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			

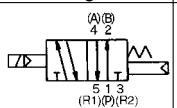
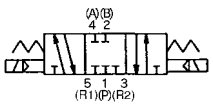
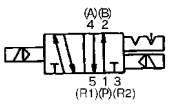
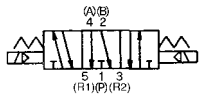
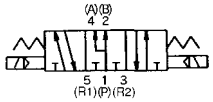
Note 1) Based on JIS B 8375 (once per 30 days) for the minimum operating frequency.
Note 2) According to JIS B 8375-1981. (The value at supply pressure 0.5 MPa.)
Note 3) In the case of grommet type Note 4) Factors of "Note 1)" and "Note 2)" are achieved in controlled clean air.

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.

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

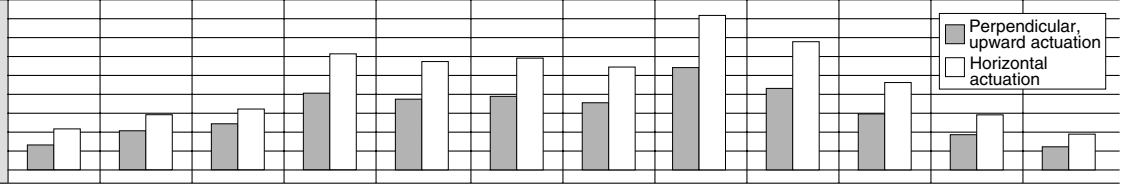
Nil	Non-locking push type (Flush)
A∗	Non-locking push type (Extended)
B∗	Locking type (Tool required)

∗ 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												

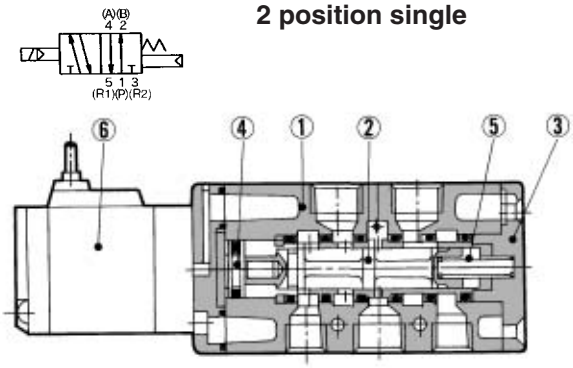
Conditions

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		

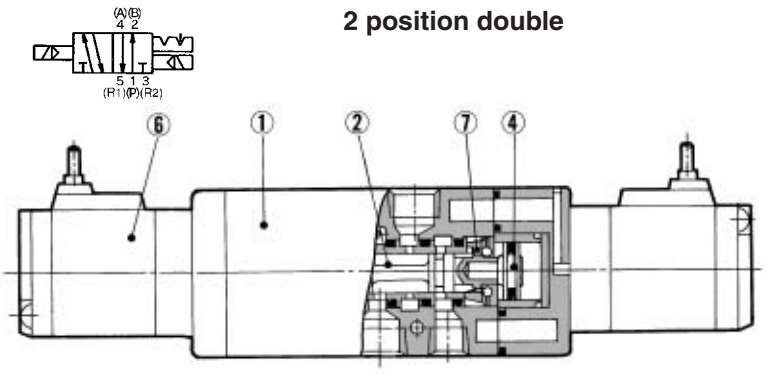
∗ It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
∗ The average velocity of the cylinder is what the stroke is divided by the total stroke time.
∗ Load factor: ((Load weight x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

Construction

2 position single

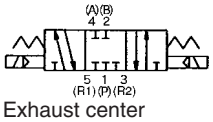


2 position double

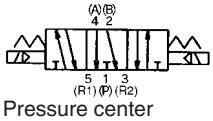


3 position closed center/exhaust center/pressure center

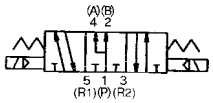
Closed center

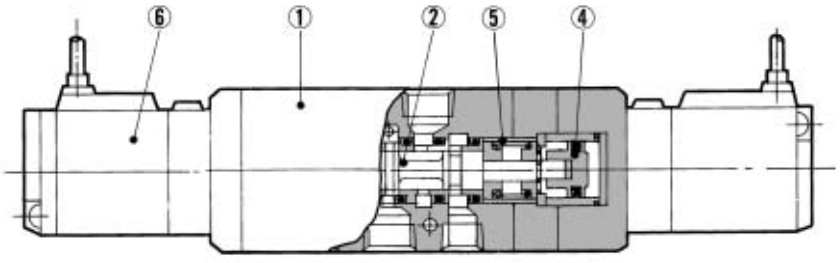


Exhaust center



Pressure center





Component Parts

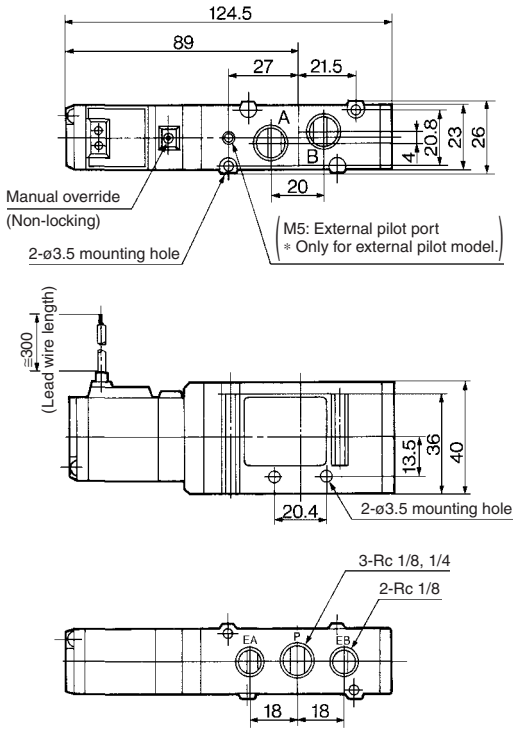
No.	Description	Material	Note
①	Body	Aluminum die-casted	Platinum silver
②	Spool/Sleeve	Stainless steel	—
③	End plate	Resin	—
④	Piston	Resin	—

Replacement Parts

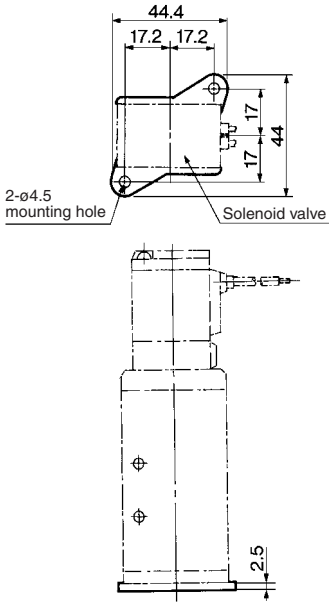
No.	Description	Material	Part no.		
			VFS2120	**VFS2220**	**VFS2320/2420/2520**
⑤	Return spring	Stainless steel	VFS2000-17-1	—	VFS2000-17-2
⑥	Pilot valve assembly	—	Refer to “How to Order Pilot Valve Assembly” on page 3-8-18.		
⑦	Detent assembly	—	—	VFN2000-8A	—

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

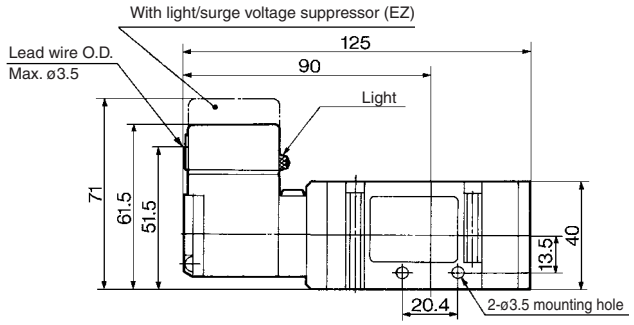
Grommet: VFS2120-□G



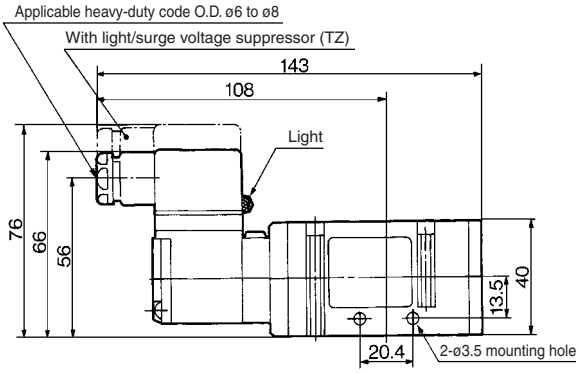
Foot bracket (F)
Part no.: VFN200-17A



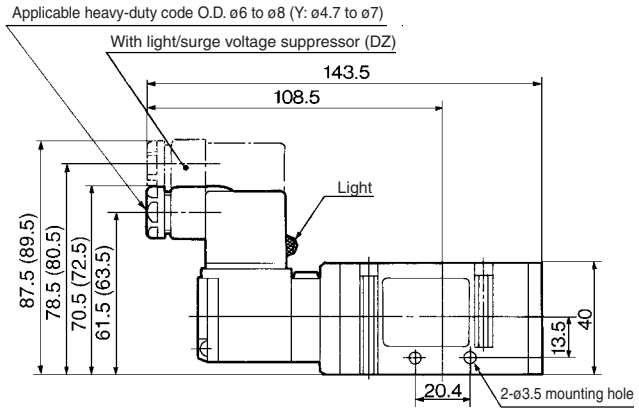
Grommet terminal: VFS2120-□E/EZ



Conduit terminal: VFS2120-□T/TZ



DIN terminal: VFS2120-□D/DZ/Y/YZ



( ): Y, YZ