

ISO Standard Solenoid Valve/SIZE ②

Rubber Seal

Series VP7-8



With interface regulator

2 position	Single solenoid (FG-S)	Double solenoid (FG-D)	Reverse pressure* (YZ-S)	Reverse pressure* (YZ-D)
3 position	Closed centre (FHG-D)	Exhaust centre (FJG-D)	Double pilot check (FPG-D)	Pressure centre* (FIG-D)

*Option

Standard Specifications

Fluid			Air
Operating pressure (MPa)	Single	2 position	0.15 to 0.9
		2 position	0.1 to 0.9
	Double	3 position	0.15 to 0.9
Ambient and fluid temperature			Max. 50°C
Manual operation			Non-locking
Electric entry			DIN connector
Lubrication			Turbine oil class 1 (ISOVG32), Non-lube operation possible.
Shock/Vibration resistance ⁽¹⁾			300/50m/s ²



Note 1) Shock resistance: No malfunction resulted from the impact test using a drop impact tester. The test was performed on the axis and right angle direction of the main valve and armature, for both energized and de-energized states.

Vibration resistance: No malfunction occurred in a one-sweep test between 8.3 and 2000Hz. Test was performed at both energized and de-energized states to the axis and right angle direction of the main valve and armature. (value in the initial stage.)

Pilot Valve Specifications

Part No.	AXT511C-1	AXT511C-2	AXT511C-3	AXT511C-4
Rated voltage (V)	100V AC 50/60Hz	200V AC 50/60Hz	24V DC	12V DC
Inrush current (A) ⁽¹⁾	0.049/0.043	0.024/0.021	0.075	0.15
Holding current (A) ⁽¹⁾	0.031/0.020	0.015/0.01		
Allowable voltage (V)	85 to 110% of rated voltage			
Coil insulation	Class B (130°C) or equivalent			



Note 1) At rated voltage

Accessories

Mounting screw (washer)	TA-B-6 X 45
Gasket	AXT510-13

Option

Protection circuit	Surge voltage suppressor
Reverse pressure ⁽¹⁾	R1/R2 port pressurized, R1=P1 pressure, R2=P2 pressurization



Note 1) Operate under the condition of P₁>P₂ when "YZ-S" is operated.

Interface Regulator (Options)

Model	Regulation port	Note
ARB350-00-P	P	Refer to p.1.9-14 for specifications.
ARB350-00-A	A	
ARB350-00-B	B	

Model

No. of positions	Model	Effective area ($\frac{3}{8}$ With sub-plate) (mm ²)(N/min)	Max. operating frequency ⁽¹⁾ (c/s)	Response time ⁽²⁾ (S)	Weight ⁽³⁾ (kg)
2(Single)	VP7-8-FG-S-□	65 (3533.40)	5	0.05 or less	0.92
2(Double)	VP7-8-FG-D-□	65 (3533.40)	5	0.05 or less	1.12
3(Closed centre)	VP7-8-FHG-D-□	57.6 (3140.80)	3	0.07 or less	1.12
3(Exhaust centre)	VP7-8-FJG-D-□	57.6 (3140.80)	3	0.07 or less	1.12
3(Double pilot check)	VP7-8-FPG-D-□	40 (2159.30)	3	0.07 or less	1.52
3(Pressure centre)*	VP7-8-FIG-D-□	57 (3111.36) [30.6 (1668.55)]	3	0.07 or less	1.12



Note 1) Min. operating frequency: According to JIS B8375 (once in 30 days).

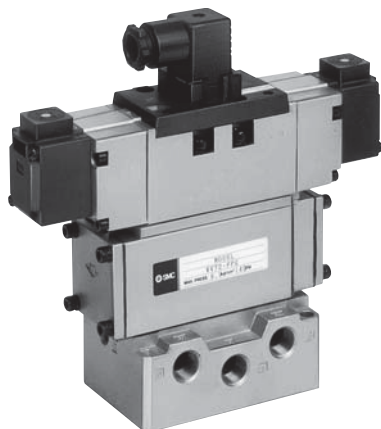
Note 2) According to JIS B8375-1975 dynamic performance test.(0.5MPa, Coil temperature: 20°C, At rated voltage, Without surge voltage suppressor)

Note 3) Without sub-plate. (Sub-plate: 0.68kg)

Note 4) [] : In normal position. *Option

Permits Long Period Intermediate Stops.

Mounting a double pilot check spacer makes it possible to keep a cylinder in the mid stroke position for a long time without influence of air leakage between spool valves.



VP7-8-FPG-D-□

⚠ Caution

For 3 position double pilot check valve, make sure that there is no leakage from the piping between valve and cylinder or from the fitting parts or so, checking it with solvent like neutral detergent solution. Leakage from sealant of cylinder should be checked. If any leakage occurs, cylinder piston may not stop at the mid position and be movable when the valve is de-energized.

Note:

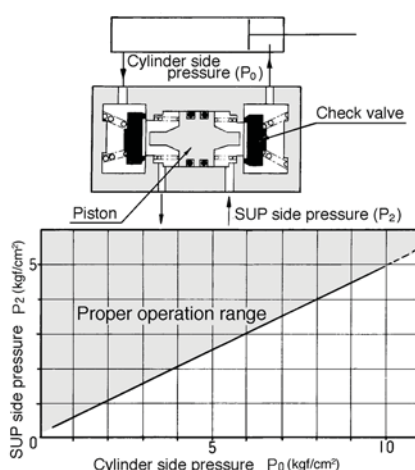
Please note that single subplates and manifolds have changed colour from platinum silver to white as standard. Valves will remain platinum silver.

Double Pilot Check Spacer Specifications

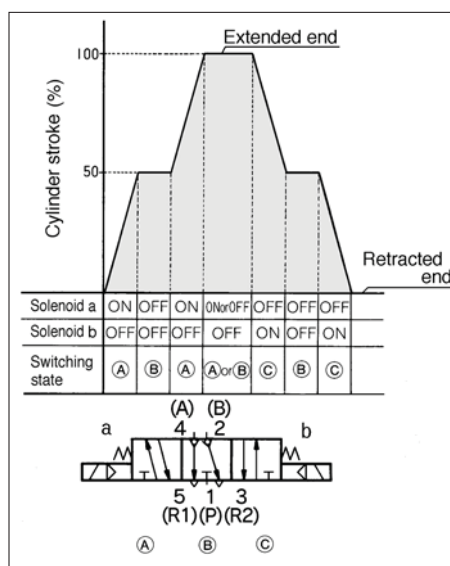
Part number		VV72-FPG				
Applicable solenoid valve		VP7-8-FJG-D (Exhaust center)				
Leakage cm ³ /min (ANR)	Solenoid on one side being energized	P	R1	50 or less		
			R2			
	Solenoid on both sides being de-energized	P	R1	50 or less		
			R2			
				A	R1	0
				B	R2	

Characteristics of Check Valve Operating Pressure

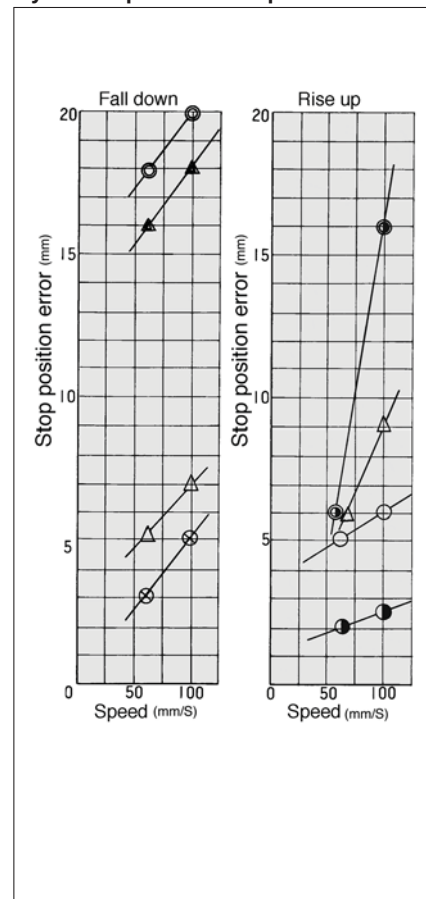
Check valves are operated properly as long as the cylinder side pressure is below twice as much as the P side pressure.



Mid Stroke Cylinder Position Holding Circuit with Double Pilot Check Valve



Cylinder Speed and Stop Position Error

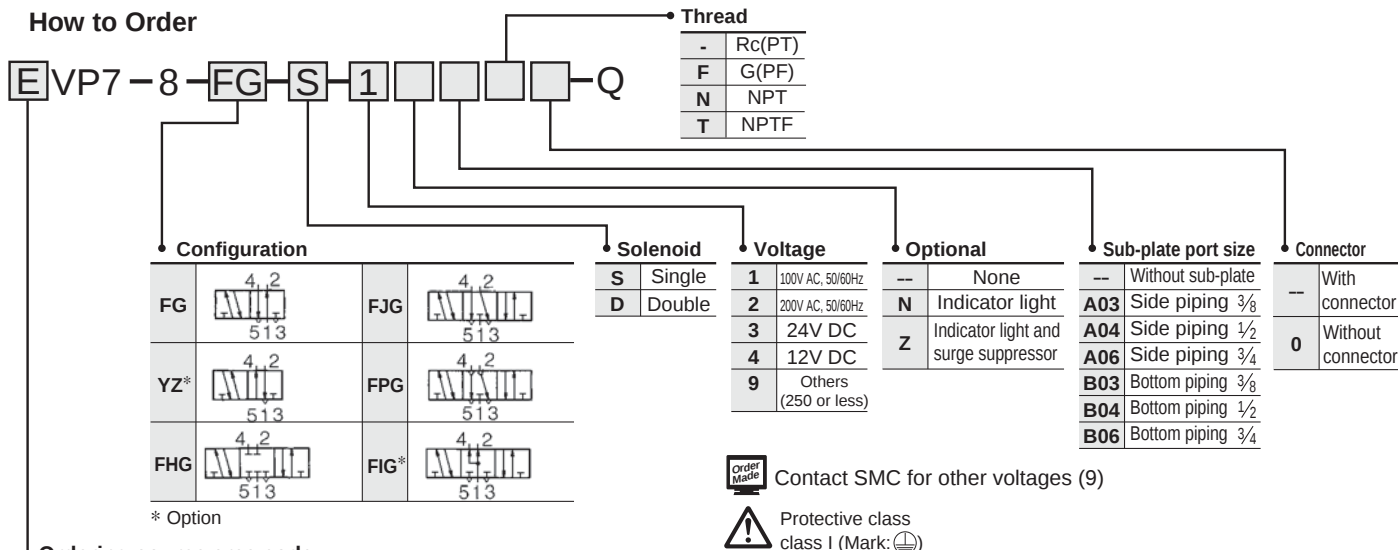


Cylinder		Supply pressure	Cylinder load	Load ratio	
ø50-450 st	ø80-450 st			ø50	ø80
—○—	—○—	0.2MPa	25kg	51%	28%
—⊗—	—⊗—	0.5	25	25	11
—●—	—●—	0.2	35	72	39
—△—	—△—	0.5	35	36	16

SV
SY
SYJ
SX
VK
VZ
VF
VFR
VP7
VQC
SQ
VQ
VQ4
VQ5
VQZ
VQD
VFS
VS
VS7
VQ7

VP7-8

How to Order



Ordering source area code

Code	areas
-	Japan, Asia Australia
E	Europe
N	North America

⚠ Precautions

Be sure to read before handling. Refer to p.0-33 to 0-36 for Safety Instruction and common precautions.

⚠ Caution

DIN connector (Wiring)

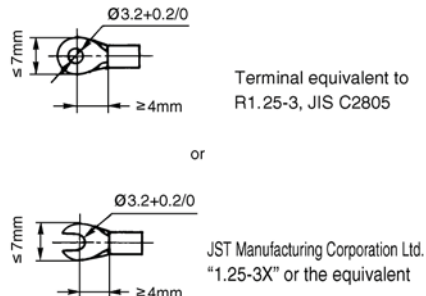
- Solenoids are connected to the male pin terminal on the DIN connector terminal block as follows. Connect to each terminal block on the connector part.

Terminal	
1	A side
2	B side
3	COM
⏏	Ground

Either +COM or -COM is applicable.

- Applicable cable
Core wire effective sectional area: 0.5 to 1.5mm²
Cable O.D.: $\phi 6.8$ to $\phi 10$
- Applicable crimp style terminal

As shown below



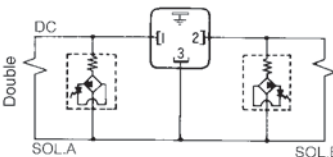
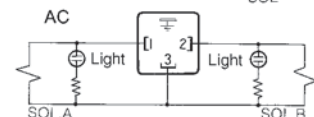
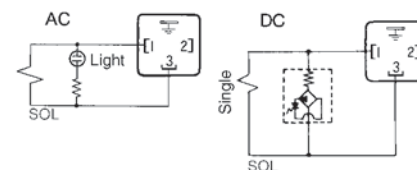
- Appropriate tightening torque of the connector part

Connector fixing thread: 0.5 to 0.6Nm

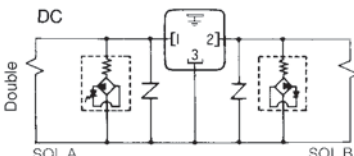
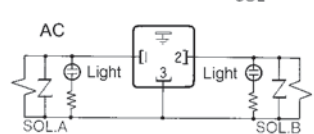
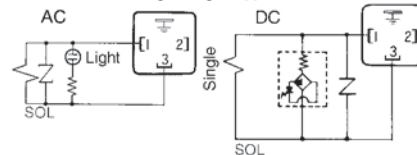
Terminal thread: 0.5 to 0.6Nm

Indicator Light/Surge Suppressor

With indicator light



With indicator light/surge suppressor



Interface Regulator Specifications

Specifications

Model	ARB350		
Applicable solenoid valve	VP7-8		
Regulation port	A	B	P
Max. operating pressure	1.0MPa ⁽¹⁾		
Set pressure range	0.1 to 0.83MPa ⁽²⁾		
Ambient and fluid temp.	5 to 60° ⁽³⁾		
Gauge port size	1/8		
Weight (kg)	0.83		
Supply eff. area (mm ²)	P→A	40	31
S at P1=0.7MPa, P2=0.5MPa	P→B	31	34
Exhaust eff. area (mm ²)	A→EA	60	
S at P2=0.5MPa	B→EB	53	

Note 1) Solenoid valve max. operating pressure: 0.9MPa

Note 2) Set within the solenoid valve operating pressure range.

Note 3) Solenoid valve: Max. 50°C

Note 4) Effective area shown in the above table is the synthesized value with 2 position (single) type.

●Interface regulator: Pressurize only from P port of the base except when used with reverse pressure valve.

●Use the ARB210 or ARB310 model to combine a pressure center valve and the A and B port pressure reduction of an interface regulator.

●Use the ARB210 or ARB310 model to combine a reverse pressure valve and an interface regulator. The P port pressure reduction cannot be used.

●To use a double pilot check valve and an interface regulator, use a manifold or a sub-plate the standard and stack in the following order: as the double pilot check interface, an interfacier regulator, and the valve.

●When a closed center valve is combined with the A and B port pressure reduction of an interface regulator, it cannot be used for intermediate stops of the cylinder because of the leakage from the relief port of the regulator.

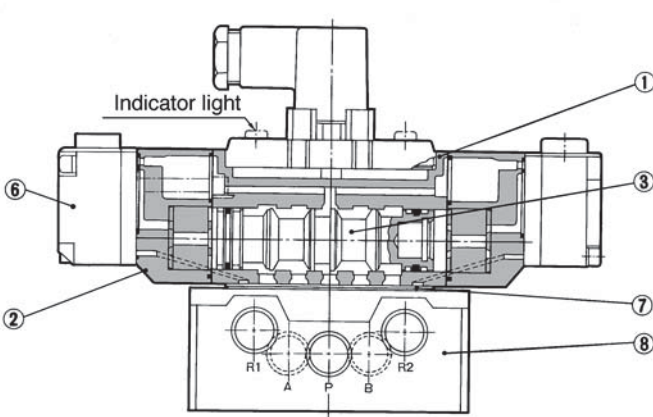
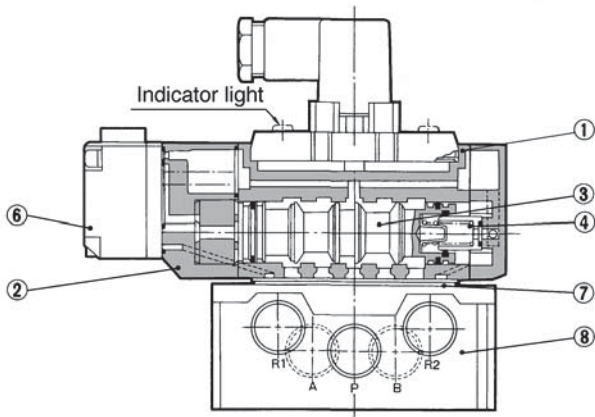
How to Calculate Flow Rate

Refer to p.0-36 for flow rate calculation.

Construction

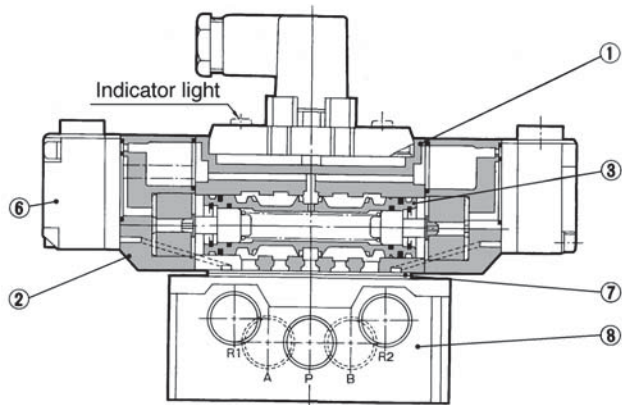
Single: VP7-8-FG-S-□-Q

Double: VP7-8-FG-D-□□-Q

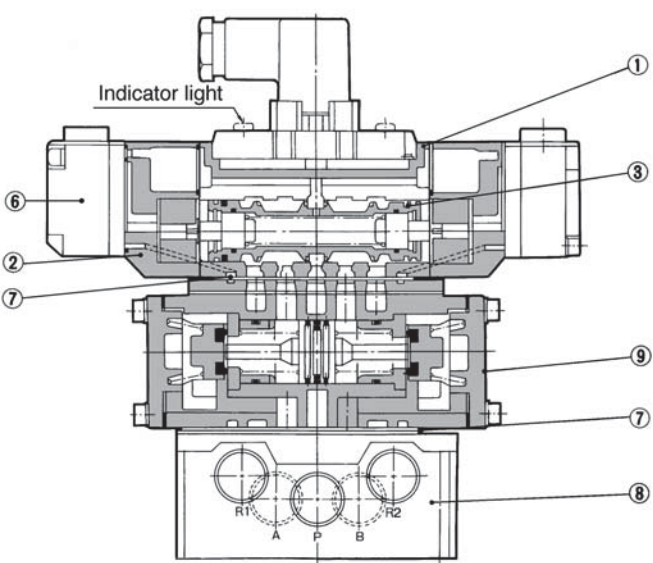


Closed centre: VP7-8-FHG-D-D-□□-Q
Exhaust centre: VP7-8-FJG-D-□□-Q
Pressure centre: VP7-8-FIG-D-□□-Q

Double pilot check: VP7-8-FPG-D-□□-Q



(Closed centre)



Component Parts

No.	Description	Material
①	Body	Aluminum die cast
②	Adapter plate	Aluminum die cast
③	Spool ass'y	Aluminum, NBR, etc.
④	End cover	Aluminum die cast
⑤	Spool spring	Stainless steel

Replacement Parts

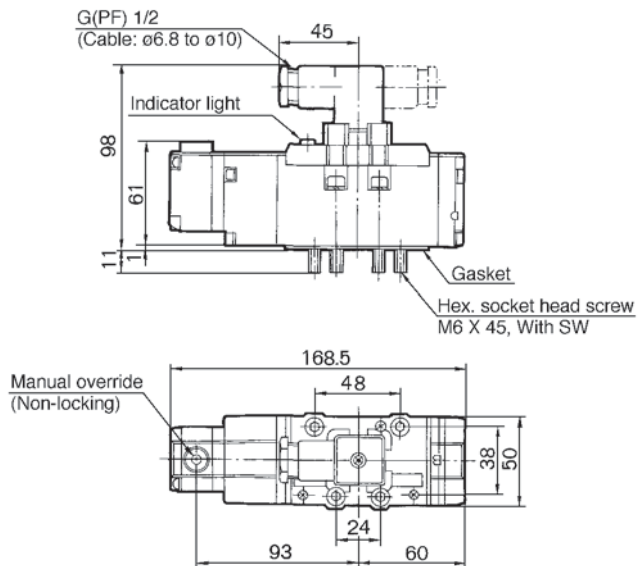
No.	Description	Part No.	Material
⑥	Pilot valve ass'y	AXT511C-□	
⑦	Gasket	AXT510-13	NBR
⑧	Sub-plate	VS7-2-□	Aluminum
⑨	Double pilot check spacer	VV71-FPG	

- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7**
- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

VP7-8

Without Sub-plate

Single: VP7-8-FG-S-Q

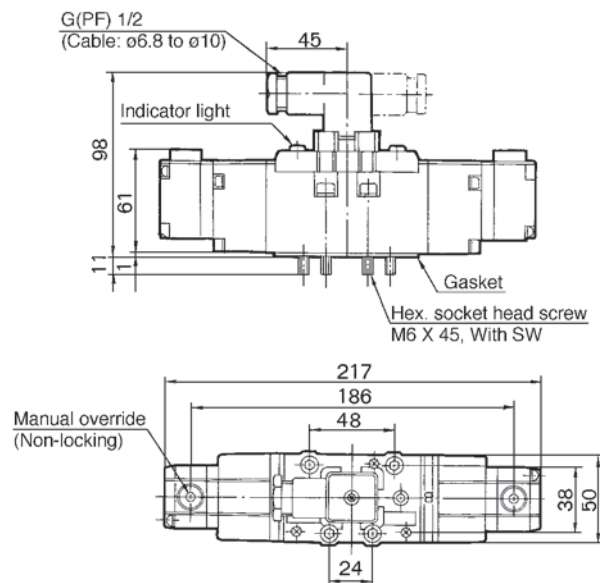


Double: VP7-8-FG-D-Q

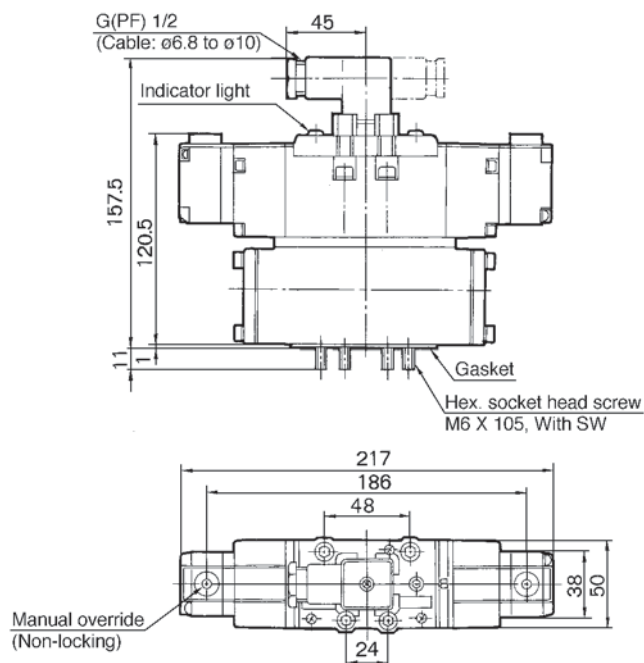
Closed centre: VP7-8-FHG-D-Q

Exhaust centre: VP7-8-FJG-D-Q

Pressure centre: VP7-8-FIG-D-Q

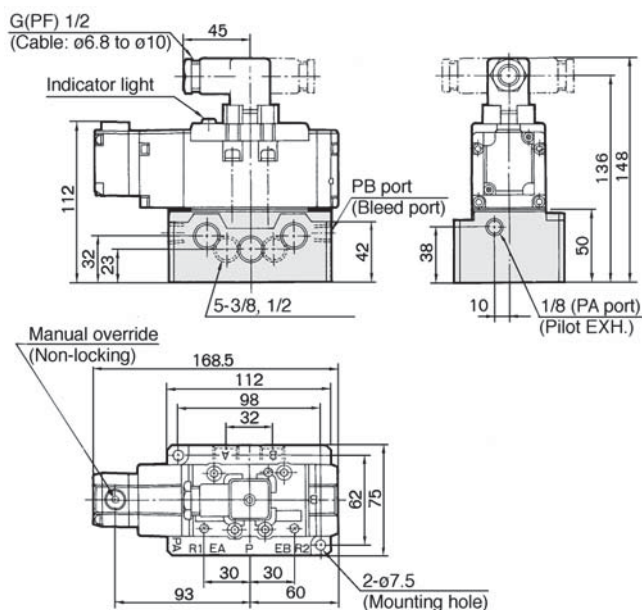


Double pilot check: VP7-8-FPG-D-Q



With Sub-plate

Single: VP7-8-FG-S-Q

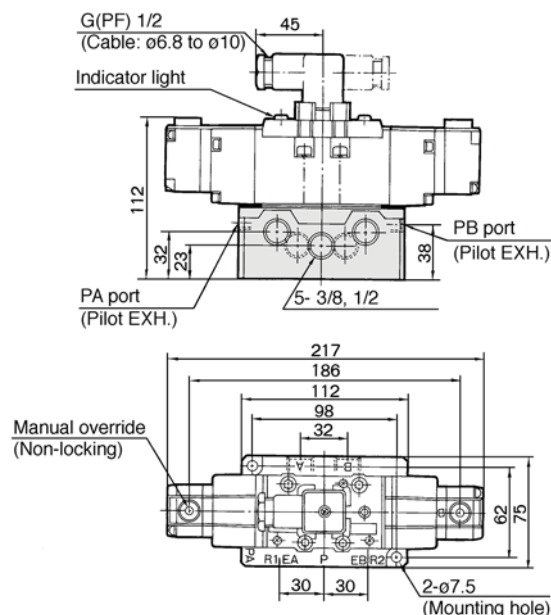


Double: VP7-8-FG-D-Q

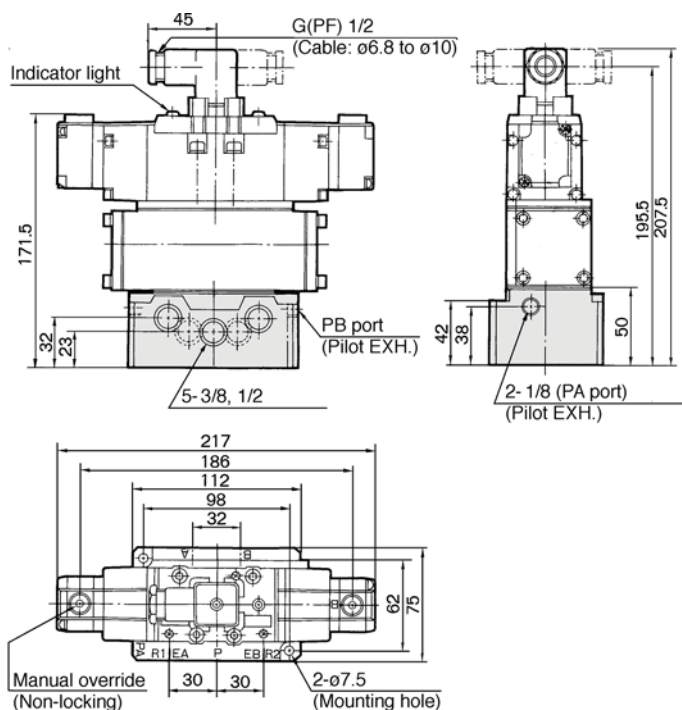
Closed centre: VP7-8-FHG-D-Q

Exhaust centre: VP7-8-FJG-D-Q

Pressure centre: VP7-8-FIG-D-Q



Double pilot check: VP7-8-FPG-D-Q



SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

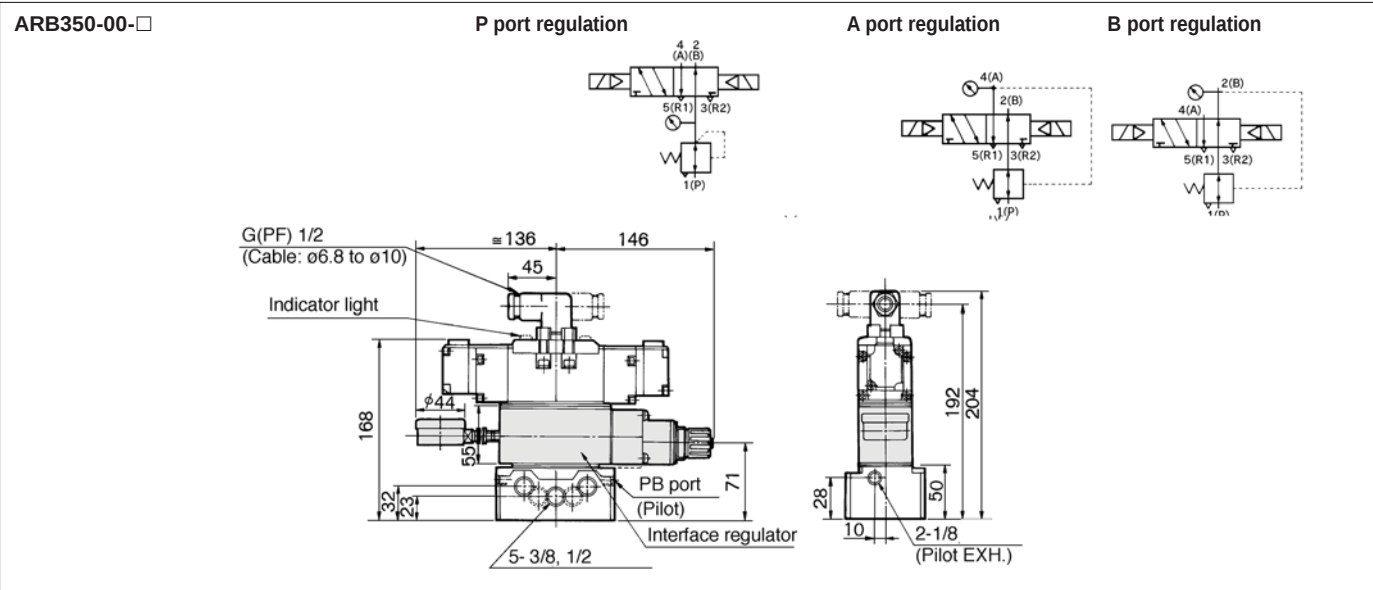
VS

VS7

VQ7

VP7-8

With Interface Regulator



Sub-plate: Series VS7-2

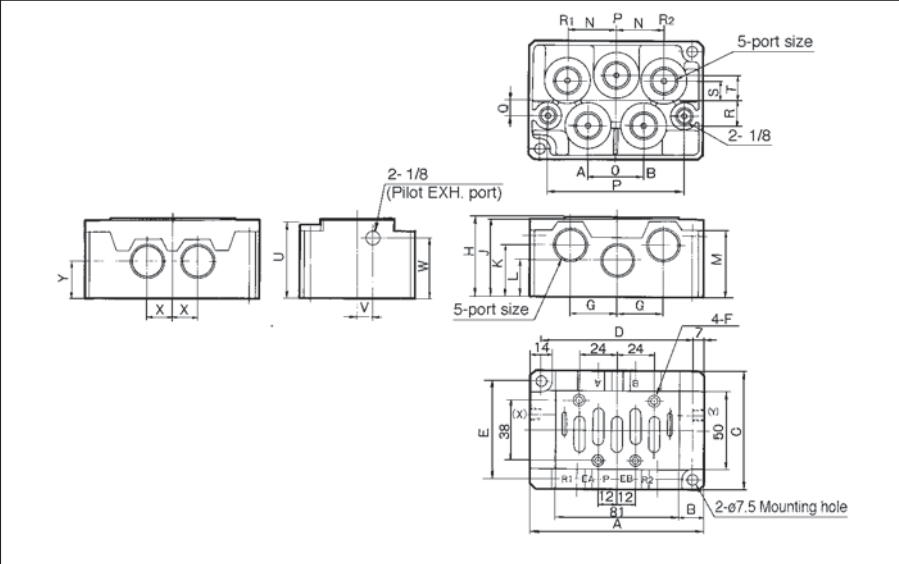


Specifications

Applicable solenoid valve	ISO size 2
Sub-plate size	ISO size 2
Piping	Side piping: 3/8, 1/2, 3/4
	Bottom piping: 3/8, 1/2, 3/4
Weight	0.68 (3/8, 1/2) 1.29 (3/4)

How to Order

Dimensions



Note:

Please note that single subplates and manifolds have changed colour from platinum silver to white as standard. Valves will remain platinum silver.

	Piping	Port size	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
VS7-2-A03	Side	3/8, 1/2	112	15.5	75	98	62	4-M6, 12 Deep	30	50	49	32	23	42	31	36	88	10	16	12	16	47.5	10	38	16	23
VS7-2-B03	Bottom																									
VS7-2-A06	Side	3/4	142	30.5	86	128	72	4-M6, 12 Deep	42	63	62	42	30	55	42	40	116	11	22	16	23	60	11	53	20	30
VS7-2-B06	Bottom																									

Series VP7-8 Manifold



Note:

Please note that single subplates and manifolds have changed colour from platinum silver to white as standard. Valves will remain platinum silver.

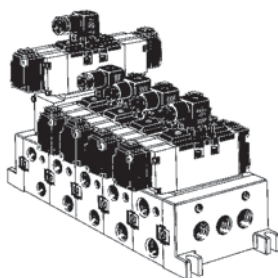
Specifications

Manifold block size		ISO size 2
Applicable Solenoid valve		ISO size 2 series
Stations		1 to 10 stations
Piping	A/B port	$\frac{3}{8}$ $\frac{1}{2}$
	P/R1/R2 port	$\frac{1}{2}$ $\frac{3}{4}$
Individual SUP Spacer		VV72-P-□ (O3: $\frac{3}{8}$, O4: $\frac{1}{2}$)
Individual EXH Spacer		VV72-R-□ (O3: $\frac{3}{8}$, O4: $\frac{1}{2}$)
Block plate (For multiple pressure supply)		AXT512-14-1A(For P port)
		AXT512-14-2A(For R1/R2 port)
Blank plate		AXT512-9A

VV72 □ manifold gives a wide variety of functions and piping methods. Most suitable type for the operation can be found in the product line-up.

Common Exhaust

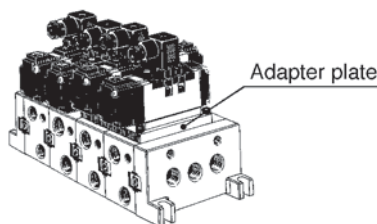
Air supply and exhaust to each valve are performed with P and R ports which runs through the connected manifold.



V Type

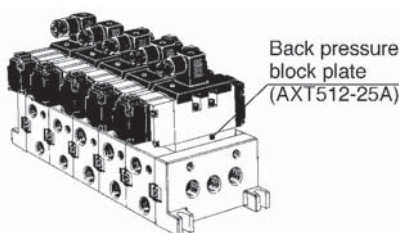
Type that valves of different body sizes can be combined.

(Adapter plate: VV72-V-1)



Main Exhaust Back Pressure Block

If the number of stations simultaneously operated is large it may cause a trouble with back pressure of the main exhaust. Mounting back pressure block plate ("AXT512-25A") makes it possible to prevent the influence of main exhaust back pressure.



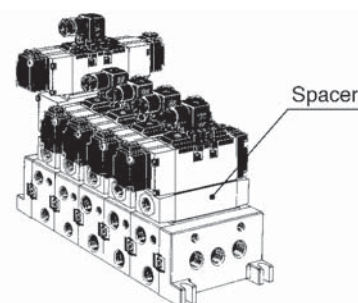
Individual Exhaust

R ports are independent for each valves.

● Releases air individually with an individual exhaust spacer ("VV72-R-□") on manifold block.

Individual Supply

● Supplies P pressure individually with an individual supply spacer ("VV72-P-□") on manifold block.



Multi Level Pressure Supply

Two or more different levels of pressure are supplied into one manifold.

● Place a block plate ("AXT512-14-1A") among stations whose pressure levels are different. If supplying two different levels of P pressure, place it from the right/left directions of manifold. If more than two, use an Individual SUP spacer ("VV72-P-□").

Bottom Piping (3/8, 1/2)

In case piping from the side obstructs view the sight or in case there is not enough space for side piping A/B port can be piped from the bottom of manifold.

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

VS7

VQ7

VP7-8

How to Order

E

VV72

5

03R

04D

Q

Stations

1	1 station
⋮	⋮
10	10 stations

A/B port piping

03R	3/8 (Right)
04R	1/2 (Right)
03L	3/8 (Left)
04L	1/2 (Left)
03Y	3/8 (Bottom)
04Y	1/2 (Bottom)
*	Mixed

If mixed piping is desired, write "" and indicate piping specifications separately.

Air release valve

—	None
E	With air release valve

P/R1/R2 port piping

04D	1/2 (Bottom)
04U	1/2 (Top)
04B	1/2 (Both sides)
06D	3/4 (Bottom)
06U	3/4 (Top)
06B	3/4 (Both sides)

Rated voltage of coil of air release valve

—	W/o air releasing valve
1	100V AC 50/60Hz
2	200V AC 50/60Hz
3	24V DC
4	12V DC
9	Others (250V or less)

Ordering source area code

Code	areas
-	Japan, Asia Australia
E	Europe
N	North America

Note:

Manifold exploded view see page 1.9-24 for details.

Order Made

Contact SMC for other voltages (9)

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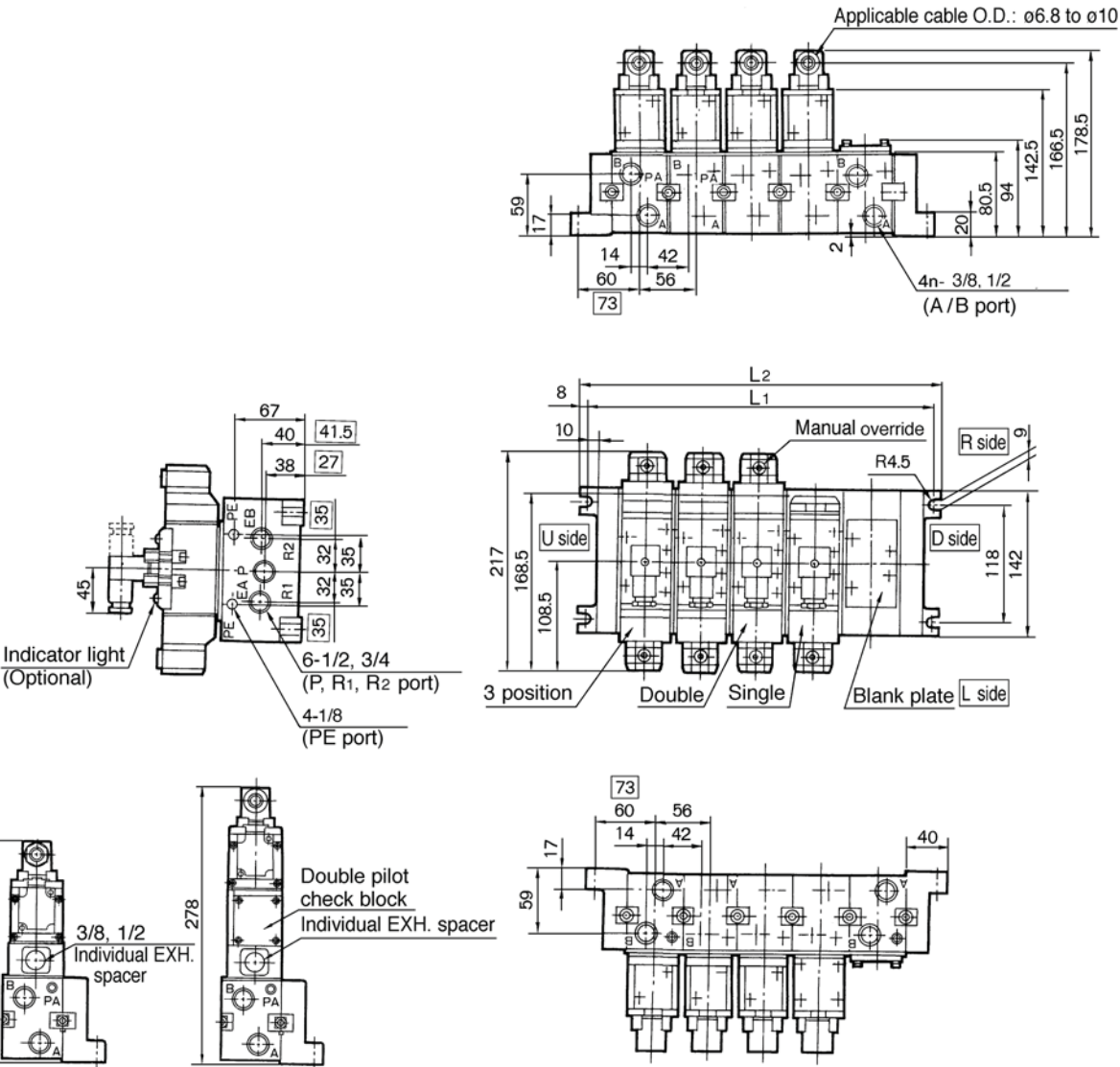
Protective class class I (Mark: ⚡)

Options

Blank plate		AXT512-9A
		AXT512-18A (For air releasing valve adapter plate)
Air release valve adapter plate		AXT512-17A
With interface regulator	Relief	P(P regulation) ARB350-00-A(A regulation) B(B regulation)
Spacer for reverse pressure		AXT512-19A-1(3/8)
		AXT512-19A-2(1/2)
Spacer for R1/R2 individual EXH.		VV72-R2-04
Interface speed control		AXT510-32A
Main EXH. back pressure block plate		AXT512-25A
Silencer for pilot EXH.		AN110-01

Manifold

Common EXH



Size in □: 3/4

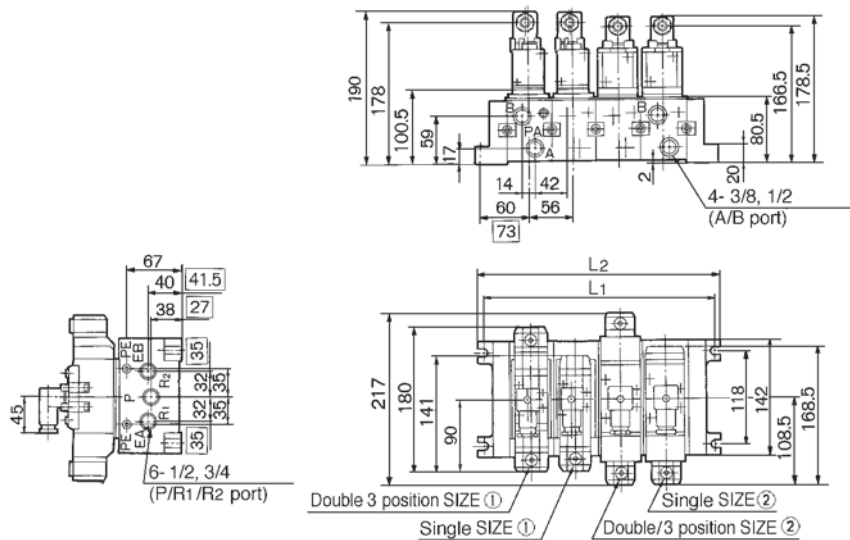
Size	$\frac{n}{L}$	1	2	3	4	5	6	7	8	9	10	Equation
1/2	L1	120	176	232	288	344	400	456	512	568	624	n: Station L1=56n+64 L2=56n+80
	L2	136	192	248	304	360	416	472	528	584	640	
3/4	L1	146	202	258	314	370	426	482	538	594	650	n: Station L1=56n+90 L2=56n+106
	L2	162	218	274	330	386	442	498	554	610	666	

- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7**
- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

VP7-8

Manifold

V Type

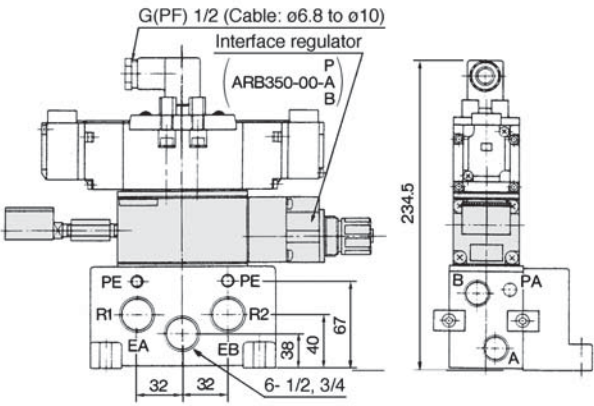
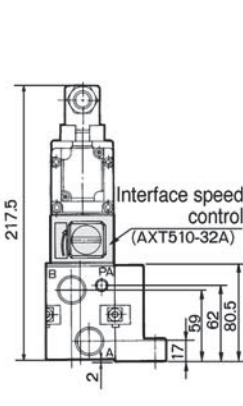
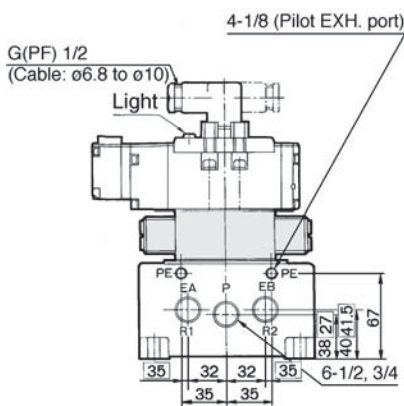


Size	$\frac{L}{n}$	1	2	3	4	5	6	7	8	9	10	Equation
1/2	L1	120	176	232	288	344	400	456	512	568	624	n: Station L1=56n+64 L2=56n+80
	L2	136	192	248	304	360	416	472	528	584	640	
3/4	L1	146	202	258	314	370	426	482	538	594	650	n: Station L1=56n+90 L2=56n+106
	L2	162	218	274	330	386	442	498	554	610	666	

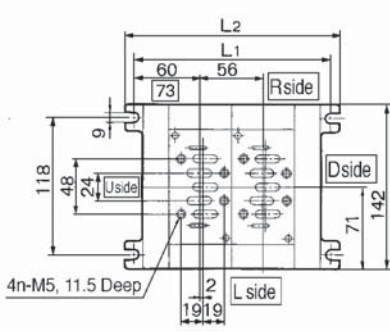
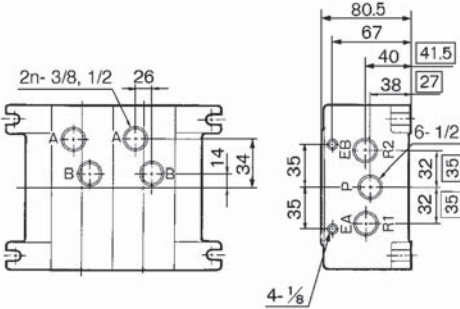
Size in □: 3/4

Interface speed control

Interface Regulator



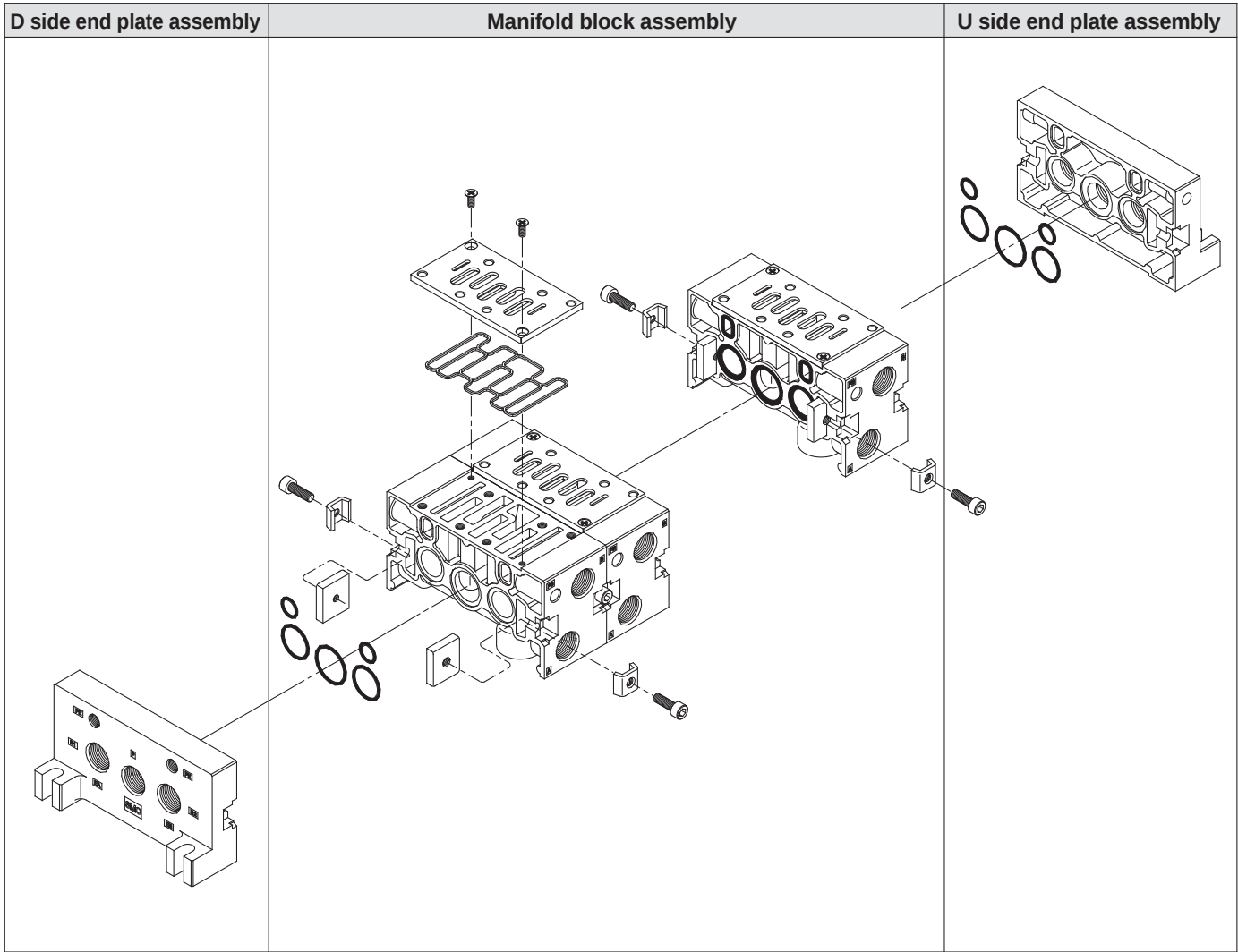
Bottom piping



Size in □: 3/4

VP7-8

Manifold Exploded View VP7-8



< End plate assembly >

E AXT512 - ☐ A - ☐

End plate position	
L	L side
R	R side

P, R port size

04	1/2
06	3/4
C12	ø12 One-touch fitting

Ordering source area code

Code	areas
-	Japan, Asia Australia
E	Europe
N	North America

<Manifold block assembly>

E AXT512 - 1A - ☐ ☐ - ☐

Wiring specification

A	Side
B	Bottom

Cylinder port position

L	L side
R	R side

Ordering source area code

Code	areas
-	Japan, Asia Australia
E	Europe
N	North America

Cylinder port size

03	3/8
04	1/2

< Manifold block replacement parts>

Part No.	Description	Qty.	Material
AXT512-13	O-ring	2	NBR
AS568-022	O-ring	1	NBR
AS568-020	O-ring	2	NBR
AXT512-5	Gasket	1	NBR
AXT512-4	Plate	1	SPCC
M4X10	Oval countersunk head screw	2	SWRH3
AXT512-6-1	Connection fitting A	2	
AXT512-6-4	Connection fitting B	2	
AXT512-6-3	Hexagon socket head screw	2	