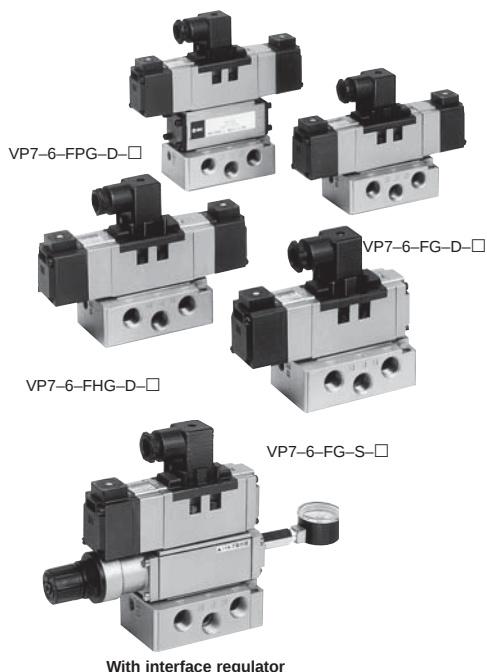


ISO Standard Solenoid Valve/SIZE①

Rubber Seal

Series VP7-6



	2 position			
	Single solenoid (FG-S)	Double solenoids (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
Electrical entry			DIN connector
Lubrication			Turbine oil class 1(ISO VG32) 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.	AXT511B-1	AXT511B-2	AXT511B-3	AXT511B-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

Model

No. of positions	Model	Effective area ($\frac{1}{4}$ with sub-plate) (mm ²) (Nl/min)	Max. operating ⁽¹⁾ frequency (c/s)	Response time ⁽²⁾ (S)	Weight ⁽³⁾ (kg)
2 (Single)	VP7-6-FG-S-□-Q	30 (1639.11)	5	0.04 or less	0.53
2 (Double)	VP7-6-FG-D-□-Q	30 (1639.11)	5	0.04 or less	0.73
3 (Closed centre)	VP7-6-FHG-D-□-Q	28.8 (1570.40)	3	0.06 or less	0.73
3 (Exhaust centre)	VP7-6-FJG-D-□-Q	28.8 (1570.40)	3	0.06 or less	0.73
3 (Double pilot check)	VP7-6-FPG-D-□-Q	20 (1079.65)	3	0.06 or less	1.13
3 (Pressure centre)*	VP7-6-FIG-D-□-Q	20 (1079.65) [14.4 (785.2)]	3	0.06 or less	0.73

Note 1) Min. operating frequency: Based on 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: 0.37kg)

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

Accessories

Mounting screw (Including washer)	TA-B-5 X 35
Gasket	AXT500-13

Options

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

Note1) Operate under the condition of P1>P2 when "YZ-S" is used.

Interface Regulator (Options)

Model	Regulation port	Note
ARB250-00-P	P	Refer to p.1.9-3 for specifications.
ARB250-00-A	A	
ARB250-00-B	B	

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

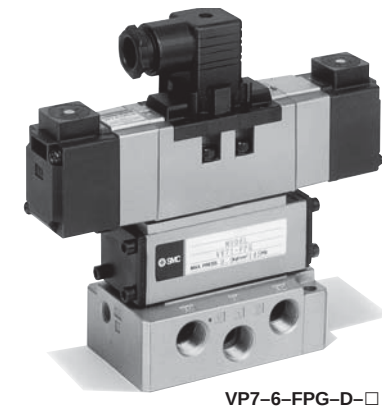
VS

VS7

VQ7

VP7-6

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.



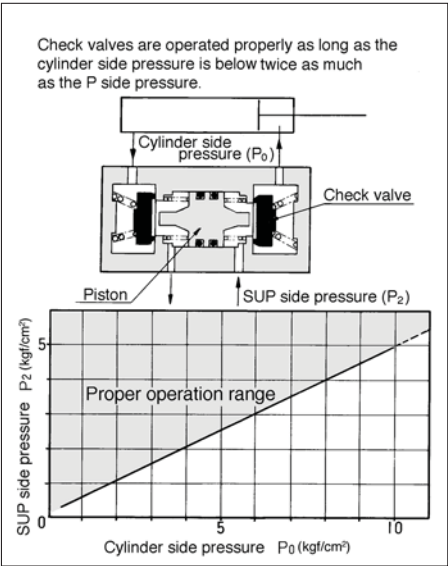
⚠ Caution
 For 3 position double pilot check valve, make sure that there is no leakage from the piping between valve and cylinder or from the fitting parts, checking it with solvent like neutral detergent solution. Leakage from sealant of cylinder should be checked. If any leakage occurs, cylinder piston 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.

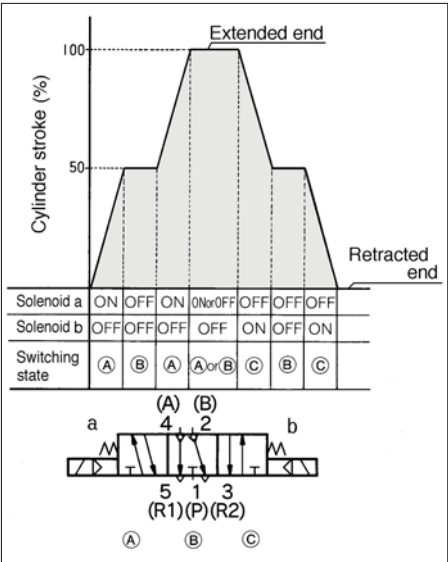
Double Pilot Check Spacer Specifications

Part number		VV71-FPG		
Applicable solenoid valve		VP7-6-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	

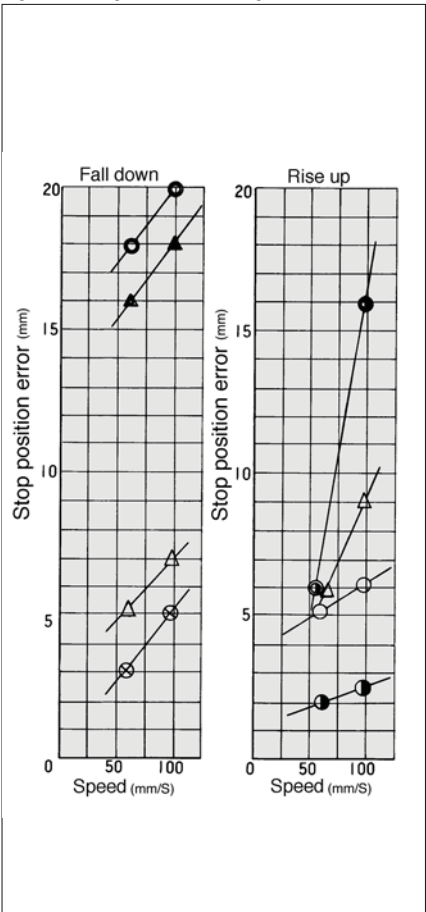
Characteristics of Check Valve Operating Pressure



Mid Stroke Cylinder Position Holding Circuit with Double Pilot Check Valve



Cylinder Speed and Stop Position Error



Cylinder		Supply pressure	Cylinder load	Loading ratio	
ø50-450 st	ø80-450 st			ø50	ø80
—○—	—○—	0.2MPa	25kg	51%	28%
—⊗—	—⊗—	5	25	25	11
—●—	—●—	2	35	72	39
—△—	—△—	5	35	36	16

How to Order

E VP7-6 FG S 1 1 1 1 Q

Configuration

FG		FJG	
YZ*		FPG	
FHG		FIG*	

* Option

Solenoid

S	Single
D	Double

Voltage

1	100V AC, 50/60Hz
2	200V AC, 50/60Hz
3	24V DC
4	12V DC
9	Others (250V or less)



Contact SMC for other voltages (9)



Protective class class I (Mark: ⚡)

Optional

—	None
N	With indicator light
Z	With indicator light and surge suppressor

Sub-plate port size

—	Without sub-plate
A02	Side piping* 1/4
A03	Side piping* 3/8
B02	Bottom piping* 1/4
B03	Bottom piping* 3/8

* R port: 3/8

Connector

—	With connector
0	Without connector

Thread

—	Rc(PT)
F	G(PF)
N	NPT
T	NPTF

Ordering source area code

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

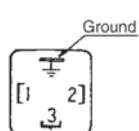
⚠ Precautions

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

⚠ Caution

DIN connector(Wiring)

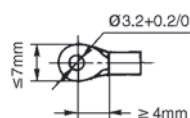
- Solenoids are connected to the male pin terminal on the DIN connector terminal block as follows. Connect to each terminal block on the connector part.



Terminal	
1	A side
2	B side
3	COM
⏏	Ground

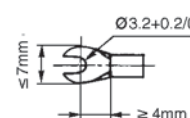
Either+COM or -COM is applicable.

- Applicable cable
Core wire effective sectional area: 0.5 to 1.5mm²
Cable O. D.: ø6.8 to ø10
- Applicable crimp style terminal
As shown below;



Terminal equivalent to R1.025-3, JIS C2805

or

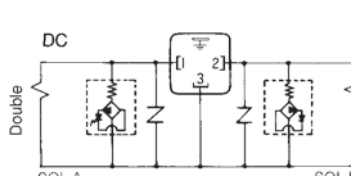
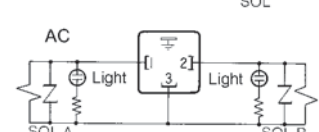
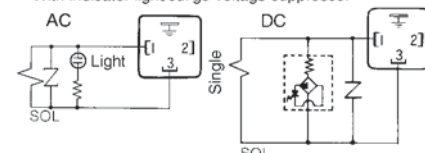
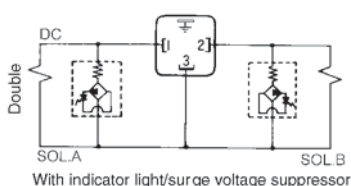
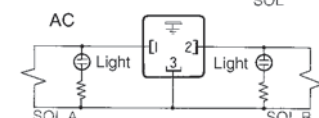
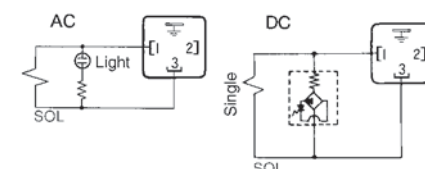


JST Manufacturing Corporation Ltd.
"1.25-3X" or the equivalent

- Appropriate tightening torque of the connector part
Connector fixing thread 0.5 to 0.6 Nm
Terminal thread 0.5 to 0.6Nm

Indicator Light/Surge Voltage Suppressor

With indicator light



Interface Regulator Specifications

Specifications

Model	ARB250		
Applicable solenoid valve	VP7-6		
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°C ⁽³⁾		
Gauge port size	1/8		
Weight (kg)	0.55		
Supply eff. area (mm ²)	P-A	15	16
S at P1=0.7MPa, P2=0.5MPa	P-B	16	11
Exhaust eff. area (mm ²)	A-EA	25	
S at P2=0.5MPa	B-EB	18	

Note 1) Solenoid valve max. operating press. : 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.

Note 5) 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 interfacer 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

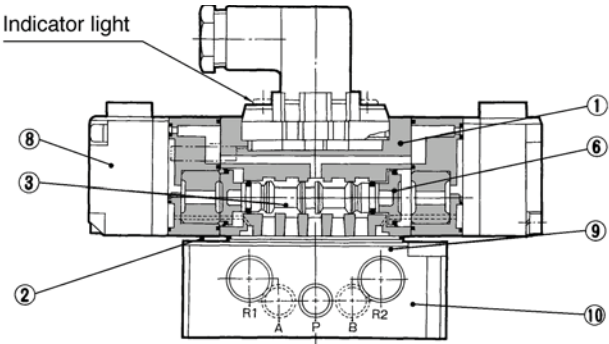
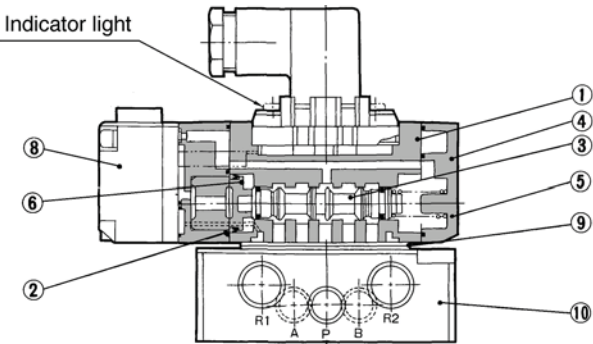
Refer to p.0-36 for flow rate calculation.

VP7-6

Construction

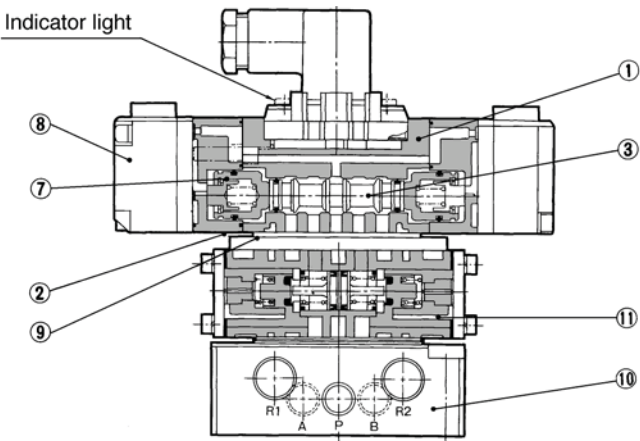
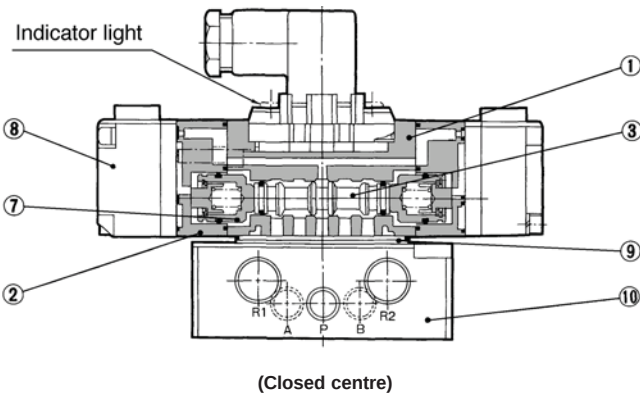
Single: VP7-6-FG-S-□□-Q

Double: VP7-6-FG-D-□□-Q



Closed centre: VP7-6-FHG-D-□□-Q
Exhaust centre: VP7-6-FJG-D-□□-Q
Pressure centre: VP7-6-FIG-D-□□-Q

Double pilot check: VP7-6-FPG-D-□□-Q



Component Parts

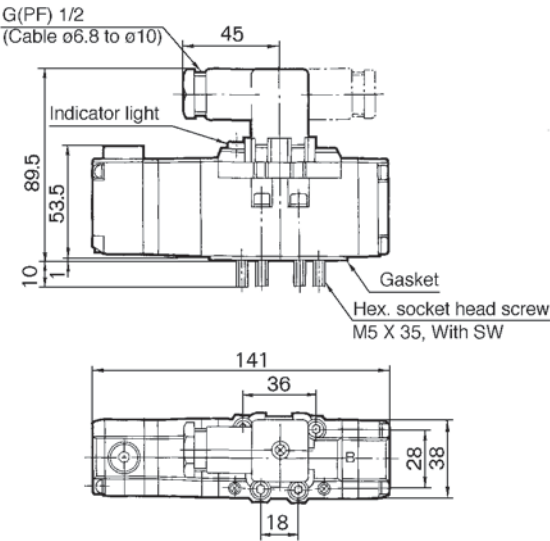
No.	Description	Material
①	Body	Aluminum die cast
②	Adapter plate	Aluminum die cast
③	Spool valve	Aluminum, NBR
④	End cover	Aluminum die cast
⑤	Spool spring	Stainless steel
⑥	Piston	Resin
⑦	Piston ass'y	Aluminum and others

Replacement Parts

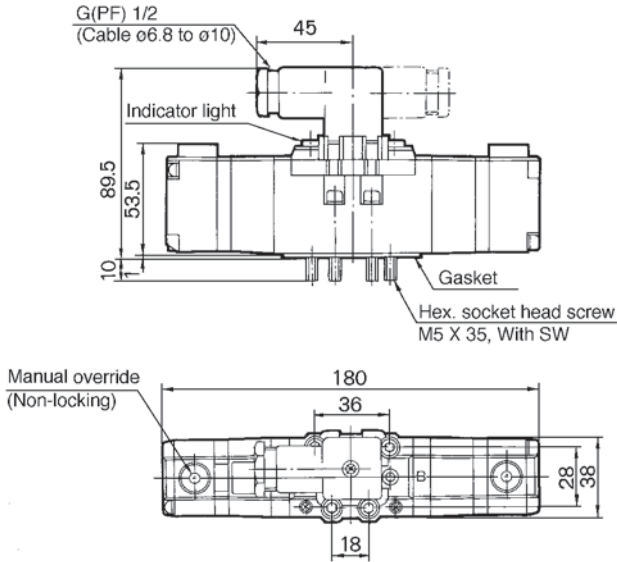
No.	Description	Part No.	Material
⑧	Pilot valve ass'y	AXT511B-□	
⑨	Gasket	AXT500-13	NBR
⑩	Sub-plate	VS7-1-□	Aluminum die cast
⑪	Double pilot check spacer	VV71-FPG	

Without Sub-Plate

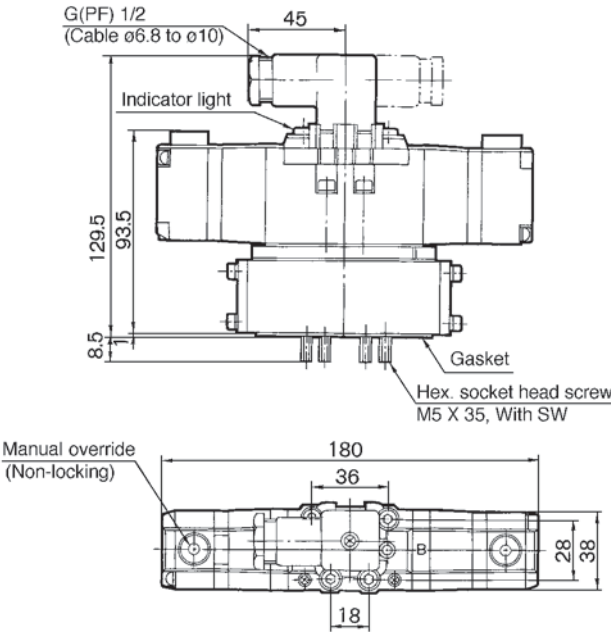
Single: VP7-6-FG-S-Q



Double: VP7-6-FG-D-Q
Closed centre: VP7-6-FHG-D-Q
Exhaust centre: VP7-6-FJG-D-Q
Pressure centre: VP7-6-FIG-D-Q



Double pilot check: VP7-6-FPG-D-Q

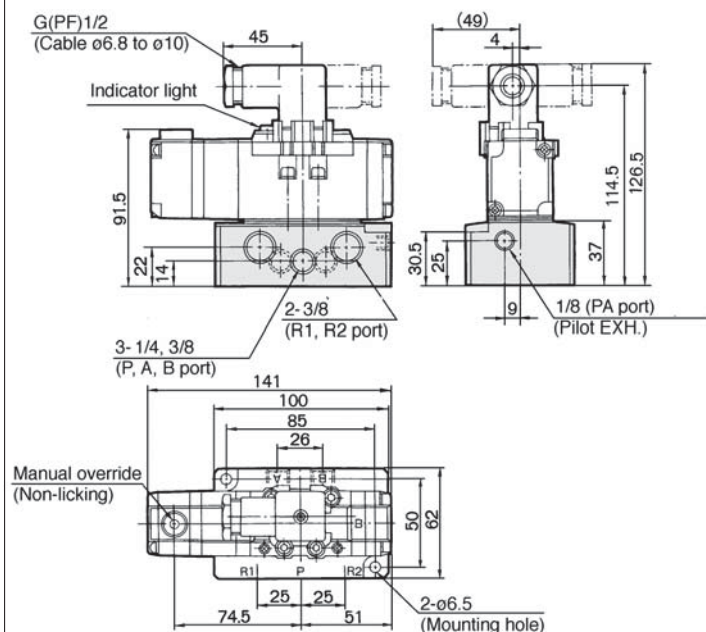


SV
SY
SYJ
SX
VK
VZ
VF
VFR
VP7
VQC
SQ
VQ
VQ4
VQ5
VQZ
VQD
VFS
VS
VS7
VQ7

VP7-6

With Sub-plate

Single: VP7-6-FG-S-Q

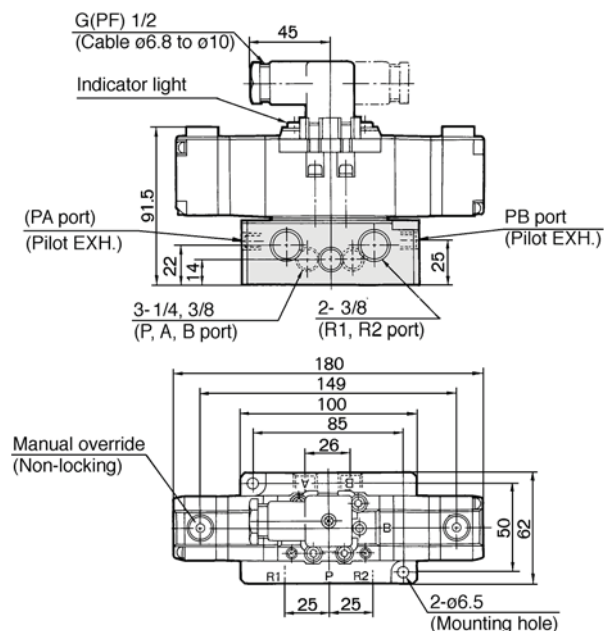


Double: VP7-6-FG-D-Q

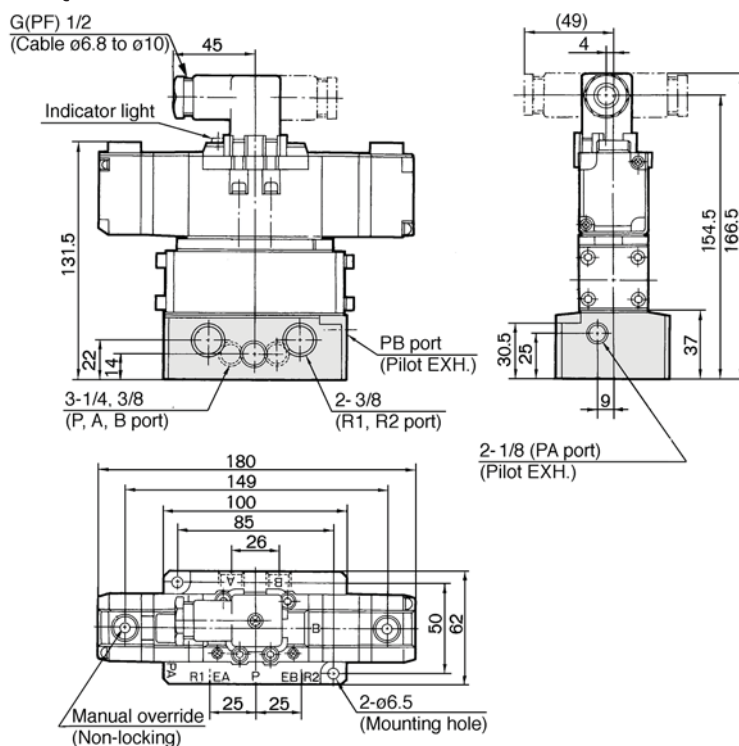
Closed centre: VP7-6-FHG-D-Q

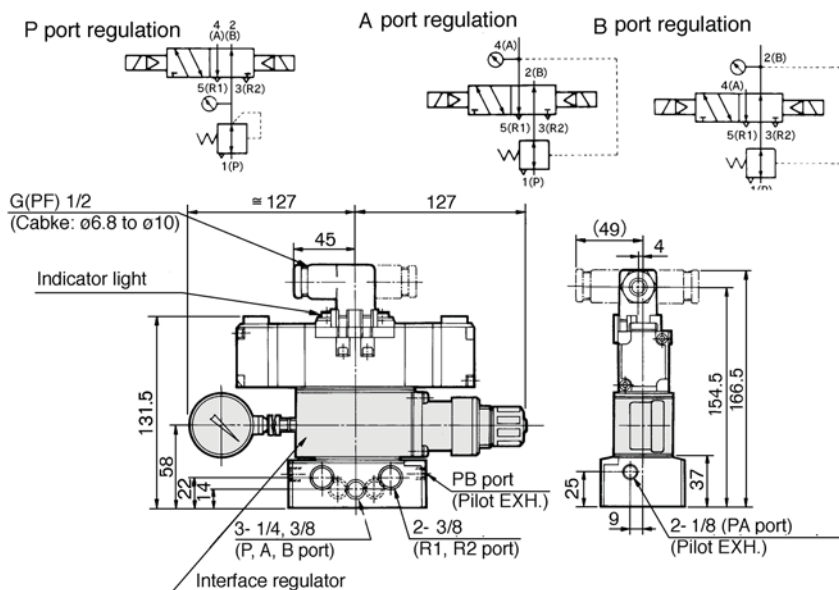
Exhaust centre: VP7-6-FJG-D-Q

Pressure centre: VP7-6-FIG-D-Q

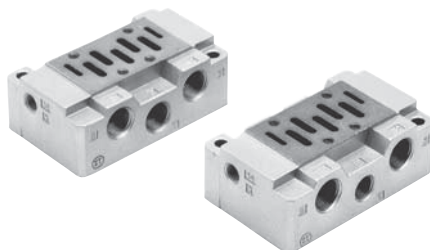


Double pilot check: VP7-6-FPG-D-Q



ARB250-00-

VQC
SQ
VQ
VQ4
VQ5
VQZ
VQD
VFS
VS
VS7
VQ7



Applicable solenoid valve	ISO size 1
Sub-plate size	ISO size 1
Piping*	Side piping, 1/4 3/8
	Bottom piping, 1/4 3/8
Weight	0.37kg



* All R ports: 3/8

[illegible]

Thread

-	Rc(PT)
F	G(PF)
N	NPT
T	NPTF

Piping and port size

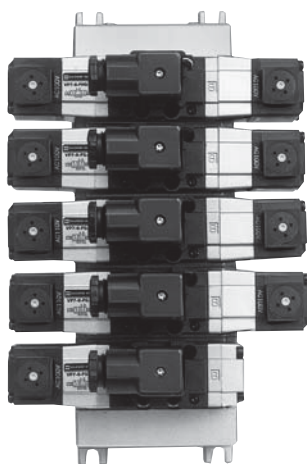
A02	Side* 1/4
A03	Side 3/8
B02	Bottom* 1/4
B03	Bottom 3/8

*R port: 3/8

Ordering source area code

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

Series VP7-6 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

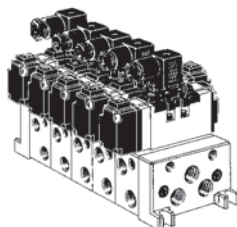
Manifold block size		ISO size 1
Applicable solenoid valve		ISO size 1 series
Station		1 to 10 stations*
Piping	A, B port	1/4, 3/8 One-touch fitting ø6, ø8, ø10
	P, R1, R2 port	1/4, 3/8 One-touch fitting ø12
Individual SUP spacer		W71-P-□(02: 1/4, 03: 3/8, C10: ø10)
Individual EXH spacer		VV71-R-□(02: 1/4, 03: 3/8, C12: ø12)
Block plate (For multiple pressure supply)		AXT502-14
Blank plate		AXT502-9A

*Stations including control unit. (Control unit: equivalent to 2 stations.)

Series VV71 manifold provides a wide variety of functions and piping methods. Most suitable type to the operation purpose 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 run through the connected manifold. This is the most popular among users.

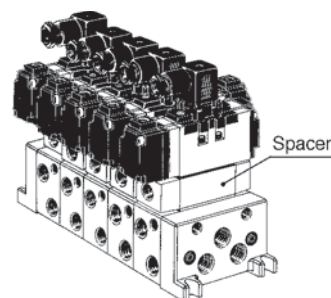


Individual Exhaust

- Releases air individually with an individual exhaust spacer ("VV71-R-□") on manifold block.

Individual Supply

- Supplies P pressure individually with an individual supply spacer ("VV71-P-□") on manifold block.



Multi Level Pressure Supply

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

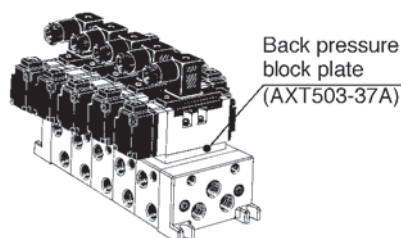
- Place a block plate ("AXT502-14") among stations whose pressure levels are different. If supplying two different levels of P pressure, place it from the right/left directions of manifold. If ">2", use an Individual SUP spacer ("VV71-P-□").

Bottom Piping(1/4, 3/8(A/B port)

In case piping from the side disturbs the sight or in case there is no enough space for side piping, A/B port can be piped from the bottom of manifold.

Main Exhaust Back Pressure Block

- If the number of stations simultaneously operated is large it may cause trouble with back pressure of the main exhaust. Mounting back pressure block plate ("AXT503-37A") makes it possible to prevent the influence of main exhaust back pressure.



How to Order (Manifold)

E VV71 5 02R 02D Q

Stations

1	1 station
⋮	⋮
10	10 stations*

*Stations including a controller equivalent to two stations.

Piping of A/B port

02R	1/4(Right)
03R	3/8(Right)
02L	1/4(Left)
03L	3/8(Left)
02Y	1/4(Bottom)
03Y	3/8(Bottom)
C6R	One-touch ø6 (Right)
C8R	One-touch ø8 (Right)
C10R	One-touch ø10 (Right)
C6L	One-touch ø6 (Left)
C8L	One-touch ø8 (Left)
C10L	One-touch ø10 (Left)
*	Mixed

Control unit

—	None
A	Filter with auto drain, Regulator, Air release valve
AP	Filter with auto drain, Regulator, Pressure switch, Air release valve
M	Filter with manual drain, Regulator, Air release valve
MP	Filter with manual drain, Regulator, Pressure switch, Air release valve
F	Filter with auto drain, Regulator (Air release valve blank plate)
G	Filter with manual drain, Regulator (Air releasing valve blank plate)
C	Air release valve (Filter, Regulator blank plate)
E	Air release valve

Piping of P/R1/R2 port

02D	1/4 (Bottom)
02U	1/4 (Top)
02B	1/4 (Both sides)
03D	3/8 (Bottom)
03U	3/8 (Top)
03B	3/8 (Both sides)
C12D	One-touch ø12 (Bottom)
C12U	One-touch ø12 (Top)
C12B	One-touch ø12 (Both sides)
*	Mixed

Note) For mixed, put an "*" and indicate piping specifications separately.

Rated coil voltage of air releasing valve

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

Order Made Contact SMC for other voltages (9)

Protective class class I (Mark: ⚡)

Ordering source area code

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

Note) For the mixed, put "*" mark and indicate piping specifications separately.

Note: Manifold exploded view see page 1.9-23 for details.

Manifold Control Unit

Piping can be simplified by mounting control equipment like air filters, regulators, air release valve and the like to a manifold as a unit.

Control units

Symbol for ordering	—	A	AP	M	MP	F	G	C	E
Control equipment									
Air filter with auto drain		○	○			○			
Air filter with manual drain				○	○		○		
Regulator		○	○	○	○	○	○		
Air release valve		○	○	○	○			○	○
Pressure switch			○		○				
Blank plate (Air release valve)						○	○		
Blank plate (Filter, Regulator)								○	
No. of necessary manifold blocks for mounting		2	2	2	2	2	2	2	1

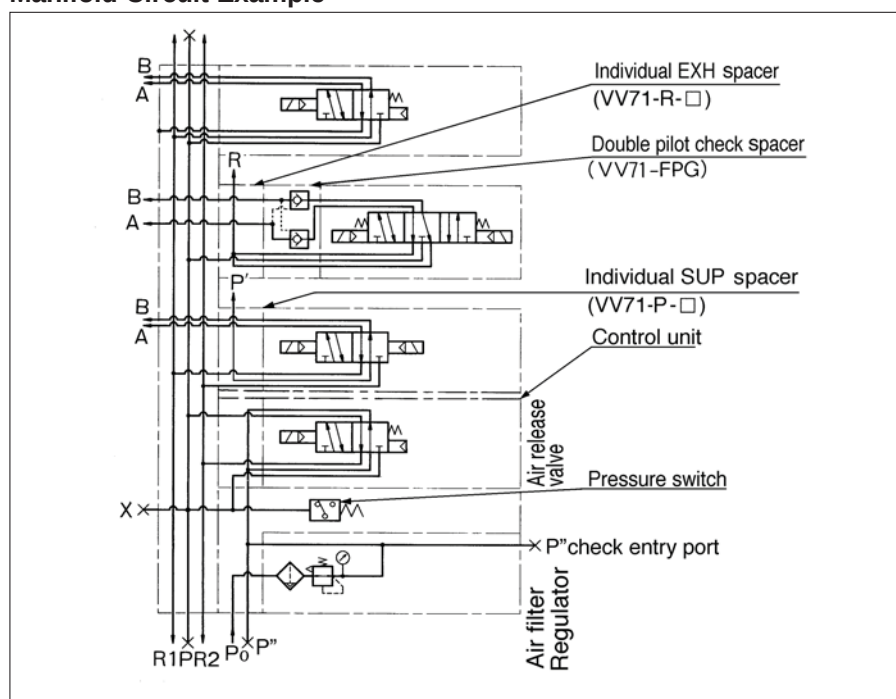
Control Unit Specifications

Air filter (With auto drain/With manual drain)	
Filtration	5μm
Regulator	
Set pressure (Secondary pressure)	0.05 to 0.85MPa
Pressure switch	
Pressure setting range	0.1 to 0.7MPa
Contact structure	1ab
Rated current	(induced load) 125V AC 3A, 250V AC 2A
Air release valve (Single only)	
Operating pressure range	0.15 to 0.9MPa

Options

Blank plate	AXT502-9A (For manifold)	Spacer for reverse pressure	AXT502-21A-1 (3/8)
	AXT502-18A (For air release valve adapter plate)	Spacer for R1/R2/Individual EXH	VV71-R2-03
	MP2 (For controller/Filter regulator)	Interface speed control	AXT503-23A
	MP3 (For pressure switch)	Adapter plate for lock up cylinder	AXT502-26A
Air release valve adapter plate	AXT502-17A	With interface regulator	Relief
	VAW-A (Adapter plate/Filter with auto drain cock/Regulator)	Main EXH. back press. proof block	P (P port regulation) ARB250-00-A (A port regulation) B (B port regulation)
	VAW-M (Adapter plate/Filter with manual drain cock/Regulator)	Silencer for pilot EXH.	AXT503-37A
	IS3100-02 (2-M5 X 12)	Residual press. release valve interface	AN110-01
Controller		Individual SUP spacer with residual press. release valve	VV71-PR-□ 02: 1/4 03: 3/8
		Double pilot check spacer with residual press. release valve	VV71-FPGR

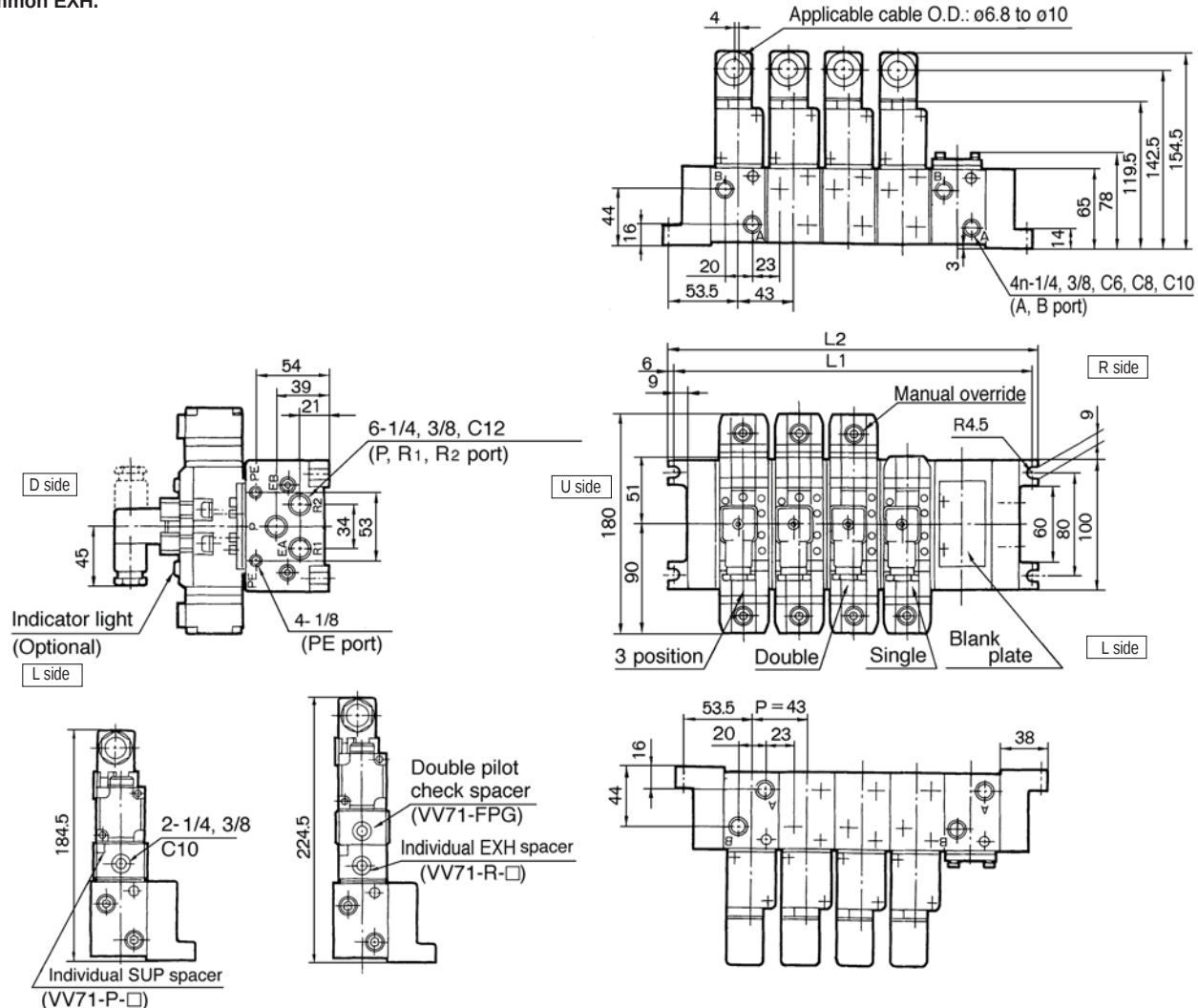
Manifold Circuit Example



VP7-6

Manifold

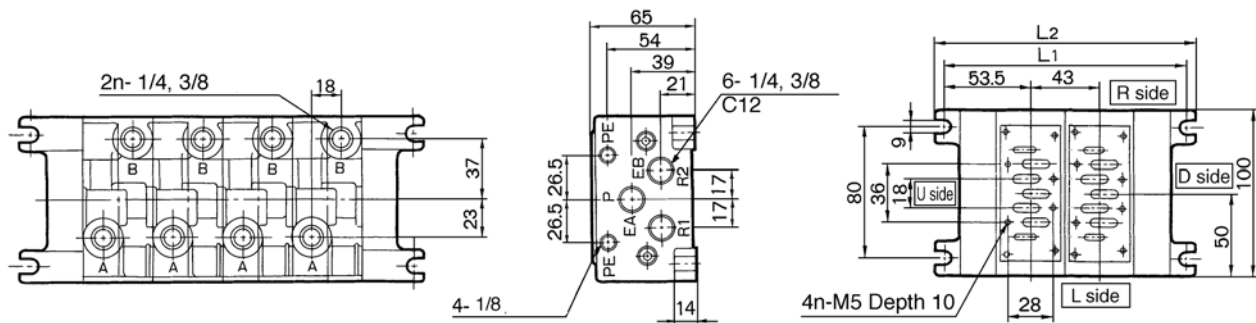
Common EXH.



n: Station Equation $L_1=43n+64$, $L_2=43n+76$

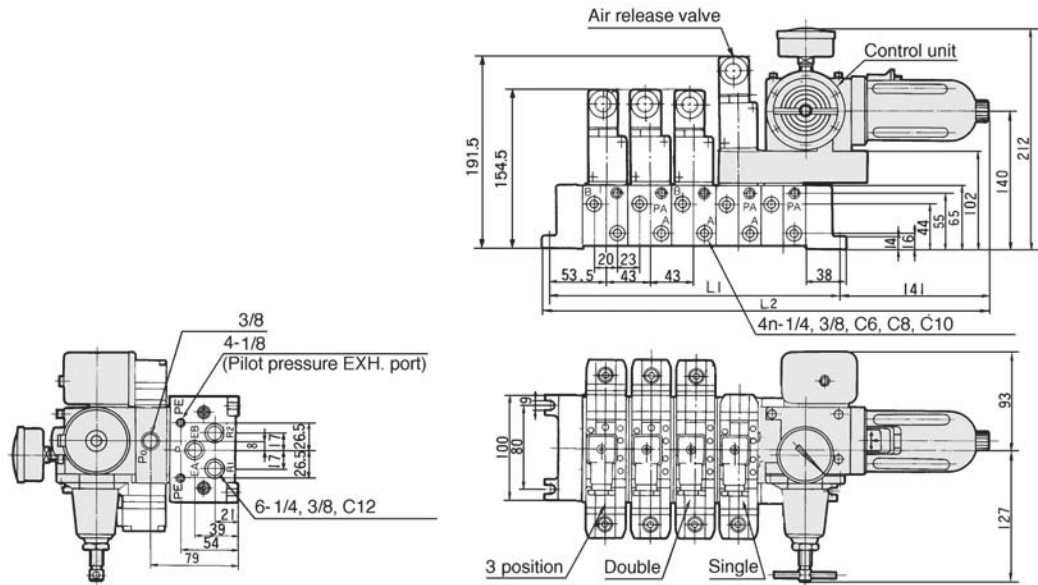
L	n	1	2	3	4	5	6	7	8	9	10
L ₁		107	150	193	236	279	322	365	408	451	494
L ₂		119	162	205	248	291	334	377	420	463	506

Bottom Piping



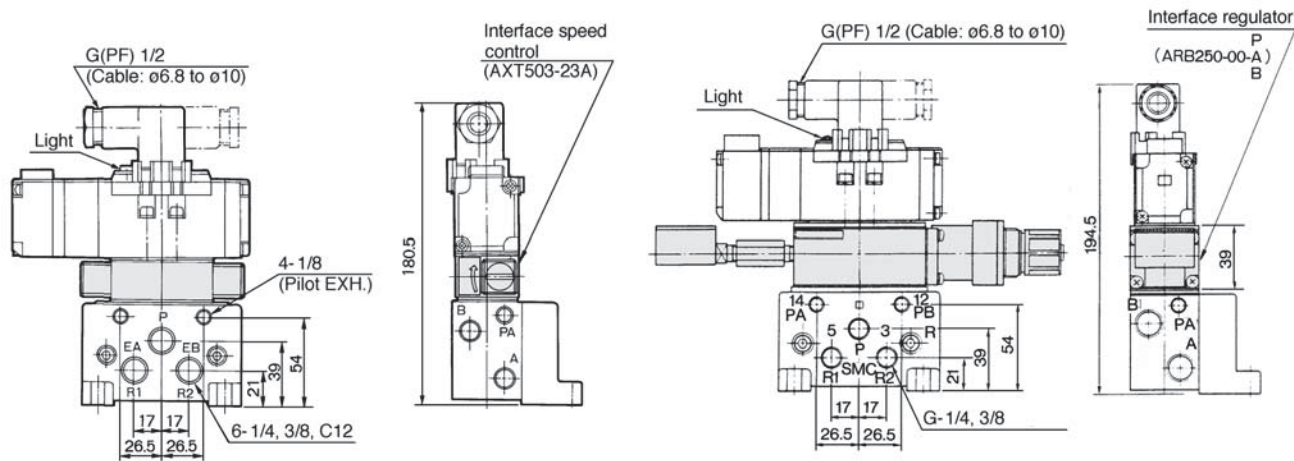
Manifold

Controller



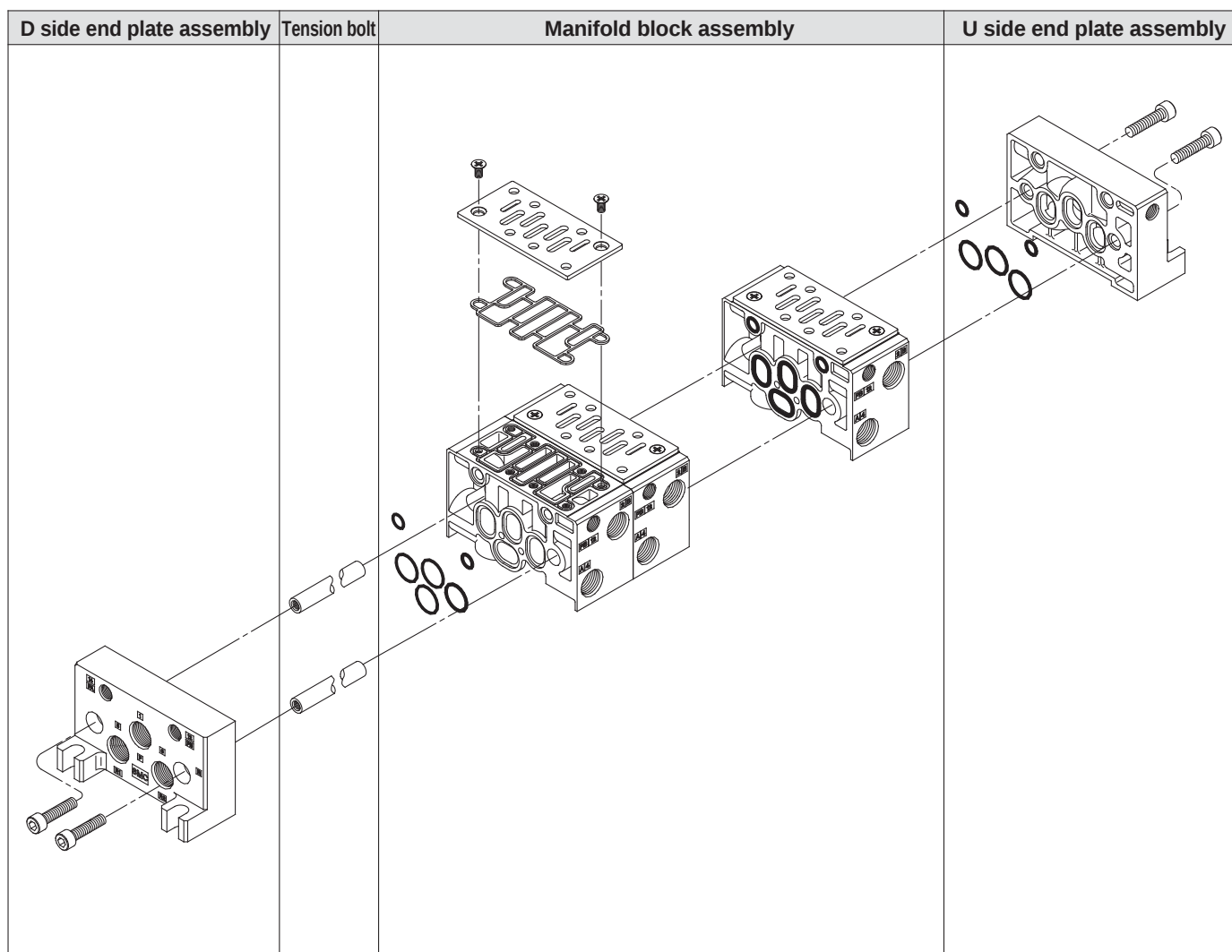
L: Size		n: Station									
L	n	2	3	4	5	6	7	8	9	10	Equation
L1		150	193	236	279	322	365	408	451	494	$L1=43n+64$
L2		297	340	383	426	469	512	555	598	641	$L2=43n+211$

Interface speed control



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

Manifold Exploded View VP7-6



SV
SY
SYJ
SX
VK
VZ
VF
VFR
VP7

VQC
SQ
VQ
VQ4

VQ5

VQZ

VQD

VFS

VS

VS7

VQ7

< End plate assembly >

E AXT502 - **A** -

End plate position

L	L side
R	R side

Ordering source area code

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

P, R port size

02	1/4
03	3/8
C12	ø12 One-touch fitting

< Tension bolt part number >

AXT502 - 34 -

Number of stations

2	For 2 stations
3	For 3 stations
:	:
10	For 10 stations

Note) These tie-rods are solid pieces for each number of stations.

< Manifold block assembly >

* This manifold block assembly includes tension bolts for a single station addition.

E AXT502 - 1A -

Wiring specification

A	Side
B	Bottom

Ordering source area code

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

Cylinder port position

L	L side
R	R side

Cylinder port size

02	1/4
03	3/8
C6 Note 1)	ø6 One-touch fitting
C8 Note 1)	ø8 One-touch fitting
C10 Note 1)	ø10 One-touch fitting

Note 1) Side ported only

< Manifold block replacement parts >

Part No.	Description	Qty.	Material
AXT502-19	O-ring	4	NBR
AXT502-20	O-ring	2	NBR
AXT502-22-2	Plate	1	SPCC
AXT502-31	Gasket	1	NBR
M4 X 8	Oval countersunk head screw	2	SWRH3