



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



**2 new options: 4 position dual 3 port valve, and valve with built-in check valve to prevent back pressure problems.**

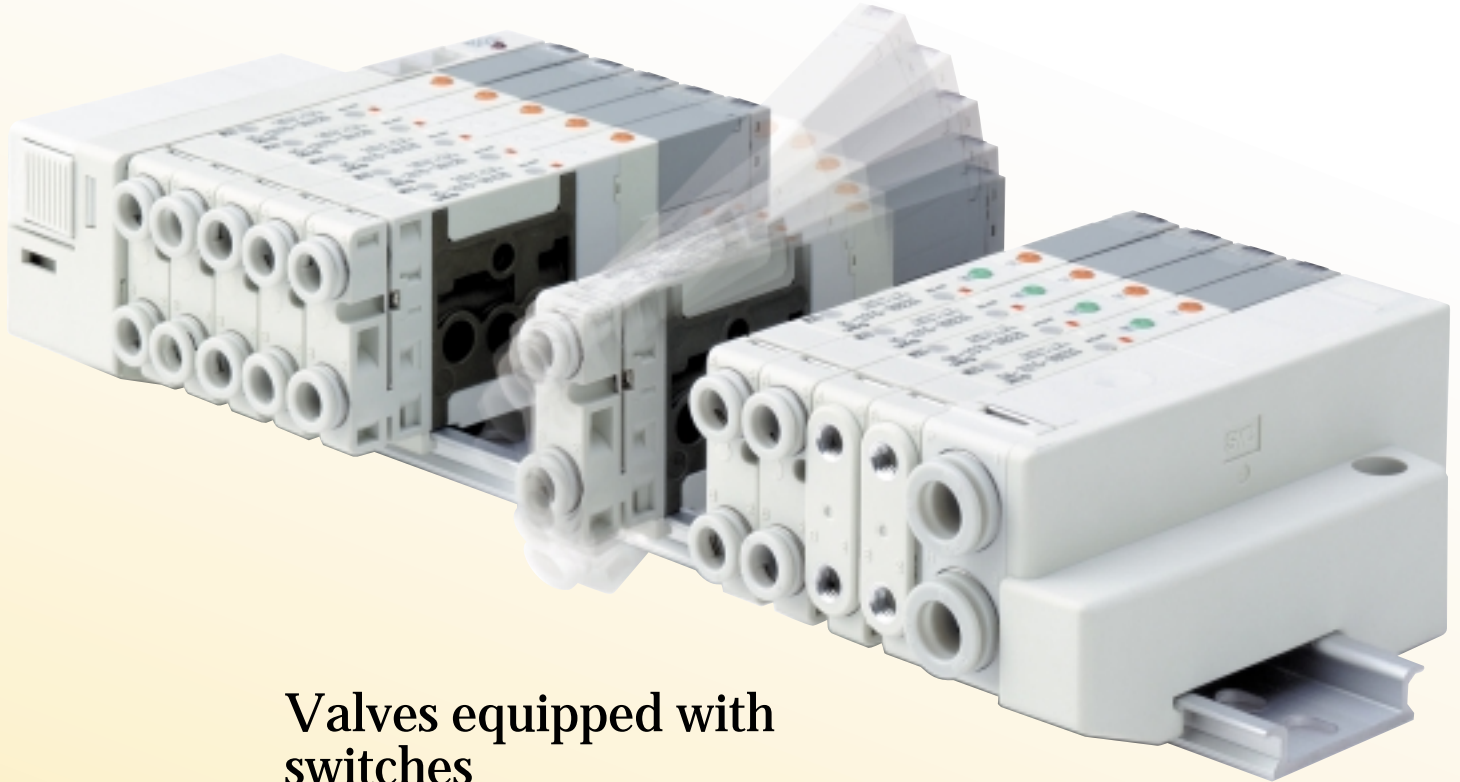
# The plug-in cassette system makes valve replacement easy.

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

Valve replacement can be performed easily.

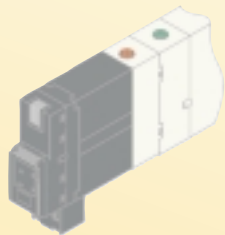
Moreover, since spare terminals for wiring (receptacle housings) are contained inside the manifold, terminal changes (additions) can be performed quickly and easily.

(The number of additional stations is limited by the manifold specifications. Refer to page 14 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.



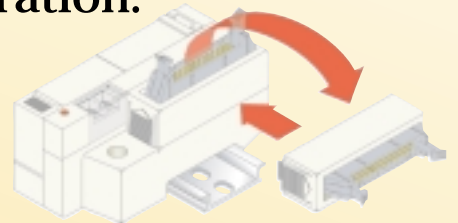
## High speed response of 10ms (SZ3000 single, 0.5MPa, 24VDC, without surge voltage suppressor)

Low power consumption and a fast response time of 10ms are obtained with a unique pilot valve construction.

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

Low power consumption enables direct operation by a PLC. Cost savings are realized through the use of a smaller power supply and the elimination of relay cards.

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 with guide ring construction which prevents eccentricity of the main valve, and a return piston with increased return force.

(Single and double solenoid types)

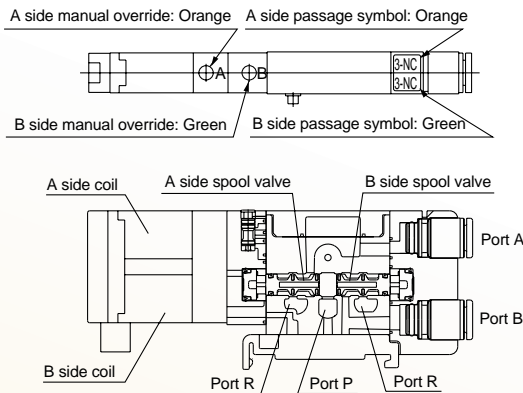
# 5 Port Solenoid Valve/Body Ported Cassette Type Manifold Series **SZ3000**



**New**

## 4 position dual 3 port valve

- Two 3 port valves are contained in one valve body.
- The A and B ports can be individually controlled.
- [N.C./N.C.], [N.O./N.O.] and [N.C./N.O.] combinations are available.
- Mixed mounting with 5 port valves is also possible.
- Labels matched to the colors of the manual overrides are affixed to indicate the "A" and "B" side functions.

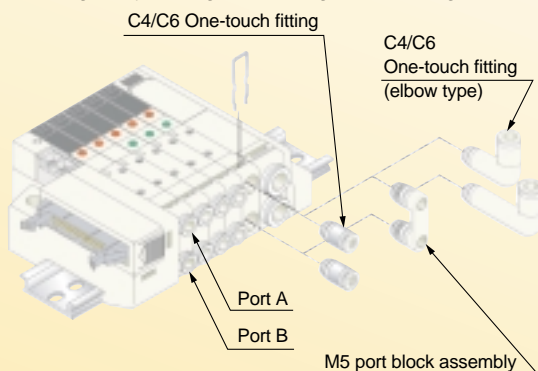


Model	A side	B side	JIS symbol
SZ3A60	N.C. valve	N.C. valve	
SZ3B60	N.O. valve	N.O. valve	
SZ3C60	N.C. valve	N.O. valve	

\* External pilot specifications are not available for 4 position dual 3 port valves.

## Easy attaching/detaching of tubes

The interval between ports A and B is a wide 20.5mm, allowing easy changes of fittings and tubing.



**New**

## Valve with back pressure check valve

- Prevents malfunction caused by exhaust from other valves.
- Effective for driving single acting cylinders and air operated valves, or when using exhaust center valves.
- Prevents back pressure individually on "A" and "B" sides of a 4 position dual 3 port valve.

## One-touch fittings can be changed

Series	Replaceable port sizes		
SZ3000	C4	C6	M5

\* Elbow fittings are for C4 and C6 only.

## New design and bright color tones

The top of the manifold has been flattened and the rounding of corners has been enlarged for easier handling. In addition, bright white color tones have been adopted to compliment modern operating environments.

## Size and weight reduced by eliminating the manifold base

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

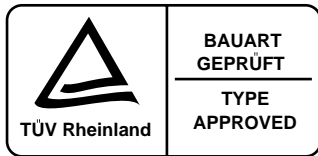
(Compared with SX3000-45 with DIN rail manifold and 5 stations)

## Common exhaust

This feature provides for a cleaner operating environment by exhausting the pilot air through the main valve body rather than directly to the atmosphere.

## Outstanding seal performance

The new rubber seals offer improved durability and performance. Valve failures due to line contaminants have been greatly reduced. (Ozone resistant seals available by special order.)



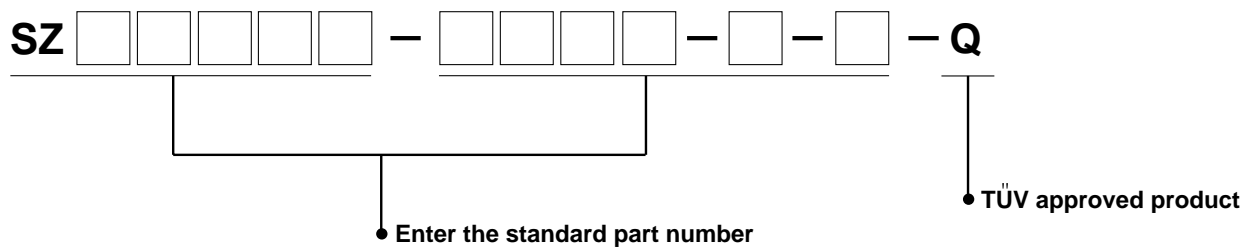
## TÜV Approved Product

( Conforms to standards necessary to satisfy EC directives. )

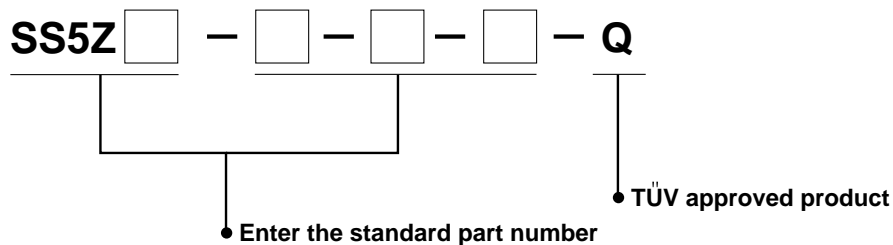
The SZ series has received approval for conformity to standards related to EMC Directives and DIN VDE 0580, from TÜV Rheinland, an EC Notified Body (EC authorization No. 0197). Moreover, since the rated voltage for this series is 50VDC or less, it is not subject to low voltage directives.

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

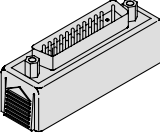
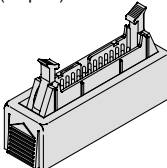
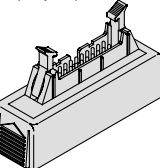
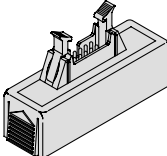
## Plug-in Type

### How to Order

#### • Plug-in manifold with power supply terminals

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

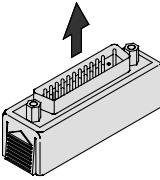
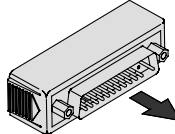
#### • Connector type

<b>F:</b> D-Sub connector (25 pins) 	<b>P:</b> Flat cable (26 pins) 
<b>PG:</b> Flat cable (20 pins) 	<b>PH:</b> Flat cable (10 pins) 

#### • Connector mounting position

Symbol	Mounting position
<b>D</b>	D side

#### • Connector entry direction

<b>1:</b> Perpendicular connector 	<b>2:</b> Lateral connector 
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#### • Supply/Exhaust block mounting position

<b>U</b>	U Side (2 to 10 stations)
<b>D</b>	D Side (2 to 10 stations)
<b>B</b>	Both sides (2 to 20 stations)
<b>*M</b>	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

<b>Nil</b>	Internal pilot specifications
<b>R</b>	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
<b>P</b>	24VDC, positive common
<b>P12</b>	12VDC, positive common
<b>N</b>	24VDC, negative common
<b>N12</b>	12VDC, negative common

#### • Supply/Exhaust block fitting specifications

<b>Nil</b>	Straight
<b>L</b>	Elbow fittings (upward)
<b>B</b>	Elbow fittings (downward)

#### • Valve stations

##### F: D-sub connector

Symbol	Stations	Note
<b>02</b>	2 stations	Double wiring specification <small>Note 1)</small>
⋮	⋮	
<b>10</b>	10 stations	Specified layout <small>Note 2)</small> (up to 21 solenoids possible)
<b>02</b>	2 stations	
⋮	⋮	
<b>20</b>	20 stations	

##### P: Flat cable connector (26 pins)

Symbol	Stations	Note
<b>02</b>	2 stations	Double wiring specification
⋮	⋮	
<b>11</b>	11 stations	Specified layout (up to 22 solenoids possible)
<b>02</b>	2 stations	
⋮	⋮	
<b>20</b>	20 stations	

##### PG: Flat cable connector (20 pins)

Symbol	Stations	Note
<b>02</b>	2 stations	Double wiring specification
⋮	⋮	
<b>08</b>	8 stations	Specified layout (up to 16 solenoids possible)
<b>02</b>	2 stations	
⋮	⋮	
<b>16</b>	16 stations	

##### PH: Flat cable connector (10 pins)

Symbol	Stations	Note
<b>02</b>	2 stations	Double wiring specification
⋮	⋮	
<b>04</b>	4 stations	Specified layout (up to 8 solenoids possible)
<b>02</b>	2 stations	
⋮	⋮	
<b>08</b>	8 stations	

Note 1) Double wiring specifications: Single, double and 3 position/4 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/4 position valves.)

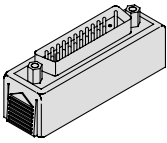
## How to Order

### • Plug-in manifold [without power supply terminals]

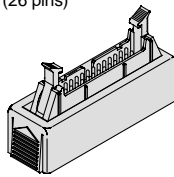
SS5Z3-60 **F** **D** **1** - **05** **U**       -   

#### • Connector type

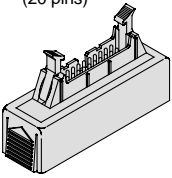
F: D-Sub connector  
(25 pins)



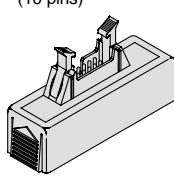
P: Flat cable  
(26 pins)



PG: Flat cable  
(20 pins)



PH: Flat cable  
(10 pins)

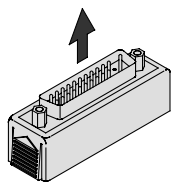


#### • Connector mounting position

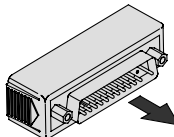
Symbol	Mounting position
<b>D</b>	D side

#### • Connector entry direction

1: Perpendicular connector



2: Lateral connector



#### • Supply/Exhaust block mounting position

<b>U</b>	U Side (2 to 10 stations)
<b>D</b>	D Side (2 to 10 stations)
<b>B</b>	Both sides (2 to 20 stations)
<b>*M</b>	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.

#### • Supply/Exhaust block fitting specifications

<b>Nil</b>	Straight
<b>L</b>	Elbow fittings (upward)
<b>B</b>	Elbow fittings (downward)

#### • Pilot specifications

<b>Nil</b>	Internal pilot specifications
<b>R</b>	External pilot specifications

#### • Valve stations

##### F: D-sub connector

Symbol	Stations	Note
<b>02</b>	2 stations	Double wiring specification <small>Note 1)</small>
⋮	⋮	
<b>12</b>	12 stations	Specified wiring <small>Note 2)</small> (up to 24 solenoids possible)
<b>13</b>	13 stations	
⋮	⋮	
<b>20</b>	20 stations	

##### P: Flat cable connector (26 pins)

Symbol	Stations	Note
<b>02</b>	2 stations	Double wiring specification
⋮	⋮	
<b>12</b>	12 stations	Specified wiring (up to 25 solenoids possible)
<b>13</b>	13 stations	
⋮	⋮	
<b>20</b>	20 stations	

##### PG: Flat cable connector (20 pins)

Symbol	Stations	Note
<b>02</b>	2 stations	Double wiring specification
⋮	⋮	
<b>09</b>	9 stations	Specified wiring (up to 19 solenoids possible)
<b>10</b>	10 stations	
⋮	⋮	
<b>19</b>	19 stations	

##### PH: Flat cable connector (10 pins)

Symbol	Stations	Note
<b>02</b>	2 stations	Double wiring specification
⋮	⋮	
<b>04</b>	4 stations	Specified wiring (up to 9 solenoids possible)
<b>05</b>	5 stations	
⋮	⋮	
<b>09</b>	9 stations	

Note 1) Double wiring specifications: Single, double and 3 position/4 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/4 position valves.)

## How to Order

• **How to order solenoid valves** For plug-in (common for both with and without power supply terminals)

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

• **Type of actuation**

<b>1</b>	2 position single solenoid 
<b>2</b>	2 position double solenoid 
<b>3</b>	3 position closed center 
<b>4</b>	3 position exhaust center 
<b>5</b>	3 position pressure center 
<b>A</b>	4 position dual 3 port valve: N.C./N.C. 
<b>B</b>	4 position dual 3 port valve: N.O./N.O. 
<b>C</b>	4 position dual 3 port valve: N.C./N.O. 

• **Rated voltage**

<b>5</b>	24VDC
<b>6</b>	12VDC

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

• **Back pressure check valve**

<b>Nil</b>	None
<b>K</b>	Built-in

- The built-in back pressure check valve type has an effective area approximately 20% smaller.
- The 3 position closed center and 3 position pressure center are not available with back pressure check valve.

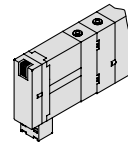
• **Pilot specifications**

<b>Nil</b>	Internal pilot
<b>R</b>	External pilot

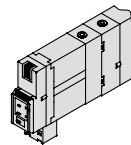
- The 4 position dual 3 port valve is not available with external pilot specifications.

• **Switch specifications**

Nil: Without switch



J: With switch



\* Refer to page 48 regarding switch operation.

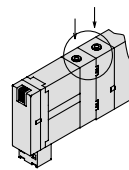
• **Common specifications**

<b>Nil</b>	Pos. common
<b>N</b>	Neg. common

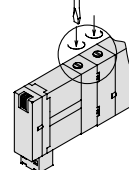
- When using on a manifold with power supply terminals, be sure to match with the manifold's common specifications.

• **Manual override**

Nil: Non-locking push type

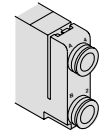


D: Slotted locking type  
Screw driver operated

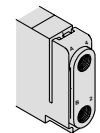


• **A, B port size**

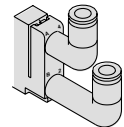
C4: ø4 One-touch fitting  
C6: ø6 One-touch fitting



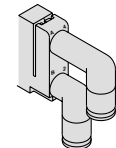
M5: M5 x 0.5



Elbow fitting assembly (upward)  
L4: ø4 elbow fitting assembly  
L6: ø6 elbow fitting assembly



Elbow fitting assembly (downward)  
B4: ø4 elbow fitting assembly  
B6: ø6 elbow fitting assembly

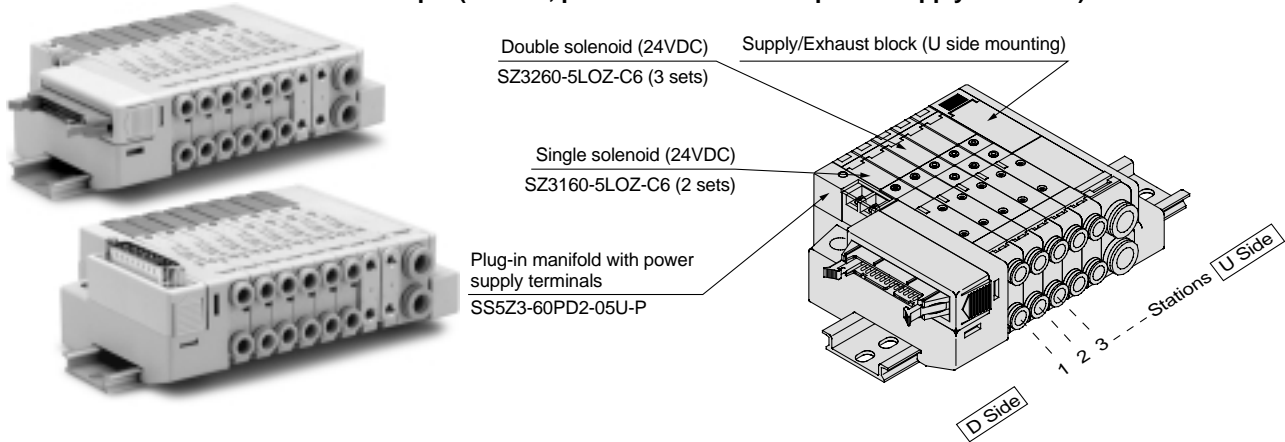




# Series SZ3000

## 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 the 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 37.)

## Manifold Specifications

Model	D-sub connector 60F	Flat cable type 60P□		
		60P	60PG	60PH
<b>Manifold type</b>	Plug-in type			
<b>P (SUP), R (EXH) system</b>	Common SUP, EXH			
<b>Valve stations (with power terminal)</b>	2 to 20 stations		2 to 16 stations	2 to 8 stations
<b>A, B port piping specifications</b>	<b>Location</b>	Valve		
	<b>Direction</b>	Lateral, Upward, Downward		
<b>Port size</b>	<b>P, R ports</b>	C8		
	<b>A/B ports</b>	C4, C6, M5		
<b>Valve effective area mm<sup>2</sup> (Cv factor)</b> <small>Note 2)</small>	C4	P→A/B	3.4 (0.19) [3.0 (0.17)]	
		A/B→R	3.2 (0.18) [3.2 (0.18)]	
	C6	P→A/B	3.7 (0.21) [3.2 (0.18)]	
		A/B→R	3.9 (0.22) [3.8 (0.21)]	
	M5	P→A/B	3.4 (0.19) [3.2 (0.18)]	
		A/B→R	3.2 (0.18) [3.2 (0.18)]	
<b>Applicable connector</b>	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
<b>Internal wiring</b>	+COM, -COM			
<b>Weight W (g)</b> <small>Note 3)</small> (n1: Stations n2: Number of supply/exhaust blocks m: Weight of DIN rail)	$W = 3.2n_1 + 53n_2 + m + 126.5$			

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 individual operation.

- Values inside [ ] are for 4 position dual 3 port valves. Furthermore, when the "A" and "B" sides of a 4 position dual 3 port valve are operated simultaneously, the value for the Cv factor will be approximately 35% less than shown in the table above.
- The Cv factor for a valve with back pressure check valve will be approximately 20% less than shown in the table above.

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 5 for the appropriate number of stations. Refer to page 7 for the weight of DIN rails.



# Cassette Type Manifold **Series SZ3000**

## Solenoid Valve Specifications

Series		SZ3000	
Fluid		Air	
Internal pilot operating pressure range MPa	2 position single	0.15 to 0.7	
	2 position double	0.1 to 0.7	
	3 position	0.2 to 0.7	
	4 position dual 3 port valve	0.15 to 0.7	
External pilot operating pressure range MPa	Operating pressure range		-100kPa to 0.7
	Pilot pressure range	2 position single	0.25 to 0.7
		2 position double	0.25 to 0.7
		3 position	0.25 to 0.7
Ambient and fluid temperature °C		Maximum 50	
Max. operating frequency Hz	2 position single, double		10
	4 position dual 3 port valve		
	3 position		3
Manual override		Non-locking push type, Screw driver operated slotted locking type	
Pilot system		Main valve/Pilot valve common exhaust type	
Lubrication		Not required	
Mounting position		Unrestricted	
Impact/Vibration resistance m/s <sup>2</sup> <small>Note)</small>		150/30 (8.3 to 2000Hz)	
Enclosure		Dust proof	

Note) Impact resistance: No malfunction when tested with a drop tester in the axial direction and at a right angle to the main valve and armature 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 and at a right angle to the main valve and armature 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 <small>Note)</small>	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 24VDC 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).

Type of actuation	Response time ms (at 0.5MPa)	
	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
4 position dual 3 port valve	30 or less	35 or less

## Weight Table

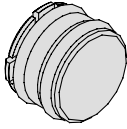
Valve model	Type of actuation		Port size	Weight g
			A, B	
SZ3□60-□-C4	2 position	Single	C4 (ø4 One-touch fitting)	78
		Double		84
	3 position	Closed center		88
		Exhaust center		
		Pressure center		
	4 position	Dual 3 port valve		84
SZ3□60-□-C6	2 position	Single	C6 (ø6 One-touch fitting)	74
		Double		81
	3 position	Closed center		85
		Exhaust center		
		Pressure center		
	4 position	Dual 3 port valve		81
SZ3□60-□-M5	2 position	Single	M5 x 0.8	69
		Double		75
	3 position	Closed center		79
		Exhaust center		
		Pressure center		
	4 position	Dual 3 port valve		75

# Series SZ3000

## Manifold Options

### ■ SUP blocking disk

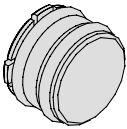
By installing a SUP blocking disk in the pressure supply passage of a manifold valve, it is possible to supply two or more different high and low pressures to one manifold. (Use in combination with a pilot port blocking disk.)



Series	Part no.
<b>SZ3000</b>	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.
<b>SZ3000</b>	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.
<b>SZ3000</b>	SZ3000-114-2A

### ■ Indicator stickers for blocking disks

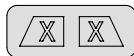
These stickers are to be put on valves in which SUP and EXH blocking disks have been installed so that confirmation is possible from the outside. (3pcs. of each are included.)

#### SZ3000-155-1A

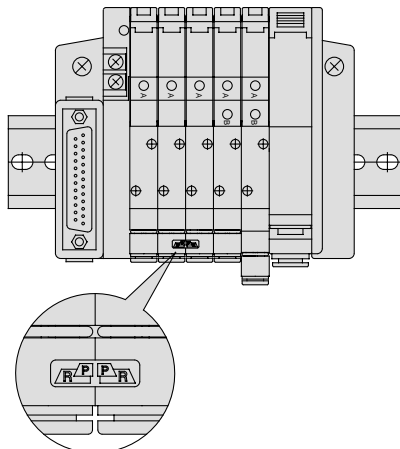
Sticker for SUP/EXH blocking disk      Sticker for EXH blocking disk



Sticker for SUP blocking disk      Sticker for pilot passage blocking disk

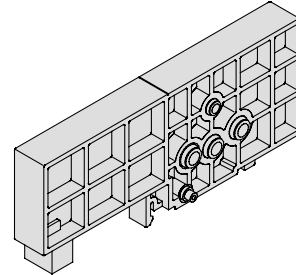


\* If blocking disks are ordered on manifold specification sheets, etc., at the same time that manifolds are ordered, stickers will be attached to the valves with blocking disks installed before shipment.



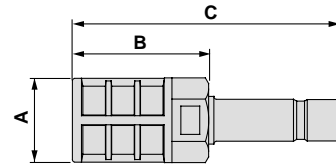
### ■ Blanking block assembly SZ3000-55-1A

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.

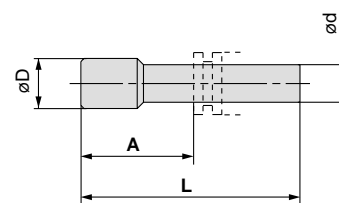


Series	Model	Effective sectional area	A	B	C
<b>for SZ3000 (ø8)</b>	AN203-KM8	14mm <sup>2</sup>	ø16	26	51

### ■ 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.



### Dimensions

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

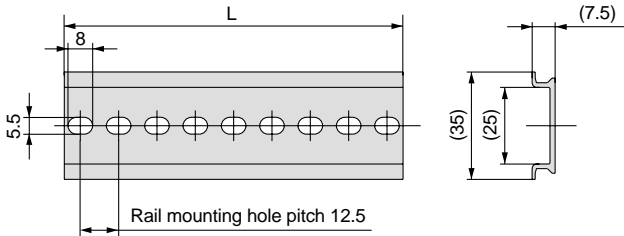
## Manifold Options

### ■ DIN rail dimensions/Weight table

VZ1000-11-1-□

• Refer to the L dimension tables

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



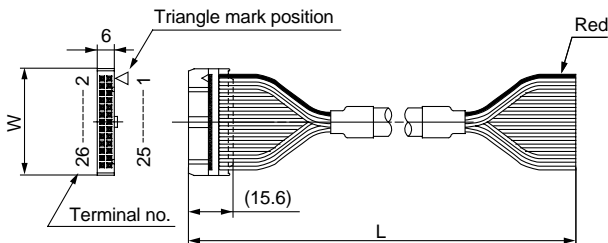
No.	0	1	2	3	4	5	6	7	8	9
L dimension	98	110.5	123	135.5	148	160.5	173	185.5	198	210.5
Weight (g)	17.6	19.9	22.1	24.4	26.6	28.9	31.1	33.4	35.6	37.9

No.	10	11	12	13	14	15	16	17	18	19
L dimension	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
L dimension	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□- $\frac{1}{3}$



#### Flat cable assembly

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

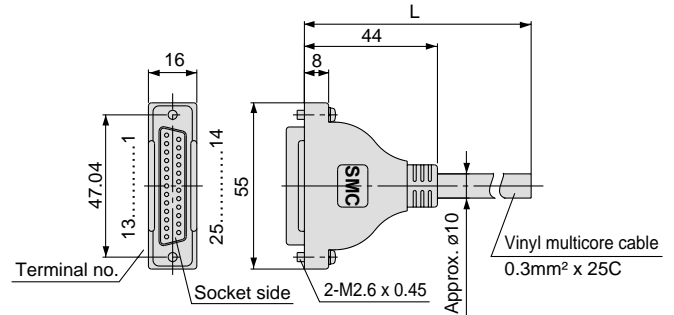
\* If it is desired to use a commercially available connector, use one conforming to MIL-C-83503 with strain relief.

#### 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

AXT100-DS25- $\frac{015}{030}{050}$



#### 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
<b>1.5m</b>	AXT100-DS25-015	Cable 25 cores x24AWG
<b>3m</b>	AXT100-DS25-030	
<b>5m</b>	AXT100-DS25-050	

\* 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 $\Omega/\text{km}$ , 20°C	65 or less
Withstand voltage VAC for 1min.	1000
Insulation resistance $M\Omega/\text{km}$ , 20°C	5 or less

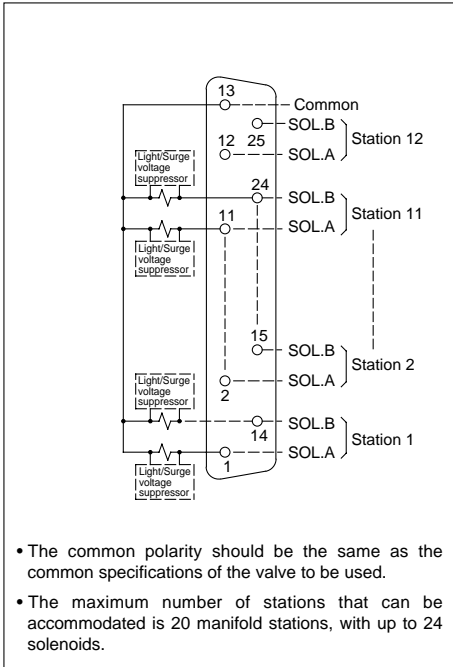
Note) The minimum inside bending radius for the D-sub connector cable is 20mm.

# Series SZ3000

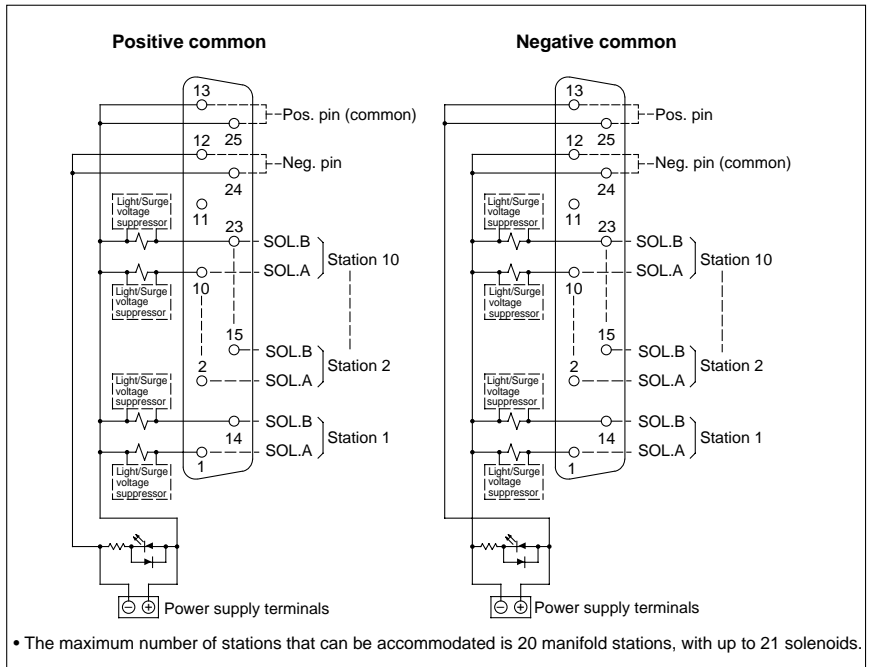
## Manifold Electrical Wiring

### 60F D-sub connector type (25 pins)

#### • Without power supply terminals



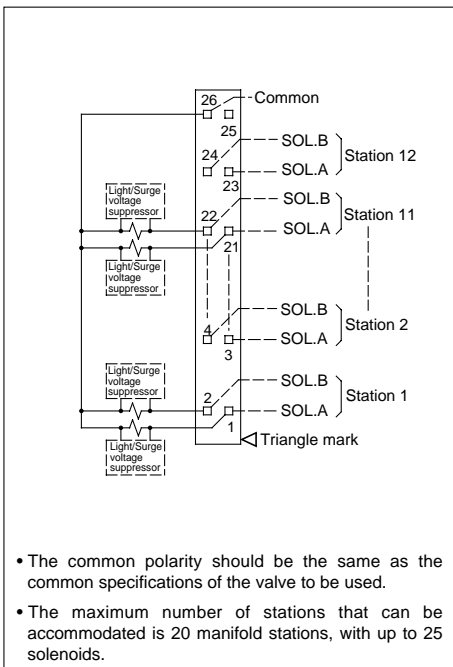
#### • With power supply terminals



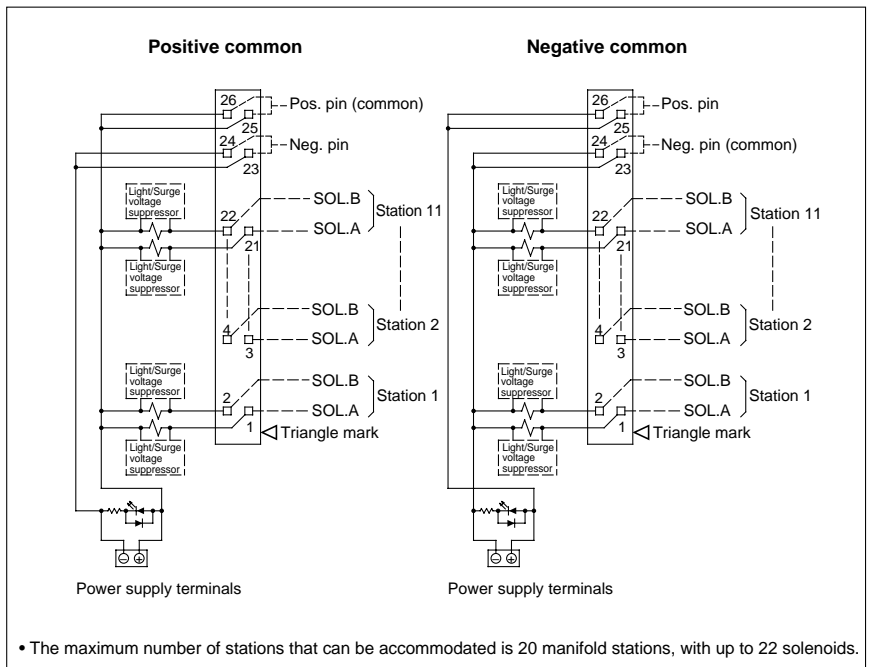
- The circuits above are for the double wiring specification with up to 10 or 12 stations. Connect to SOL.A in the case of a single solenoid. Moreover, when wiring instructions are given on a manifold specification sheet, the "A" signal for single and the "A, B" signals for double should be wired in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

### 60P Flat cable type (26 pins)

#### • Without power supply terminals



#### • With power supply terminals

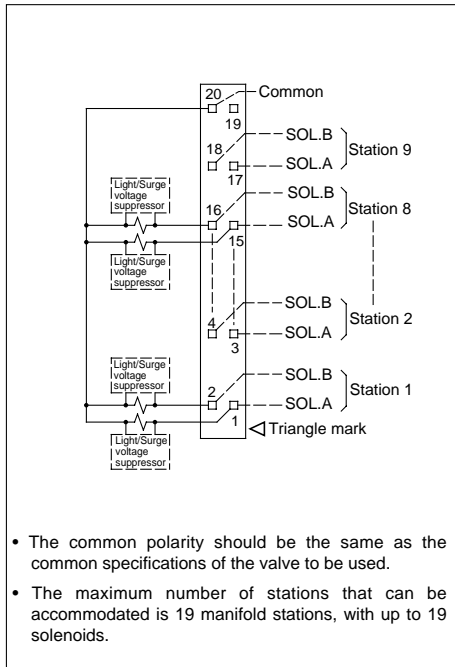


- The circuits above are for the double wiring specification with up to 11 or 12 stations. Connect to SOL.A in the case of a single solenoid. Moreover, when wiring instructions are given on a manifold specification sheet, the "A" signal for single and the "A, B" signals for double should be wired in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

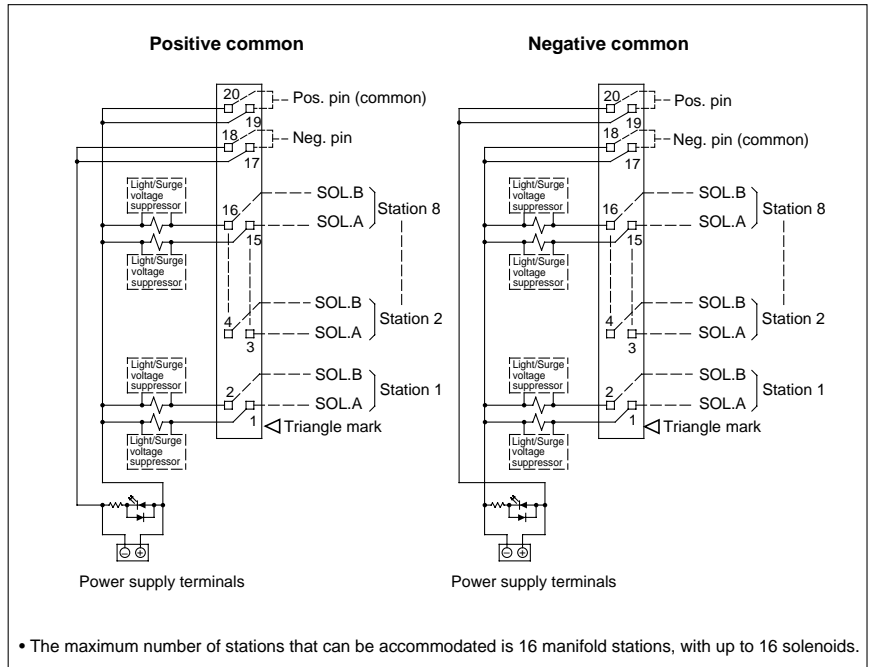
## Manifold Electrical Wiring

### 60PG Flat cable type (20 pins)

#### • Without power supply terminals



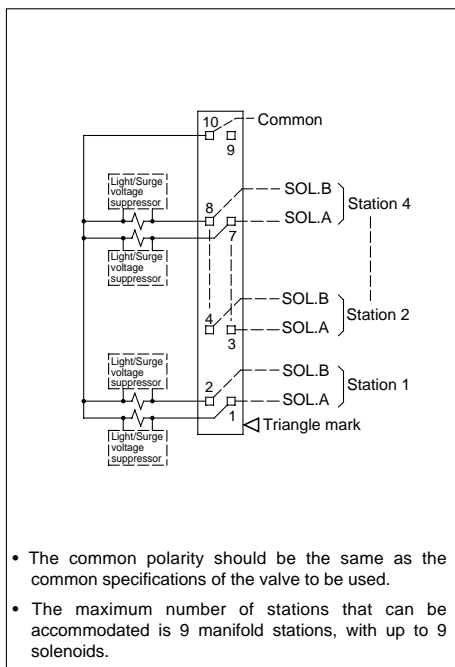
#### • With power supply terminals



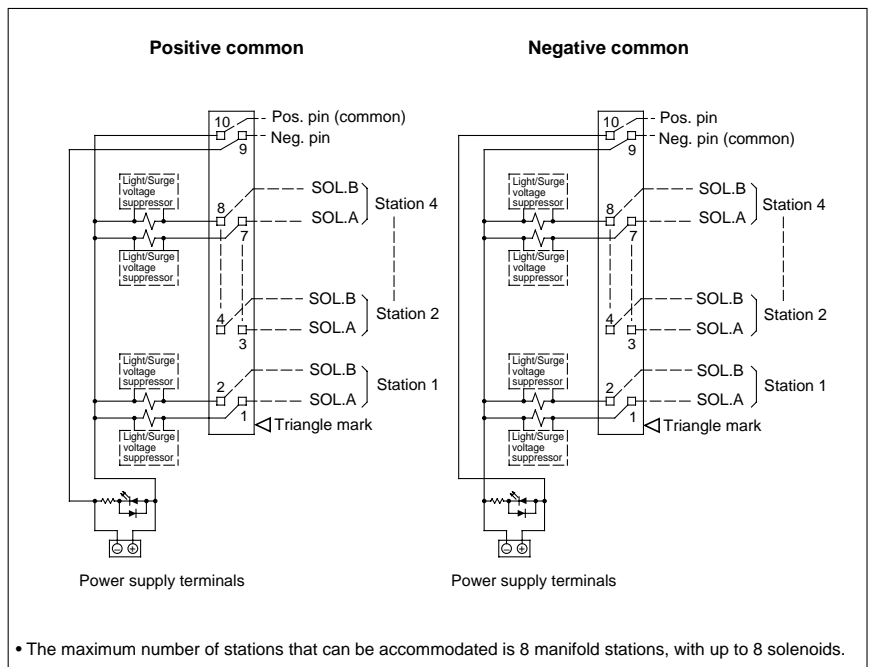
- The circuits above are for the double wiring specification with up to 8 or 9 stations. Connect to SOL.A in the case of a single solenoid. Moreover, when wiring instructions are given on a manifold specification sheet, the "A" signal for single and the "A, B" signals for double should be wired in order 1, 2, 3, 4.....etc., without skipping or leaving any connectors remaining.
- Stations are counted starting with station 1 on the 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



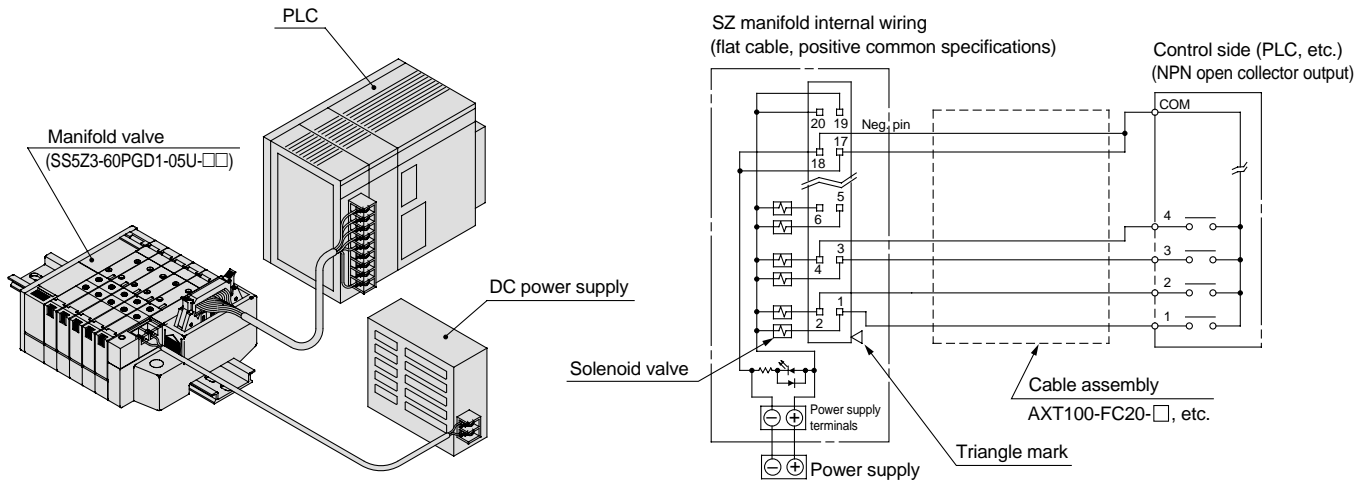
- The circuits above are for the double wiring specification with up to 4 stations. Connect to SOL.A in the case of a single solenoid. Moreover, when wiring instructions are given on a manifold specification sheet, the "A" signal for single and the "A, B" signals for double should be wired in order 1,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

# Series SZ3000

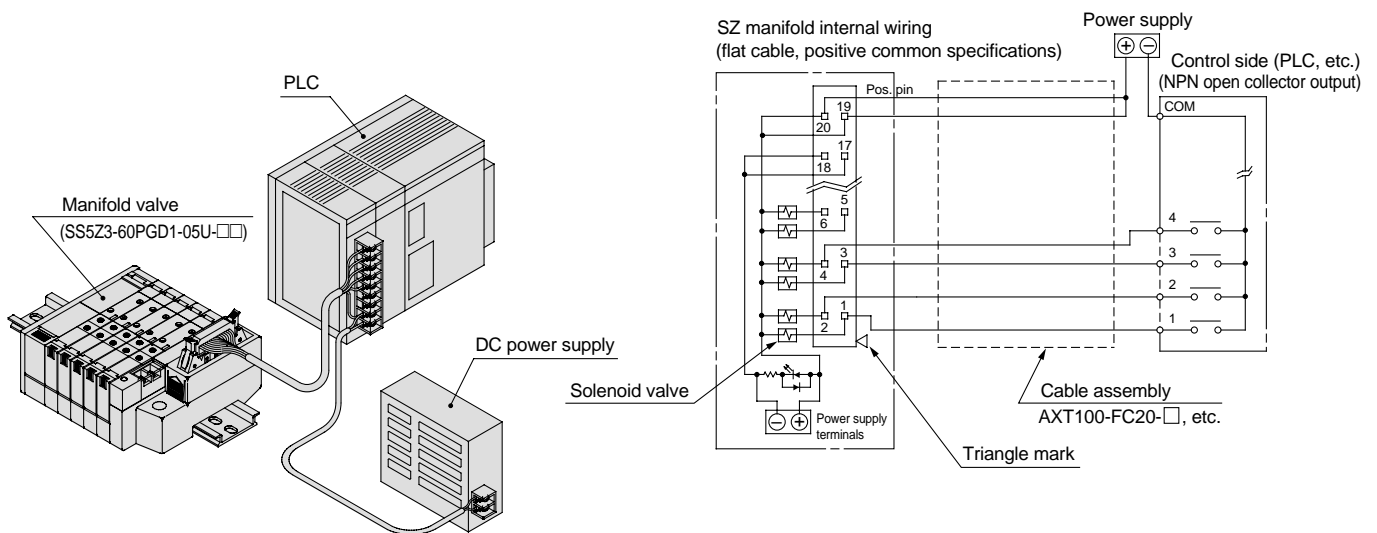
## Wiring of Plug-in Type Manifold with Power Supply Terminals (Examples)

- 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.)



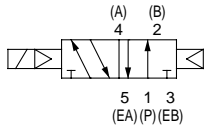
### ⚠ Caution

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

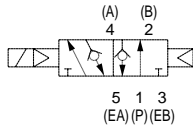
## Construction

### JIS symbol

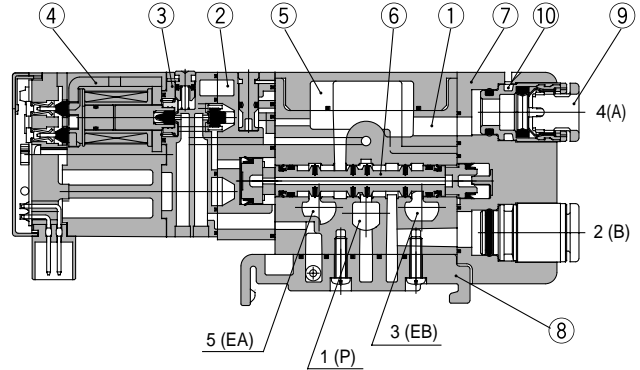
#### 2 position single



#### 2 position single with back pressure check valve

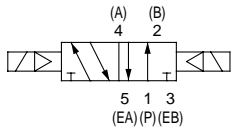


#### 2 position single

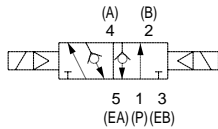


### JIS symbol

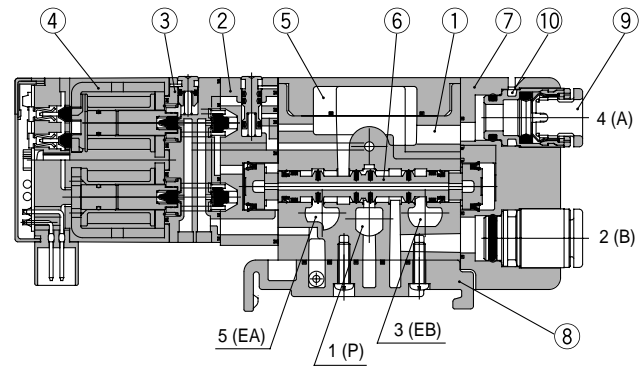
#### 2 position double



#### 2 position double with back pressure check valve

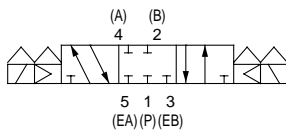


#### 2 position double

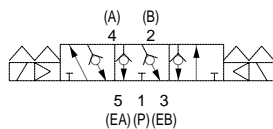


### JIS symbol

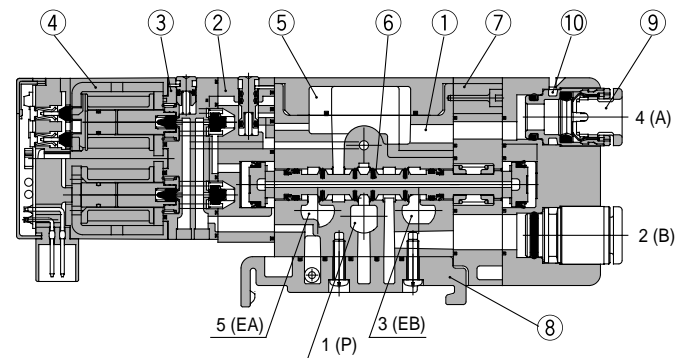
#### 3 position closed center



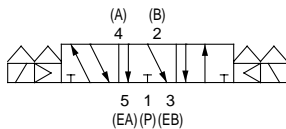
#### 3 position exhaust center with back pressure check valve



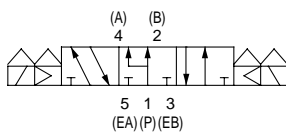
#### 3 position closed center/exhaust center/pressure center



#### 3 position exhaust center



#### 3 position pressure center



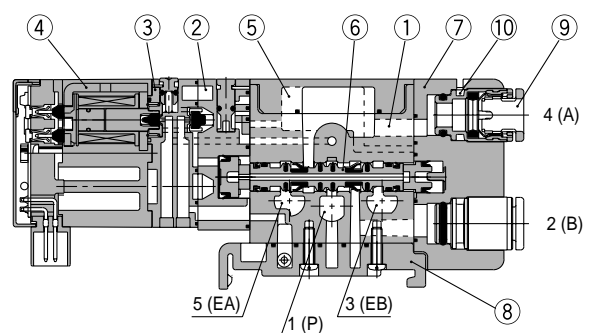
## Parts list

No.	Description	Material	Note
1	Body	Zinc die cast	-
2	Adapter plate	PBT	White
3	Pilot body	PA	White
4	Molded coil	-	Gray
5	Body cover	PA	White
6	Spool valve assembly	Aluminum/NBR	-
7	Port block	PA	White
8	Bottom cover assembly	-	White

## Replacement parts

No	Description	Part no.
9	One-touch fitting	Refer to One-touch fitting part number information on page 51.
10	Clip	SX3000-115-2

#### 2 position single with back pressure check valve



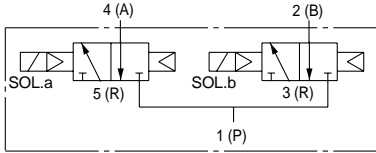


# Series SZ3000

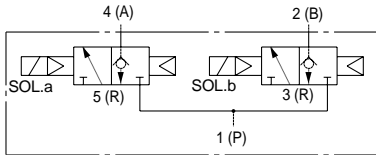
## JIS symbol

### 4 position dual 3 port valve

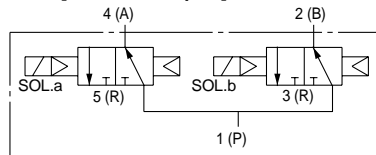
#### SZ3A60 [N.C. valve x 2pcs.]



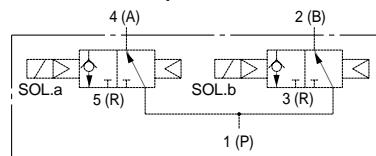
#### SZ3A60K/With back pressure check valve



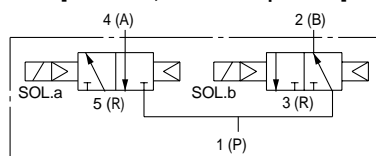
#### SZ3B60 [N.C. valve x 2pcs.]



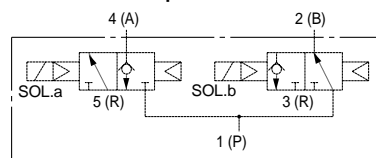
#### SZ3B60K/With back pressure check valve



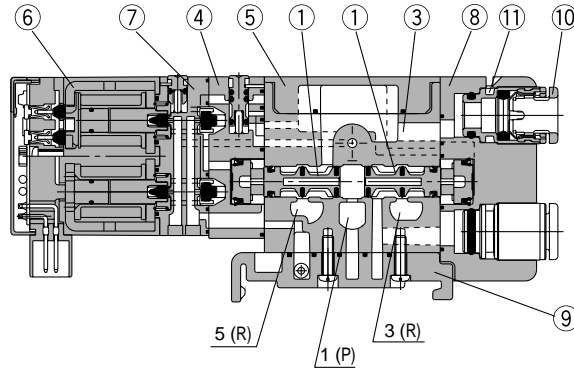
#### SZ3C60 [N.C. valve, N.O. valve 1pc. each]



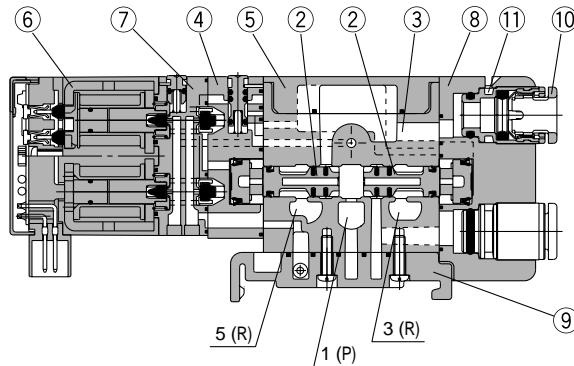
#### SZ3C60K/With back pressure check valve



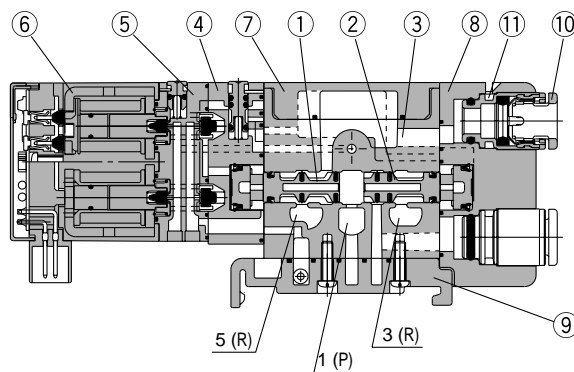
### SZ3A60 [N.C. valve x 2pcs.]



### SZ3B60 [N.O. valve x 2pcs.]



### SZ3C60 [N.C valve, N.O. valve 1pc. each]



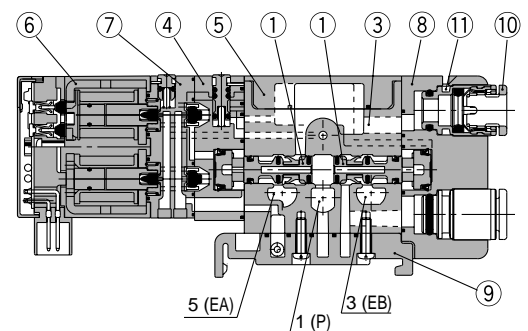
## Parts list

No.	Description	Material	Note
1	Spool valve assembly	PA/NBR	For N.C. (normally closed)
2	Spool valve assembly	PA/NBR	For N.O. (normally open)
3	Body	Zinc die cast	—
4	Adapter plate	PBT	White
5	Pilot body	PA	White
6	Molded coil	—	Gray
7	Body cover	PA	White
8	Port block	PA	White
9	Bottom cover assembly	—	White

## Replacement parts

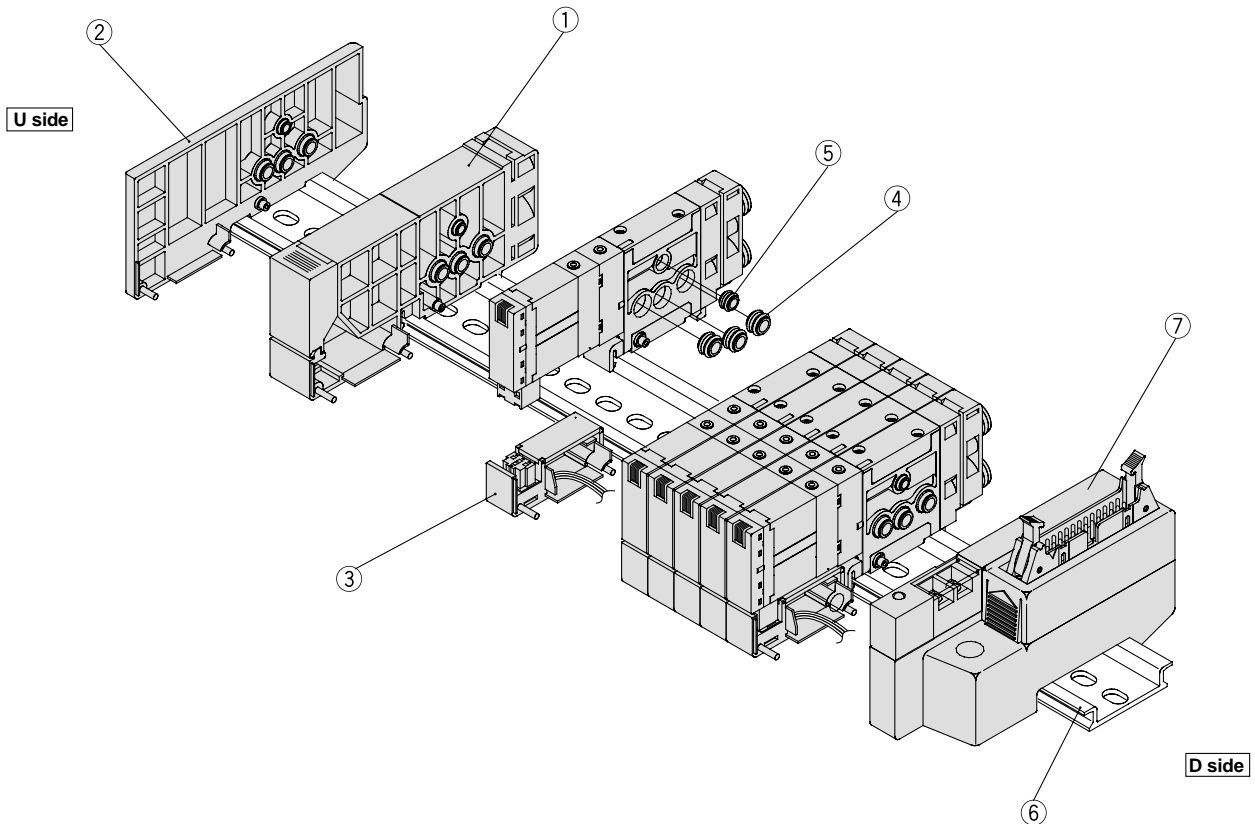
No.	Description	Part no.
10	One-touch fitting	Refer to One-touch fitting part number information on page 51.
11	Clip	SX3000-115-2

### SZ3A60K/With back pressure check valve



## Manifold Exploded View

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



### Parts list

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

### Connector block assembly part numbers

Connector specifications	Mounting position	Part no.		Note
		Without power supply terminals	With power supply terminals	
For D-sub connector	D side	<b>SZ3000-40-1A-□□D<sub>2</sub><sup>1</sup></b>	<b>SZ3000-40-2A-□□D<sub>2</sub><sup>1-P</sup><sub>N</sub></b>	* 1: Perpendicular connector * 2: Lateral connector P: Positive common N: Negative common
For flat cable 26 pins	D side	<b>SZ3000-40-3A-□□D<sub>2</sub><sup>1</sup></b>	<b>SZ3000-40-4A-□□D<sub>2</sub><sup>1-P</sup><sub>N</sub></b>	
For flat cable 20 pins	D side	<b>SZ3000-40-5A-□□D<sub>2</sub><sup>1</sup></b>	<b>SZ3000-40-6A-□□D<sub>2</sub><sup>1-P</sup><sub>N</sub></b>	(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 10 pins	D side	<b>SZ3000-40-7A-□□D<sub>2</sub><sup>1</sup></b>	<b>SZ3000-40-8A-□□D<sub>2</sub><sup>1-P</sup><sub>N</sub></b>	

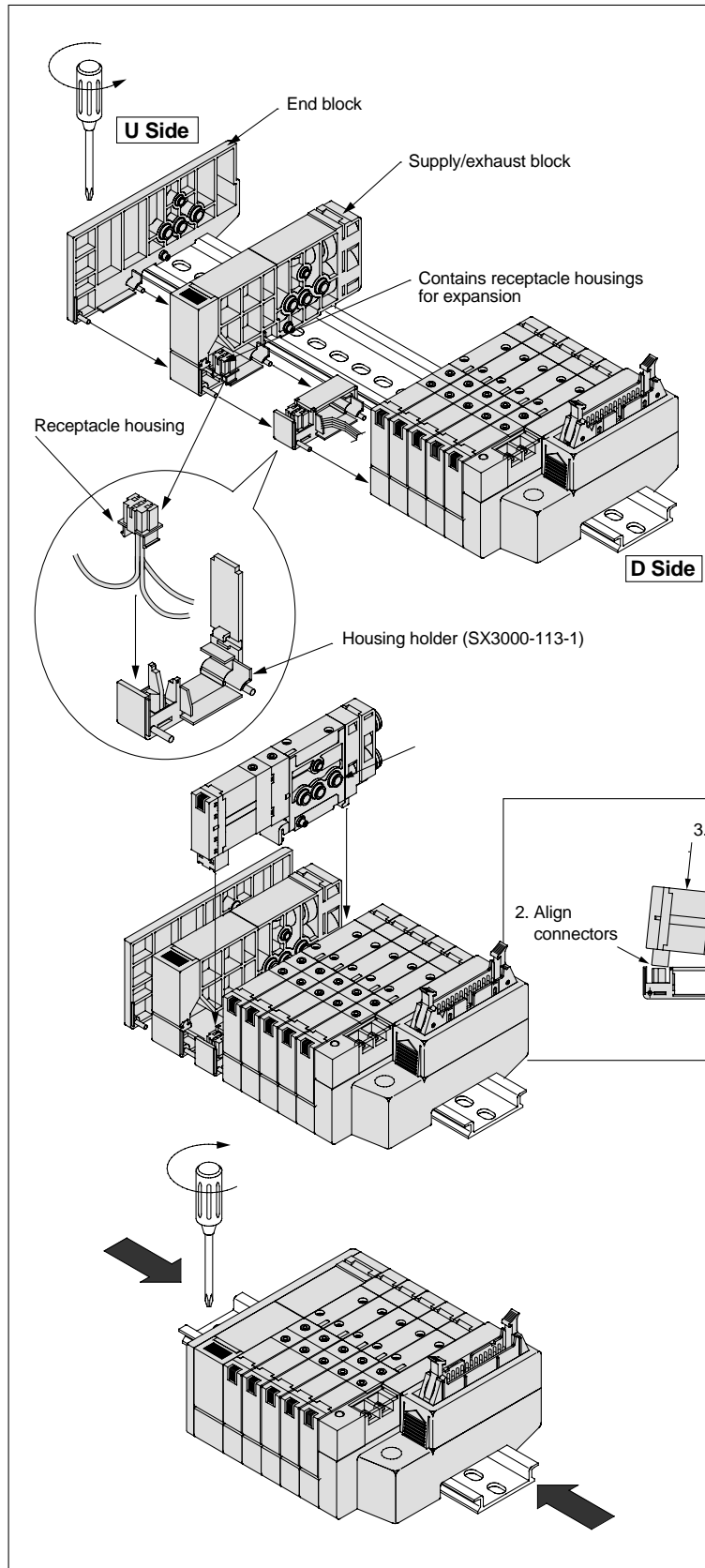
Note 1) A connector block assembly can be shipped as an assembly only in the case of double wiring. Since the possible number of stations differs depending on the connector type, refer to the valve station section on catalog page 2 and enter the number of stations in the □□ section of the assembly part 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 the 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. (Numbers 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.**

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

### ⚠ Caution

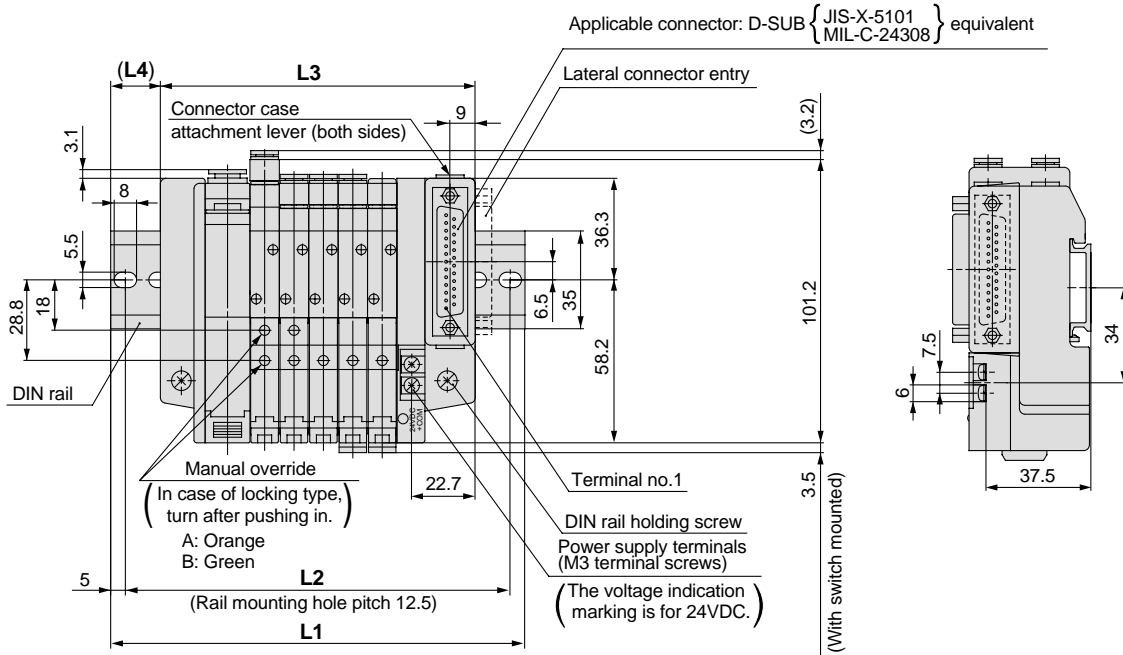
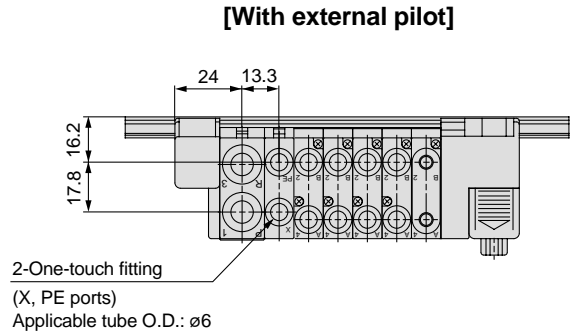
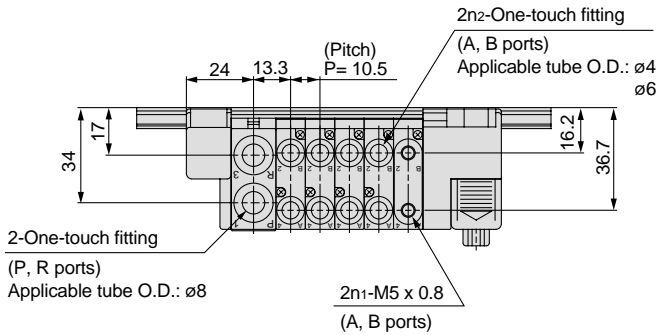
1. Be sure to shut off the power and air supplies before disassembling. Since air may remain inside actuators, piping and manifolds, confirm that the air is completely exhausted before beginning work.
2. When disassembly and assembly are performed, air leakage may result if connections between blocks and tightening of the end block's holding screw, is 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**

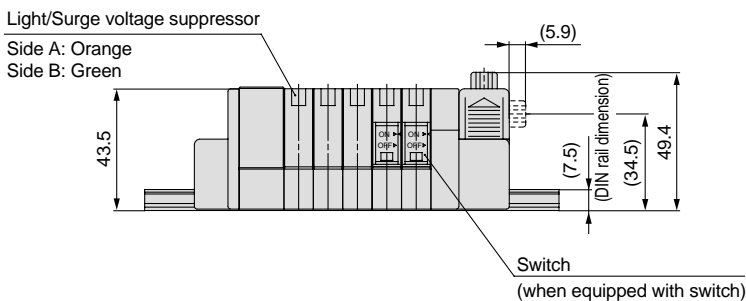
## Dimensions/SZ3000: Plug-in

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

**Scale: 37%**



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



Note ) Refer to page 19 for manifold dimensions with elbow fitting.

### Internal pilot manifold L: Dimensions

n: Stations (n<sub>1</sub> + n<sub>2</sub>)

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 (n<sub>1</sub> + n<sub>2</sub>)

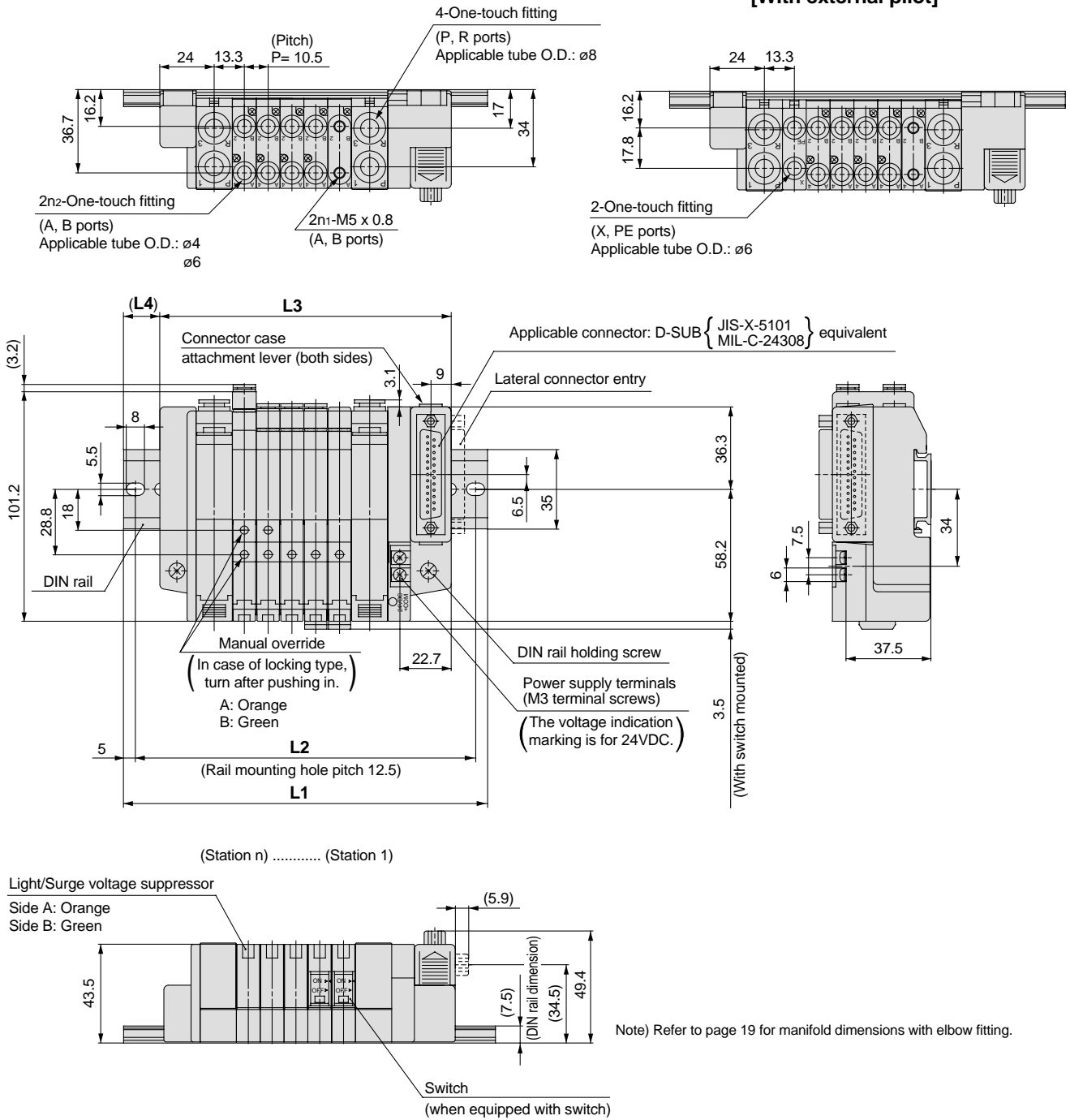
L \ n	2	3	4	5	6	7	8	9	10
L1	123	135.5	148	148	160.5	173	185.5	198	210.5
L2	112.5	125	137.5	137.5	150	162.5	175	187.5	200
L3	91.5	102	112.5	123	133.5	144	154.5	165	175.5
L4	16	17	18	12.5	13.5	14.5	15.5	16.5	17.5

# Series SZ3000

## Dimensions/SZ3000: Plug-in

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

Scale: 37%



### Internal pilot manifold L: Dimensions

n: Stations (n<sub>1</sub> + n<sub>2</sub>)

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 (n<sub>1</sub> + n<sub>2</sub>)

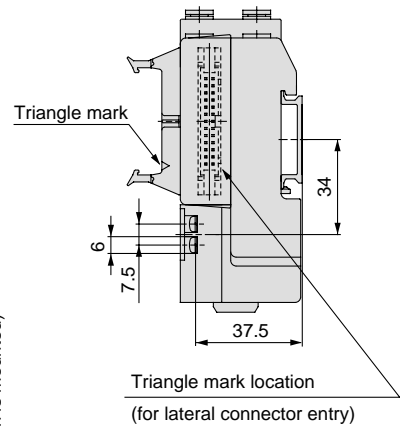
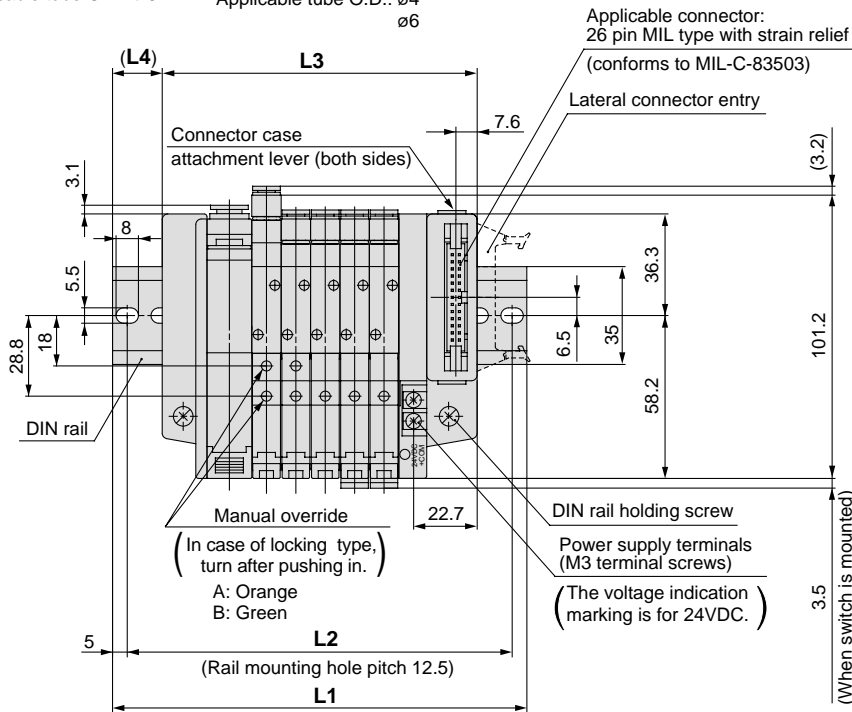
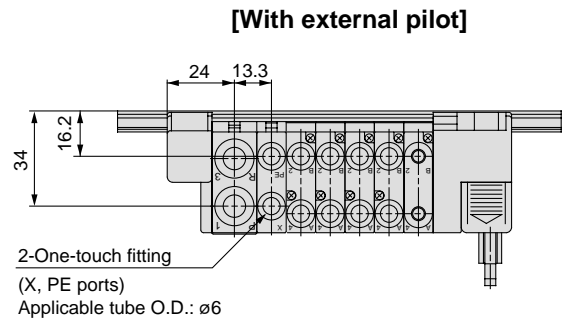
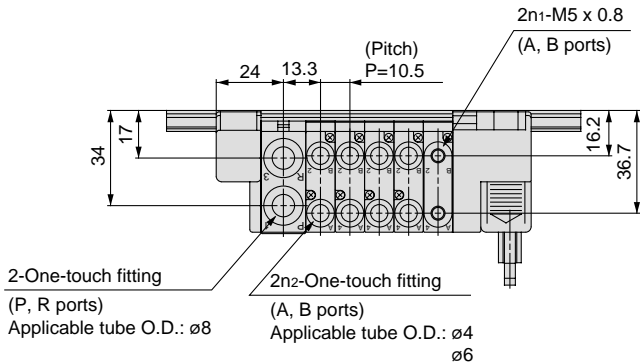
L \ n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	135.5	148	160.5	173	173	185.5	198	210.5	223	235.5	248	248	260.5	273	285.5	298	310.5	310.5	323
L2	125	137.5	150	162.5	162.5	175	187.5	200	212.5	225	237.5	237.5	250	262.5	275	287.5	300	300	312.5
L3	107.5	118	128.5	139	149.5	160	170.5	181	191.5	202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

# Cassette Type Manifold **Series SZ3000**

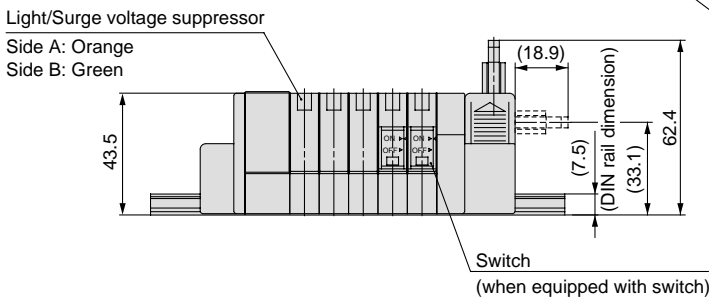
## Dimensions/SZ3000: Plug-in

SS5Z3-60PD  $\frac{1}{2}$  - Stations U-□ (26 pins)

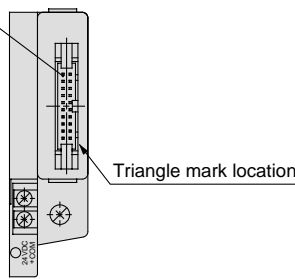
Scale: 37%



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

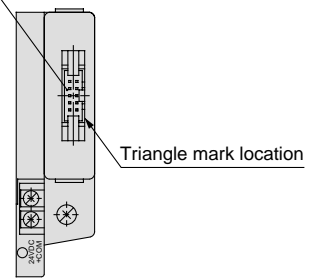


Applicable connector: 20 pin MIL type with strain relief (conforms to MIL-C-83503)



**60PG (20 pins)**

Applicable connector: 10 pin MIL type with strain relief (conforms to MIL-C-83503)



**60PH (10 pins)**

Note 1) Types 60PG and 60PH differ only in their connectors, and the L1 through L4 dimensions are the same as type 60P.

Note 2) Refer to page 19 for manifold dimensions with elbow fitting.

Internal pilot manifold		L: Dimensions									n: Stations (n1 + n2)	
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			

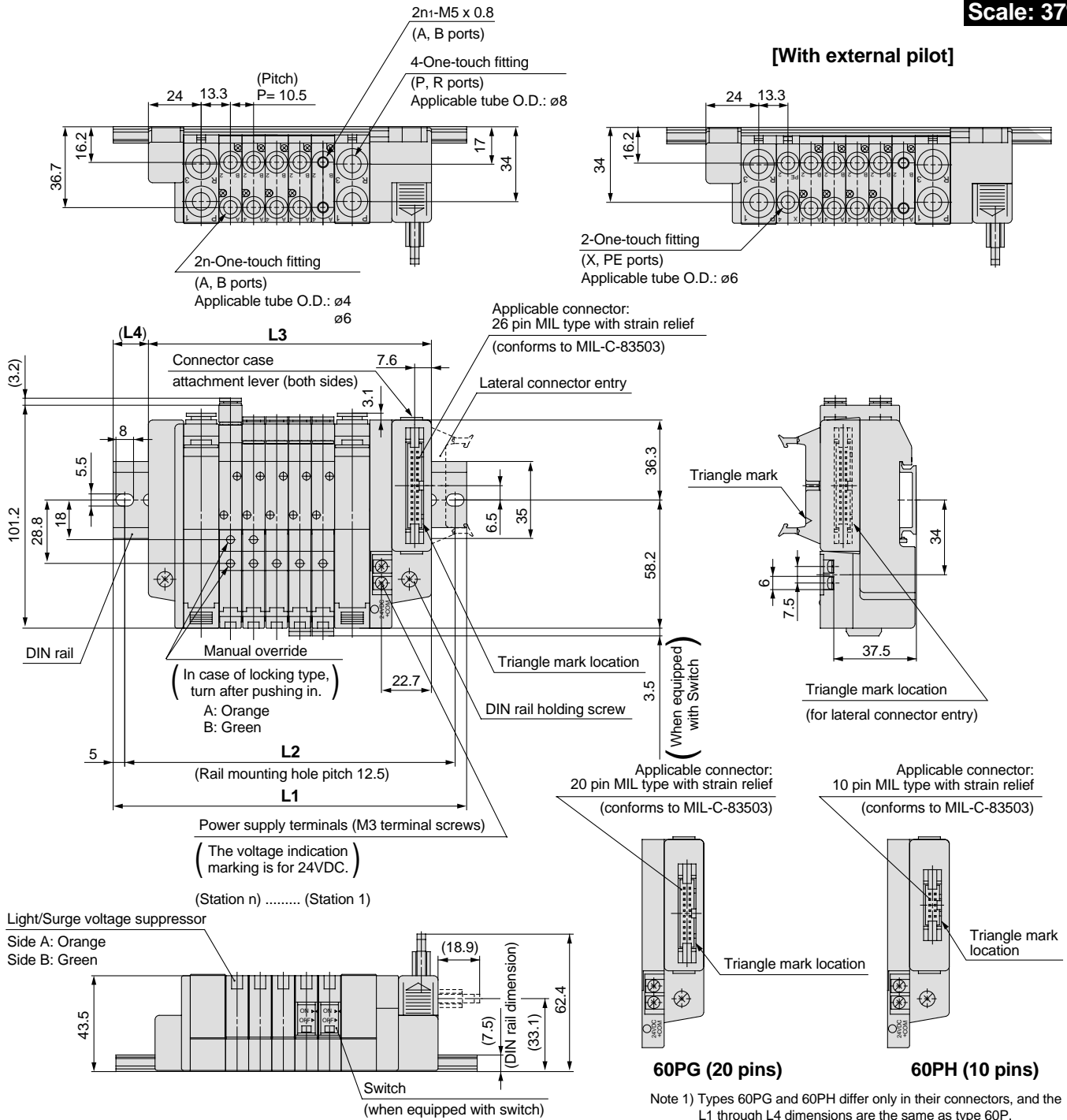
External pilot manifold		L: Dimensions									n: Stations (n1 + n2)	
L \ n	2	3	4	5	6	7	8	9	10			
L1	123	135.5	148	148	160.5	173	185.5	198	210.5			
L2	112.5	125	137.5	137.5	150	162.5	175	187.5	200			
L3	91.5	102	112.5	123	133.5	144	154.5	165	175.5			
L4	16	17	18	12.5	13.5	14.5	15.5	16.5	17.5			

# Series SZ3000

## Dimensions/SZ3000: Plug-in

SS5Z3-60PD  $\frac{1}{2}$  - Stations B-□ (26 pins)

Scale: 37%



### Internal pilot manifold L: Dimensions

n: Stations (n<sub>1</sub> + n<sub>2</sub>)

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	12.3

### External pilot manifold L: Dimensions

n: Stations (n<sub>1</sub> + n<sub>2</sub>)

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

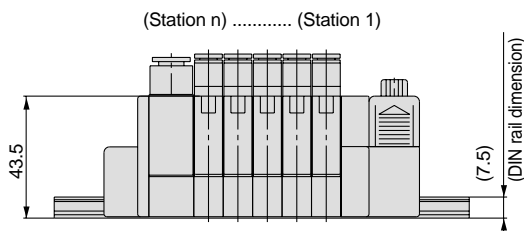
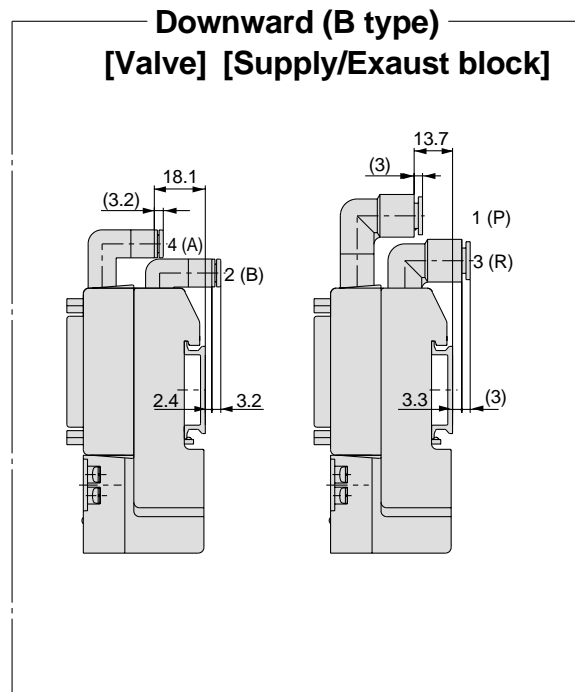
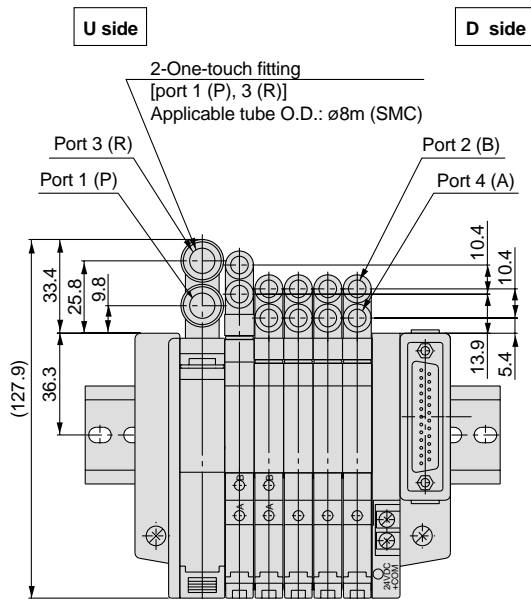
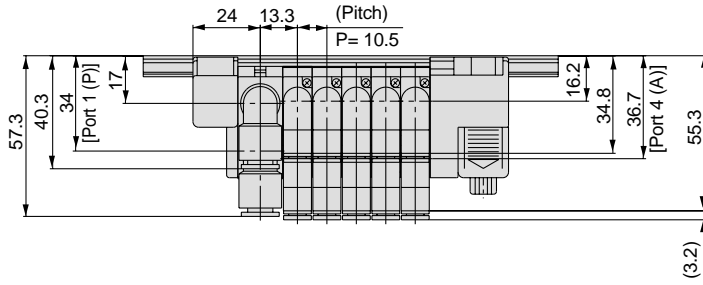


## Dimensions with Elbow Fitting/SZ3000: Plug-in, D-Sub Connector

SS5Z3-60F1D - Station D<sub>B</sub> L - □

Scale: 37%

(The fitting dimension of the flat cable and non-plug-in types is the same.)



# 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.

**Supply/Exhaust block fitting specifications**

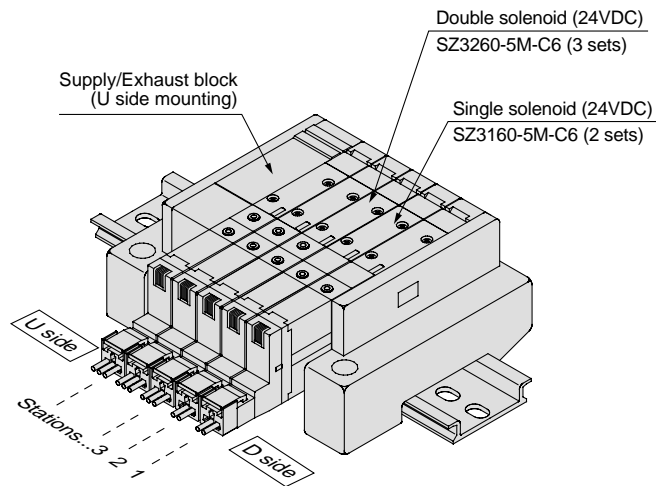
Nil	Straight
L	Elbow type (upward)
B	Elbow type (downward)

**Pilot specifications**

Nil	Internal pilot specifications
R	External pilot specifications

### How to Order Manifold Assemblies (Example)

#### Example (SZ3000, non-plug-in)



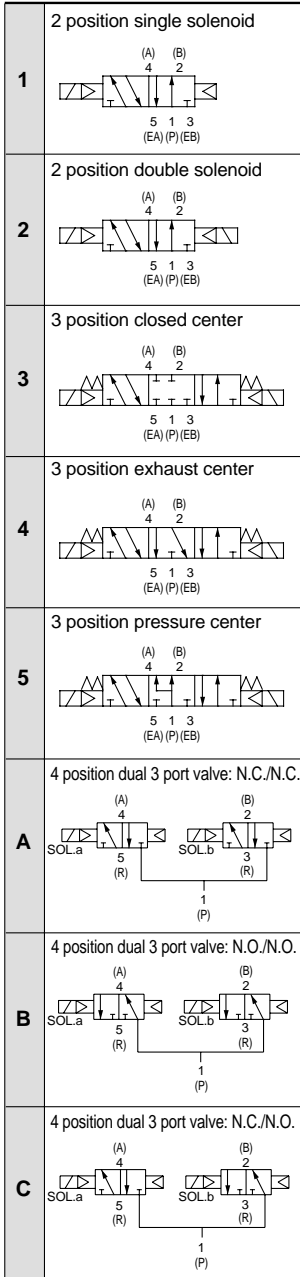
SS5Z3-60-05U	.....	1 set	(manifold part number)
*SZ3160-5M-C6	.....	2 sets	(single solenoid part number)
*SZ3260-5M-C6	.....	3 sets	(double solenoid part number)

- 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 the 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 specification sheet on page 39.)

## How to Order

**SZ3** **1** **60** **5** **M** **C6**

### Type of actuation



### Pilot specifications

<b>Nil</b>	Internal pilot
<b>R</b>	External pilot

- The 4 position dual 3 port valve is not available with external pilot specifications.

### Back pressure check valve

<b>Nil</b>	None
<b>K</b>	Built-in

### Rated voltage

<b>5</b>	24VDC
<b>6</b>	12VDC
<b>V</b>	6VDC
<b>S</b>	5VDC
<b>R</b>	3VDC

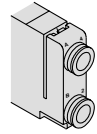
### Common specifications

<b>Nil</b>	Pos. common
<b>N</b>	Neg. common

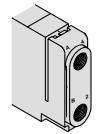
- The symbol is "Nil" when not equipped with light/surge voltage suppressor.

### A, B port size

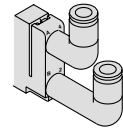
C4: ø4 One-touch fitting  
C6: ø6 One-touch fitting



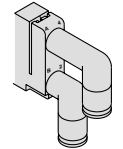
M5: M5 x 0.5



Elbow fitting assembly (upward)  
L4: ø4 elbow fitting assembly  
L6: ø6 elbow fitting assembly

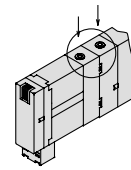


Elbow fitting assembly (downward)  
B4: ø4 elbow fitting assembly  
B6: ø6 elbow fitting assembly

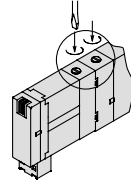


### Manual override

Nil: Non-locking push type



D: Slotted locking type  
Screw driver operated

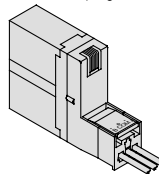


### Light/Surge voltage suppressor

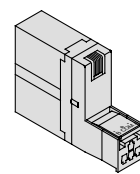
<b>Nil</b>	Without light/Surge voltage suppressor
<b>S</b>	With surge voltage suppressor
<b>Z</b>	With light/Surge voltage suppressor

### Electrical entry

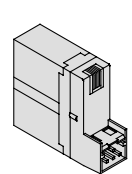
M: With lead wire (length 300mm)



MN: Without lead wire



MO: Without connector





## Manifold Specifications

<b>Model</b>		<b>SS5Z3-60</b>	
<b>Manifold type</b>		Non-plug-in type	
<b>P (SUP), R (EXH) system</b>		Common SUP, EXH	
<b>Valve stations</b>		2 to 20 stations	
<b>A, B port piping specifications</b>		<b>Location</b>	Valve
		<b>Direction</b>	Lateral, Upward, Downward
<b>Port size</b>	<b>P, EA, EB ports</b>	C8	
	<b>A/B ports</b>	C4, C6, M5	
<b>Valve effective area mm<sup>2</sup> (Cv factor)</b> <small>Note 2)</small>	<b>C4</b>	<b>P→A/B</b>	3.4 (0.19) [3.0 (0.17)]
		<b>A/B→R</b>	3.2 (0.18) [3.2 (0.18)]
	<b>C6</b>	<b>P→A/B</b>	3.7 (0.21) [3.2 (0.18)]
		<b>A/B→R</b>	3.9 (0.22) [3.8 (0.21)]
	<b>M5</b>	<b>P→A/B</b>	3.4 (0.19) [3.2 (0.18)]
		<b>A/B→R</b>	3.2 (0.18) [3.2 (0.18)]
<b>Weight W (g)</b> <small>Note 3)</small> (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.

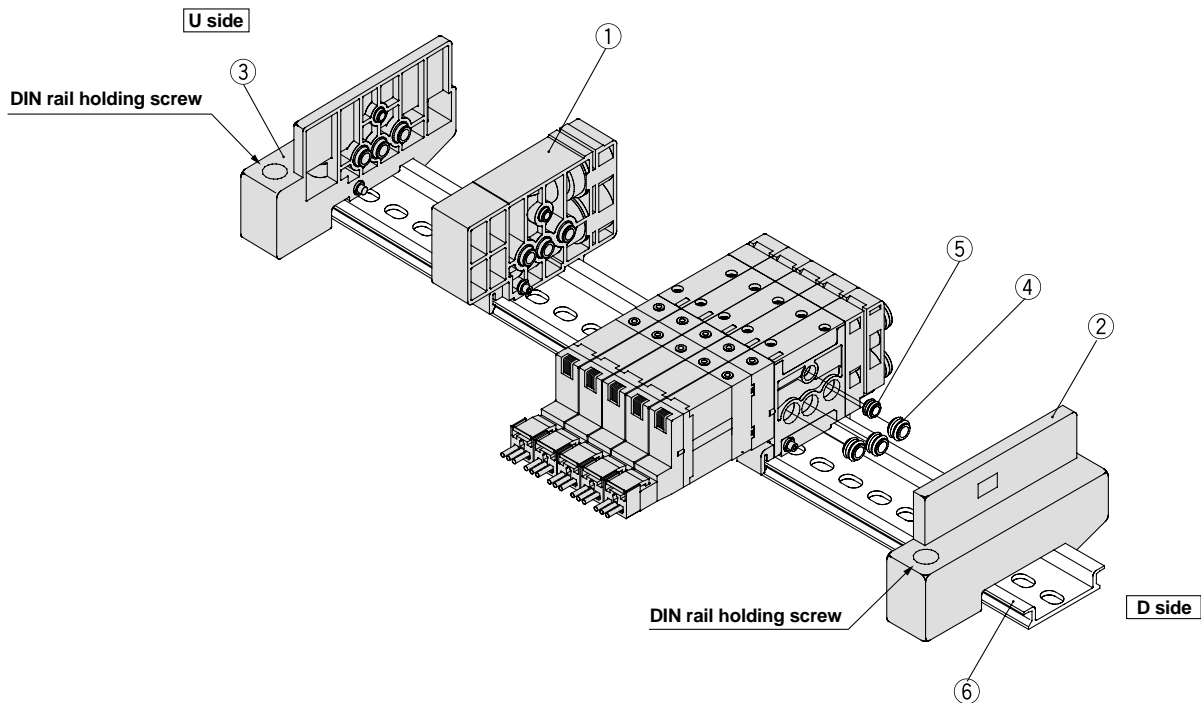
Note 2) •The value is for manifold base mounting (5 stations). 2 position type with individual operation.

- Values inside [ ] are for 4 position dual 3 port valves. Furthermore, when the "A" and "B" sides of a 4 position dual 3 port valve are operated simultaneously, the value for the Cv factor will be approximately 35% less than shown in the table above.
- The Cv factor for a valve with back pressure check valve will be approximately 20% less than shown in the table above.

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 5 for the appropriate number of stations. Refer to page 7 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	<b>SZ3000-50-2A-</b> C6 C8	C6: With ø6 One-touch fitting C8: With ø8 One-touch fitting
2	End block assembly	<b>SZ3000-53-3A</b>	For D side
3	End block assembly	<b>SZ3000-53-4A</b>	For U side
4	Bushing assembly	<b>SZ3000-114-3A</b>	
5	Bushing assembly	<b>SZ3000-114-1A</b>	
6	DIN rail	<b>VZ1000-11-1-□</b>	Refer to page 7.

### Manifold station expansion Station expansion is possible at any position.

1. Loosen one DIN rail holding screw on either the 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: 1.4N·m)

#### ⚠ Caution

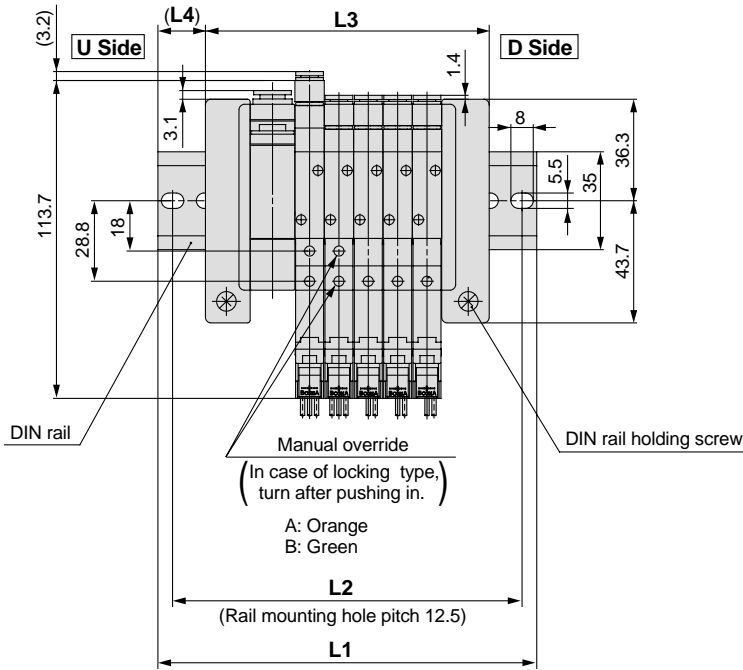
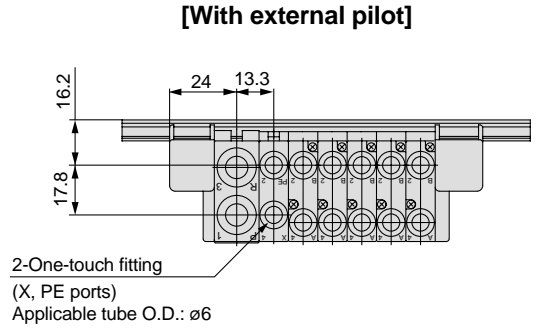
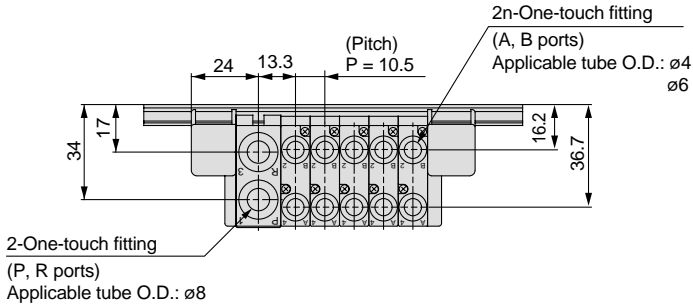
1. Be sure to shut off the power and air supplies before disassembling. Since air may remain inside actuators, piping and manifolds, confirm that the air is completely exhausted before beginning work.
2. When disassembly and assembly are performed, air leakage may result if connections between blocks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

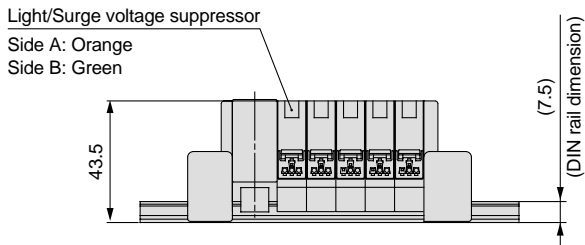
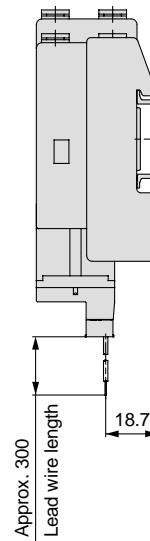
## Dimensions/SZ3000: Non-plug-in

SS5Z3-60 - Stations U

Scale: 37%



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



Note ) Refer to page 19 for manifold dimensions with elbow fitting.

### 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

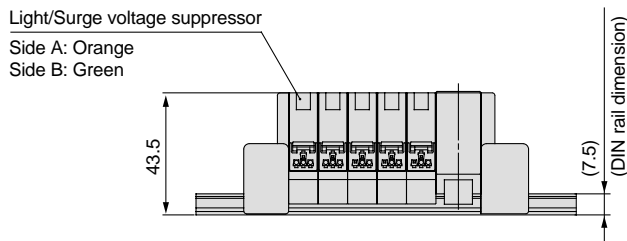
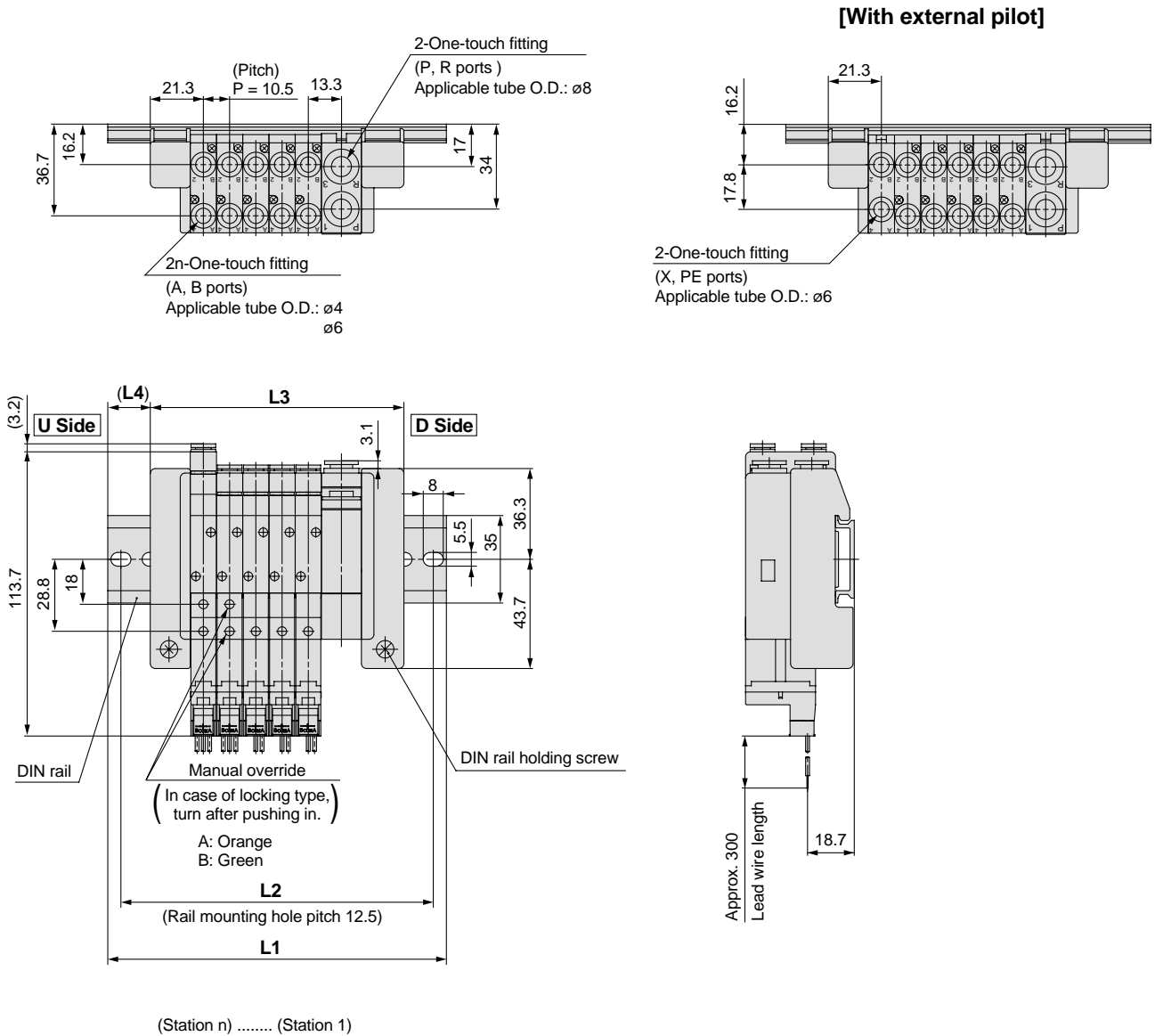
n: Stations

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

## Dimensions/SZ3000: Non-plug-in

SS5Z3-60 - Stations **D**

**Scale: 37%**



Note ) Refer to page 19 for manifold dimensions with elbow fitting.

**Internal pilot manifold L: Dimensions** n: Stations

L \ n	2	3	4	5	6	7	8	9	10
<b>L1</b>	98	110.5	123	135.5	135.5	148	160.5	173	185.5
<b>L2</b>	87.5	100	112.5	125	125	137.5	150	162.5	175
<b>L3</b>	70	80.5	91	101.5	112	122.5	133	143.5	154
<b>L4</b>	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
<b>L1</b>	110.5	123	135.5	135.5	148	160.5	173	185.5	198
<b>L2</b>	100	112.5	125	125	137.5	150	162.5	175	187.5
<b>L3</b>	80.5	91	101.5	112	122.5	133	143.5	154	164.5
<b>L4</b>	15	16	17	12	13	14	15	16	17

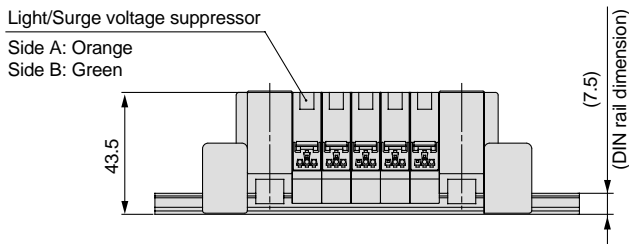
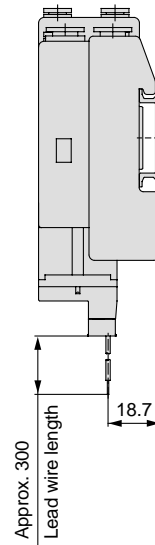
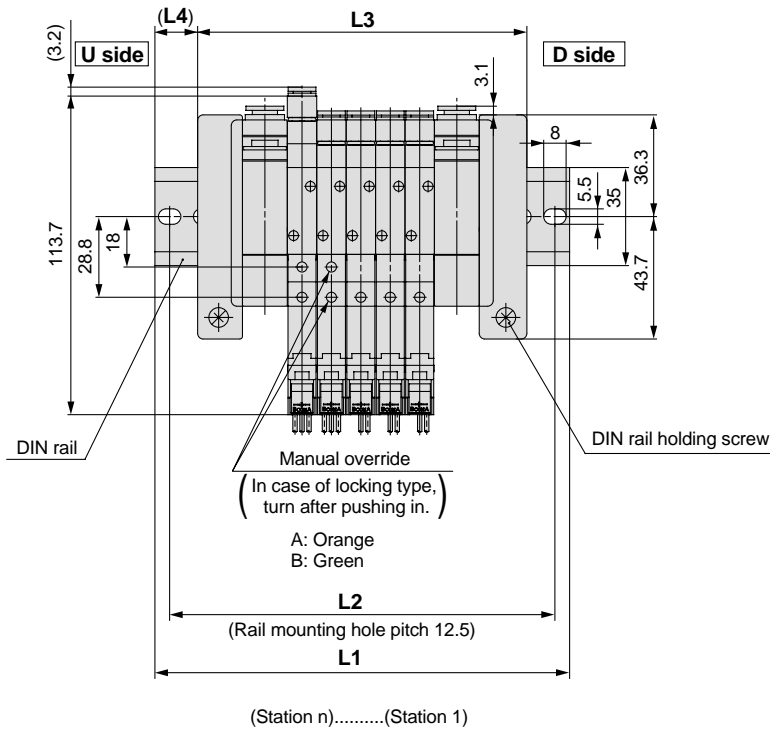
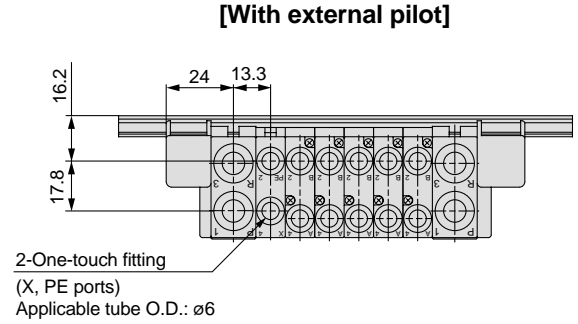
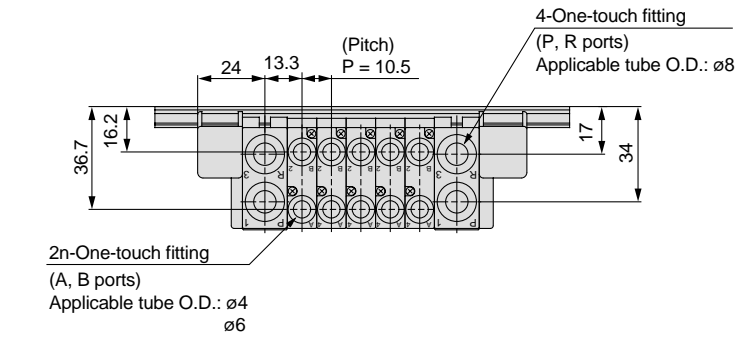


# Series SZ3000

## Dimensions/SZ3000: Non-plug-in

SS5Z3-60 - Stations B

Scale: 37%



Note ) Refer to page 19 for manifold dimensions with elbow fitting.

### 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	



60S□

# 5 Port Solenoid Valve

# Series SZ3000

## Serial Transmission Type

### How to Order

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

#### Compatible equipment

<b>Q</b>	DeviceNet compatible: OMRON Corp. CompoBus/D compatible
<b>R1</b>	OMRON Corporation: CompoBus/S (16 points) compatible
<b>R2</b>	OMRON Corporation: CompoBus/S (8 points) compatible
<b>V</b>	Mitsubishi Electric Corp.: CC-Link compatible
<b>F</b>	NKE Corporation Simple wiring standard system compatible
<b>H</b>	NKE Corporation Simple wiring H system compatible
<b>J1</b>	Sanks Corporation S-LINK system (16 point output) compatible
<b>J2</b>	Sanks Corporation S-LINK system (8 point output) compatible
<b>O</b>	Without SI unit

#### SI unit mounting position

**D** D side

• This should be indicated even without SI unit.

#### Valve stations

Symbol	Stations	Note
<b>02</b>	2 stations	Double wiring specifications
⋮	⋮	
<b>08</b>	8 stations	
<b>02</b>	2 stations	Specified layout (up to 16 solenoids possible)
⋮	⋮	
<b>16</b>	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, 3 position or 4 position valves.)

Note 3) R2 and J2 are available with up to 8 solenoids.

#### Options

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

#### Supply/Exhaust block fitting specifications

<b>Nil</b>	Straight
<b>L</b>	Elbow type (upward)
<b>B</b>	Elbow type (downward)

#### Pilot specifications

<b>Nil</b>	Internal pilot specifications
<b>R</b>	External pilot specifications

#### Supply/Exhaust block mounting position

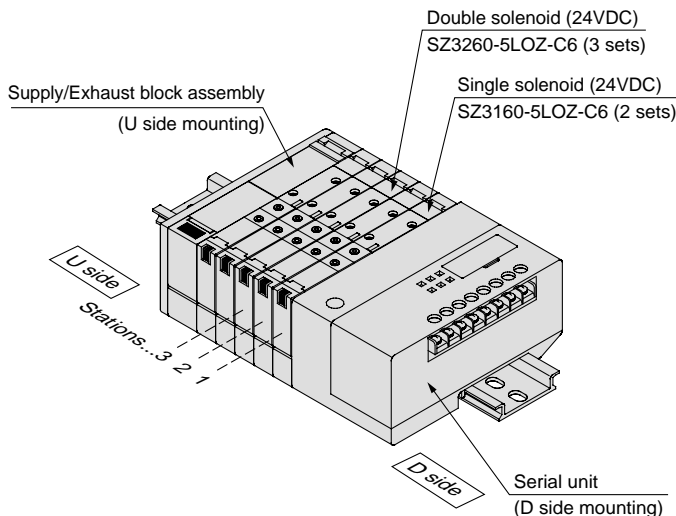
<b>U</b>	U side (2 to 10 stations)
<b>D</b>	D side (2 to 10 stations)
<b>B</b>	Both sides (2 to 16 stations)
<b>M*</b>	Special specifications

\* 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.

### 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)

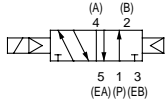
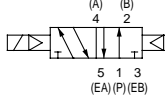
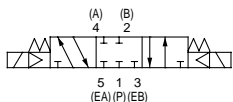
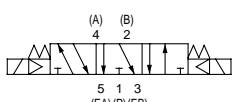
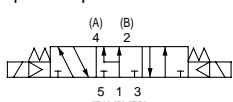
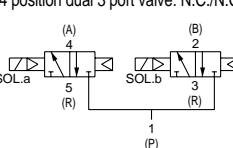
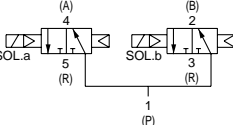
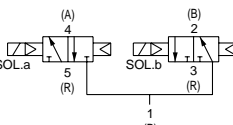
The \* symbol indicates built-in. Put the \* symbol at the beginning of the part numbers for solenoid valves, etc., which are to be installed.

- The valve layout starts with station 1 on the 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 specification sheet on page 41.)

## How to Order

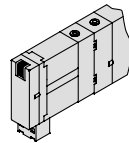
**SZ3** **1** **60** **– 5LOZ** **– C6**

### Type of actuation

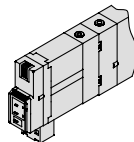
<b>1</b>	2 position single solenoid 
<b>2</b>	2 position double solenoid 
<b>3</b>	3 position closed center 
<b>4</b>	3 position exhaust center 
<b>5</b>	3 position pressure center 
<b>A</b>	4 position dual 3 port valve: N.C./N.C. 
<b>B</b>	4 position dual 3 port valve: N.O./N.O. 
<b>C</b>	4 position dual 3 port valve: N.C./N.O. 

### Switch specifications

Nil: Without switch



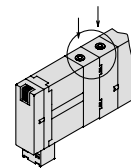
J: With switch



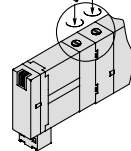
\* Refer to page 48 for switch operation.

### Manual override

Nil: Non-locking push type



D: Slotted locking type  
Screw driver operated



### Back pressure check valve

<b>Nil</b>	None
<b>K</b>	Built-in

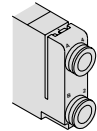
### Pilot specifications

<b>Nil</b>	Internal pilot
<b>R</b>	External pilot

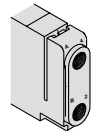
• Dual 3 port valves are not available with external pilot specifications.

### A, B port size

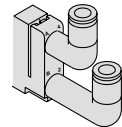
C4:  $\varnothing 4$  One-touch fitting  
C6:  $\varnothing 6$  One-touch fitting



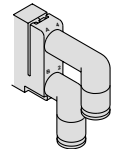
M5: M5 x 0.5



Elbow fitting assembly (upward)  
L4:  $\varnothing 4$  elbow fitting assembly  
L6:  $\varnothing 6$  elbow fitting assembly



Elbow fitting assembly (downward)  
B4:  $\varnothing 4$  elbow fitting assembly  
B6:  $\varnothing 6$  elbow fitting assembly



# Series SZ3000

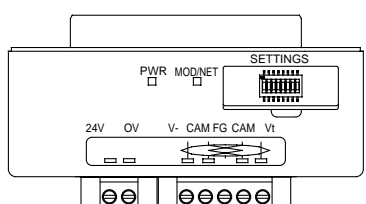
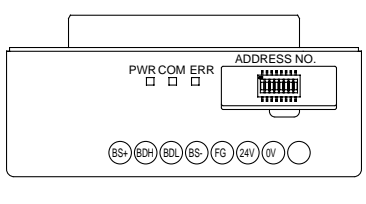
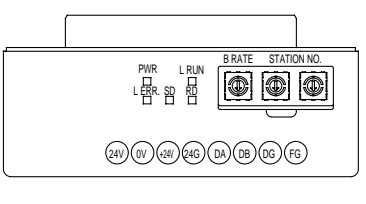
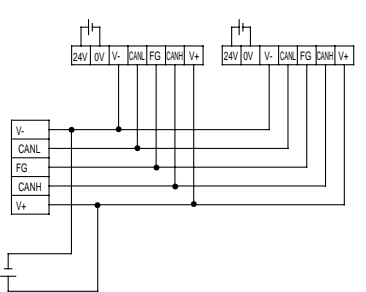
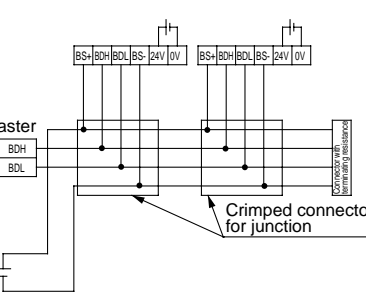
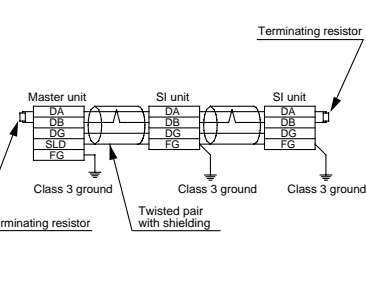
## Specifications

### Specifications

External power supply	24VDC±10%	
Current consumption (within unit)	0.1A	F, H, J1, J2 Q, R1, R2, V

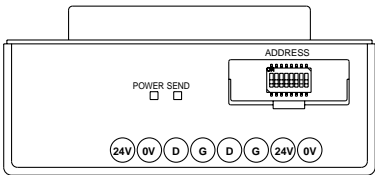
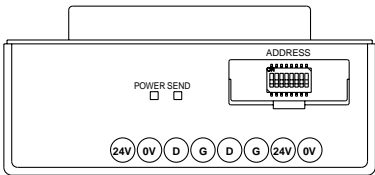
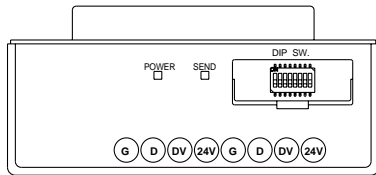
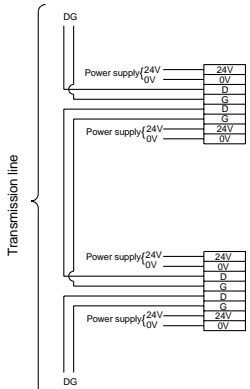
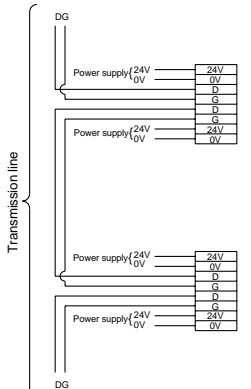
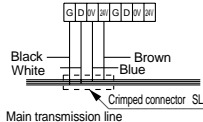
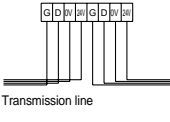
### SI unit part numbers

Symbol	Specifications	Part no.
<b>Q</b>	DeviceNet compatible: OMRON Corp. CompoBus/D compatible	EX140-SDN1
<b>R1</b>	OMRON Corporation: CompoBus/S (16 points) compatible	EX140-SCS1
<b>R2</b>	OMRON Corporation: CompoBus/S (8 points) compatible	EX140-SCS2
<b>V</b>	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</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>Blinking 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	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	Blinking 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</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	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</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 transmission</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, blinks when code or transmission speed setting changes during operation</td> </tr> </tbody> </table>	LED	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 transmission	RD	Turns on with received data	L ERR	Turns on with transmission/setting error, blinks when code or transmission speed setting changes during operation
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Note	<ul style="list-style-type: none"> <li>• DeviceNet</li> <li>• OMRON Corporation CompoBus/D system</li> <li>• Master unit: Type C200HW-DRM21</li> <li>• 16 output points</li> </ul>	<ul style="list-style-type: none"> <li>• CompoBus/S system</li> <li>Master unit: Type C200HW-SRM21</li> <li>Master unit: Type CQM1-SRM21</li> <li>• 16 output points (type SR1)</li> <li>8 output points (type SR2)</li> </ul>	<ul style="list-style-type: none"> <li>• CC-Link system</li> <li>Master unit: AJ61BT11</li> <li>Master unit: A1SJ61BT11</li> <li>Master unit: AJ61QBT11</li> <li>Master unit: A1SJ61Q8T11</li> <li>• 16 output points</li> </ul>																													
Cable wiring																																

## SI unit part numbers

Symbol	Specifications	Part no.
<b>F</b>	NKE Corporation: Simple wiring standard system compatible	EX140-SUW1
<b>H</b>	NKE Corporation: Simple wiring H system compatible	EX140-SUH1
<b>J1</b>	Sanks Corporation: S-LINK system (16 point output) compatible	EX140-SSL1
<b>J2</b>	Sanks Corporation: S-LINK system (8 point output) compatible	EX140-SSL2

	<b>Type SF</b> <b>NKE Corporation</b> Simple wiring standard system compatible	<b>Type SH</b> <b>NKE Corporation</b> Simple wiring H system compatible	<b>Type SJ1/SJ2</b> <b>Sanks Corporation</b> S-LINK system compatible																		
Terminal block/LED description	 <table border="1" style="margin-top: 10px;"> <thead> <tr> <th>LED</th> <th>Content</th> </tr> </thead> <tbody> <tr> <td>POWER</td> <td>Light turns on when power is input (Turns on when normal, flickers when voltage drops)</td> </tr> <tr> <td>SEND</td> <td>Transmission indicator Normal: Blinks, Abnormal: Turns off or on</td> </tr> </tbody> </table>	LED	Content	POWER	Light turns on when power is input (Turns on when normal, flickers when voltage drops)	SEND	Transmission indicator Normal: Blinks, Abnormal: Turns off or on	 <table border="1" style="margin-top: 10px;"> <thead> <tr> <th>LED</th> <th>Content</th> </tr> </thead> <tbody> <tr> <td>POWER</td> <td>Light turns on when power is input Turns on when normal, flickers when voltage drops)</td> </tr> <tr> <td>SEND</td> <td>Transmission indicator Normal: Blinks, Abnormal: Turns off or on</td> </tr> </tbody> </table>	LED	Content	POWER	Light turns on when power is input Turns on when normal, flickers when voltage drops)	SEND	Transmission indicator Normal: Blinks, Abnormal: Turns off or on	 <table border="1" style="margin-top: 10px;"> <thead> <tr> <th>LED</th> <th>Content</th> </tr> </thead> <tbody> <tr> <td>POWER</td> <td>Light turns on when power is input</td> </tr> <tr> <td>SEND</td> <td>Transmission indicator Normal: Blinks, Abnormal: Blinks slowly</td> </tr> </tbody> </table>	LED	Content	POWER	Light turns on when power is input	SEND	Transmission indicator Normal: Blinks, Abnormal: Blinks slowly
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Note	<ul style="list-style-type: none"> <li>Simple wiring standard system Send unit: SD-120</li> <li>16 output points</li> </ul>	<ul style="list-style-type: none"> <li>Simple wiring H system Send unit: SD-H2</li> <li>16 output points</li> </ul>	<ul style="list-style-type: none"> <li>S-LINK system S-LINK controller: SL-CU1</li> <li>16 output points (type SJ1) 8 output points (type SJ2)</li> </ul>																		
Cable wiring			<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>a) T type multidrop wiring (S-LINK system)</p>  </div> <div style="text-align: center;"> <p>b) Crossover wiring (sensor link system)</p>  </div> </div> <p>Special S-LINK flat cable SL-RCM□00 is used in the above example.</p>																		

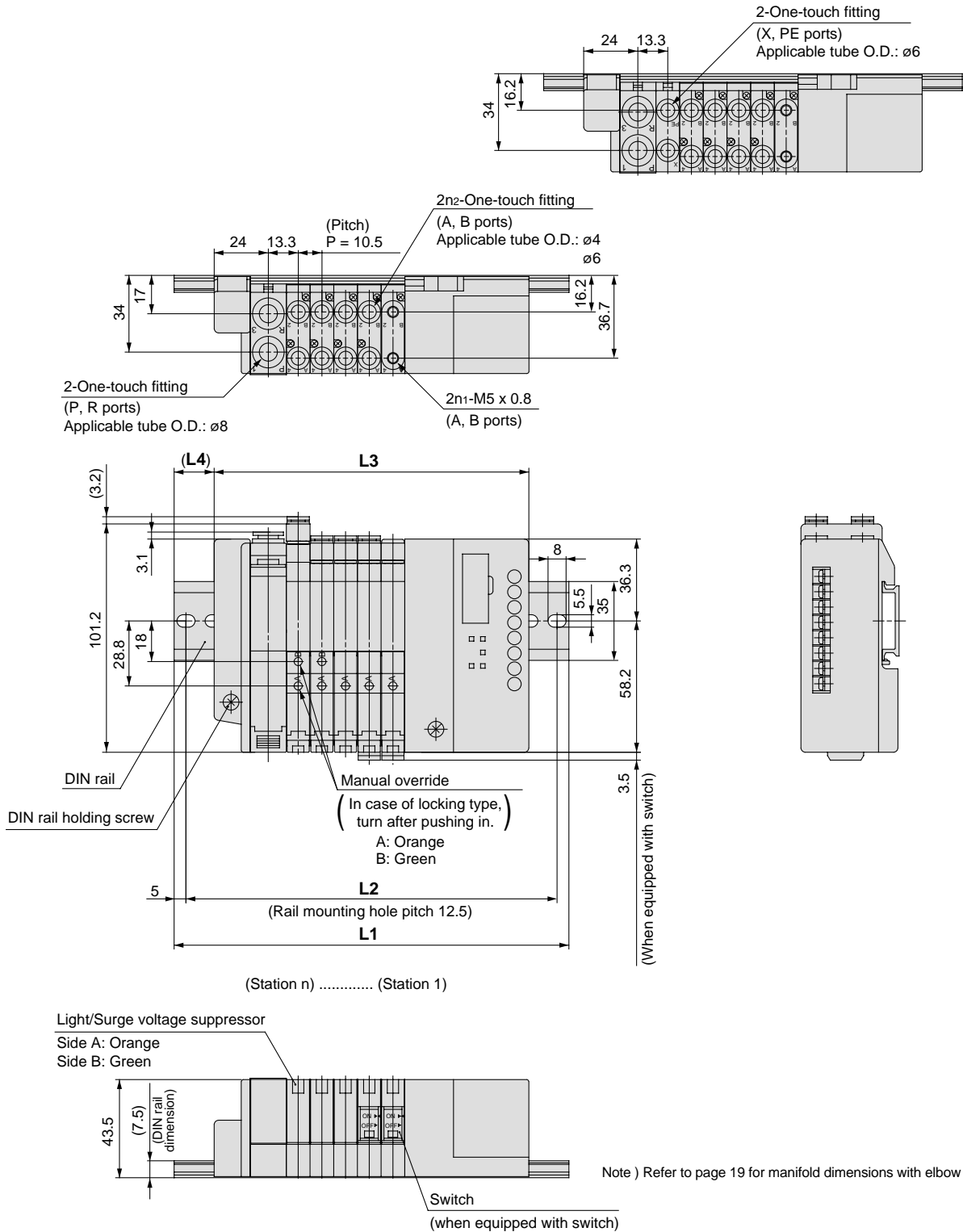
# Series SZ3000

## Dimensions/SZ3000: Serial Transmission Type

SS5Z3-60S □ D- Stations U

Scale: 37%

[With external pilot]



Internal pilot manifold L: Dimensions n : Stations (n<sub>1</sub> + n<sub>2</sub>)

L \ n	2	3	4	5	6	7	8	9	10
L1	135.5	148	160.5	173	185.5	185.5	198	210.5	223
L2	125	137.5	150	162.5	175	175	187.5	200	212.5
L3	108	118.5	129	139.5	150	160.5	171	181.5	192
L4	14	15	16	17	18	12.5	13.5	14.5	15.5

External pilot manifold L: Dimensions n : Stations (n<sub>1</sub> + n<sub>2</sub>)

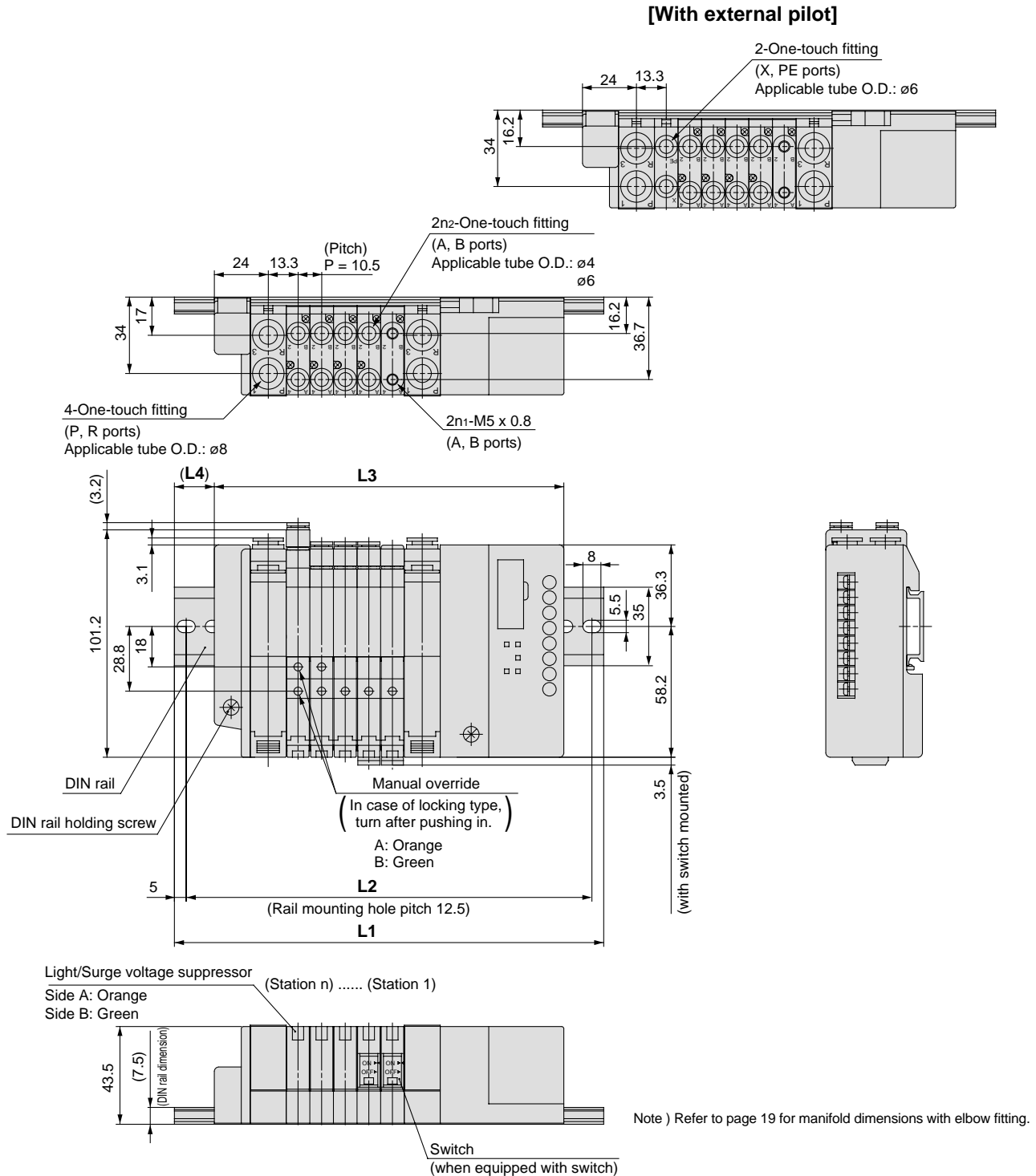
L \ n	2	3	4	5	6	7	8	9	10
L1	148	160.5	173	185.5	185.5	198	210.5	223	235.5
L2	137.5	150	162.5	175	175	187.5	200	212.5	225
L3	118.5	129	139.5	150	160.5	171	181.5	192	202.5
L4	15	16	17	18	12.5	13.5	14.5	15.5	16.5



## Dimensions/SZ3000: Serial Transmission Type

SS5Z3-60S □ D- Stations B

Scale: 37%



Note ) Refer to page 19 for manifold dimensions with elbow fitting.

Internal pilot manifold L: Dimensions

n: Stations

L \ n	2	3	4	5	6	7	8	9
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	10	11	12	13	14	15	16
L1	235.5	248	260.5	273	285.5	285.5	298
L2	225	237.5	250	262.5	275	275	287.5
L3	208	218.5	229	239.5	250	260.5	271
L4	14	15	16	17	18	12.5	13.5

External pilot manifold L: Dimensions

n: Stations

L \ n	2	3	4	5	6	7	8	9
L1	160.5	173	185.5	198	210.5	210.5	223	235.5
L2	150	162.5	175	187.5	200	200	212.5	225
L3	134.5	145	155.5	166	176.5	187	197.5	208
L4	13	14	15	16	17	12	13	14

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

# Cautions on the use of manifold valve specification sheets

**Caution** When using manifold valve specification sheets for ordering, be sure to read the cautions below.

## 1 Entering the manifold model

Boxes with solid lines  must be filled in.

Example:  
SS5Z3-60PGD1-05M-P  
(Supply/Exhaust block mounting position special specifications)

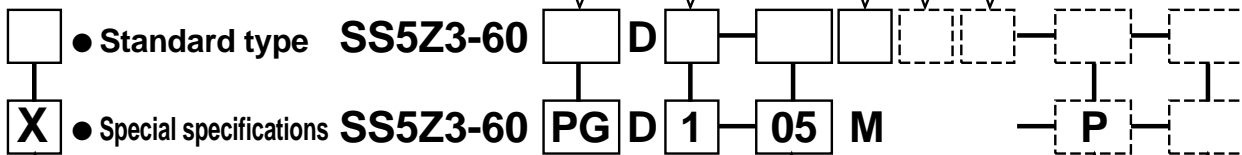
• **Enter the supply/exhaust block assembly mounting position.**  
\* This specifies positions of P and R ports. They can be located on the U side, D side or both sides. However, 11 or more stations require positions on both sides.  
\* If a manifold with supply/exhaust blocks on one side (U/D side) is required for 11 stations or more, indicate this as a special specification. Also note that in cases where many valves operate simultaneously, supply and exhaust may become inadequate for proper valve performance.

• **Enter the connector entry direction.**  
\* This determines the direction when shipped. The direction can also be changed later.  
\* Does not need to be entered for the non-plug-in type.

• **Enter for external pilot specifications.**  
\* Does not need to be entered for internal pilot specifications.

• **Enter the connector type.**  
\* D-sub connector and flat cable connector are available for the plug-in type.  
\* Does not need to be entered for the non-plug-in type.

• **Enter if elbow type fitting is required for the supply/exhaust block assembly or external pilot block assembly.**  
\* Elbow types are available facing upward or downward.  
\* Does not need to be entered for straight type.



• **Enter an "X" for the manifold type to be used. When the following types of supply/exhaust block or external pilot block assembly specifications are required, order as special specifications.**

- \* When mounting positions other than the standard U/D/B are required.
- \* When port sizes other than the standard types are required.
- \* When both straight and elbow type fittings are required.

Port size

	Standard type	Special specification port sizes
Supply/exhaust block assembly	C8, L8, B8	C8, L8, B8, C6, L6, B6
External pilot block assembly	C6, L6, B6	C6, L6, B6, C4, L4, B4

Note) Indicate with "O" or C6, L4, etc., in the station table.

• **Enter the number of valve stations.**  
\* In case of the plug-in type, depending on the type of connector and the presence of a power terminal, there is a limit to the number of stations (solenoids) that are possible. Refer to catalog page 7, and make selections so that the maximum number of stations is not exceeded.  
\* The maximum number of stations for the non-plug-in type is 20 stations.

**Options**  
\* Enter when a DIN rail longer than standard is required.  
\* Can be specified up to a maximum of 20 stations.  
\* Does not need to be entered in case of standard length.  
\* When a longer DIN rail is indicated, the U side is extended.

Enter when a power supply terminals are required.  
\* Positive and negative commons are available for both 24 and 12VDC.  
\* Does not need to be entered in cases without power supply terminals.

## 2 Entering the valve model

Boxes with solid lines  must be filled in.



• **Type of actuation**  
\* Indicate in the station table.

• **Pilot system**  
\* Indicate in the station table.  
\* When an external pilot valve is to be used, enter an "X" in section (b) of the station table.  
\* External pilot specifications are not available for 4 position dual 3 port valves.  
\* Does not need to be entered for internal pilot specifications.

• **With back pressure check valve**  
\* Indicate in the station table.  
\* When a valve with back pressure check valve is to be used, enter an "x" symbol in section (c) of the station table.  
\* Back pressure check valve is not available with 3 position closed center and 3 position pressure center.  
\* Does not need to be entered for a valve without back pressure check valve.

• **Enter the rated voltage.**  
\* When using a plug-in manifold with power supply terminals, be sure to conform with the manifold voltage specifications.

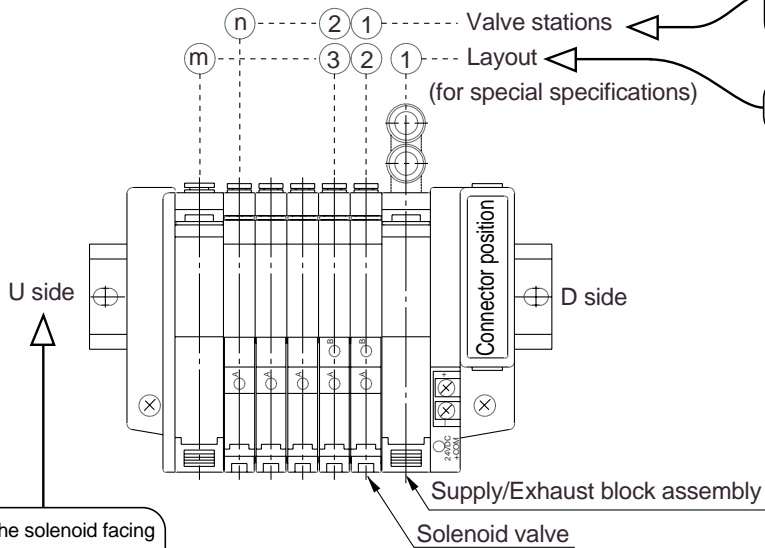
• **Enter the A, B port size.**  
\* In case of mixed port sizes, enter "M" in this section and C4, L6, etc., respectively in section (a) of the station table.

• **Enter the manual override type.**  
\* Does not need to be entered for non-locking push type.

• **Enter the switch specifications.**  
\* Enter when equipped with switches.  
\* Not applicable to non-plug-in type.  
\* Does not need to be entered when switches are not required.

• **Enter the common specifications.**  
\* When using a plug-in manifold with power supply terminals, be sure to conform with the COM specifications.  
\* Does not need to be entered for a positive common.

### 3 Station table entries



In the case of a standard type manifold, solenoid valves (and blanking block assemblies) are counted from station No. 1 on the D side, regardless of the position of supply/exhaust assemblies.

In case of special specifications, station No. 1 is always on the D side.

With the solenoid facing downward, **D side is on the right and U side is on the left.**

- In case of a manifold with external pilot specifications, enter an "X" in valve locations where an external pilot is required. Mixed internal and external specifications are also possible in this section.
- External pilot specifications are not available for 4 position dual 3 port valves.

- Enter an "X" in locations where a valve with back pressure check function is required.

- Enter in case of special specification manifolds. Indicate locations with an "X", and port size changes with symbols C6, L4, etc.
- Limit each block assembly to no more than 3 pieces. Consult with SMC if mounting of 4 pieces or more is required.

- Used to separate different pressures or exhausts.
- Enter a pilot port blocking disk when internal pilots and external pilots are mixed on the same manifold, or when using a SUP. blocking disk to allow different pressures in an internal pilot manifold.
- This can also be entered for a standard type manifold.

- Enter an "X" only to indicate wiring. Two extra stations can be specified for additions. However, this cannot exceed the maximum number of solenoids.
- Unless otherwise specified here, all stations will have double wiring specifications for the plug-in type. Use this when mixing double and single wiring, or for all single wiring. However, note that **only single solenoid valves can be used in locations where single wiring is indicated.**
- This can also be entered for a standard type manifold.

- Enter an "X" in the sections for valves to be used. In case of mixed port sizes, indicate by entering C4, L6, etc.

In the case of special specifications, this is layout instead of valve stations.

Enter quantity to be used.

Station table entry example

Valve stations or layout		8	7	6	5	4	3	2	1	Quantity
2 position	Single solenoid			C4	C6	C6				3
	Double solenoid						C6	C4		2
3 position	Closed center									
	Exhaust center									
	Pressure center									
4 position dual 3 port valve	SZ3A60 (N.C./N.C.)									
	SZ3B60 (N.O./N.O.)									
	SZ3C60 (N.C./N.O.)									
Blanking block assembly										
Valve external pilot specifications (enter only in case of external pilot)										
With back pressure check valve (enter only in case of back pressure check valve)										
Enter for special specs.	Supply/Exhaust block assembly									
	External pilot block assembly								L8	2
SUP blocking disk										
EXH blocking disk										
Pilot port blocking disk										
Wiring specifications	Single wiring									
	Double wiring									

In this case, the U side supply/exhaust block will be a straight type C8.

With upward facing elbow for the D side supply/exhaust block



# SZ3000: Cassette Type

## Plug-in manifold

### Manifold Valve Specification Sheet

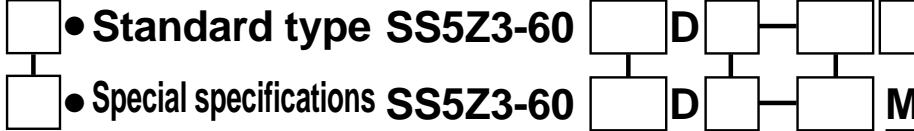
**Caution** Be sure to read "Cautions on the use of manifold valve specification sheets" on pages 34 and 35 before making entries.

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

#### 1 How to Order Manifolds

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

Enter an "X" for the manifold type to be used.



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

Symbol	Mounting position
1	Perpendicular
2	Lateral

Symbol	Stations
02	2 stations
:	:
20	20 stations

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

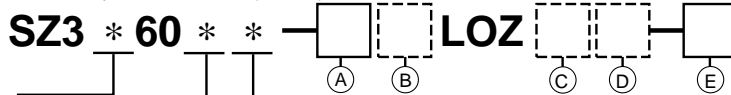
In case of R, external pilot block will be added.

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

Symbol	Specifications
Nil	Straight
L	Elbow One-touch fitting (upward)
B	Elbow One-touch fitting (downward)

#### 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
A 4 position dual 3 port valve (N.C./N.C.)
B 4 position dual 3 port valve (N.O./N.O.)
C 4 position dual 3 port valve (N.C./N.O.)

Nil	Internal pilot
R	External pilot

When an external pilot valve is to be used, enter an "X" in section (b) of the station table below. However, external pilot specifications are not available for 4 position dual 3 port valves.

Nil	None
K	Built-in

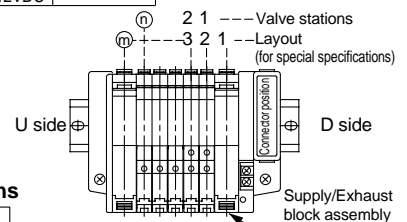
When a valve with back pressure check valve is used, enter an "X" in section (c) of the station table below.

A Rated voltage
5 24VDC
6 12VDC

B COM specifications
Nil Positive common
N Negative common

C Switch specifications
Nil Without switch
J With switch

D Manual operation
Nil Non-locking push type
D Slotted locking type Screw driver operated



E A, B port size
C4 ø4 One-touch fitting
C6 ø6 One-touch fitting
M5 M5 x 0.8
L4 ø4 elbow One-touch fitting (upward)
L6 ø6 elbow One-touch fitting (upward)
B4 ø4 elbow One-touch fitting (downward)
B6 ø6 elbow One-touch fitting (downward)
M Mixed

#### 3 Station Table

Indicate the layout of valves, etc., by entering "X's".

When the port sizes for each block assembly are mixed or special specifications, indicate with port size symbols C4, C6, etc.

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																				
4 position dual 3 port valve	SZ3A60 (N.C./N.C.)																					
	SZ3B60 (N.O./N.O.)																					
	SZ3C60 (N.C./N.O.)																					
b	Blanking block assembly																					
	External pilot specifications (enter only in case of external pilot)																					
	With back pressure check valve (enter only in case of back pressure check valve)																					
c	Enter for special specs.																					
	Supply/Exhaust block assembly	External pilot block assembly																				
e	SUP blocking disk																					
	EXH blocking disk																					
	Pilot port blocking disk (Note 2)																					
f	Wiring specifications																					
	Single wiring	Double wiring																				

- [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 (ø8): SZ3000-50-1A-C8
- Supply/Exhaust block assembly (ø6): SZ3000-50-1A-C6
- External pilot block assembly (ø6): SZ3000-54-1A-C6
- External pilot block assembly (ø4): SZ3000-54-1A-C4
- Supply/Exhaust block assembly (elbow upward): SZ3000-50-1A-L6/L8
- Supply/Exhaust block assembly (elbow downward): SZ3000-50-1A-B6/B8
- External pilot block assembly (elbow upward): SZ3000-54-1A-L4/L6
- External pilot block assembly (elbow downward): SZ3000-54-1A-B4/B6

Note) The symbols at the end of supply/exhaust block and external pilot block assembly part numbers indicate the port sizes.

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) In case of special specifications, enter the part number and quantity for supply/exhaust block and external pilot block assemblies together with the manifold type.



# SZ3000: Cassette Type

## Non-plug-in manifold

### Manifold Valve Specification Sheet

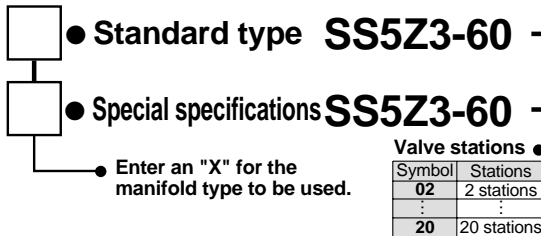
**Caution** Be sure to read "Cautions on the use of manifold valve specification sheets" on pages 34 and 35 before making entries.

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.



**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

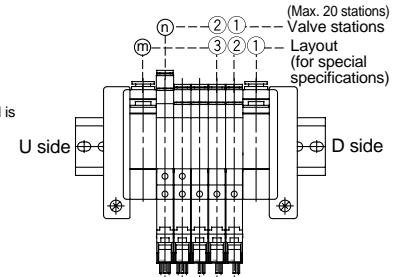
**Pilot system**

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

\* In case of R, external pilot block will be added.

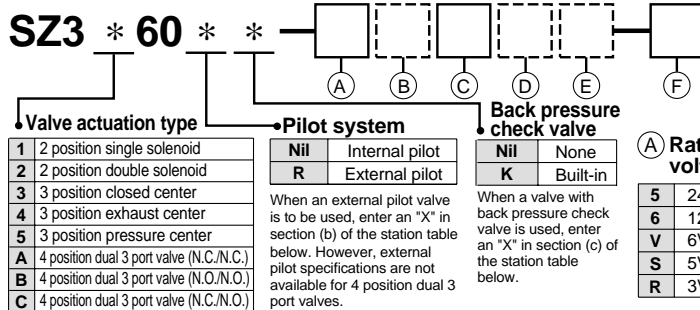
**Supply/Exhaust block assembly fitting specifications**

Symbol	Specifications
Nil	Straight
L	Elbow One-touch fitting (upward)
B	Elbow One-touch fitting (downward)



### 2 How to Order Valves

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



### (B) COM specifications

Nil	Pos. common
N	Neg. common

### (C) Electrical entry

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

### (D) Light/Surge voltage suppressor

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

### (E) Manual override

Nil	Non-locking push type
D	Slotted locking type, screw driver operated

### (F) A, B port size

C4	ø4 One-touch fitting
C6	ø6 One-touch fitting
M5	M5 x 0.8
L4	ø4 elbow One-touch fitting (upward)
L6	ø6 elbow One-touch fitting (upward)
B4	ø4 elbow One-touch fitting (downward)
B6	ø6 elbow One-touch fitting (downward)
M	Mixed

### 3 Station Table

Indicate the layout of valves, etc., by entering "X's".

• When the port sizes for each block assembly are mixed or special specifications, indicate with port size symbols C4, C6, etc.

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																				
4 position dual	SZ3A60 (N.C./N.C.)																					
	SZ3B60 (N.O./N.O.)																					
	SZ3C60 (N.C./N.O.)																					
(b)	External pilot specifications (enter only in case of external pilot)																					
	With back pressure check valve (enter only in case of back pressure check valve)																					
(c)	Enter for special specs.	Supply/Exhaust block assembly																				
		External pilot block assembly																				
(e)	SUP blocking disk																					
	EXH blocking disk																					
	Pilot port blocking disk (Note 2)																					

[Note] • SUP blocking disk: SZ3000-114-4A • EXH blocking disk: SZ3000-114-4A (2pcs./location) • Pilot port blocking disk: SZ3000-114-2A

• Supply/Exhaust block assembly (ø8): SZ3000-50-2A-C8 • Supply/Exhaust block assembly (ø6): SZ3000-50-2A-C6 • External pilot block assembly (ø6): SZ3000-54-2A-C6 • External pilot block assembly (ø4): SZ3000-54-2A-C4

• Supply/Exhaust block assembly (elbow upward): SZ3000-50-2A-L6/L8 • Supply/Exhaust block assembly (elbow downward): SZ3000-50-2A-B6/B8 • External pilot block assembly (elbow upward): SZ3000-54-2A-L4/L6 • External pilot block assembly (elbow downward): SZ3000-54-2A-B4/B6

Note) The symbols at the end of supply/exhaust block and external pilot block assembly part numbers indicate the port sizes.

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) In case of special specifications, enter the part number and quantity for supply/exhaust block and external pilot block assemblies together with the manifold type.





# SZ3000: Cassette Type

## Serial wiring manifold

### Manifold Valve Specification Sheet

**Caution** Be sure to read "Cautions on the use of manifold valve specification sheets" on pages 34 and 35 before making entries.

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

#### 1 How to Order Manifolds

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

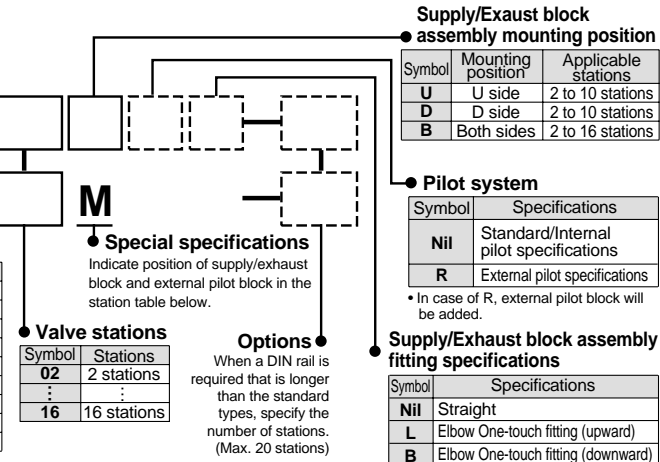
• Standard type **SS5Z3-60S**
 D

• Special specifications **SS5Z3-60S**
 D

Enter an "X" for the manifold type to be 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
F	NKE Corp.: Simple wiring standard system compatible
H	NKE Corp.: Simple wiring H system compatible
J1	Sanks Corp.: S-LINK system (16 point output) compatible
J2	Sanks Corp.: S-LINK system (8 point output) compatible
O	Without SI unit

Company name		
Contact		
Specification sheet no.		
Order no.		
Equipment name		
Quantity	set (s)	Date required



#### 2 How to Order Valves

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

**SZ3 \* 60 \* \* - 5LOZ**

A     B     C

**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
A	4 position dual 3 port valve (N.C./N.C.)
B	4 position dual 3 port valve (N.O./N.O.)
C	4 position dual 3 port valve (N.C./N.O.)

**Pilot system**

Nil	Internal pilot
R	External pilot

**Back pressure check valve**

Nil	None
K	Built-in

When an external pilot valve is to be used, enter an "X" in section (b) of the station table below. However, external pilot specifications are not available for 4 position dual 3 port valves.

When a valve with back pressure check valve is used, enter an "X" in section (c) of the station table below.

**(A) Switch specifications**

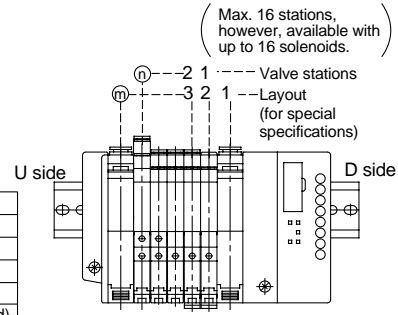
Nil	Without switch
J	With switch

**(B) Manual override**

Nil	Non-locking push type
D	Slotted locking type Screw driver operated

**(C) A, B port size**

C4	ø4 One-touch fitting
C6	ø6 One-touch fitting
M5	M5 x 0.8
L4	ø4 elbow One-touch fitting (upward)
L6	ø6 elbow One-touch fitting (upward)
B4	ø4 elbow One-touch fitting (downward)
B6	ø6 elbow One-touch fitting (downward)
M	Mixed



#### 3 Station Table

Indicate the layout of valves, etc., by entering "X's".

• The port sizes for each block assembly are mixed or special specifications, indicate with port size symbols of C4, C6, etc.

Valve stations or layout	Station positions																Quantity					
	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5		4	3	2	1	
2 position	Single solenoid																					
	Double solenoid																					
	3 position	Closed center																				
		Exhaust center																				
		Pressure center																				
4 position dual	SZ3A60 (N.C./N.C.)																					
	SZ3B60 (N.O./N.O.)																					
	SZ3C60 (N.C./N.O.)																					
3 port valve	Blanking block assembly																					
	External pilot specifications (enter only in case of external pilot)																					
(b)	With back pressure check valve (enter only in case of back pressure check valve)																					
	Enter for special specs.																					
(d)	Supply/Exhaust block assembly																					
	External pilot block assembly																					
(e)	SUP blocking disk																					
	EXH blocking disk																					
	Pilot port blocking disk <small>Note 2)</small>																					
(f)	Wiring specifications	Single wiring																				
		Double wiring																				

[Note] • SUP blocking disk: SZ3000-114-4A    • Supply/Exhaust block assembly (ø8): SZ3000-50-1A-C8    • Supply/Exhaust block assembly (elbow upward): SZ3000-50-1A-L6/L8  
 • EXH blocking disk: SZ3000-114-4A (2pcs/location)    • Supply/Exhaust block assembly (ø6): SZ3000-50-1A-C6    • Supply/Exhaust block assembly (elbow downward): SZ3000-50-1A-B6/B8  
 • Blanking block assembly: SZ3000-55-1A    • External pilot block assembly (ø6): SZ3000-54-1A-C6    • External pilot block assembly (elbow upward): SZ3000-54-1A-L4/L6  
 • Pilot port blocking disk: SZ3000-114-2A    • External pilot block assembly (ø4): SZ3000-54-1A-C4    • External pilot block assembly (elbow downward): SZ3000-54-1A-B4/B6

Note) The symbols at the end of supply/exhaust block and external pilot block assembly part numbers indicate the port sizes.

Enter the ordered part numbers.

Section below for SMC use only

Part no.	Quantity

Part no.	Quantity

Order no.	
Clerk (code no.)	
Branch code	

Note) In case of special specifications, enter the part number and quantity for supply/exhaust block and external pilot block assemblies together with the manifold type.



# Series SZ3000 Order Made Specifications

Contact SMC for detailed specifications, lead times and prices.



## 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.

- 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.
- When ozone enters or is generated in the air supply.

Part No.

SZ3  60        -X90

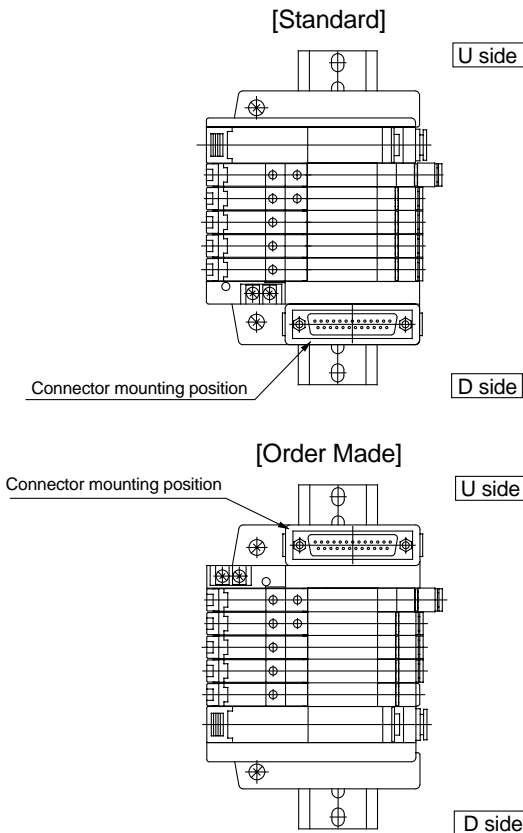
● **Make entries in the same way as for standard models.**

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 (U side). Contact SMC for details regarding part numbers and wiring specifications, etc.

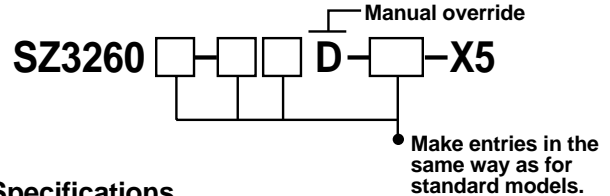


## 3 Single, Double Common Type -X5

Symbol

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

How to Order



### Specifications

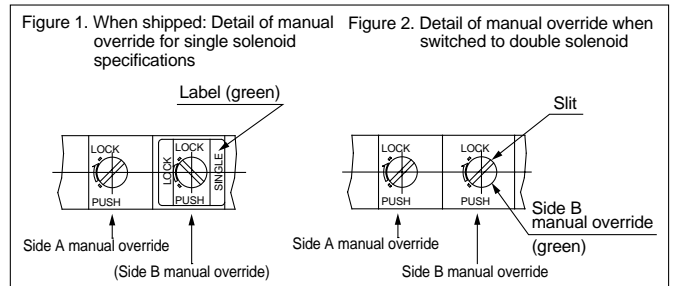
Valve type	Pilot type 2 position 5 port electrically activated valve		
Actuation type	Single solenoid, double solenoid common type		
Internal pilot operating pressure range MPa	2 position single	0.15 to 0.7	
	2 position double	0.15 to 0.7	
External pilot operating pressure range MPa	Operating pressure range		-100kPa to 0.7
	Pilot pressure range	2 position single	0.25 to 0.7
		2 position double	0.25 to 0.7
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


- Specifications are for single solenoid at time of shipment. (Refer to Figure 1.)
- When it will be used as a double solenoid type, set the manual override and connector assembly as follows.
  - 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.
  - 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 48 regarding installation.
- In case of the double solenoid set-up, do not energize the solenoids on both sides simultaneously.
- Refer to page 50 for further details regarding electrical connections and electrical circuits with light/surge voltage suppressor.
- 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: General Rules for Pneumatic Equipment

## **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 difficult 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 common exhaust 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 an air operated valve or single acting cylinder, etc., because malfunction may occur due to the exhaust from other actuators. When adverse effects from exhaust are possible, select a valve with back pressure check valve, or adopt measures such as the use of a supply/exhaust block assembly and exhaust blocking disk to separate the exhaust.

##### 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.

##### 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 case of an internal pilot type.

##### 9. Use of the double solenoid type

When using a double solenoid type for the first time, an actuator may operate in an unexpected direction due to the switching position of the valve. Implement measures to avoid danger from actuator operation.

##### 10. Ventilation

When a valve is used inside a sealed unit such as a control panel, provide ventilation holes so that pressure inside the control panel does not increase from exhaust air, and so there is no

### 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

When a valve is energized continuously for an extended period of time or the energized time is longer than the deenergized time, use DC specifications or an energy saving type. Consult SMC regarding other products which are available for AC specifications.

#### Caution

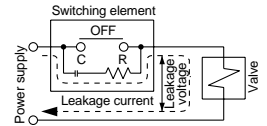
##### 1. Momentary energization

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

However, since a cylinder may malfunction 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) to protect a switching element, leakage voltage will increase due to the leakage current flowing through the C-R element.



Therefore, select a circuit or element so that the amount of previous residual leakage voltage conforms to the values shown below. Furthermore, when a reset fault occurs due to the leakage voltage, install a bleeder resistor. Consult SMC for details on the bleeder resistor.

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  $-10^{\circ}\text{C}$ , but appropriate measures should be taken to avoid solidification or freezing of drainage and moisture, etc.

##### 4. Operation for air blowing

When using solenoid valves for air blowing, use an external pilot type.

Note that the pressure drop caused by air blowing can have an effect on internal pilot type valves when internal pilots and external pilots are used on the same manifold. Furthermore, supply compressed air to the pilot port within the pressure range prescribed in the specifications, and when using a double solenoid type for air blowing, make sure that it is always energized when air is being blown.

##### 5. Mounting position

The mounting position is unrestricted.



## 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.

After 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 resin parts, as this may have an adverse effect due to the paint solvent.

### Piping

#### ⚠ Caution

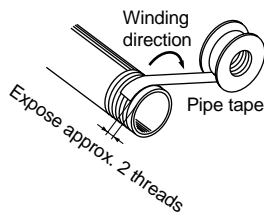
##### 1. Preparation before piping

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

##### 2. Wrapping of pipe tape

When connecting pipes and fittings, etc., be sure that 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 threads.



##### 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. Connection of fittings

When connecting fittings to valves, tighten as indicated below.

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, such as 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.

### Piping

#### ⚠ Caution

##### 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 burn out.

- 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 burn out the coil.

##### 3. Confirmation of the connections

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

##### 4. Handling of pilot valves

Do not allow a force greater than 20N to be applied to the pilot valve unit due to deflection of lead wires or external forces, etc., as this may cause damage.

### 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.

Contact SMC regarding class 2 turbine oil (with 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 or Drain Catch, etc.

Air that includes excessive drainage may cause malfunction of valves and other pneumatic equipment. To prevent this, install an air dryer, after cooler or Drain Catch, 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 "Compressed Air Cleaning Systems" catalog for further details on compressed air quality.

### Operating Environment

#### ⚠ Warning

- Do not use valves in atmospheres of corrosive gases, chemicals, salt water, water or steam, or where there is direct contact with same.
- Do not use in an explosive atmosphere.
- Do not use in locations subject to vibration or impact. Confirm the specifications in the main section of this catalog.
- Use a protective cover, etc., to shield valves from direct sunlight.
- Shield valves from radiated heat generated by nearby heat sources.
- Employ suitable protective measures in locations where there is contact with water droplets, oil or welding spatter, etc.
- When solenoid valves are mounted in 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 removal and supply/exhaust of compressed air

When equipment is removed, 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

Switch valves 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. Drainage removal

Remove drainage 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 area (mm<sup>2</sup>)

ΔP: Differential pressure (P<sub>1</sub>-P<sub>2</sub>) [MPa]

P<sub>1</sub>: Upstream pressure [MPa]

P<sub>2</sub>: 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.

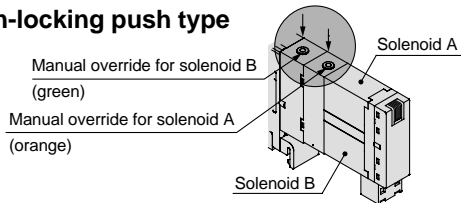
Refer to pages 44 through 47 for safety instructions and common precautions.

## Warning

### Manual operation

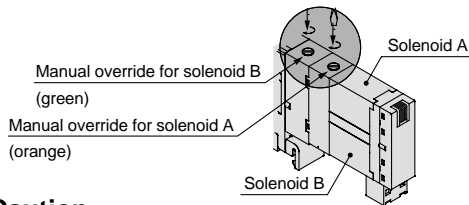
Handle carefully, as connected equipment will be actuated through manual operation.

#### Non-locking push type



#### Slotted 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.



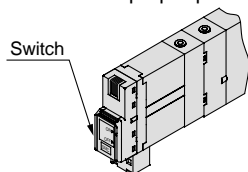
### Caution

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

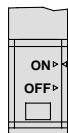
## Warning

### Valves with switches

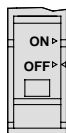
When turning OFF with the switch, be sure to move the switch to the locked position. Connected equipment may be actuated if current flow occurs with the switch at an improper position.



ON position



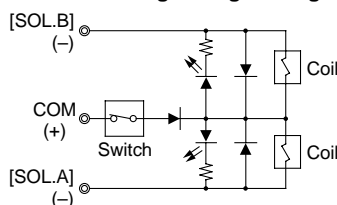
OFF position



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 suppressor)



## Caution

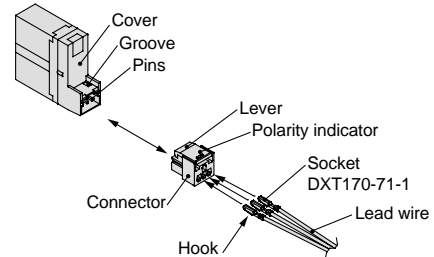
### How to use plug connectors

When attaching and detaching a connector, first shut off the electric power and the air supply.

Also, crimp the lead wires and sockets securely.

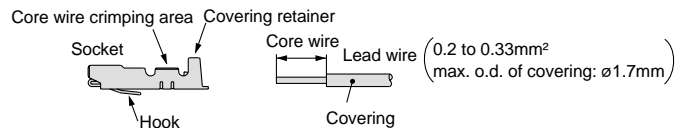
#### 1. Attaching and detaching connectors

- 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)



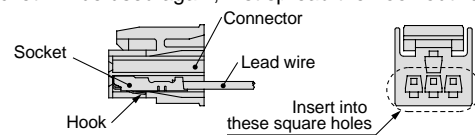
#### 3. Attaching and detaching lead wires with sockets

##### Attaching

Insert the sockets into the square holes of the connector (with  $\oplus$ ,  $\ominus$  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 44 through 47 for safety instructions and common precautions.

## Caution

### Common connector assembly for manifold

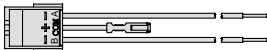
By using a common connector assembly for the solenoid valves on a manifold, the common wiring for each solenoid valve is reduced to one line, making it possible to achieve labor savings on wiring work.

#### Common connector assembly part numbers

**Pos. common specifications  
For single solenoid  
SX100-42-4S**



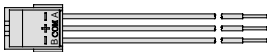
**For double solenoid,  
3 position type  
SX100-42-4D**



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



**With common lead wire  
for double solenoid,  
3 position type  
SX100-40-4D**

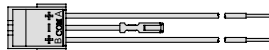


(lead wire length 300mm)

**Neg. common specifications  
For single solenoid  
SX100-43-4S**



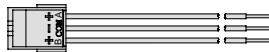
**For double solenoid,  
3 position type  
SX100-43-4D**



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



**With common lead wire  
for double solenoid,  
3 position type  
SX100-41-4D**



(lead wire length 300mm)

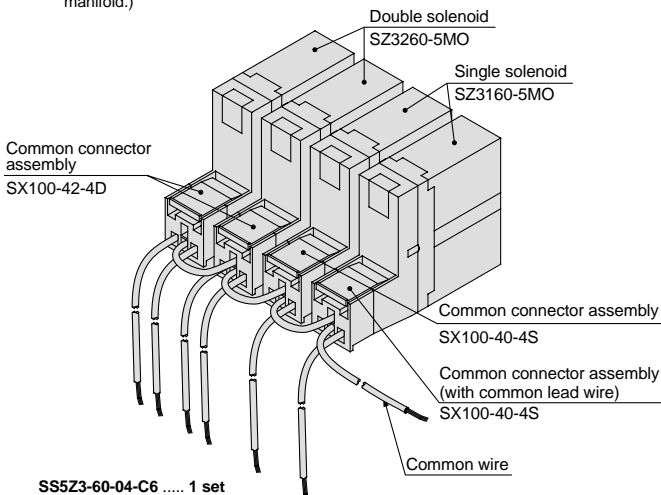
### How to order

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 (pages 37 to 41).

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 places 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 ..... 1 set

\*SZ3160-5MO ..... 2 sets

\*SZ3260-5MO ..... 2 sets

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

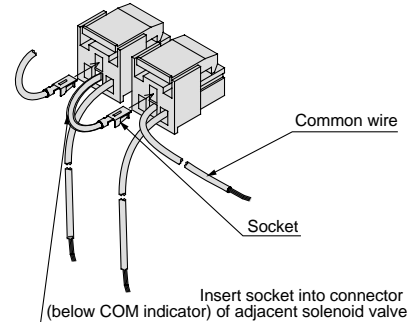
\*SX100-42-4S ..... 1 set (for single solenoid)

[ SX100-42-4D ..... 2 sets (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 48.



## 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 44 through 47 for safety instructions and common precautions.

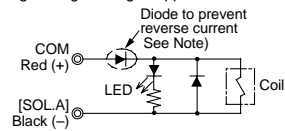
## Caution

### Light/Surge voltage suppressor

#### Pos. common specifications

##### Single solenoid type

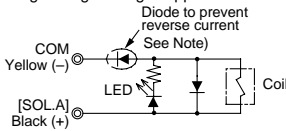
##### Light/Surge voltage suppressor



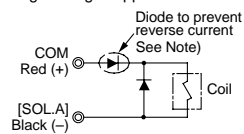
#### Neg. common specifications

##### Single solenoid type

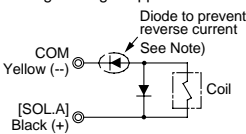
##### Light/Surge voltage suppressor



##### Surge voltage suppressor



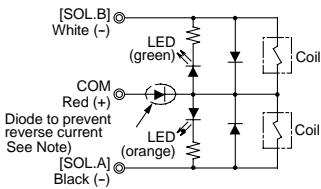
##### Surge voltage suppressor



#### Pos. common specifications

##### Double solenoid, 3 position type

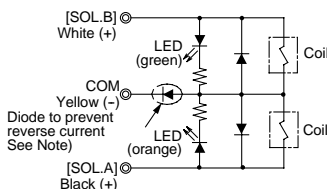
##### Light/Surge voltage suppressor



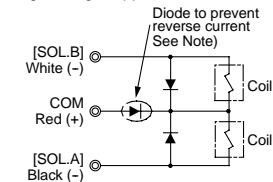
#### Neg. common specifications

##### Double solenoid, 3 position type

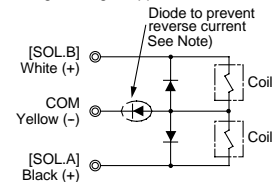
##### Light/Surge voltage suppressor



##### 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.

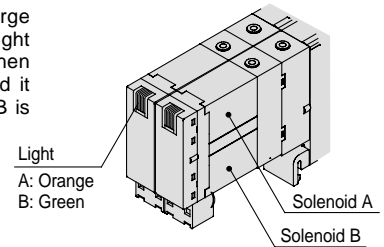
**Pos. common specifications**  
**A (-): Black**  
**COM (+): Red**  
**B (-): White** (no lead wire in case of single solenoid)

**Neg. common specifications**  
**A (+): Black**  
**COM (-): Yellow**  
**B (+): White** (no lead wire in case of single solenoid)

## Caution

### Light indication

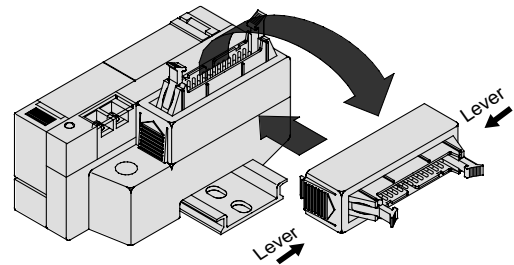
In the case of light/surge voltage suppressor, the light window turns orange when solenoid A is energized, and it turns green when solenoid B is energized.



## 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.





# SZ3000: Specific Product Precautions 4

Be sure to read before handling.

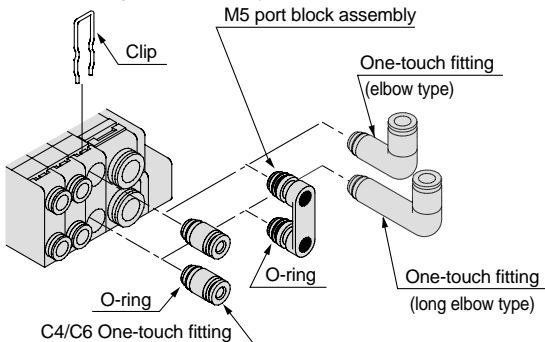
Refer to pages 44 through 47 for safety instructions and common precautions.

## ⚠ Caution

### Replacement of fitting assemblies

By replacing a valve's fitting assembly, it is possible to change the connection diameter of the A, B, P and R 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, insert it into place and then fully reinsert the clip.



#### Part numbers

	Port size	Part no.
Ports A, B	ø4 One-touch fitting assembly	VVQ1000-50A-C4
	ø6 One-touch fitting assembly	VVQ1000-50A-C6
	ø4 One-touch fitting assembly (elbow type)	SZ3000-73-1A-L4
	ø6 One-touch fitting assembly (elbow type)	SZ3000-73-1A-L6
	ø4 One-touch fitting assembly (long elbow type)	SZ3000-73-2A-L4
	ø6 One-touch fitting assembly (long elbow type)	SZ3000-73-2A-L6
Ports P, R	M5 port block assembly	SZ3000-56-1A
	ø6 One-touch fitting assembly	VVQ1000-51A-C6
	ø8 One-touch fitting assembly	VVQ1000-51A-C8
	ø6 One-touch fitting assembly (elbow type)	SZ3000-74-1A-L6
	ø8 One-touch fitting assembly (elbow type)	SZ3000-74-1A-L8
	ø6 One-touch fitting assembly (long elbow type)	SZ3000-74-2A-L6
	ø8 One-touch fitting assembly (long elbow type)	SZ3000-74-2A-L8

Note 1) When changing the connection diameters for ports P and R, indicate this on the manifold specification sheets (pages 37 through 41).

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 straight type 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 button (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.

Note 5) When inserting tubing into an elbow type fitting assembly, insert the tubing while holding the elbow fitting assembly body with your hand. If the tubing is inserted without holding the elbow, excessive force can be applied to the valve and fitting assembly, causing air leakage or damage, etc.

## ⚠ 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. This can make a secure installation impossible, and cause 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 button sufficiently, pushing the collar evenly.

② Pull out the tube while holding down the release button so that it does not come out. If the release button 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

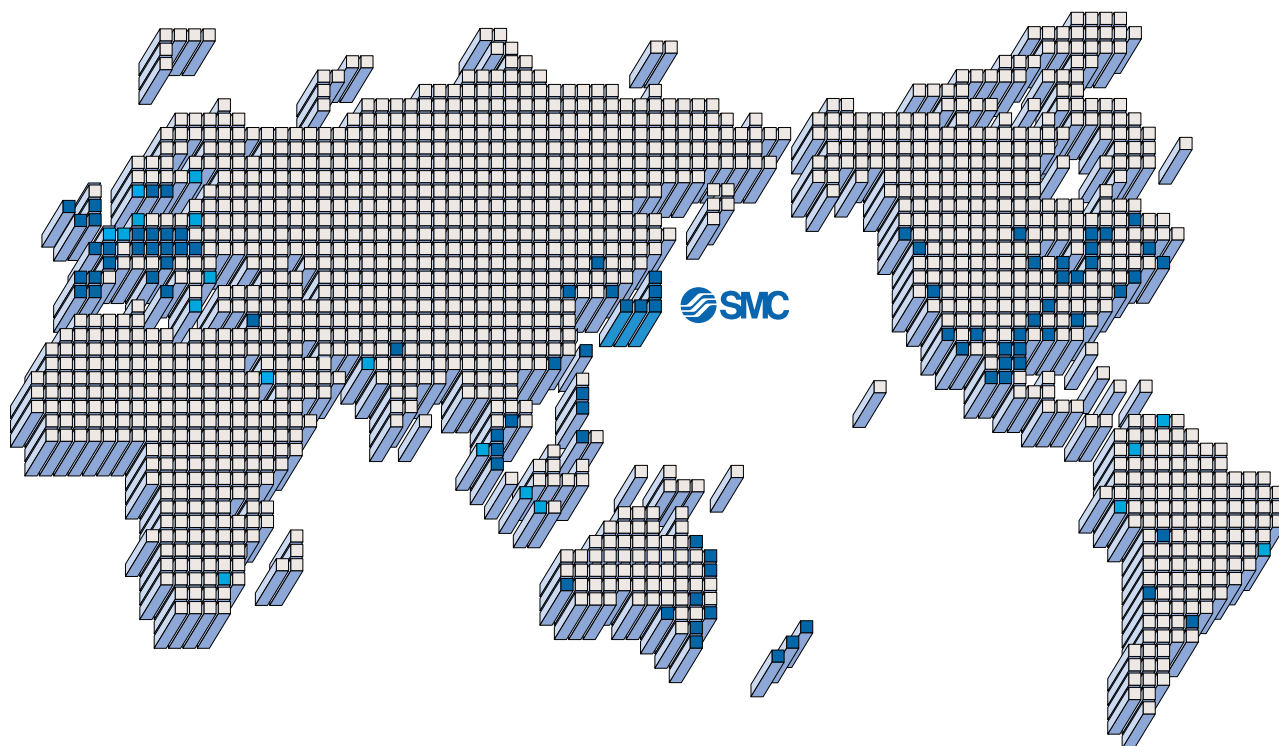
#### 1. When using other than SMC brand tubes, confirm that the following specifications are satisfied with respect to the outside diameter tolerance of the tube.

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

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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