



5 Port Solenoid Valve/Body Ported
Cassette Type Manifold
Series SZ3000



The plug-in cassette system makes valve replacement easy.

A plug-in manifold has been realized having a manifold height of 43.5mm (including DIN rail).

Valve replacement can be performed easily.

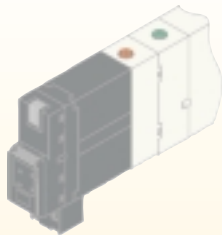
Moreover, since spare terminals for wiring are contained inside the manifold (receptacle housing), terminal changes (expansion) can be performed quickly and easily.

(The number of expansion stations is limited by the manifold specifications. Refer to page 12 for details.)



Valves equipped with switches

Adjustment and maintenance of equipment can be performed with greater safety, since the power to each valve can be shut off individually with built-in switches.



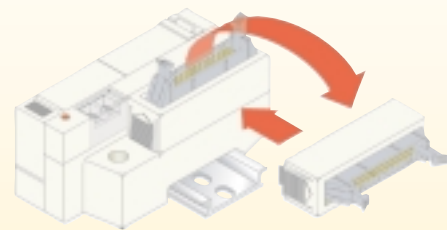
High speed response of 10ms (SZ3000 single, 0.5MPa) (24VDC, without surge voltage suppressor)

While having a low power consumption, a fast response time of 10ms is obtained through a unique pilot valve construction.

Low power consumption of 0.6W (current value: 25mA 24VDC)

By making possible direct drive from a PLC, relays, etc. become unnecessary, and cost savings can also be realized through reductions in the size of the switching element and power supply.

The connector entry direction can be changed from top to side with a simple operation.



High reliability and long life of 50 million cycles or more

High reliability and long life have been achieved by a guide ring construction, which prevents eccentricity of the main valve, and a return piston with increased return force.

(Single and double solenoid types)

Copper free

There is no copper in fluid contact areas, making it possible to use standard products as they are.

New design and bright color tones

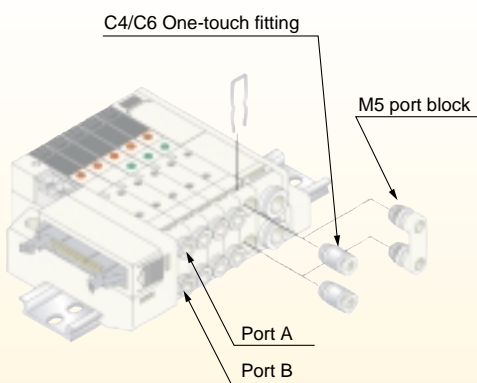
The top of the manifold has been made flat and the rounding of corners has been enlarged, resulting in a design which is easy on workers. Furthermore, bright color tones using shades of white have been adopted to match the changes in operating environments.



5 Port Solenoid Valve/Body Ported Cassette Type Manifold Series **SZ3000**

Easy attaching/detaching of tubes

The interval between ports A and B is a wide 20.5mm, allowing easy attaching and detaching of tubes.



Size and weight reduction has been realized by eliminating the manifold base

Series	SZ3000
Height	△31% reduction
Weight	△12% reduction

(Compared with SX3000-45 with DIN rail manifold and 5 stations)

Pilot valve exhaust mist and noise eliminated

(main valve/pilot valve converging exhaust construction)

Since the pilot valve exhaust is not discharged directly to the outside, there is no discharge of effluent or harsh exhaust noise from the pilot exhaust port, making the valve "environmentally friendly".

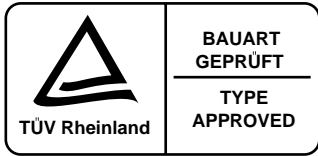
One-touch fittings can be changed

Series	Replaceable port sizes		
SZ3000	C4	C6	M5

Improved moisture resistance

A special rubber with outstanding water resistance is used in the main valve area.

Trouble in the main valve area is reduced under a wide range of operating conditions. (Rubber with ozone resistant specifications is also separately available.)



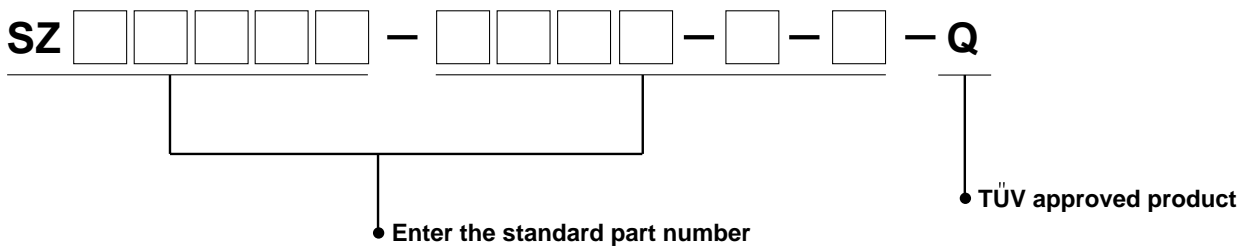
TÜV Approved Product

(Conforms to standards necessary to satisfy EC directives.)

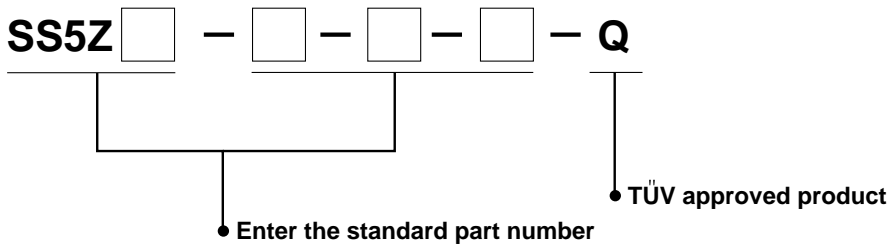
The SZ series has received approval for conformity to standards related to EMC Directives and DIN VDE 0580, from TÜV Rheinland, an EC Notified Body (EC authorization No. 0197). Moreover, since the rated voltage for this series is 50VDC or less, it is not subject to low voltage directives.

When ordering TÜV approved products, add "- Q" at the end of the standard part number.

Example of how to order a valve



Example of how to order a manifold



Note) Contact SMC for details, as there are limitations on product models, voltage specifications and electrical entry, etc.

5 Port Solenoid Valve

Series SZ3000

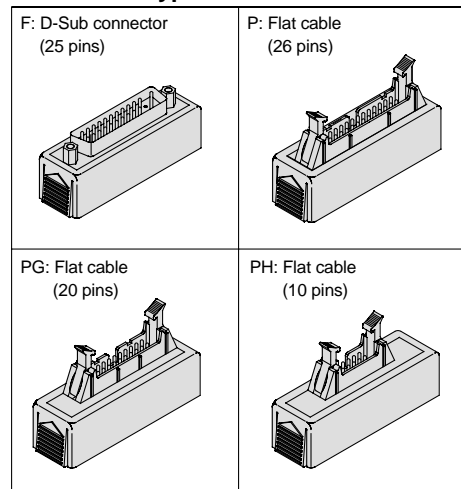
Plug-in Type

How to Order

• Plug-in manifold with power supply terminals

SS5Z3-60 **F** **D** **1** - **05** **U** **□** - **P** - **□**

• Connector type



Supply/Exhaust block mounting position

U	U Side (2 to 10 stations)
D	D Side (2 to 10 stations)
B	Both sides (2 to 20 stations)
M*	Special specifications

* In the case of special specifications, indicate separately on a manifold specification sheet.
 Note) A total of up to 3 supply/exhaust blocks can be mounted. Contact SMC if 4 or more will be mounted.

Pilot specifications

Nil	Internal pilot specifications
R	External pilot specifications

• Options

When a DIN rail is required that is longer than the standard types, specify the number of stations.

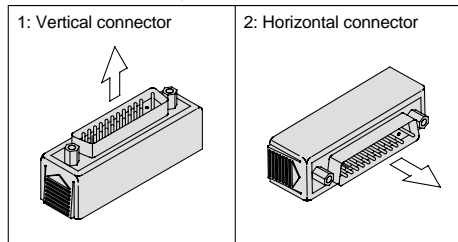
Power supply terminal specifications

Symbol	Specifications
P	24VDC, positive common
P12	12VDC, positive common
N	24VDC, negative common
N12	12VDC, negative common

Connector mounting position

Symbol	Mounting position
D	D Side

Connector entry direction



• Valve stations

F: D-sub connector

Symbol	Stations	Note
02	2 stations	Double wiring specification ^{Note 1)}
...	...	
10	10 stations	Specified layout ^{Note 2)} (up to 21 solenoids possible)
11	11 stations	
...	...	
20	20 stations	

P: Flat cable connector (26 pins)

Symbol	Stations	Note
02	2 stations	Double wiring specification
...	...	
11	11 stations	Specified layout (up to 22 solenoids possible)
12	12 stations	
...	...	
20	20 stations	

PG: Flat cable connector (20 pins)

Symbol	Stations	Note
02	2 stations	Double wiring specification
...	...	
08	8 stations	Specified layout (up to 16 solenoids possible)
09	9 stations	
...	...	
16	16 stations	

PH: Flat cable connector (10 pins)

Symbol	Stations	Note
02	2 stations	Double wiring specification
...	...	
04	4 stations	Specified layout (up to 8 solenoids possible)
05	5 stations	
...	...	
08	8 stations	

Note 1) Double wiring specifications: Single, double and 3 position solenoid valves can be used at all of the manifold stations.

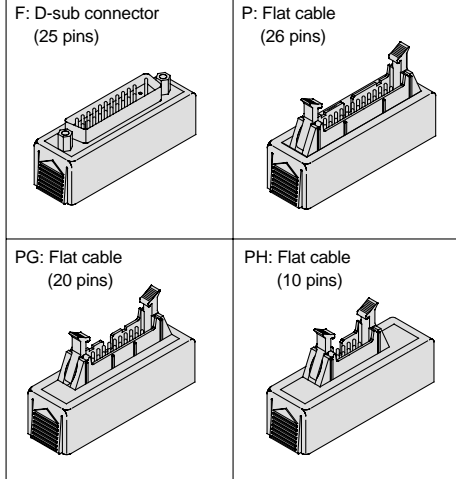
Note 2) Specified layout: Indicate the wiring specifications on a manifold specification sheet. (Please note that in locations where single solenoid wiring is indicated, it will be impossible to use double or 3 position valves.)

Series SZ3000

• Plug-in manifold [without power supply terminals]

SS5Z3-60 **F** **D** **1** - **05** **U** -

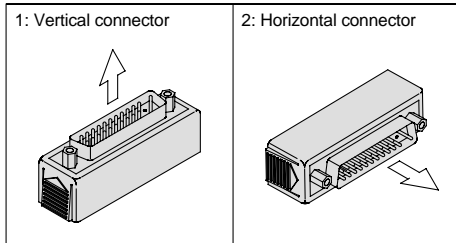
• Connector type



Connector mounting position

Symbol	Mounting position
D	D Side

Connector entry direction



Supply/Exhaust block mounting position

U	U Side (2 to 10 stations)
D	D Side (2 to 10 stations)
B	Both sides (2 to 20 stations)
M*	Special specifications

* In the case of special specifications, indicate separately on a manifold specification sheet.
 Note) A total of up to 3 supply/exhaust blocks can be mounted. Contact SMC if 4 or more will be mounted.

• Options

When a DIN rail is required that is longer than the standard types, specify the number of stations.

• Pilot specifications

Nil	Internal pilot specifications
R	External pilot specifications

• Valve stations

F: D-sub connector

Symbol	Stations	Note
02	2 stations	Double wiring ^{Note 1)} specification
...	...	
12	12 stations	Specified wiring ^{Note 2)} (up to 24 solenoids possible)
13	13 stations	
...	...	
20	20 stations	

P: Flat cable connector (26 pins)

Symbol	Stations	Note
02	2 stations	Double wiring specification
...	...	
12	12 stations	Specified wiring (up to 25 solenoids possible)
13	13 stations	
...	...	
20	20 stations	

PG: Flat cable connector (20 pins)

Symbol	Stations	Note
02	2 stations	Double wiring specification
...	...	
09	9 stations	Specified wiring (up to 19 solenoids possible)
10	10 stations	
...	...	
19	19 stations	

PH: Flat cable connector (10 pins)

Symbol	Stations	Note
02	2 stations	Double wiring specification
...	...	
04	4 stations	Specified wiring (up to 9 solenoids possible)
05	5 stations	
...	...	
09	9 stations	

Note 1) Double wiring specifications: Single, double and 3 position solenoid valves can be used at all of the manifold stations.

Note 2) Specified layout: Indicate the wiring specifications on a manifold specification sheet. (Please note that in locations where single solenoid wiring is indicated, it will be impossible to use double or 3 position valves.)

• How to order solenoid valves

For plug-in (common for both with and without power supply terminals)

SZ3 **1** **60** - **5** **LOZ** - **C6**

Switching system

1	2 position single solenoid
2	2 position double solenoid
3	3 position closed center
4	3 position exhaust center
5	3 position pressure center

Pilot specifications

Nil	Internal pilot
R	External pilot

Rated voltage

5	24VDC
6	12VDC

Note 1) When using on a manifold with power supply terminals, be sure to match with the manifold's voltage specifications.

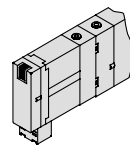
Common specifications

Nil	Pos. common
N	Neg. common

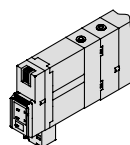
Note 2) When using on a manifold with power supply terminals, be sure to match with the manifold's common specifications.

Switch specifications

Nil: Without switch



J: With switch

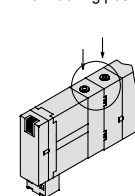


A, B port size

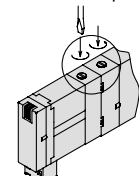
C4	ø4 One-touch fitting
C6	ø6 One-touch fitting
M5	M5 x 0.8

Manual override

Nil: Non-locking push type



D: Push and turn locking type Screw driver operated

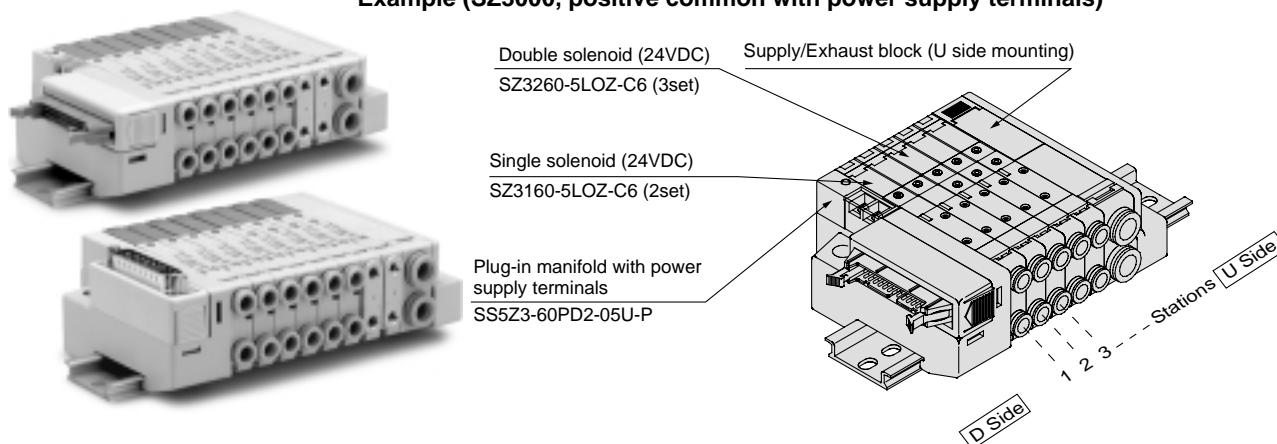


* Refer to page 35 regarding switch operation.

Cassette Type Manifold Series SZ3000

How to Order Manifold Assemblies (Example)

Example (SZ3000, positive common with power supply terminals)



SS5Z3-60PD2-05U-P....1 set (manifold part number)
 *SZ3160-5LOZ-C6 2 sets (single solenoid part number)
 *SZ3260-5LOZ-C6 3 sets (double solenoid part number)

The * symbol indicates built-in. Put the * symbol at the beginning of the part numbers for solenoid valves, etc. which are to be attached.

- * Valve stations are numbered from station 1 on D side.
- * Indicate the valves to be attached below the manifold part number, in order starting from station 1 as shown in the drawing. When a layout becomes complicated, please indicate on a manifold specification sheet. (Manifold specification sheet on page 28.)

Manifold specifications

Model	D-sub connector Type 60F	Flat cable type 60P□		
		Type 60P	Type 60PG	Type 60PH
Manifold type	Plug-in type			
P(SUP), R(EXH) system	Common SUP, EXH			
Valve stations	2 to 20 stations		2 to 16 stations	2 to 8 stations
A, B port piping specifications	Location	Valve		
	Direction	Lateral		
Port size	P, R ports	C8		
	A/B ports	C4, C6, M5		
Valve effective sectional area mm² (Cv value)	C4	P→A/B	3.4(0.19)	
		A/B→R	3.2(0.18)	
	C6	P→A/B	3.7(0.21)	
		A/B→R	3.9(0.22)	
	M5	P→A/B	3.4(0.19)	
		A/B→R	3.2(0.18)	
Applicable connector	D-sub connector Complies with MIL-C-24308 JIS-X-5101	Flat cable connector Socket: 26 pin MIL type with strain relief Complies with MIL-C-83503	Flat cable connector Socket: 20 pin MIL type with strain relief Complies with MIL-C-83503	Flat cable connector Socket: 10 pin MIL type with strain relief Complies with MIL-C-83503
Internal wiring	+COM, -COM			
Weight W(g) ^{Note 3)} (n1: Stations n2: Number of supply/exhaust blocks) m: Weight of DIN rail	W = 3.2n1 + 53n2 + m + 126.5			

Note 1) In cases such as those where many valves are operated simultaneously, use type B (double side supply/exhaust), applying pressure to the P ports on both sides and exhausting from the R ports on both sides.

Note 2) The value is for manifold base mounting (5 stations). 2 position type with single action.

Note 3) The weight W is the value for the D-sub connector manifold with power supply terminals only. To obtain the weight with solenoid valves attached, add the solenoid valve weights given on page 6 for the appropriate number of stations. Refer to page 6 for the weight of DIN rails.

Series SZ3000

Solenoid Valve Specifications

Series		SZ3000	
Fluid		Air	
Internal pilot operating pressure range MPa(kgf/cm ²)	2 position single	0.15 to 0.7 {1.5 to 7.1}	
	2 position double	0.1 to 0.7 {1 to 7.1}	
	3 position	0.2 to 0.7 {2 to 7.1}	
External pilot operating pressure range MPa(kgf/cm ²)	Operating pressure range		-100kPa to 0.7 {10Torr to 7.1}
	Pilot pressure range	2 position single	0.25 to 0.7 {2.5 to 7.1}
		2 position double	0.25 to 0.7 {2.5 to 7.1}
		3 position	0.25 to 0.7 {2.5 to 7.1}
Fluid temperature °C		Maximum 50	
Max. operating frequency Hz	2 position single, double		5
	3 position		3
Manual override		Non-locking push type, Screw driver operated push & turn locking type	
Pilot system		Main valve, Pilot valve convergent exhaust type	
Lubrication		Not required	
Mounting position		Unrestricted	
Impact/Vibration resistance m/s ²		150/30 (8.3 to 2000Hz)	
Enclosure		Dust proof	

Note) Impact resistance: No malfunction when tested with a drop tester in the axial direction of the main valve and moving parts of the magnet core, and at right angles, one time each in both an energized and deenergized condition. (Initial value.)
 Vibration resistance: No malfunction when tested with one sweep of 8.3 to 2000Hz in the axial direction of the main valve and moving parts of the magnet core, and at right angles, one time each in both an energized and deenergized condition. (Initial value.)

Solenoid Specifications

Electrical entry	L type (for plug-in), M type plug connector (M)
Rated coil voltage V ^{Note)}	24, 12, 6, 5, 3DC
Allowable voltage fluctuation	±10% of rated voltage
Power consumption W	0.6 (with light: 0.65)
Surge voltage suppressor	Diode
Indicator light	LED

Note) Only 24V and 12VDC are available for plug-in use.

Response Time

Note) Based on JISB8375-1981 dynamic performance test (with coil temperature of 20°C and at rated voltage).

Switching system	Response time ms (at 0.5MPa {5.1kgf/cm ² })	
	Without surge voltage suppressor	With surge voltage suppressor S, Z type
2 position single	12 or less	15 or less
2 position double	10 or less	13 or less
3 position	15 or less	20 or less

Weight Table

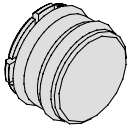
Valve model	Switching system		Port size	Weight g
			A, B	
SZ3□60-□-C4	2 position	Single	C4 (ø4 One-touch fitting)	77.1
		Double		83.7
	3 position	Closed center		87.6
		Exhaust center		
		Pressure center		
SZ3□60-□-C6	2 position	Single	C6 (ø6 One-touch fitting)	73.5
		Double		80.2
	3 position	Closed center		84.1
		Exhaust center		
		Pressure center		
SZ3□60-□-M5	2 position	Single	M5 x 0.8	68.3
		Double		75
	3 position	Closed center		78.8
		Exhaust center		
		Pressure center		

Cassette Type Manifold Series SZ3000

Manifold Options

■ SUP blocking disk

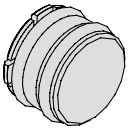
By installing a SUP blocking disk in the pressure supply passage of a manifold valve, it is possible to supply more than two different high and low pressures to one manifold.



Series	Part No.
SZ3000	SZ3000-114-4A

■ EXH blocking disk

By installing an EXH blocking disk in the exhaust passage of a manifold valve, it is possible to divide the valve's exhaust so that it does not affect another valve. (Two blocking disk are needed to divide both exhausts.)



Series	Part No.
SZ3000	SZ3000-114-4A

■ Pilot port blocking disk

By installing a pilot port blocking disk in the pilot passage of a manifold valve, it can function as an internal pilot/external pilot mixed manifold.



Series	Part No.
SZ3000	SZ3000-114-2A

■ Indicator stickers for blocking disk

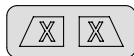
These stickers are to be put on valves in which SUP and EXH blocking disk have been installed so that confirmation is possible from the outside. (3pcs. of each are included.)

SZ3000-155-1A

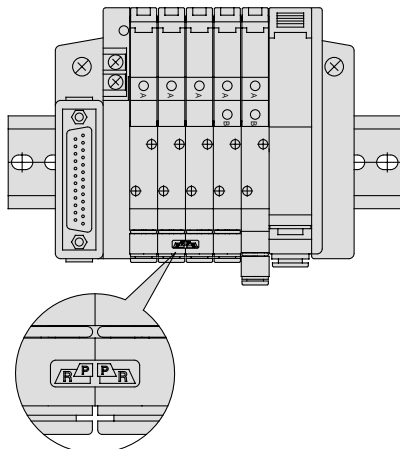
Sticker for SUP/EXH blocking disk Sticker for EXH blocking disk



Sticker for SUP blocking disk Sticker for pilot passage blocking disk

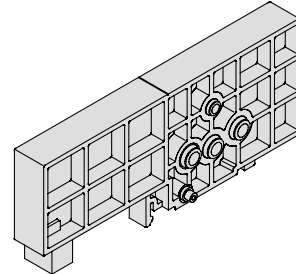


*If blocking disk are ordered on manifold specification sheets, etc. at the same time that manifolds are ordered, stickers will be attached to the valves with blocking disk installed before shipment.



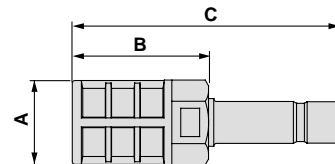
■ Blanking block assembly SZ3000-55-1A

These are mounted when later addition of valves is planned, etc.



■ Silencer with One-touch fitting

This silencer can be mounted on the manifold's port R (exhaust) with a single touch.

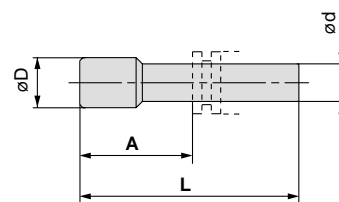


Series	Model	Effective sectional area	A	B	C
for SZ3000(ø8)	AN203-KM8	14mm ²	ø16	26	51

■ Plugs (White)

These are inserted in cylinder ports or SUP/EXH ports which are not being used.

They can be ordered in multiples of 10 pieces.



Dimension table

Applicable fitting size ød	Model	A	L	D
4	KQ2P-04	16	32	6
6	KQ2P-06	18	35	8
8	KQ2P-08	20.5	39	10

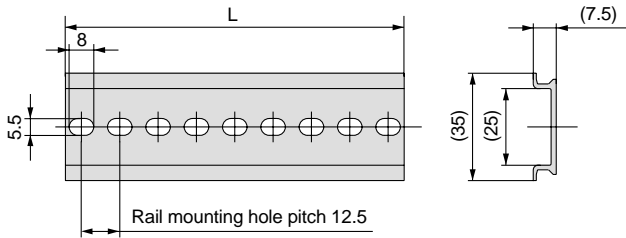
Series SZ3000

■ DIN rail dimension table/weight table

VZ1000-11-1-□

• Refer to the L dimension table

*Enter a number from the DIN rail dimension table below in the □.



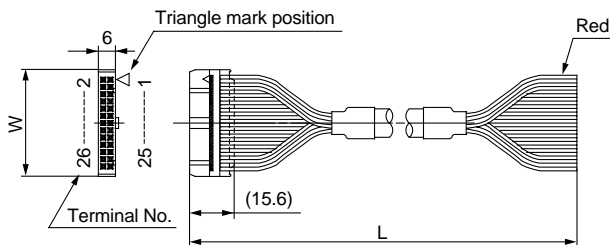
No.	0	1	2	3	4	5	6	7	8	9
Dimension L	98	110.5	123	135.5	148	160.5	173	185.5	198	210.5
Weight (g)	17.6	19.9	22.1	24.4	26.6	28.9	31.1	33.4	35.6	37.9

No.	10	11	12	13	14	15	16	17	18	19
Dimension L	223	235.5	248	260.5	273	285.5	298	310.5	323	335.5
Weight (g)	40.1	42.4	44.6	46.9	49.1	51.4	53.6	55.9	58.1	60.4

No.	20	21	22	23	24	25	26	27	28	29
Dimension L	348	360.5	373	385.5	398	410.5	423	435.5	448	460.5
Weight (g)	62.6	64.9	67.1	69.4	71.6	73.9	76.1	78.4	80.6	82.9

■ Flat cable type/cable assembly

AXT100-FC□-¹/₃



Flat cable assembly

Cable length (L)	10 pins	20 pins	26 pins
1.5m	AXT100-FC10-1	AXT100-FC20-1	AXT100-FC26-1
3m	AXT100-FC10-2	AXT100-FC20-2	AXT100-FC26-2
5m	AXT100-FC10-3	AXT100-FC20-3	AXT100-FC26-3
Connector width (W)	17.2	30	37.5

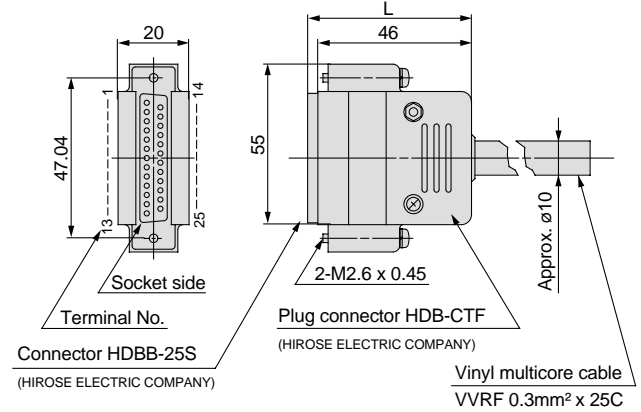
* If it is desired to use a commercially available connector, use one conforming to MIL-C-83503 with strain relief.

Sample of connector manufacturers

- HIROSE ELECTRIC COMPANY
- SUMITOMO/3-M LIMITED
- FUJITSU LTD.
- Japan Aviation Electronics Industry, Ltd.
- J.S.T. Mfg. Co., Ltd.

■ D-sub connector (25 pins)/cable assembly

VVZS3000-21A-¹/₃



D-sub connector cable assembly wire colors by terminal number

Terminal No.	Lead wire color	Dot marking
1	Black	None
2	Brown	None
3	Red	None
4	Orange	None
5	Yellow	None
6	Pink	None
7	Blue	None
8	Purple	White
9	Gray	Black
10	White	Black
11	White	Red
12	Yellow	Red
13	Orange	Red
14	Yellow	Black
15	Pink	Black
16	Blue	White
17	Purple	None
18	Gray	None
19	Orange	Black
20	Red	White
21	Brown	White
22	Pink	Red
23	Gray	Red
24	Black	White
25	White	None

D-sub connector cable assembly

Cable length (L)	Assembly No.	Note
1.5m	VVZS3000-21A-1	Cable 25 cores x24AWG
3m	VVZS3000-21A-2	
5m	VVZS3000-21A-3	

* If it is desired to use a commercially available cable, use a 25 pin female type connector conforming to MIL-C24308.

Sample of connector manufacturers

- HIROSE ELECTRIC COMPANY
- FUJITSU LTD.
- Japan Aviation Electronics Industry, Ltd.
- J.S.T. Mfg. Co., Ltd.

Electrical characteristics

Item	Characteristic
Conductor resistance Ω/km, 20°C	65 or less
Withstand voltage VAC for 1min.	1000
Insulation resistance MΩkm, 20°C	5 or less

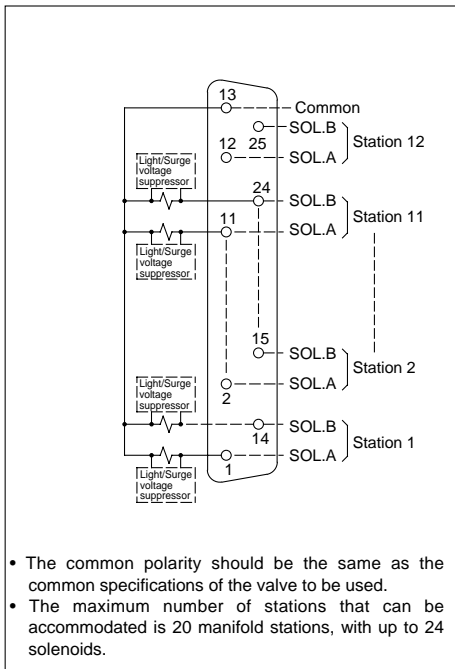
Note) The minimum inside bending radius for the D-sub connector cable is 20mm.

Cassette Type Manifold Series SZ3000

Manifold Electrical Wiring

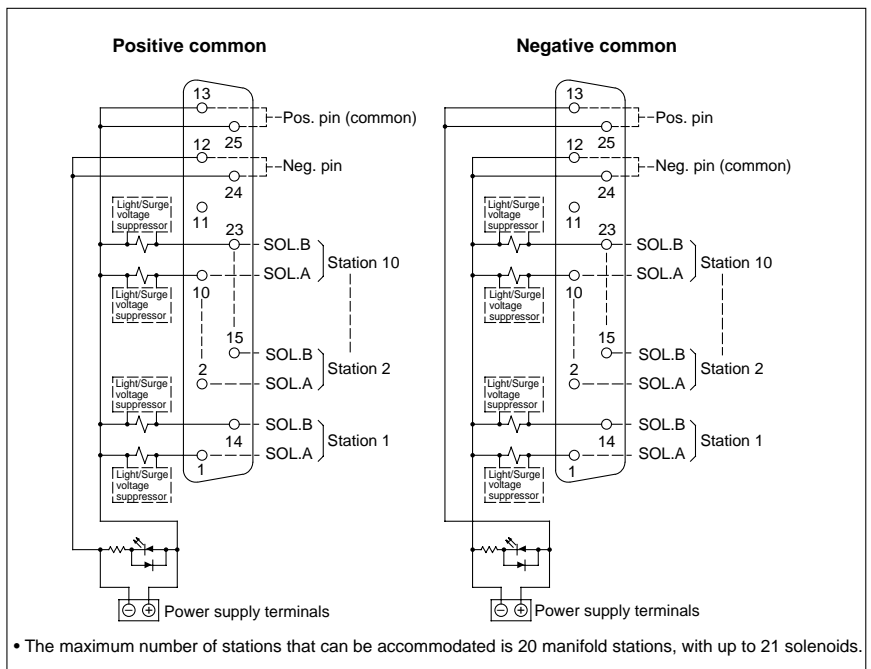
60F D-sub connector type (25 pins)

• Without power supply terminals



- The common polarity should be the same as the common specifications of the valve to be used.
- The maximum number of stations that can be accommodated is 20 manifold stations, with up to 24 solenoids.

• With power supply terminals

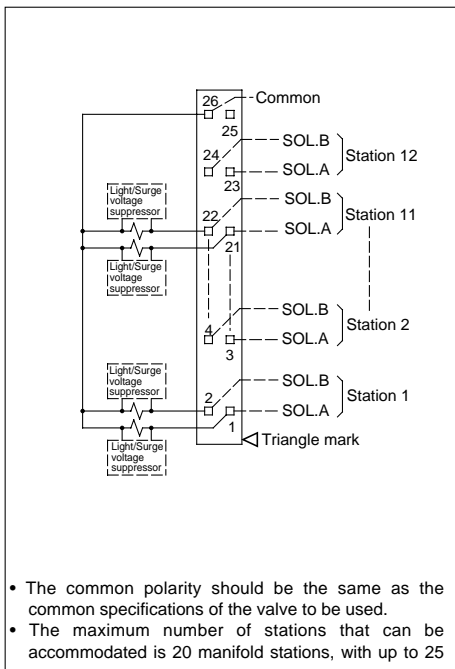


- The maximum number of stations that can be accommodated is 20 manifold stations, with up to 21 solenoids.

- The circuit above is for the double wiring specification with up to 10 or 12 stations. Connect to SOL.A in the case of a single solenoid. Moreover, when wiring instructions are given on a manifold specification sheet, the A signal for single and the A, B signals for double should be wired in order 1, 14, 2, 15.....etc., without skipping or leaving any connectors remaining.
- Stations are counted starting with station 1 on D side.

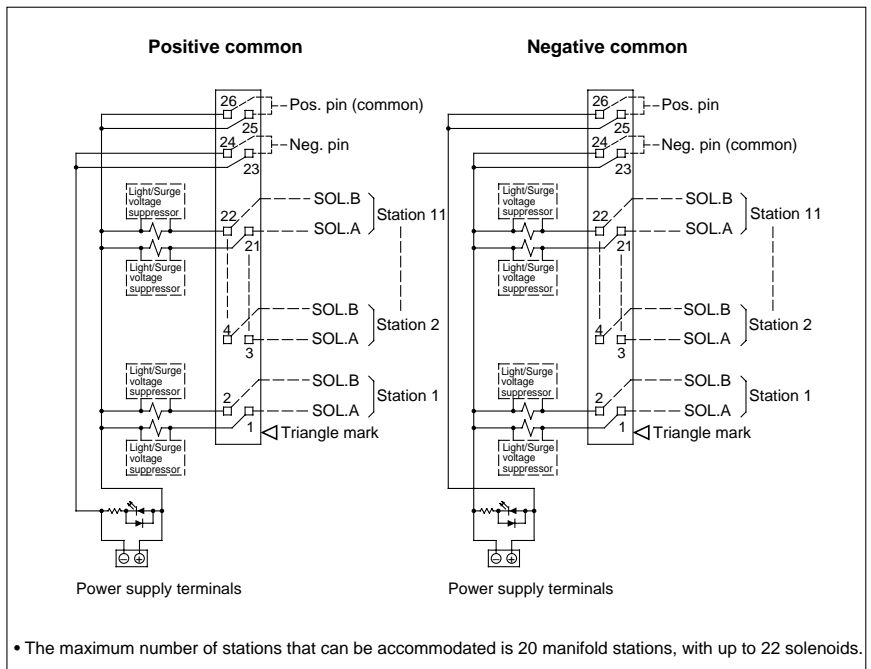
60P Flat cable type (26 pins)

• Without power supply terminals



- The common polarity should be the same as the common specifications of the valve to be used.
- The maximum number of stations that can be accommodated is 20 manifold stations, with up to 25 solenoids.

• With power supply terminals



- The maximum number of stations that can be accommodated is 20 manifold stations, with up to 22 solenoids.

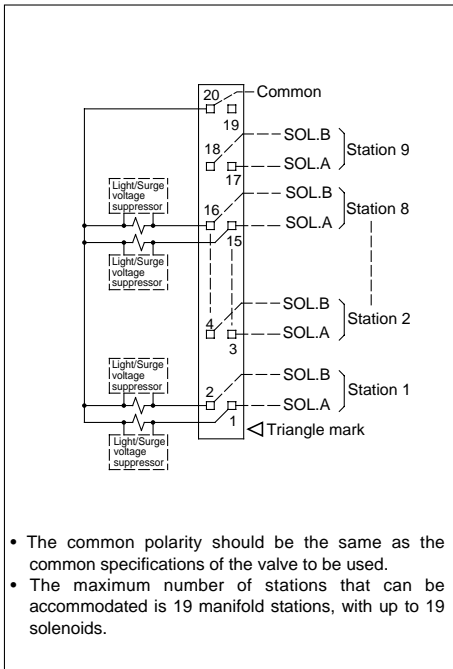
- The circuit above is for the double wiring specification with up to 11 or 12 stations. Connect to SOL.A in the case of a single solenoid. Moreover, when wiring instructions are given on a manifold specification sheet, the A signal for single and the A, B signals for double should be wired in order 1, 2, 3, 4.....etc., without skipping or leaving any connectors remaining.
- Stations are counted starting with station 1 on D side.
- Since terminal numbers are not indicated on the flat cable, use the triangle mark as a reference when wiring.

Series SZ3000

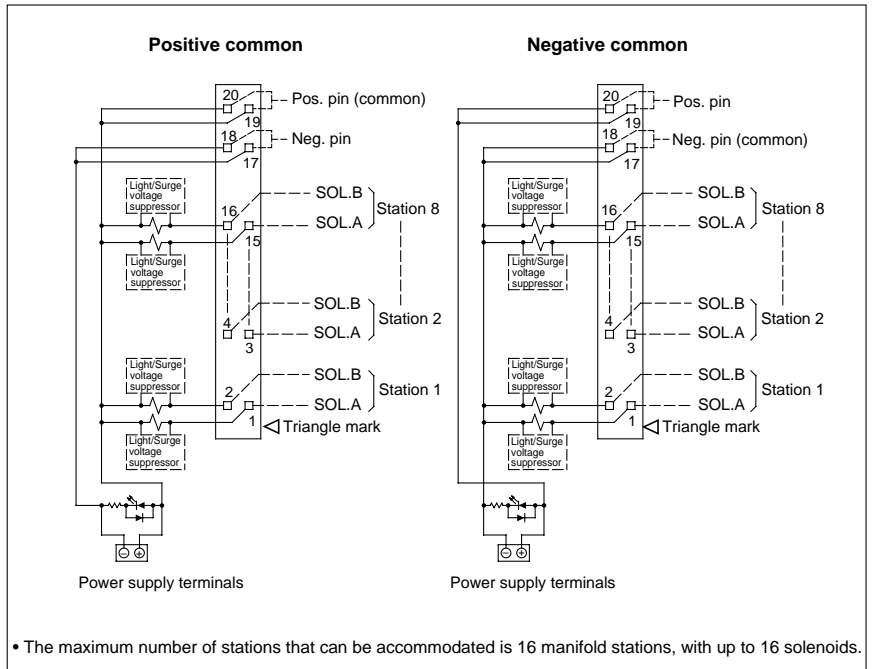
Manifold Electrical Wiring

60PG Flat cable type (20 pins)

• Without power supply terminals



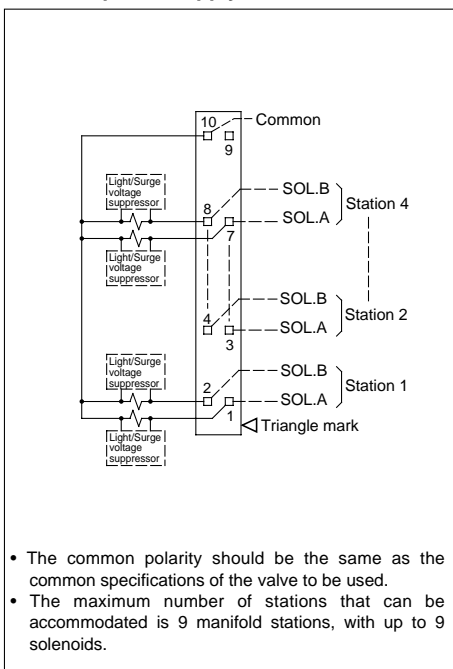
• With power supply terminals



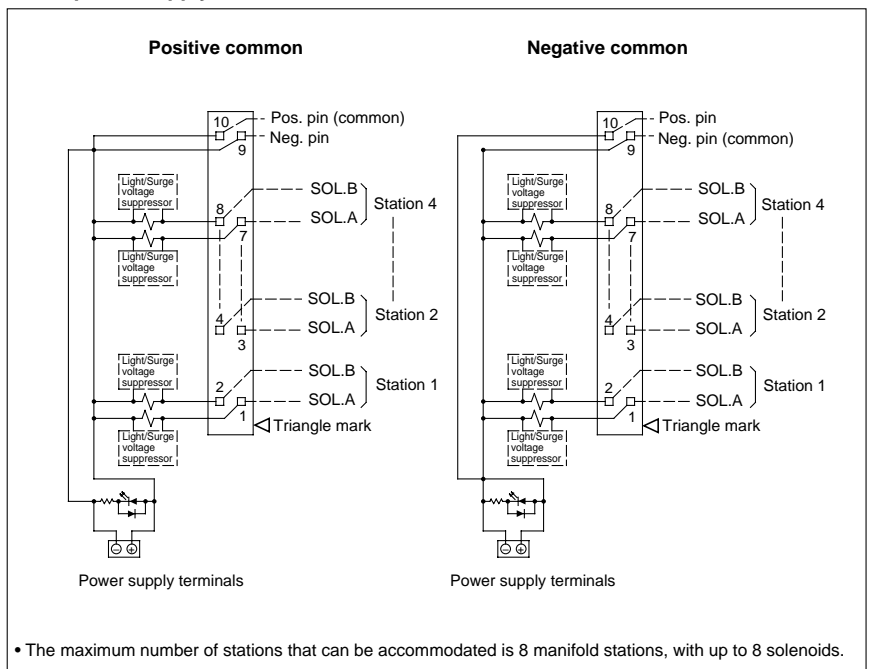
- The circuit above is for the double wiring specification with up to 8 or 9 stations. Connect to SOL.A in the case of a single solenoid. Moreover, when wiring instructions are given on a manifold specification sheet, the A signal for single and the A, B signals for double should be wired in order 1, 2, 3, 4.....etc., without skipping or leaving any connectors remaining.
- Stations are counted starting with station 1 on D side.
- Since terminal numbers are not indicated on the flat cable, use the triangle mark as a reference when wiring.

60PH Flat cable type (10 pins)

• Without power supply terminals



• With power supply terminals



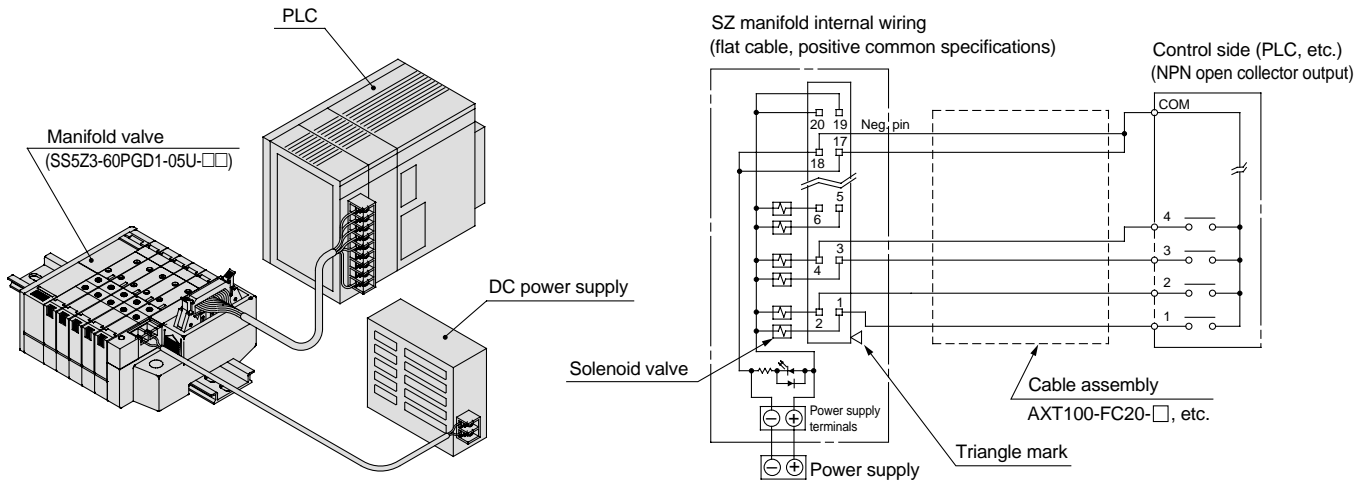
- The circuit above is for the double wiring specification with up to 4 stations. Connect to SOL.A in the case of a single solenoid. Moreover, when wiring instructions are given on a manifold specification sheet, the A signal for single and the A, B signals for double should be wired in order 1, 2, 3, 4.....etc., without skipping or leaving any connectors remaining.
- Stations are counted starting with station 1 on D side.
- Since terminal numbers are not indicated on the flat cable, use the triangle mark as a reference when wiring.

Cassette Type Manifold Series SZ3000

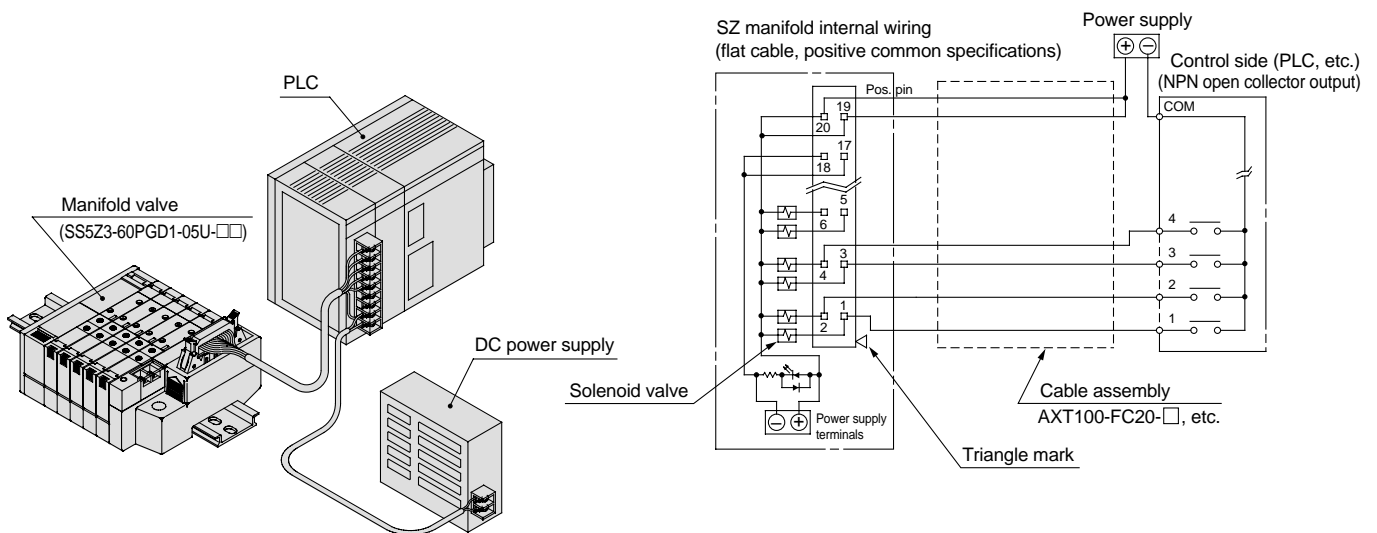
Wiring of Plug-in Type Manifold with Power Supply Terminals (Examples)

- Since the power supply to drive valves with power supply terminals can be supplied from either the control side or the manifold side, these wiring examples should be used for reference when wiring is performed.

1. Wiring example when using manifold power supply terminals



2. Wiring example when not using manifold power supply terminals (power is supplied to the control side or along the wiring, etc.)



⚠ Caution

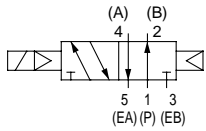
- When connecting to a PLC (Programmable Logic Controller), etc., the wiring of the signal lines and COM position, etc. will differ with each manufacturer. Connections should be made after thoroughly reviewing the electrical circuits of both units in their catalogs, etc. If connections are made incorrectly, failure may occur not only in the manifolds and valves, etc., but also in the PLC (control side) and power supply, etc.

Series SZ3000

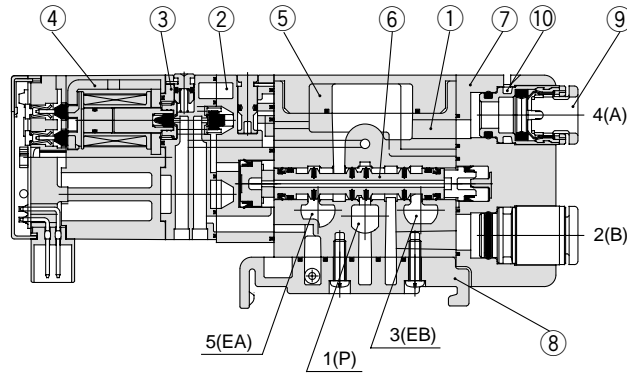
Construction

JIS symbol

2 position single

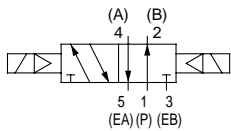


2 position single

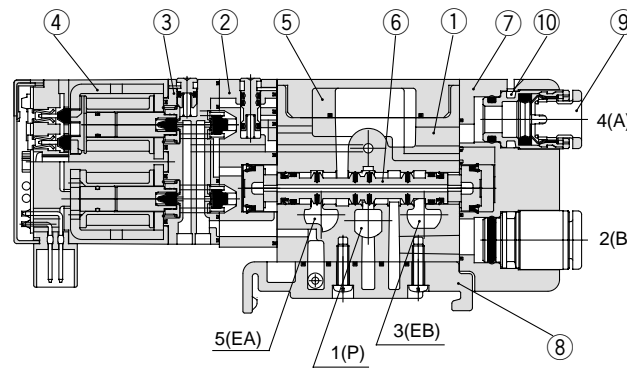


JIS symbol

2 position double

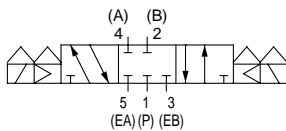


2 position double

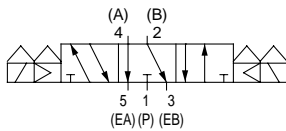


JIS symbol

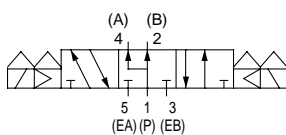
3 position closed center



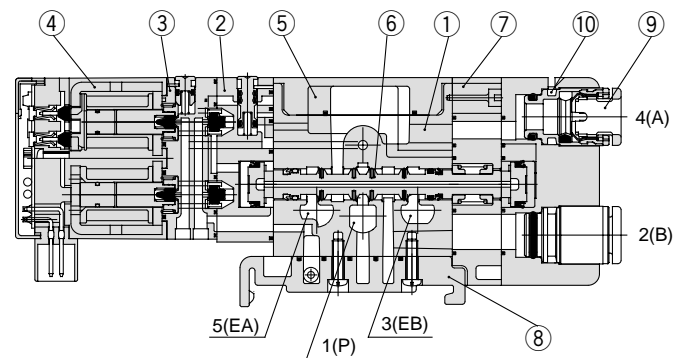
3 position exhaust center



3 position pressure center



3 position closed center/exhaust center/pressure center



Parts list

No.	Description	Material	Note
1	Body	Die-cast zinc	-
2	Adapter plate	PBT	Urban white
3	Pilot body	PA	Urban white
4	Molded coil	-	Urban gray
5	Body cover	PA	Urban white
6	Spool valve assembly	Aluminum/NBR	-
7	Port block	PA	Urban white
8	Bottom cover assembly	-	Urban white

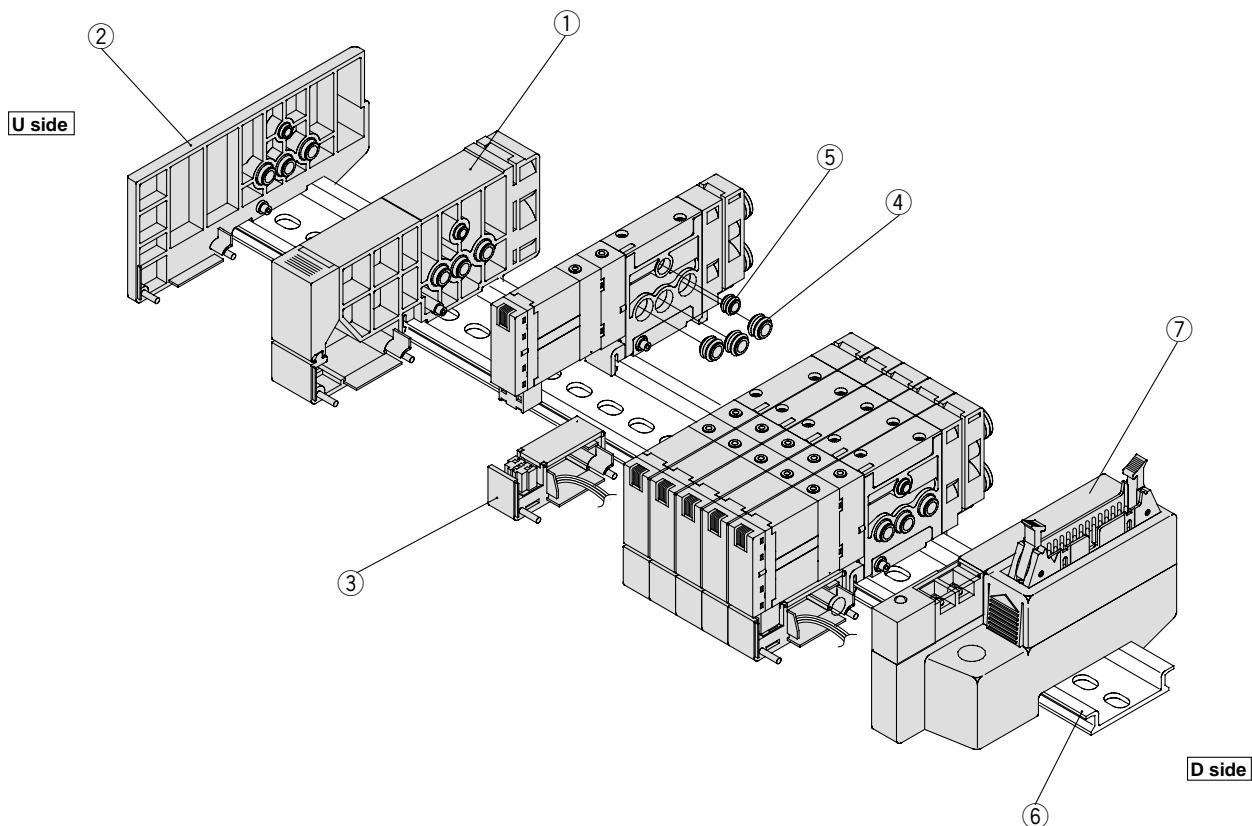
Replacement parts list

No.	Description	Part No.
9	One-touch fitting	Refer to One-touch fitting part number information on page 38.
10	Clip	SX3000-115-1

Cassette Type Manifold Series SZ3000

Manifold Exploded View

60P manifold (plug-in, flat cable type)



Parts list

No.	Description	Part No.	Note
1	Supply/exhaust block assembly	SZ3000-50-1A-C₆	C6: with ø6 One-touch fitting, C8: with ø8 One-touch fitting
2	End block assembly	SZ3000-53-1A	
3	Housing holder	SX3000-113-1	
4	Bushing assembly	SZ3000-114-3A	
5	Bushing assembly	SZ3000-114-1A	
6	DIN rail	VZ1000-11-1-□	Refer to page 6.
7	Connector block assembly	SZ3000-40-□□	Refer to the connector block assembly part no. table below.

Connector block assembly part number table

Connector specifications	Mounting position	Part No.		Note
		Without power supply terminals	With power supply terminals	
For D-sub connector	D side	SZ3000-40-1A-□□D $\frac{1}{2}$	SZ3000-40-2A-□□D $\frac{1}{2}$ $\frac{P}{N}$	* 1: Vertical connector * 2: Horizontal connector P: Positive common N: Negative common
For flat cable 26 pins	D side	SZ3000-40-3A-□□D $\frac{1}{2}$	SZ3000-40-4A-□□D $\frac{1}{2}$ $\frac{P}{N}$	(Note) The assembly part numbers with power supply terminals are 24VDC specifications. If 12VDC specifications are required, enter "12" at the end of the assembly part number.
For flat cable 20 pins	D side	SZ3000-40-5A-□□D $\frac{1}{2}$	SZ3000-40-6A-□□D $\frac{1}{2}$ $\frac{P}{N}$	
For flat cable 10 pins	D side	SZ3000-40-7A-□□D $\frac{1}{2}$	SZ3000-40-8A-□□D $\frac{1}{2}$ $\frac{P}{N}$	

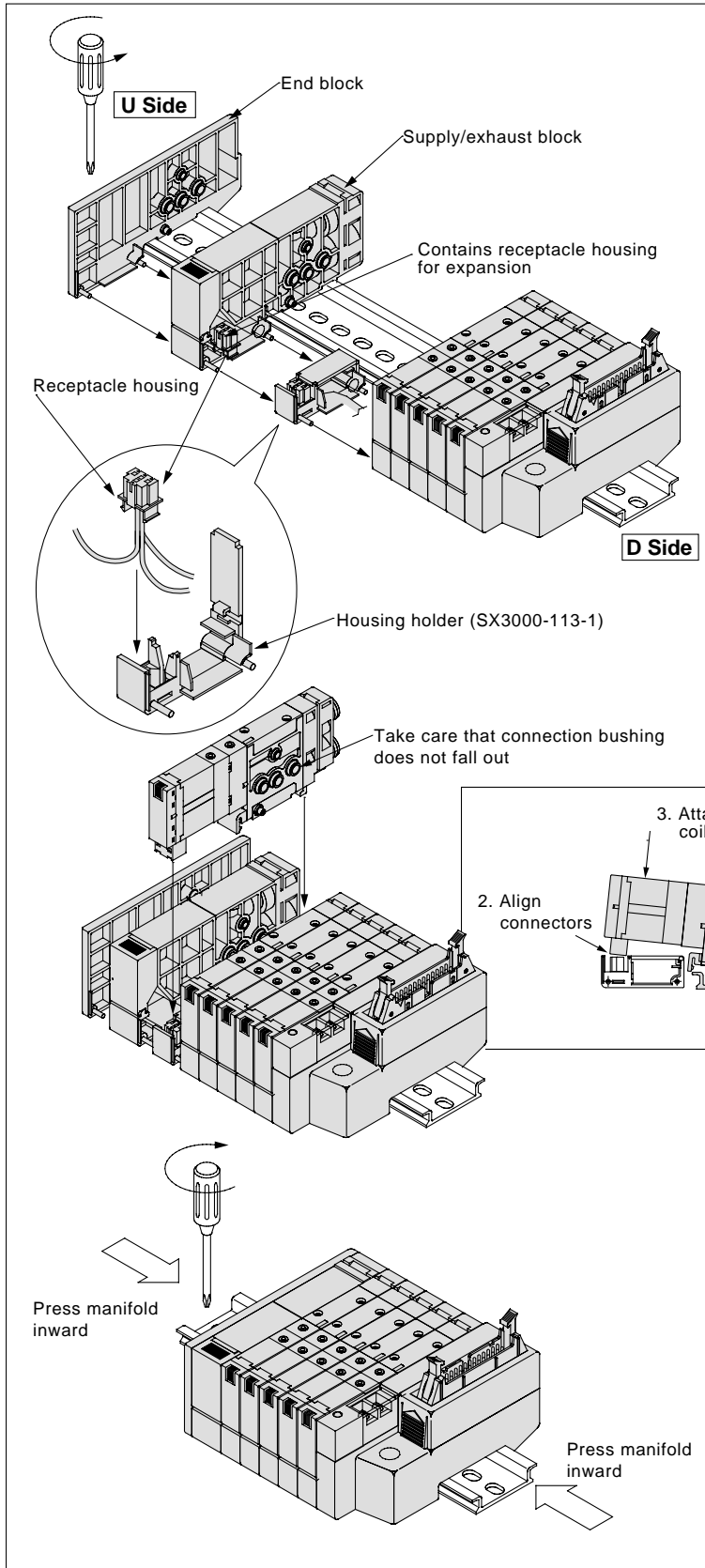
Note 1) A connector block assembly can be shipped as an assembly only in the case of double wiring. Since the possible number of stations differs depending on the connector type, refer to the valve station section on catalog page 3 and enter the number of stations in the □□ section of the assembly part number. Contact SMC if a connector block assembly is required having a wiring specification other than double wiring.

Series SZ3000

Plug-in Manifold Station Expansion

⚠ Caution In addition to solenoid valves, housing holders (SX3000-113-1) are necessary for expansion of manifold stations.

- Double wiring specification manifolds which do not have the maximum number of stations, contain spare receptacle housings for expansion in the housing holder of the last station, or inside the supply/exhaust block assembly (for a maximum of 2 stations). When expanding stations, perform the disassembly and assembly of the manifold while referring to the expansion method shown below.



1. Loosen the DIN rail holding screw of the end block on U side.

2. Separate the end block and supply/exhaust block.

3. Take out the receptacle housing for expansion which is inside the supply/exhaust block, attach it to the newly added housing holder, and attach to the manifold. (Number are displayed on the side of the receptacle housings, and they should be used in order from the lowest number.)

4. Mount the valve on the DIN rail.

3. Attach to rail by pushing on coil area

2. Align connectors

1. Hook on rail

5. While pressing the manifold together from both sides, retighten the side U end block's DIN rail holding screw.
⚠ Caution (fastening torque: 1.4Nm)

⚠ Caution

1. Be sure to shut off the power and air supplies before disassembling. Since air may remain inside actuators, piping and manifolds, confirm that the air is completely exhausted before beginning work.
2. When disassembly and assembly are performed, air leakage may result if connections between blocks and tightening of the end block's holding screw, etc. are inadequate. Before supplying air, confirm that there are no gaps, etc. between blocks, and that manifold blocks are securely fastened to the DIN rail. Then, supply air and confirm that there is no air leakage before operating.
3. Note that for manifolds specified with other than double wiring, spare receptacle housings for expansion are not included unless indicated at the time of order.

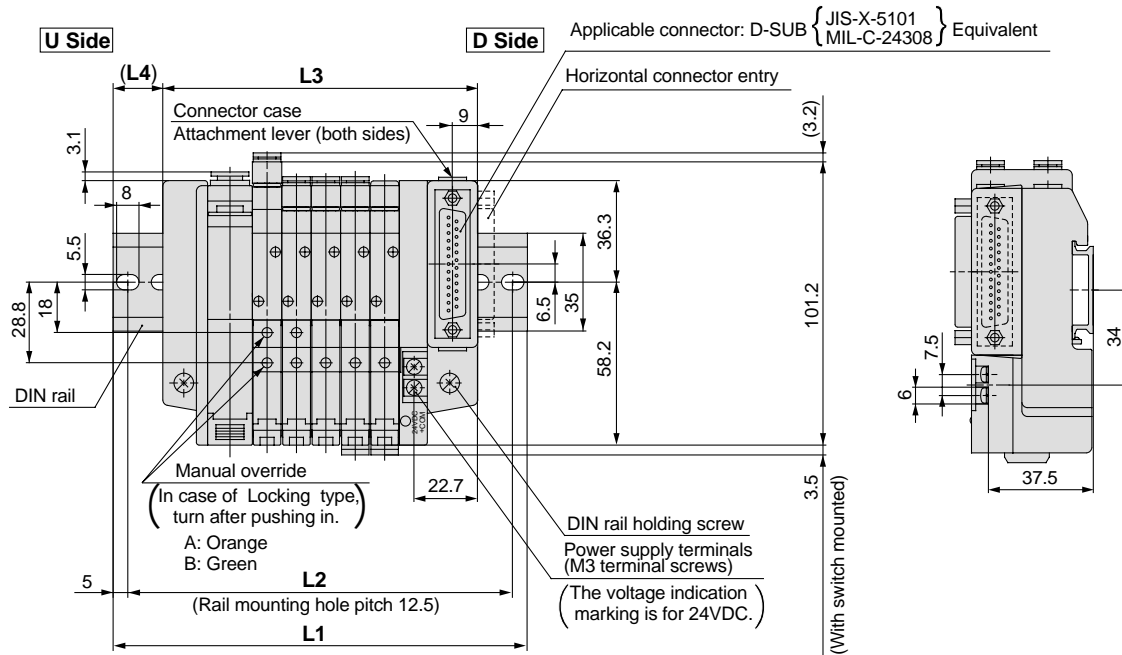
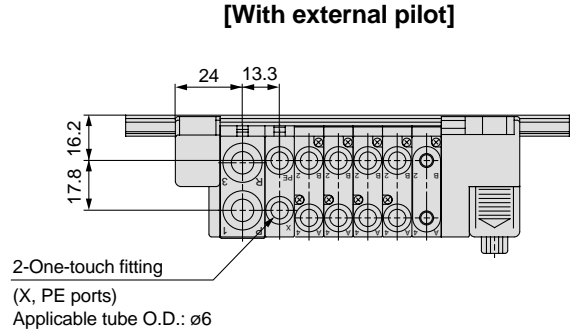
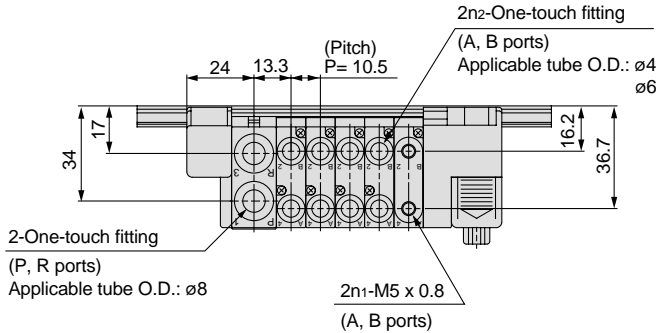
Cassette Type Manifold Series SZ3000

Dimensions/SZ3000: Plug-in

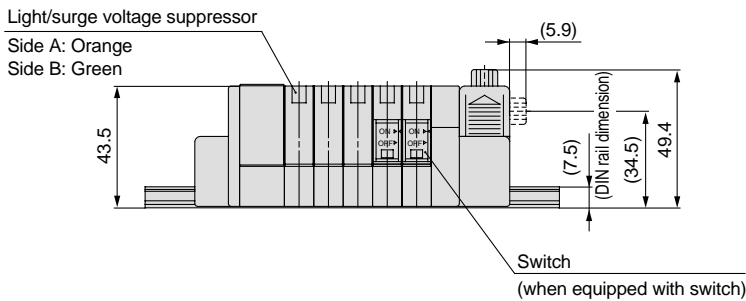
SS5Z3-60FD $\frac{1}{2}$ - Stations U-□

Note) The L1 to L4 dimensions for SS5Z3-60FD $\frac{1}{2}$ -[Stations] D-□ are the same as the SS5Z3-60FD $\frac{1}{2}$ -[Stations] U-□ dimensions.

Scale: 37%



(Station n).....(Station 1)



Internal pilot manifold L: Dimensions

n: Stations

L \ n	2	3	4	5	6	7	8	9	10
L1	110.5	123	135.5	148	148	160.5	173	185.5	198
L2	100	112.5	125	137.5	137.5	150	162.5	175	187.5
L3	81	91.5	102	112.5	123	133.5	144	154.5	165
L4	15	16	17	18	12.5	13.5	14.5	15.5	16.5

External pilot manifold L: Dimensions

n: Stations

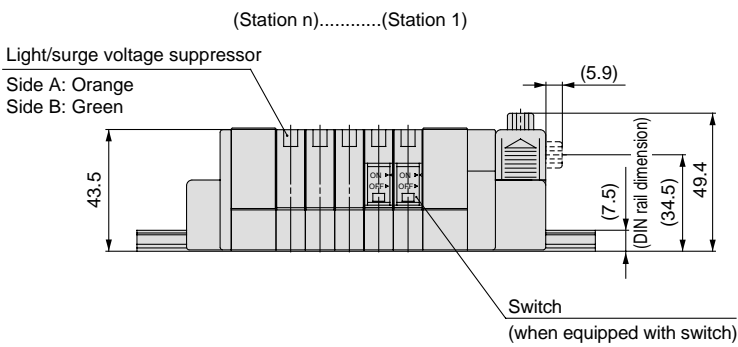
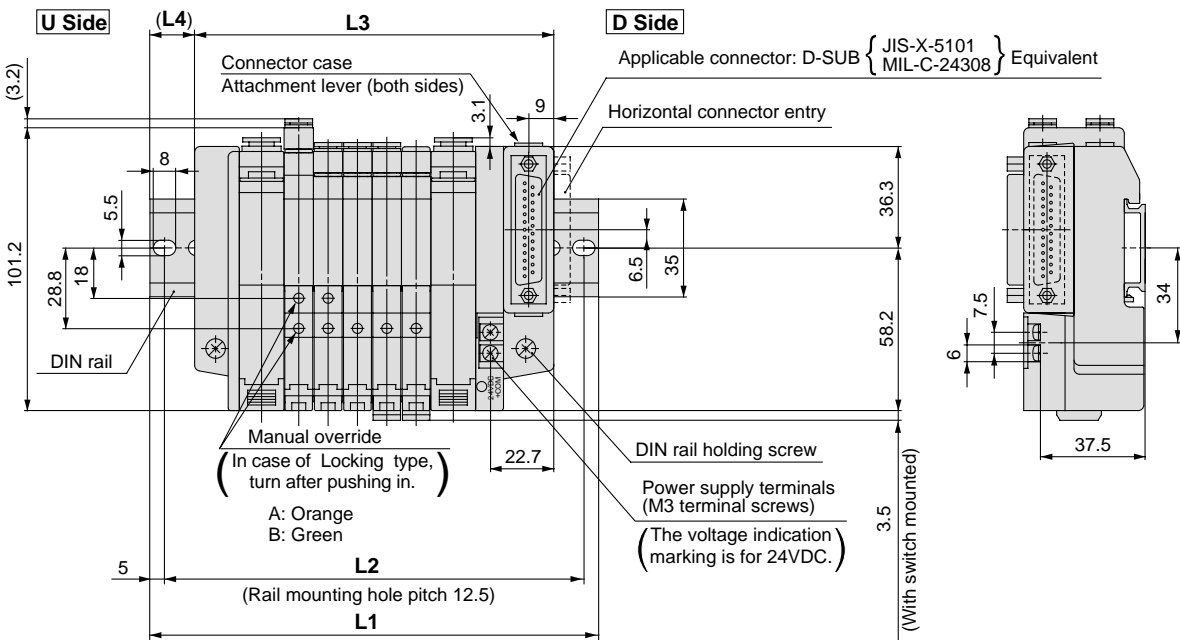
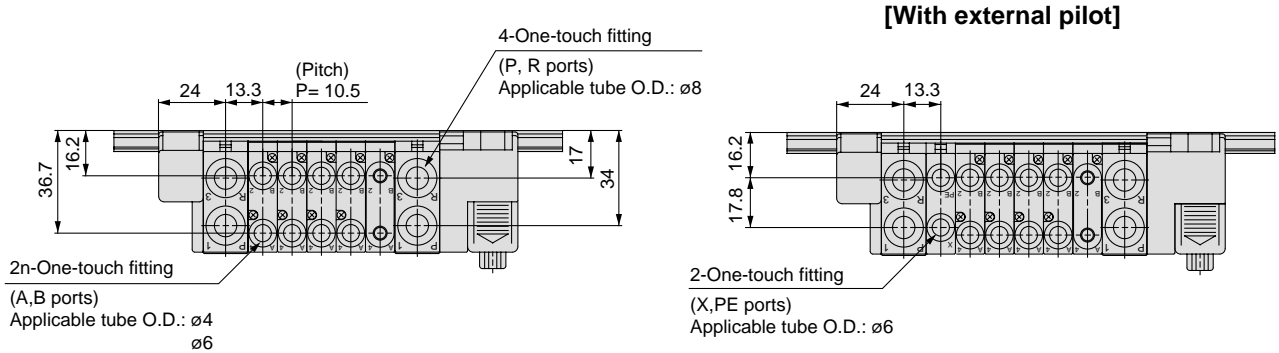
L \ n	2	3	4	5	6	7	8	9	10
L1	123	135.5	148	148	160.5	173	185.5	198	210.5
L2	112.5	125	137.5	137.5	150	162.5	175	187.5	200
L3	91.5	102	112.5	123	133.5	144	154.5	165	175.5
L4	16	17	18	12.5	13.5	14.5	15.5	16.5	17.5

Series SZ3000

Dimensions/SZ3000: Plug-in

SS5Z3-60FD₂ - Stations B-□

Scale: 37%



Internal pilot manifold L: Dimensions

		n: Stations																		
L \ n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
L1	123	135.5	148	160.5	173	173	185.5	198	210.5	223	235.5	248	248	260.5	273	285.5	298	310.5	310.5	
L2	112.5	125	137.5	150	162.5	162.5	175	187.5	200	212.5	225	237.5	237.5	250	262.5	275	287.5	300	300	
L3	97	107.5	118	128.5	139	149.5	160	170.5	181	191.5	202	212.5	223	233.5	244	254.5	265	275.5	286	
L4	13	14	15	16	17	12	13	14	15	16	17	18	12.5	13.5	14.5	15.5	16.5	17.5	12.5	

External pilot manifold L: Dimensions

		n: Stations																		
L \ n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
L1	135.5	148	160.5	173	173	185.5	198	210.5	223	235.5	248	248	260.5	273	285.5	298	310.5	310.5	323	
L2	125	137.5	150	162.5	162.5	175	187.5	200	212.5	225	237.5	237.5	250	262.5	275	287.5	300	300	312.5	
L3	107.5	118	128.5	139	149.5	160	170.5	181	191.5	202	212.5	223	233.5	244	254.5	265	275.5	286	296.5	
L4	14	15	16	17	12	13	14	15	16	17	18	12.5	13.5	14.5	15.5	16.5	17.5	12.5	13.5	

5 Port Solenoid Valve

Series SZ3000

Non-Plug-in Type

How to Order

• Non-plug-in manifold

SS5Z3 – 60 – 05 U

Manifold stations

02	2 stations
⋮	⋮
20	20 stations

Supply/Exhaust block mounting position

D	D side (2 to 10 stations)
U	U side (2 to 10 stations)
B	Both sides (2 to 20 stations)
M*	Special specifications

* In the case of special specifications, indicate separately on a manifold specification sheet.

Note) A total of up to 3 supply/exhaust blocks can be mounted. Contact SMC if 4 or more will be mounted.

Options

When a DIN rail is required that is longer than the standard types, specify the number of stations.

Pilot specifications

Nil	Internal pilot specifications
R	External pilot specifications

• Solenoid valve (for non-plug-in manifold)

SZ3 1 60 **– 5** **M** **– C6**

Type of actuation

1	2 position single solenoid
2	2 position double solenoid
3	3 position closed center
4	3 position exhaust center
5	3 position pressure center

Pilot specifications

Nil	Internal pilot
R	External pilot

A, B port size

C4	ø4 One-touch fitting
C6	ø6 One-touch fitting
M5	M5 x 0.8

Rated voltage

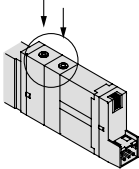
5	24VDC
6	12VDC
V	6VDC
S	5VDC
R	3VDC

Common specifications

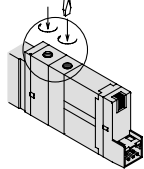
Nil	Pos. common
N	Neg. common

Manual override

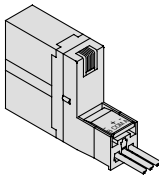
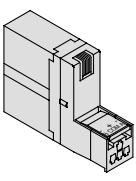
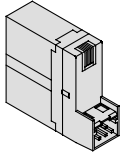
Nil: Non-locking push type



D: Push and turn locking type Screw driver operated



Electrical entry

M: With lead wire (length 300mm)	MN: Without lead wire	MO: Without connector
		

Light/Surge voltage suppressor

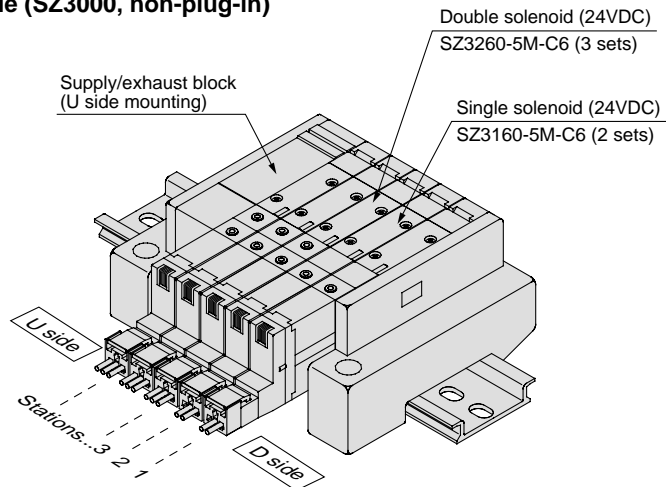
Nil	Without light/surge voltage suppressor
S	With surge voltage suppressor
Z	With light/surge voltage suppressor

Series SZ3000



How to Order Manifold Assemblies (Example)

Example (SZ3000, non-plug-in)



SS5Z3-60-05U 1 set (manifold part number)
 *SZ3160-5M-C6 2 sets (single solenoid part number)
 *SZ3260-5M-C6 3 sets (double solenoid part number)

The * symbol indicates built-in. Put the * symbol at the beginning of the part numbers for solenoid valves, etc. which are to be attached.

- The layout of valves starts with station 1 on D side.
- Indicate the valves to be attached below the product part number, in order starting from station 1 as shown in the drawing. When a layout becomes complicated, please indicate on a manifold specification sheet. (Manifold specifications sheets are on page 29.)

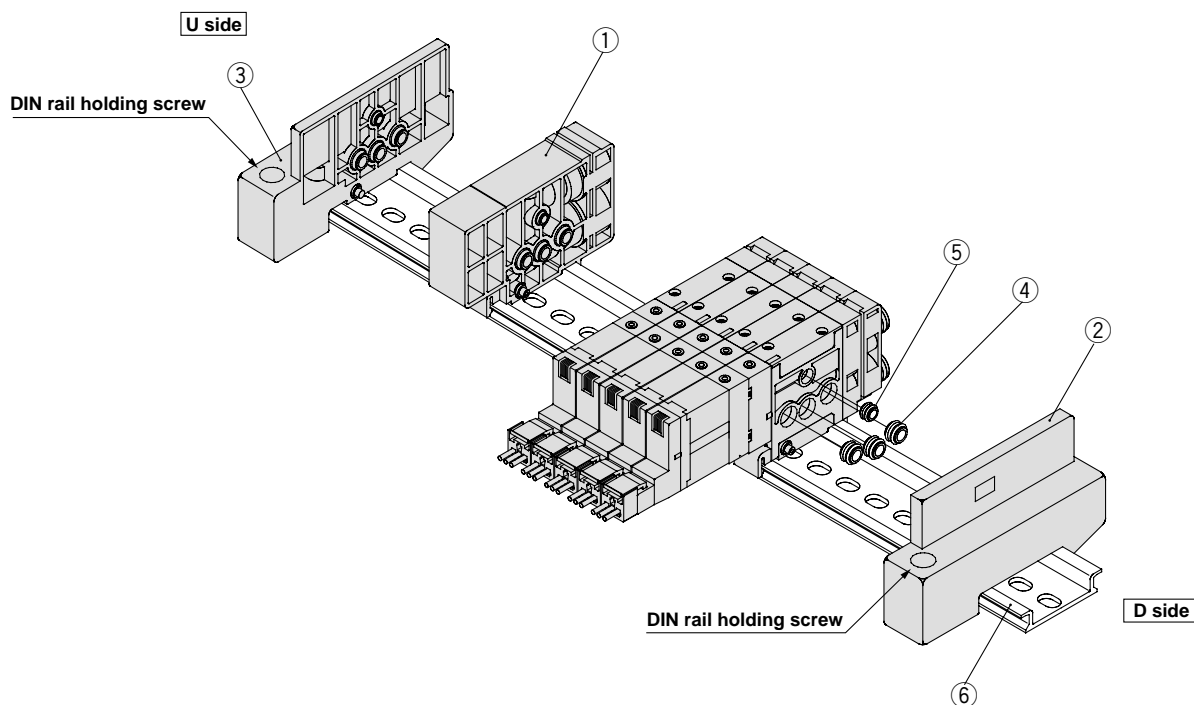
Manifold specifications

Model		SS5Z3-60	
Manifold type		Non-plug-in type	
P(SUP), R(EXH) system		Common SUP, EXH	
Valve stations		2 to 20 stations	
A, B port piping specifications		Location	Valve
		Direction	Lateral
Port size	P, EA, EB ports	C8	
	A/B ports	C4, C6, M5	
Valve effective area mm ² (Cv value)	C4	P→A/B	3.4 (0.19)
		A/B→R	3.2 (0.18)
	C6	P→A/B	3.7 (0.21)
		A/B→R	3.9 (0.22)
	M5	P→A/B	3.4 (0.19)
		A/B→R	3.2 (0.18)
Weight W(g) Note 3) (n : Number of supply/exhaust blocks) (m : Weight of DIN rail)		W = 34n + m + 89	

- Note 1) In cases such as those where many valves are operated simultaneously, use type B (double side supply/exhaust), applying pressure to the P ports on both sides and exhausting from the R ports on both sides.
 Note 2) The value is for manifold base mounting (5 stations). 2 position type with single action.
 Note 3) The weight W is the value for the manifold only. To obtain the weight with solenoid valves attached, add the solenoid valve weights given on page 4 for the appropriate number of stations. Refer to page 6 for the weight of DIN rails.

Manifold Exploded View

Type 60 (non-plug-in) manifold



No.	Description	Part No.	Note
1	Supply/exhaust block assembly	SZ3000-50-2A ^{C6} _{C8}	C6: With ø6 One-touch fitting C8: With ø8 One-touch fitting
2	End block assembly	SZ3000-53-3A	For D side
3	End block assembly	SZ3000-53-4A	For U side
4	Bushing assembly	SZ3000-114-3A	
5	Bushing assembly	SZ3000-114-1A	
6	DIN rail	VZ1000-11-1-□	Refer to page 6.

Manifold Station Expansion

Station expansion is possible at any position.

1. Loosen one DIN rail holding screw on either U side or D side.
2. Separate the blocks at the location where station expansion is desired.
3. Mount the valve on the DIN rail.
4. While pressing the manifold together from both sides, retighten the DIN rail holding screw of the end block assembly which was loosened.

⚠ Caution (tightening torque: 1.4Nm)

⚠ Caution

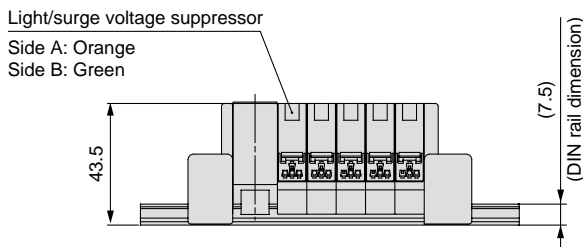
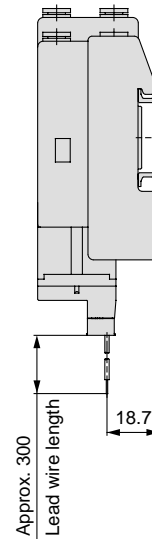
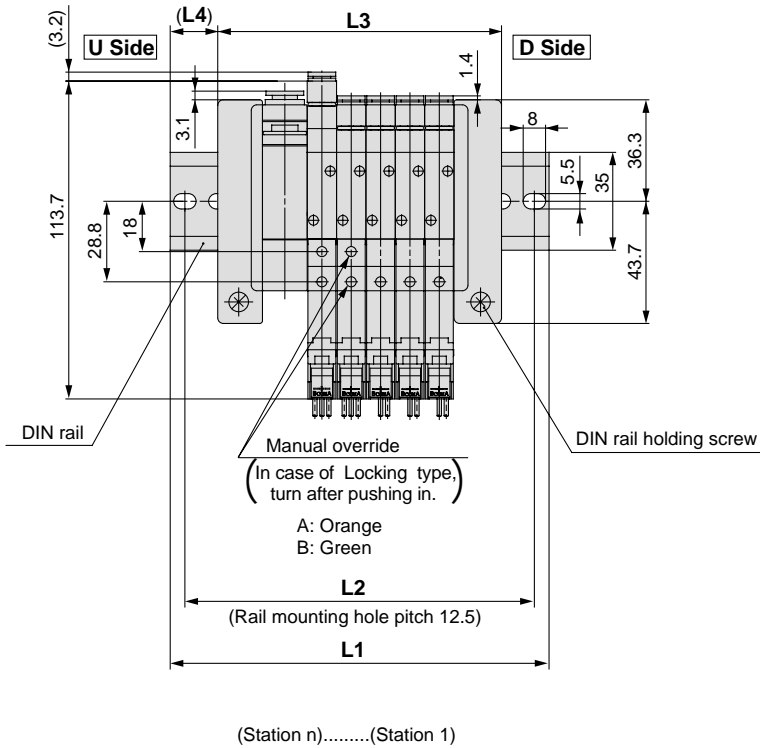
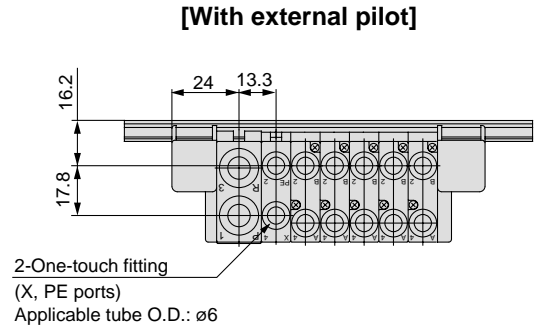
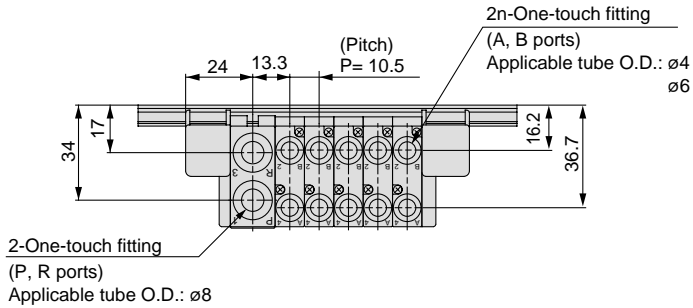
1. Be sure to shut off the power and air supplies before disassembling. Since air may remain inside actuators, piping and manifolds, confirm that the air is completely exhausted before beginning work.
2. When disassembly and assembly are performed, air leakage may result if connections between blocks and tightening of the end block's holding screw, etc. are inadequate. Before supplying air, confirm that there are no gaps, etc. between blocks, and that manifold blocks are securely fastened to the DIN rail. Then, supply air and confirm that there is no air leakage before operating.

Series SZ3000

Dimensions/SZ3000: Non-plug-in

SS5Z3-60 - Stations U

Scale: 37%



Internal pilot manifold		L: Dimensions								n: Stations
L \ n	2	3	4	5	6	7	8	9	10	
L1	98	110.5	123	135.5	135.5	148	160.5	173	185.5	
L2	87.5	100	112.5	125	125	137.5	150	162.5	175	
L3	70	80.5	91	101.5	112	122.5	133	143.5	154	
L4	14	15	16	17	12	13	14	15	16	

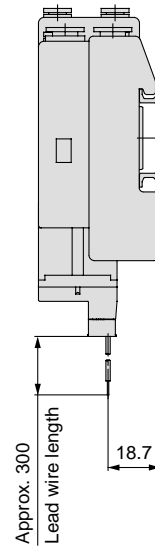
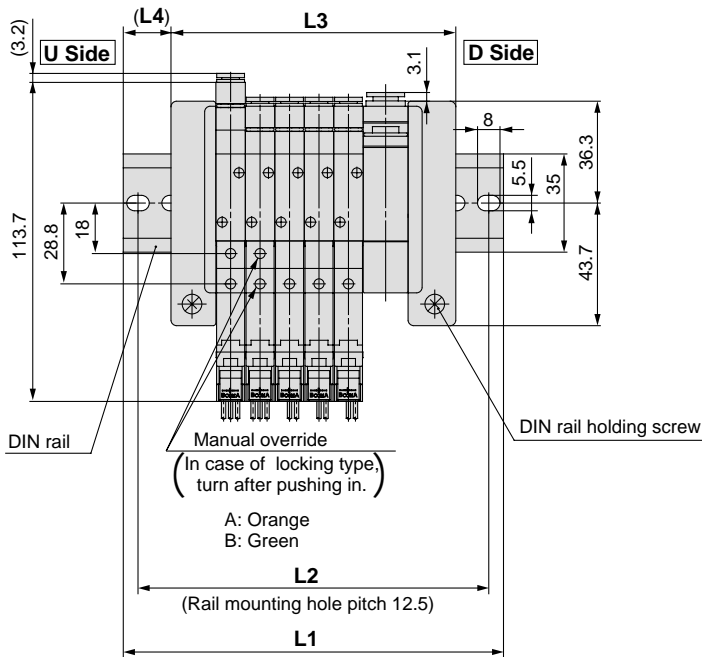
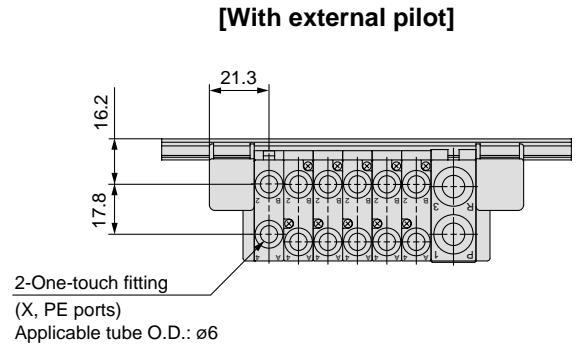
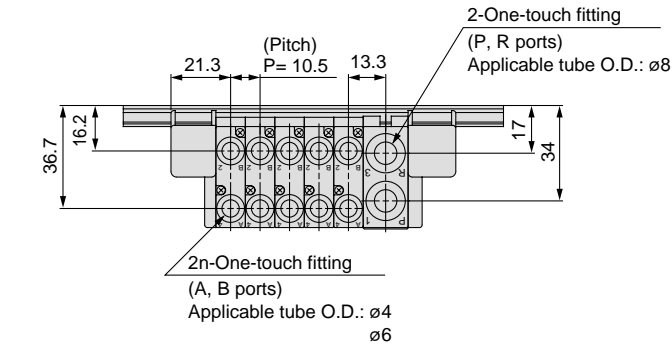
External pilot manifold		L: Dimensions								n: Stations
L \ n	2	3	4	5	6	7	8	9	10	
L1	110.5	123	135.5	135.5	148	160.5	173	185.5	198	
L2	100	112.5	125	125	137.5	150	162.5	175	187.5	
L3	80.5	91	101.5	112	122.5	133	143.5	154	164.5	
L4	15	16	17	12	13	14	15	16	17	

Cassette Type Manifold Series SZ3000

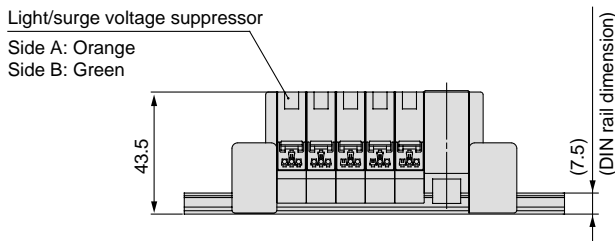
Dimensions/SZ3000: Non-plug-in

SS5Z3-60 - Stations **D**

Scale: 37%



(Station n).....(Station 1)



Internal pilot manifold L: Dimensions n: Stations

L \ n	2	3	4	5	6	7	8	9	10
L1	98	110.5	123	135.5	135.5	148	160.5	173	185.5
L2	87.5	100	112.5	125	125	137.5	150	162.5	175
L3	70	80.5	91	101.5	112	122.5	133	143.5	154
L4	14	15	16	17	12	13	14	15	16

External pilot manifold L: Dimensions n: Stations

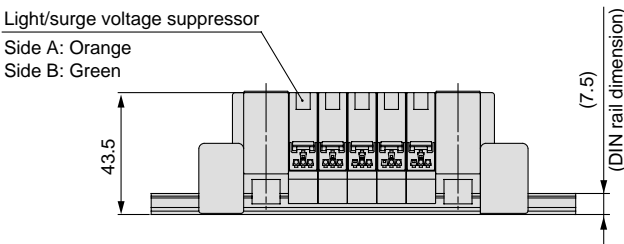
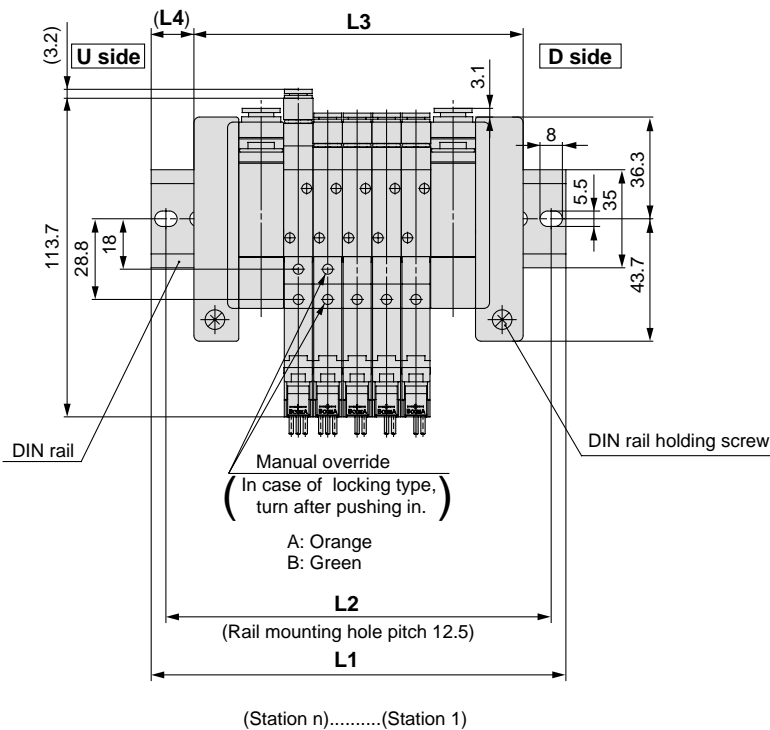
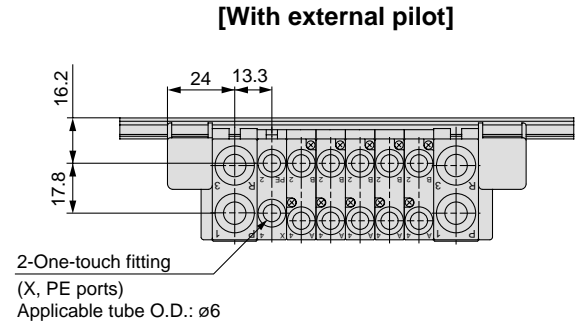
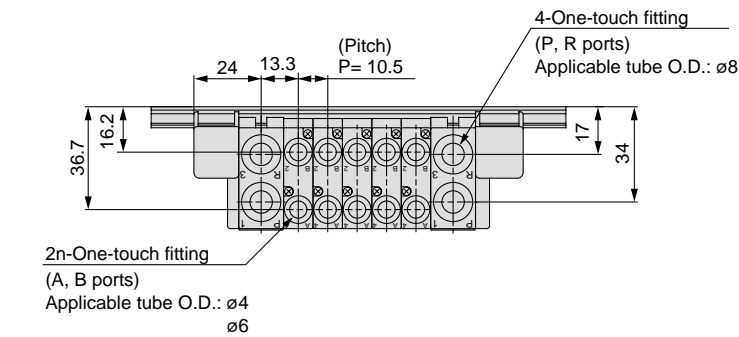
L \ n	2	3	4	5	6	7	8	9	10
L1	110.5	123	135.5	135.5	148	160.5	173	185.5	198
L2	100	112.5	125	125	137.5	150	162.5	175	187.5
L3	80.5	91	101.5	112	122.5	133	143.5	154	164.5
L4	15	16	17	12	13	14	15	16	17

Series SZ3000

Dimensions/SZ3000: Non-plug-in

SS5Z3-60 - Stations B

Scale: 37%



Internal pilot manifold L: Dimensions

		n: Stations																		
L \ n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
L1	110.5	123	135.5	148	160.5	173	173	185.5	198	210.5	223	235.5	235.5	248	260.5	273	285.5	298	310.5	
L2	100	112.5	125	137.5	150	162.5	162.5	175	187.5	200	212.5	225	225	237.5	250	262.5	275	287.5	300	
L3	86	96.5	107	117.5	128	138.5	149	159.5	170	180.5	191	201.5	212	222.5	233	243.5	254	264.5	275	
L4	12	13	14	15	16	17	12	13	14	15	16	17	12	13	14	15	16	17	18	

External pilot manifold L: Dimensions

		n: Stations																		
L \ n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
L1	123	135.5	148	160.5	173	173	185.5	198	210.5	223	235.5	235.5	248	260.5	273	285.5	298	310.5	310.5	
L2	112.5	125	137.5	150	162.5	162.5	175	187.5	200	212.5	225	225	237.5	250	262.5	275	287.5	300	300	
L3	96.5	107	117.5	128	138.5	149	159.5	170	180.5	191	201.5	212	222.5	233	243.5	254	264.5	275	285.5	
L4	13.5	14.5	15.5	16.5	17.5	12	13	14	15	16	17	12	13	14	15	16	17	18	12.5	

Type 60S

5 Port Solenoid Valve

Series SZ3000

Serial Transmission Type

How to Order

SS5Z3-60S **Q** **D** - **05** **U** -

Compatible equipment

Q	DeviceNet compatible: OMRON Corp. CompoBus/D compatible
R1	OMRON Corporation: CompoBus/S (16 points) compatible
R2	OMRON Corporation: CompoBus/S (8 points) compatible
V	Mitsubishi Electric Corp.: CC-Link compatible
O	Without SI unit

SI unit mounting position

D	D Side
----------	--------

- This should be indicated even without SI unit.

Options

When a DIN rail is required that is longer than the standard types, specify the number of stations.

Pilot specifications

Nil	Internal pilot specifications
R	External pilot specifications

Supply/Exhaust block mounting position

U	U Side (2 to 10 stations)
D	D Side (2 to 10 stations)
B	Both sides (2 to 16 stations)
M*	Special specifications

* In the case of special specifications, indicate separately on a manifold specification sheet.

Note) A total of up to 3 supply/exhaust blocks can be mounted. Contact SMC if 4 or more will be mounted.

Valve stations

Symbol	Stations	Note
02	2 stations	Double wiring specifications
...	...	
08	8 stations	
02	2 stations	Specified layout (up to 16 solenoids possible)
...	...	
16	16 stations	

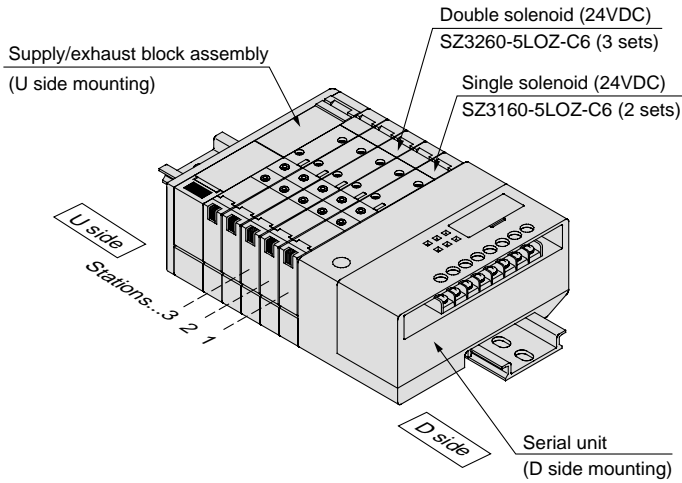
Note 1) Double wiring specifications:
Single, double and 3 position solenoid valves can be used at all of the manifold stations.

Note 2) Specified layout:
Indicate the wiring specifications on a manifold specification sheet. (Note that in locations where single solenoid wiring is indicated, it will be impossible to use double or 3 position valves.)

Series SZ3000

How to Order Manifold Assemblies (Example)

Example (OMRON Corporation compatible serial unit)



SS5Z3-60SRID-05U-C6 1 set (manifold part number)
 * SZ3160-5LOZ-C6..... 2 sets (single solenoid part number)
 * SZ3260-5LOZ-C6..... 3 sets (double solenoid part number)

The * symbol indicates built-in. Put the * symbol at the beginning of the part numbers for solenoid valves, etc. which are to be installed.

- The valve layout starts with station 1 on D side.
- Indicate the valves to be installed below the product part number, in order starting from station 1 as shown in the drawing. When a layout becomes complicated, please indicate on a manifold specification sheet. (Manifold specifications sheets are on pages 30.)

How to Order Solenoid Valves

SZ3 **1** **60** **□** - **5LOZ** **□** **□** - **C6**

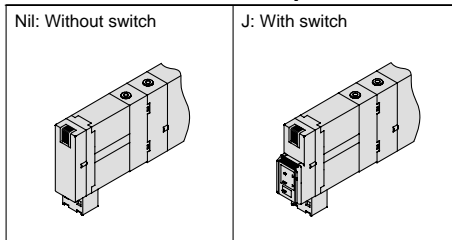
Type of actuation

1	2 position single solenoid
2	2 position double solenoid
3	3 position closed center
4	3 position exhaust center
5	3 position pressure center

Pilot specifications

Nil	Internal pilot
R	External pilot

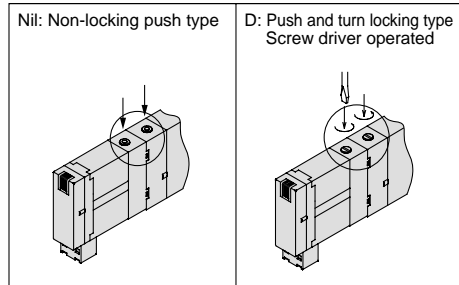
Switch specifications



A, B port size

C4	ø4 One-touch fitting
C6	ø6 One-touch fitting
M5	M5 x 0.8

Manual override



Cassette Type Manifold Series SZ3000

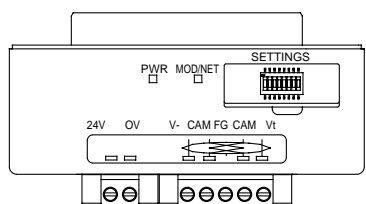
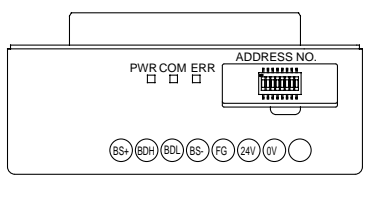
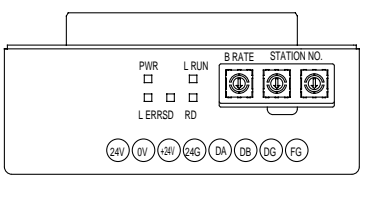
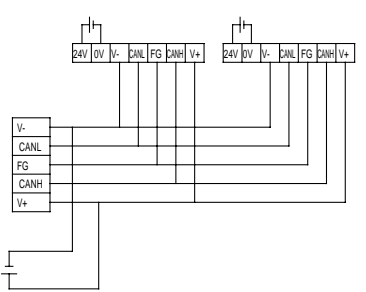
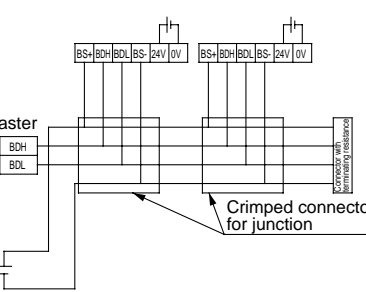
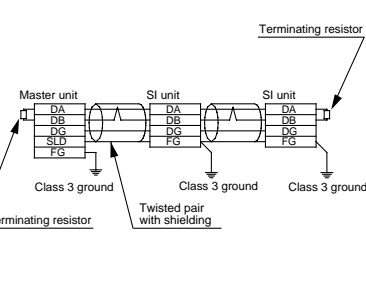
Specifications

Specifications

External power supply	24VDC±10%	
Current consumption (within unit)	0.1A	R1, R2, V, Q

SI unit part numbers

Symbol	Specifications	Part No.
Q	DeviceNet compatible: OMRON Corp. CompoBus/D compatible	EX140-SDN1
R1	OMRON Corporation: CompoBus/S (16 points) compatible	EX140-SCS1
R2	OMRON Corporation: CompoBus/S (8 points) compatible	EX140-SCS2
V	Mitsubishi Electric Corporation: CC-Link compatible	EX140-SMJ1

	Type SQ DeviceNet compatible	Type SR1/SR2 OMRON Corporation CompoBus/S compatible	Type SV Mitsubishi Electric Corporation CC-Link compatible																													
Terminal block/LED description	 <table border="1"> <thead> <tr> <th>LED name</th> <th>Content</th> </tr> </thead> <tbody> <tr> <td>PWR</td> <td>Green light turns on when line power is input</td> </tr> <tr> <td rowspan="4">MOD/NET</td> <td>Light off: When unit is off-line or power is turned off</td> </tr> <tr> <td>Continuous green light: When unit is on-line and also in operation</td> </tr> <tr> <td>Flashing red light: When a recoverable transmission error is occurring</td> </tr> <tr> <td>Continuous red light: When a nonrecoverable transmission error occurs or on-line status cannot be achieved</td> </tr> </tbody> </table>	LED name	Content	PWR	Green light turns on when line power is input	MOD/NET	Light off: When unit is off-line or power is turned off	Continuous green light: When unit is on-line and also in operation	Flashing red light: When a recoverable transmission error is occurring	Continuous red light: When a nonrecoverable transmission error occurs or on-line status cannot be achieved	 <table border="1"> <thead> <tr> <th>LED name</th> <th>Content</th> </tr> </thead> <tbody> <tr> <td>PWR</td> <td>Turns on during supply of communication power, turns off when there is no input</td> </tr> <tr> <td>COMM</td> <td>Turns on during normal communication, turns off during communication error or standby</td> </tr> <tr> <td>ERR</td> <td>Turns on when communication error occurs, turns off during normal communication or standby</td> </tr> </tbody> </table>	LED name	Content	PWR	Turns on during supply of communication power, turns off when there is no input	COMM	Turns on during normal communication, turns off during communication error or standby	ERR	Turns on when communication error occurs, turns off during normal communication or standby	 <table border="1"> <thead> <tr> <th>LED name</th> <th>Content</th> </tr> </thead> <tbody> <tr> <td>PWR</td> <td>Turns on during supply of communication power, turns off when there is no input</td> </tr> <tr> <td>L RUN</td> <td>Turns on with receipt of normal data</td> </tr> <tr> <td>SD</td> <td>Turns on with data communication</td> </tr> <tr> <td>RD</td> <td>Turns on with received data</td> </tr> <tr> <td>L ERR.</td> <td>Turns on with transmission/setting error, flashes when code or transmission speed setting changes during operation</td> </tr> </tbody> </table>	LED name	Content	PWR	Turns on during supply of communication power, turns off when there is no input	L RUN	Turns on with receipt of normal data	SD	Turns on with data communication	RD	Turns on with received data	L ERR.	Turns on with transmission/setting error, flashes when code or transmission speed setting changes during operation
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RD	Turns on with received data																															
L ERR.	Turns on with transmission/setting error, flashes when code or transmission speed setting changes during operation																															
Note	<ul style="list-style-type: none"> • DeviceNet • OMRON Corporation CompoBus/D system • Master unit: Type C200HW-DRM21 • 16 output points 	<ul style="list-style-type: none"> • CompoBus/S system Master unit: Type C200HW-SRM21 Master unit: Type CQM1-SRM21 • 16 output points (type SR1) 8 output points (type SR2) 	<ul style="list-style-type: none"> • CC-Link system Master unit: AJ61BT11 Master unit: A1SJ61BT11 Master unit: AJ61QBT11 Master unit: A1SJ61Q8T11 • 16 output points 																													
Cable wiring																																

Series SZ3000

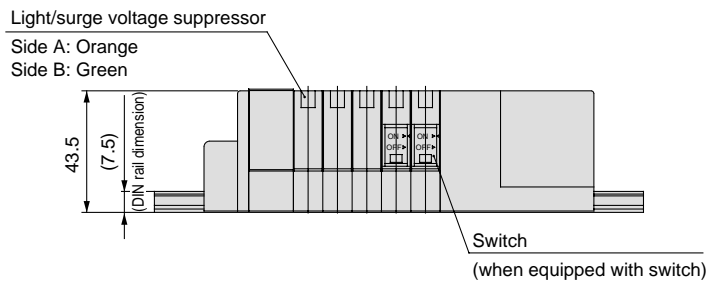
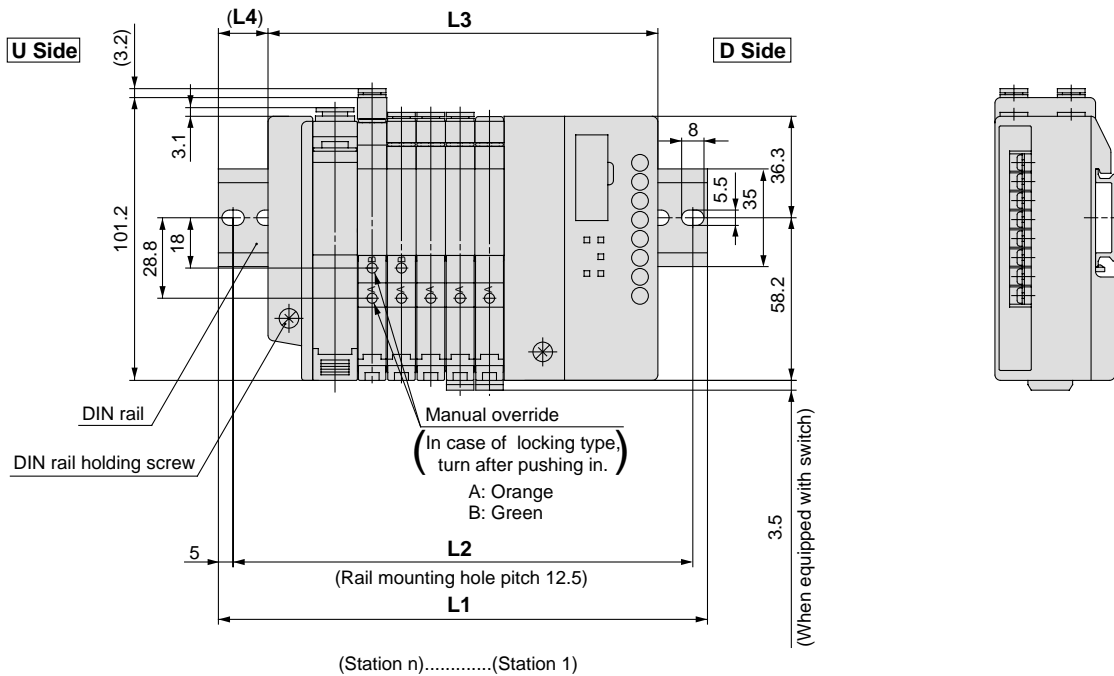
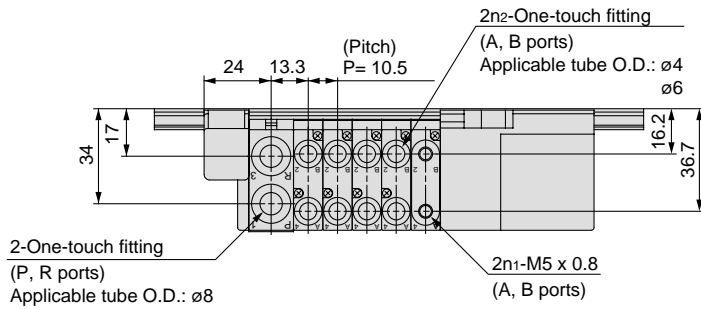
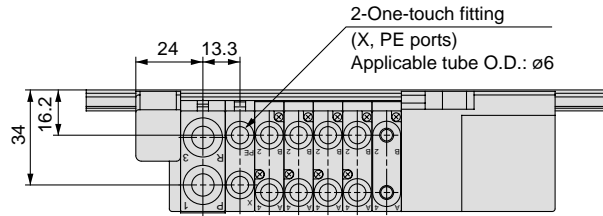
Dimensions/SZ3000: Serial Transmission Type

SS5Z3-60S □ D - Stations U

Note) The L1 to L4 dimensions for SS5Z3-60S □ D - Stations D are the same as the SS5Z3-60S □ D - Stations U dimensions.

Scale: 37%

[With external pilot]



Internal pilot manifold L: Dimensions n: Stations

L \ n	1	2	3	4	5	6	7	8
L1	123	135.5	148	160.5	173	185.5	185.5	198
L2	112.5	125	137.5	150	162.5	175	175	187.5
L3	97.5	108	118.5	129	139.5	150	160.5	171
L4	13	14	15	16	17	18	12.5	13.5

External pilot manifold L: Dimensions n: Stations

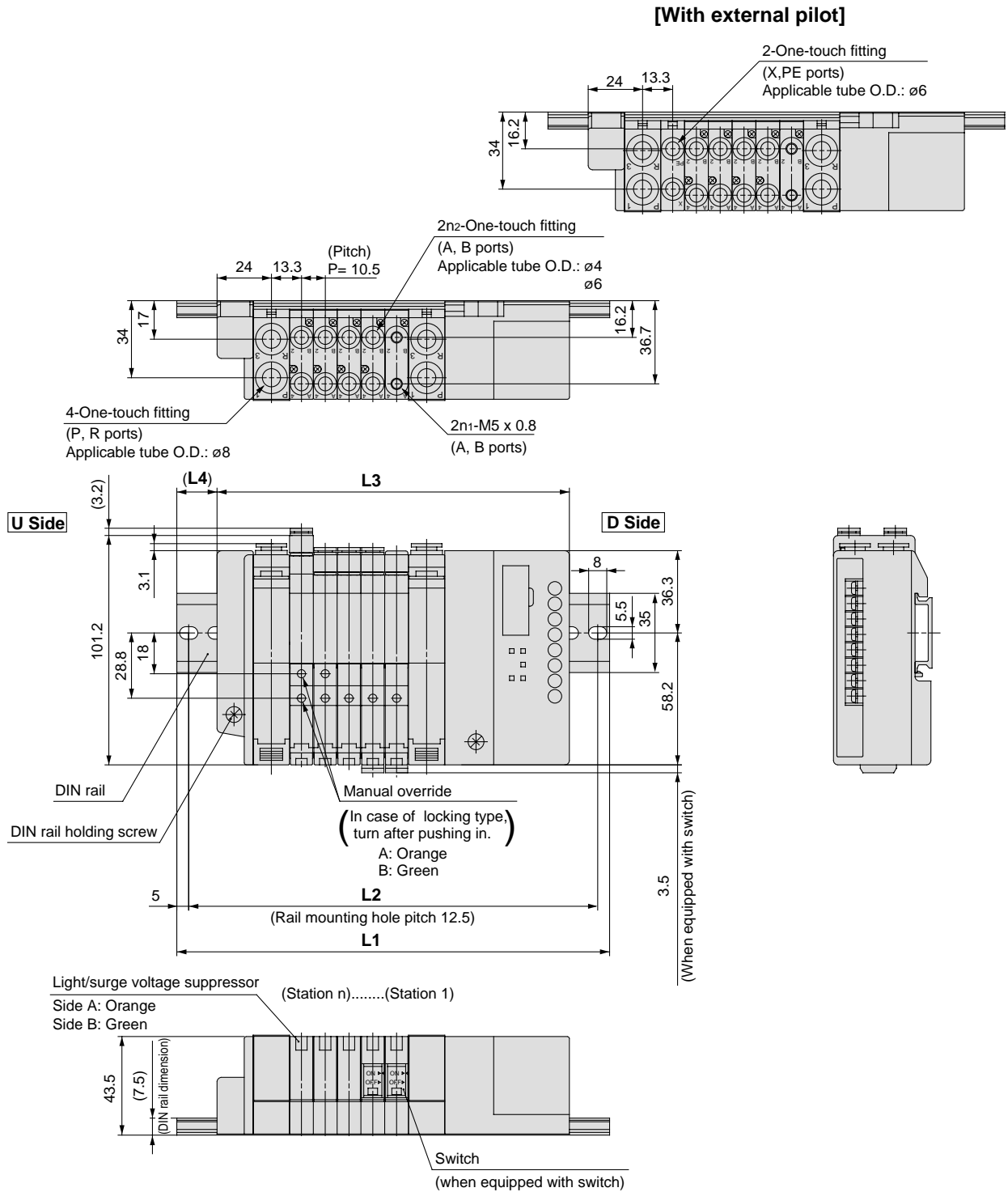
L \ n	1	2	3	4	5	6	7	8
L1	135.5	148	160.5	173	185.5	185.5	198	210.5
L2	125	137.5	150	162.5	175	175	187.5	200
L3	108	118.5	129	139.5	150	160.5	171	181.5
L4	14	15	16	17	18	12.5	13.5	14.5

Cassette Type Manifold Series SZ3000

Dimensions/SZ3000: Serial Transmission Type

SS5Z3-60S □ D- Stations B

Scale: 37%



Internal pilot manifold L: Dimensions

n: Stations

L \ n	1	2	3	4	5	6	7	8
L1	148	148	160.5	173	185.5	198	210.5	210.5
L2	137.5	137.5	150	162.5	175	187.5	200	200
L3	113.5	124	134.5	145	155.5	166	176.5	187
L4	17.5	12	13	14	15	16	17	12

L \ n	9	10	11	12	13	14	15	16
L1	223	235.5	248	260.5	273	285.5	285.5	298
L2	212.5	225	237.5	250	262.5	275	275	287.5
L3	197.5	208	218.5	229	239.5	250	260.5	271
L4	13	14	15	16	17	18	12.5	13.5

External pilot manifold L: Dimensions

n: Stations

L \ n	1	2	3	4	5	6	7	8
L1	148	160.5	173	185.5	198	210.5	210.5	223
L2	137.5	150	162.5	175	187.5	200	200	212.5
L3	124	134.5	145	155.5	166	176.5	187	197.5
L4	12	13	14	15	16	17	12	13

L \ n	9	10	11	12	13	14	15	16
L1	235.5	248	260.5	273	285.5	285.5	298	310.5
L2	225	237.5	250	262.5	275	275	287.5	300
L3	208	218.5	229	239.5	250	260.5	271	281.5
L4	14	15	16	17	18	12.5	13.5	14.5

SZ3000: Cassette Type

Plug-in manifold

Manifold Valve Specification Sheet

Make entries in order from (1) to (3).

Company name		
Contact		
Specification sheet No.		
Order No.		
Equipment name		
Quantity	Set(s)	Date required

1 How to Order Manifolds

Enter the symbols for the required specifications in the blanks below.



Connector type

Symbol	Connector type
F	D-sub connector, 25 pins
P	Flat cable connector, 26 pins
PG	Flat cable connector, 20 pins
PH	Flat cable connector, 10 pins

Connector entry direction

Symbol	Mounting position
1	Vertical
2	Horizontal

Valve stations

Symbol	Stations
02	2 stations
...	...
20	20 stations

Supply/exhaust block assembly mounting position

Symbol	Mounting position	Applicable stations
U	U side	2 to 10 stations
D	D side	2 to 10 stations
B	Both sides	2 to 20 stations
M	Special specifications	

Options
When a DIN rail is required that is longer than the standard types, specify the number of stations. (Max. 20 stations)

Pilot system

Symbol	Specifications
Nil	Standard/internal pilot specifications
R	External pilot specifications

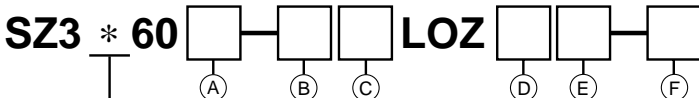
Power supply terminal specifications

	None	Pos. common	Neg. common
Nil			
P	24VDC		
P12	12VDC		
N	24VDC		
N12	12VDC		

Caution
* The possible number of valve stations (number of solenoids) is limited depending on the connector type and the presence or absence of power supply terminals. Referring to catalog pages 1 & 2, make selections so that the maximum number of stations is not exceeded.

2 How to Order Valves

Enter the symbols for the required specifications in the blanks below.



Type of valve actuation

1	2 position single solenoid
2	2 position double solenoid
3	3 position closed center
4	3 position exhaust center
5	3 position pressure center

(A) Pilot system

Nil	Internal pilot
R	External pilot

When an external pilot valve is to be used, enter a ○ symbol in section (b) of the station table below.

(B) Rated voltage

5	24VDC
6	12VDC

Match to the voltage specifications of the manifold.

(C) COM specifications

Nil	Positive common
N	Negative common

Match to the common specifications of the manifold.

(F) A, B port size

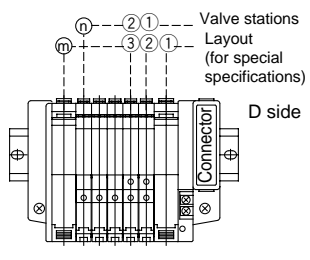
C4	ø4 One-touch fitting
C6	ø6 One-touch fitting
M5	M5 x 0.8
M	Mixed

(D) Switch specifications

Nil	Without switch
J	With switch

(E) Manual override

Nil	Non-locking push type
D	Push & turn locking type, screw driver operated



3 Station Table

Indicate the layout of valves, etc. with ○ symbols.

- When the sizes of ports A and B are mixed, indicate in section (a) with C4, C6 and M5.
- When the port size of the supply/exhaust block assembly is ø6, indicate with C6 in section (c). (It will be ø8 when indicated with a ○ symbol.)
- When the port size of the external pilot block assembly is ø4, indicate with C4 in section (c). (It will be ø6 when indicated with a ○ symbol.)

Valve stations or layout		20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	Quantity	
(a)	2 position	Single solenoid																					
		Double solenoid																					
	3 position	Closed center																					
		Exhaust center																					
		Pressure center																					
(b)	External pilot specifications (enter only in case of external pilot)																						
(c)	Enter for special specs. (Note 1)	Supply/exhaust block assembly																					
External pilot block assembly																							
(d)	SUP blocking disk																						
	EXH blocking disk																						
	Pilot port blocking disk (Note 2)																						
(e)	Wiring specifications	Single wiring																					
		Double wiring																					

Enter only when specifying wiring. 2 extra stations can be specified for station expansion. However, this will be less than the maximum number of solenoids.

Note 1) The number of supply/exhaust block assemblies and pilot block assemblies should each be 3 or less. Contact SMC in case 4 or more will be installed.

Note 2) Enter only when internal pilots and external pilots will be mixed on the same manifold.

- [Note] • SUP blocking disk: SZ3000-114-4A • Pilot port blocking disk: SZ3000-114-2A • Supply/exhaust block assembly (ø6): SZ3000-50-1A-C6
 • EXH blocking disk: SZ3000-114-4A (2pcs./location) • Supply/exhaust block assembly (ø8): SZ3000-50-1A-C8 • External pilot block assembly (ø6): SZ3000-54-1A-C6
 • Blanking block assembly: SZ3000-55-1A • External pilot block assembly (ø4): SZ3000-54-1A-C4

Section below for SMC use only

Enter the ordered part numbers.

Part No.	Quantity

Part No.	Quantity

Order No.	
Clerk (code No.)	
Branch code	

Note) When there are special specifications for the mounting position of the supply/exhaust block assembly, enter the part number and quantity for the supply/exhaust block assembly together with the manifold type.

SZ3000: Cassette Type

Non-plug-in manifold

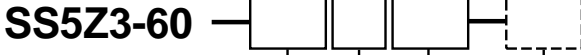
Company name			
Contact			
Specification sheet No.			
Order No.			
Equipment name			
Quantity	Set(s)	Date required	

Manifold Valve Specification Sheet

Make entries in order from (1) to (3).

1 How to Order Manifolds

Enter the symbols for the required specifications in the blanks below.



Valve stations

Symbol	Stations
02	2 stations
...	...
20	20 stations

Supply/exhaust block assembly mounting position

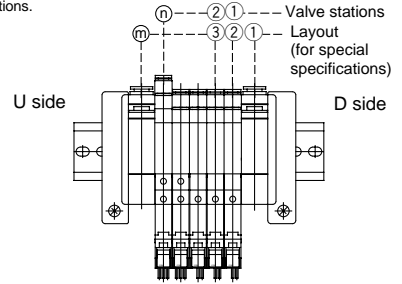
Symbol	Mounting position	Applicable stations
D	D side	2 to 10 stations
U	U side	2 to 10 stations
B	Both sides	2 to 20 stations
M	Special specifications	

In case of special specifications, indicate in the station table below.

Pilot system

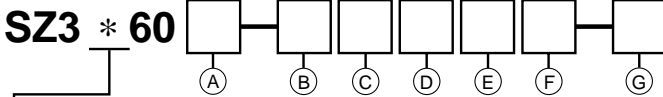
Symbol	Specifications
Nil	Standard/internal pilot specifications
R	External pilot specifications

Options
When a DIN rail is required that is longer than the standard types, specify the number of stations. (Max. 20 stations)



2 How to Order Valves

Enter the symbols for the required specifications in the blanks below.



Valve actuation type

1	2 position single solenoid
2	2 position double solenoid
3	3 position closed center
4	3 position exhaust center
5	3 position pressure center

(B) Rated voltage

5	24VDC
6	12VDC
V	6VDC
S	5VDC
R	3VDC

(D) Electrical entry

M	M type plug connector	With lead wire
MN		Without lead wire
MO		Without connector

(E) Light/surge voltage suppressor

Nil	Without light/surge voltage suppressor
S	With surge voltage suppressor
Z	With light/surge voltage suppressor

(F) Manual override

Nil	Non-locking push type
D	Push & turn locking type, screw driver operated

(G) A, B port size

C4	ø4 One-touch fitting
C6	ø6 One-touch fitting
M5	M5 x 0.8
M	Mixed

Note) In case of mixed port sizes indicate by entering C4, C6 and M5 as required in section (a) of the station table below.

Indicate in the station table below.

(A) Pilot system

Nil	Internal pilot
R	External pilot

When an external pilot valve is to be used, enter a \odot symbol in section (b) of the station table below.

(C) COM specifications

Nil	Pos. common
N	Neg. common

3 Station Table

Indicate the layout of valves, etc. with \odot symbols.

- When the sizes of ports A and B are mixed, indicate in section (a) with C4, C6 and M5.
- When the port size of the supply/exhaust block assembly is ø6, indicate with C6 in section (c). (It will be ø8 when indicated with a \odot symbol.)
- When the port size of the external pilot block assembly is ø4, indicate with C4 in section (c). (It will be ø6 when indicated with a \odot symbol.)

Valve stations or layout		20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	Quantity
(a)	2 position	Single solenoid																				
		Double solenoid																				
	3 position	Closed center																				
		Exhaust center																				
		Pressure center																				
(b)	External pilot specifications (enter only in case of external pilot)																					
Note 1) (c)	Enter for special specs.	Supply/exhaust block assembly																				
		External pilot block assembly																				
(d)	SUP blocking disk																					
	EXH blocking disk																					
	Pilot port blocking disk <small>Note 2)</small>																					

Note 1) The number of supply/exhaust block assemblies and pilot block assemblies should each be 3 or less. Contact SMC in case 4 or more will be installed.

Note 2) Enter only when internal pilots and external pilots will be mixed on the same manifold.

- [Note] • SUP blocking disk: SZ3000-114-4A • Pilot port blocking disk: SZ3000-114-2A • Supply/exhaust block assembly (ø6): SZ3000-50-2A-C6
 • EXH blocking disk: SZ3000-114-4A (2pcs./location) • Supply/exhaust block assembly (ø8): SZ3000-50-2A-C8 • External pilot block assembly (ø6): SZ3000-54-2A-C6
 • External pilot block assembly (ø4): SZ3000-54-2A-C4

For SMC use only

Enter the ordered part numbers.

Part No.	Quantity

Part No.	Quantity

Order No.	
Clerk (code No.)	
Branch code	

Note) When there are special specifications for the mounting position of the supply/exhaust block assembly, enter the part number and quantity for the supply/exhaust block assembly together with the manifold type.

SZ3000 Cassette Type

Serial Wiring Manifold

Manifold Valve Specification Sheet

Make entries in order from (1) to (3).

① How to Order Manifolds

Enter the symbols for the required specifications in the blanks below.

SS5Z3-60S **D**

Company name		
Contact		
Specification sheet No.		
Order No.		
Equipment name		
Quantity	Set(s)	Date required

Equipment used

Symbol	Specifications
Q	DeviceNet compatible, OMRON Corp. CompoBus/D compatible
R1	OMRON Corporation: CompoBus/S (16 points) compatible
R2	OMRON Corporation: CompoBus/S (8 points) compatible
V	Mitsubishi Electric Corporation: CC-Link compatible
O	Without SI unit

Valve stations

Symbol	Stations	Note
02	2 stations	Double wiring specifications
...	...	
08	8 stations	Up to 16 solenoids are possible. Indicate wiring specifications in section (d) of the station table.
09	9 stations	
...	...	
16	16 stations	

Supply/exhaust block assembly mounting position

Symbol	Mounting position	Applicable stations
U	U Side	2 to 10 stations
D	D Side	2 to 10 stations
B	Both sides	2 to 20 stations
M	Special specifications	

Pilot system

Symbol	Specifications
Nil	Standard/internal pilot specifications
R	External pilot specifications

(Maximum of 16 stations, but up to 16 solenoids are possible.)

*In the case of a general-purpose type, a transmission unit is necessary on the CPU side.

② How to Order Valves

Enter the symbols for the required specifications in the blanks below.

SZ3 * **60** **LOZ**

Type of valve actuation

1	2 position single solenoid
2	2 position double solenoid
3	3 position closed center
4	3 position exhaust center
5	3 position pressure center

A Pilot system

Nil	Internal pilot
R	External pilot

When an external pilot valve is to be used, enter a \circ symbol in section (b) of the station table below.

B Rated voltage

5	24VDC
6	12VDC

Match to the voltage specifications of the manifold.

C Switch specifications

Nil	Without switch
J	With switch

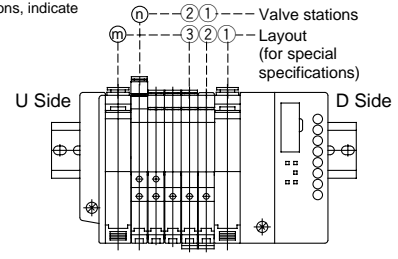
D Manual override

Nil	Non-locking push type
D	Push & turn locking type, screw driver operated

E A, B port size

C4	ϕ 4 One-touch fitting
C6	ϕ 6 One-touch fitting
M5	M5 x 0.8
M	Mixed

Note) In case of mixed port sizes, indicate by entering C4, C6 and M5 as required in section (a) of the station table below.



③ Station Table

Indicate the layout of valves, etc. with \circ symbols.

- When the sizes of ports A and B are mixed, indicate in section (a) with C4, C6 and M5.
- When the port size of the supply/exhaust block assembly is ϕ 6, indicate with C6 in section (c). (It will be ϕ 8 when indicated with a \circ symbol.)
- When the port size of the external pilot block assembly is ϕ 4, indicate with C4 in section (c). (It will be ϕ 6 when indicated with a \circ symbol.)

Valve stations or layout		20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	Quantity	
a	2 position	Single solenoid																					
		Double solenoid																					
	3 position	Closed center																					
		Exhaust center																					
		Pressure center																					
	Blanking block assembly																						
b	External pilot specifications (enter only in case of external pilot)																						
Note 1) c	Enter for special specs.	Supply/exhaust block assembly																					
		External pilot block assembly																					
d	SUP blocking disk																						
	EXH blocking disk																						
	Pilot port blocking disk ^{Note 2)}																						
e	Wiring specifications	Single wiring																					
		Double wiring																					

Enter only when specifying wiring. 2 extra stations can be specified for station expansion. However, this will be less than the maximum number of solenoids. (Refer to catalog page 30 for further details.)

- Note 1) The number of supply/exhaust block assemblies and pilot block assemblies should each be 3 or less. Contact SMC in case 4 or more will be installed.
- Note 2) Enter only when internal pilots and external pilots will be mixed on the same manifold.
- [Note] • SUP blocking disk: SZ3000-114-4A • EXH blocking disk: SZ3000-114-4A (2pcs./location) • Blanking block assembly: SZ3000-55-1A • Pilot port blocking disk: SZ3000-114-2A • Supply/exhaust block assembly (ϕ 6): SZ3000-50-1A-C6 • External pilot block assembly (ϕ 6): SZ3000-54-1A-C6 • Supply/exhaust block assembly (ϕ 8): SZ3000-50-1A-C8 • External pilot block assembly (ϕ 4): SZ3000-54-1A-C4

Section below for SMC use only

Enter the ordered part numbers.

Part No.	Quantity

Part No.	Quantity

Order No.	
Clerk (code No.)	
Branch code	

Note) When there are special specifications for the mounting position of the supply/exhaust block assembly, enter the part number and quantity for the supply/exhaust block assembly together with the manifold type.

Series SZ3000 Order Made Specifications

Contact SMC for detailed dimensions, specifications and lead times.



1 Main Valve Fluororubber Specifications -X90

Symbol

Fluororubber specifications are used for the rubber parts of the main valve, making possible the following types of applications.

1. When operated with lubrication other than the recommended turbine oil, and malfunction occurs due to swelling of the spool valve seal, or there is a possibility of this occurring.
2. When ozone enters or is generated in the air supply.

Part No.

SZ3 60 -X90

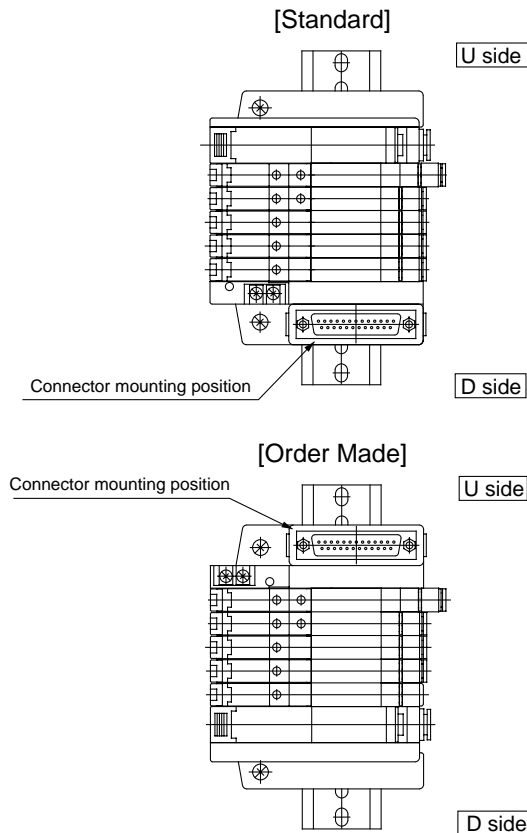
• Make entries in the same way as for standard models.

Specifications and performance are the same as those of standard models.

Note) Please note that in the -X90 series, only the rubber parts of the main valve have fluororubber specifications, and it cannot be used for heat resistant applications.

2 Plug-in Manifold Connector and Serial Unit Mounted on Side D

Products are also available with the plug-in manifold connector mounting position and the serial unit mounting position on the reverse side (sideD). Contact SMC for details regarding part numbers and wiring specifications, etc.



3 Single, Double Common Use Type -X5

Symbol

Can be changed easily at the installation between single solenoid and double solenoid.

How to Order

SZ3260 D -X5

• Make entries in the same way as for standard models.

Specifications

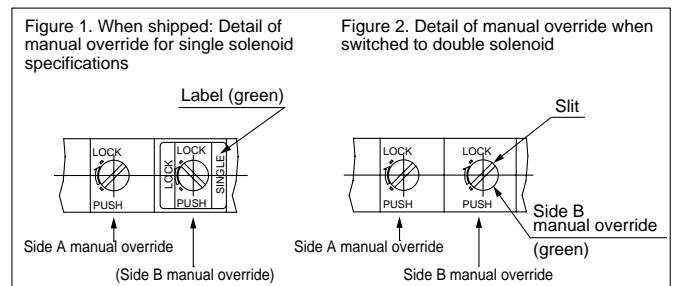
Valve type	Pilot type 2 position 5 port electrically activated valve		
Actuation type	Single solenoid, double solenoid common use type		
Internal pilot operating pressure range MPa{kgf/cm ² }	2 position single	0.15 to 0.7{1.5 to 7.1}	
	2 position double	0.15 to 0.7{1.5 to 7.1}	
External pilot operating pressure range MPa{kgf/cm ² }	Operating pressure range	-100kPa to 0.7{10Torr to 7.1}	
	Pilot pressure range	2 position single	0.25 to 0.7{2.5 to 7.1}
		2 position double	0.25 to 0.7{2.5 to 7.1}
	Ambient and fluid temperature °C	Maximum 50	
Power consumption W	0.6 (with light: 0.65)		
Weight (g)	C4: 81, C6: 77		

* Other specifications (effective area, response time, etc.) are the same as standard models.

⚠ Caution

Operating Precautions

1. Specifications are for single solenoid at time of shipment. (Refer to Figure 1.)
2. When it will be used as a double solenoid type, set the manual override and connector assembly as follows.
 - ① Peel off the manual override label (green) from side B, and turn the side B manual override with a watchmakers screw driver so that the slit is in the position shown in Figure 2.
 - ② Install the socket of the accessory lead wire assembly (white), for energizing the side B solenoid, into the square hole marked "B" on the connector. Refer to the section "How to Use Plug Connectors" on catalog page 36 regarding the installation method.
3. In case of the double solenoid set-up, do not energize the solenoids on both sides simultaneously.
4. Refer to page 38 for further details regarding electrical connections and electrical circuits with light/surge voltage suppressor.
5. Dimensions are the same as standard models.








Series **SZ3000**

Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by a label of "**Caution**", "**Warning**" or "**Danger**". To ensure safety, be sure to observe ISO 4414 Note 1), JIS B 8370 Note 2) and other safety practices.

 **Caution** : Operator error could result in injury or equipment damage.

 **Warning** : Operator error could result in serious injury or loss of life.

 **Danger** : In extreme conditions, there is a possible result of serious injury or loss of life.

Note 1) ISO 4414 : Pneumatic fluid power – Recommendations for the application of equipment to transmission and control systems.

Note 2) JIS B 8370 : Pneumatic system axiom.

Warning

1. The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.

Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements.

2. Only trained personnel should operate pneumatically operated machinery and equipment.

Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.

1. Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc. (Bleed air into the system gradually to create back-pressure.)

4. Contact SMC if the product is to be used in any of the following conditions:

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.



SZ3000

5 Port Solenoid Valve Precautions 1

Be sure to read before handling.

Precautions on Design

⚠ Warning

1. Actuator drive.

When an actuator, such as a cylinder, is to be driven using a valve, take appropriate measures to prevent potential danger caused by actuator operation.

2. Intermediate stopping.

When a 3 position closed center valve is used to stop a cylinder at an intermediate position, accurate stopping of the piston in a predetermined position is not possible due to the compressibility of air. Furthermore, since valves and cylinders are not guaranteed for zero air leakage, it may not be possible to hold a stopped position for an extended length of time. Contact SMC if it is necessary to hold a stopped position for an extended time.

3. Effect of back pressure when using a manifold.

Use caution when valves are used on a manifold, as actuator malfunction due to back-pressure may occur. Special caution is necessary when using a 3 position exhaust center valve, or when driving a single acting cylinder, etc. Contact SMC in cases where there is a danger of this kind of malfunction.

4. Holding of pressure (including vacuum).

Since valves are subject to air leakage, they cannot be used for applications such as holding pressure (including vacuum) in a pressure vessel.

5. Cannot be used as an emergency shutoff valve, etc.

The valves presented in this catalog are not designed for safety applications such as an emergency shutoff valve. If the valves are used in this type of system, other reliable safety assurance measures should also be adopted.

6. Maintenance space.

The installation should allow sufficient space for maintenance activities (removal of valve, etc.).

7. Release of residual pressure.

Provide a residual pressure release function for maintenance purposes. Special consideration should be given to the release of residual pressure between the valve and cylinder in the case of a 3 position closed center type valve.

8. Vacuum applications.

When a valve is used for vacuum switching, etc., take measures against the suction of external dust or other contaminants from vacuum pads and exhaust ports, etc. Moreover, an external pilot type valve should be used in this case. Contact SMC in the case of an internal pilot type valve.

Selection

⚠ Warning

1. Confirm the specifications.

The products presented in this catalog are designed only for use in compressed air systems (including vacuum). Do not operate at pressures or temperatures, etc. beyond the range of specifications, as this can cause damage or malfunction. (Refer to specifications.)

Contact SMC when using a fluid other than compressed air (including vacuum).

2. Extended periods of continuous energization.

Contact SMC if valves will be continuously energized for extended periods of time.

⚠ Caution

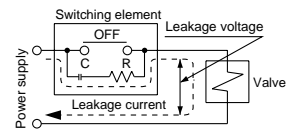
1. Momentary energization.

If a double solenoid valve will be operated with momentary energization, it should be energized for at least 0.1 second.

However, depending on the secondary load conditions, it should be energized until the cylinder reaches the stroke end position.

2. Leakage voltage.

Particularly when using a C-R element (surge voltage suppressor) for the protection of a switching element, take note that leakage voltage will increase due to leakage current flowing through the C-R element.



Limit the amount of residual leakage voltage to the following values:

With DC coil

3% or less of rated voltage

With AC coil

8% or less of rated voltage

3. Low temperature operation.

Unless otherwise indicated in the specifications for each valve, operation is possible to -10°C , but appropriate measures should be taken to avoid solidification or freezing of drain and moisture, etc.

4. Operation for air blowing.

When using solenoid valves for air blowing, an external pilot type should be used.

Take note that when internal pilots and external pilots are used on the same manifold, the pressure drop caused by the air blowing can have an effect on the internal pilot type valves.

Moreover, when compressed air within the pressure range of the established specifications is supplied to the external pilot port, and a double solenoid valve is used for air blowing, the solenoids should normally be energized when air is being blown.

5. Mounting orientation.



Series SZ3000 5 Port Solenoid Valve Precautions 2

Be sure to read before handling.

Mounting

⚠ Warning

1. If air leakage increases or equipment does not operate properly, stop operation of the valve.

At the time of mounting and maintenance, etc., connect the compressed air and power supplies, and perform appropriate function and leakage inspections to confirm that the unit is mounted properly.

2. Instruction manual.

Mount and operate the product after reading the manual carefully and understanding its contents. Also keep the manual where it can be referred to as necessary.

3. Painting and coating.

Warnings or specifications printed or pasted on the product should not be erased, removed or covered up.

Consult SMC if paint is to be applied to resinous parts, as this may have an adverse effect due to the paint solvent.

Piping

⚠ Caution

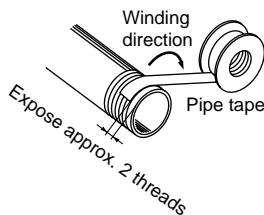
1. Preparation before piping.

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove cutting chips, cutting oil and other debris from inside the pipe.

2. Wrapping of pipe tape.

When connecting pipes and fittings, etc., be sure that cutting chips from the pipe threads and sealing material do not get inside the valve.

Further, when pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the pipe/fitting.



3. When using closed center valves.

When using a closed center type valve, check carefully to be sure there are no air leaks from the piping between the valves and cylinders.

4. Tightening torques.

When connecting fittings, etc. to valves, tighten as indicated below.

1) M5 type

1. When using SMC fittings, follow the guidelines below.

M5: After tightening by hand, tighten an additional 1/6 turn with a tightening tool. However, if miniature fittings are used, tighten an additional 1/4 turn with a tightening tool after tightening by hand. For fittings with gaskets in 2 locations, e.g., universal elbow or universal tee, tighten an additional 1/2 turn.

Note) If fittings are over-tightened, air leakage may result due to breaking of fitting threads or deformation of the gaskets. However, if fittings are not tightened sufficiently, loosening of the threads and air leakage may occur.

2. When fittings other than SMC fittings are used, follow the instructions of the respective fitting manufacturer.

5. Connection of piping to products.

When connecting piping to a product, refer to its instruction manual to avoid mistakes regarding the supply port, etc.

Wiring

⚠ Caution

1. Polarity.

When connecting power to a DC specification solenoid valve equipped with (light/) surge voltage suppressor, confirm whether or not there is polarity.

If there is polarity, take note of the following points.

• Without built-in diode to protect polarity:

If a mistake is made regarding polarity, the diode in the valve, the control device switching element or power supply equipment, etc. may be damaged.

• With diode to protect polarity:

If a mistake is made regarding polarity, it will not be possible to switch the valve.

2. Applied voltage.

When electric power is connected to the solenoid valve, be careful to apply the proper voltage. Improper voltage may cause malfunction or coil damage.

3. Confirm the connections.

After completing the wiring, confirm that the connections are correct.

Lubrication

⚠ Caution

1. Lubrication.

1) The valve has been lubricated for life at the factory, and does not require any further lubrication.

2) In the event that it is lubricated, use Class 1 turbine oil (without additives), ISO VG32.

However, once lubrication is applied it must be continued, as the original lubricant may be eliminated leading to malfunction.

Refer to the table below for brands of Class 1 turbine oil (without additives), ISO VG32.



Series SZ3000

5 Port Solenoid Valve Precautions 3

Be sure to read before handling.

Air Supply

Warning

1. Use clean air.

Do not use compressed air which contains chemicals, synthetic oils containing organic solvents, salts or corrosive gases, etc., as this can cause damage or malfunction.

Caution

1. Install air filters.

Install air filters close to valves at their upstream side. A filtration degree of 5µm or less should be selected.

2. Install an air dryer, after cooler, etc.

Air that includes excessive condensate may cause malfunction of valves and other pneumatic equipment. To prevent this, install an air dryer or after cooler etc..

3. If excessive carbon powder is generated, eliminate it by installing mist separators at the upstream side of valves.

If excessive carbon powder is generated by the compressor, it may adhere to the inside of valves and cause malfunction.

Refer to SMC's "Air Cleaning Equipment" catalog for further details on compressed air quality.

Operating Environment

Warning

1. Do not use valves in atmospheres of corrosive gases, chemicals, salt water, water or steam, or where there is direct contact with same.
2. Do not use in an explosive atmosphere.
3. Do not use in locations subject to vibration or impact. Confirm the specifications in the main section of this catalog.
4. A protective cover, etc. should be used to shield valves from direct sunlight.
5. Shield valves from radiated heat generated by nearby heat sources.
6. Employ suitable protective measures in locations where there is contact with water droplets, oil or welding spatter, etc.
7. When solenoid valves are mounted on a control panel or are energized for extended periods of time, employ measures to radiate excess heat, so that temperatures remain within the valve specification range.

Maintenance

Warning

1. Perform maintenance procedures as shown in the instruction manual.

If handled improperly, malfunction or damage of machinery or equipment may occur.

2. Equipment maintenance and supply/exhaust of compressed air.

When equipment is serviced, first confirm that measures are in place to prevent dropping of work pieces and run-away of equipment, etc. Then cut the supply pressure and power, and exhaust all compressed air from the system using its residual pressure release function.

Furthermore, in the case of 3 position closed center type valves, compressed air will remain between valves and cylinders, and must be exhausted similarly.

When the equipment is to be started again after remounting or replacement, first confirm that measures are in place to prevent lurching of actuators, etc., and then confirm that the equipment is operating normally.

3. Low frequency operation.

Valves should be switched at least once every 30 days to prevent malfunction. (Use caution regarding the air supply.)

4. Manual override operation.

When the manual override is operated, connected equipment will be actuated. Confirm safety before operating.

Caution

1. Drain removal.

Remove condensate from air filters regularly. (Refer to specifications.)

How to Find the Flow Rate (at air temperature of 20°C)

Subsonic flow when $P_1 + 0.1013 < 1.89 (P_2 + 0.1013)$

$$Q = 226S \sqrt{\Delta P (P_2 + 0.1013)}$$

Sonic flow when $P_1 + 0.1013 \geq 1.89 (P_2 + 0.1013)$

$$Q = 113S (P_1 + 0.1013)$$

Q: Air flow rate [l/min(ANR)]

S: Effective sectional area (mm²)

ΔP: Differential pressure (P₁-P₂) [MPa]

P₁: Upstream pressure [MPa]

P₂: Downstream pressure [MPa]

* Correction for different air temperatures

Multiply the flow rate calculated with the above formula by a coefficient from the table below.

Air temperature (°C)	-20	-10	0	10	30	40	50	60
Correction coefficient	1.08	1.06	1.04	1.02	0.98	0.97	0.95	0.94



SZ3000: Specific Product Precautions 1

Be sure to read before handling.

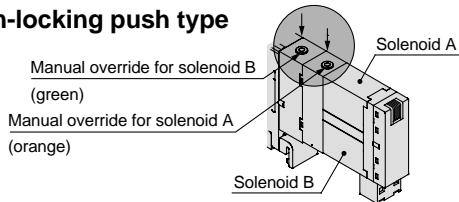
Refer to pages 32 through 35 for safety instructions and common precautions.

Warning

Manual operation

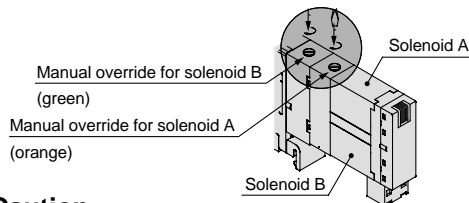
Handle carefully, as connected equipment can be actuated through manual operation.

Non-locking push type



Push and turn locking type (screw driver operated)

After pushing down, turn in the direction of the arrow. If it is not turned, it can be operated the same way as the non-locking type.



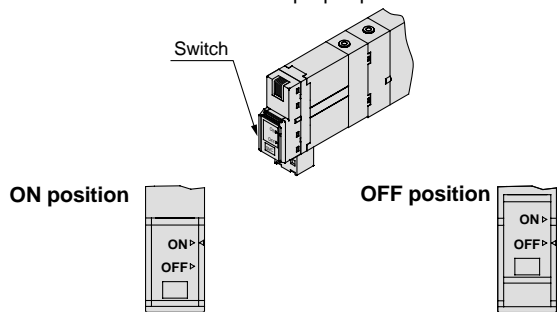
Caution

When locking the manual override on the screw driver operated push-turn locking type, be sure to push it down before turning. Turning without first pushing it down can cause damage to the manual override and trouble such as air leakage, etc.

Warning

Valves with switches

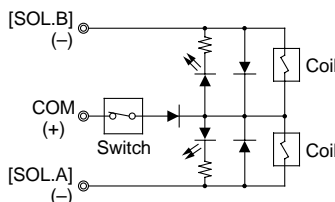
When turning OFF with the switch, be sure to move the switch to the locked position. Connected equipment may be actuated if current flow occurs with the switch at an improper position.



Normal operating condition. Switching of valve is based on an electric signal from the connector.

The valve coil is kept in a deenergized state even when there is an electric signal from the connector.

Electric circuit diagram (with positive common and light/surge voltage protection circuit)



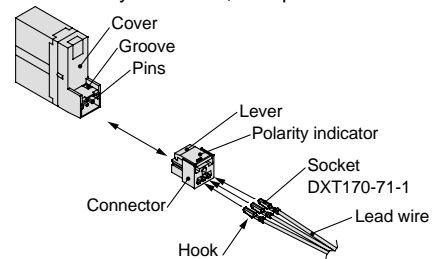
Caution

How to use plug connectors

When attaching and detaching a connector, first shut off the electric power and the air supply. Also, crimp the lead wires and sockets securely.

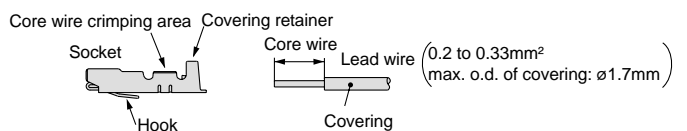
1. Attaching and detaching connectors

- To attach a connector, hold the lever and connector unit between your fingers and insert straight onto the pins of the solenoid valve so that the lever's pawl is pushed into the groove and locks.
- To detach a connector, remove the pawl from the groove by pushing the lever downward with your thumb, and pull the connector straight out.



2. Crimping of lead wires and sockets

Strip 3.2 to 3.7mm at the end of the lead wires, insert the ends of the core wires evenly into the sockets, and then crimp with a crimping tool. When this is done, take care that the coverings of the lead wires do not enter the core wire crimping area. (crimping tool: model no. DXT170-75-1)



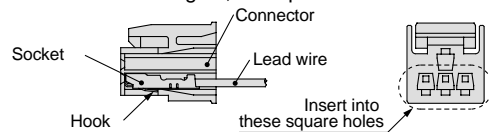
3. Attaching and detaching lead wires with sockets

Attaching

Insert the sockets into the square holes of the connector (with ⊕, ⊖ indication), and continue to push the sockets all the way in until they lock by hooking into the seats in the connector. (When they are pushed in, their hooks open and they are locked automatically.) Then confirm that they are locked by pulling lightly on the lead wires.

Detaching

To detach a socket from a connector, pull out the lead wire while pressing the socket's hook with a stick having a thin tip (about 1mm). If the socket will be used again, first spread the hook outward.



Plug connector lead wire lengths

Plug connector lead wires have a standard length of 300mm, however, the following lengths are also available.

M type connector assembly part numbers

Positive common specifications

For single solenoid: **SX100-40-4S-**

For double solenoid: **SX100-40-4D-**

For 3 position type

Negative common specifications

For single solenoid: **SX100-41-4S-**

For double solenoid: **SX100-41-4D-**

For 3 position type

Lead wire length

Nil	300mm
6	600mm
10	1000mm
15	1500mm
20	2000mm
25	2500mm
30	3000mm
50	5000mm

Ordering

Include the connector assembly part number together with the part number for the plug connector's solenoid valve without connector.

<Example>

Lead wire length 2000mm
SZ3160-5MO-M5
SX100-40-4S-20



SZ3000: Specific Product Precautions 2

Be sure to read before handling.

Refer to pages 32 through 35 for safety instructions and common precautions.

⚠ Caution

Common connector assembly for manifold

By using a common connector assembly for the solenoid valves on a manifold, the common wiring for each solenoid valve is reduced to one line, making it possible to achieve labor savings on wiring work.

Common connector assembly part numbers

Pos. common specifications for single solenoid SX100-42-4S



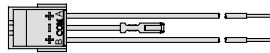
Neg. common specifications for single solenoid SX100-43-4S



Double solenoid, for 3 position type SX100-42-4D



Double solenoid, for 3 position type SX100-43-4D



With common lead wire for single solenoid SX100-40-4S



With common lead wire for single solenoid SX100-41-4S



Double solenoid, with common lead wire for 3 position type SX100-40-4D



(lead wire length 300mm)

Double solenoid, with common lead wire for 3 position type SX100-41-4D



(lead wire length 300mm)

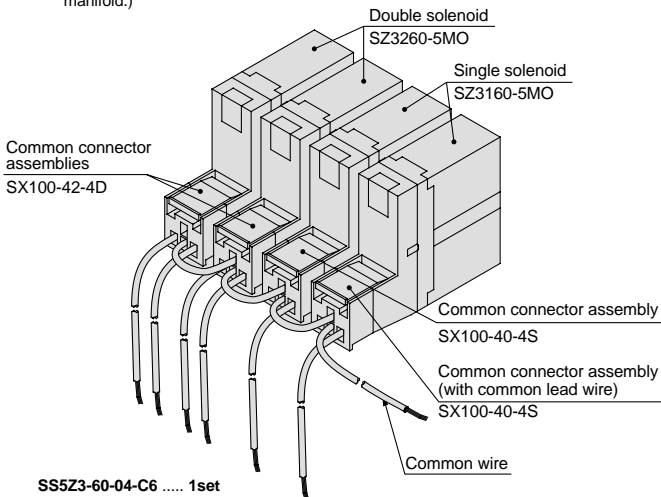
How to order

Include the common connector assembly part number together with the manifold and solenoid valve part numbers. If the arrangement becomes complicated, then indicate on the manifold specification sheets (p. 28 to 30).

Note 1) Take note that applications with unused connectors or with blanking plates between stations are not possible.

Note 2) For the solenoid valve, specify "without connector" for the plug connector type. The grommet type cannot be used.

Note 3) In cases where signals will be sent to the common wiring, use a connector assembly with a common lead wire. (This is limited to the first station or the last station of a manifold.)



SS5Z3-60-04-C6 1set

*SZ3160-5MO 2set

*SZ3260-5MO 2set

*SX100-40-4S 1set (with common lead wire for single solenoid)

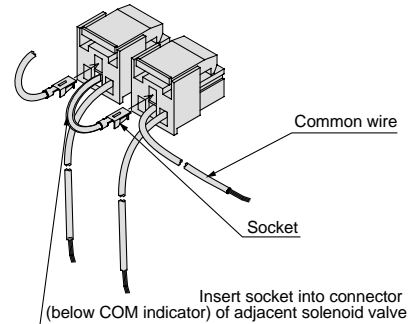
*SX100-42-4S 1set (for single solenoid)

SX100-42-4D 2set (for double solenoid, for 3 position type)

⌈The * symbol indicates built-in. Put the * symbol at the beginning of part numbers for solenoid valves, etc. which are to be attached.

Common connector assembly wiring

When ordering common connector assemblies alone, wiring should be performed as outlined in the drawing below. For details on attachment of sockets, refer to the section "How to use plug connectors" on page 36.



⚠ Caution

Precautions for One-touch fittings

The pitch of each piping port (P, A, B, etc.) for Series SZ is based on the assumption that Series KJ One-touch fittings will be used. For this reason, when other fittings are used, they may interfere with one another depending on their types and sizes. Therefore, the dimensions of the fittings to be used should first be confirmed in their respective catalogs.

⚠ Caution

Exhaust restriction

Since the Series SZ is a type in which the pilot valve exhaust joins the main valve exhaust inside the valve, care must be taken that the piping from the exhaust port is not restricted.

⚠ Caution

Series SZ3000 used as a 3 port valve

Using a 5 port valve as a 3 port valve

Series SZ3000 valves can be used as normally closed (N.C.) or normally open (N.O.) 3 port valves by closing one of the cylinder ports (A or B) with a plug. However, they should be used with the exhaust ports kept open. They are convenient at times when a double solenoid type 3 port valve is required.

Plug position		Port B	Port A
Switching		N.C.	N.O.
Number of solenoids	Single		
	Double		



SZ3000: Specific Product Precautions 3

Be sure to read before handling.

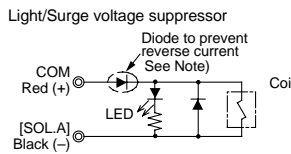
Refer to pages 32 through 35 for safety instructions and common precautions.

⚠ Caution

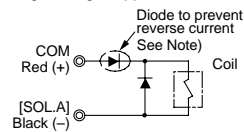
Light/Surge voltage suppressor

Pos. common specifications

Single solenoid type

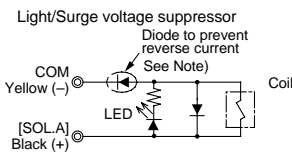


Surge voltage suppressor

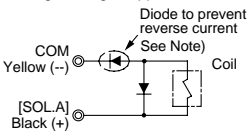


Neg. common specifications

Single solenoid type



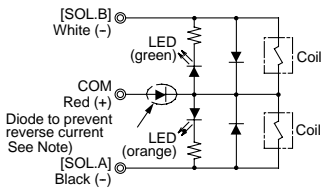
Surge voltage suppressor



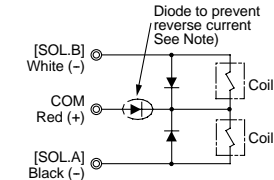
Pos. common specifications

Double solenoid, 3 position type

Light/Surge voltage suppressor



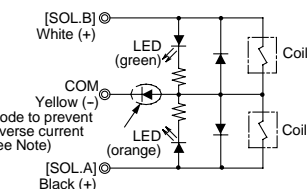
Surge voltage suppressor



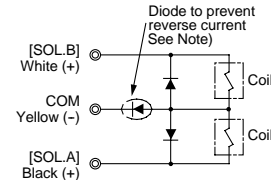
Neg. common specifications

Double solenoid, 3 position type

Light/Surge voltage suppressor



Surge voltage suppressor



Note) Connect so that polarity is matched to the connector's (+), (-) and A, B, COM indicators. In case of voltage specifications other than 12 or 24VDC, take care to avoid mistaking polarity, as there is no diode to prevent reverse current. In the event that lead wires are connected in advance, they will be as shown below.

Pos. common specifications A (+): Black

COM (+): Red

B (-): White (no lead wire in case of single solenoid)

Neg. common specifications A (+): Black

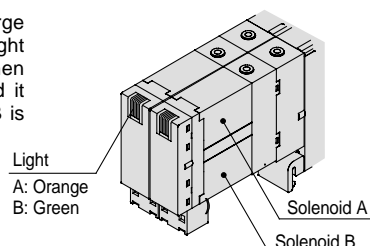
COM (-): Yellow

B (+): White (no lead wire in case of single solenoid)

⚠ Caution

Light indication

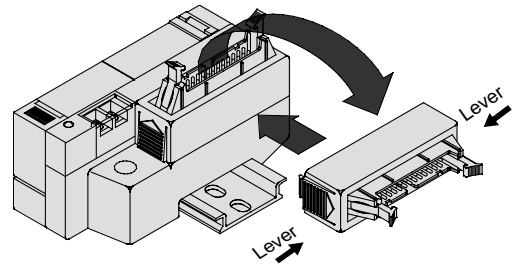
In the case of light/surge voltage suppressor, the light window turns orange when solenoid A is energized, and it turns green when solenoid B is energized.



⚠ Caution

Changing the connector entry direction

To change the connector's entry direction, press the levers on both sides of the connector, take it off, and change the direction as shown in the drawing. Since lead wires are attached to the connector, excessive pulling or twisting can cause broken wires or other trouble. Also, take care that lead wires are not pinched when installing the connector.

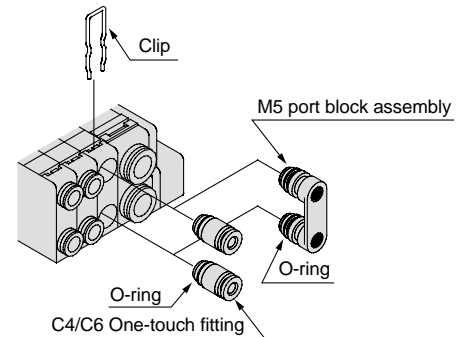


⚠ Caution

Replacement of fittings

By replacing a valve's fitting assembly, it is possible to change the connection diameter of the A and B ports.

When replacing it, pull out the fitting assembly after removing the clip with a flat head screw driver, etc. To mount a new fitting assembly, put it into place and then fully reinsert the clip.



Part numbers

Port size	Part No.
ø4 One-touch fitting assembly	VVQ1000-50A-C4
ø6 One-touch fitting assembly	VVQ1000-50A-C6
M5 port block assembly	SZ3000-56-1A

Note 1) When changing the connection diameters for ports P and R, indicate this on the manifold specification sheets (pages 28 through 30).

Note 2) Take care not to get scratches or dirt, etc. on O-rings, as this can cause air leakage.

Note 3) When removing a fitting assembly from a valve, after removing the clip, connect a tube or plug (KQP-□□) to the One-touch fitting and pull it out by holding the tube (or plug). If the fitting assembly is pulled out by holding its release bushing (resin part), the release bushing may be damaged.

Note 4) Before disassembly, be sure to turn off the electric power and air supplies. Also, since air may still remain inside actuators, piping and manifolds, confirm that this air has been completely exhausted before performing any work.



SZ3000: Specific Product Precautions 4

Be sure to read before handling.

Refer to pages 32 through 35 for safety instructions and common precautions.

Caution

Precautions for One-touch fittings

1. Tube attachment/detachment for One-touch fittings

1) Attaching of tube

- ① Take a tube having no flaws on its periphery and cut it off at a right angle. When cutting the tube, use tube cutters TK-1, 2 or 3. Do not use pinchers, nippers or scissors, etc. If cutting is done with tools other than tube cutters, the tube may be cut diagonally or become flattened, etc., making a secure installation impossible, and causing problems such as the tube pulling out after installation or air leakage. Allow some extra length in the tube.
- ② Grasp the tube and push it in slowly, inserting it securely all the way into the fitting.
- ③ After inserting the tube, pull on it lightly to confirm that it will not come out. If it is not installed securely all the way into the fitting, this can cause problems such as air leakage or the tube pulling out.

2) Detaching of tube

- ① Push in the release bushing sufficiently, and push the collar equally at the same time.
- ② Pull out the tube while holding down the release bushing so that it does not come out. If the release bushing is not pressed down sufficiently, there will be increased bite on the tube and it will become more difficult to pull it out.
- ③ When the removed tube is to be used again, cut off the portion which has been chewed before reusing it. If the chewed portion of the tube is used as is, this can cause trouble such as air leakage or difficulty in removing the tube.

Caution

Precautions on other tube brands

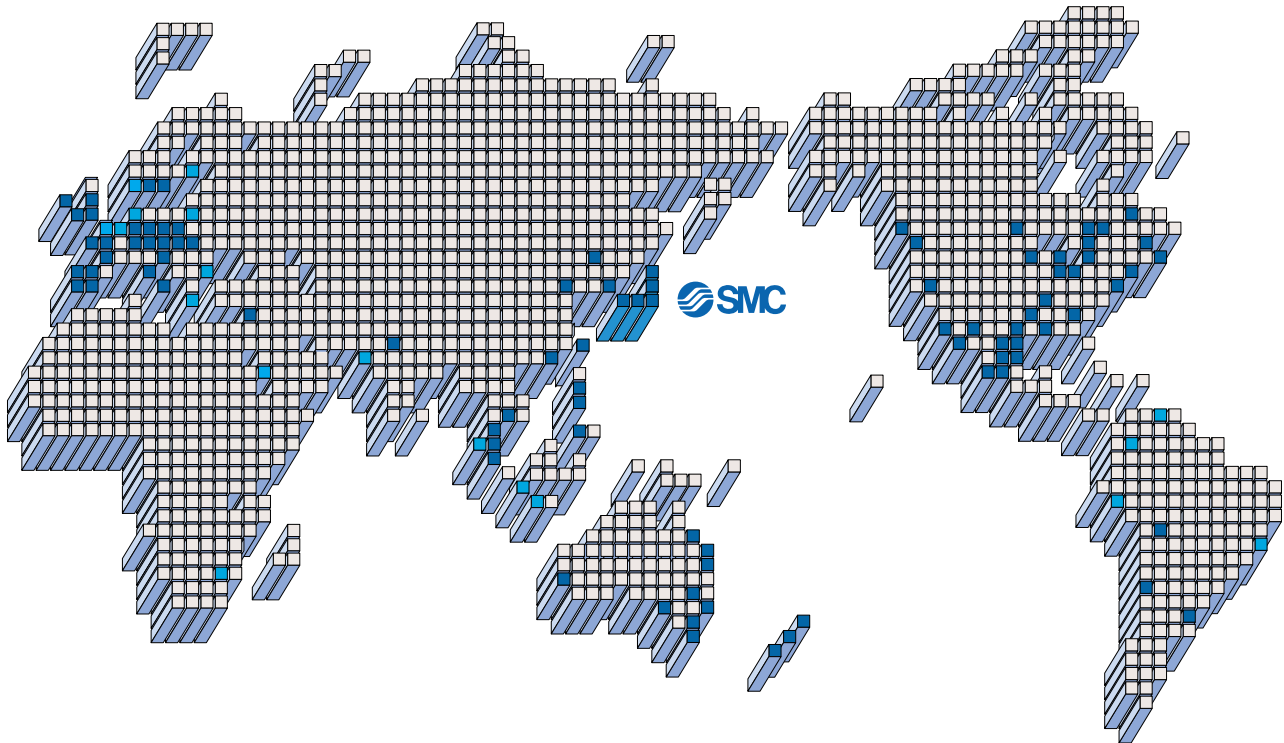
1. When using other than SMC brand tubes, confirm that the following specifications are satisfied with respect to the outside diameter tolerance of the tube.

- 1) Nylon tube within $\pm 0.1\text{mm}$
- 2) Soft nylon tube within $\pm 0.1\text{mm}$
- 3) Polyurethane tube within $+0.15\text{mm}$ or less
 within -0.2mm or less

Do not use tubes which do not meet these outside diameter tolerances. It may not be possible to connect them, or they may cause other trouble, such as air leakage or the tube pulling out after connection.



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SMC CORPORATION

1-16-4 Shimbashi, Minato-ku, Tokyo 105 JAPAN
Tel: 03-3502-2740 Fax: 03-3508-2480