000-22A-1	VVFS4000-22A-2



Interface regulator

Interface regulator set on manifold block can regulate the pressure to each valve. (Refer to page 3-8-6 for "Flow Characteristics".)

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

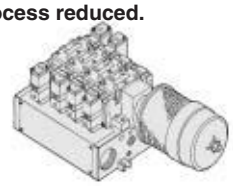
Body type	Plug-in type	Non plug-in type
Part no.	VVFS4000-10A	

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.**

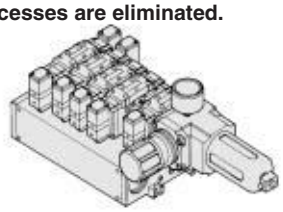


For details, refer to page 3-8-79.

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.**

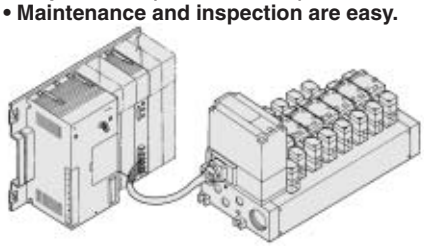


For details, refer to page 3-8-81.

With serial interface unit for serial transmission

Plug-in type

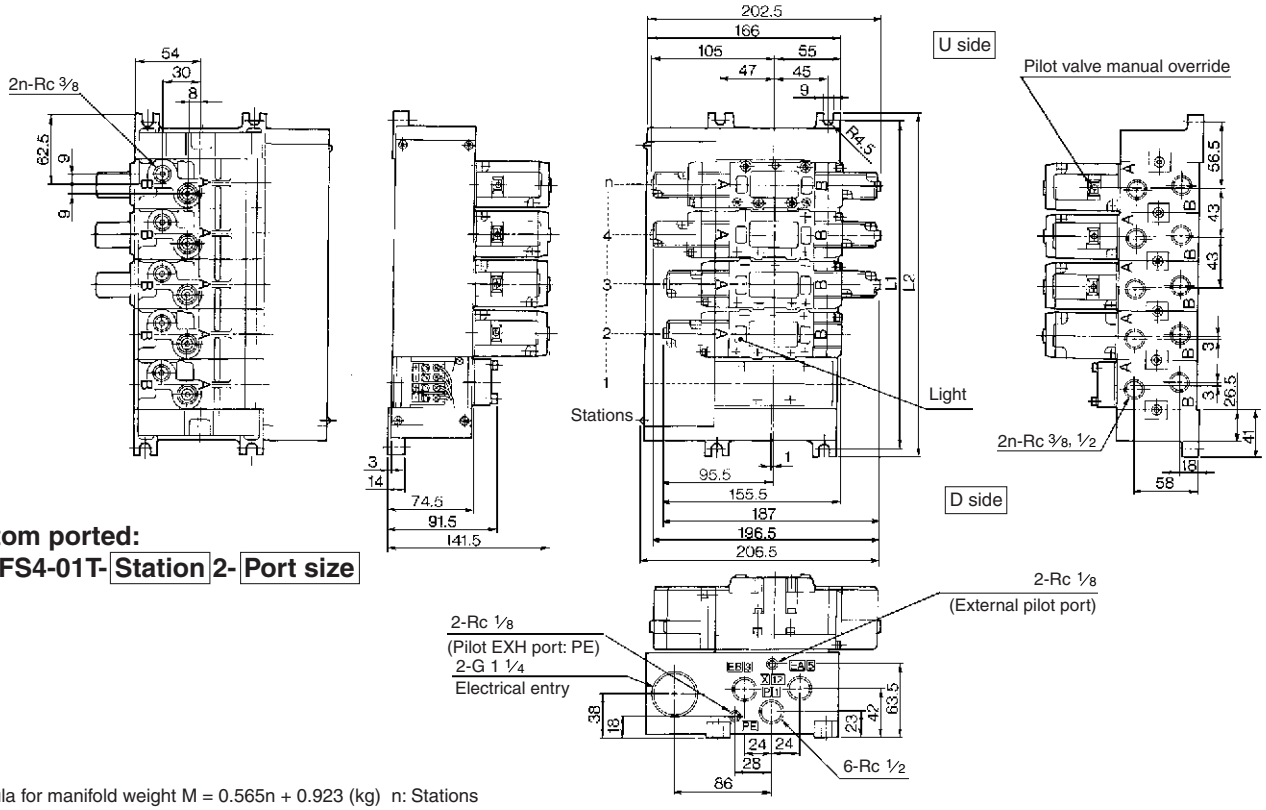
- **Solenoid valve wiring process reduced considerably.**
- **Disperse installation possible. Manifold solenoid valve: 8 stations max. 32 positions (512 solenoids).**
- **Maintenance and inspection are easy.**



For details, refer to "Serial Transmission" catalog separately.

Manifold Plug-in type, Non plug-in type

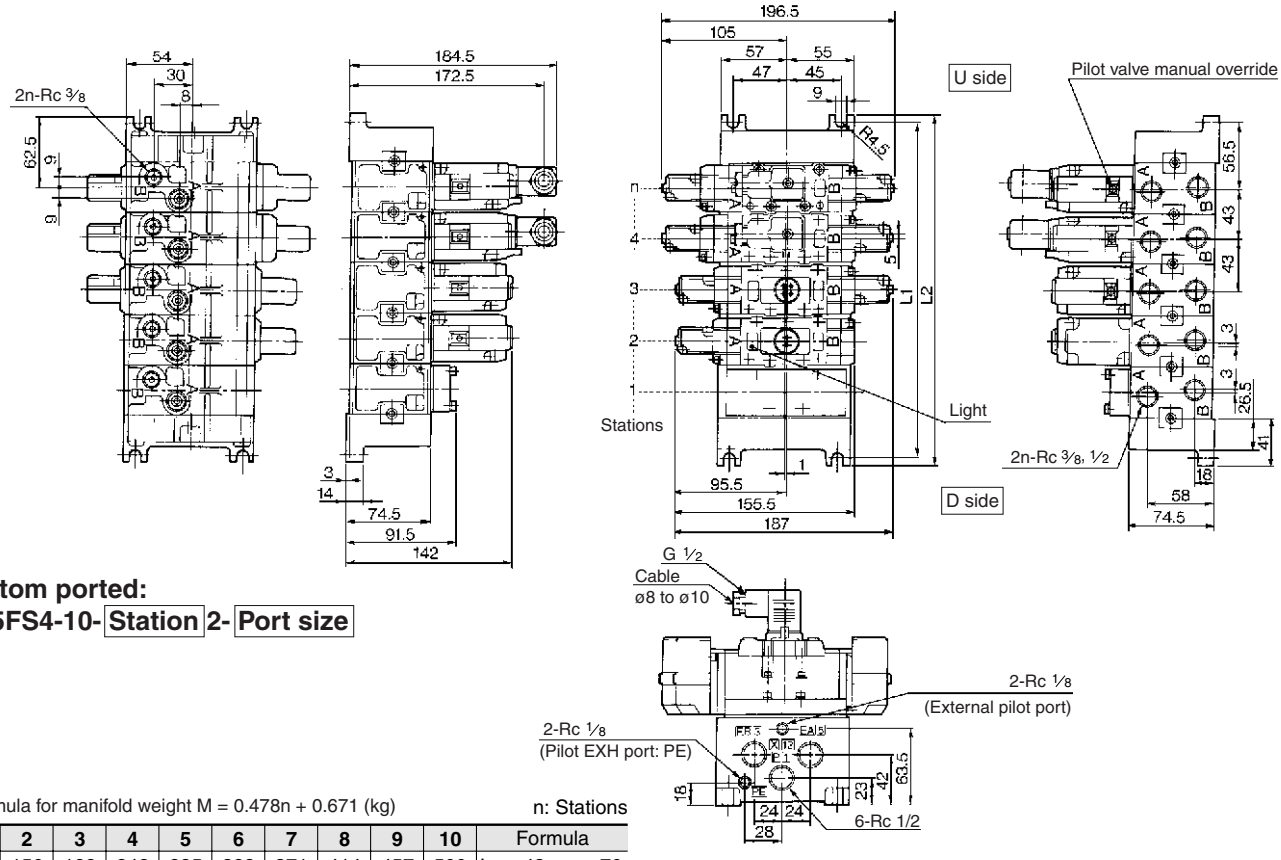
Plug-in type (With terminal block): VV5FS4-01T-[Station]1-[Port size]



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]

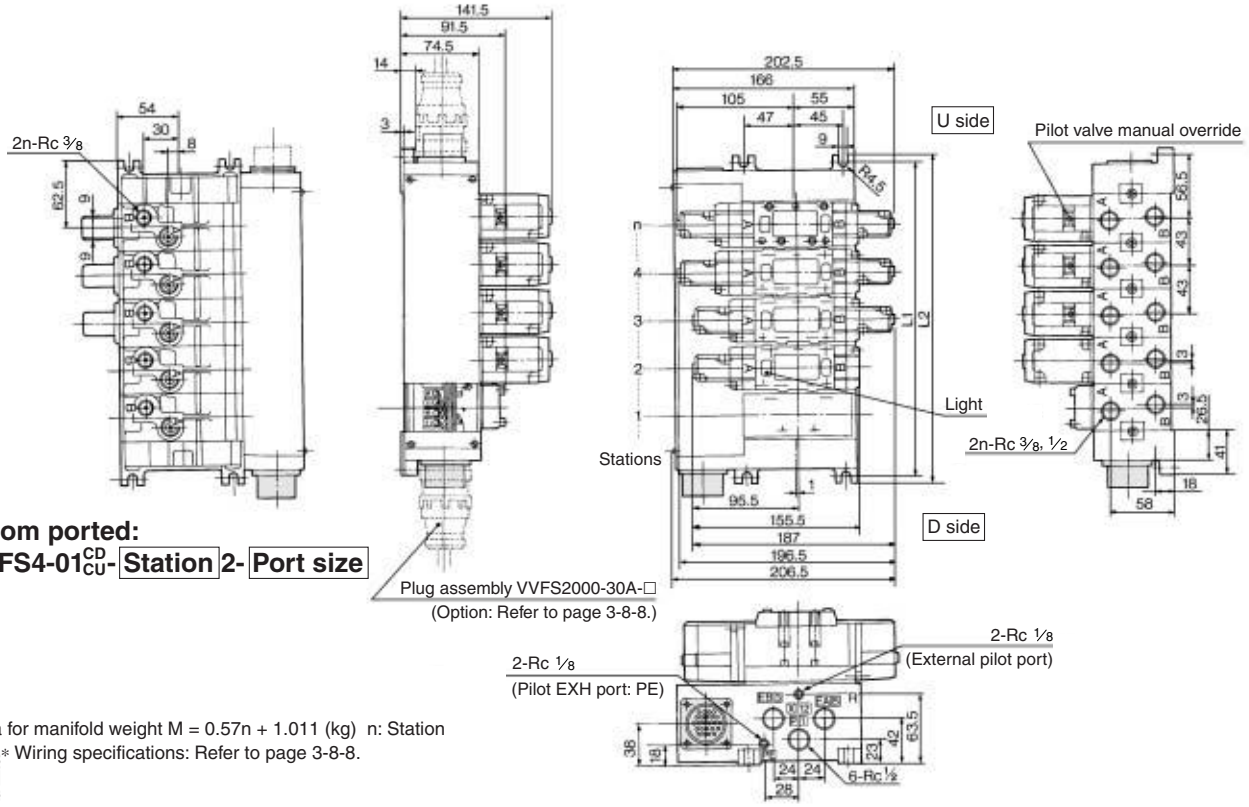
Formula for manifold weight M = 0.478n + 0.671 (kg) n: Stations

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	$L_2 = 43 \times n + 82$

Series VFS4000

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

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

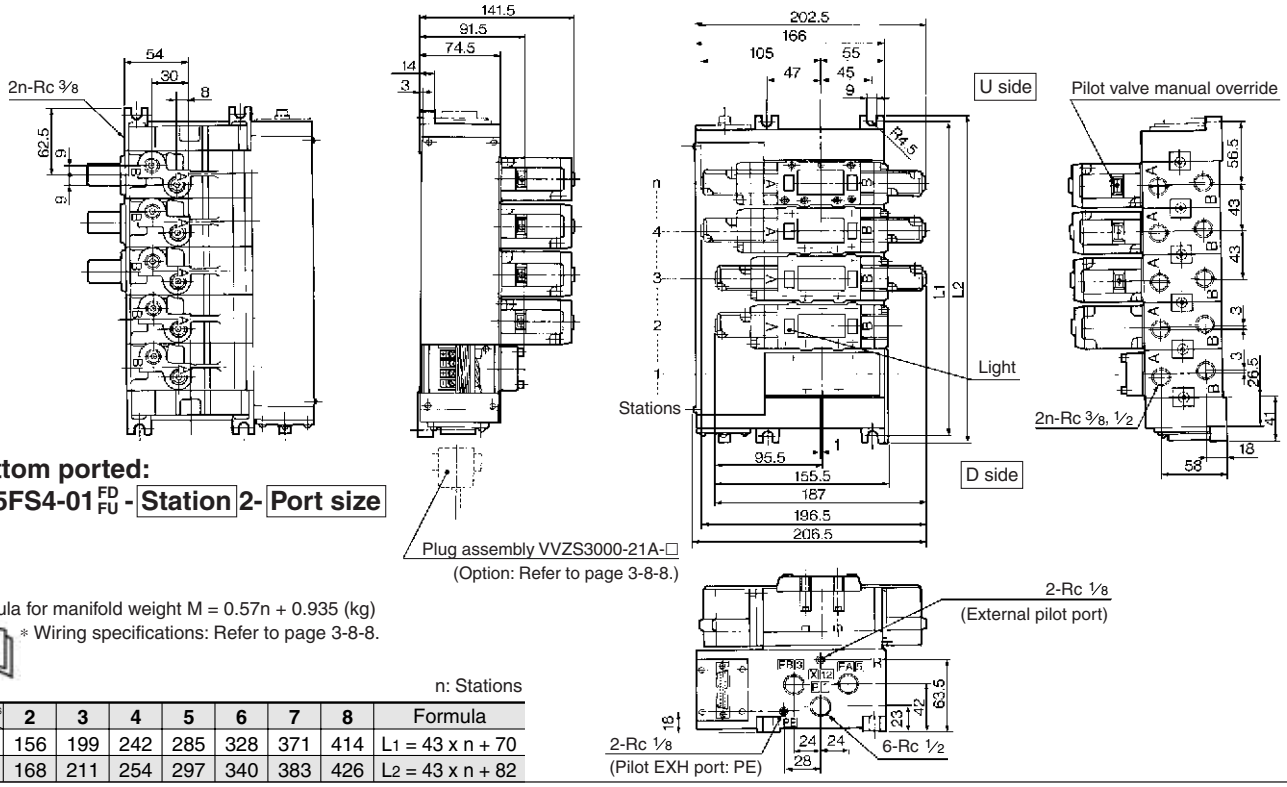


Bottom ported:
VV5FS4-01$^{CD}_{CU}$-Station 2-Port size

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

∗ Wiring specifications: Refer to page 3-8-8.

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)

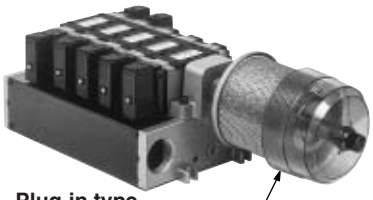
∗ Wiring specifications: Refer to page 3-8-8.

n: Stations

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

Manifold with Exhaust Cleaner

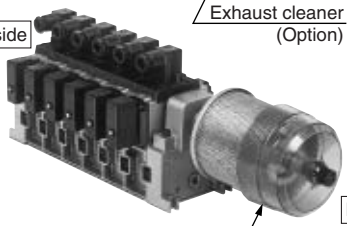
- **Serves to protect working environment.**
- **Valve exhaust noise dampening: 35 dB or more.**
- **Collection rate of drainage and oil mist: 99.9% or more.**
- **Piping work is reduced.**



Plug-in type

Exhaust cleaner (Option)

U side



D side

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: Rc 3/8, 1/2, Bottom: Rc 3/8 (Option)	
	1(P), 3(R2), 5(R1) port	P: Rc 1/2, EXH: Rc 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

Symbol

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

* Option

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

Exhaust cleaner mounting direction

Symbol	Exhaust 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. 5 for Exhaust Cleaner details.

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

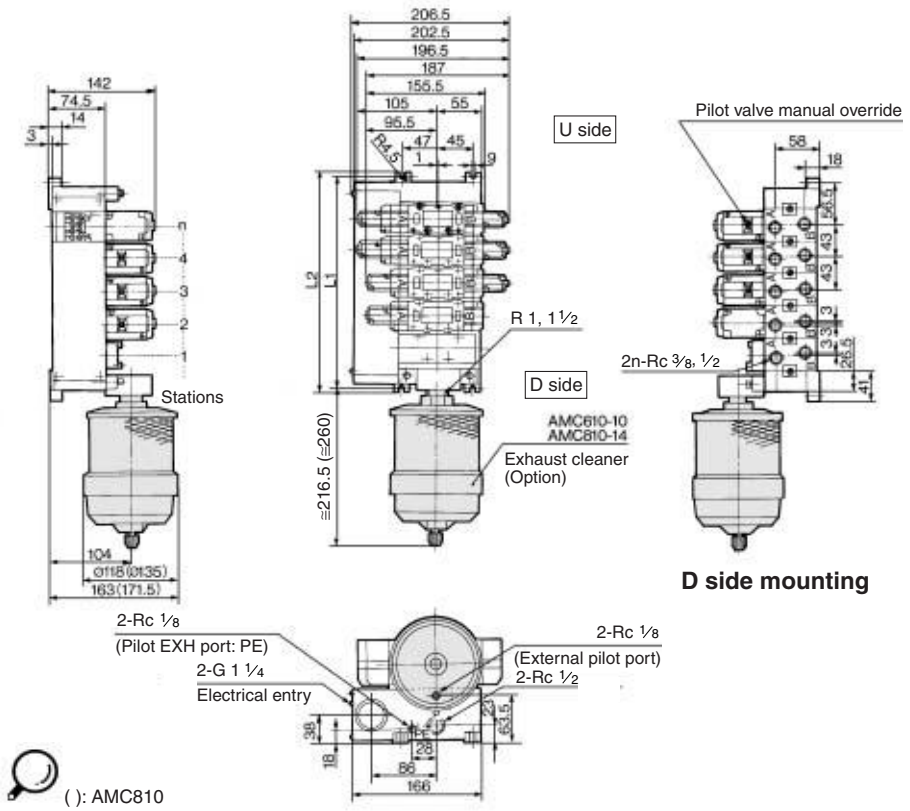
<Example>

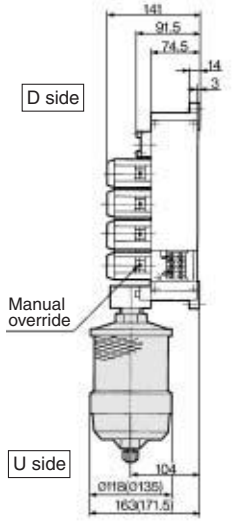
- Plug-in type with terminal block (6 stations)
  - (Manifold base) VV5FS4-01T-061-03-CD ····· 1
  - (2 position single) VFS4100-5FZ ····· 3
  - (2 position double) VFS4200-5FZ ····· 2
  - (Blanking plate) VVFS4000-10A ····· 1
  - (Exhaust cleaner) AMC610-10 ····· 1
- Non plug-in type (6 stations)
  - (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

Series VFS4000

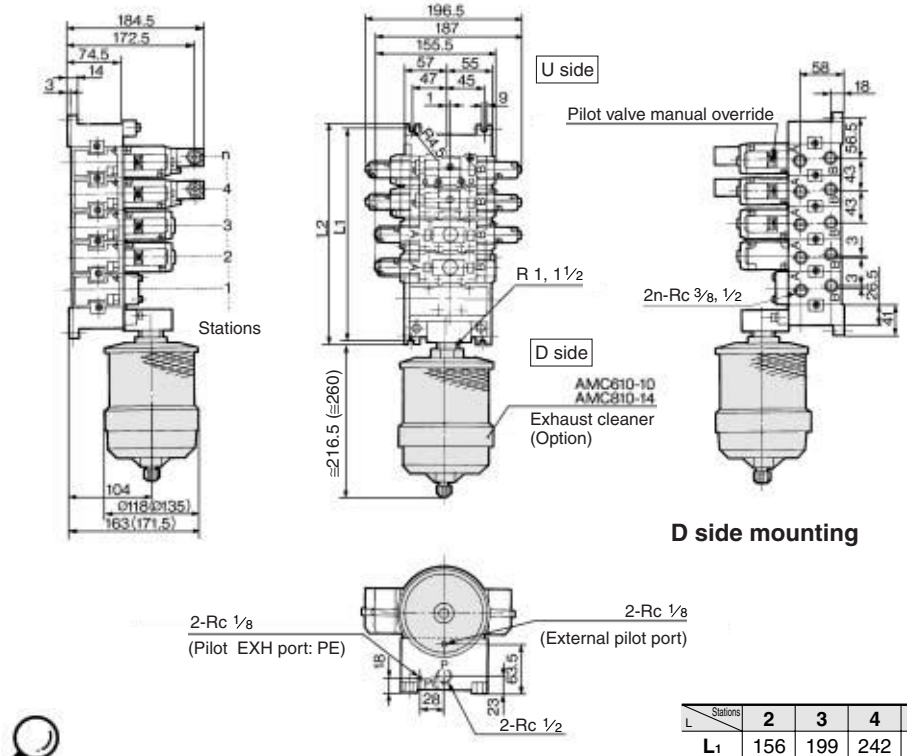
Manifold with Exhaust Cleaner — Plug-in type, Non plug-in type

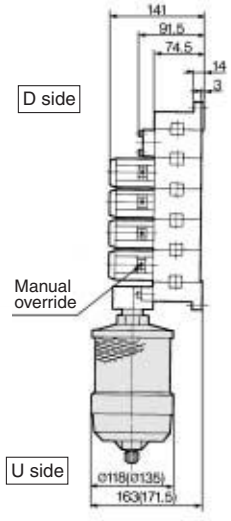
Plug-in type: VV5FS4-01T-[Station]1-[Port size]-$^{CD}_{CU}$





Non plug-in type: VV5FS4-10-[Station]1-[Port size]-$^{CD}_{CU}$



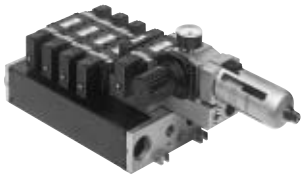


n: Stations

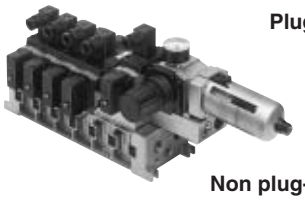
L / Stations	2	3	4	5	6	7	8	9	10	Formula
L_1	156	199	242	285	328	371	414	457	500	$L_1 = 43 \times n + 70$
L_2	168	211	254	297	340	383	426	469	512	$L_2 = 43 \times n + 82$

Manifold 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	Common SUP, Common EXH	
	2(B), 4(A) port	Side: Rc 3/8, 1/2, Bottom: Rc 3/8
	1(P), 3(R2), 5(R1) port	Side: Rc 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		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.

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

Air release valve coil rating

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

Control unit type

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

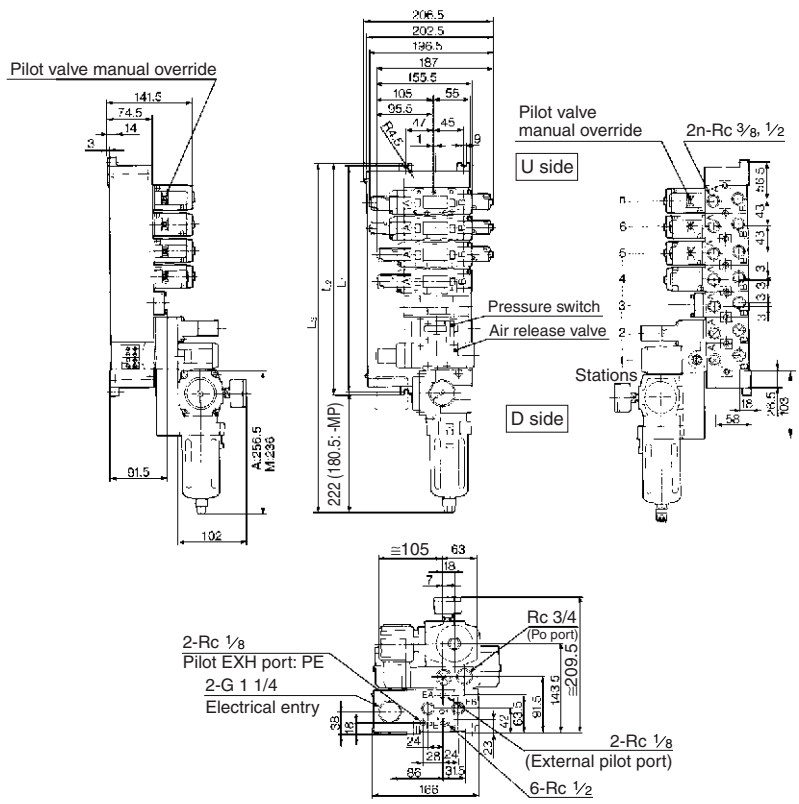
Please indicate manifold base type, corresponding valve, and option parts.

<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

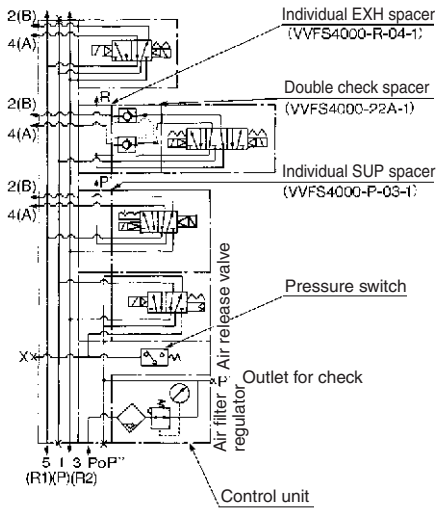
Series VFS4000

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

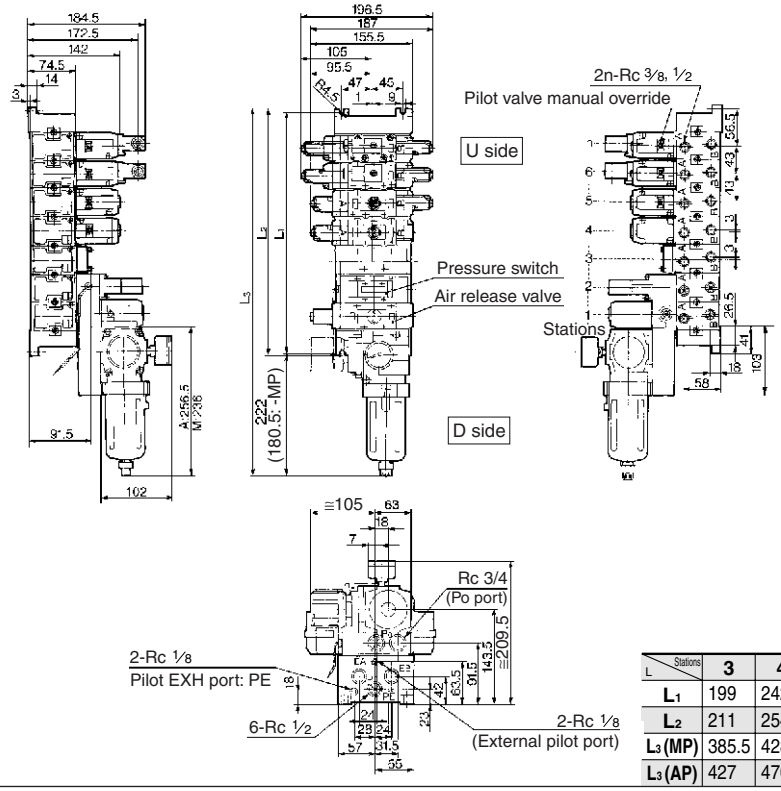
Plug-in type: VV5FS4-01T-[Station]1-[Port size]-AP [Voltage for release valve]



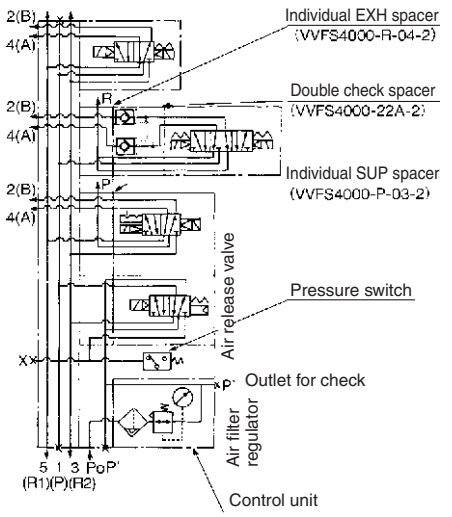
Example for manifold



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



Example for manifold

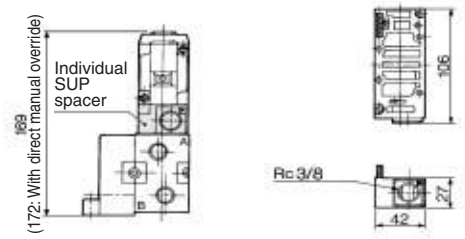


n: Stations

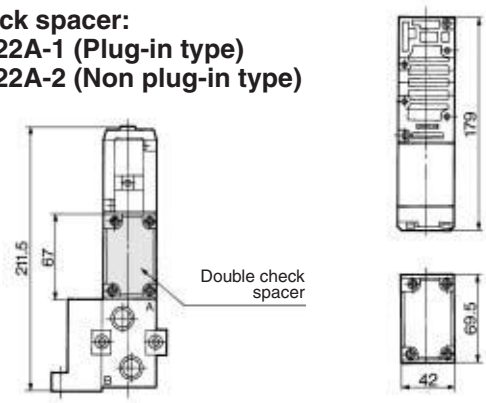
L \ Stations	3	4	5	6	7	8	9	10	Formula
L_1	199	242	285	328	371	414	457	500	$L_1 = 43 \times n + 70$
L_2	211	254	297	340	383	426	469	512	$L_2 = 43 \times n + 82$
L_3(MP)	385.5	428.5	471.5	514.5	557.5	600.5	643.5	686.5	$L_3 = 43 \times n + 256.5$
L_3(AP)	427	470	513	556	599	642	685	728	$L_3 = 43 \times n + 298$

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

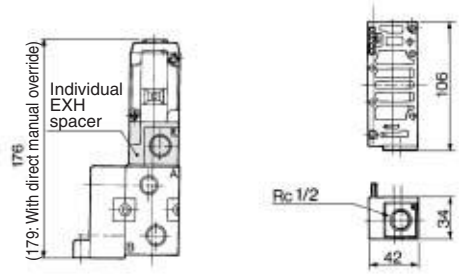
Individual SUP spacer:
VVFS4000-P-03-1 (Plug-in type)
VVFS4000-P-03-2 (Non plug-in type)



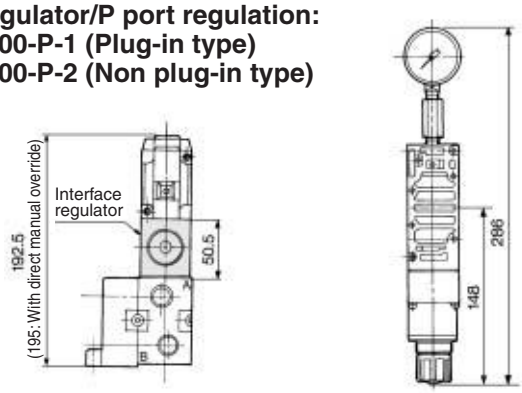
Double check spacer:
VVFS4000-22A-1 (Plug-in type)
VVFS4000-22A-2 (Non plug-in type)



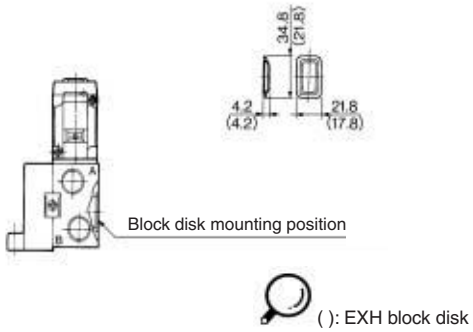
Individual EXH spacer:
VVFS4000-R-04-1 (Plug-in type)
VVFS4000-R-04-2 (Non plug-in type)



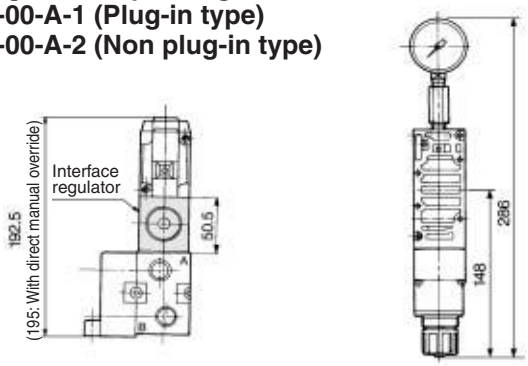
Interface regulator/P port regulation:
ARBF4050-00-P-1 (Plug-in type)
ARBF4050-00-P-2 (Non plug-in type)



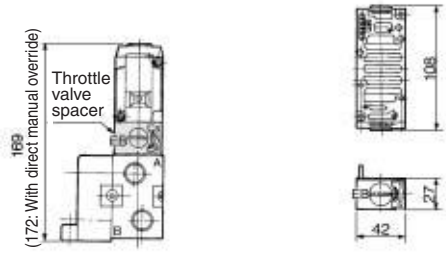
SUP block disk: AXT634-10A
EXH block disk: AXT634-11A



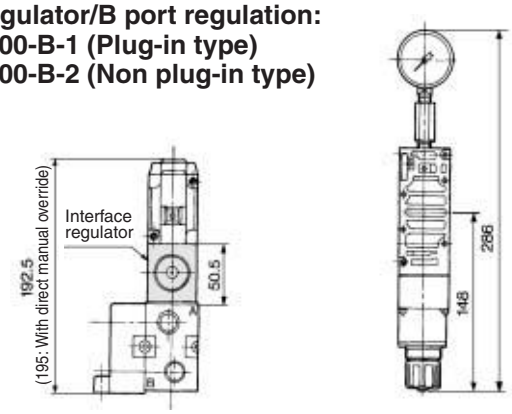
Interface regulator/A port regulation:
ARBF4050-00-A-1 (Plug-in type)
ARBF4050-00-A-2 (Non plug-in type)



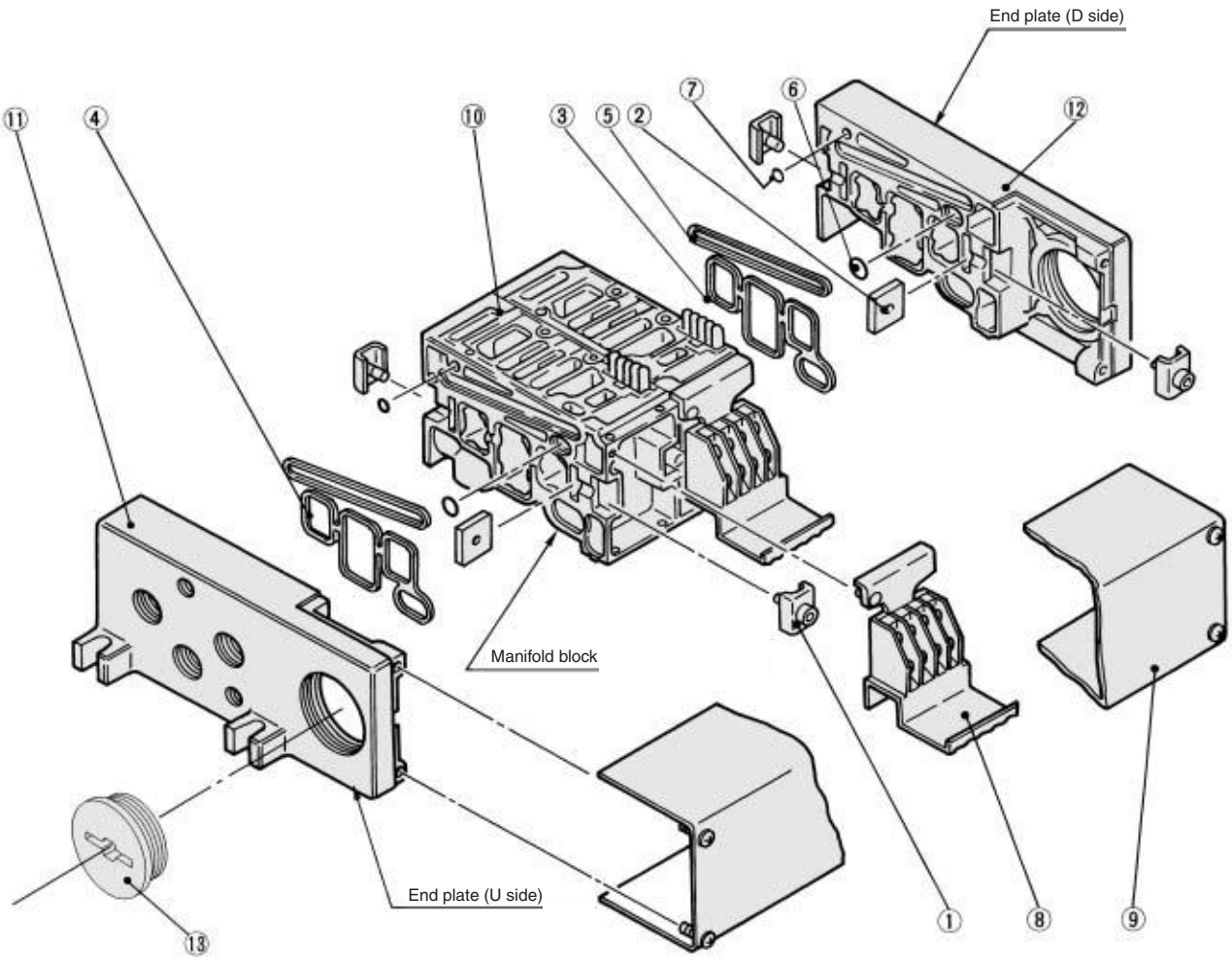
Throttle valve spacer:
VVFS4000-20A-1 (Plug-in type)
VVFS4000-20A-2 (Non plug-in type)



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.

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

Replacement Parts: Sub Assembly

No.	Description	Assembly part no.	Component parts	Applicable manifold base
⑩	Manifold block assembly	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

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(2) (ms)	Weight(3) (kg)
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	**VFS600**	**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 3/8, 1/2—0.744 kg, 3/4—0.966 kg and 3/8, 1/2—0.577 kg, 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)

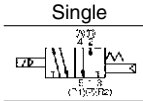
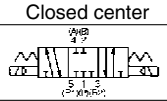
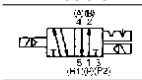
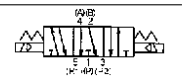
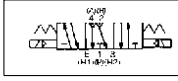
Low power consumption: 1.8 W DC

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

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: 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

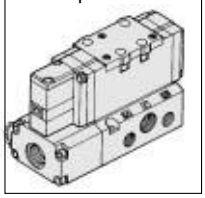
Note) Operating pressure: 0 to 1.0 MPa
Pilot pressure: 0.1 to 1.0 MPa

Series VFS5000

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 (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

Plug-in VFS5 [1] 0 [0] [ ] — 2 F [ ] [ ] — [ ] 04 [ ]

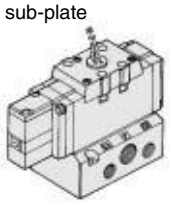
Non plug-in VFS5 [1] 1 [0] [ ] — 5 [D] [ ] [ ] — [ ] 06 [ ]

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

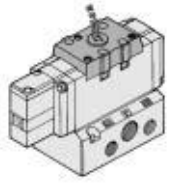
Option

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

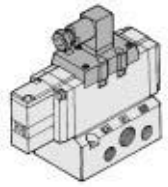
* Type "P", "ZP" is available for DIN type only.

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
9*	Other

* 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

How to Order Pilot Valve Assembly

SF4 — [1] F [ ] — 30

Coil rated voltage

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

* Option

* Refer to page 3-8-5 for voltage conversion.

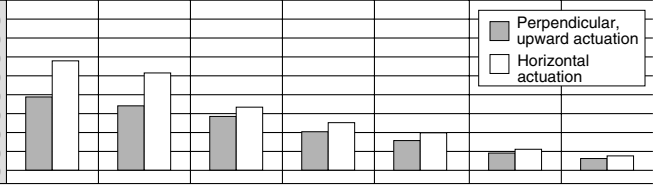
Manual override

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

* Option

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, 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%

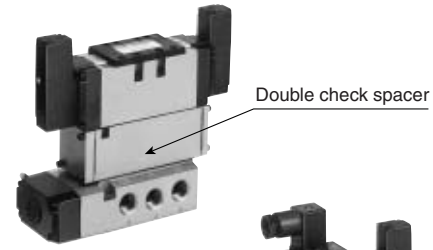
Conditions

		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

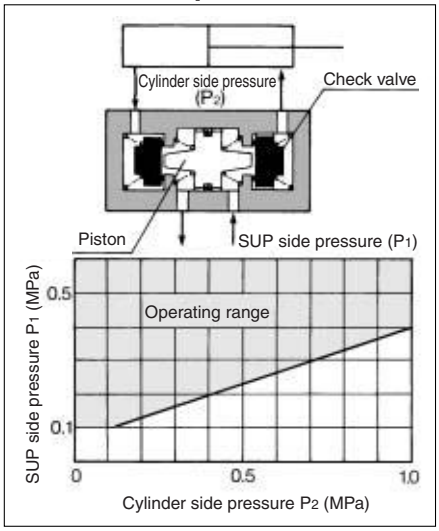
Double check spacer part no.	Plug-in type			Non plug-in type
	VVFS5000-22A-1			**VVFS5000-22A-2**
Applicable valve model	VFS5400-□F			VFS5410-□D VFS5410-□E
Leakage∗ (cm³/min)	Solenoid one side energized	P	R1	320 or less
			R2	
	Solenoid both sides de-energized	P	R1	320 or less
			R2	
		A	R1	0
		B	R2	

∗ Supply pressure: 0.5 MPa

⚠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

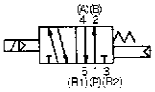


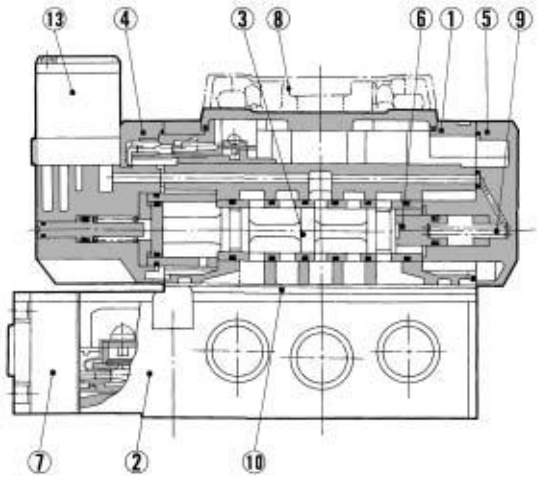
- The combination of VFS51$^{0}_{1}$0, VFS52$^{0}_{1}$0 and a double check spacer can be used as prevention of falling at the stroke end but cannot hold the intermediate position of the cylinder.

Series VFS5000

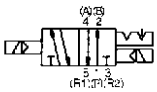
Construction

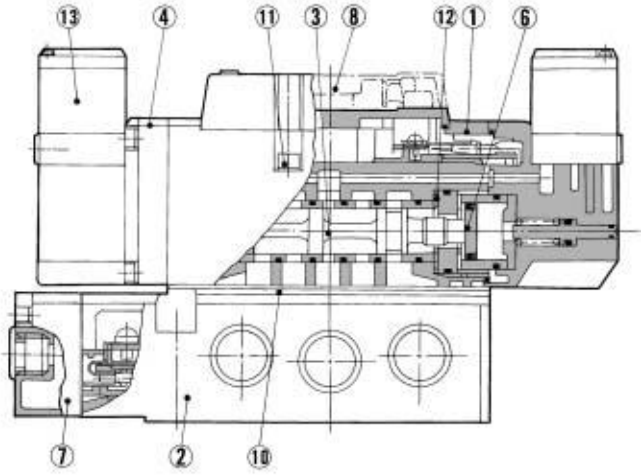
2 position single





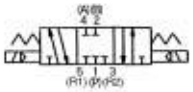
2 position double





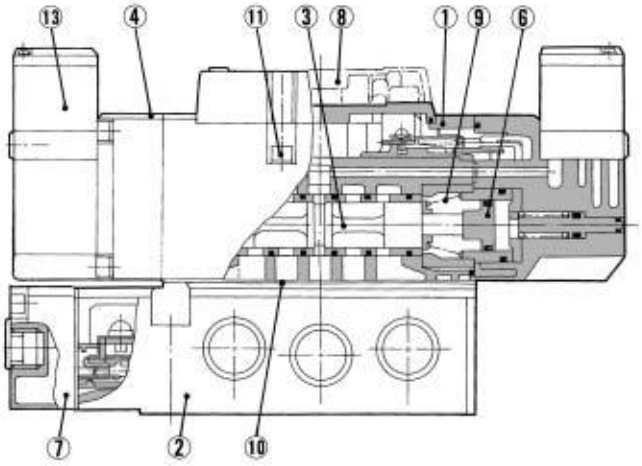
3 position closed center/exhaust center/pressure center

Closed center



Exhaust center

Pressure center



Component Parts

No.	Description	Material	Note
①	Body	Aluminum die-casted	Platinum silver
②	Sub-plate	Aluminum die-casted	Platinum silver
③	Spool/Sleeve	Stainless steel	—
④	Adapter plate	Aluminum die-casted	Black
⑤	End plate	Aluminum die-casted	Black
⑥	Piston	Resin	—
⑦	Junction cover	Resin	—
⑧	Light cover	Resin	—

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.

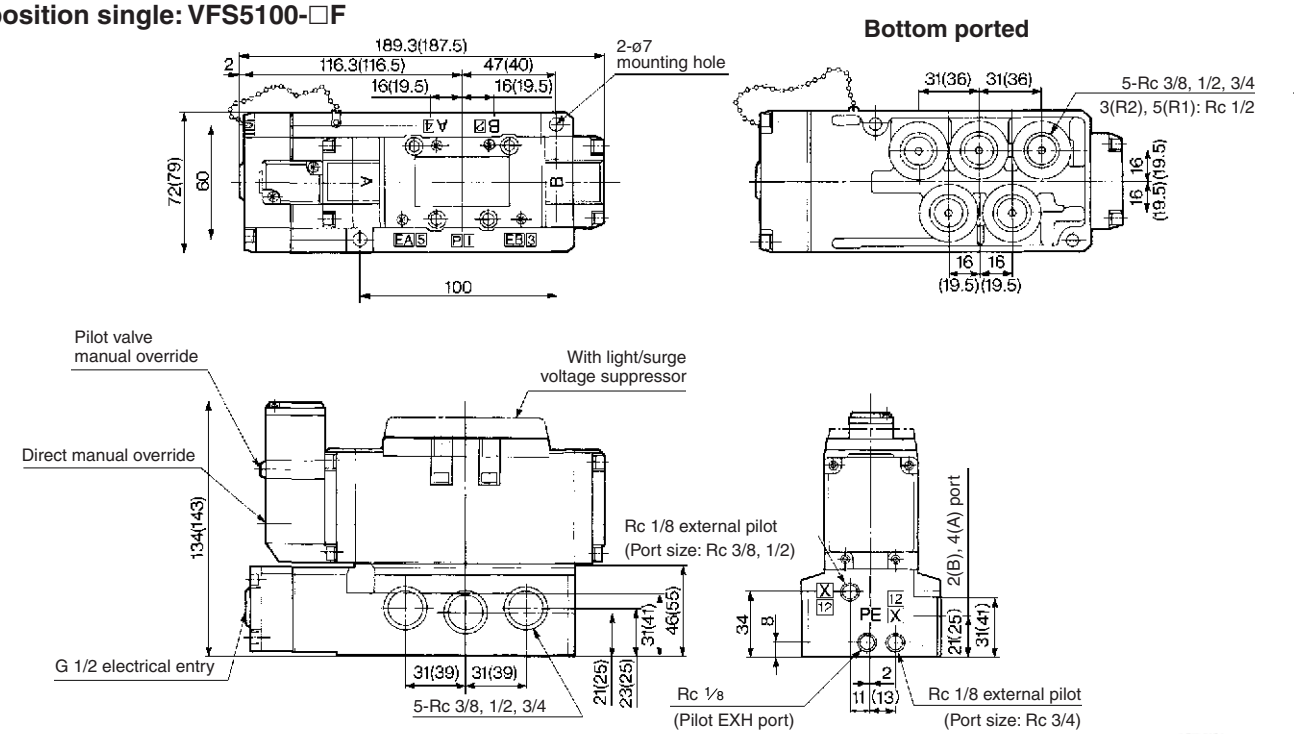
Part no. for mounting bolt and gasket
BG-VFS5000

Replacement Parts

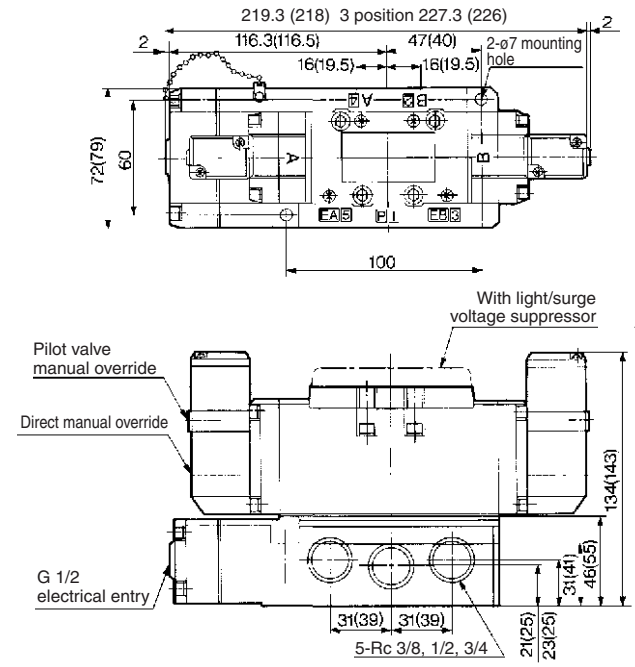
No.	Description	Material	Part no.		
			VFS51□□	**VFS52□□**	**VFS53□□/54□□/55□□**
⑨	Return spring	Stainless steel	VFS5000-9	—	AXT627-18
⑩	Gasket	NBR	AXT627-10-1	AXT627-10-1	AXT627-10-1
⑪	Hexagon socket head screw	Steel	M5 x 50	M5 x 50	M5 x 50
⑫	Detent assembly	—	—	AXT510-9	—
⑬	Pilot valve assembly	—	Refer to “How to Order Pilot Valve Assembly” on page 3-8-86.		

Plug-in **2 position single/double, 3 position closed center/exhaust center/pressure center/double check**

2 position single: VFS5100-□F

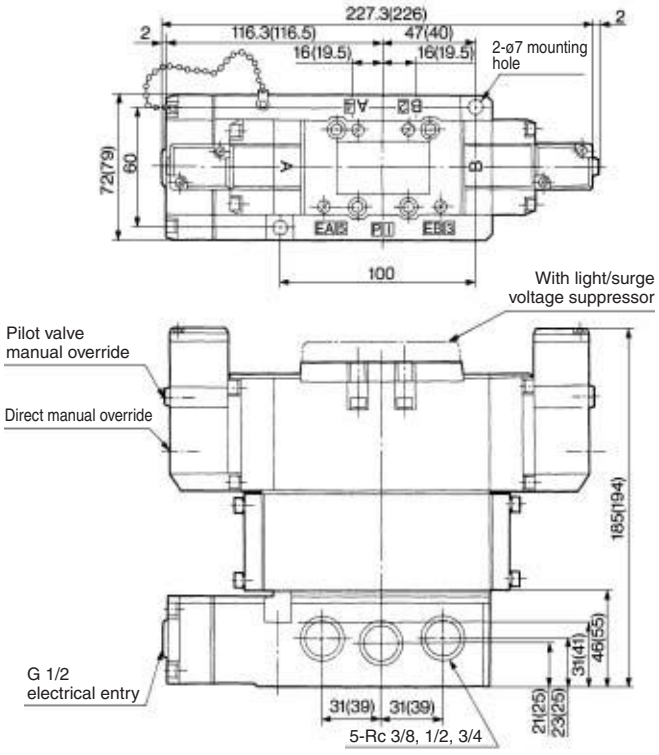


2 position double: VFS5200-□F
3 position closed center: VFS5300-□F
3 position exhaust center: VFS5400-□F
3 position pressure center: VFS5500-□F



( ): Rc 3/4

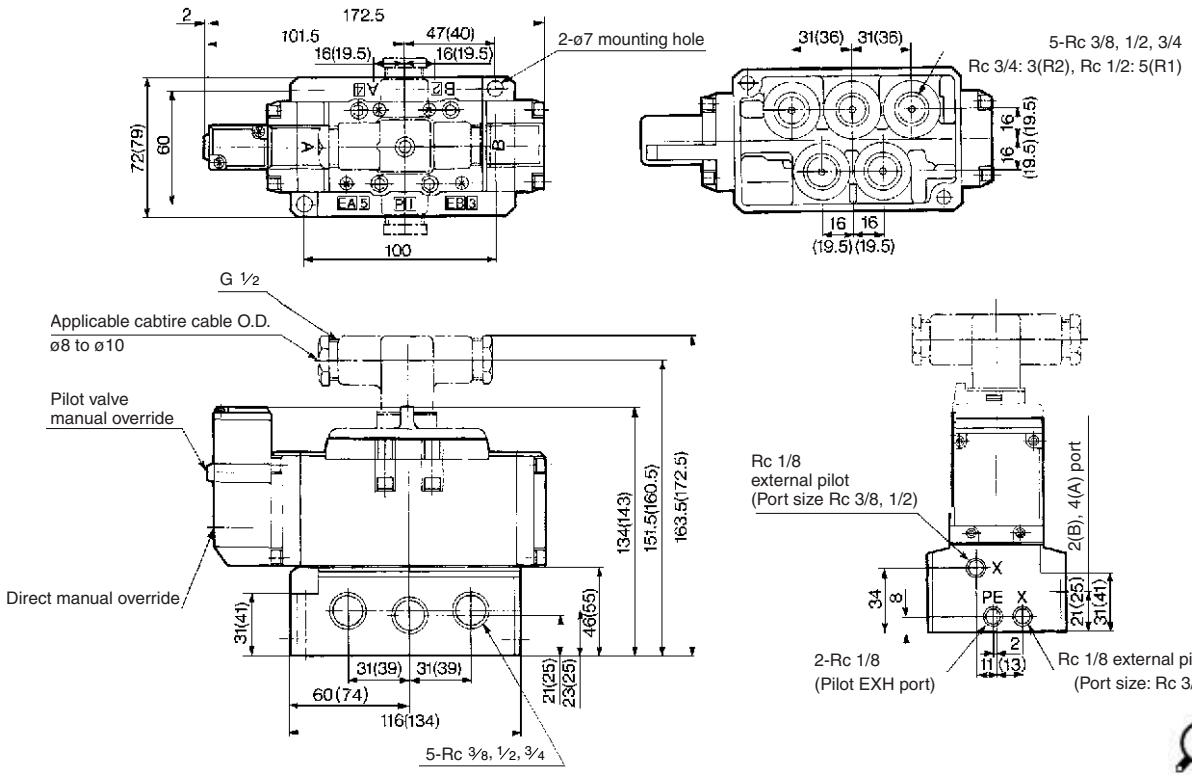
3 position double check: VFS5600-□F



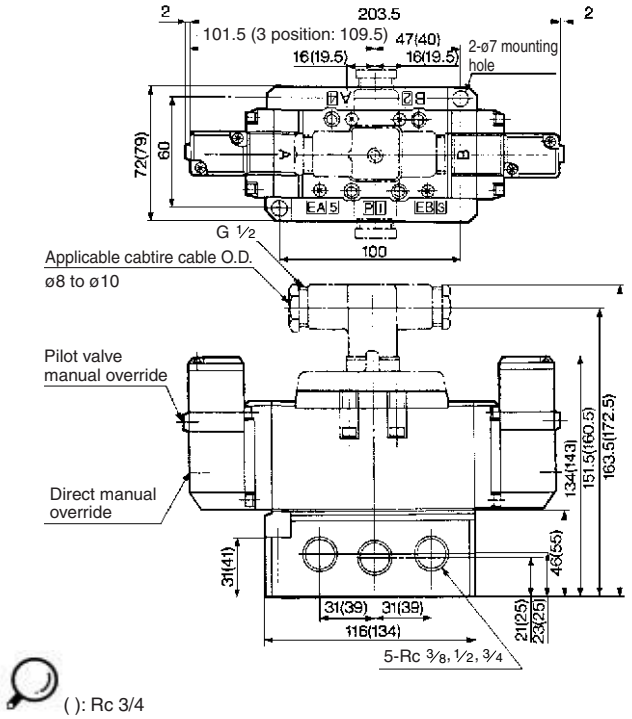
( ): Rc 3/4

Non Plug-in 2 position single/double, 3 position closed center/exhaust center/pressure center/double check

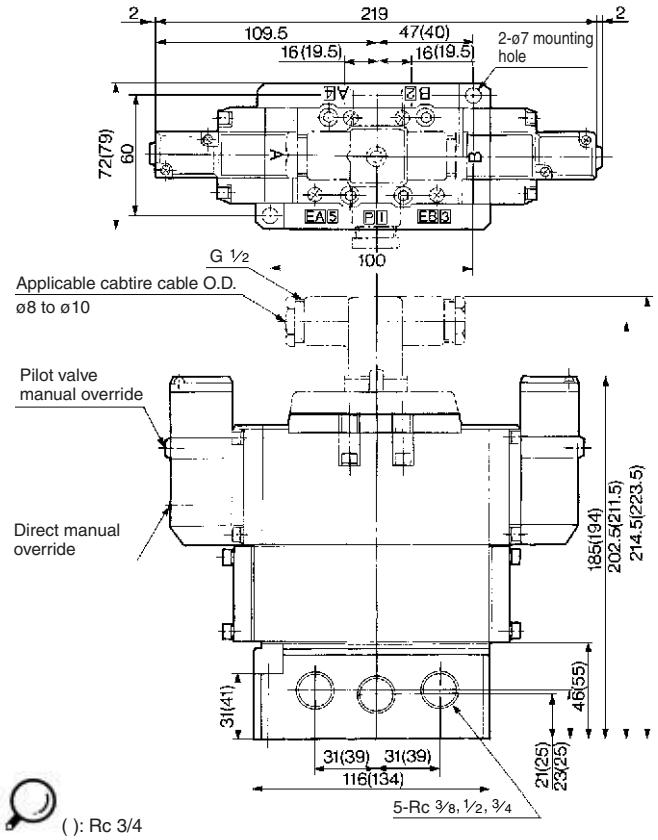
2 position single: VFS5110-□E, VFS5110-□D



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



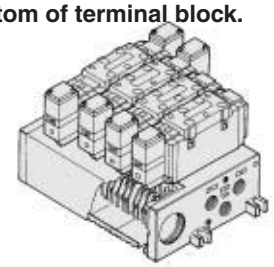
3 position double check: VFS5610-□E, VFS5610-□D



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 P	Passage R1, R2	Porting specifications (A, B)
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.

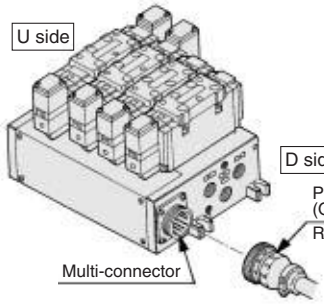
- **Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

Plug-in Type: With Multi-connector (Wiring specifications: Refer to page 3-8-8.)

- **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 P	Passage R1, R2	Porting specifications (A, B)
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.

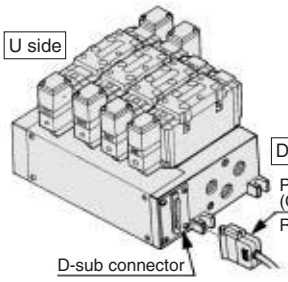
- **Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

Plug-in Type: With D-sub Connector (Wiring specifications: Refer to page 3-8-8.)

- **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 P	Passage R1, R2	Porting specifications (A, B)
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.

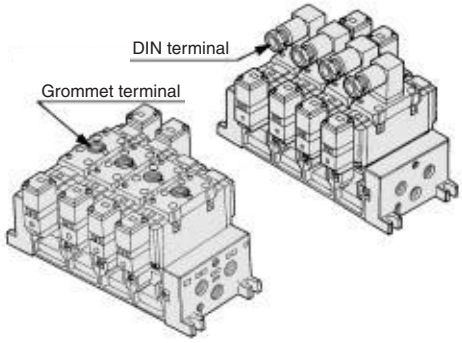
- **Thread type**

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 P	Passage R1, R2	Porting specifications (A, B)
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.

- **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)]	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

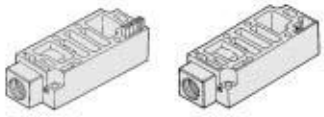
* Port size: Rc 1/2, 3/4

Manifold Option Parts Assembly

Individual SUP spacer

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

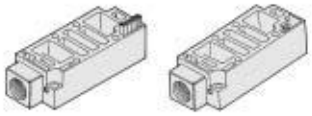
Body type	Plug-in type	Non plug-in type
Part no.	VVFS5000-P-04-1	VVFS5000-P-04-2



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 disk

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

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

EXH block disk

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 disk in between stations to separate valve exhaust.

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

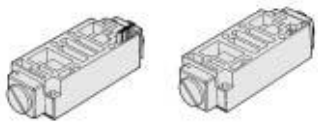
EXH block disk

SUP block disk

Throttle valve spacer

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

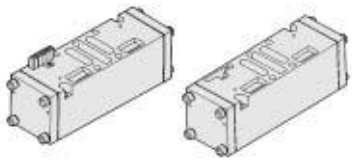
Body type	Plug-in type	Non plug-in type
Part no.	VVFS5000-20A-1	VVFS5000-20A-2



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.

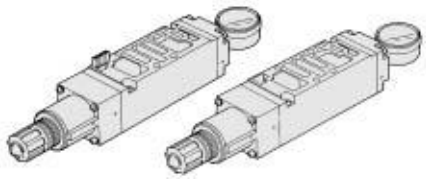
Body type	Plug-in type	Non plug-in type
Part no.	VVFS5000-22A-1	VVFS5000-22A-2



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 3-8-6).

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.

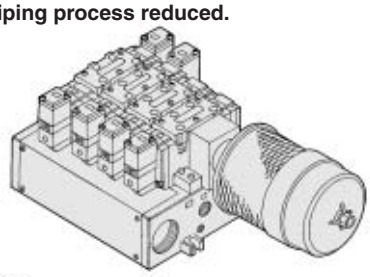
Body type	Plug-in type	Non plug-in type
Part no.	VVFS5000-10A	

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.**

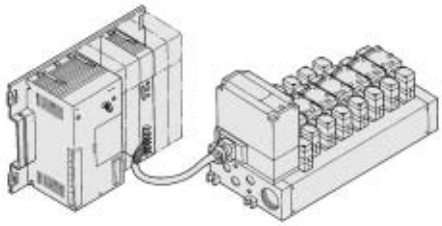


For details, refer to page 3-8-95.

With serial interface unit for serial transmission

Plug-in type

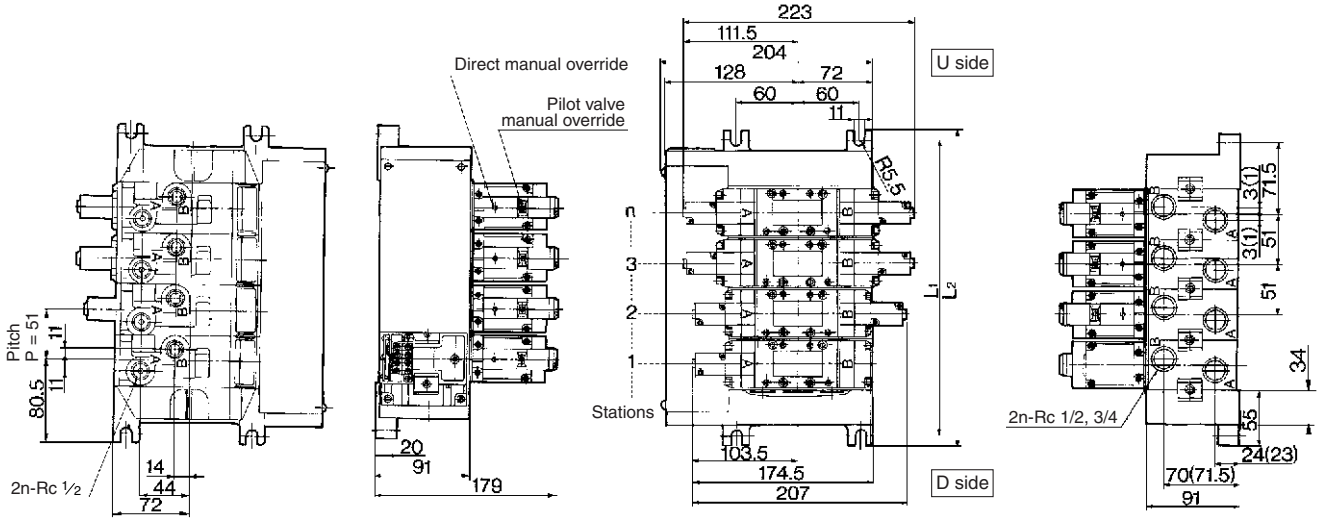
- **Solenoid valve wiring process reduced considerably.**
- **Disperse installation possible.**
  Manifold solenoid valve: 8 stations max.
  32 positions (512 solenoids).
- **Maintenance and inspection are easy.**



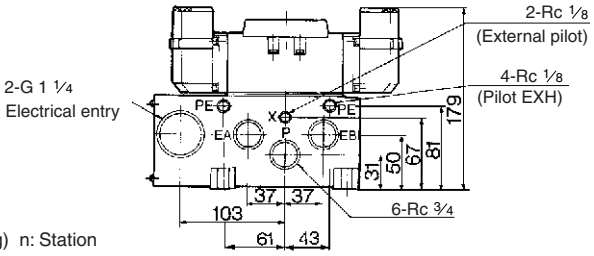
For details, refer to "Serial Transmission" catalog separately.

Manifold Plug-in type, Non plug-in type

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



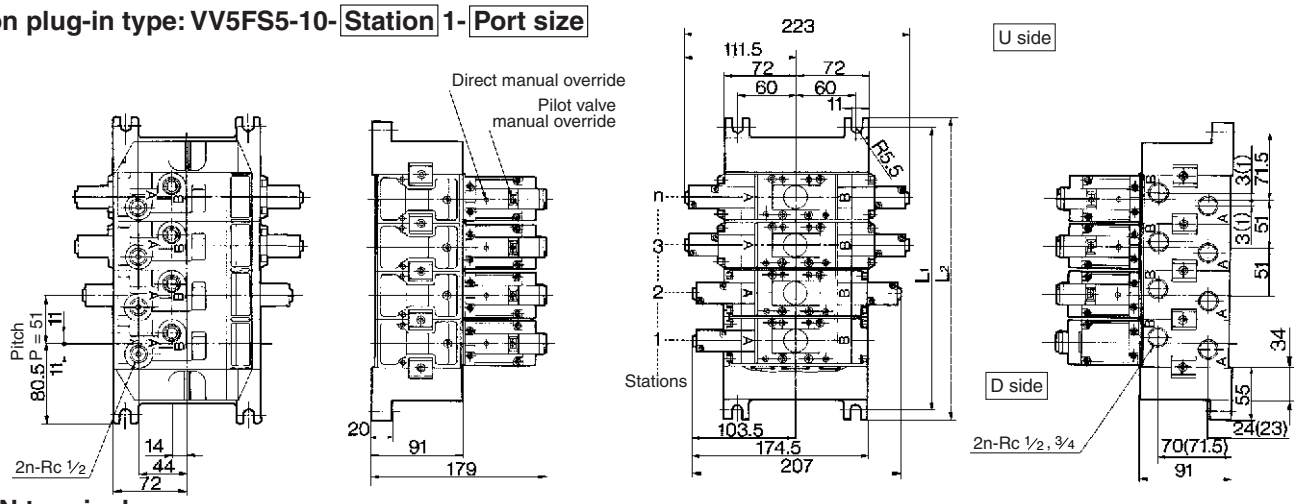
Bottom ported: VV5FS5-01T-Station 2-Port size



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

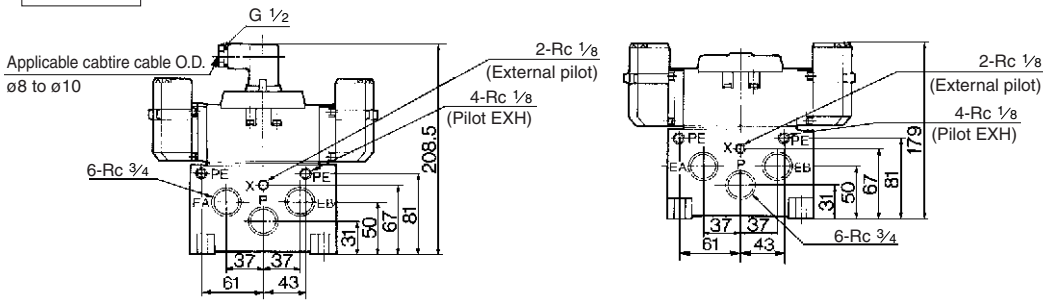
( ): 2(B)/4(A) port Rc ¾

Non plug-in type: VV5FS5-10-Station 1-Port size



DIN terminal VV5FS5-10-Station 2-Port size

Grommet with terminal



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

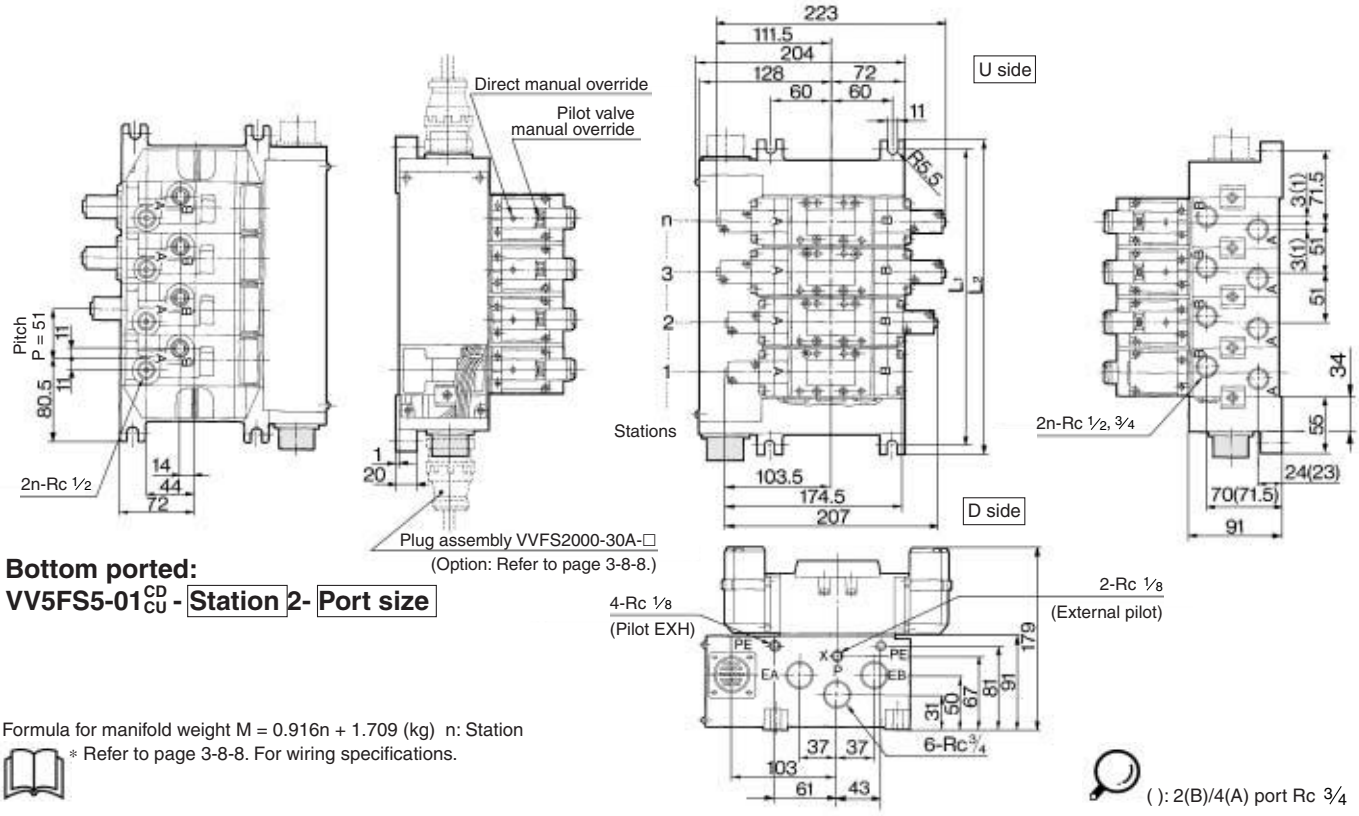
( ): 2(B)/4(A) port Rc ¾

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

Series VFS5000

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

Plug-in type with multi-connector: VV5FS5-01CD-Station 1-Port size, VV5FS5-01CU-Station 1-Port size

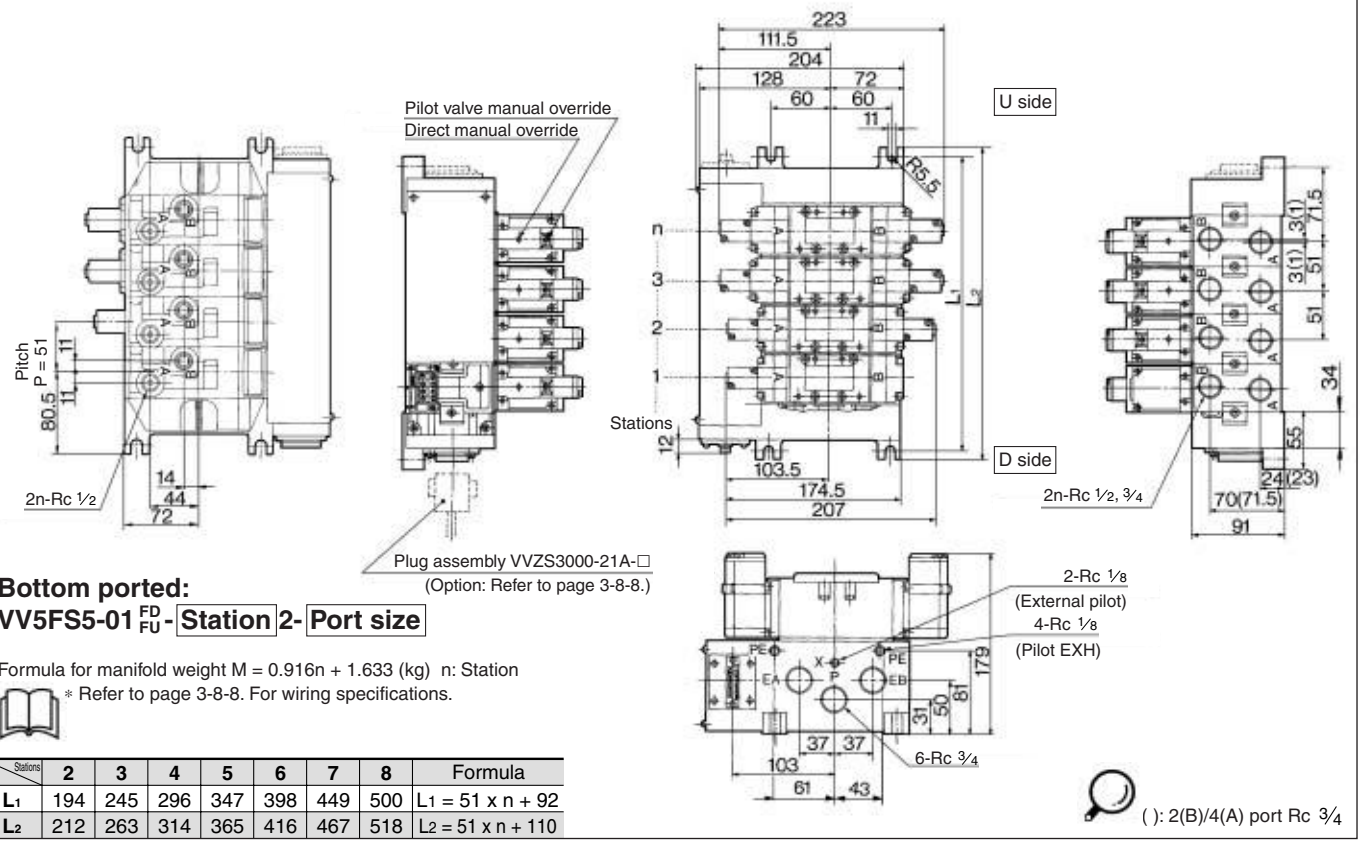


Bottom ported:
VV5FS5-01 CD/CU - Station 2- Port size

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

∗ Refer to page 3-8-8. For wiring specifications.

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



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

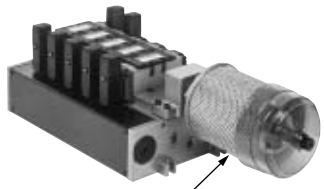
Formula for manifold weight M = 0.916n + 1.633 (kg) n: Station

∗ Refer to page 3-8-8. 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

Manifold with Exhaust Cleaner

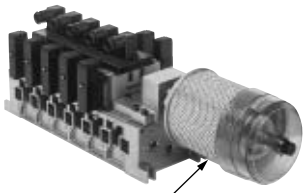
- **Serves to protect working environment.**
- **Valve exhaust noise dampening: 35 dB or more.**
- **Collection rate of drainage and oil mist: 99.9% or more.**
- **Piping work is reduced.**



Plug-in type

Exhaust cleaner (Option)

U side



D side

Non plug-in type

Exhaust cleaner (Option)

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: RC 1/2, 3/4, Bottom: Rc 1/2 (Option)	
	1(P), 3(R2), 5(R1) port	P: Rc 3/4, EXH: Rc 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

Symbol

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

* Option

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.

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

⚠Caution

When using an exhaust cleaner, mount it downwards.

* Refer to Best Pneumatics Vol. 5 for Exhaust Cleaner details.

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

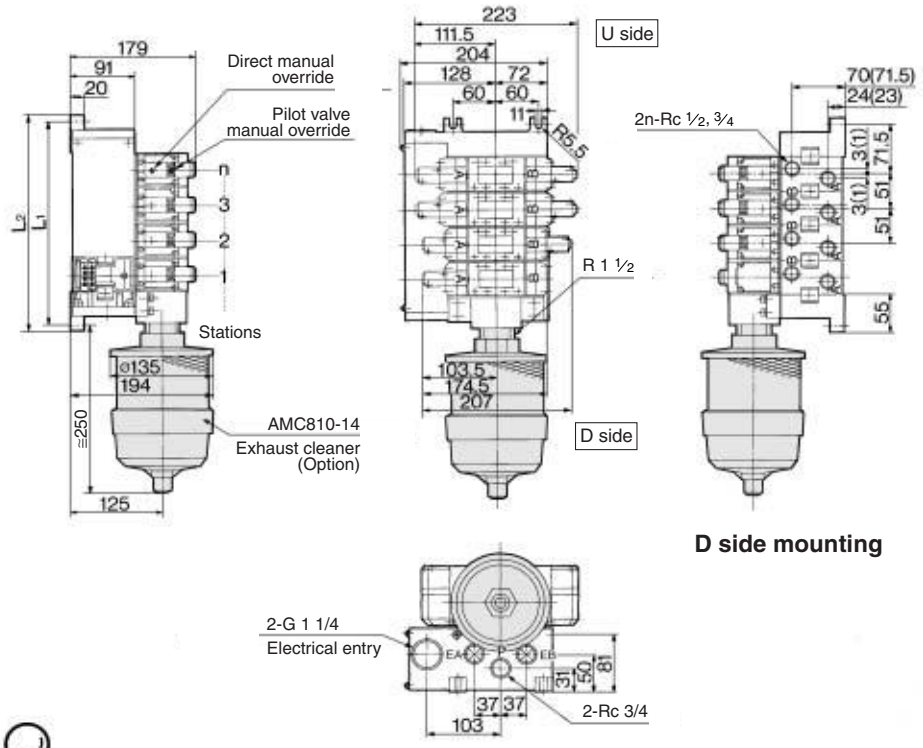
<Example>

- Plug-in type with terminal block (6 stations)
  - (Manifold base) VV5FS5-01T-061-04-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

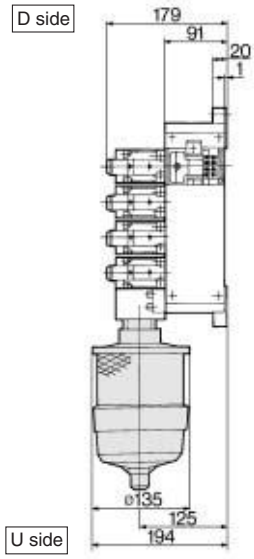
Series VFS5000

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

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



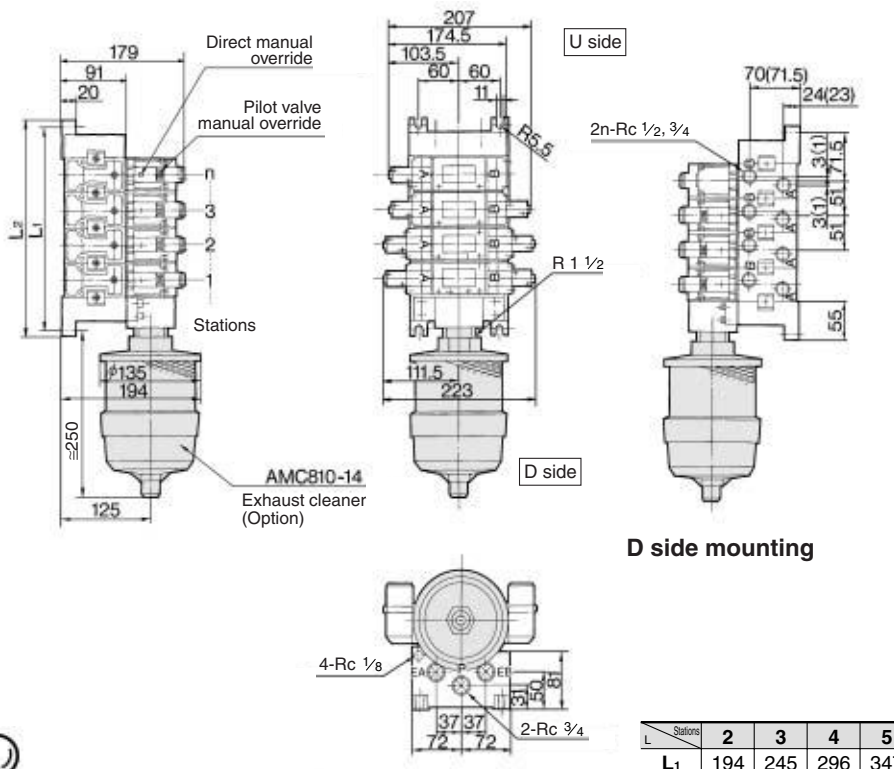
D side mounting



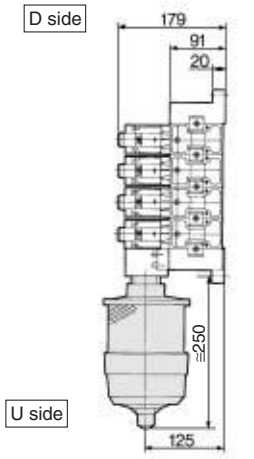
U side mounting

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

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



D side mounting



U side mounting

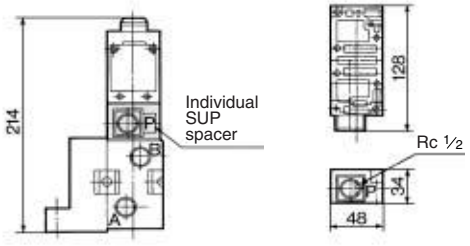
( ): 2(B)/4(A) port Rc 3/4

n: Stations

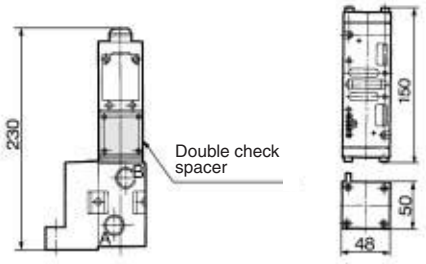
L / Stations	2	3	4	5	6	7	8	9	10	Formula
L_1	194	245	296	347	398	449	500	551	602	$L_1 = 51 \times n + 92$
L_2	212	263	314	365	416	467	518	569	620	$L_2 = 51 \times n + 110$

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

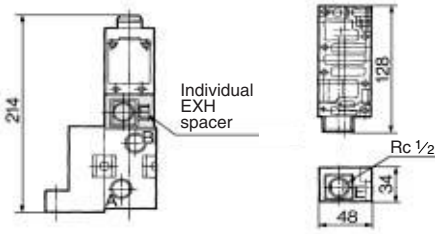
Individual SUP spacer:
VVFS5000-P-04-1 (Plug-in type)
VVFS5000-P-04-2 (Non plug-in type)



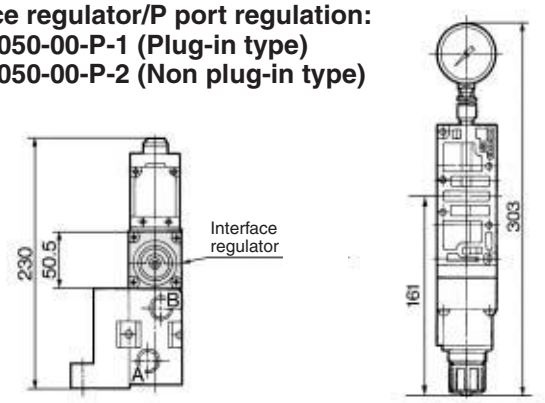
Double check spacer:
VVFS5000-22A-1 (Plug-in type)
VVFS5000-22A-2 (Non plug-in type)



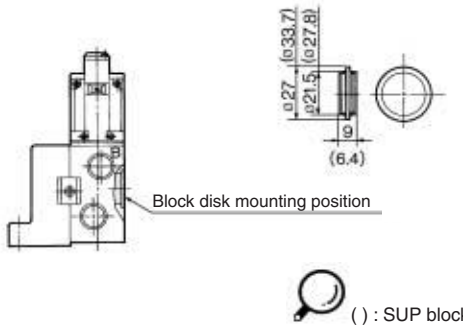
Individual EXH spacer:
VVFS5000-R-04-1 (Plug-in type)
VVFS5000-R-04-2 (Non plug-in type)



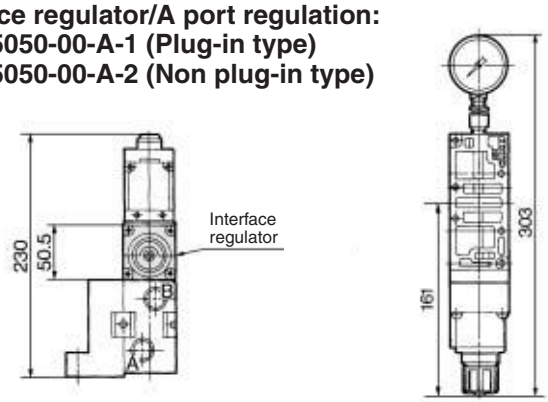
Interface regulator/P port regulation:
ARBF5050-00-P-1 (Plug-in type)
ARBF5050-00-P-2 (Non plug-in type)



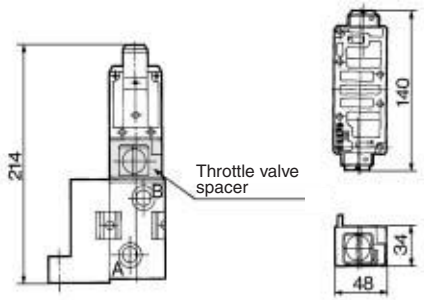
SUP block disk: AXT628-12A
EXH block disk: AXT512-14-1A



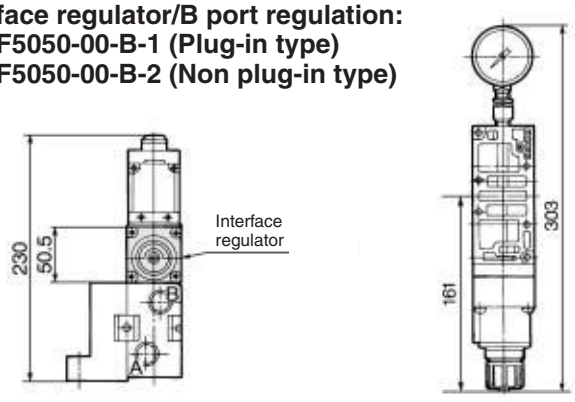
Interface regulator/A port regulation:
ARBF5050-00-A-1 (Plug-in type)
ARBF5050-00-A-2 (Non plug-in type)



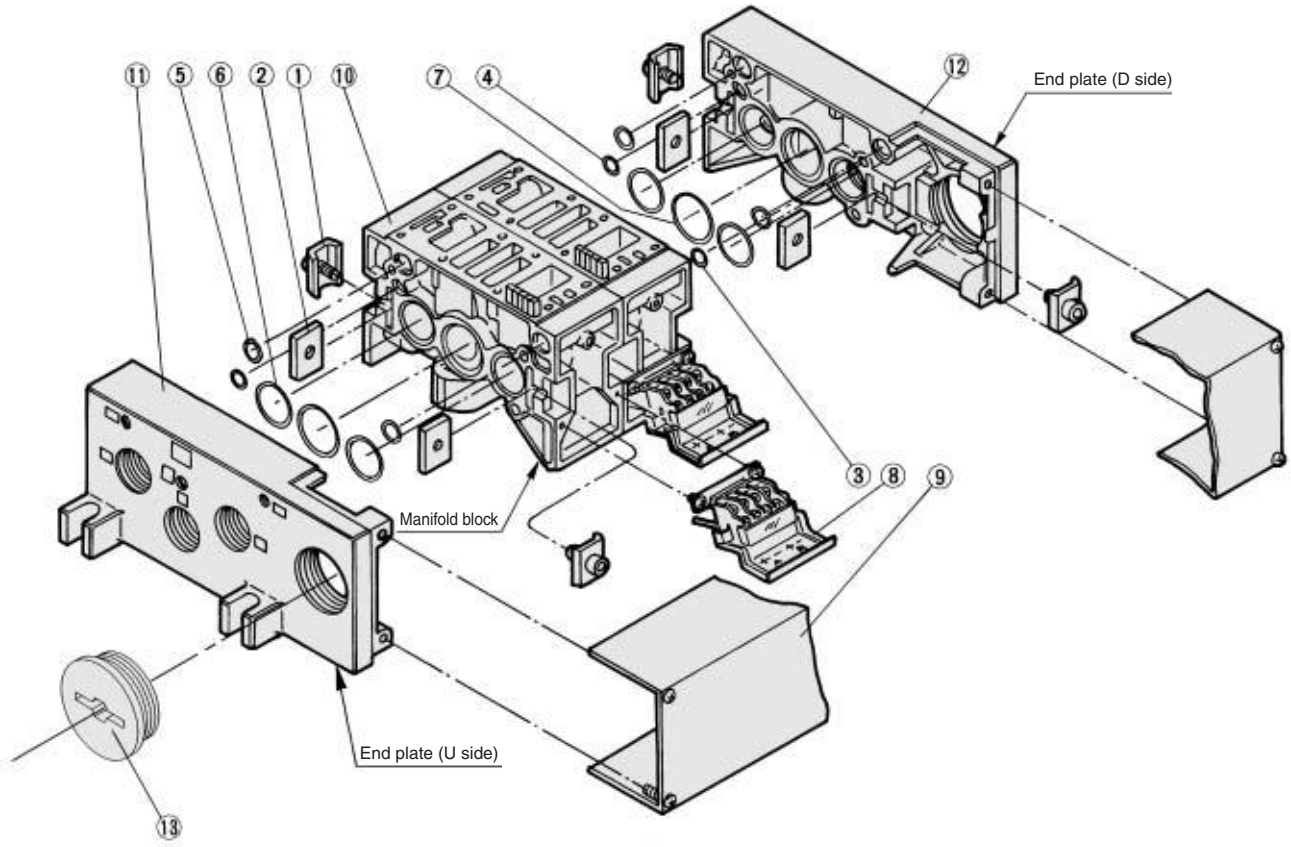
Throttle valve spacer:
VVFS5000-20A-1 (Plug-in type)
VVFS5000-20A-2 (Non plug-in type)



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

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)	Weight(3) (kg)
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)

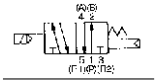
Low power consumption: 1.8 W DC

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

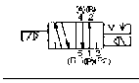
JIS Symbol

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

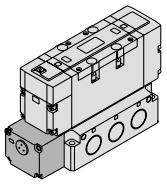
Note) Operating pressure: 0 to 1.0 MPa
Pilot pressure: 0.1 to 1.0 MPa

Series VFS6000

How to Order

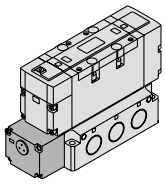
Body type

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 (Option), bottom piping is not available.

Port size

Nil	Without sub-plate
06	Rc 3/4
10	Rc 1

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

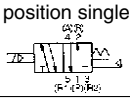
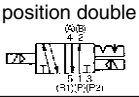
* Option

Plug-in	VFS6	1	0	0	□	5	F	Z	□	10	□	
Non plug-in	VFS6	1	1	0	□	5	D	Z	□	10	□	

Option

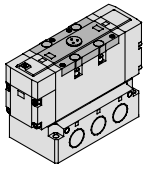
Nil	None
Z	With light/surge voltage suppressor

Symbol

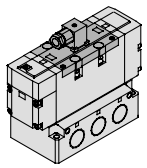
1	2 position single 
2	2 position double 

Electrical entry

E: Grommet terminal

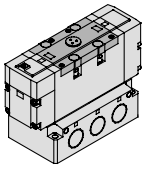


D: DIN terminal



Body type

1: Non plug-in type sub-plate



Coil rated voltage

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

* Option

Body Option

0	Standard
1*	Direct manual override

* Option

Pilot type

Nil	Internal pilot
R*	External pilot

* Option

How to Order Pilot Valve Assembly

SF4 – 1 F – 22

Coil rated voltage

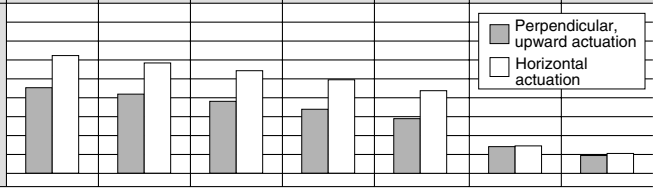
1	100 VAC, 50/60 Hz
2	200 VAC, 50/60 Hz
3*	110 to 120 VAC, 50/60 Hz
4*	220 VAC, 50/60 Hz
5	24 VDC
6*	12 VDC
7*	240 VAC, 50/60 Hz
9*	Other

* Option

* Refer to page 3-8-5 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, 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							

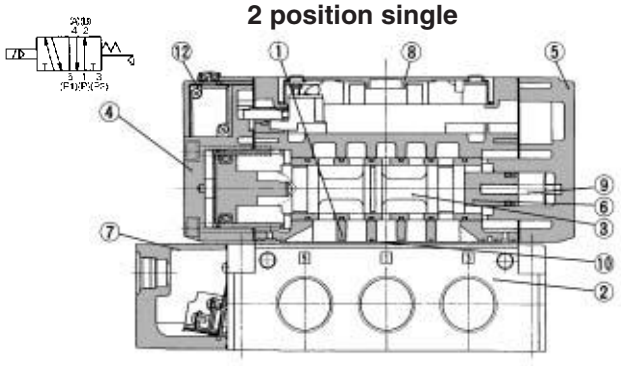
∗ It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
∗ The average velocity of the cylinder is what the stroke is divided by the total stroke time.
∗ Load factor: ((Load weight x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

Conditions

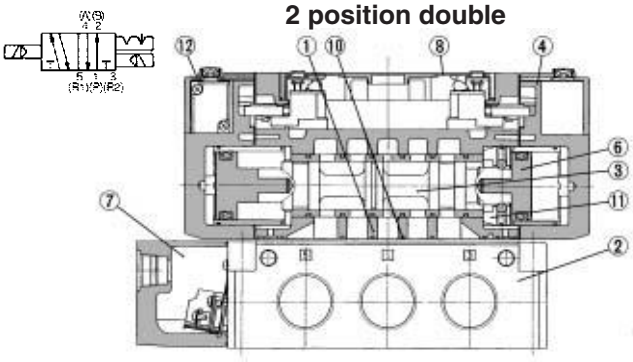
		Series CS1
VFS6100-10	Tube bore x Length	SGP25A x 1 m
	Speed controller	AS600-10
	Silencer	AN600-10

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	—

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.

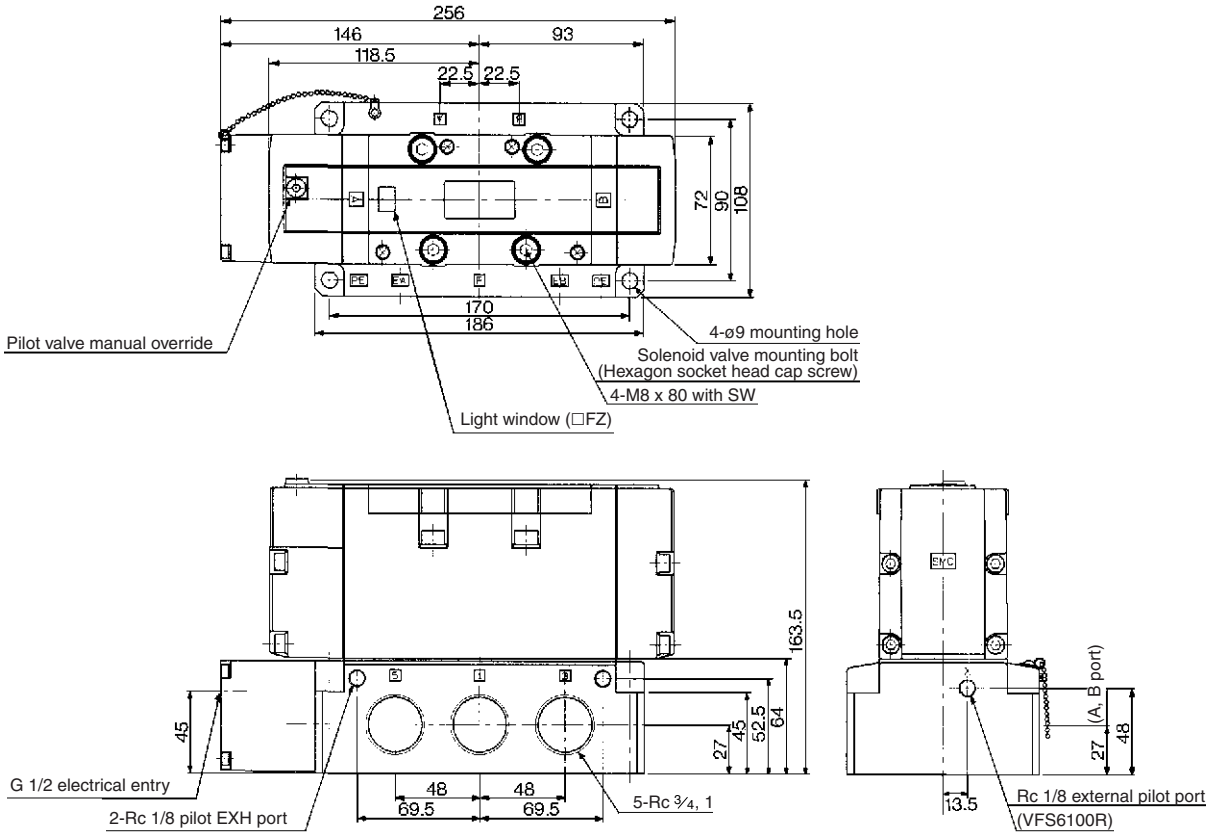
Part no. for mounting bolt and gasket
BG-VFS6000

Replacement Parts

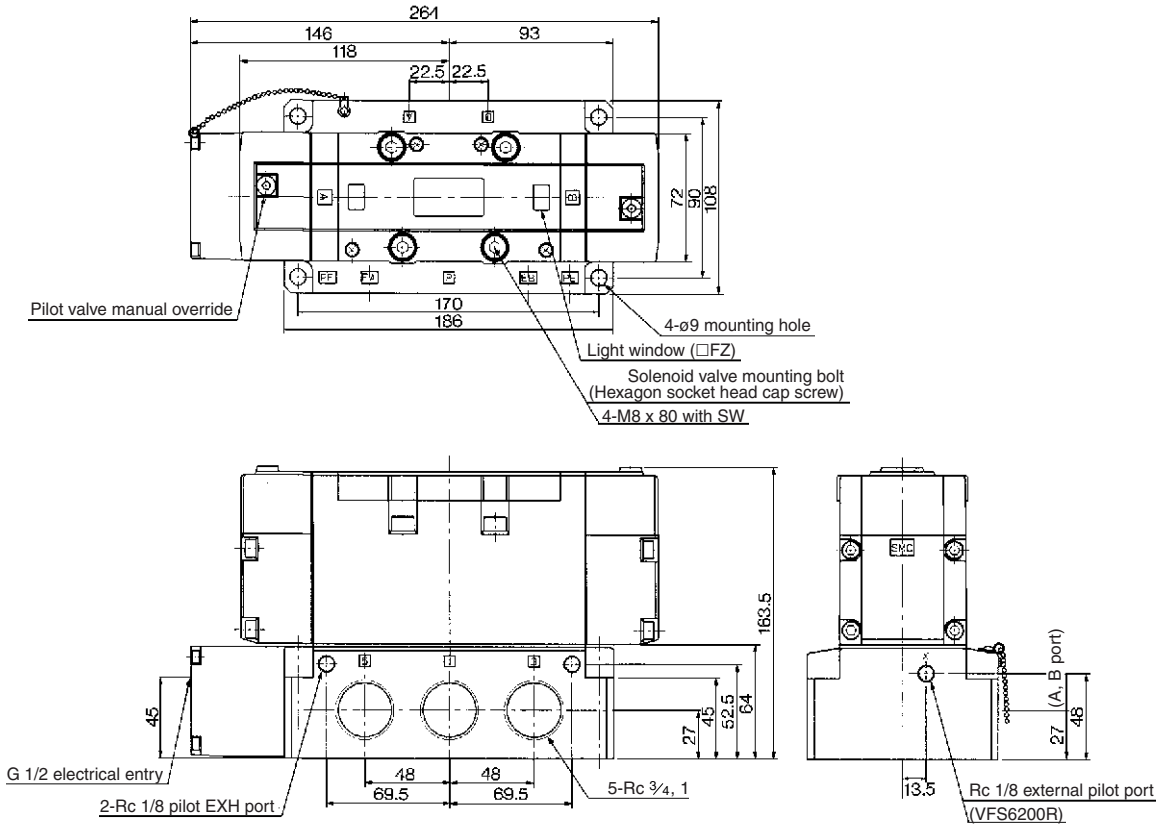
No.	Description	Material	Part no.	
			VFS61□□	**VFS62□□**
⑨	Return spring	Stainless steel	VFS6000-16-3	—
⑩	Gasket	NBR	VFS6000-15	VFS6000-15
⑪	Detent assembly	—	—	VFS6000-8A
⑫	Pilot valve assembly	—	Refer to “How to Order Pilot Valve Assembly” on page 3-8-70.	

Plug-in 2 position single/double

2 position single: VFS6100-□F

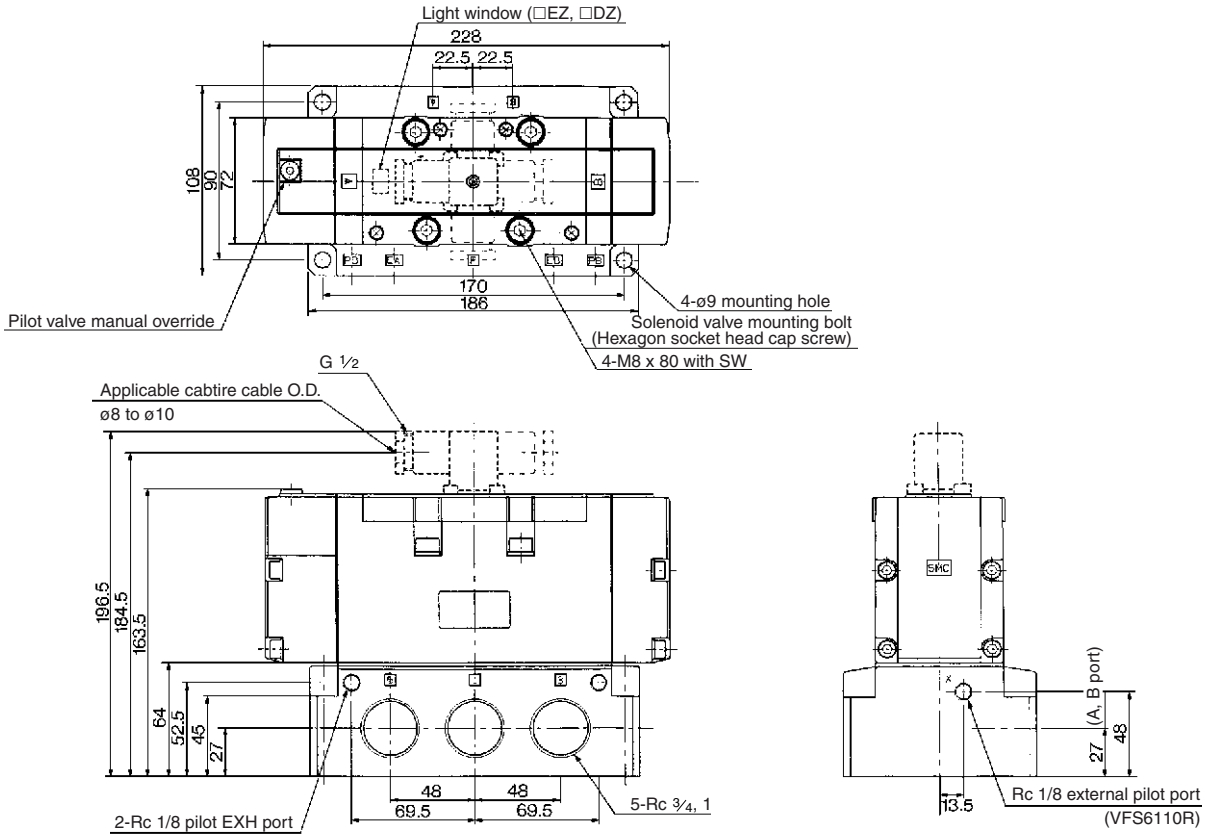


2 position double: VFS6200-□F



Non Plug-in 2 position single/double

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



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