

5 Port Pilot Operated Solenoid Valve Metal Seal, Body Ported

Series VFS3000 C €

Model

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



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

Compact yet provides a large flow capacity
3/8: C: 6.8 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	
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/s ² ⁽³⁾	
Enclosure	Dustproof (Degrees of protection 0) ⁽⁴⁾	
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.: VFS3000-52A, VFS3120 (single) only



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

Manifold

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

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

How to Order

VFS3 1 20 - 1 G - 02 - - -

Symbol

1: 2 position single

2: position double

3: position closed center

4: position exhaust center

5: position pressure center

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

Body (Pilot exhaust)

20: Individual EXH

30*: Common EXH

* Manifold only

Pilot type

Nil	Internal pilot
R*	External pilot

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

Option

CE-compliant

Nil	—
Q	CE-compliant

Thread type

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

Port size

02	Rc 1/4
03	Rc 3/8

Manual override

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

Light/Surge voltage suppressor

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

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

Electrical entry

G: Grommet 	E: Grommet terminal 	T: Conduit terminal 	D, Y: DIN terminal
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Coil rated voltage

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

* Option

How to Order Pilot Valve Assembly

SF4 - 1 DZ - 21

Coil rated voltage

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

* Option

Electrical entry, Light/Surge voltage suppressor

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

Manual override

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

* Option

Applicable model

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

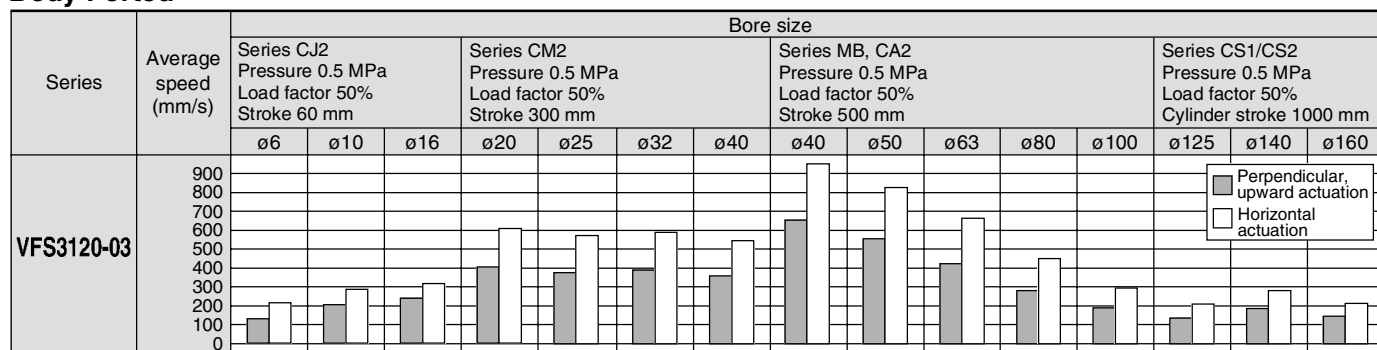
* Y: Conforming to DIN43650B standard
** DIN connector is not attached.

Series VFS3000

Cylinder Speed Chart

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

Body Ported



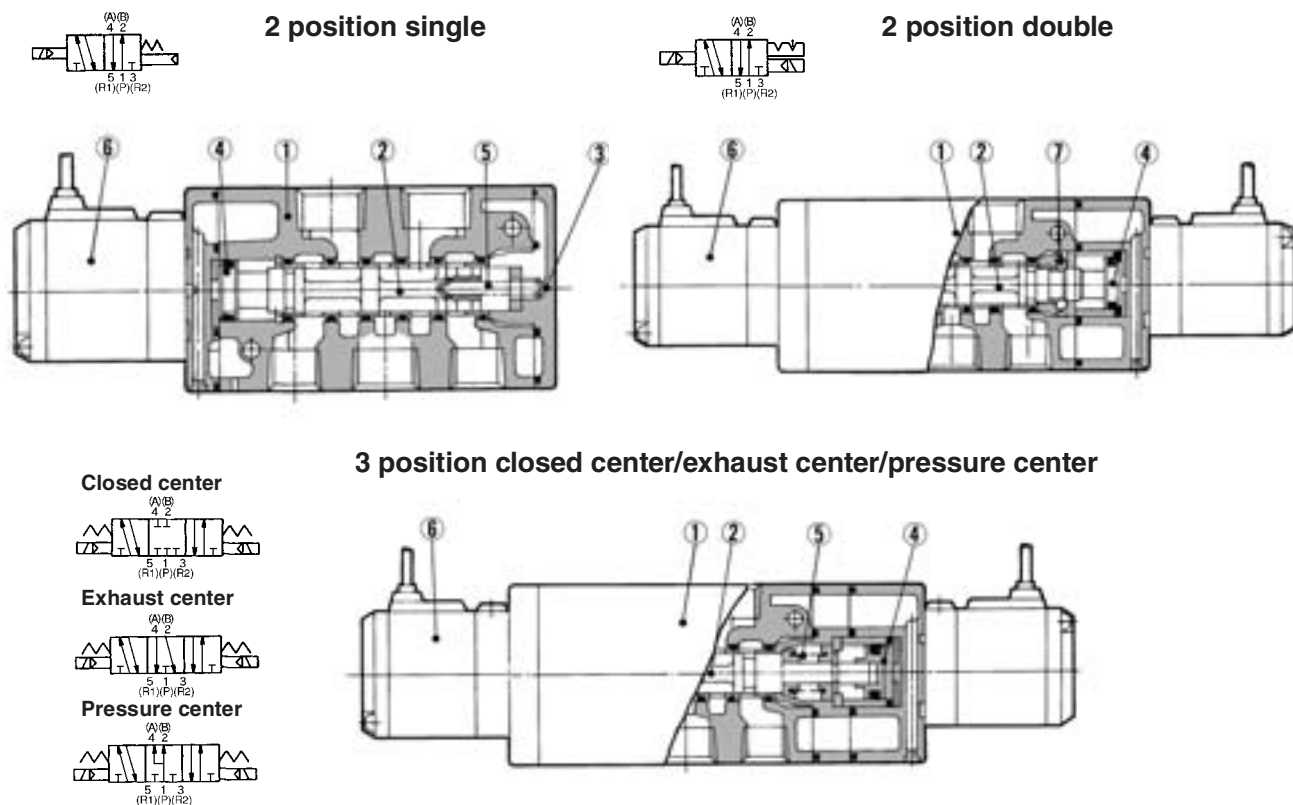
- * It is when the cylinder is extending that is meter-out controlled by speed controller which is directly connected with cylinder, and its needle valve with being fully open.
- * The average velocity of the cylinder is the value that the stroke is divided by the total stroke time.
- * Load factor: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

Conditions

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

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

Construction



Component Parts

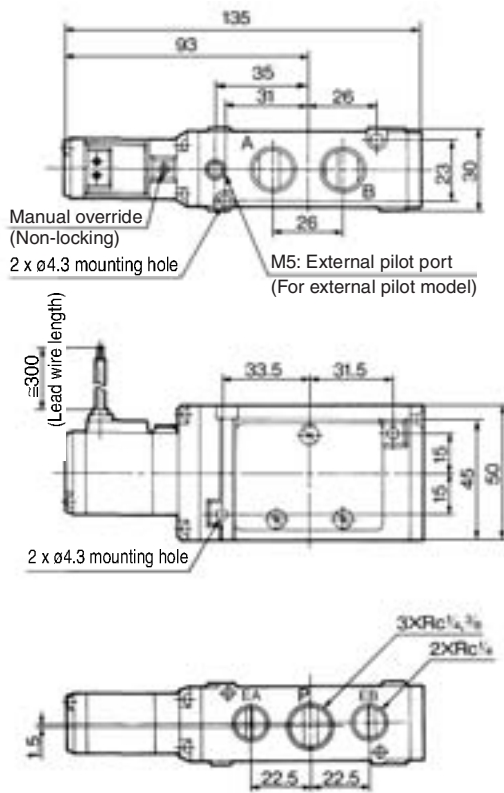
No.	Description	Material	Note
1	Body	Aluminum die-casted	Platinum silver
2	Spool/Sleeve	Stainless steel	—
3	End plate	Resin	Black
4	Piston	Resin	—
5	Return spring	Stainless steel	—
6	Pilot valve assembly	—	—
7	Detent assembly	—	—

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

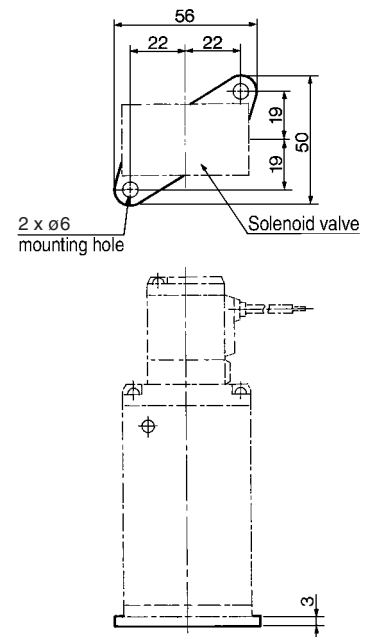
Series VFS3000

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

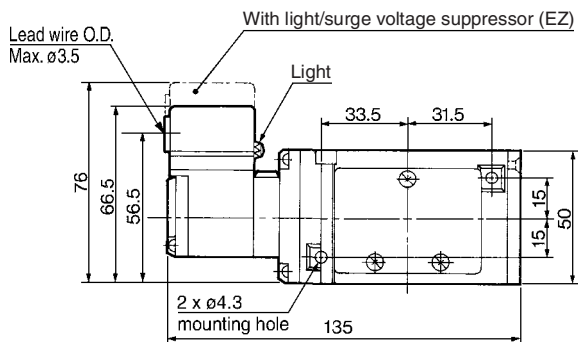
Grommet: VFS3120-□G



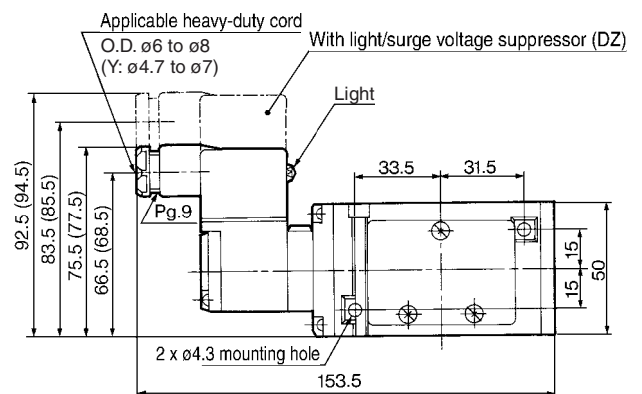
Foot bracket (F)
Part no.: VFS3000-52A



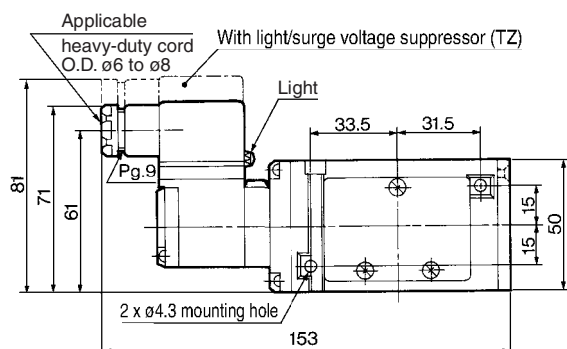
Grommet terminal: VFS3120-□E/EZ



DIN terminal: VFS3120-□D/DZ/Y/YZ



Conduit terminal: VFS3120-□T/TZ

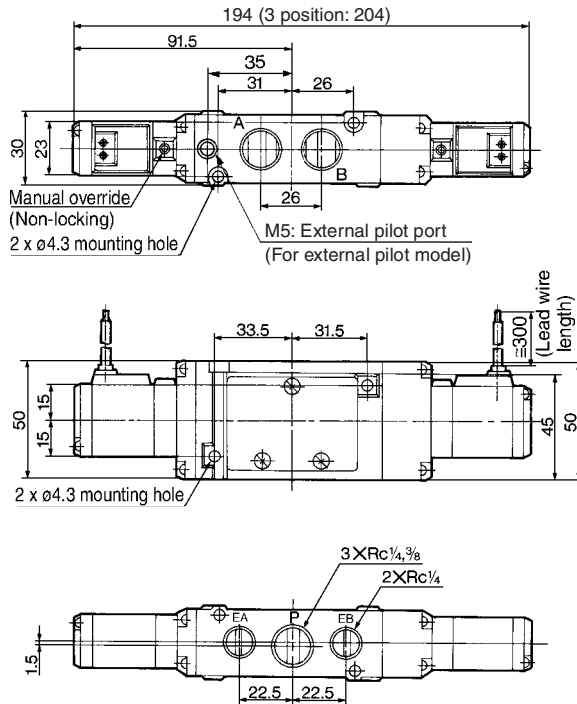


(): Y, YZ

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

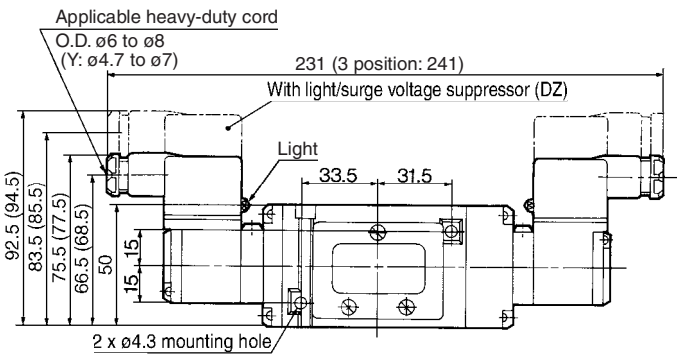
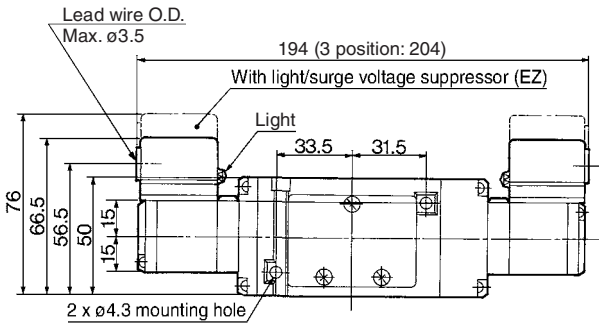
2 Position Double, 3 Position — Grommet, Grommet terminal, Conduit terminal, DIN terminal

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

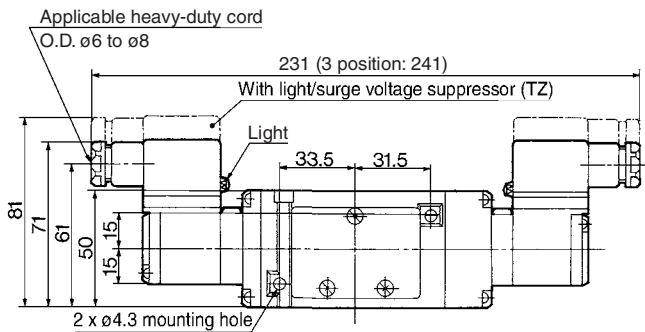


**Grommet terminal: VFS3220-□E/EZ VFS3320-□E/EZ
VFS3420-□E/EZ VFS3520-□E/EZ**

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



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

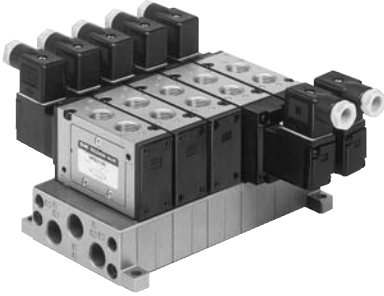


(): Y, YZ

Series VFS3000 Manifold Specifications Stacking Type

Keeps environmental air clean from pilot exhaust

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

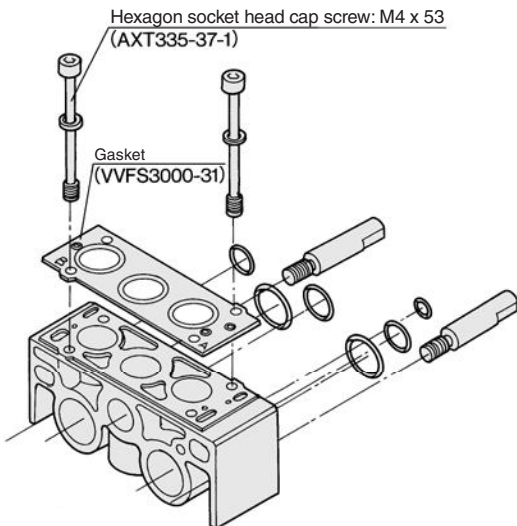


VV5FS3-31

Part no. for mounting bolt and gasket
BG-VFS3030

Exploded View of Manifold

Manifold block assembly VVFS3000-1A-30



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

Specifications

Manifold base type	Stacking type
Stations	Max. 15 stations

Port Specifications

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

Option

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



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

How to Order Manifold Base

VV5FS3 - 31 - 05 1 - 03 [] - []

Series VFS3000
Manifold

• **CE-compliant**

Nil	—
Q	CE-compliant

• **Thread type**

Nil	Rc
N*	NPT
T*	NPTF
F*	G

* Option

• **P, EA, EB port size**

03	Rc 3/8
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• **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 3/8	Common Rc 3/8	Top Rc 1/4, Rc 3/8

Base model

Model	Pilot exhaust	Applicable valve model
31	Pilot common EXH Type 20 Type 30	VFS3□20-□□-□□ VFS3□30-□□-□□



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

How to Order Manifold Assembly [Example]

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

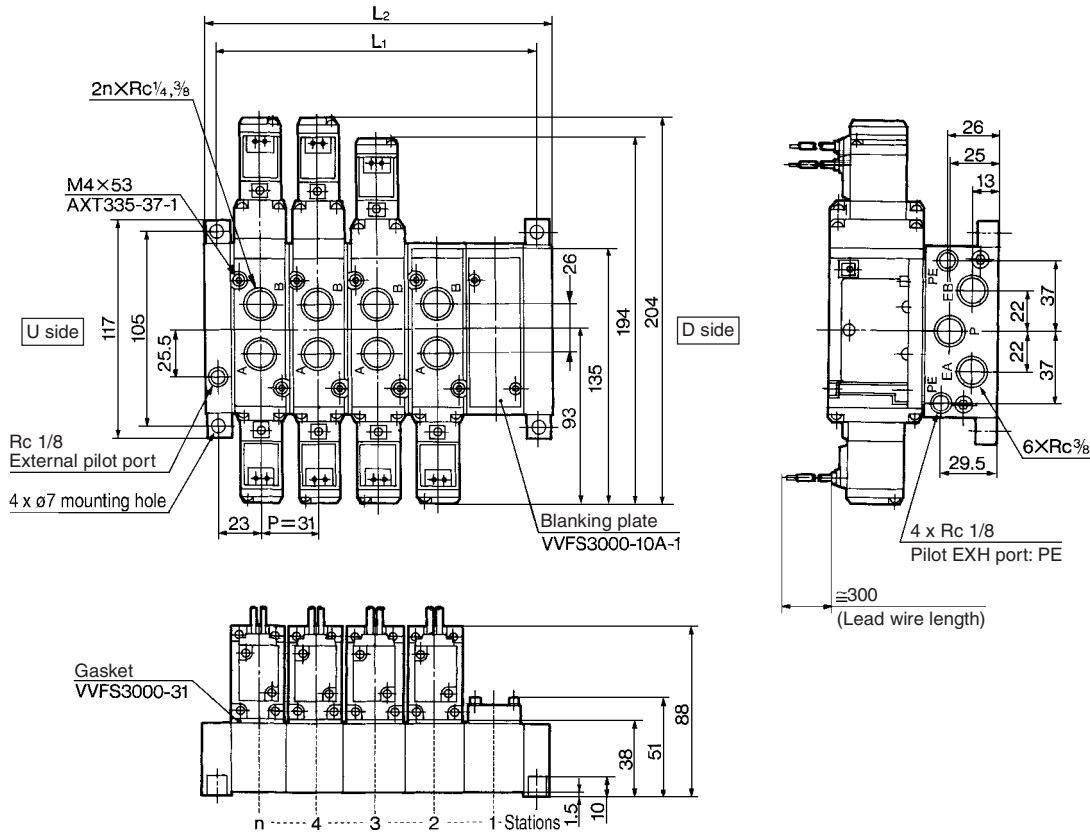
<Example>
(Manifold base) VV5FS3-31-061-03 1
(2 position single) * VFS3130-1D-02 3
(2 position double) * VFS3230-1D-02 2
(Blanking plate) * VVFS3000-10A-1 1

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

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

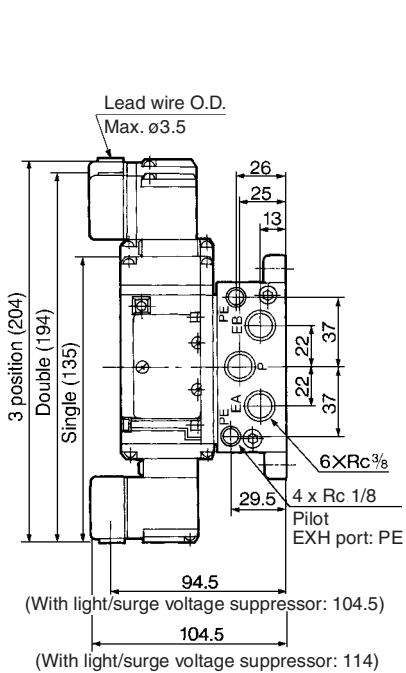
Type 31 Manifold — Pilot common exhaust: VV5FS3-31- Station 1-03

Grommet: G

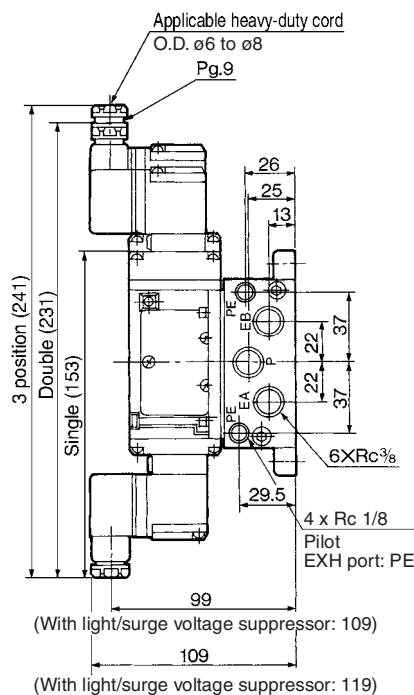


Formula for manifold weight $M = 0.184n + 0.16$ (kg) n: Station

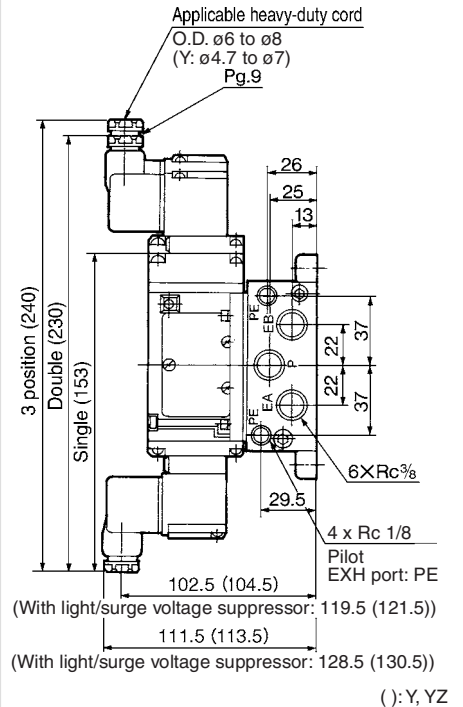
Grommet terminal: E/EZ



Conduit terminal: T/TZ



DIN terminal: D/DZ/Y/YZ



(): Y, YZ

n: Station

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