3 Port Pilot Operated Poppet Rubber Seal

VP300/500/700

High flow capacity
Cv1.0 (VP300), Cv2.3 (VP500), Cv4.0 (VP700)

Low power consumption: 1.8W(DC)

Possible to use as either selector valve or divider valve

Changeable from normally closed style to normally open style

Vacuum applicable
Up to –101.2kPa

VP342-□D **Series VP300**

VP542-□D **Series VP500**

VP742-□D **Series VP700**

Option

Description	Model	Part No.
Bracket with screw	VP342	VP300-27-1A
	VP542	VP500-27-1A
	VP742	VP700-27-1A

Model

Series		Series VP300		Series VP500		Series VP700	
Model	Body ported	VP342		VP542		VP742	
	Base mounted	VP344		VP544		VP744	
Port size		1/8	1/4	1/4	3/8	3/8	1/2
Effective area (mm^2) (Nℓ/min)		16.2 (883)	18 (981)	36 (1963)	41.4 (2257)	62 (3337)	72 (3926)
Weight (kg) (Body ported/Base mounted) (1)		0.19/0.25		0.33/0.43		0.64/0.75	

Note 1) Values for grommet style. Body ported style: Without bracket

Specifications

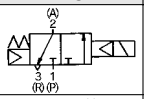
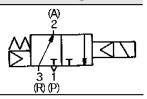
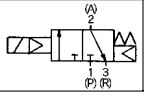
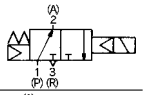
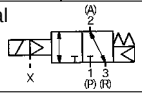
Fluid	Air		
Style	Normally Closed or Normally Open (Changeable)		
Pilot style	Internal pilot	External pilot	
Operating pressure range (MPa)	0.2 to 0.8	Supply pressure	–101.2kPa to 0.8
		External pilot pressure	Same as supply pressure: Min. 0.2
Ambient and fluid temperature (˚C)	Max. 50		
Response time(1) (ms)	30 or less (at 0.5MPa)		
Max. operating frequency (Hz)	5		
Lubrication	Not required (If requiring, turbine oil class 1 ISO VG32)		
Manual override	Non-locking push style		
	Locking slotted style*, Locking leyer style*		
Mounting	Free		
Impact/Vibration resistance(2) (m/s^2)	300/50		

Note 1) According to dynamic performance test JIS B8374 -1981. (Coil temperature 20˚C, at rated voltage, without surge voltage suppressor)
Note 2) Impact resistance: No malfunction on test using drop impact tester, to axis and right angle directions of main valve and armature, each one time when energized and de-energized. (Value in the initial stage.)
Vibration resistance: No malfunction on test with 8.3 to 2000 Hz one sweep, to axis and right angle directions of main valve and armature, each one time when energized and de-energized. (Value in the initial stage.)

Electrical entry			DIN terminal (D)
Coil rated voltage (V)	AC(50/60Hz)		100, 200, 12*, 24*, 48*, 110* to 120, 220*, 240*
	DC		24, 6*, 12*, 48*, 100*, 110*
Allowable voltage			–15 to +10% of rated voltage
Apparent power(1) (VA)	AC	Inrush	5.6(50Hz), 5.0(60Hz)
		Holding	3.4(50Hz), 2.3(60Hz)
Power consumption(1) (W)	DC		1.8, 2 With light

*Option Note 1) At rated voltage

JIS Symbol

Style		N.C.	N.O.
Standard	Body ported		
	Base mounted		
External pilot	Universal		

External pilot (Option)

Use the external pilot style in the following cases.

- For vacuum or the low pressure less than 0.2MPa
- Consult SMC for the use in vacuum hold
- When having P port downsized in diameter
- When using A port as the atmospheric releasing port, e.g. air blower
- If manifold, external pilot piping can be centralized in manifold base

How to Order

E VP 3 4 2 ☐ – 1 D ☐ B – 01 ☐ A – ☐ – Q

VP Solenoid valve

Body size

3	1/4 Base
5	3/8 Base
7	1/2 Base

Valve style

4	Common use to normally closed and normally open (Pilot)

Body style

2	Body ported
4	Base mounted

Valve option

–	Standard (Internal pilot)
R*	External pilot

*Option

Rated voltage

1	100V AC 50/60Hz
2	200V AC 50/60Hz
3	110 AC to 120V50/60Hz
4	220V AC 50/60Hz
5	24V DC
6	12V DC
7	240V AC 50/60Hz
9	Others

Contact SMC for other voltages (9)

Ordering source area code

Code	areas
–	Japan, Asia Austria, England
E	Europe
N	North America

Electrical entry

D	DIN terminal, With connector
DO	DIN terminal, Without connector
Y	DIN terminal, With connector (DIN43650C)
YO	DIN terminal, Without connector (DIN43650C)

Light and surge voltage suppressor

–	None
Z*	With light and surge voltage suppressor

*Option

Manual override

–	Non-locking push style
B*	Push-locking slotted style
C*	Push-locking lever style

*Option

Port size

Symbol	Port size Rc(PT)	VP342 VP344	VP542 VP544	VP742 VP744
–*	Without sub-plate	●	●	●
01	1/8	●		
02	1/4	●	●	
03	3/8		●	●
04	1/2			●

*VP344, VP544 or VP744 only.

Thread

–	Rc (PT)
F	G (PF)
N	NPT
T	NPTF

Actuation

A	Normally closed
B	Normally open

Option

F	With bracket

(Only VP342, 542 or 742.)

How to Order Pilot Valve Assembly

SF4 – 1 D Z B – 50 – Q

Rated voltage

1	100V AC 50/60Hz
2	200V AC 50/60Hz
3	110 to 120V AC 50/60Hz
4	220V AC 50/60Hz
5	24V DC
6	12V DC
7	240V AC 50/60Hz
9	Others

Manual override

–	Non-locking push style
B*	Push-locking slotted style
C*	Push-locking lever style

*Option

Light and surge voltage suppressor

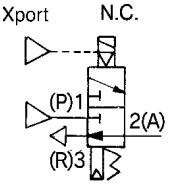
–	None
Z*	With light and surge voltage suppressor

Electrical entry

D	DIN terminal, With connector
DO	DIN terminal, Without connector
Y	DIN terminal, With connector (DIN43650C)
YO	DIN terminal, Without connector (DIN43650C)

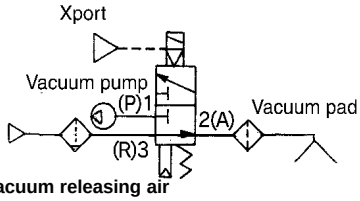
Application Examples

①Blow off valve



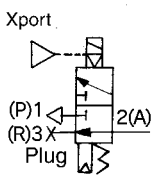
External pilot model

④Vacuum control valve



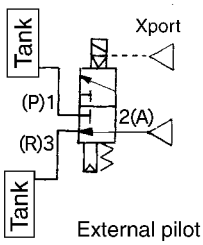
Vacuum releasing air
Atmospheric pressure or small pressure
External pilot

②Pressure release valve



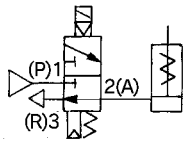
External pilot

⑤Divider valve

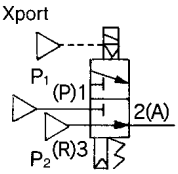


External pilot

⑥Operation of a single acting cylinder

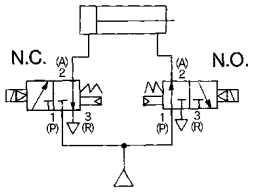


③Selector valve

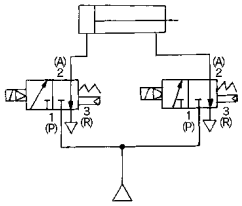


External pilot

⑦Operation of a double acting cylinder

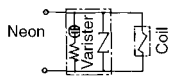
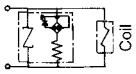
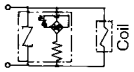


⑧Operation of a double acting cylinder (Exhaust centre)



⚠ Caution

Light and Surge Voltage Suppressor

Rated voltage	Circuit	Symbol	DIN terminal (D)
AC	Surge voltage suppressor	S	–
	Light and surge voltage suppressor	Z	 DZ More than 100V AC
			 DZ Less than 24V AC
DC	Surge voltage suppressor	S	–
	Light and surge voltage suppressor	Z	 DZ More than 100V DC
			 DZ Less than 24V DC

Electrical Connection

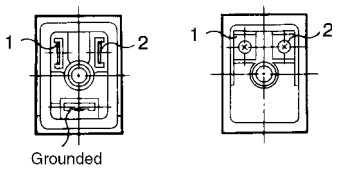
For grommet with surge voltage suppressor for DC specification please correctly connect the lead wires to positive and negative indications on the connector. For non-polar style such as DIN connector or Terminal, the lead wires can be connected to either one.

Grommet

Lead wire color	Red	Black
Polarity	+	–

DIN terminal or Terminal

With DIN terminal block With terminal block



Piping

Pilot solenoid valve is easy to generate the voltage drop due to the small flow upstream of the valve. It causes the valve to malfunction. Select the I.D. fitting size more than ø8 for VP344 and VP342, more than ø10 for VP544 and VP542, more than ø12 for VP744 and VP742 when piping length is less than 3 metres. Use the external pilot for the case of small flow upstream of the valve.

⚠ Precautions

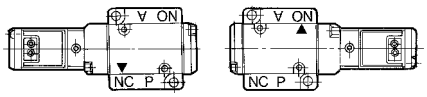
Be sure to read before Handing. Refer to the p.0-33 to 0-36 Safety Instructions and common precautions.

⚠ Caution

Change of Actuation

1) Base mounted

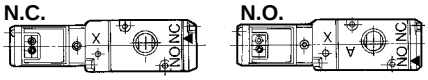
N.C. **N.O.**



When changing the actuation from normally closed style to normally open style, remove the body from the sub plate and reset the "▼" mark on the body corresponding to the "NO" mark on the sub plate as shown in the figure above. It is not necessary to change the piping at that time.

2) Body ported

N.C. **N.O.**

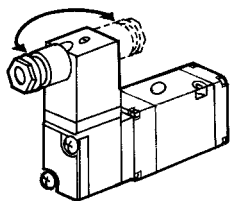


When changing the actuation from normally closed style to normally open style, remove the body from the sub plate and reset the "▼" mark on the body corresponding to the "NO" mark on the sub plate as shown in the figure above. Refer to the following table for piping.

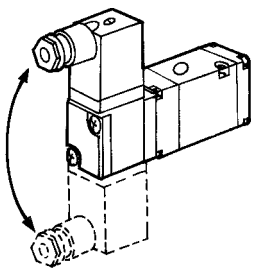
Actuation \ Port	P	A	R
N.C.	Upstream	Downstream	Exhaust side
N.O.	Exhaust side	Downstream	Upstream

Change of Electrical Entry

1) Push out the body of DIN terminal from the cover, turn it at 180° and then insert it .



2) Remove pilot valve mounting screws (M3, 2 pcs.), rotate the pilot valve at 180° and then re-tighten the valve with the screw.

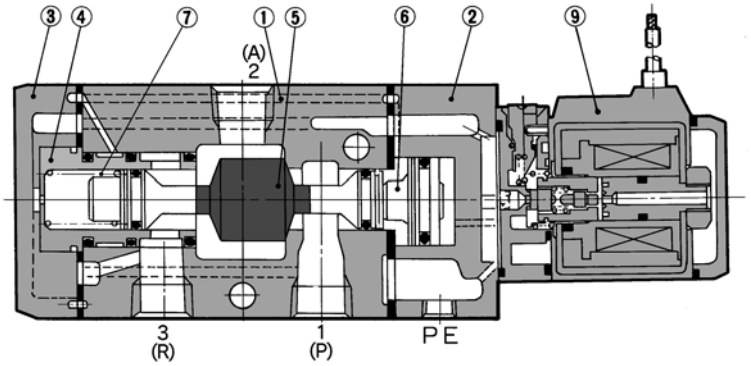


How to calculate the flow rate

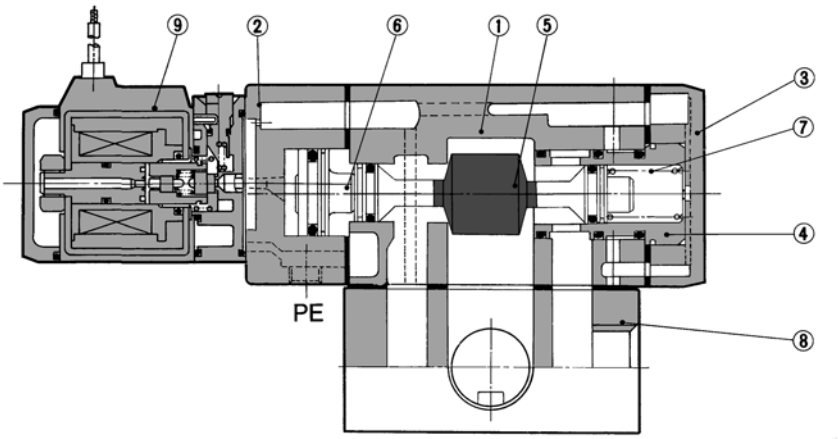
Please refer to the p.0-36 for the details.

Construction

Body Ported



Base Mounted



SY
SYJ
VK
VZ
VT
VT
VP
VG
VQ
VQZ

Component Parts

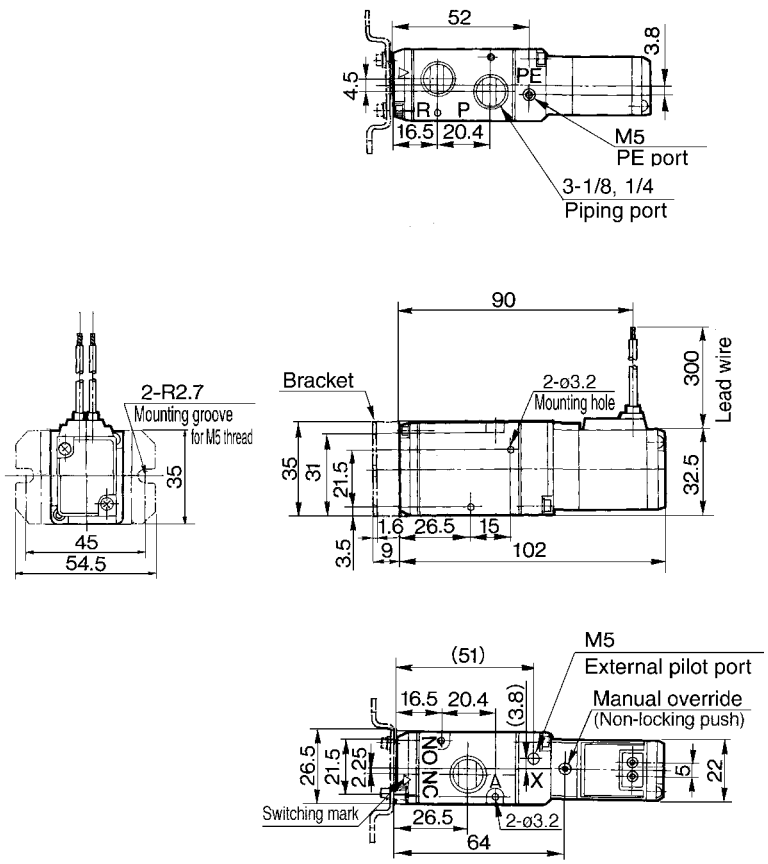
No.	Description	Material	Note
①	Body	Aluminium die cast	Painted silver
②	Adapter plate	Aluminium die cast	Painted silver
③	End plate	Aluminium die cast	Painted silver
④	Retainer	Brass	
⑤	Spool valve	Aluminium/NBR	
⑥	Piston	Resin	
⑦	Spring	SUS	

Replacement Parts

No.	Description	Part No.	Note	
⑧	Sub plate	VP300-2-1P	VP344, 1/8	Aluminium die cast
		VP300-2-2P	VP344, 1/4	
		VP500-2-1P	VP544, 1/4	
		VP500-2-2P	VP544, 3/8	
		VP700-2-1P	VP744, 3/8	
		VP700-2-2P	VP744, 1/2	
⑨	Pilot valve ass'y	SF4-□□□□-50	Refer to "How to Order Pilot Valve Assembly" on p.2.6-2	

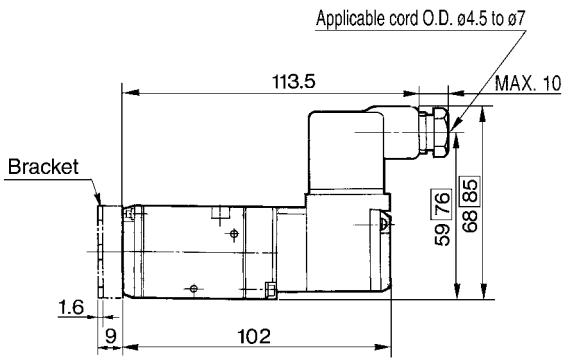
VP300: Body ported/Dimensions

Grommet (G)



Note: This valve series is now only available with DIN connector.

DIN terminal (D) (Y)

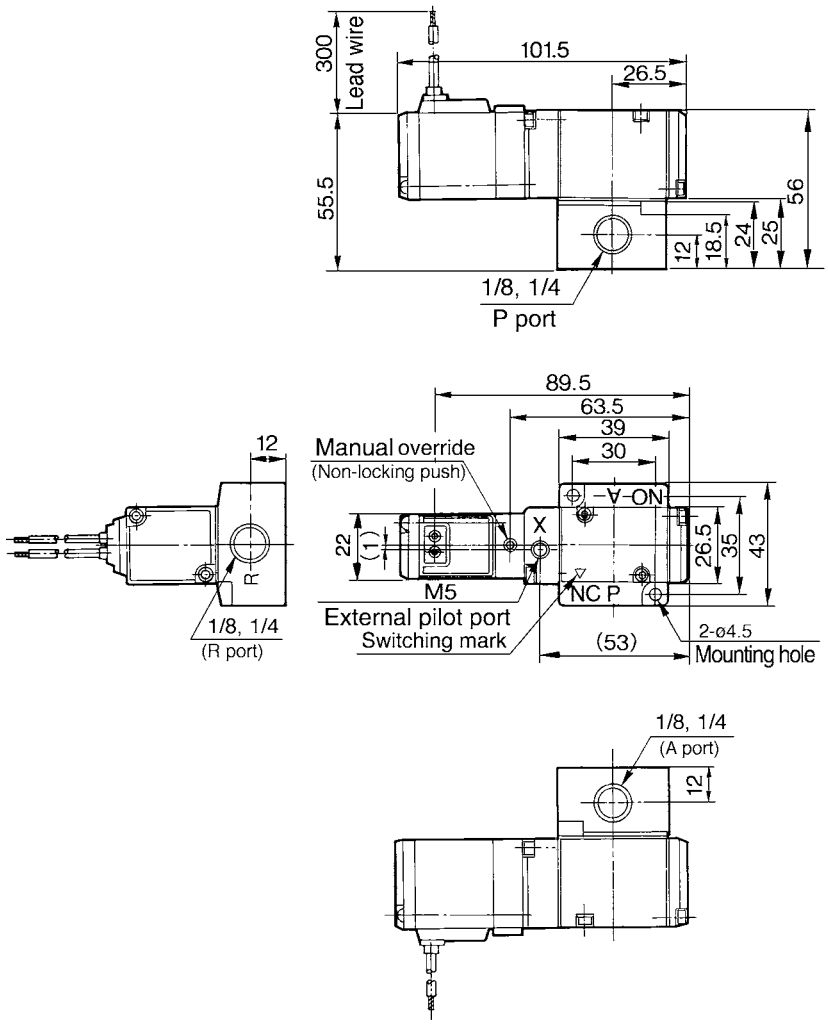


( ): Dimensions for external pilot

▭: With light and surge voltage suppressor

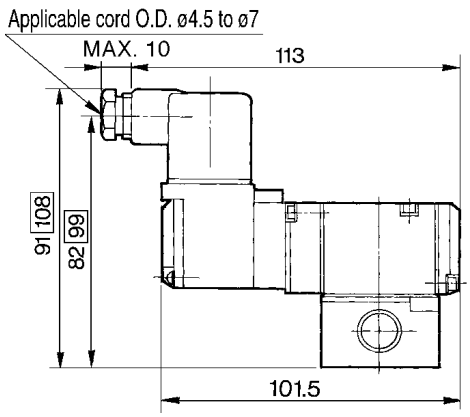
VP300: Base mounted/Dimensions

Grommet (G)



Note: This valve series is now only available with DIN connector.

DIN terminal (D) (Y)

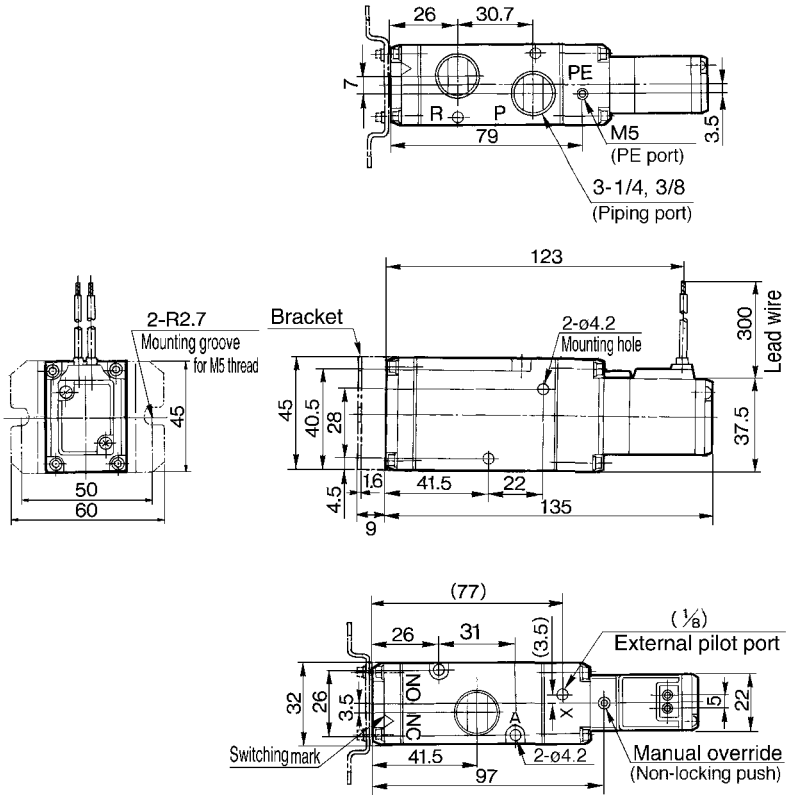


( ): Dimensions for external pilot

▭: With light and surge voltage suppressor

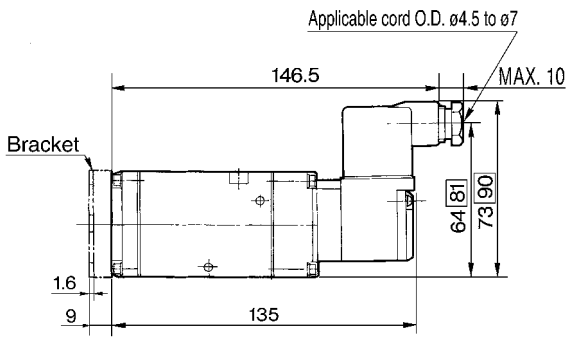
VP500: Body ported/Dimensions

Grommet (G)



Note: This valve series is now only available with DIN connector.

DIN terminal (D) (Y)

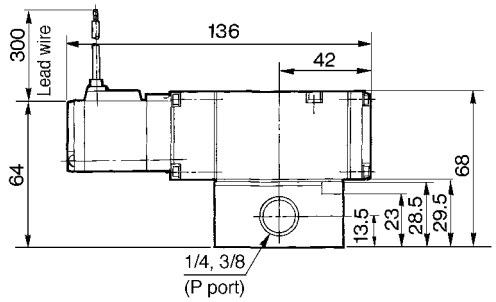


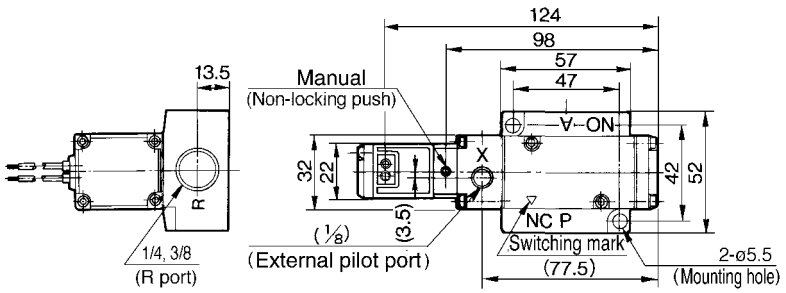
( ): Dimensions for external pilot

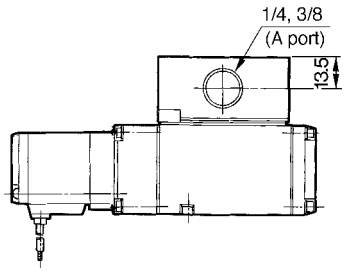
□: With light and surge voltage suppressor

VP500: Base mounted/Dimensions

Grommet (G)

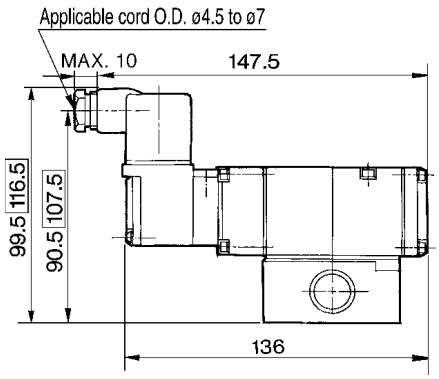






Note: This valve series is now only available with DIN connector.

DIN terminal (D) (Y)

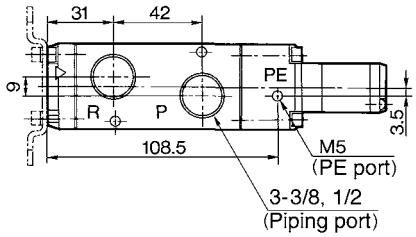


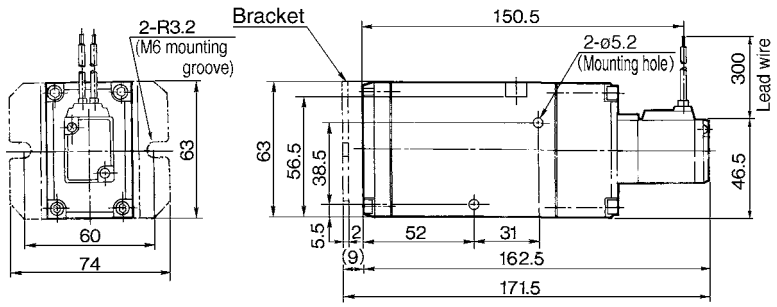
( ): Dimensions for external pilot

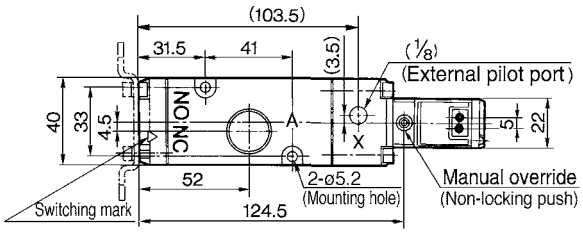
□: With light and surge voltage suppressor

VP700: Body ported/Dimensions

Grommet (G)

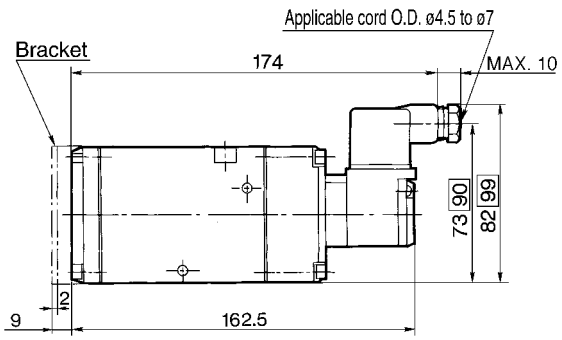






Note: This valve series is now only available with DIN connector.

DIN terminal (D) (Y)

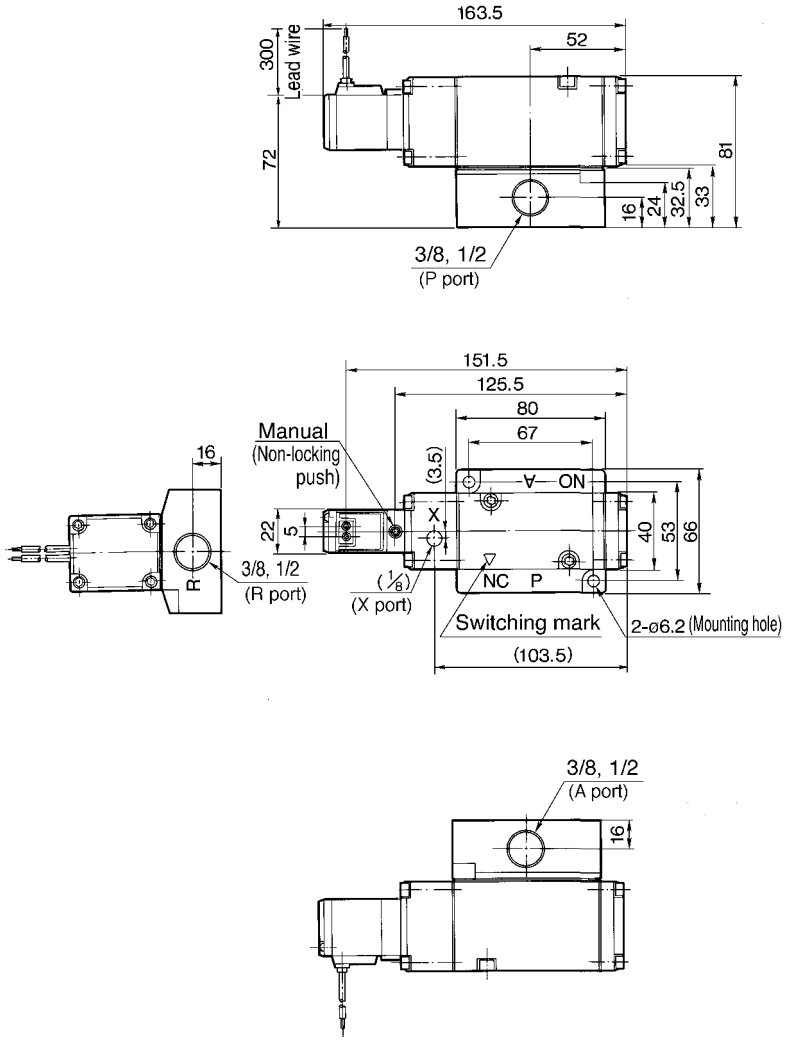


( ): Dimensions for external pilot

□: With light and surge voltage suppressor

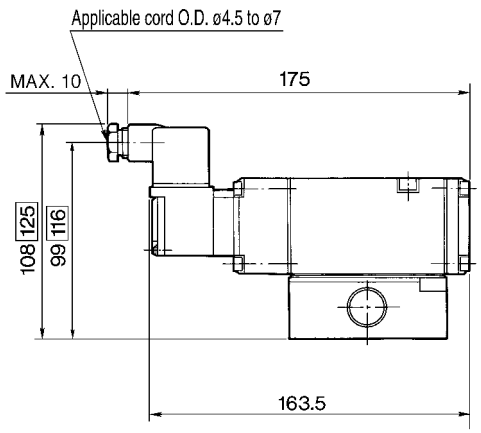
VP700: Base mounted/Dimensions

Grommet (G)



Note: This valve series is now only available with DIN connector.

DIN terminal (D) (Y)



( ): Dimensions for external pilot

: With light and surge voltage suppressor

VP300/500/700
Manifold

Piping is concentrated at the base side.

All external pilots are gathered in the base.

Common external, pilot port allows one piping.

2 styles of exhaust ports

Select either a common or individual exhaust port. Individual exhaust style is possible to control the flow rate.

Easy to change switching style. (Nomally Closed or Nomally Open)

Switching style is easily changed from nomally closed to nomally open by changing the direction of the valve only 180°.

VV3P5-42-053-03

Specifications

Manifold style	B mount Single base
R(EXH) style	Common EXH, Individual EXH
P(SUP) style	Common SUP
Valve stations	Max. 20*

*In case of more than 10 stations, use 2 SUP/EXH ports to supply/exhaust pressure.

Model

Series	Manifold base part number	R port style	Port size (P.A.R)	Applicable valve model
VP300	**VV3P3-41-** No. of stations **1-02**	Common	1/4	VP344-□□
	VV3P3-42- No. of stations **3-02**	Individual	1/4	
VP500	**VV3P5-41-** No. of stations **1-03**	Common	3/8	VP544-□□
	VV3P5-42- No. of stations **3-03**	Individual	3/8	
VP700	**VV3P7-41-** No. of stations **1-04**	Common	1/2	VP744-□□
	VV3P7-42- No. of stations **3-04**	Individual	1/2	

•Common external pilot style (VV3P*-41R, -42R).
In case of external pilot manifold, valve is external pilot style (standard specification).

Option

Description	Part No.	Applicable manifold base model
Blank plate assembly (with gasket and mounting screw)	VP300-25-1A	VV3P3
	VP500-25-1A	VV3P5
	VP700-25-1A	VV3P7

How to Order

E VV3P 3 – 41 □ – 04 1 – 02 □

Series VP
3 port solenoid valve manifold

Body size

3	1/4 standard
5	3/8 standard
7	1/2 standard

Base specifications

41	Common exhaust
42	Individual exhaust

Supply port is common.

Special specifications

–	Standard
R	Common external pilot

Ordering source area code

Code	areas
–	Japan, Asia Austria, England
E	Europe
N	North America

Stations

02	2 stations
⋮	⋮
20	20 stations

Symbol

Symbol	Flow passage		Piping	Note
	P	R	A	
1	Common	Common	Side	41 type
3	Common	Individual	Side	42 type

Port size

Symbol	Port size	Applicable manifold base model
02	1/4	VV3P3
03	3/8	VV3P5
04	1/2	VV3P7

Thread(P, R port)

–	Rc (PT)
F	G (PF)
N	NPT
T	NPTF

Note) The part numbers of valve and blank plate are required to order.

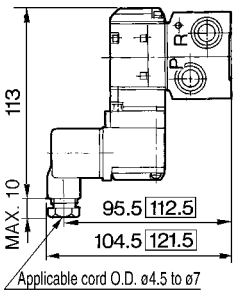
Ex.) 4 stations manifolds

VV3P3-41-041-02·····1
VP344-1D-Q·····3
VP300-25-1A (Blank plate) ·····1

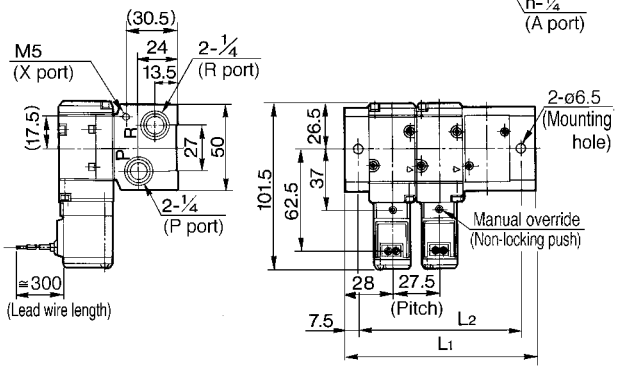
VV3P3/Dimensions (N.C.)

Common exhaust: VV3P3-41□- Number of stations 1-02

(D)(Y)



(G)



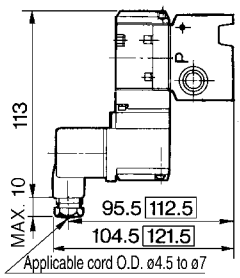
Note: This valve series is now only available with DIN connector.

□: With light and surge voltage suppressor
( ): Dimensions for external pilot

L \ n	2	3	4	5	6	7	8	9	10	Calculation formula
L1	83.5	111	138.5	166	193.5	221	248.5	276	303.5	L1=27.5 X n+28.5
L2	68.5	96	123.5	151	178.5	206	233.5	261	288.5	L2=27.5 X n+13.5

Individual exhaust: VV3P3-42□- Number of stations 3-02

(D)(Y)



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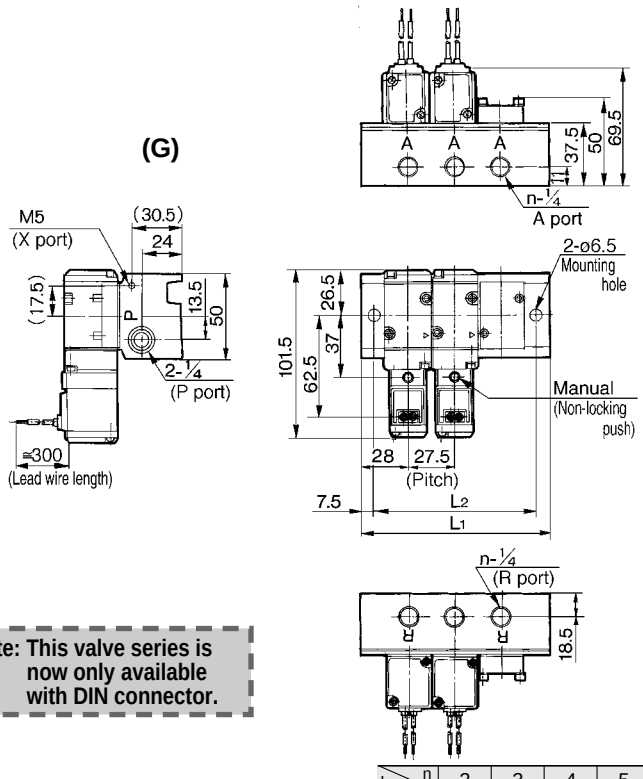


Note: This valve series is now only available with DIN connector.

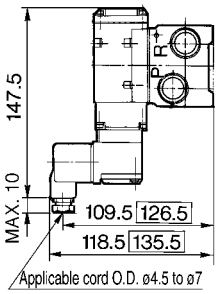
□: With light and surge voltage suppressor
( ): Dimensions for external pilot

L \ n	2	3	4	5	6	7	8	9	10	Calculation formula
L1	83.5	111	138.5	166	193.5	221	248.5	276	303.5	L1=27.5 X n+28.5
L2	68.5	96	123.5	151	178.5	206	233.5	261	288.5	L2=27.5 X n+13.5

VV3P5/Dimensions (N.C.)

Common exhaust: VV3P5-41□- Number of stations 1-03

(D)(Y)



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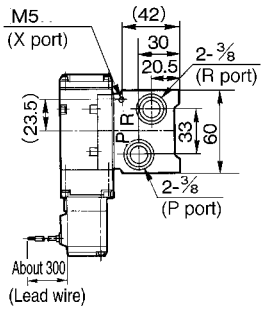
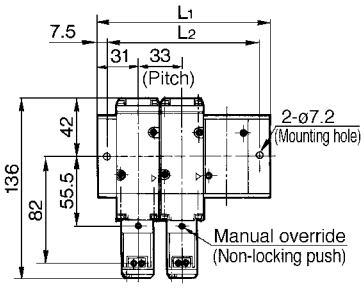
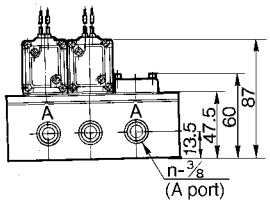






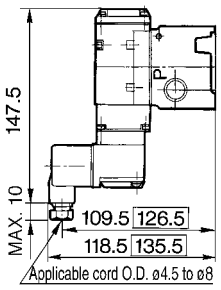
Note: This valve series is now only available with DIN connector.

□: With light and surge voltage suppressor
( ): Dimensions for external pilot

L \ n	2	3	4	5	6	7	8	9	10	Calculation formula
L1	95	128	161	194	227	260	293	326	359	L1=33 X n+29
L2	80	113	146	179	212	245	278	311	344	L2=33 X n+14

Individual exhaust: VV3P5-42□- Number of stations 3-03

(D)(Y)



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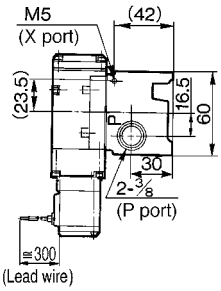
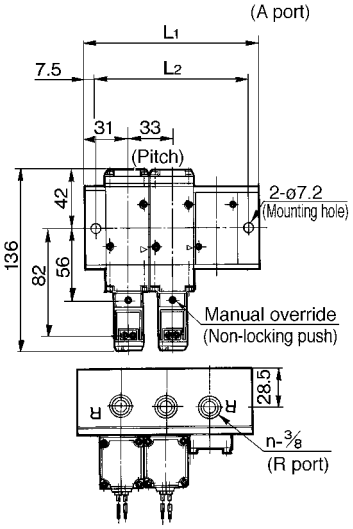
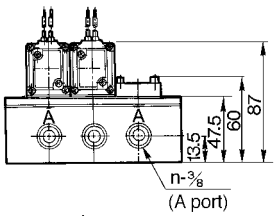






Note: This valve series is now only available with DIN connector.

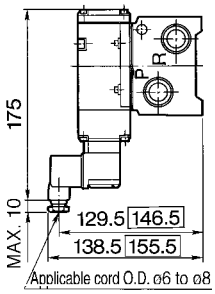
□: With light and surge voltage suppressor
( ): Dimensions for external pilot

L \ n	2	3	4	5	6	7	8	9	10	Calculation formula
L1	95	128	161	194	227	260	293	326	359	L1=33 X n+29
L2	80	113	146	179	212	245	278	311	344	L2=33 X n+14

VV3P7/Dimensions (N.C.)

Common exhaust: VV3P7-41□- Number of stations 1-04

(D)(Y)



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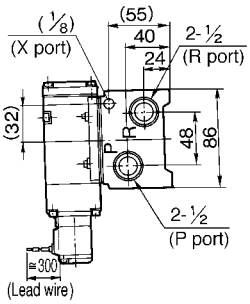
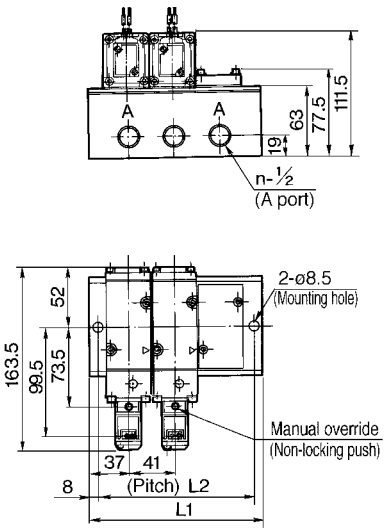




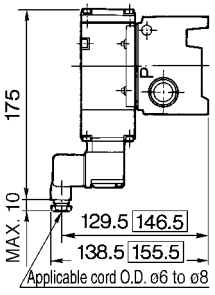
Note: This valve series is now only available with DIN connector.

□: With light and surge voltage suppressor
( ): Dimensions for external pilot

L \ n	2	3	4	5	6	7	8	9	10	Calculation formula
L1	115	156	197	238	279	320	361	402	443	L1=41 X n+33
L2	99	140	181	222	263	304	345	386	427	L2=41 X n+17

Individual exhaust: VV3P7-42□- Number of stations 3-04

(D)(Y)



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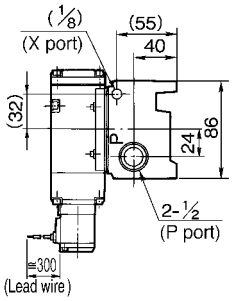

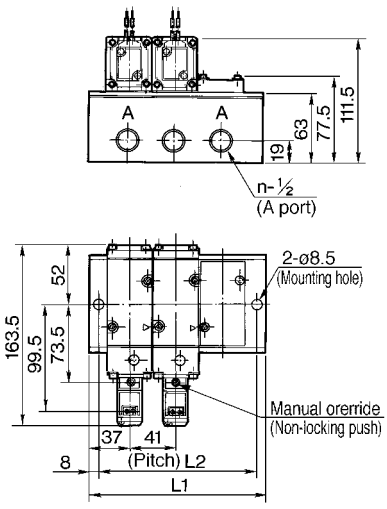

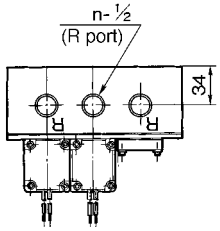

Note: This valve series is now only available with DIN connector.

□: With light and surge voltage suppressor
( ): Dimensions for external pilot

L \ n	2	3	4	5	6	7	8	9	10	Calculation formula
L1	115	156	197	238	279	320	361	402	443	L1=41 X n+33
L2	99	140	181	222	263	304	345	386	427	L2=41 X n+17