Solenoid Valve SVB Series

This is a standard model designed to confidence a si sitt cost performance with importance placed on basic functions.



SVB series is best suitable for controlling valve direct mount type vacuum generators (VH, VS type).



15, 18, 22 Series

- Equipped with Push & Lock Manual Button as standard to enhance operational efficiency during maintenance work. (2 manual override buttons: top & side)
- The valve body is prepared in two different colors enabling the user to opt for either of the two according to operational environment.
- Equipped with individual connectors and designed for the valve to be taken out in two different directions, enabling the user to choose either of the two directions to match particular installation conditions.



I5 (15 series), 18 (18 series) and 22 (22 series) mm-wide valves are offered in order to respond to a wide range of applications.

10 Series

- A new line-up of compactly-configured, 10mm-wide solenoid valves has been added to the conventional SVB series.
- A higher level of cost performance has been realized in the new line-up of solenoid valves, each inheriting the traditional design concept and emphasizing on basic functions of the SVB series.
- With the new SVB 10 series solenoid valves, power consumption has been reduced-from the usual 0.8W to 0.55W. -making substantial power savings a reality.



The piping specification can be chosed from stand-alone type, direct piping-manifold type and base piping-manifold type depending on applications.





(There is no compatibility between stand-alone Direct piping-manifold type type and manifold piping type.)

Equipped with indivisual connecters and disigned for the valve to be taken out in two different directions, enabling the user to choose either of the directions to match particular installations.

(Please note that 10 series are not convertible with conventional model.)



Direction of wiring Dir taken out: Above ta

Base piping-manifold type

Direction of wiring taken out: Side

SVE 10, 15, 18, 22 Series

Pilot Valve Specifications

Voltage rating	24VDC	100VAC	110VAC	200VAC	220VAC					
Operating system		Direct operation								
Valve construction		Elastic seal, poppet valve								
Allowable voltage range	21.6 ~ 26.4VDC	90 ~ 110VAC	99 ~ 121VAC	180 ~ 220VAC	198 ~ 242VAC					
Power consumption (with lamp)	0.8W (0.55W*)	1VA	1.1VA	2VA	2.2VA					
Surge limiting circuit	Surge absorber		Bridge	diode						
Manual operation	Push & Lock type									
Direction of wiring taken out	Straight type (S), Elbow type (L)									
Lamp			LED							

* The power consumption of 0.55W is for 10 series. * 200VAC and 220VAC specifications are not available for SVB 10 series.

* 110VAC for SVB 10series will be available soon.

SVI 10 Series

Main Valve Specifications

	Model	Specification	ns for individual sol	enoid valves	N	anifold specificatio	ns	
		SVB10S	SVB10D	SVB10A	SVB10S-M	SVB10D-M	SVB10A-M	
				SVB10R			SVB10R-M	
Item				SVB10P			SVB10P-M	
Fluid admitted				A	ir			
Service pressure	e range	22 ~ 102psi (0	.15 ~ 0.7MPa)	43.5 ~ 102psi (0.3 ~ 0.7MPa)	22 ~ 102psi (0	.15 ~ 0.7MPa)	43.5 ~ 102psi (0.3 ~ 0.7MPa)	
Proof pressure				152psi (1	.05MPa)			
Service temperat	ture range			41 ~ 122°F	(5 ~ 50°C)			
Installation		Free						
Operating system	m			Pilot valve-activat	ted indirect action			
Port thread size			M5×0.8		M5×0.8 (*1)			
Valve construction	on			Elastic seal,	spool valve			
No. of positions		2 pos	sitions	3 positions	2 pos	positions 3 positions		
No. of ports			-	5 p	orts			
Valve function		Single	Do	uble	Single	Do	uble	
Response time	$\rightarrow ON$	15m·sec	12m·sec	15m·sec (*3)	15m·sec	12m·sec	15m·sec (*3)	
(*2)	→ OFF	20m·sec	12m·sec	25m·sec (*3)	20m·sec	12m·sec	25m·sec (*3)	
Max. operation cycle					5Hz			
Min. excitation time			50m·sec			50m·sec		
Lubrication	cation				Not required			
Effective sectional area	$P \to A,B$	2.0mm	² (0.11)	2.0mm ² (0.11)	1.8mm	1.8mm ² (0.10)		
(Cv factor)	A, $B \rightarrow P$	2.0mm	² (0.11)	3.2mm ² (0.17)	1.6mm	² (0.09)	2.5mm ² (0.14)	

The P and R ports are not threaded for screws because these solenoid valves are for manifold-mounted use only.
 The values are at the air pressure of 0.5MPa (72psi).

*3. Values at the three positions are for response times from neutral to ON and OFF from operation state to neutral, respectively.

Cylinder Speed Table

Cylinde	r speed		Cylinder b	ylinder bore (mm)				
(mm/s)	(in./s)	ø20mm (ø0.79in.)	ø25mm (ø0.98in.)	ø32mm (ø1.26in.)	ø40mm (ø1.57in.)			
100	3.94							
200	7.87							
300	11.81							
400	15.75							
500	19.69							
600	23.62							
700	27.56							

Note) The average speed of the cylinder represents the case where the pressure is 0.5MPa (72psi), the load factor is 30% and the piping tube length is 1m (3.28ft).

The cylinder speed varies with the piping and joint configurations.
 The pipin sizes of A and B ports for these data represent ø6mm quick-fitting joint (POC6-M5M). (Valves: SVB10D)

SVB 15 Series

Main Valve Specifications

Model	SVB15S	SVB15D	SVB15A	SVB15J	SVB15Y				
			SVB15R	SVB15L	SVB15Z				
			SVB15P	SVB15M					
Item				SVB15N					
Fluid admitted		Air							
Service pressure range	22 ~ 102psi (0	.15 ~ 0.7MPa)	29 ~ 102psi (0.2 ~ 0.7MPa)	22 ~ 102psi (0	.15 ~ 0.7MPa)				
Proof pressure			152psi (1.05MPa)						
Service temperature range			41 ~ 122°F (5 ~ 50°C)						
Installation		Free							
Operating system	Pneumatic operation by pilot valve								
Port thread size			M5×0.8 (*1)						
Valve construction			Elastic seal, spool valve	1					
No. of positions	2 pos	itions	3 positions	2 positions					
No. of ports		5 ports		3 ports					
Valve function	Single	Do	uble	Single	Double				
Response time	15m·sec	12n	1.SEC	15m·sec	12m·sec				
Max. operation cycle			5Hz						
Min. excitation time		50m·sec			50m·sec				
Lubrication			Not required						
Effective sectional area	2 4mm	2 (0 19)	A · R: 3.2mm ² (0.17)	2 (mm)	2 (0.19)				
(Cv factor) (*2)	3.411111	3.4mm² (0.18)		5.411111 (0.18)					

*1. There is thread processing of P · R1 · R2 port for SVB15J · L · Y type as they are manifold mount valve. *2. The figure of effective sectional area is $P \rightarrow A$.

Cylinder Speed Table

Cylinde	r speed	Cylinder bore (mm)									
(mm/s)	(in./s)	ø20mm (ø0.79in.)	ø25mm (ø0.98in.)	ø32mm (ø1.26in.)	ø40mm (ø1.57in.)	ø50mm (ø1.97in.)	ø63mm (ø2.48in.)	ø80mm (ø3.15in.)	ø100mm (ø3.94in.)	ø125mm (ø4.92in.)	ø140mm (ø5.51in.)
100	3.94										
200	7.87										
300	11.81										
400	15.75										
500	19.69										
600	23.62										
700	27.56										
800	31.50										
900	35.40										

Note) The average speed of the cylinder represents the case where the pressure is 0.5MPa (72psi), the load factor is 30% and the piping tube length is 1m (3.28tt). The cylinder speed varies with the piping and joint configurations. The joint sizes of A and B ports for these data represent o6mm quick-fitting joint. (Valves: SVB15D)

SVB 18 Series

Main Valve Specifications

Model	SVB18S	SVB18D	SVB18A	SVB18J	SVB18Y			
			SVB18R	SVB18L	SVB18Z			
			SVB18P	SVB18M				
Item				SVB18N				
Fluid admitted		Air						
Service pressure range	22 ~ 102psi (0	.15 ~ 0.7MPa)	29 ~ 102psi (0.2 ~ 0.7MPa)	22 ~ 102psi (0.15 ~ 0.7MPa)				
Proof pressure			152psi (1.05MPa)					
Service temperature range			$41 \sim 122^{\circ}F (5 \sim 50^{\circ}C)$					
Installation		Free						
Operating system	Pneumatic operation by pilot valve							
Port thread size			Rc1/8 (*1)					
Valve construction			Elastic seal, spool valve					
No. of positions	2 pos	itions	3 positions	2 positions				
No. of ports		5 ports		3 ports				
Valve function	Single	Do	uble	Single	Double			
Response time	20m·sec	15n	1-SEC	20m·sec	15m·sec			
Max. operation cycle			5Hz					
Min. excitation time		50m·sec			50m·sec			
Lubrication			Not required					
Effective sectional area	19mm	2 (0 70)	A · R: 5.2mm ² (0.28)	19mm	2 (0 70)			
(Cv factor) (*2)	1311111	(0.70)	P: 13mm ² (0.70)	1311112 (0.70)				

*1. There is thread processing of $P \cdot R1 \cdot R2$ port for SVB18J $\cdot L \cdot Y$ type as they are manifold mount valve. *2. The figure of effective sectional area is $P \rightarrow A$.

Cylinder Speed Table

Cylinde	r speed	Cylinder bore (mm)									
(mm/s)	(in./s)	ø20mm (ø0.79in.)	ø25mm (ø0.98in.)	ø32mm (ø1.26in.)	ø40mm (ø1.57in.)	ø50mm (ø1.97in.)	ø63mm (ø2.48in.)	ø80mm (ø3.15in.)	ø100mm (ø3.94in.)	ø125mm (ø4.92in.)	ø140mm (ø5.51in.)
100	3.94										
200	7.87										
300	11.81										
400	15.75										
500	19.69										
600	23.62										
700	27.56										
800	31.50										
900	35.40										
1,000	39.40										
1,100	43.30										

Note) The average speed of the cylinder represents the case where the pressure is 0.5MPa (72psi), the load factor is 30% and the piping tube length is 1m (3.28ft).

The cylinder speed varies with the piping and joint configurations.
 The joint sizes of A and B ports for these data represent ø8mm quick-fitting joint. (Valves: SVB18D)

SVB 22 Series

Main Valve Specifications

Model	SVB22S	SVB22D	SVB22A				
			SVB22R				
Item			SVB22P				
Fluid admitted		Air					
Service pressure range	29 ~ 102psi (0	29 ~ 102psi (0.15 ~ 0.7MPa) 43.5 ~ 102psi (0.3 ~ 0.7					
Proof pressure		152psi (1.05MPa)					
Service temperature range		41 ~ 122°F (5 ~ 50°C)					
Installation		Free					
Operating system	Pneumatic operation by pilot valve						
Port thread size	F	P · A · B port: Rc1/4, R1 · R2 port: Rc1/8	3				
Valve construction		Elastic seal, spool valve					
No. of positions	2 pos	itions	3 positions				
No. of ports		5 ports					
Valve function	Single	Sin	gle				
Response time	25m·sec	18m·sec	25m·sec				
Max. operation cycle		5Hz					
Min. excitation time		50m·sec					
Lubrication	Not required						
Effective sectional area	19mm	A · B: 13mm ² (0.70)					
(Cv factor) (*1)	1811111	(0.90)	P: 15mm ² (0.81)				

*1. The figure of effective sectional area is $P \rightarrow A$.

Cylinder Speed Table

Cylinde	r speed	Cylinder bore (mm)									
(mm/s)	(in./s)	ø20mm (ø0.79in.)	ø25mm (ø0.98in.)	ø32mm (ø1.26in.)	ø40mm (ø1.57in.)	ø50mm (ø1.97in.)	ø63mm (ø2.48in.)	ø80mm (ø3.15in.)	ø100mm (ø3.94in.)	ø125mm (ø4.92in.)	ø140mm (ø5.51in.)
100	3.94										
200	7.87										
300	11.81										
400	15.75										
500	19.69										
600	23.62										
700	27.56										
800	31.50										
900	35.40										
1,000	39.40										
1,100	43.30										

Note) The average speed of the cylinder represents the case where the pressure is 0.5MPa (72psi), the load factor is 30% and the piping tube length is 1m (3.28ft). The cylinder speed varies with the piping and joint configurations. The joint sizes of A and B ports for these data represent ø10mm quick-fitting joint. (Valves: SVB22D)

Solenoid Valve SVB Series

Construction

2-position, 5-ports single solenoid valve



No.	Component name	Material
1	Valve body	Aluminum alloy
2	Spool	Aluminum alloy
3	Spool packing	NBR
4	Pilot ass'y	-
5	Middle block	PBT
6	End block	PBT
7	Piston	POM
8	Y-packing	NBR
9	Push-type manual	POM

2-position, 5-ports double solenoid valve



3-position, 5-ports all port block (Closed center)



No.	Component name	Material
1	Valve body	Aluminum alloy
2	Spool	Aluminum alloy
3	Spool packing	NBR
4	Pilot ass'y	-
5	Middle block	PBT
6	Piston	POM
7	Y-packing	NBR
8	Push-type manual	POM

No.	Component name	Material
1	Valve body	Aluminum alloy
2	Spool	Aluminum alloy
3	Spool packing	NBR
4	Pilot ass'y	-
5	Middle block	PBT
6	Piston	POM
7	Y-packing	NBR
8	Push-type manual	POM

2-position, 3-ports single solenoid valve (for mixed-installation with 5-ports valve)



No.	Component name	Material
1	Valve body	Aluminum alloy
2	Spool	Aluminum alloy
3	Spool packing	NBR
4	Pilot ass'y	-
5	Middle block	PBT
6	End block	PBT
7	Piston	POM
8	Y-packing	NBR
9	Push-type manual	POM

2-position, 3-ports double solenoid valve (for mixed-installation with 5-ports valve)



No.	Component name	Material
1	Valve body	Aluminum alloy
2	Spool	Aluminum alloy
3	Spool packing	NBR
4	Pilot ass'y	-
5	Middle block	PBT
6	Piston	POM
7	Y-packing	NBR
8	Push-type manual	POM



_								
	No.	Component name	Material					
	1	Valve body	Aluminum alloy					
	2	Spool	Aluminum alloy					
	3	Spool packing	NBR					
	4	Pilot ass'y	-					
	5	Middle block	PBT					
	6	End block	PBT					
	7	Piston	POM					
	8	Y-packing	NBR					
	9	Push-type manual	POM					

2-position, 3-ports single solenoid valve (normally closed or normally open)

2-position, 3-ports double solenoid valve



No.	Component name	Material
1	Valve body	Aluminum alloy
2	Spool	Aluminum alloy
3	Spool packing	NBR
4	Pilot ass'y	_
5	Middle block	PBT
6	Piston	POM
7	Y-packing	NBR
8	Push-type manual	POM





Model Designation of Directly plumbed valve-dedicated manifold as a single unit

Model Designation of Block plate as a single unit

→(3) Specification for manifold (15, 18 and 22 series only) No code: Manifold installed in combination with 3-, 5-port valves Y: 3-port valve-dedicated manifold (15, 18 Seires only)

1D: 10 series (10mm (0.39in.) width valve)

15: 15 series (15mm (0.59in.) width valve) **18**: 18 series (18mm (0.71in.) width valve)

22: 22 series (22mm (0.87in.) width valve)

(1) Block plate for metallic body solenoid valve

Order Example

Model	Series	No. of manifold	Specification of manifold		Direction of wiring taken out	Color	Manual button spec.		Valve		Voltage spec.		Piping spec.	Check valve
	(1)	(2)	(3)		(4)	(5)	(6)		(7)		(8)	-	(9)	(10)
SVB	18	7		-	L	В		_	K	_	D24	-		

(Note) Valve mounting order, R1 port to the front as shown is St.1 through St.7 from left to right.

	Station No,	Valve mounted type
ĺ	St.1	S
	St.2	S
	St.3	S
	St.4	D
	St.5	D
	St.6	A
	St.7	A
	St.8	
Ĵ	St.9	
	St.10	

Detailed Safety Instructions

Before using the PISCO device, be sure to read the "Safety Instructions", "Common Safety Instructions for Products Listed in This Manual", on page 114 to 116 and "Common Safety Instructions for Solenoid Valves" on page 117.

Warning

 Where the Solenoid Valve is used with vibration of 5G or below, install it in such a way that the direction of vibration is perpendicular to the spool valve.
 * See the following illustration

Caution

- 1. When the valves are used as Valve Manifold, back pressure can cause malfunction of the actuator (single acting cylinder, etc.) In such a case, provide a check valve to the exhaust port.
- 2. Do not use a 3-position valve for center position stop of the cylincer that requires accuracy. Compressiveness of air may not allow accuracy in stop position. Also, the valve permits leakage, so that the stop position may not remain constant for a long time.
- 3. Do not give excessive tension or bending to the individual plug-in connector (cable). Disconnection or damage to the connector may result.
- 4. 24VDC specifications. As a countermeasure against surges, this valve is equipped with surge absorbers as standard. However, since surges cannot be completery absorbed, care should be taken to prevent them.
- When manual cover is closed, the manual and lock operation can not be conducted.

Unit: mm(inch)

SVI 10 Series

2-position 5-port Single solenoid valve, Direction of wiring taken out: Above

Solenoid Valve SVB Series

SVI 10 Series

2-position 5-port Double solenoid valve, Direction of wiring taken out: Side

2-position 5-port All port block, ABR connection, PAB connection Direction of wiring taken out: Side

SVE 15 Series

2-position 5-port Single solenoid valve, Direction of wiring taken out: Above

SVB 15 Series

2-position 5-port Double solenoid valve, Direction of wiring taken out: Side

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136(5.35)

<u>__</u>_

10.8(0.43)

0-

10.8(0.43)

3-M5×0.8 (P,R port)

2-position 3-port Single solenoid valve (For mixed-installation with 5-port valve), Normally Closed or Normally Open, Direction of wiring taken out: Above

2-position 3-port Single solenoid valve (For mixed-installation with 5-port valve), Normally Closed or Normally Open, Direction of wiring taken out: Side

2-position 3-port Double solenoid valve (For mixed-installation with 5-port valve), Direction of wiring taken out: Above

Solenoid Valve SVB Series

SVB 15 Series

2-position 3-port Double solenoid valve (For mixed-installation with 5-port valve), Direction of wiring taken out: Side

2-position 3-port Single solenoid valve, Normally Closed or Normally Open, Direction of wiring taken out: Above

2-position 3-port Single solenoid valve, Normally Closed or Normally Open, Direction of wiring taken out: Side

2-position 3-port Double solenoid valve, Direction of wiring taken out: Above

2-position 3-port Double solenoid valve, Direction of wiring taken out: Side

Quick-fitting joints available for SVB 10 and 15 series connection ports.

[for M5 port] PC Straight Mini-type

Model PC1/8-M5M

PC5/32-M5M PC1/4-M5M *

* The fitting will be available soon.

[for Female Rc1/8 port] PC Straight

PL Elbow Mini-type

Model PL1/8-M5M PL5/32-M5M PL1/4-M5M *

* The fitting will be available soon.

PL Elbow

Poc Hex. Holed Straight Mini-type

Model POC1/8-M5M POC5/32-M5M POC3/16-M5M POC1/4-M5M *

POC3/16-M5M POC1/4-M5M * * The fitting will be available soon.

Model POC1/4-01 POC3/8-01

SVB 18 Series

2-position 5-port Single solenoid valve, Direction of wiring taken out: Above

2-position 5-port Single solenoid valve, Direction of wiring taken out: Side

2-position 5-port Double solenoid valve, Direction of wiring taken out: Above

2-position 5-port Double solenoid valve, Direction of wiring taken out: Side

3-position 5-port All port block, ABR connection, PAB connection, Direction of wiring taken out: Above

3-position 5-port All port block, ABR connection, PAB connection, Direction of wiring taken out: Side

Solenoid Valve SVB Series

SVB 18 Series

2-position 3-port Single solenoid valve (For mixed-installation with 5-port valve), Normally Closed or Normally Open, Direction of wiring taken out: Above

2-position 3-port Single solenoid valve (For mixed-installation with 5-port valve), Normally Closed or Normally Open, Direction of wiring taken out: Side

2-position 3-port Double solenoid valve (For mixed-installation with 5-port valve), Direction of wiring taken out: Above

2-position 3-port Double solenoid valve (For mixed-installation with 5-port valve), Direction of wiring taken out: Side

2-position 3-port Single solenoid valve, Normally Closed or Normally Open, Direction of wiring taken out: Above

2-position 3-port Single solenoid valve, Normally Closed or Normally Open, Direction of wiring taken out: Side

SVB 18 Series

2-position 3-port Double solenoid valve, Direction of wiring taken out: Above

Quick-fitting joints available for SVB 18 and 22 series connection ports.

[for Female Rc1/8 port]

1_____

[for Female Rc1/4 port] PC Straight

PL Elbow

PL Elbow

POC Hex. Holed Straight

Model POC1/4-01 POC3/8-01

POC Hex. Holed Straight

Model POC1/4-02 POC3/8-02

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SVE 22 Series

2-position 5-port Single solenoid valve, Direction of wiring taken out: Above

18(0.71)

18(0.71) 2-Rc1/8 (R port)

SVB 22 Series

2-position 5-port Double solenoid valve, Direction of wiring taken out: Side

SVI 10 Series

Directly plumbed valve-installed manifold type Direction of wiring taken out: Above

Directly plumbed valve-installed manifold type Direction of wiring taken out: Side

* Please refer to P.97 for quick-fitting joints applied to the connection ports of above items.

SVIJ 10 Series

Base piping valve-installed manifold type Direction of wiring taken out: Above

Base piping valve-installed manifold type Direction of wiring taken out: Side

Unit: mm(inch)

SVB 15 Series

Manifold installed in combination with 3-, 5-port valves, Direction of wiring taken out: Above

Model: SVB 15 ------

Manifold installed in combination with 3-, 5-port valves, Direction of wiring taken out: Side

 Model: SVB 15_-L__ Image: SVB 15_-L___

SVB 15 Series

3-port valve-dedicated manifold, Direction of wiring taken out: Above

Model: SVB 15 Y-S ----

Unit: mm(inch)

3-port valve-dedicated manifold, Direction of wiring taken out: Side

SVE 18 Series

Manifold installed in combination with 3-, 5-port valves, Direction of wiring taken out: Above

Manifold installed in combination with 3-, 5-port valves, Direction of wiring taken out: Side

 Model: SVB 18_-L____

SVE 18 Series

3-port valve-dedicated manifold, Direction of wiring taken out: Above

3-port valve-dedicated manifold, Direction of wiring taken out: Side

* Please refer to P.102 for quick-fitting joints applied to the connection ports of above items.

SVE 22 Series

Manifold installed in combination with 3-, 5-port valves, Direction of wiring taken out: Above

Manifold installed in combination with 3-, 5-port valves, Direction of wiring taken out: Side
Model: SVB 22_-L__-

* Please refer to P.102 for quick-fitting joints applied to the connection ports of above items.

Solenoid Valve SVB Series

Characteristics

SVB15 Series SVB18 Series Outlet Outlet pressure pressure MPa(psi) MPa(psi) Supply pressure MPa(psi) Supply pressure MPa(psi) 0.7(101) 0.7(101) 0.6(87) 0.6(87) 0.7(101) 0.6(87) 0.5(72.5) 0.5(72.5) 0.7(101) 0.5(72.5) 0.5(72.5) 0.4(58) 0.4(58) 0.4(58) 0.4(58) 0.3(43.5) 0.3(43.5) 0.3(43.5) 0.3(43.5) 0.2(29) 0.2(29) -0:2(29) 0.2(29) 0.1(14.5) 0.1(14.5) 0 0 50 100 200 250 300 ℓ/min(ANR) 200 400 600 800 1000 1200 *U*min(ANR) 150 7.0 SCEM 7.0 14.0 21.0 28.0 35.0 42.0 SCEN Flow rate Flow rate

Operating Notes

1. Quality of Air Used

- Impurities in the compressed air may adversely affect the unit's performance and cause problems. Remove drainage and dust, and use clean air.
- In piping, perform flushing on both the compressed air side and the cylinder side. Install an airfilter (filtering capacity: 5µm or below) near the valve.
- Large amounts of drainage, excess oil and very dry air may adversely affect the unit's performance and cause problems. Therefore execise ample care in monitoring air quality.

2. Environment Conditions

Please observe the following conditions

- Observe the operating temperature range of (5 ~ 50°C/41 ~ 122°F).
- Prevent condensation from occurring with temperature changes.
- Use in an environment free from moisture, oil and dust.
- Prevent contact with corrosive gases.

3. Leakage Current

If the programmable controller operates the valve, leakage of valve output current could cause malfunction. Make sure that leakage current does not exceed 1mA.

4. Installation

Where there is vibration, install the spool valve at right angle to the direction of vibration. (Use where vibration is less than 5G).

5. Lubrication

Valve can be used without supply of oil.

If you choose to lubricate, use Turbine Oil Class 1 (ISO VG32) without adulteration. If you discontinue lubrication, initial lubrication will be lost, eventually leading to failure. Therefore be sure to continue lubrication.

6. Recommendable Torque for Tightening Manifold "Fixing Screws"

To fix valves on to manifold, tightening manifold "fixing screws" following recommendable torque. Use of torque other than recommended will cause loosening and/or damage.

		0 0	
Valve series	SVB15 Series	SVB18 Series	SVB22 Series
Recommendable tightening torque	0.25 ~ 0.35N·m	0.25 ~ 0.35N·m	0.3 ~ 0.5N·m

7. Electric Circuit Diagram

8. Individual Wiring Connector Installation and Removal

- To install an individual plug-in connector, push into place until it stops.
- To remove a connector from the valve body, do so while pushing the lever on the back of the connector in the direction of arrow.

9. Manual Operations

- Valves can be switched over by manual operation. (Switching over can only be performed at times when the valve is supplied with pilot pressure).
- To lock manual button, push it with a timepiece-use screw driver until it comes to a stop, then turn it clockwise. To release lock, turn manual button anticlockwise.
- Be sure to unlock manual button before commencing normal operation (or, before commencing operations in normal mode).
- Do not apply unnecessary pressures to manual button to avoid possible damage.

10. Fixing of Joints

To fix joints on to valves and manifolds, hold valve or manifold itself. Tightening joints holding pilot valve may possibly cause damage. ▲ Safety Instructions

This Safety Instructions aim to prevent injuries to human bodies and damage to properties by requiring proper use of PISCO devices.

Also the relevant requirements of ISO 4414 and JIS B8370 must be observed.

ISO 4414: Pneumatic fluid power---Recomendations for the application of equipment to transmission and control systems.

JIS B8370: General standards for pneumatic systems

Safety instructions are classified into "Danger", "Warning" and "Caution", depending on the degree of danger or damage involved when the safety instructions are not complied with in handling the equipment.

Danger Failure to heed the warning of appatrent danger may result in death or serious injuries.

Warning > Failure to heed the warning of conditionally dangerous situations may result in death or serious injuries.

Caution Failure to heed the warning of conditionally dangerous situations may result in minor or not too serious injuries or damage to properties.

* Safety Instructions are subject to change without advance notice.

PISCO products are designed and manufactured for use with general industrial machinery and equipment. Therefore be sure to observe the following safety instructions:

∆Danger

- 1. Do not use PISCO devices with the following equipment:
 - (1) Equipment used for the sustenance or control of people's health or lives
 - (2) Equipment used for the movement or transport of people
 - (3) Equipment used specifically to ensure safety

Warning

- 1. Avoid the following uses for PISCO devices:
 - (1) Use under conditions not specified for the device
 - (2) Use in any outdoor environment
 - (3) Use in locations where the device is exposed to excessive vibration or shocks
 - (4) Use in locations where the device is exposed to any corrosive gas, inflammable gas, chemicals, seawater, or vapor.

* Certain PISCO devices, however, can be used in environments as described above. Therefore check on the specifications for the use of individual devices.

- 2. Do not disassemble or remodel the PISCO devices in such a way as may affect the basic structure, performance or function of them.
- 3. Carry out maintenance and checks of the PISCO devices only after turning power off, shutting air off and making certain that the pressure in the piping has dropped to zero.
- 4. Never touch the release ring of the Quick-Fitting Joint when there is pressure working on it. Touching may release the ring, which in turn may cause the tube to fall out.
- 5. Avoid too freequent switching of air pressure. Otherwise the device body may heat up to cause burns on you.
- 6. Do not allow tension, twist or bending forces to act on the joints. Undue forces may damage the joint body.

- 1. In installing the piping, be sure to remove dust or drainage from within the piping. Dust or drainage left unremoved may enter other equipment, thus causing troubles.
- 2. When using an ultrasoft tube to connect to a Quick-Fitting Joint, be sure to use an insert ring in the bore of the tube. Otherwise the tube may fall out to cause leakage.
- 3. When you use tubes of brands of brands other than ours, be sure to confirm that the outside diameter of the tubes satisfies the tolerance specified Table 1.

mm size	Nylon tube	Urethane tube
ø3mm	-	±0.15mm
ø4mm	±0.1mm	±0.15mm
ø6mm	±0.1mm	±0.15mm
ø8mm	±0.1mm	±0.15mm
ø10mm	±0.1mm	±0.15mm
ø12mm	±0.1mm	±0.15mm

inch size	Nylon tube	Urethane tube
 1/8" OD	±0.0039"	±0.0059"
E/20" OD	+0.0039"	+0.0059"
5/32 00	-0.002"	-0.0039"
 3/16" OD	±0.0039"	±0.0059"
 1/4" OD	±0.0039"	±0.0059"
	+0.0059"	+0.0079"
5/10 OD	0	-0.002"
3/8" OD	±0.0039"	±0.0059"
1/2" OD	±0.0039"	±0.0059"

Table 1. Tube O.D. Tolerance

- 4. Cautions on the fitting of tube
 - (1) Make certain that the end of the tube is cut at right angles, the tube surface is free from flaws, and the tube is not deformed into an ellipse.
 - (2) When fitting a tube, refer to the dimensional specification of Table 2. To prevent leaks, insert the tube to end (C) completely.

Table 2

Standard type	Э					C T
Tuba dia	ø4	ø6	ø8	ø10	ø12	
Tube dia.	5/32" OD	3/16" OD, 1/4" OD	5/16" OD	3/8" OD	1/2" OD	
C (mm)	15mm	17mm	18.5mm	20.5mm	23.5mm	
C (inch)	0.59"	0.67"	0.73"	0.81"	0.92"	
Mini type				_ 10mm		
Tubo dia	ø3	ø4	~ 6	(0.39")		
Tube ula.	(*)	1/8" OD, 5/32" OD	00			
C (mm)	9.5mm	11mm	12mm		31 <u>"</u>	
C (inch)	0.37"	0.43"	0.47"		<u>و</u> اھ	
* Even with the	tube of 0mm/0	10") diamatar (11			

* Even with the tube of 3mm(0.12") diameter, C=11mm (0.43") for the release ring of the dimensions shown right.

(3) On completion of fitting, make certain that the tube does not come out at your pulling.

Common Safety Instructions for Products Listed in This Manual

5. Cautions on the release of tube

(1) Before releasing the tube, make certain that the pressure inside the tube is zero.

(2) Push the release ring fully inside and pull out the tube. Unless you push it completely in, the tube may not come out and scrapings of tube may be left inside the joint.

6. Cautions on the installation of joint body

(1) When installing the joint body, tighten it with a proper tool, using the outside or inside hexagon.

- (2) In tightening the screw, use the tightening torque recommended in Table 3.
 - · Use of a torque highter than the recommended level may damage thread or deform gasket, thus causing leaks.
 - \cdot Use of a torque lower than the recommended level may cause loose screw and leakage.
- (3) With the joint whose piping direction will not change after tightening, make adjustment within the recommended range of tightening torques.
- Table 3. Tightening Torque, Sealock Color and Gasket Material

Thread type	Thread size	Tightening torqe	Sealock color	Gasket material	
Metric thread	M5×0.8	1.0 ~ 1.5N·m (0.74 ~ 1.11lbf·ft)	-	SUS304, NBR	
Tapar pipe thread	R1/8	7~9N·m (5.16~6.64lbf·ft)	\\/bita		
Taper pipe tiffead	R1/4	12~14N·m (8.85~10.33lbf·ft)	vvnite	—	

7. Cautions on the removal of joint body

(1) When removing the joint body, loosen it with a proper tool, using the outside or inside hexagon.

(2) Remove sealant sticking to the thread on the mating equipment. The sealant left sticking may enter the perpheral equipment and cause trouble.

PISCO sure to read the following instructions before selecting and using the PISCO devices. Also read the detailed instructions for individual series.

Warning

- 1. The Valves have their own direction of air flow. Therefore confirm the direction in the catalog and by the mark on the product before use. Mistaking the flow direction may cause injuries on the operator or damage to the equipment.
- 2. Do not operate the manually changing valve mechanically. Such operation may damage the valve itself.
- 3. Remove drainage and dust and use clean air. Also provide an air filter on the upstream side of the valve. Impurities compressed air can cause malfunction.
- 4. Do not give tension, twist or bending to the Change Series valves. Also do not drop or give excessive shocks to them. Such careless handling can inflict damage to them.

Common Safety Instructions for Solenoid Valves

PISCO sure to read the following instructions before selecting and using the PISCO devices. Also read the detailed instructions for individual series.

Warning

- 1. When installing the piping, carry out flushing on both the compressed air side and the cylinder side and provide an air filter (nominal filtration rating: 5µm or below) on the upstream side near the valve. Drainage or dirt, if left unremoved, may cause malfunction.
- 2. Do not allow excessive lubrication air or super-drying air to flow. Degradation due to dust or malfunction due to oil may result.
- 3. Do not use these device in locations where they can be exposed to water drops, oil drops, dust, etc. The valves are neither drip-proof, so that malfunction may result.
- 4. Do not use these device in locations with inflammable or explosive gas, fluid or atmosphere. Fire or explosion may occur.
- 5. Do not use these devices in atmosphere or gas containing corrosive substances. Trouble may occur eventually.
- 6. Avoid the use of these device where they are exposed to excessive vibration or shocks. Such use may cause malfunction or trouble.
- 7. For operation of the valves, make certain that the leakage current is 1mA or below. Leakage current may cause malfunction.

Caution

- 1. These valves are designed to accommodate some leakage, so do not use them in applications that permit no leakage.
- 2. Do not use the valves for large-flow air blowing. As the structure is an internal pilot type, the drop of internal pressure may lead to malfunction.
- 3. Manual operation of the valve can operate the actuator connected to it. Therefore operate after confirming safety.
- 4. Consult PISCO on applications where power is continuously supplied to the valve for a long time.
- 5. Be sure to turn off power before installing the wiring. Also pay special attention to wire colors in wiring.
- 6. You can use these valves without lubrication. When you lubricate, however, use Turbine Oil Class 1 (ISO VG32). Once you start the habit of lubrication, do not stop it. Otherwise the initial lubricant will be lost, thus causing malfunction.
- 7. Before wiring, check the ports of the valve by the marking on the body.
- 8. For maintenance or checks, turn off power, stop air supply and make certain that the pressure inside the piping has become zero. With the 3-position all port block type, watch out for the air remaining between valve and cylinder.
- 9. With the manifold having a silencer, clogging of the element raises the resistance to exhaust, thus lowering the performance of the system as a whole. Therefore conduct periodic maintenance and checks.