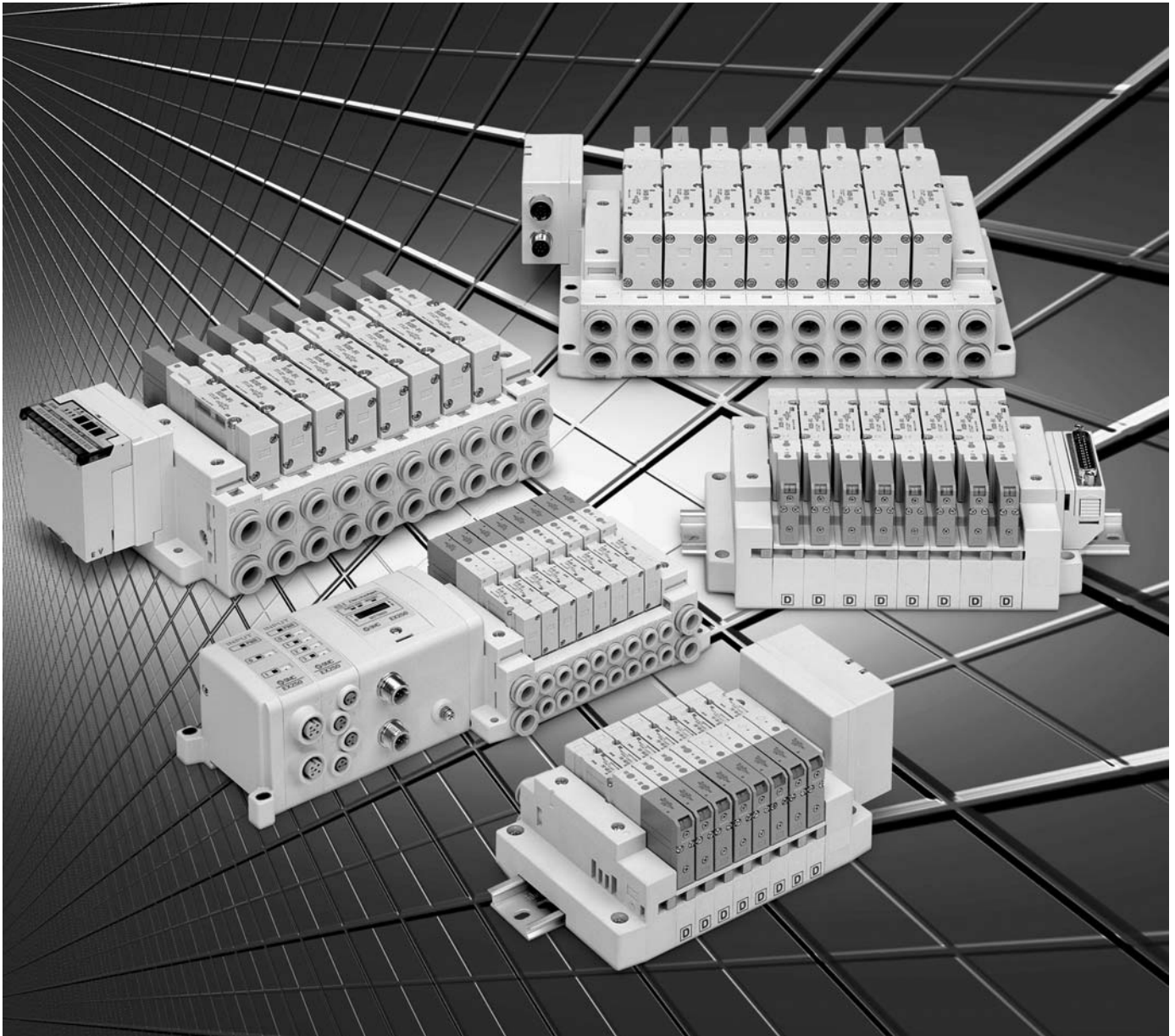


# 5 Port Solenoid Valve

# Series *SV*



**SV**

**SY**

**SYJ**

**SX**

**VK**

**VZ**

**VF**

**VFR**

**VP7**

**VQC**

**SQ**

**VQ**

**VQ4**

**VQ5**

**VQZ**

**VQD**

**VFS**

**VS**

**VS7**

**VQ7**



# New Concept Connector Type Manifold Series SV1000/2000/3000/4000

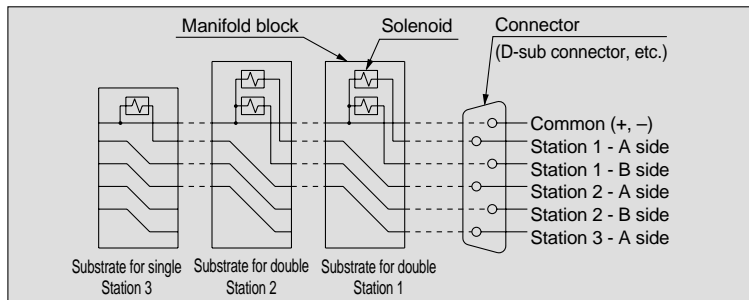
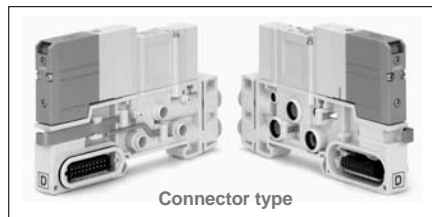
The use of multi-pin connectors to replace wiring inside manifold blocks provides flexibility when adding stations or changing manifold configuration.

The SV series employs a multi-connector instead of the conventional lead wires for internal manifold wiring. By connecting each block with a connector, changes to manifold stations are greatly simplified.

## Connector wiring diagram

For both serial and parallel wiring, additional manifold blocks are sequentially assigned pins on the connector.

This makes it completely unnecessary to disassemble the connector unit.



## 4 position dual 3 port valves available for series SV1000/2000

- Two 3 port valves built into a single valve body.
- A and B ports can be individually controlled.
- Three combinations are available: [N.C./N.C.], [N.O./N.O.] and [N.C./N.O.].
- Mixed mounting with 5 port valves is also possible.
- Labels are attached to indicate A and B side functions, using the same colour as the manual override.

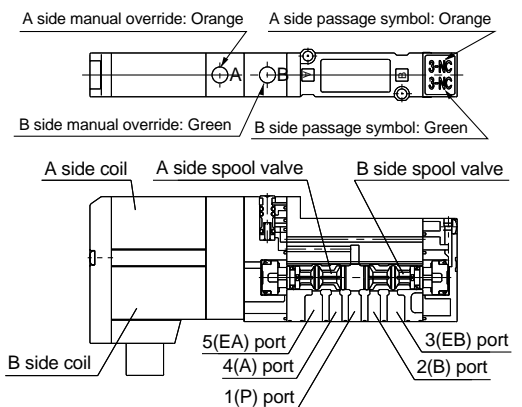
## Cassette base type manifold (for SV1000/2000)

Cassette base type manifolds offer the ultimate in flexibility. Manifold sections can be added using a simple release mechanism.

① Pull the lever forward with a screw driver, etc.

② Loosen the DIN rail holding screws at both ends, and separate the manifold to the right and left.

③ Pull the valve up at the front.



Model	A side	B side	JIS symbol
SV <sub>2</sub> A00	N.C. valve	N.C. valve	
SV <sub>2</sub> B00	N.O. valve	N.O. valve	
SV <sub>2</sub> C00	N.C. valve	N.O. valve	

\* External pilot specification is not available for 4 position dual 3 port valves.

## Tie-rod base manifold (for SV1000/2000/3000/4000)

Conventional tie-rod base type manifolds are also available. The use of 34 pin connectors allows up to 16 stations with double solenoids.

# NEW Serial options: Accommodates gateway type serial wiring

## Series EX500 gateway features:

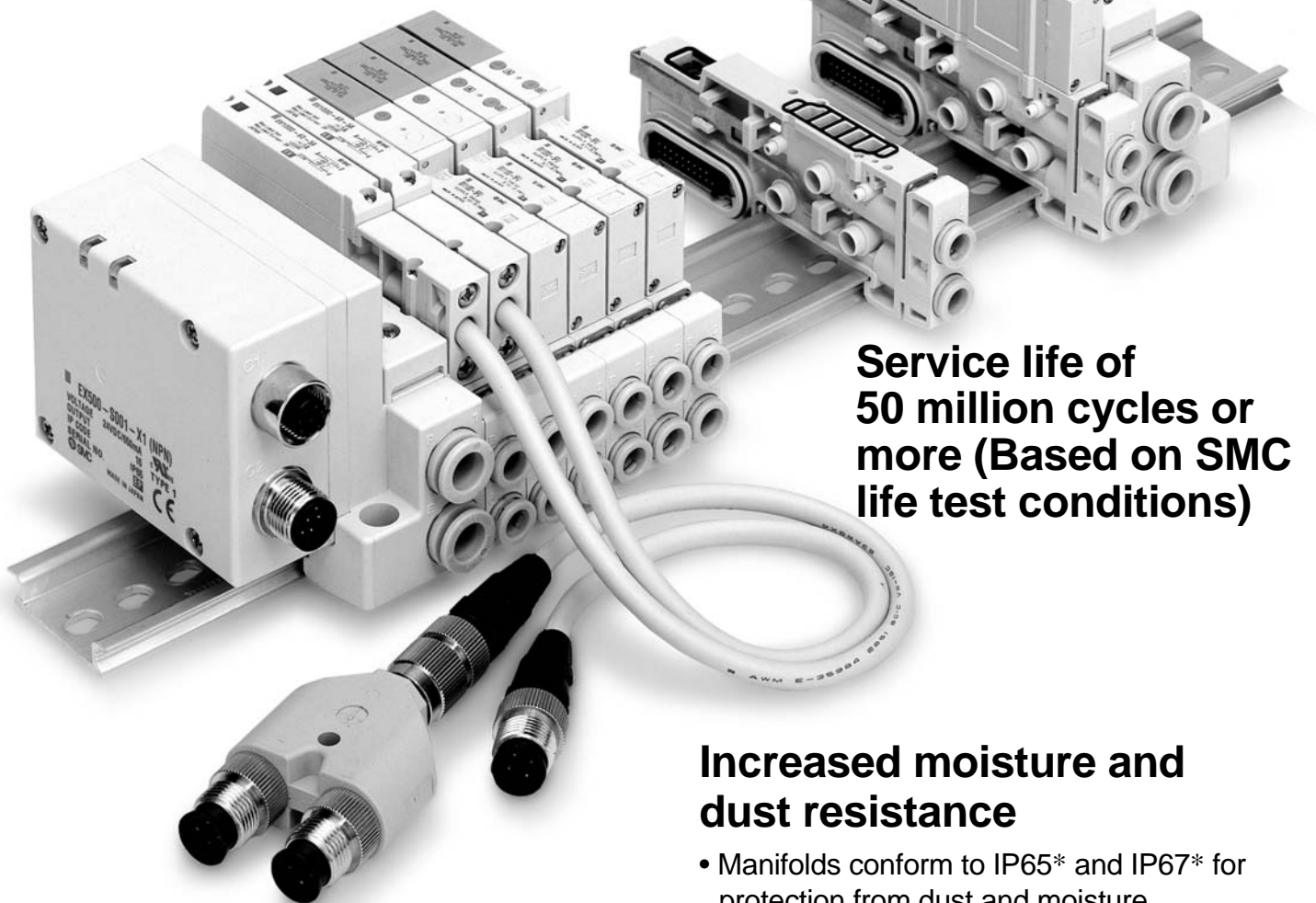
- IP65 protection
- 128 I/O (64 inputs, 64 outputs)
- Controls up to 4 branches with 32 I/O per branch
- A single cable from the gateway provides both signal and power for each branch, eliminating the need for separate power connections for each manifold.

## Series EX250 features:

### Serial wiring with I/O unit Series EX250

- IP65 protection
- 64 I/O (32 inputs, 32 outputs)
- Double solenoid allows up to 16 stations (up to 32 solenoids).

**Product is CE compliant**



**Service life of  
50 million cycles or  
more (Based on SMC  
life test conditions)**

## Increased moisture and dust resistance

- Manifolds conform to IP65\* and IP67\* for protection from dust and moisture.  
(Based on IEC529\*.)  
(Refer to the catalogue contents for details, as some types of connectors do not meet these standards.)

**Power consumption: 0.6W  
(Current: 25mA, 24VDC)**

**A relay output module is  
available for control of  
devices up to 110VAC, 3A.**

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

VS7

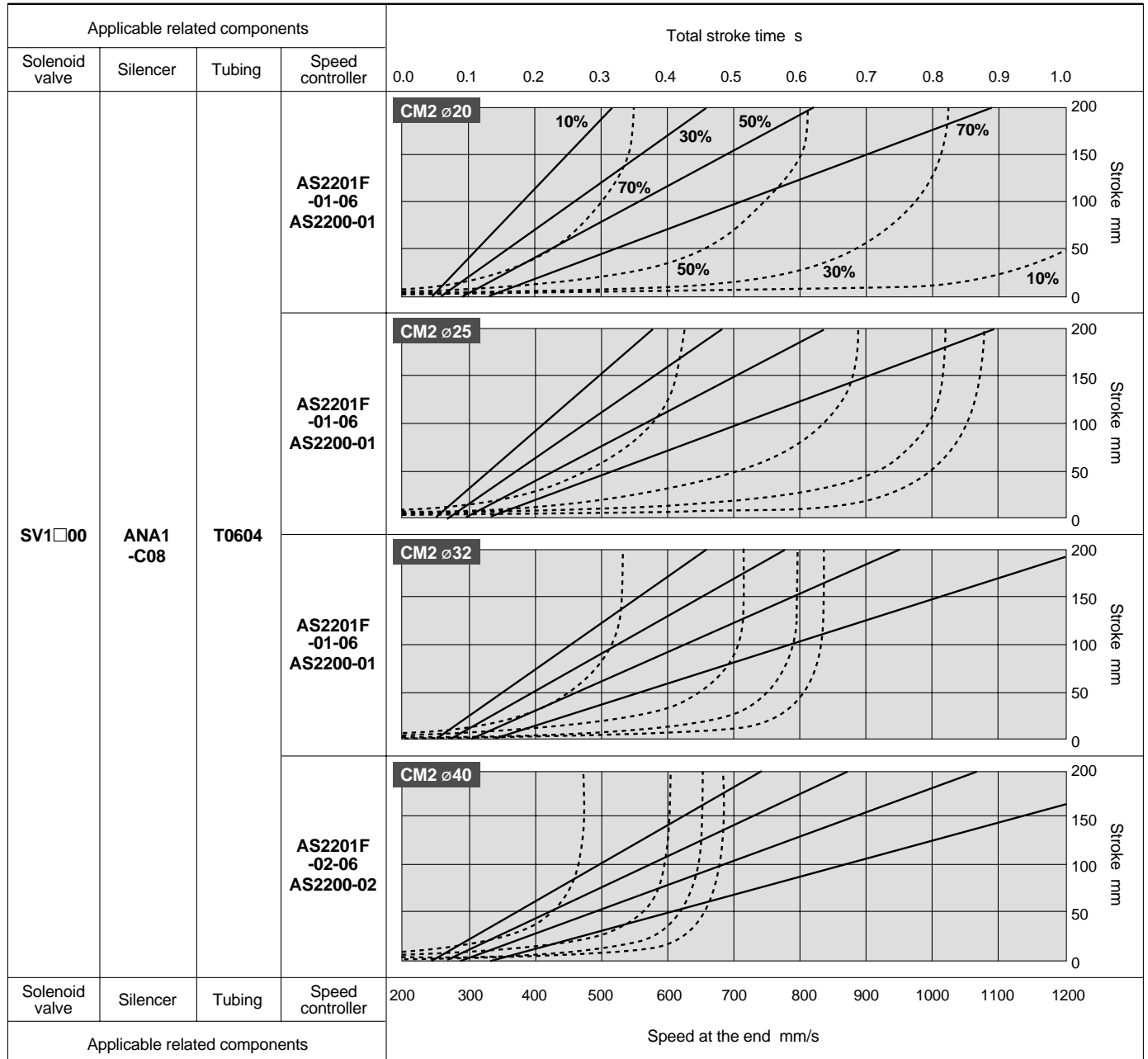
VQ7

# Air Cylinder Drive Systems

## Total Stroke Time and Speed at the End

### Series SV1000

Applicable bore size:  $\varnothing 20$ ,  $\varnothing 25$ ,  $\varnothing 32$ ,  $\varnothing 40$



For details regarding different conditions, make determinations after using the SMC Model Selection Program - Pneumatic Cylinder Drive Systems.

### Reading the graphs

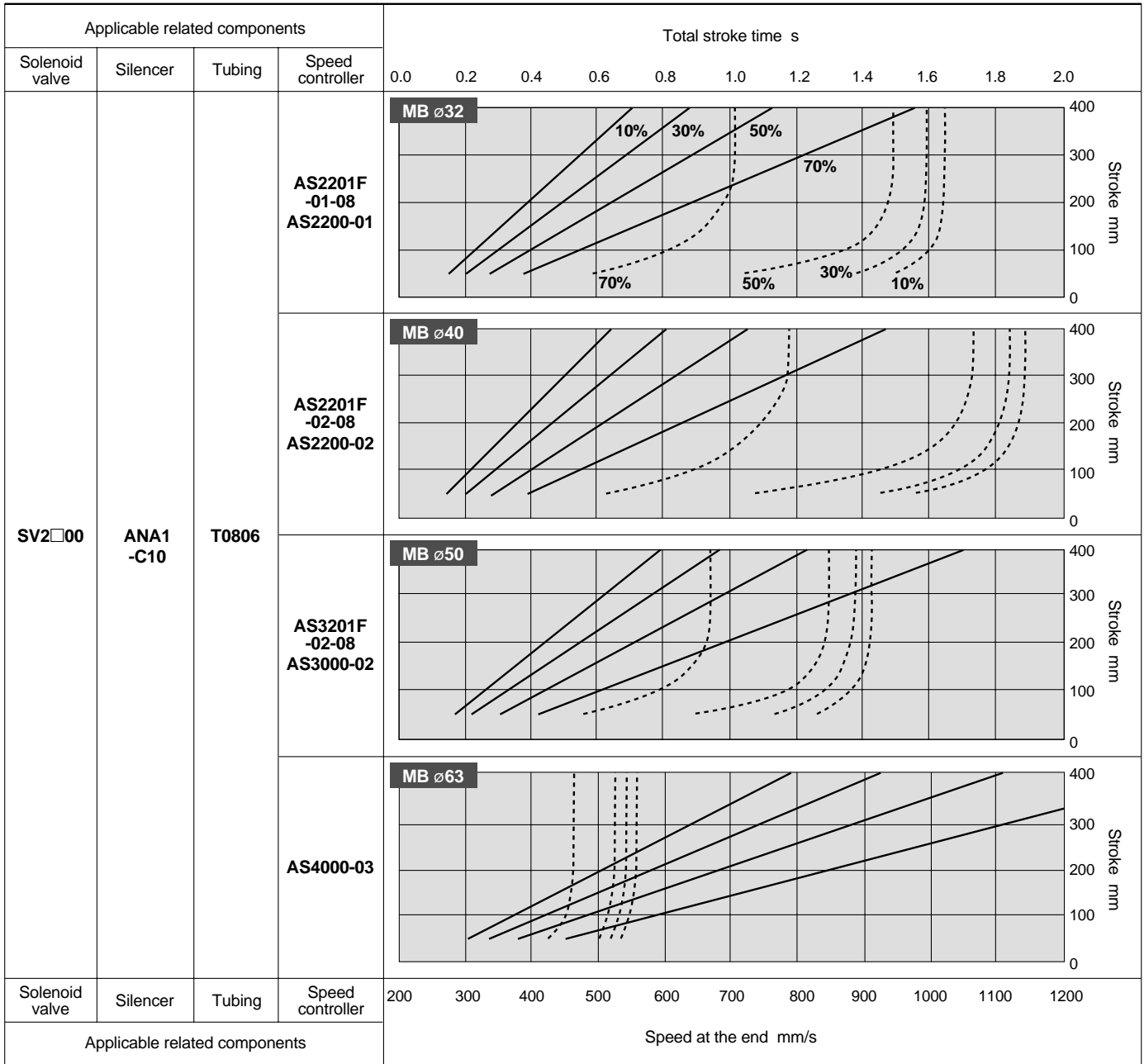
These graphs show the total stroke time and speed at the end when a cylinder drive system is composed of the ideal components. The graphs above indicate the total stroke time and speed at the end with respect to various load ratios and strokes for each cylinder bore size.

#### Common conditions

Supply pressure	0.5MPa
Piping length	SV1000: 1m, SV2000/3000: 2m, SV4000: 3m
Cylinder direction	Vertical upward
Speed controller	Meter-out, Directly connected to cylinder, Needle fully open
Load ratio	$\{(Load\ weight)/(Theoretical\ output)\} \times 100\%$

# Series SV2000

Applicable bore size:  $\varnothing 32, \varnothing 40, \varnothing 50, \varnothing 63$

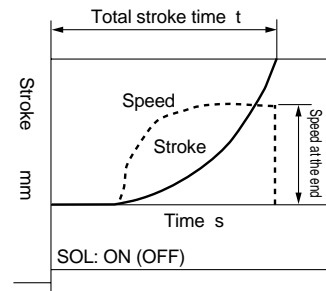
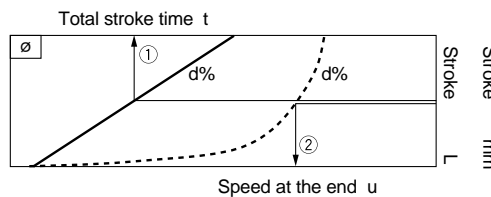


- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7
- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

For details regarding different conditions, make determinations after using the SMC Model Selection Program - Pneumatic Cylinder Drive Systems.

### Example

Go to the chart for the bore size cylinder you are using ( $\varnothing$ ). To find the stroke time (t), follow arrow ① from your stroke length ("L") to the solid line representing the load ratio (d%) for the application then up to the stroke time (t). To find the ending cylinder speed (u), follow arrow ② from your stroke length ("L") to the dotted line representing the load ratio (d%) then down to the ending cylinder speed (u).

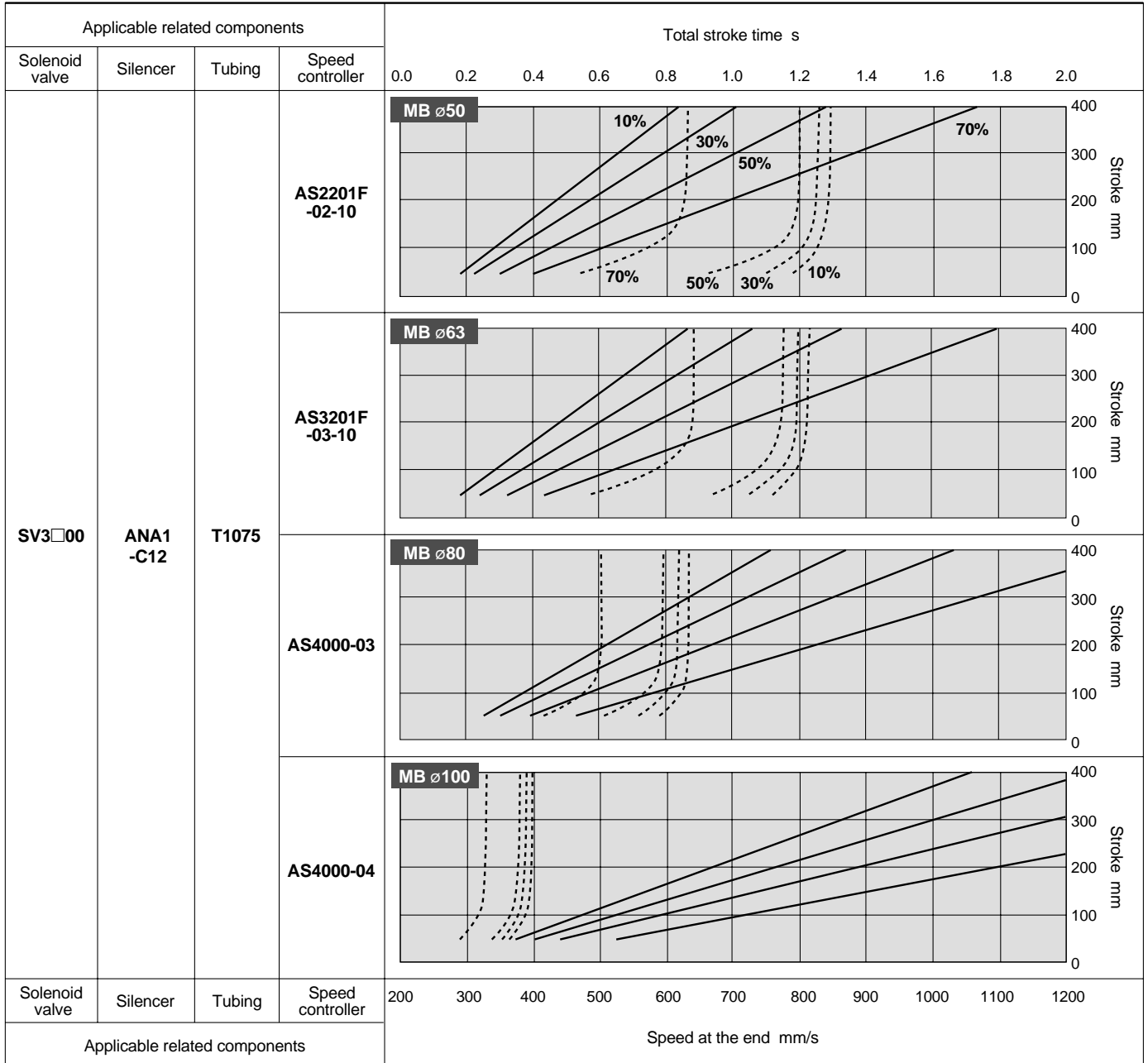


# Air Cylinder Drive Systems

## Total Stroke Time and Speed at the End

### Series SV3000

Applicable bore size:  $\varnothing 50$ ,  $\varnothing 63$ ,  $\varnothing 80$ ,  $\varnothing 100$



For details regarding different conditions, make determinations after using the SMC Model Selection Program - Pneumatic Cylinder Drive Systems.

### Reading the graphs

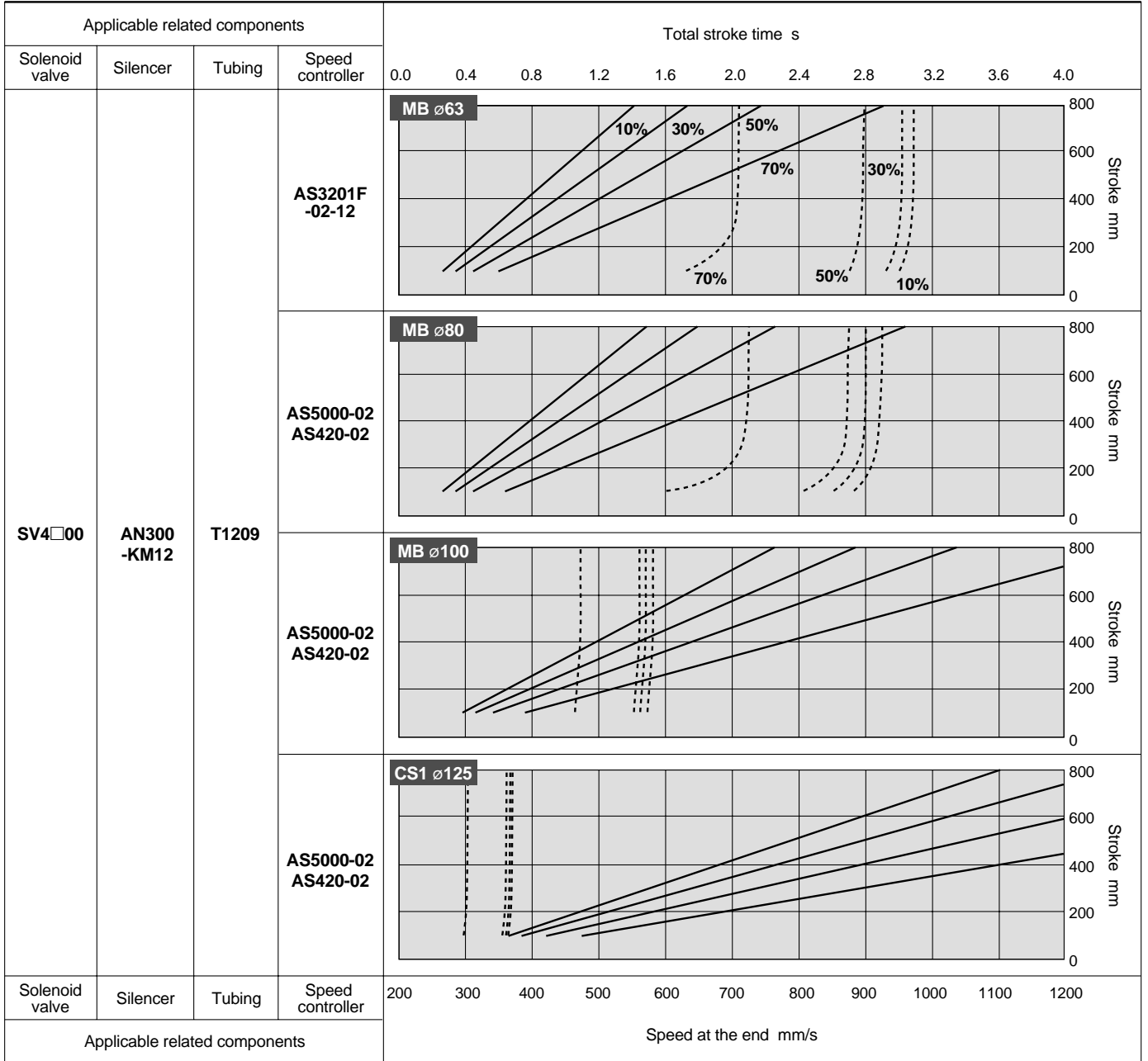
These graphs show the total stroke time and speed at the end when a cylinder drive system is composed of the ideal components. The graphs above indicate the total stroke time and speed at the end with respect to various load ratios and strokes for each cylinder bore size.

#### Common conditions

Supply pressure	0.5MPa
Piping length	SV1000: 1m, SV2000/3000: 2m, SV4000: 3m
Cylinder direction	Vertical upward
Speed controller	Meter-out, Directly connected to cylinder, Needle fully open
Load ratio	$\{(Load\ weight)/(Theoretical\ output)\} \times 100\%$

# Series SV4000

Applicable bore size:  $\varnothing 63, \varnothing 80, \varnothing 100, \varnothing 125$

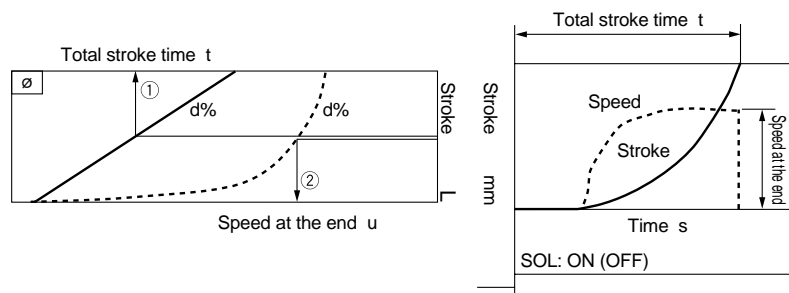


For details regarding different conditions, make determinations after using the SMC Model Selection Program - Pneumatic Cylinder Drive Systems.

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

### Example

Go to the chart for the bore size cylinder you are using ( $\varnothing$ ). To find the stroke time (t), follow arrow ① from your stroke length ("L") to the solid line representing the load ratio (d%) for the application then up to the stroke time (t). To find the ending cylinder speed (u), follow arrow ② from your stroke length ("L") to the dotted line representing the load ratio (d%) then down to the ending cylinder speed (u).







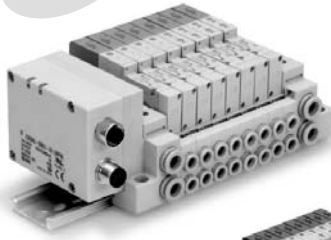
# Table of Contents

## Series SV Manifold Variations

### Serial Wiring

**Valve Manifold Common Specifications** P. 1.1-10

Manifold specifications



**Decentralized Serial Wiring** P. 1.1-13

IP67 protection

Applicable series

Cassette base manifold  
SV1000/SV2000

Tie-rod base manifold  
SV1000/SV2000/SV3000/SV4000

- Number of outputs: 16
- EX500 gateway communication specifications  
Remote I/O, DeviceNet, Profibus



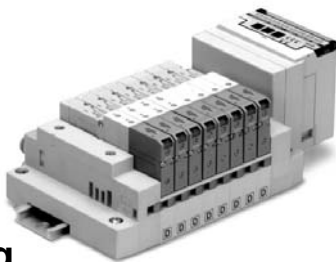
**Serial Wiring with Input/Output Unit** P. 1.1-31

IP67 protection

Applicable series

Tie-rod base manifold  
SV1000/SV2000/SV3000

- Number of inputs/outputs: 32 each



**Serial Wiring for Dedicated Output** P. 1.1-39

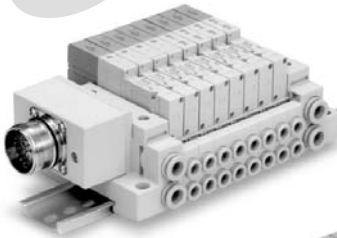
Applicable series

Cassette base manifold  
SV1000/SV2000

Tie-rod base manifold  
SV1000/SV2000/SV3000/SV4000

- Number of outputs: 16

### Parallel Wiring



**Circular Connector**

P. 1.1-51

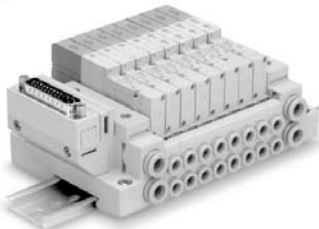
IP67 protection

Applicable series

Cassette base manifold  
SV1000/SV2000

Tie-rod base manifold  
SV1000/SV2000/SV3000/SV4000

- Number of connectors: 26 pins



**D-sub Connector**

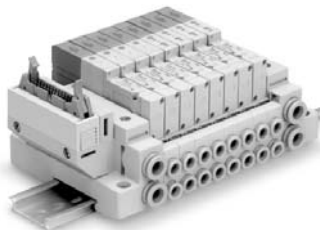
P. 1.1-61

Applicable series

Cassette base manifold  
SV1000/SV2000

Tie-rod base manifold  
SV1000/SV2000/SV3000/SV4000

- Number of connectors: 25 pins
- MIL-C-24308
- Conforms to JIS-X-5101



**Flat Ribbon Cable**

P. 1.1-71

Applicable series

Cassette base manifold  
SV1000/SV2000

Tie-rod base manifold  
SV1000/SV2000/SV3000/SV4000

- Number of connectors: 26, 20, 10 pins
- With strain relief
- Conforms to MIL-C-83503

**Valve Manifold Specifications**

P. 1.1-82

Manifold exploded view  
Manifold options

**Single Valve/Sub-plate**

P. 1.1-94

IP67 protection

Applicable series

SV1000/SV2000/SV3000/SV4000

- With waterproof M12 connector

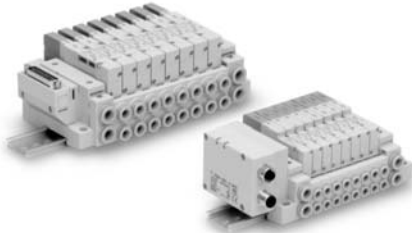


- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7

- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

# Valve Manifold Common Specifications Series SV

## Cassette base



- Manifold stations can be easily changed by lever operation.

## Specification

Applicable series		SV1000	SV2000
Manifold type		Stacking type cassette base manifold	
1 (P: SUP)/3, 5 (E: EXH) type		Common SUP, EXH	
Valve stations (maximum)		18 stations	20 stations
Max. number of solenoids		18 points	26 points
Port size	1(P)/3, 5 (E) port	C8, N9	C10, N11
	4(A)/2(B) port	C3, C4, C6 N1, N3, N7	C4, C6, C8 N3, N7, N9

## Flow Characteristics

Model	Port size		Flow characteristics	
	1, 5, 3 (P/EA/EB)	4, 2 (A/B)	1→4, 2 (P→A, B)	4, 2→5, 3 (A, B→EA, EB)
			Nl/min	Nl/min
SS5V1-16	C8	C6	216	226
SS5V2-16	C10	C8	491	550

Note) Value is for manifold base with 5 stations and individually operated 2 position type.

## Tie-rod base



- A 34 pin connector allows up to 16 stations with double solenoids.

## Specification

Applicable series		SV1000	SV2000	SV3000	SV4000
Manifold type		Tie-rod base manifold			
1(P: SUP)/3, 5(E: EXH) type		Common SUP, EXH			
Valve stations (maximum)		20 stations			
Max. number of solenoids		32 points			
Port size	1(P)/3, 5(E) port	C8, N9	C10, N11	C12, N11	C12, N11, O3
	4(A)/2(B) port	C3, C4, C6 N1, N3, N7	C4, C6, C8 N3, N7, N9	C6, C8, C10 N7, N9, N11	C8, C10, C12 N9, N11, O2, O3

## Flow Characteristics

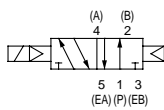
Model	Port size		Flow characteristics	
	1, 5, 3 (P, EA, EB)	4, 2 (A, B)	1→4, 2(P→A, B)	4, 2→5, 3(A, B→EA, EB)
			Nl/min	Nl/min
SS5V1-10	C8	C6	236	275
SS5V2-10	C10	C8	452	471
SS5V3-10	C12	C10	893	913
SS5V4-10	C12	C12	1276	1570

Note) Value is for manifold base with 5 stations and individually operated 2 position type.

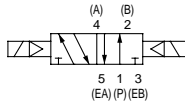
## Series SV Solenoid Valve Specifications

JIS symbol

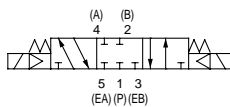
2 position single solenoid



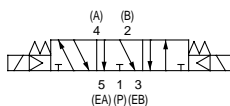
2 position double solenoid



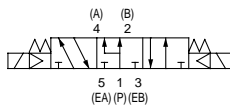
3 position closed centre



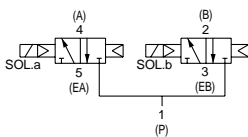
3 position exhaust centre



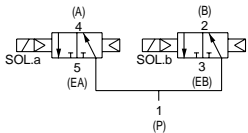
3 position pressure centre



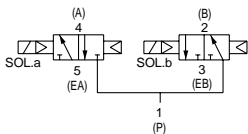
4 position dual 3 port valve: N.C./N.C.



4 position dual 3 port valve: N.O./N.O.



4 position dual 3 port valve: N.C./N.O.



Fluid	Air	
Internal pilot operating pressure range MPa	2 position single	0.15 to 0.7
	4 position dual 3 port valve	
	2 position double	
3 position	0.2 to 0.7	
	Operating pressure range	-100kPa to 0.7
External pilot operating pressure range MPa	2 position single, double	0.25 to 0.7
	3 position	
Ambient and fluid temperature °C	-10 to 50 (with no freezing)*	
Maximum operating frequency Hz	2 position single, double	5
	4 position dual 3 port valve	
	3 position	
Manual override	Non-locking push type	
	Slotted locking type	
Pilot exhaust method	Internal pilot	Main valve/Pilot valve common exhaust
	External pilot	
Lubrication	Not required	
Mounting orientation	Unrestricted	
Impact/Vibration resistance ms <sup>2</sup>	150/30 (8.3 to 2000Hz)	
Enclosure	IP67 (based on IEC529)	
Rated coil voltage	24VDC, 12VDC	
Allowable voltage fluctuation	±10% of rated voltage	
Power consumption W	0.6 (With light: 0.65)	
Surge voltage suppressor	Zener diode	
Indicator light	LED	

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 energized and de-energized states (at 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, in both energized and de-energized states (at initial value).

### Response time

Type of actuation	Response time ms (at 0.5MPa)			
	SV1000	SV2000	SV3000	SV4000
2 position single	11 or less	25 or less	28 or less	40 or less
2 position double	10 or less	17 or less	26 or less	40 or less
3 position	18 or less	29 or less	32 or less	82 or less
4 position dual 3 port valve	15 or less	33 or less	—	—

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

### Weights

Series	Type of actuation	Weight g
SV1000	Single solenoid	66
	Double solenoid	71
	3 position	73
	4 position dual 3 port	71
SV2000	Single solenoid	74
	Double solenoid	78
	3 position	83
	4 position dual 3 port	78
SV3000	Single solenoid	99
	Double solenoid	102
	3 position	110
SV4000	Single solenoid	186
	Double solenoid	190
	3 position	211

Note) Weights of solenoid valve only.

SV

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VQ4

VQ5

VQZ

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VS7

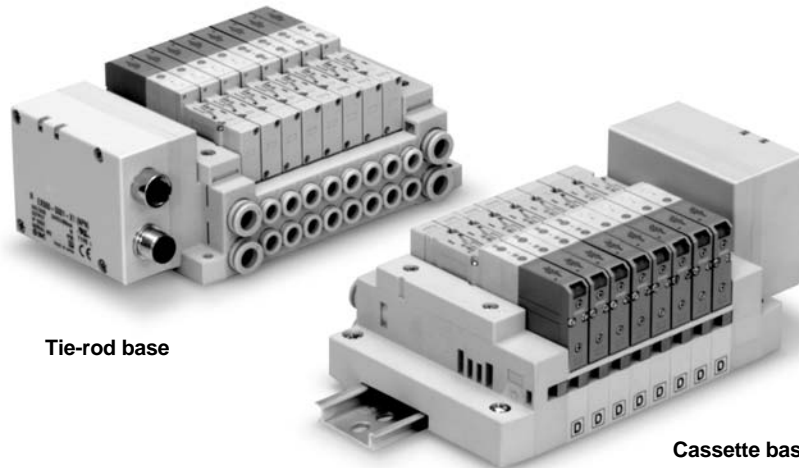
VQ7



# Decentralized Serial Wiring

## Series EX500

IP67 protection



Tie-rod base

Cassette base

Applicable series	Cassette base manifold SV1000/SV2000
	Tie-rod base manifold SV1000/SV2000/SV3000/SV4000
	<ul style="list-style-type: none"> <li>• Number of outputs: 16</li> <li>• EX500 gateway unit communication specifications Remote I/O, DeviceNet, PROFIBUS-DP</li> </ul>

SV

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VS

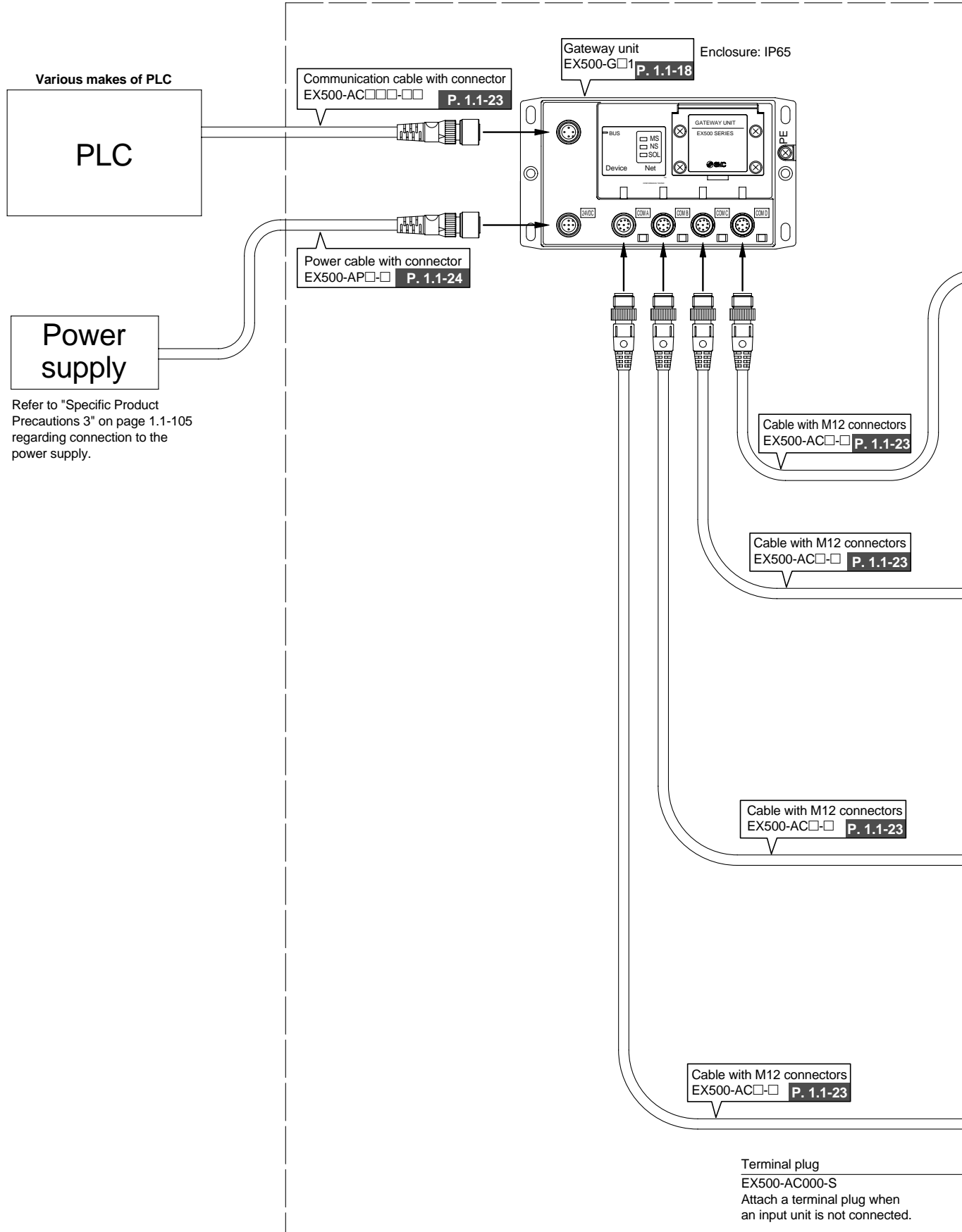
VS7

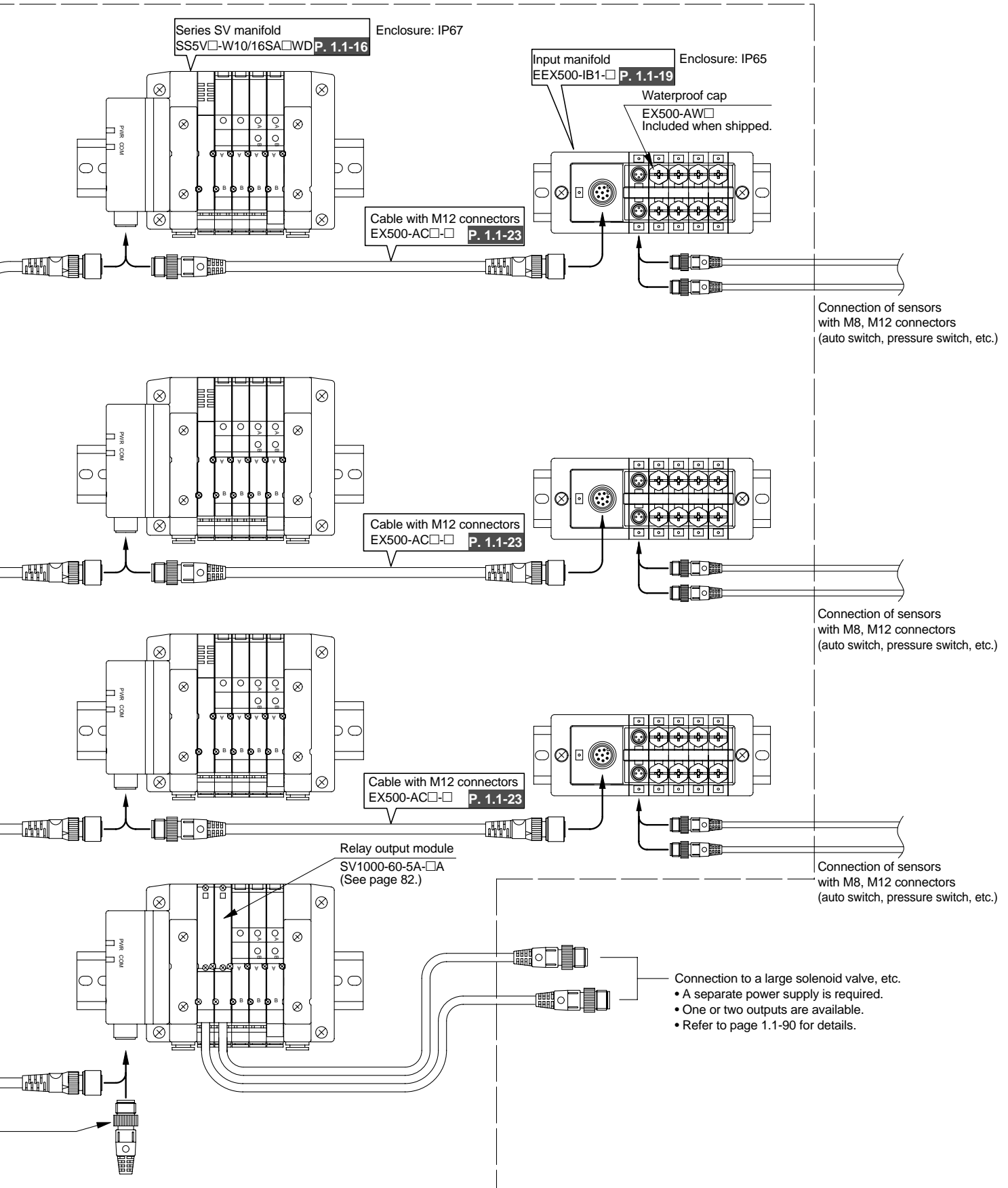
VQ7

## Series EX500 Decentralized Serial System Configuration A configuration of series EX500 serial system with series SV is shown below.

- One gateway unit can be configured with manifold valves (outputs) and input unit manifolds (inputs) for up to 16 inputs and outputs per branch, with a maximum of four branches. (Maximum of 64 outputs and 64 inputs)

Series EX500 Decentralized Serial System Configuration





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

# EX500 Decentralized Serial Wiring Series SV

## How to Order

**Series**

1	SV1000
2	SV2000
3	SV3000
4	SV4000

**Tie-rod base**  
SS5V 1 — W 10S A1W D — 05 U

**Cassette base**  
SS5V 1 — W 16S A1W D — 05 U

**Series**

1	SV1000
2	SV2000

**Enclosure IP67 specification**

**SI unit specification**

A1W	For remote I/O
A2W	For DeviceNet/ PROFIBUS-DP
0	Without SI unit

**Valve stations**

Symbol	Stations	Note
02	2 stations	Double wiring specification <small>Note 1)</small>
⋮	⋮	
08	8 stations	Specified layout <small>Note 2)</small> (Up to 16 solenoids possible.)
02	2 stations	
⋮	⋮	
16	16 stations	

**P, E port position**

U	U side (2 to 10 stations)
D	D side (2 to 10 stations)
B	Both sides (2 to 16 stations)

**Supply/Exhaust block assembly specification**

Nil	Internal pilot specification
S*	Internal pilot/Built-in silencer
R	External pilot specification
RS*	External pilot/Built-in silencer

\* When the built-in silencer type is used, keep the exhaust port from coming in direct contact with water or other liquids.

**Mounting**

Nil	Direct mount	
D	DIN rail mount (with DIN rail)	
D0 <small>Note)</small>	DIN rail mount (without DIN rail)	
D3	For 3 stations	When a DIN rail longer than the specified stations is required. (Specify a rail longer than the standard length.)
⋮	⋮	
D16	For 16 stations	

Note) In case of D0, only DIN rail fittings are attached.

**DIN rail length**

Nil	Standard length	
3	For 3 stations	Specify a rail longer than the standard length.
⋮	⋮	
16	For 16 stations	

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

Symbol	A, B port	P, E port	Applicable series
C3	ø3.2 One-touch fitting	ø8 One-touch fitting	SV1000
C4	ø4 One-touch fitting		
C6	ø6 One-touch fitting		
C4	ø4 One-touch fitting	ø10 One-touch fitting	SV2000
C6	ø6 One-touch fitting		
C8	ø8 One-touch fitting		
C6	ø6 One-touch fitting	ø12 One-touch fitting	SV3000
C8	ø8 One-touch fitting		
C10	ø10 One-touch fitting		
C8	ø8 One-touch fitting	ø12 One-touch fitting	SV4000
C10	ø10 One-touch fitting		
C12	ø12 One-touch fitting		
02	Rc 1/4	Rc 3/8	
03	Rc 3/8		
02F	G 1/4		
03F	G 3/8	G 3/8	
M	A, B ports mixed		

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

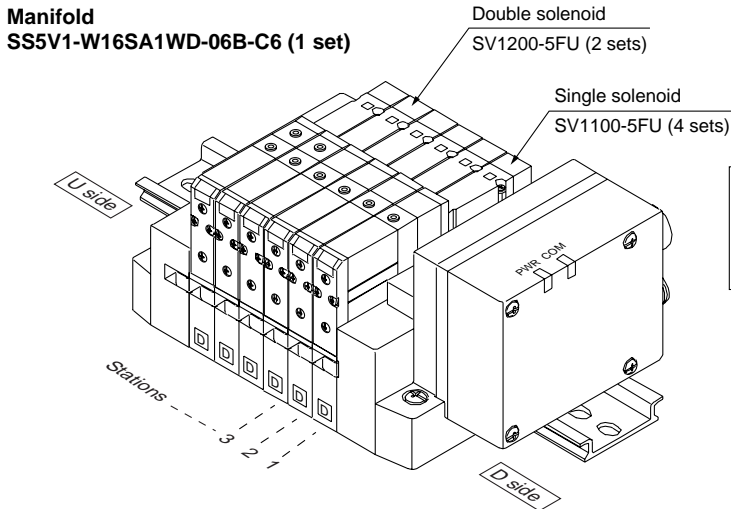
Symbol	A, B port	P, E port	Applicable series
N1	ø1/8" One-touch fitting	ø5/16" One-touch fitting	SV1000
N3	ø5/32" One-touch fitting		
N7	ø1/4" One-touch fitting		
N3	ø5/32" One-touch fitting	ø3/8" One-touch fitting	SV2000
N7	ø1/4" One-touch fitting		
N9	ø5/16" One-touch fitting		
N7	ø1/4" One-touch fitting	ø3/8" One-touch fitting	SV3000
N9	ø5/16" One-touch fitting		
N11	ø3/8" One-touch fitting		
N9	ø5/16" One-touch fitting	ø3/8" One-touch fitting	SV4000
N11	ø3/8" One-touch fitting		
02N	NPT 1/4		
03N	NPT 3/8		
02T	NPTF 1/4		
03T	NPTF 3/8	NPTF 3/8	
M	A, B ports mixed		

\* In case of mixed specification (M), indicate separately on a manifold specification sheet.



## How to Order Manifold Assemblies (Order Example)

### Example (SV1000)



SS5V1-W16SA1WD-06B-C6 ..... 1 set (manifold part no.)  
 \* SV1100-5FU ..... 4 sets (single solenoid part no.)  
 \* SV1200-5FU ..... 2 sets (double solenoid part no.)

## How to Order Solenoid Valves

**SV 1 1 0 0** — **5 F**

Note) Available with manifold block for station additions. Refer to pages 1.1-85 and 1.1-89.

#### Series

1	SV1000
2	SV2000
3	SV3000
4	SV4000

#### Type of actuation

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

\* 4 position dual 3 port valves are applicable to series SV1000 and SV2000 only.

#### Pilot specification

Nil	Internal pilot
R	External pilot

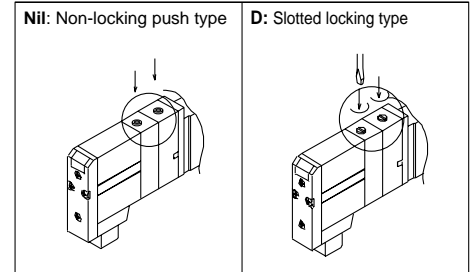
\* External pilot specification is not available for 4 position dual 3 port valves.

#### Back pressure check valve

Nil	None
K	Built-in

\* Built-in back pressure check valve type is applicable to series SV1000 only.  
 \* Back pressure check valve is not available for 3 position closed center and 3 position pressure center.  
 \* Flow rate with the built-in back pressure check valve is reduced approximately 20%.

#### Manual override



#### Light/Surge voltage suppressor

U	With light and surge voltage suppressor
R	With surge voltage suppressor

#### Rated voltage

5	24VDC
---	-------

**SV**  
**SY**  
**SYJ**  
**SX**  
**VK**  
**VZ**  
**VF**  
**VFR**  
**VP7**

**VQC**  
**SQ**  
**VQ**  
**VQ4**  
**VQ5**  
**VQZ**  
**VQD**  
**VFS**  
**VS**  
**VS7**  
**VQ7**

# Series SV

## Gateway (GW) Unit



## Specifications

Model	EX500-GAB1-X1	EX500-GDN1	EX500-GPR1
Applicable PLC/Communication protocol	Rockwell Automation PLC	DeviceNet Release 2.0	PROFIBUS-DP
Communication speed	57.6Kbit/sec, 115.2Kbit/sec 230.4Kbit/sec	125Kbit/sec, 250Kbit/sec 500Kbit/sec	9.6/19.2/93.75/187.5/500Kbit/sec 1.5/3/6/12Mbit/sec
Rated voltage	24VDC		
Power supply voltage range	Input and control unit power supply: 24VDC $\pm$ 10% Solenoid valve power supply: 24VDC +10%/−5% (power drop warning at approx. 20V)		
Current consumption	200mA or less		
Number of inputs/outputs	Maximum 64 inputs/64 outputs		
Number of input/output branches	4 branches (16 inputs/16 outputs per branch)		
Branch cable	8 core heavy duty cable		
Branch cable length	5m or less (total extension 10m or less)		
Communication connector	M12 connector (8 pins, socket)		
Power connector	M12 connector (5 pins, plug)		
Ambient operating temperature/humidity	+5°C to +45°C/35% to 85%RH (no condensation)		
Enclosure	IP65		
Applicable standard	UL, CSA, CE		
Weight g	470		

\* Communication cables and connectors are sold separately.  
Refer to options on page 1.1-23.

## How to Order

EX500 – G **DN** 1   

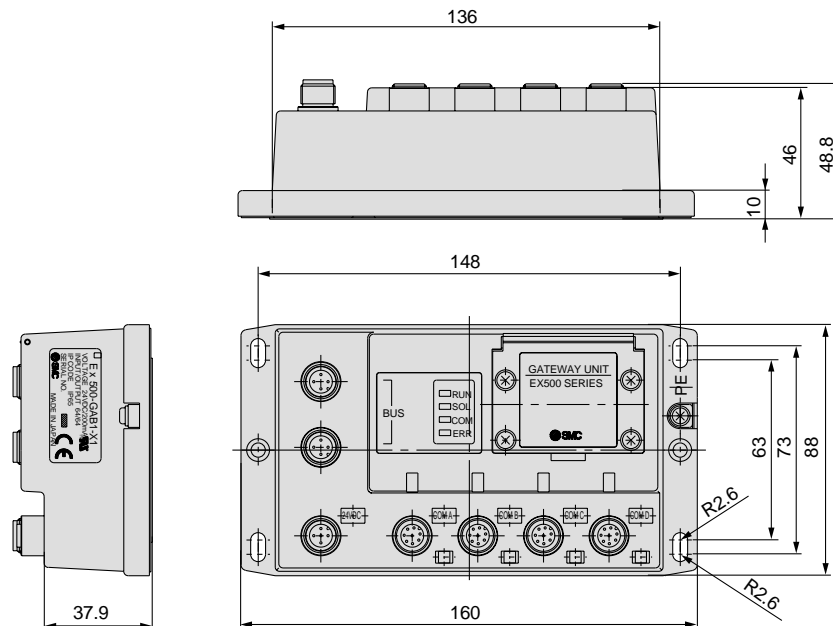
• Communication protocol

DN	DeviceNet
PR	PROFIBUS-DP
AB	Remote I/O (RIO)

• Applicable GW unit

Nil	DeviceNet PROFIBUS-DP
-X1	Remote I/O (RIO)

## Dimensions



### How to Order Input Manifolds

### How to Order Input Blocks

Input unit manifold



**EEX500-IB1-E8** **EX500-IE1**

Input unit specification

Connector type

E	M8 connector
T	M12 connector
M	M8, M12 mixed

Stations

1	1 station
⋮	⋮
8	8 stations

Applicable GW unit

Nil	DeviceNet PROFIBUS-DP
-X1	Remote I/O (RIO)

Block type

1	M8 connector, PNP specification
2	M8 connector, NPN specification
3	M12 connector, PNP specification
4	M12 connector, NPN specification
5	8 point integrated type, M8 connector, PNP specification
6	8 point integrated type, M8 connector, NPN specification

Applicable GW unit

Nil	DeviceNet PROFIBUS-DP
-X1	Remote I/O (RIO)

### Input Unit Specifications

Connection block	Current source type input block (PNP input block) or Current sink type input block (NPN input block)
Communication connector	M12 connector (8 pins, plug)
Number of connection blocks	Maximum 8 blocks
Block supply voltage	24VDC
Block supply current	0.65A maximum
Current consumption	100mA or less (at rated voltage)
Short circuit protection	Operates at 1ATyp. (power supply cut) GW unit reset by turning power OFF and back ON.
Enclosure	IP65
Weight g <sup>Note)</sup>	100 (Input unit + End block)

Note) Since the DIN rail weight is not included, confirm the DIN rail length being used on page 1.1-21, and add the weight found in the DIN rail dimension table on page 1.1-93.

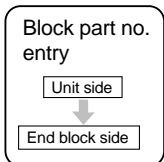
### Input Block Specifications

Applicable sensor	Current source type (PNP output) or Current sink type (NPN output)
Sensor connector	M8 connector (3 pins) or, M12 connector (4 pins)
Number of inputs	2 inputs/8 inputs (M8 only)
Rated voltage	24VDC
Indication	Green LED
Insulation	None
Sensor supply current	Maximum 30mA/Sensor
Enclosure	IP65
Weight g	[For M8: 20] [For M12: 40] [8 point integrated type, for M8: 55]

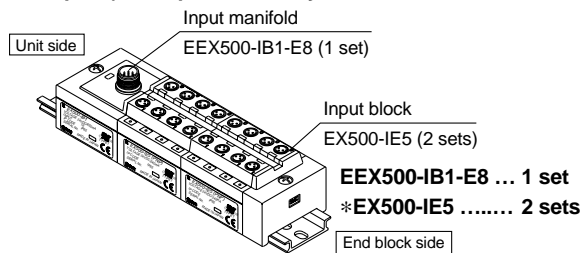
### How to Order Input Unit Manifolds [Order Example]

When ordering an input unit manifold, enter the [Input manifold part no.] + [Input block part no.] together.

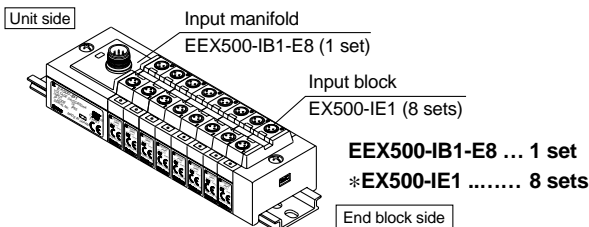
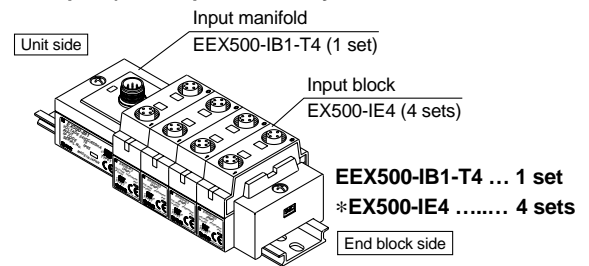
The [Input unit], [End block] and [DIN rail] are included in the input manifold. Refer to the indications below.



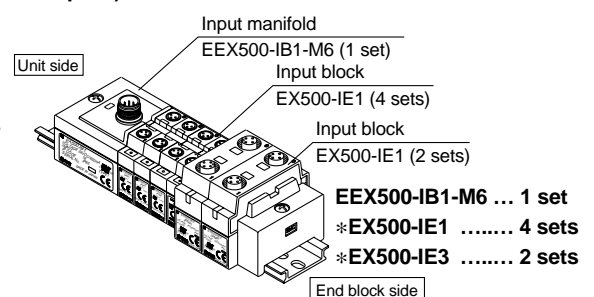
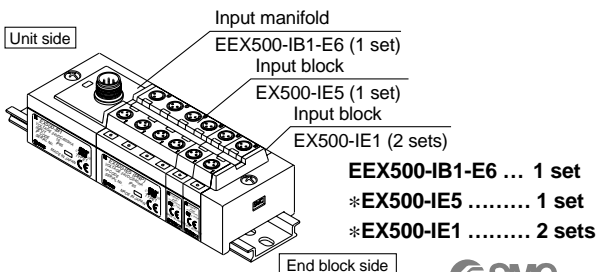
#### Example 1) M8 input block only



#### Example 2) M12 input block only



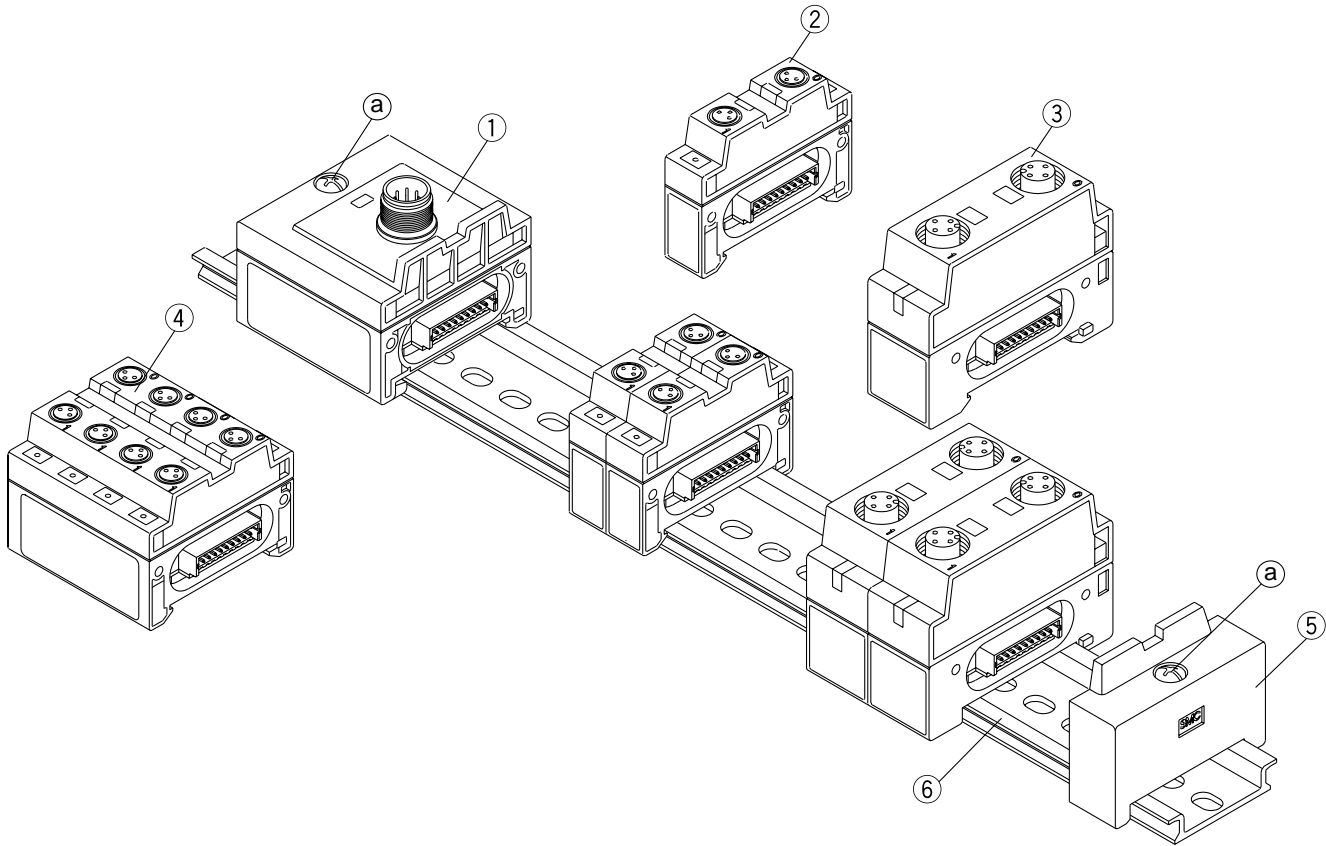
#### Example 3) M8 and M12 mixed



Note) • Since the 8 point integrated type input block is equivalent to the length of four stations on an M8 input block, pay attention to the number of stations on an input manifold.  
• When an input block layout becomes complicated, indicate on an input unit manifold specification sheet.

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

## Input Unit Manifold Exploded View



### Parts list

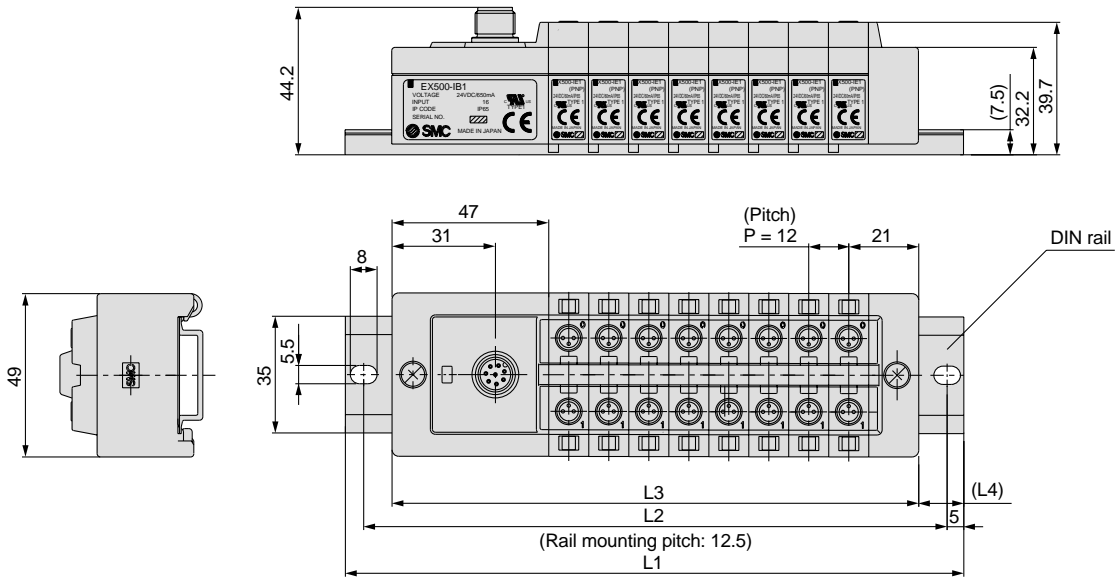
No.	Description	Part no.		Note
		For standard	For RIO	
1	Input unit	EX500-IB1	EX500-IB1-X1	
2	Input block (M8 connector)	EX500-IE□	EX500-IE□-X1	PNP specifications ... □: 1, NPN specifications ... □: 2
3	Input block (M12 connector)	EX500-IE□	EX500-IE□-X1	PNP specifications ... □: 3, NPN specifications ... □: 4
4	8 input block (M8 connector)	EX500-IE□	EX500-IE□-X1	PNP specifications ... □: 5, NPN specifications ... □: 6
5	End block	EX500-EB1		
6	DIN rail	VZ1000-11-1-□		□: Length (Refer to page 1.1-93.)

### How to add input block stations

- 1 Loosen the screws (a) (2 places) that are holding the end blocks.
- 2 Separate the blocks at the locations where stations are to be added.
- 3 Attach the additional blocks to the DIN rail, and connect the blocks so that they fit together securely.
- 4 While holding the blocks together so that there are no gaps between them, secure them to the DIN rail by tightening the screws (a).  
Note: Be sure to tighten the screws with the prescribed tightening torque. (0.6N·m)

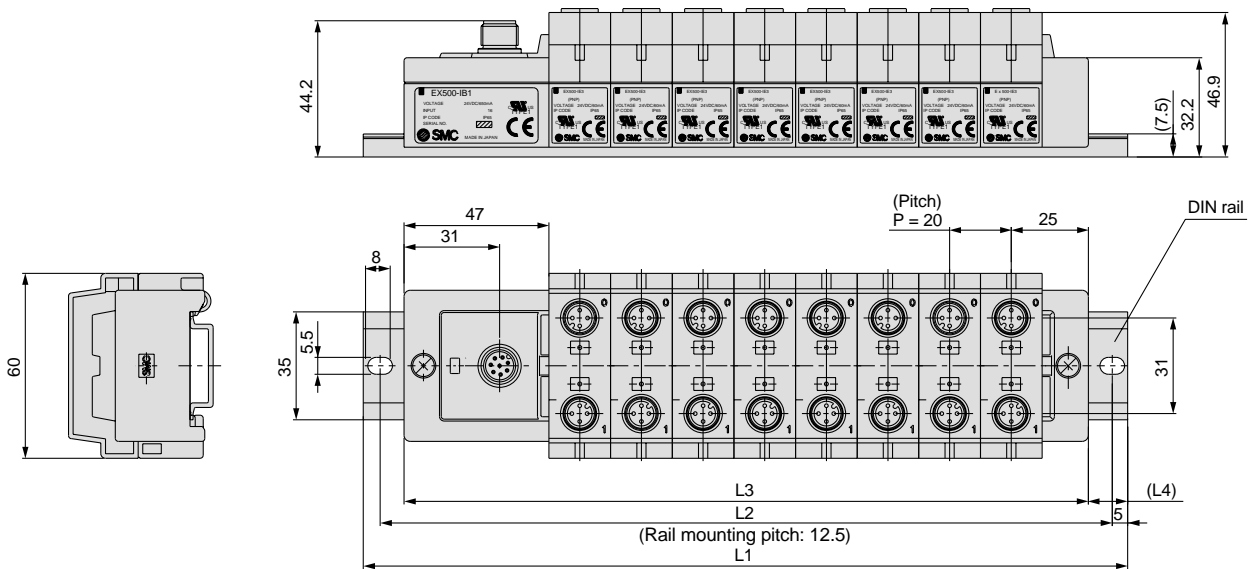
## Input Unit Manifold Dimensions

### Input block (M8) only



Stations	1	2	3	4	5	6	7	8
Rail length L1	98	110.5	123	135.5	148	160.5	173	185.5
Mounting pitch L2	87.5	100	112.5	125	137.5	150	162.5	175
Manifold length L3	74	86	98	110	122	134	146	158
L4	12	12	12.5	12.5	13	13	13.5	13.5

### Input block (M12) only



Stations	1	2	3	4	5	6	7	8
Rail length L1	110.5	123	148	173	185.5	210.5	223	248
Mounting pitch L2	100	112.5	137.5	162.5	175	200	212.5	237.5
Manifold length L3	82	102	122	142	162	182	202	222
L4	12	12	12.5	12.5	13	13	13.5	13.5

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

VS7

VQ7



Refer to page 1.1-11 for valve specifications.

## How to Order SI Unit

# EX500 – S001



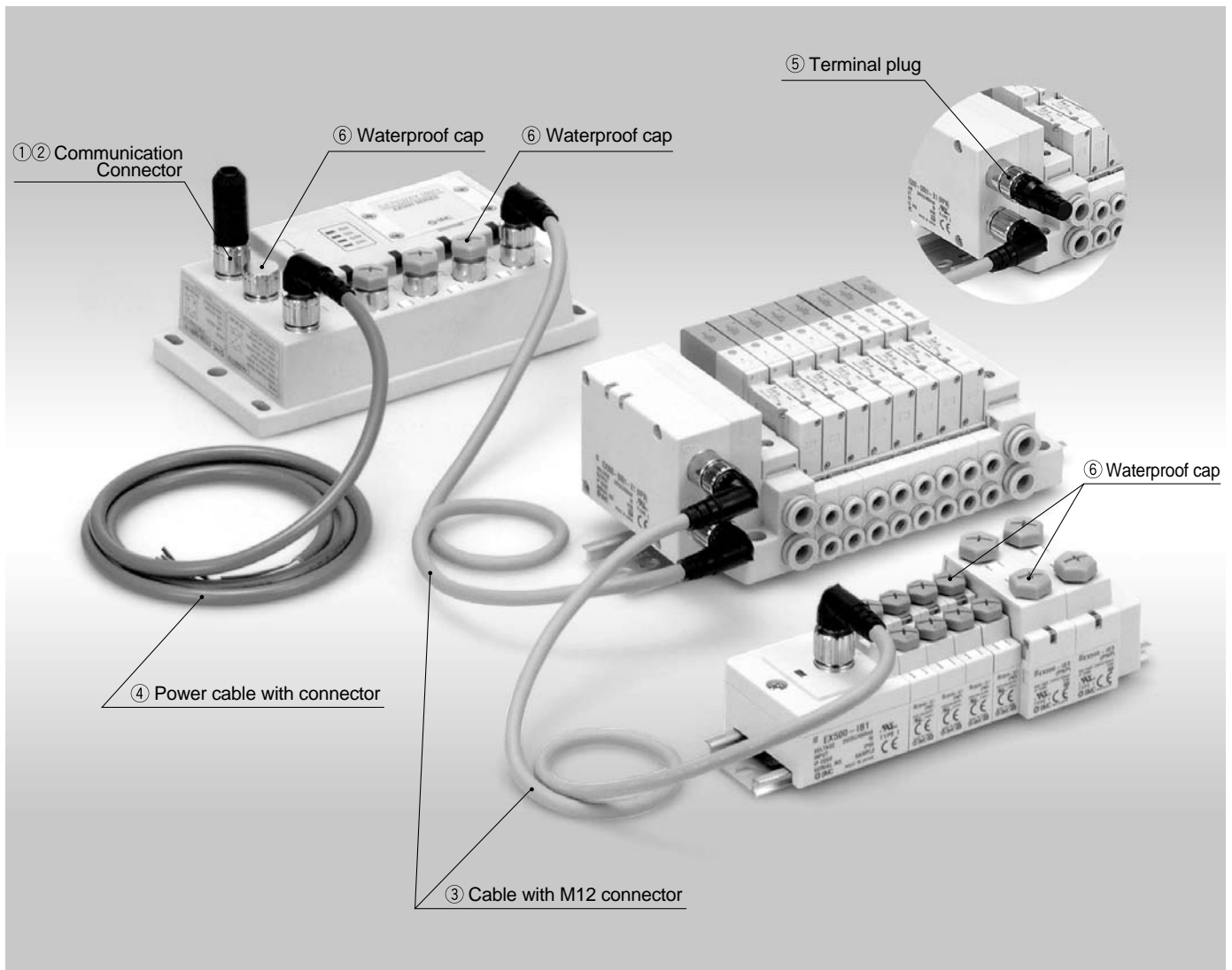
### ● Applicable GW unit

Nil	DeviceNet PROFIBUS-DP
-X1	Remote I/O (RIO)

## Specifications

Connection block	Solenoid valve (single, double) Relay output module (1 output, 2 outputs)
Communication connector	M12 connector (8 pins, plug, socket)
Connection block stations	Double solenoid valve Relay output module (2 points): Maximum 8 stations Single solenoid valve Relay output module (1 point): Maximum 16 stations
Block supply voltage	24VDC
Block supply current	0.65A maximum
Current consumption	100mA or less (at rated voltage)
Weight g	115

## Options

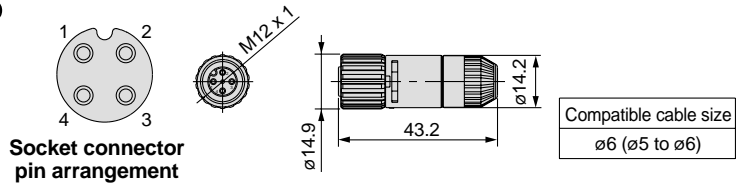


**Options**

① Communication connector (for RIO type GW unit)

**EX500 – AC000 – AB**

Nr.	Pin arrangement
1.	Line 1
2.	No connection
3.	Line 2
4.	Shield

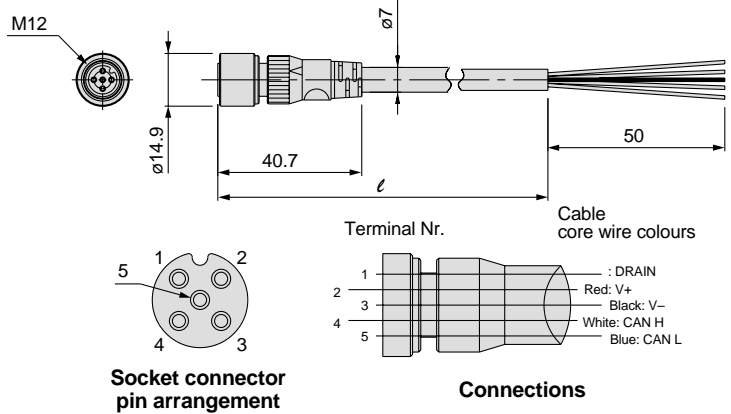


② Communication connector cable (for DeviceNet type GW unit)

**EX 500 – AC 050 – DN**

Cable length (l)

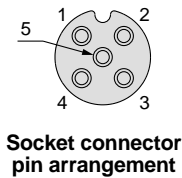
010	1m
050	5m



③ Communication connector (for GW unit with PROFIBUS- DP)

Example: Lumberg GmbH: RKCS 5/7 (Shielded)

Pin arrangement	
Input	Output
1. VP	1. No connection
2. RxD/TxD(N) A line	2. RxD/TxD (N) A line
3. DGND	3 No connection
4. RxD/TxD (P) B line	4. RxD/TxD (P) B line
5. Shield	5 Shield



④ Cable with M12 connector

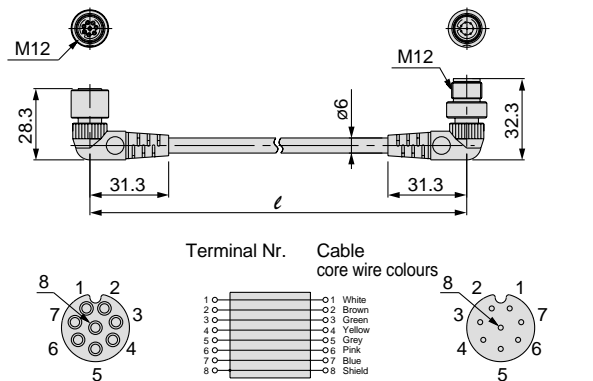
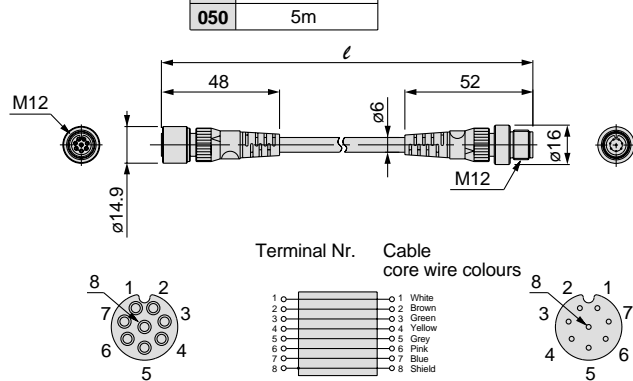
**EX500 – AC 030 – SSPS**

Cable length (l)

003	0.3m
005	0.5m
010	1m
030	3m
050	5m

Connector specification

<b>SSPS</b>	Socket side: Straight, Plug side: Straight
<b>SAPA</b>	Socket side: Angle, Plug side: Angle



Socket connector pin arrangement

Connections

Plug connector pin arrangement

**Straight connector type**

Socket connector pin arrangement

Connections

Plug connector pin arrangement

**Angle connector type**

- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7

- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

# Series SV

## Options

### ④ Power cable with connector

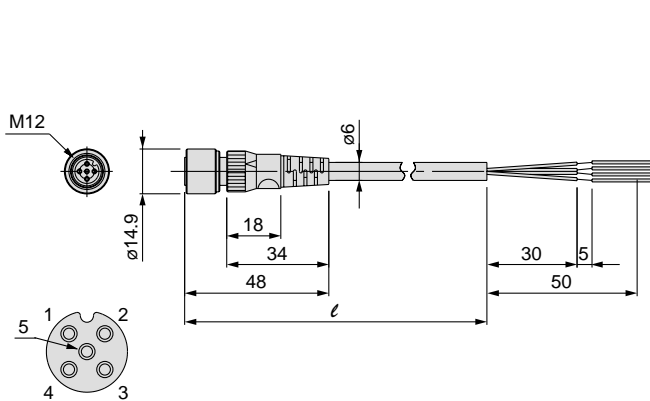
**EX500 — AP 050 — S**

Cable length (ℓ)

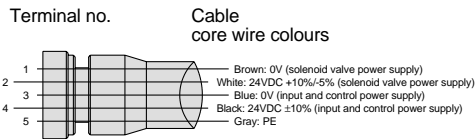
010	1m
050	5m

Connector specifications

S	Straight
A	Angle

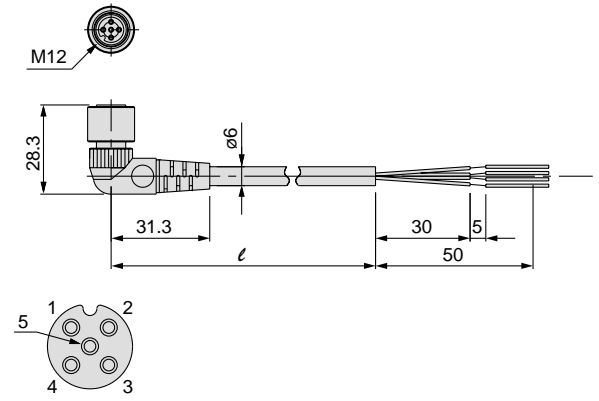


Socket connector pin arrangement

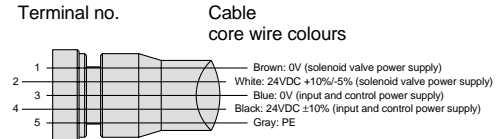


Connections

Straight connector type



Socket connector pin arrangement



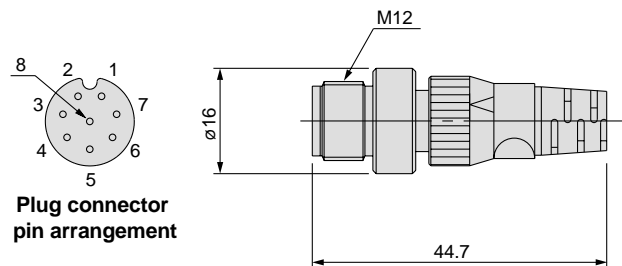
Connections

Angle connector type

### ⑤ Terminal plug

This is used where an input manifold (input unit/input block) is not being used.  
(If a terminal plug is not used, the GW unit's COM LED will not light up.)

**EX500 — AC000 — S**



Plug connector pin arrangement

### ⑥ Waterproof cap

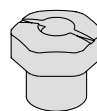
Use this on ports that are not being used for a GW unit or input block.  
Use of this waterproof cap maintains the integrity of the IP65 enclosure.  
(Included with each input block.)

Note) Tighten the waterproof cap with the prescribed tightening torque. (For M8: 0.05N·m, For M12: 0.1N·m)

**EX500 — AW**

Connector type

ES	M8 connector (for socket)
TP	M12 connector (for plug)
TS	M12 connector (for socket)



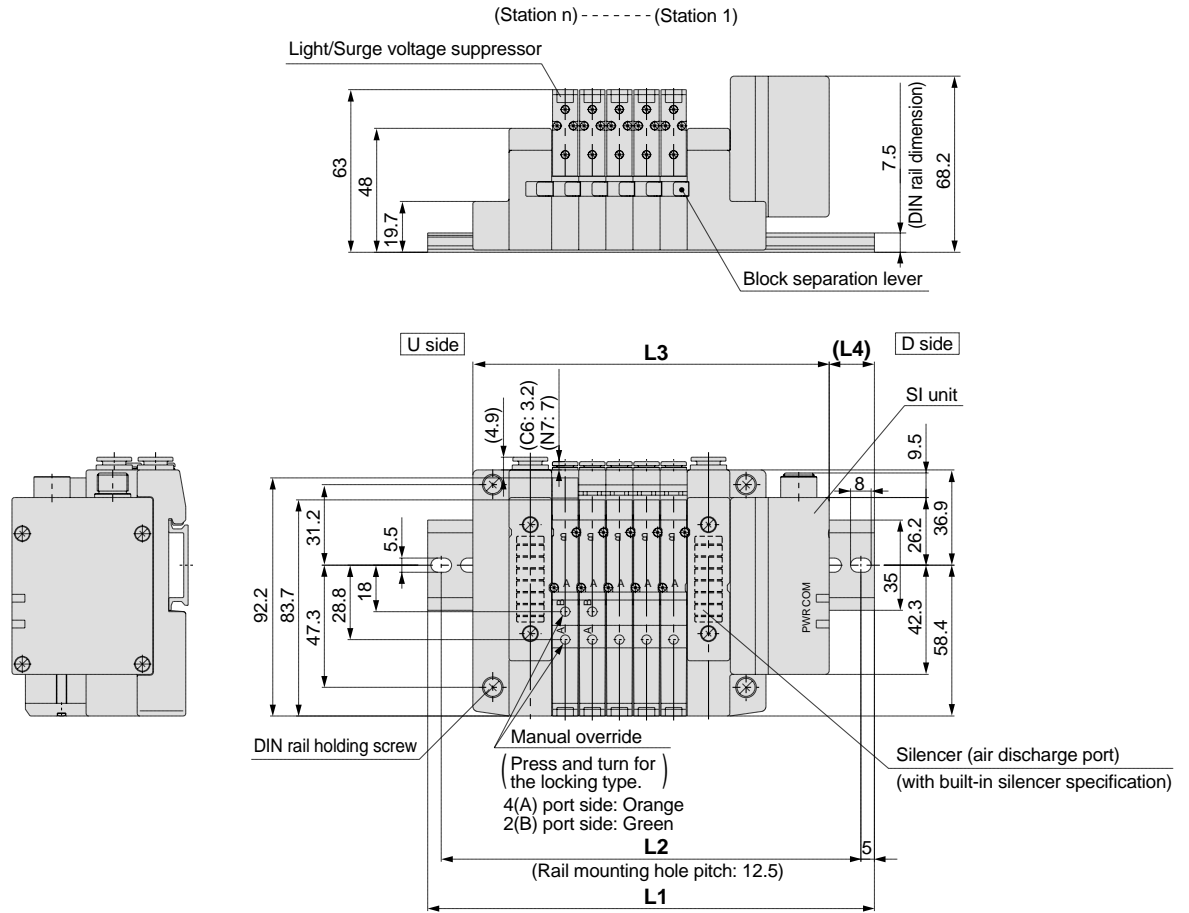
Waterproof cap



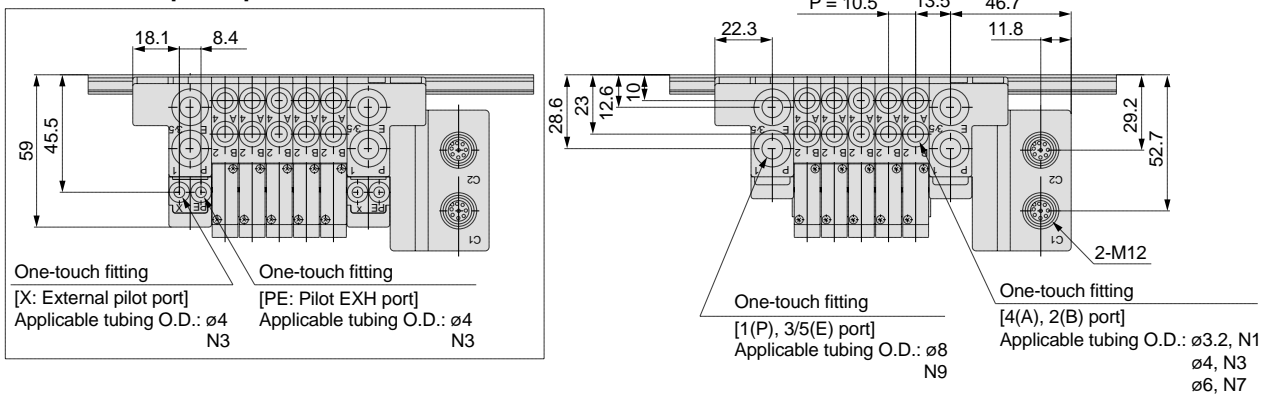
**Dimensions: Series SV1000 for EX500 Decentralized Serial Wiring**

• Cassette base manifold: **SS5V1-W16SA** □ **WD** - Stations  $\begin{matrix} U \\ D \\ B \end{matrix}$  (**S, R, RS**) -  $\begin{matrix} C3, N1 \\ C4, N3 \\ C6, N7 \end{matrix}$

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



**With external pilot specification**



**L dimensions**

$L_n$	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<b>L1</b>	135.5	148	160.5	173	173	185.5	198	210.5	223	235.5	235.5	248	260.5	273	285.5
<b>L2</b>	125	137.5	150	162.5	162.5	175	187.5	200	212.5	225	225	237.5	250	262.5	275
<b>L3</b>	106.5	117	127.5	138	148.5	159	169.5	180	190.5	201	211.5	222	232.5	243	253.5
<b>L4</b>	14.5	15.5	16.5	17.5	12.5	13.5	14.5	15.5	16.5	17.5	12	13	14	15	16

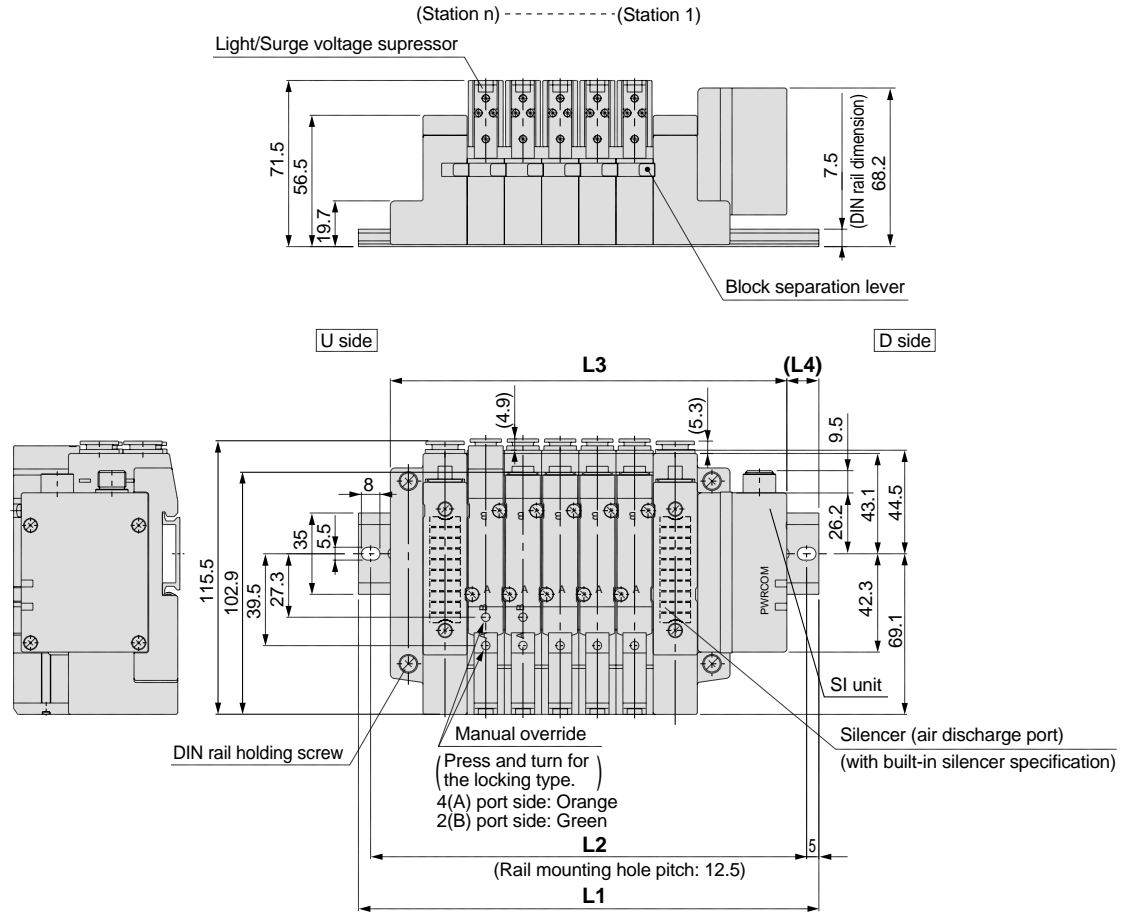
- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7
- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

# Series SV

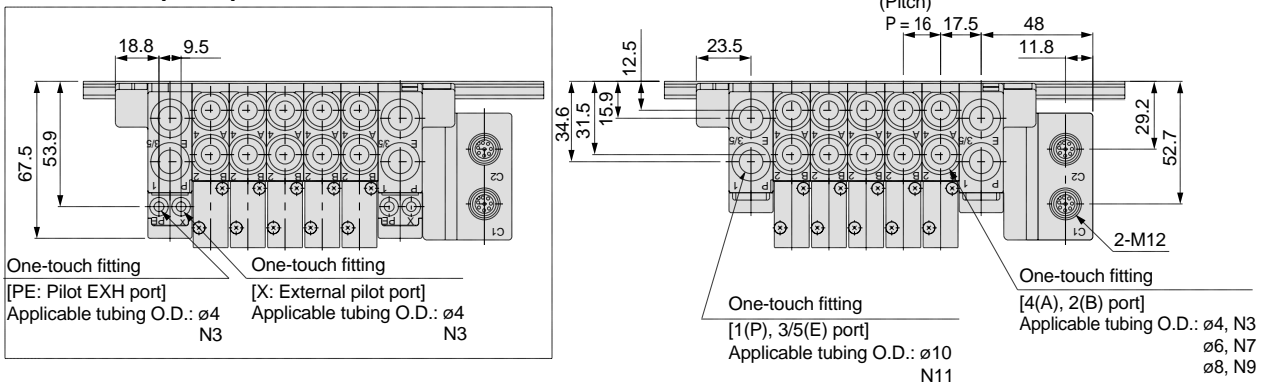
## Dimensions: Series SV2000 for EX500 Decentralized Serial Wiring

• Cassette base manifold: **SS5V2-W16SA□WD** - Stations  $\begin{matrix} U \\ D \\ B \end{matrix}$  (**S, R, RS**) -  $\begin{matrix} C4, N3 \\ C6, N7 \\ C8, N9 \end{matrix}$

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



### With external pilot specification



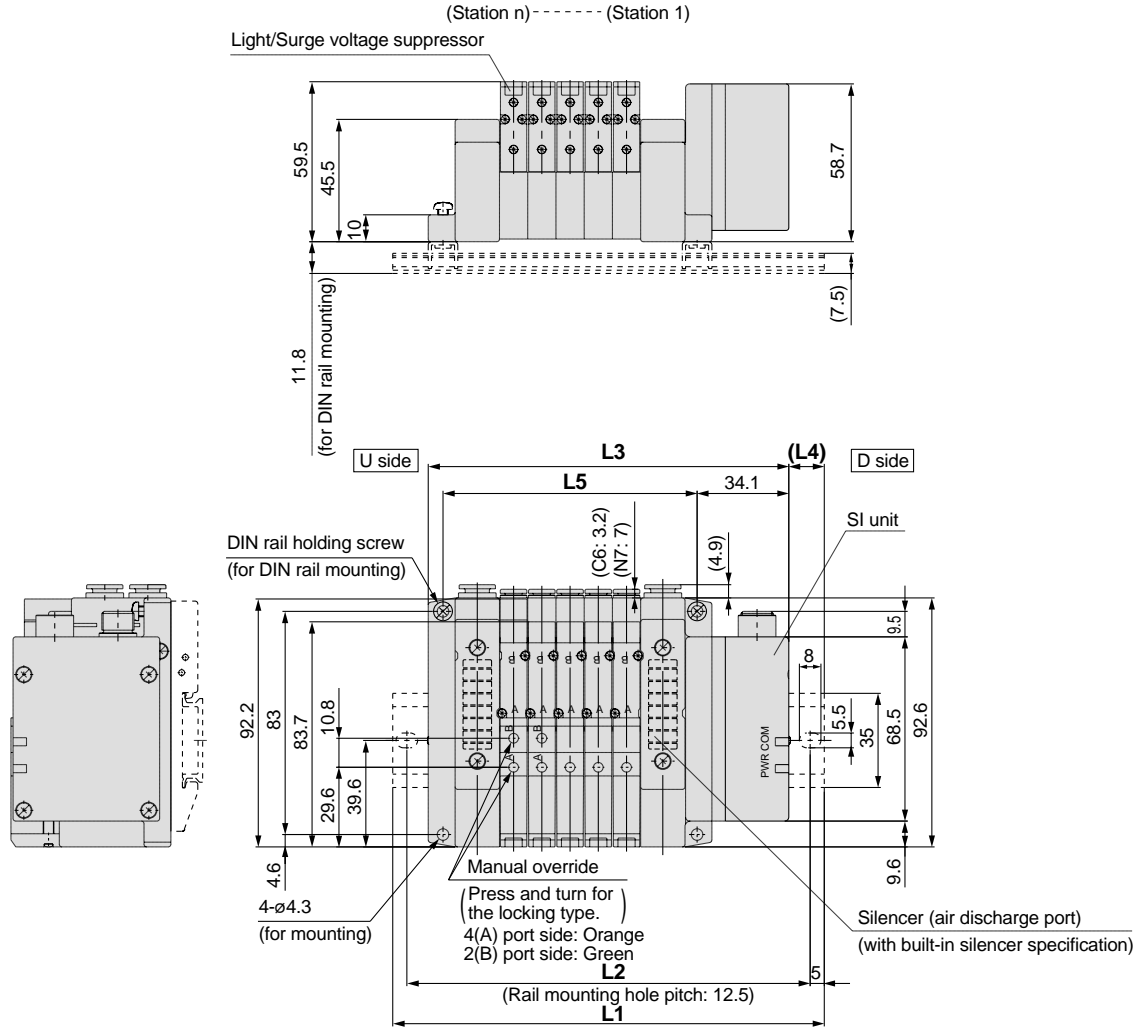
### L dimensions

$L$	$n$	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	n	148	173	185.5	198	210.5	235.5	248	260.5	285.5	298	310.5	323	348	360.5	373
L2	n	137.5	162.5	175	187.5	200	225	237.5	250	275	287.5	300	312.5	337.5	350	362.5
L3	n	122.5	138.5	154.5	170.5	186.5	202.5	218.5	234.5	250.5	266.5	282.5	298.5	314.5	330.5	346.5
L4	n	13	17.5	15.5	14	12	16.5	15	13	17.5	16	14	12.5	17	15	13.5

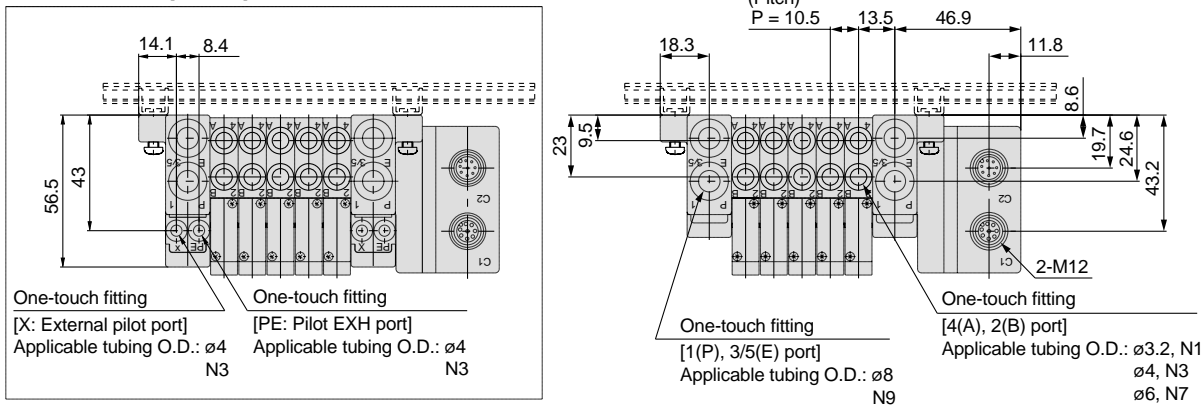
**Dimensions: Series SV1000 for EX500 Decentralized Serial Wiring**

• Tie-rod base manifold: **SS5V1-W10SA** □ **WD** - Stations  $\begin{matrix} U \\ D \end{matrix}$  (**S, R, RS**)  $\begin{matrix} C3, N1 \\ C4, N3 \\ C6, N7 \end{matrix}$  (**-D**)

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



**With external pilot specification**



**L dimensions**

L \ n	n: Stations															
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
L1	135.5	148	148	160.5	173	185.5	198	210.5	210.5	223	235.5	248	260.5	273	273	
L2	125	137.5	137.5	150	162.5	175	187.5	200	200	212.5	225	237.5	250	262.5	262.5	
L3	102.6	113.1	123.6	134.1	144.6	155.1	165.6	176.1	186.6	197.1	207.6	218.1	228.6	239.1	249.6	
L4	16.5	17.5	12	13	14	15	16	17	12	13	14	15	16	17	11.5	
L5	63	73.5	84	94.5	105	115.5	126	136.5	147	157.5	168	178.5	189	199.5	210	

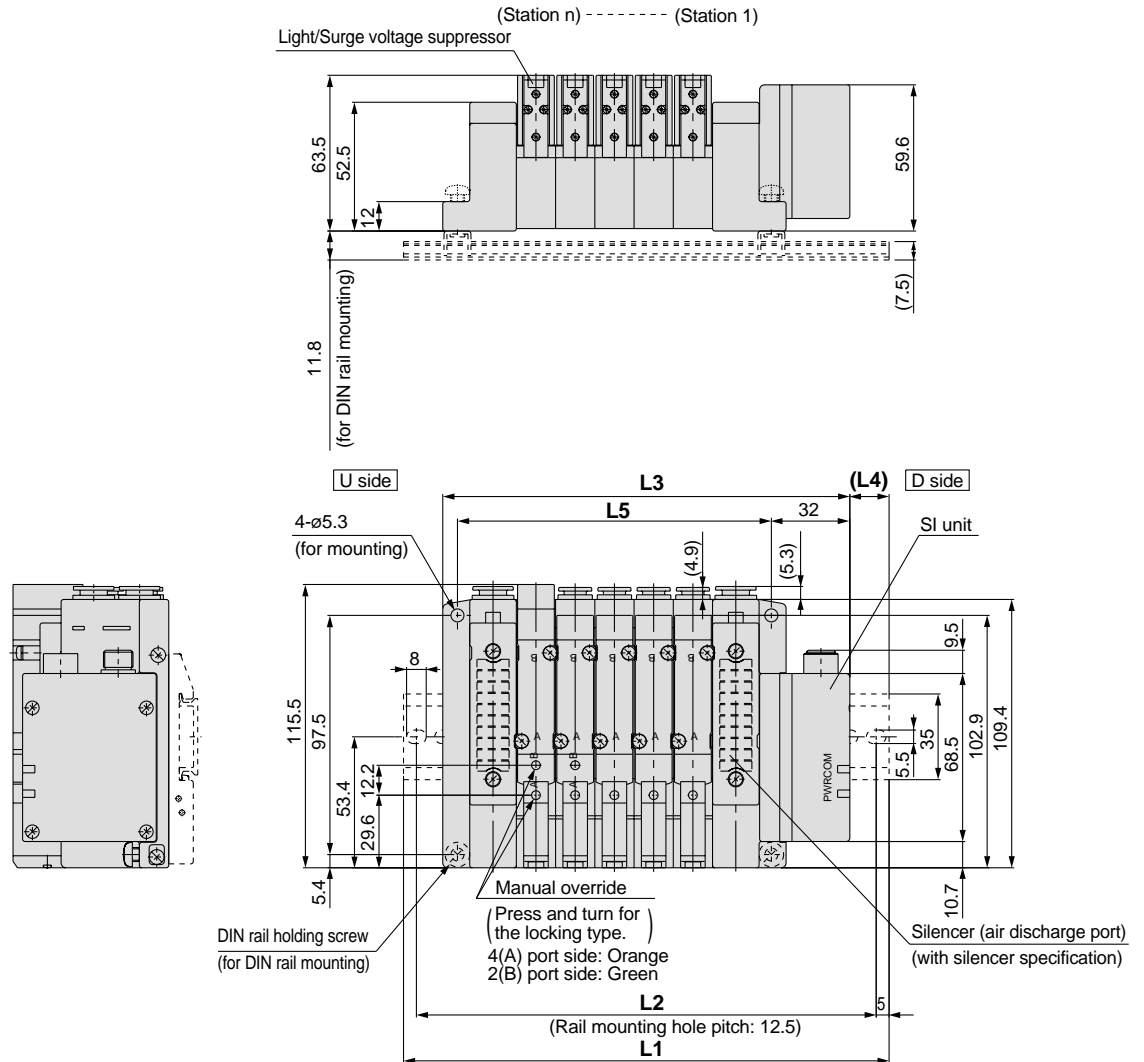
- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7
- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

# Series SV

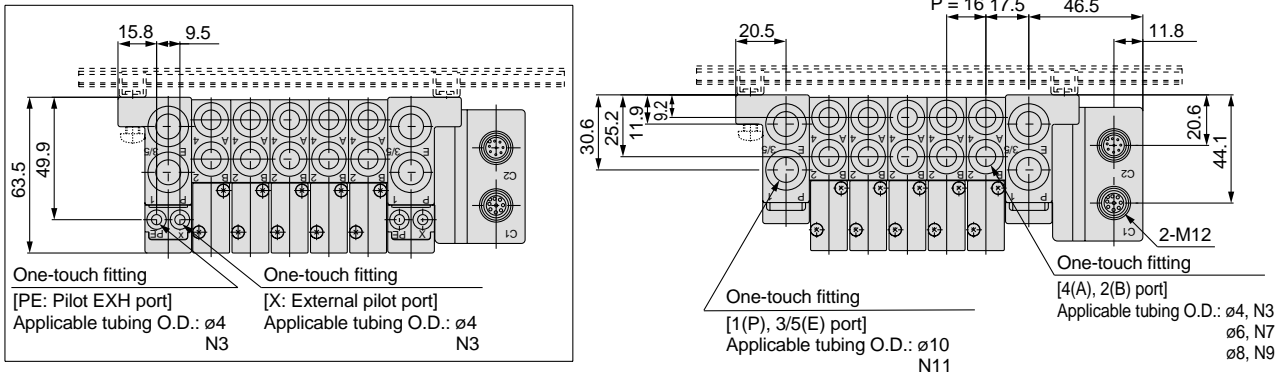
## Dimensions: Series SV2000 for EX500 Decentralized Serial Wiring

• Tie-rod base manifold: **SS5V2-W10SA□WD** - Stations  $\begin{matrix} U \\ D \end{matrix}$  (**S, R, RS**)  $\begin{matrix} C4, N3 \\ -C6, N7 \\ C8, N9 \end{matrix}$  (**-D**)

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



### With external pilot specification



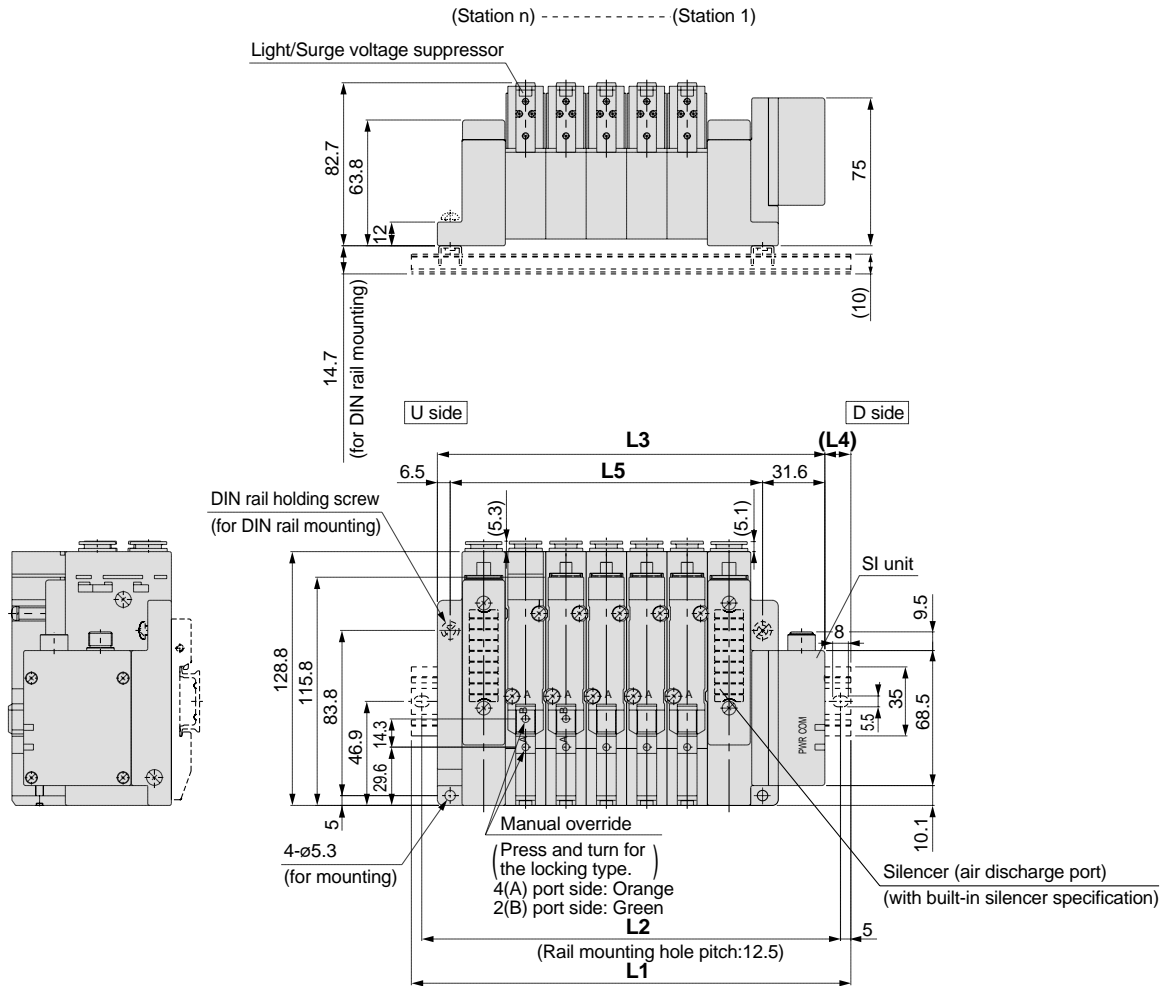
### L dimensions

L	n: Stations															
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
L1	148	160.5	185.5	198	210.5	223	248	260.5	273	285.5	310.5	323	335.5	360.5	373	
L2	137.5	150	175	187.5	200	212.5	237.5	250	262.5	275	300	312.5	325	350	362.5	
L3	118	134	150	166	182	198	214	230	246	262	278	294	310	326	342	
L4	15	13.5	18	16	14.5	12.5	17	15.5	13.5	12	16.5	14.5	13	17.5	15.5	
L5	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304	

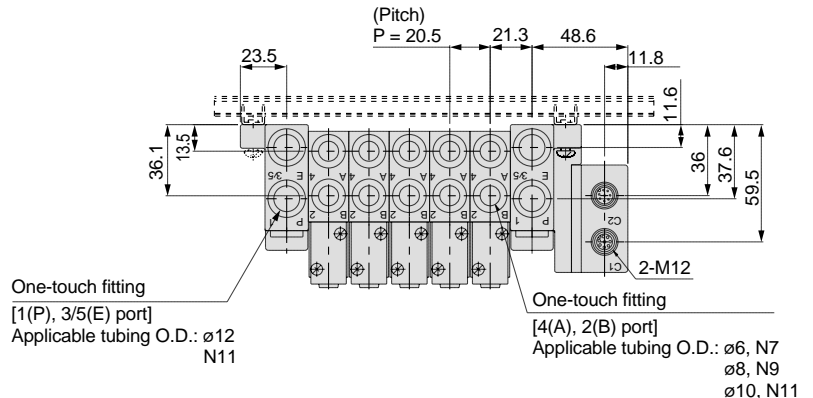
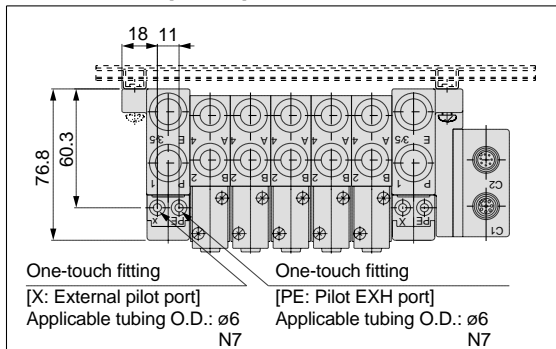
**Dimensions: Series SV3000 for EX500 Decentralized Serial Wiring**

• Tie-rod base manifold: **SS5V3-W10SA□WD - Stations**  $\begin{matrix} U \\ D \\ B \end{matrix}$  **(S, R, RS)**  $\begin{matrix} C6, N7 \\ C8, N9 \\ C10, N11 \end{matrix}$  **(-D)**

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



**With external pilot specification**



**L dimensions**

		n: Stations															
L \ n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
L1	160.5	185.5	210.5	223	248	273	285.5	310.5	323	348	373	385.5	410.5	435.5	448		
L2	150	175	200	212.5	237.5	262.5	275	300	312.5	337.5	362.5	375	400	425	437.5		
L3	135.1	155.6	176.1	196.6	217.1	237.6	258.1	278.6	299.1	319.6	340.1	360.6	381.1	401.6	422.1		
L4	12.5	15	17	13	15.5	17.5	13.5	16	12	14	16.5	12.5	14.5	17	13		
L5	97	117.5	138	158.5	179	199.5	220	240.5	261	281.5	302	322.5	343	363.5	384		

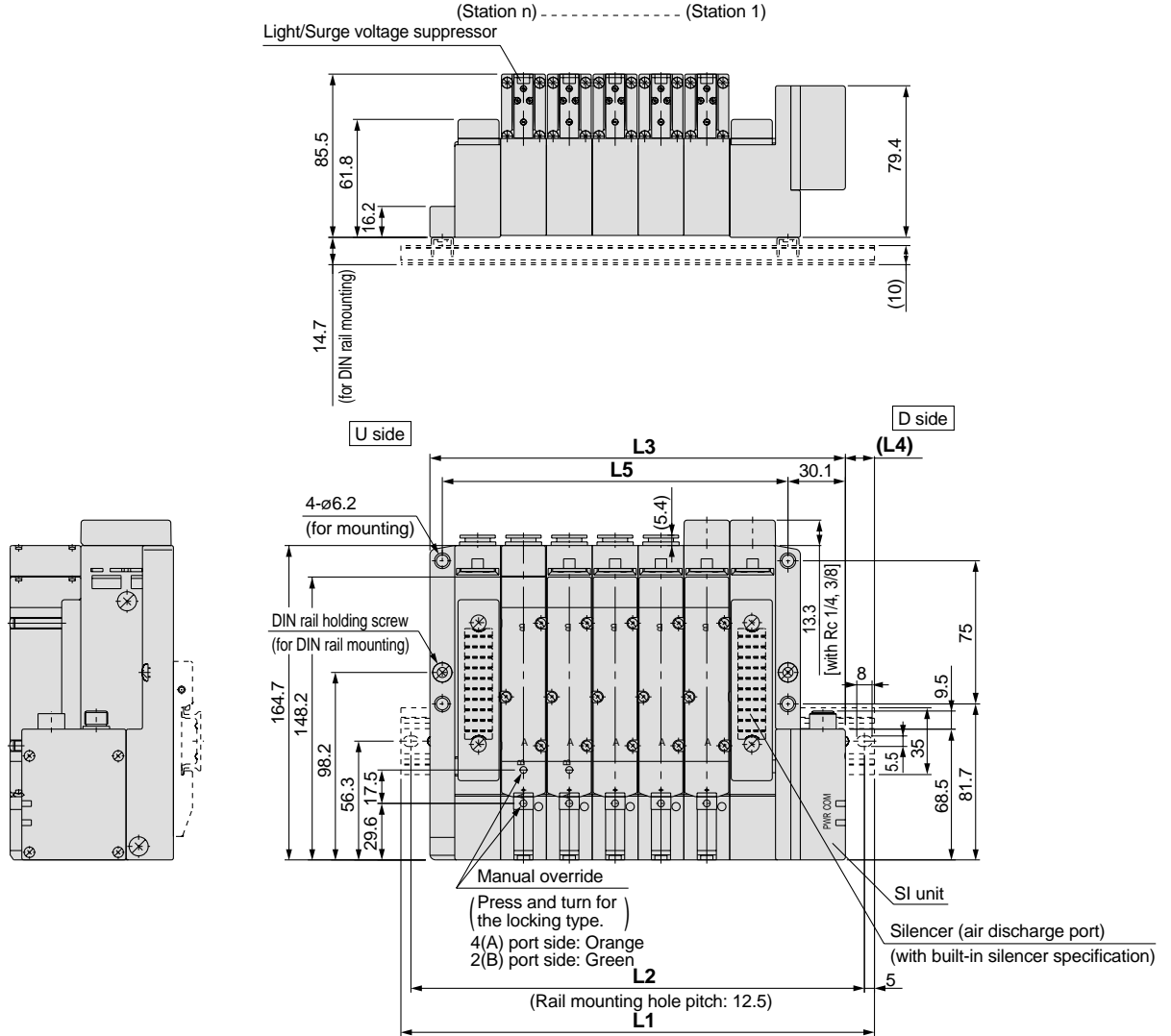
- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7
- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

# Series SV

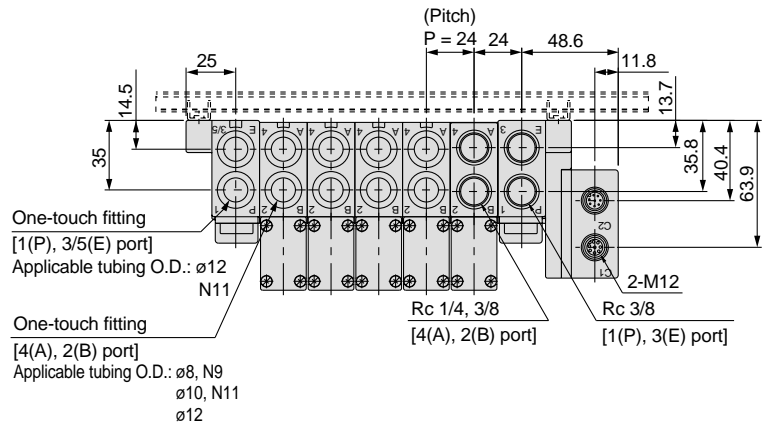
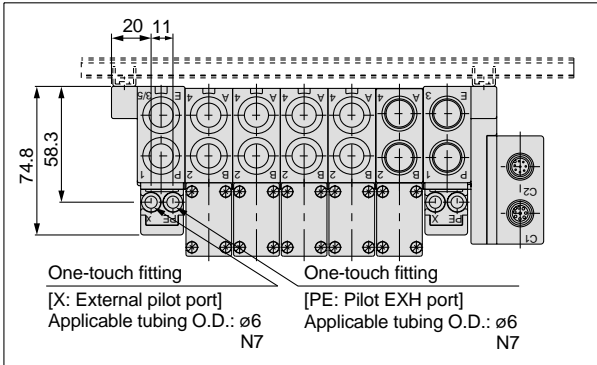
## Dimensions: Series SV4000 for EX500 Decentralized Serial Wiring

• Tie-rod base manifold: **SS5V4-W10SA**  **WD** - Stations  $\begin{matrix} U \\ D \\ B \end{matrix}$  (**S, R, RS**)  $\begin{matrix} 02, C8, N9 \\ 03, C10, N11 \end{matrix}$  (**-D**)

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



### With external pilot specification



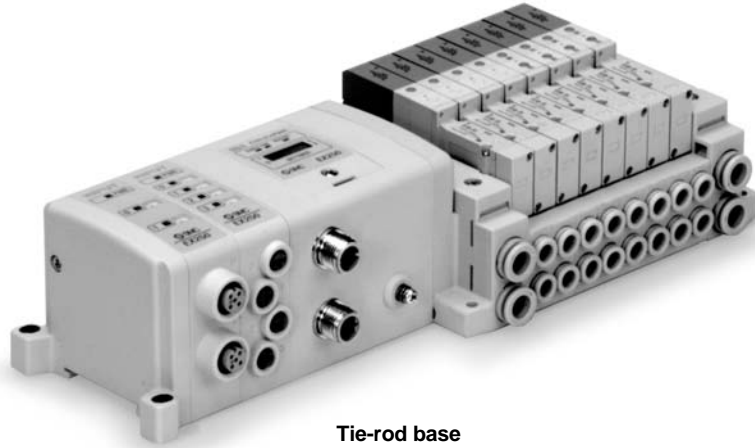
### L dimensions

	n: Stations															
$\frac{L}{n}$	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
L1	173	198	223	248	273	298	323	348	373	385.5	410.5	435.5	460.5	485.5	510.5	
L2	162.5	187.5	212.5	237.5	262.5	287.5	312.5	337.5	362.5	375	400	425	450	475	500	
L3	145.6	169.6	193.6	217.6	241.6	265.6	289.6	313.6	337.6	361.6	385.6	409.6	433.6	457.6	481.6	
L4	13.5	14	14.5	15	15.5	16	16.5	17	17.5	12	12.5	13	13.5	14	14.5	
L5	109	133	157	181	205	229	253	277	301	325	349	373	397	421	445	

# Serial Wiring with Input/Output Unit

## Series EX250

IP67 protection



Tie-rod base

Applicable series	Tie-rod base manifold SV1000/SV2000/SV3000
	DeviceNet / PROFIBUS-DP

### DeviceNet

#### Specifications

Transmission rate	500 kbit/s or less
Bus cable length	500m or less
Number of inputs/outputs	32I/32O each
Bus structure	line, tree, star

### PROFIBUS-DP

#### Specifications

Transmission rate	12'000 kbit/s or less
Bus cable length	200m or less (without repeater) 23km or less (with repeater)
Number of inputs/outputs	32I/32O each
Bus structure	line, tree, star

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

VS7

VQ7

# EX250 Serial Wiring with Input/Output Unit Series SV

## How to Order

### • Tie-rod base

SS5V **1** — **W10S1** **QW** [ ] [ ] [ ] **D** — **05** **U** [ ] [ ] [ ]

### • Mounting

**Series**

1	SV1000
2	SV2000
3	SV3000

**Enclosure  
IP67 specification**

### SI unit specification

<b>QW</b>	For DeviceNet
<b>NW</b>	For PROFIBUS-DP
<b>0</b>	Without SI unit

- Input blocks cannot be mounted without SI unit.
- When the DIN rail is included without an SI unit, the DIN rail length will accommodate an SI unit and one input block.

### Input block stations

<b>Nil</b>	None
<b>1</b>	1 station
<b>:</b>	<b>:</b>
<b>8</b>	8 stations

Note) Without SI unit, the symbol is nil.

### Input block type

<b>Nil</b>	Without input block
<b>1</b>	M12: 2 inputs
<b>2</b>	M12: 4 inputs
<b>3</b>	M8: 4 inputs (3 pins)

Note) Without SI unit, the symbol is nil.

### Input block common specification

<b>Nil</b>	+COM
<b>N</b>	-COM

### Valve stations

Symbol	Stations	Note
<b>02</b>	2 stations	Note 1) Double wiring specification
<b>:</b>	<b>:</b>	
<b>16</b>	16 stations	
<b>02</b>	2 stations	Note 2) Specified layout (Up to 32 solenoids possible.)
<b>:</b>	<b>:</b>	
<b>20</b>	20 stations	

Note 1) Double wiring specification: Single, double and 3 position solenoid valves can be used on all manifold stations. Use of a single solenoid will result in an unused control signal. If this is not desired, order with a specified layout.

Note 2) Specified layout: Indicate wiring specifications on a manifold specification sheet. (Note that double and 3 position valves cannot be used where single solenoid wiring has been specified.)

### P, E port 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)

### Supply/Exhaust block assembly specification

<b>Nil</b>	Internal pilot specification
<b>S*</b>	Internal pilot/Built-in silencer
<b>R</b>	External pilot specification
<b>RS*</b>	External pilot/Built-in silencer

\* When the built-in silencer type is used, keep the exhaust port from coming in direct contact with water or other liquids.

### A, B port size (metric)

Symbol	A, B port	P, E port	Applicable series
<b>C3</b>	ø3.2 One-touch fitting	ø8 One-touch fitting	SV1000
<b>C4</b>	ø4 One-touch fitting		
<b>C6</b>	ø6 One-touch fitting		
<b>C4</b>	ø4 One-touch fitting	ø10 One-touch fitting	SV2000
<b>C6</b>	ø6 One-touch fitting		
<b>C8</b>	ø8 One-touch fitting		
<b>C6</b>	ø6 One-touch fitting	ø12 One-touch fitting	SV3000
<b>C8</b>	ø8 One-touch fitting		
<b>C10</b>	ø10 One-touch fitting		
<b>M</b>	A, B ports mixed		

### A, B port size (inch)

Symbol	A, B port	P, E port	Applicable series
<b>N1</b>	ø1/8" One-touch fitting	ø5/16" One-touch fitting	SV1000
<b>N3</b>	ø5/32" One-touch fitting		
<b>N7</b>	ø1/4" One-touch fitting		
<b>N3</b>	ø5/32" One-touch fitting	ø3/8" One-touch fitting	SV2000
<b>N7</b>	ø1/4" One-touch fitting		
<b>N9</b>	ø5/16" One-touch fitting		
<b>N7</b>	ø1/4" One-touch fitting	ø3/8" One-touch fitting	SV3000
<b>N9</b>	ø5/16" One-touch fitting		
<b>N11</b>	ø3/8" One-touch fitting		
<b>M</b>	A, B ports mixed		

\* In case of mixed specification (M), indicate separately on a manifold specification sheet.

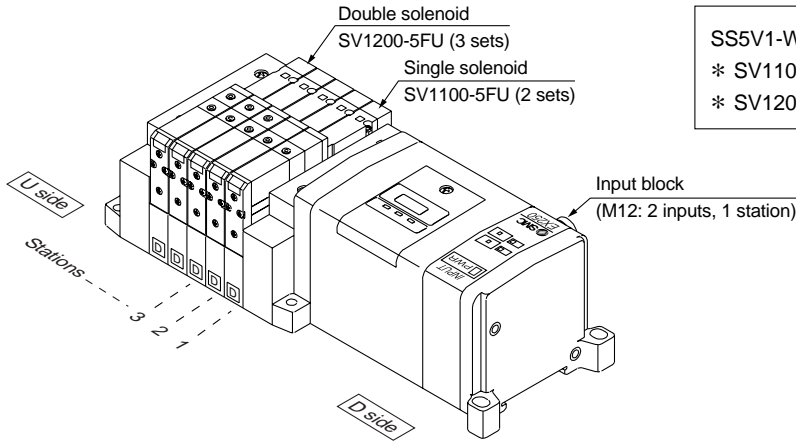


## How to Order Manifold Assemblies (Order Example)

### Example (SV1000)

#### Manifold

SS5V1-W10S1QW11ND-05B-C6 (1 set)



SS5V1-W10S1QW11ND-05B-C6 ..... 1 set (manifold part no.)  
 \* SV1100-5FU ..... 2 sets (single solenoid part no.)  
 \* SV1200-5FU ..... 3 sets (double solenoid part no.)

## How to Order Solenoid Valves

SV 1 1 0 0 — 5 F

Note) Available with manifold block for station additions. Refer to page 1.1-89.

#### Series

1	SV1000
2	SV2000
3	SV3000

#### Type of actuation

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

\* 4 position dual 3 port valves are applicable to series SV1000 and SV2000 only.

#### Pilot specification

Nil	Internal pilot
R	External pilot

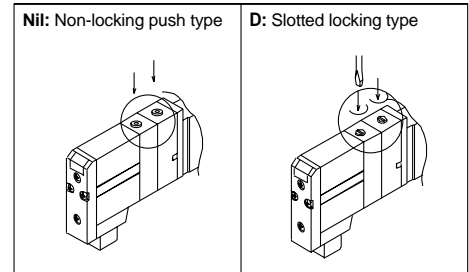
\* External pilot specification is not available for 4 position dual 3 port valves.

#### Back pressure check valve

Nil	None
K	Built-in

- \* Built-in back pressure check valve type is applicable to series SV1000 only.
- \* Back pressure check valve is not available for 3 position closed center and 3 position pressure center.
- \* Flow rate with the built-in back pressure check valve is reduced approximately 20%.

#### Manual override



#### Light/Surge voltage suppressor

U	With light and surge voltage suppressor
R	With surge voltage suppressor

#### Rated voltage

5	24VDC
---	-------

- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7

- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

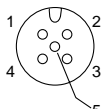
The serial data transmission system reduces connection work, while minimizing wiring cost and saves space.

**DeviceNet / Profibus DP compatible SI unit.** The unit in question is a slave unit, which can control up to 32 outputs. Additionally, by connecting input blocks a maximum of 32 inputs signals are possible. The input blocks allow the connection to the SI unit, of input signals from sensors like auto switches etc. An input module can accommodate two or four sensor inputs. Each module can be adapted to NPN/PNP sensors using a switch. Input modules with both M12 and M8 connectors are available.

### Circuit diagram Input module (EX250-IE\*)

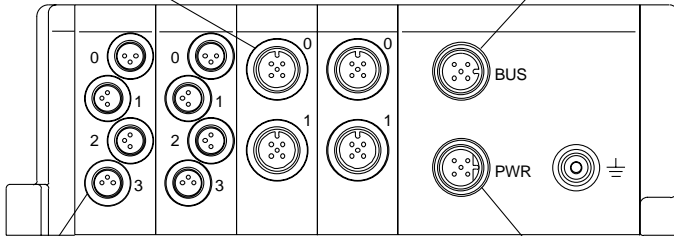
Input connection: M12 ... 5 pin (Socket)  
Example for the cable side connection:

Karl Lumberg GmbH: Series RST5; Franz Binder GmbH: Series 713,763



Pos.	Description	Function
1	SW+	Sensor power supply +
2	N.C (SIGNAL)	Open*
3	SW-	Sensor power supply -
4	SIGNAL	Sensor input signal
5	E	Sensor ground connection

\* In the 4 input type unit (EX250-IE2), this is the input signal from the second sensor connected.



Input connection: M8 ... 3 pin (Socket)

Example for cable side connection: Franz Binder GmbH Series 718, 768  
Karl Lumberg GmbH: Series RSMV3



Pos.	Description	Function
1	SW+	Sensor power supply +
3	SW-	Sensor power supply -
4	SIGNAL	Sensor input signal

### Communication connector

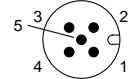
**DeviceNet:** M12...5 pin (Plug) Example for a cable set with plug / socket:

Karl Lumberg GmbH: 0935 253 103/...M, RSC RKC 57\* ... M

Accessories, bus branch Y: Karl Lumberg GmbH: 0906 UTP 101, Hans Turck GmbH: VB2-FKM-FSM57.

Accessories terminating socket with resistor: Hans Turck GmbH: RSE57-TR2, Karl Lumberg GmbH: 0939 CXT 101.

Pos.	Description	Function
1	Drain	Drain / shield
2	V+	Circuit power supply +
3	V-	Circuit power supply -
4	CAN_H	Signal H
5	CAN_L	Signal L



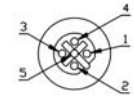
**PROFIBUS-DP:** M12... 5 pin reserve-keyed (Socket). Example for the corresponding cable sets with plug / socket:

Hans Turck GmbH: RSSW-RKSW456-...M; Karl Lumberg GmbH: 0975 254 101/...M

Accessories Bus branch Y: Hans Turck GmbH: VB2/FSW/FKW/FSW45

Accessories terminating resistor: Hans Turck GmbH: RSS4.5-PDP-TR; Karl Lumberg GmbH: 0979PTX101

Pos.	Description	Function
1	VP	Power supply for terminating resistor
2	A-N	Negative for data transfer / reception
3	DGND	Ground for terminating resistor
4	B-P	Positive for data transfer / reception
5	SHIELD	Shield



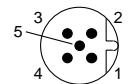
### Power supply

**DeviceNet:** M12 ... 5 pin reserve-keyed (Plug)

(The configuration of the connection surface area differs from that of the transmission plug)

Example of the cable set with socket: Hans Turck GmbH: WAKW4.5T-2, Franz Binder GmbH: 79-4449-...05.

Pos.	Description	Function
1	SV24V	+24V solenoid valve
2	SV0V	0V solenoid valve
3	SW24V	+24V SI and input blocks
4	SW0V	0V SI and input blocks
5	E	Ground connection

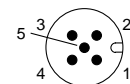


**PROFIBUS-DP:** M12...5 pin (Plug)

Example of the cable set with socket:

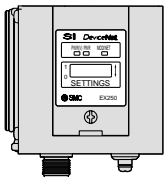
SMC: EX500-AP...S (see page 1.1-24)

Pos.	Description	Function
1	SV24V	+24V solenoid valve
2	SV0V	0V solenoid valve
3	SW24V	+24V SI and input blocks
4	SW0V	0V SI and input blocks
5	E	Ground connection



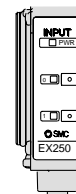
## Description and operation of the display unit (LED)

### SI unit (DeviceNet)

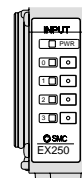


Description	Function
PWR(V)	Illuminates when the solenoid valve's power supply is switched on.
PWR	Illuminates when the power supply for the DeviceNet circuit is switched on.
MOD/NET	OFF when the power supply is switched off, off-line or during the MAC_ID duplication test GREEN BLINKING: Waiting to connect (on-line). GREEN ILLUMINATED: connection established (on-line). RED BLINKING: Connection time out exhausted (minor transmission error). RED ILLUMINATED: MAC_ID Duplication error or BUSOFF error (serious transmission error).

### input module



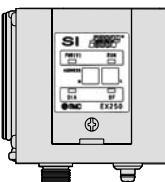
2 inputs (EX250-IE1)



4 inputs (EX250-IE2/3)

Description	Function
PWR	ON with the sensor power supply connected
0 to 1(3)	ON when switching on the respective sensor input

### SI unit (PROFIBUS-DP)



Description	Function
PWR(V)	Illuminates when the solenoid valve's power supply is switched on. OFF when the power supply is less than 19V
RUN	Illuminates whilst operational (SI unit's power supply is present).
DIA	Illuminates when there is an alarm during the auto diagnosis.
BF	Illuminates when there is a BUS operational error

### Weight

Description	Weight [g]
SI unit	225
Input module	85
End plate	30

\* See pg. 1.1-86 for the mounting of components.

**Dimensions: Series SV1000 for EX250 Serial Wiring with Input/Output Unit**

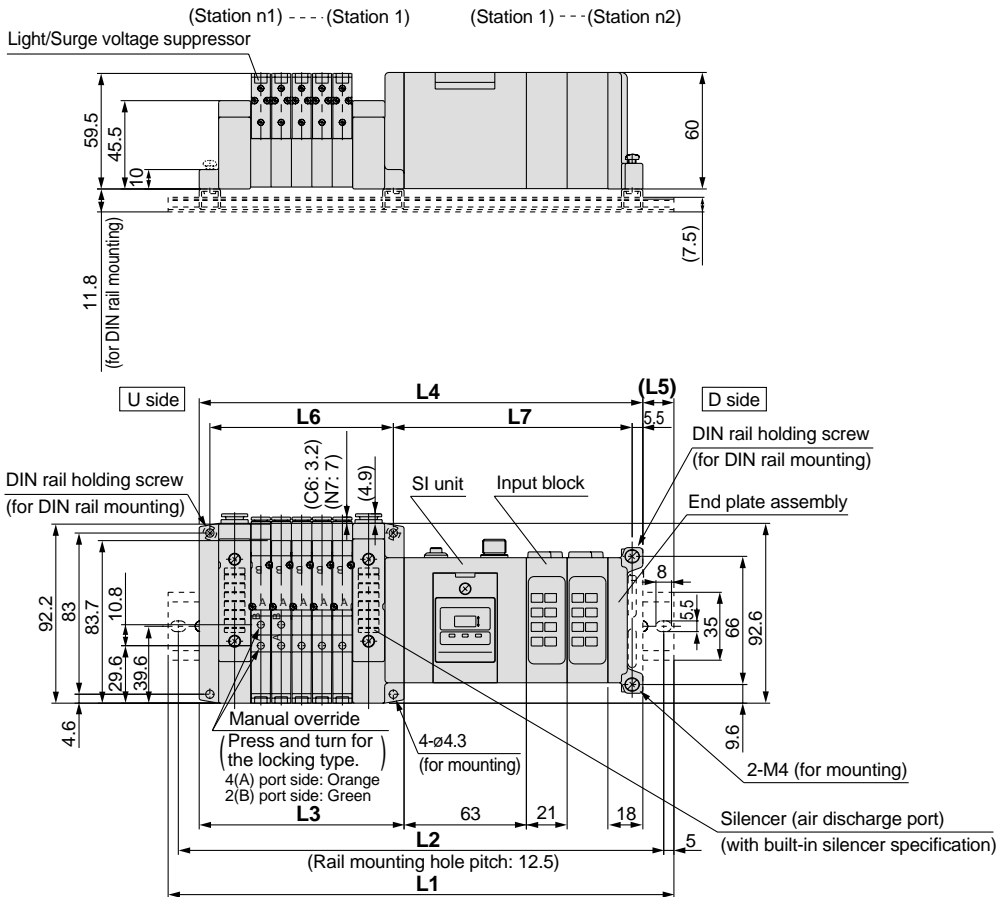
• Tie-rod base manifold: **SS5V1-W10S1□□□□D - Stations**  $\begin{matrix} U \\ D \\ B \end{matrix}$  **(S, R, RS) -**  $\begin{matrix} C3, N1 \\ C4, N3 \\ C6, N7 \end{matrix}$  **(-D)**

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.

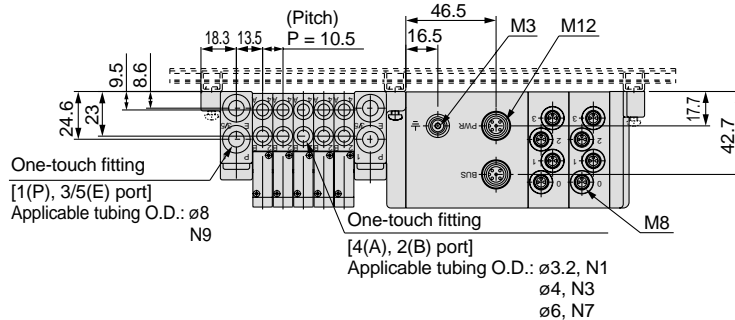
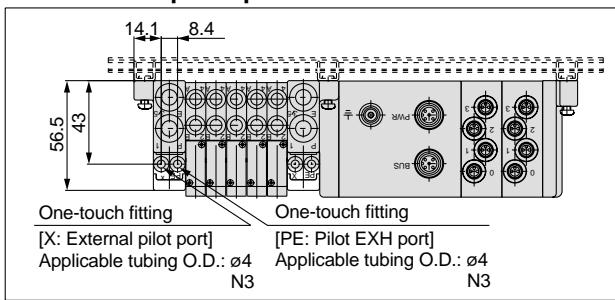
(With 2 input blocks)

n1 = Valve stations  
n2 = Input block stations

$$\begin{aligned} L2 &= L1 - 10.5 \\ L3 &= 10.5 \times n1 + 53 \\ L4 &= L3 + 81 + 21 \times n2 \\ L5 &= (L1 - L4)/2 \\ L6 &= 10.5 \times n1 + 42 \\ L7 &= 21 \times n2 + 81 \end{aligned}$$



**With external pilot specification**



**L1: DIN rail overall length**

Valve stations (n1) Input block Stations (n2)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
0	185.5	198	210.5	210.5	223	235.5	248	260.5	273	273	285.5	298	310.5	323	335.5	348	348	360.5	373
1	210.5	210.5	223	235.5	248	260.5	273	273	285.5	298	310.5	323	335.5	348	348	360.5	373	385.5	398
2	223	235.5	248	260.5	273	273	285.5	298	310.5	323	335.5	348	348	360.5	373	385.5	398	410.5	410.5
3	248	260.5	273	273	285.5	298	310.5	323	335.5	348	348	360.5	373	385.5	398	410.5	410.5	423	435.5
4	273	273	285.5	298	310.5	323	335.5	348	348	360.5	373	385.5	398	410.5	410.5	423	435.5	448	460.5
5	285.5	298	310.5	323	335.5	348	348	360.5	373	385.5	398	410.5	410.5	423	435.5	448	460.5	473	473
6	310.5	323	335.5	348	348	360.5	373	385.5	398	410.5	410.5	423	435.5	448	460.5	473	473	485.5	498
7	335.5	348	348	360.5	373	385.5	398	410.5	410.5	423	435.5	448	460.5	473	473	485.5	498	510.5	523
8	348	360.5	373	385.5	398	410.5	410.5	423	435.5	448	460.5	473	473	485.5	498	510.5	523	535.5	535.5

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

# Series SV

## Dimensions: Series SV2000 for EX250 Serial Wiring with Input/Output Unit

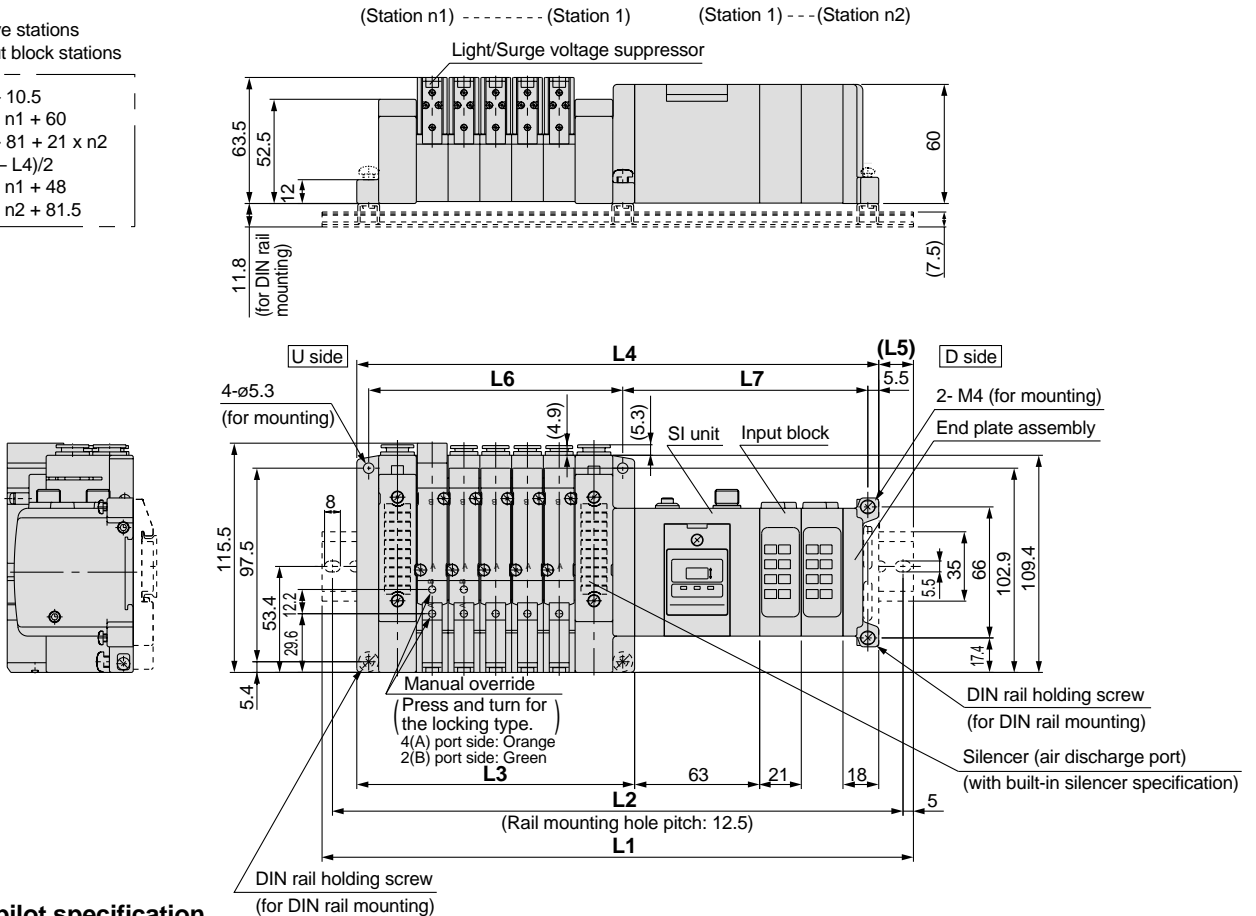
• Tie-rod base manifold: **SS5V2-W10S1** **D** - Stations  $\frac{U}{D}$  (**S, R, RS**)  $\frac{C4, N3}{C6, N7}$   $\frac{C8, N9}{C8, N9}$  (**-D**)

(With 2 input blocks)

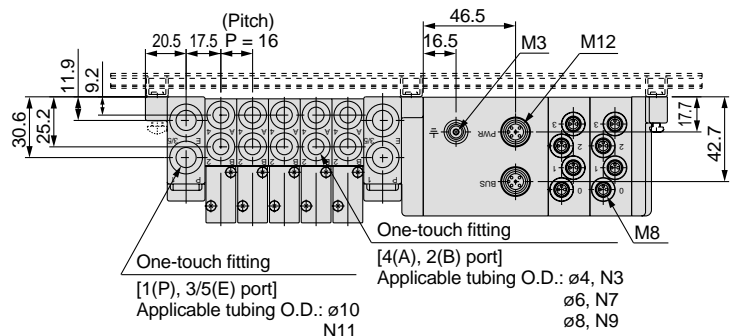
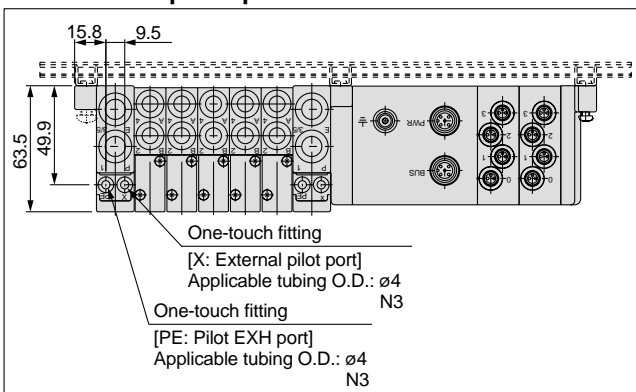
- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.

n1 = Valve stations  
n2 = Input block stations

$$\begin{aligned} L2 &= L1 - 10.5 \\ L3 &= 16 \times n1 + 60 \\ L4 &= L3 + 81 + 21 \times n2 \\ L5 &= (L1 - L4)/2 \\ L6 &= 16 \times n1 + 48 \\ L7 &= 21 \times n2 + 81.5 \end{aligned}$$



### With external pilot specification



### L1: DIN rail overall length

Valve stations (n1) Input block stations (n2)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
0	198	223	235.5	248	260.5	285.5	298	310.5	335.5	348	360.5	373	398	410.5	423	448	460.5	473	485.5
1	223	235.5	260.5	273	285.5	298	323	335.5	348	373	385.5	398	410.5	435.5	448	460.5	485.5	498	510.5
2	248	260.5	273	298	310.5	323	335.5	360.5	373	385.5	410.5	423	435.5	448	473	485.5	498	510.5	535.5
3	260.5	285.5	298	310.5	335.5	348	360.5	373	398	410.5	423	435.5	460.5	473	485.5	510.5	523	535.5	548
4	285.5	298	323	335.5	348	360.5	385.5	398	410.5	435.5	448	460.5	473	498	510.5	523	548	560.5	573
5	310.5	323	335.5	360.5	373	385.5	398	423	435.5	448	473	485.5	498	510.5	535.5	548	560.5	585.5	598
6	323	348	360.5	373	398	410.5	423	435.5	460.5	473	485.5	510.5	523	535.5	548	573	585.5	598	610.5
7	348	360.5	385.5	398	410.5	435.5	448	460.5	473	498	510.5	523	535.5	560.5	573	585.5	610.5	623	635.5
8	373	385.5	398	423	435.5	448	460.5	485.5	498	510.5	535.5	548	560.5	573	598	610.5	623	648	660.5

**Dimensions: Series SV3000 for EX250 Serial Wiring with Input/Output Unit**

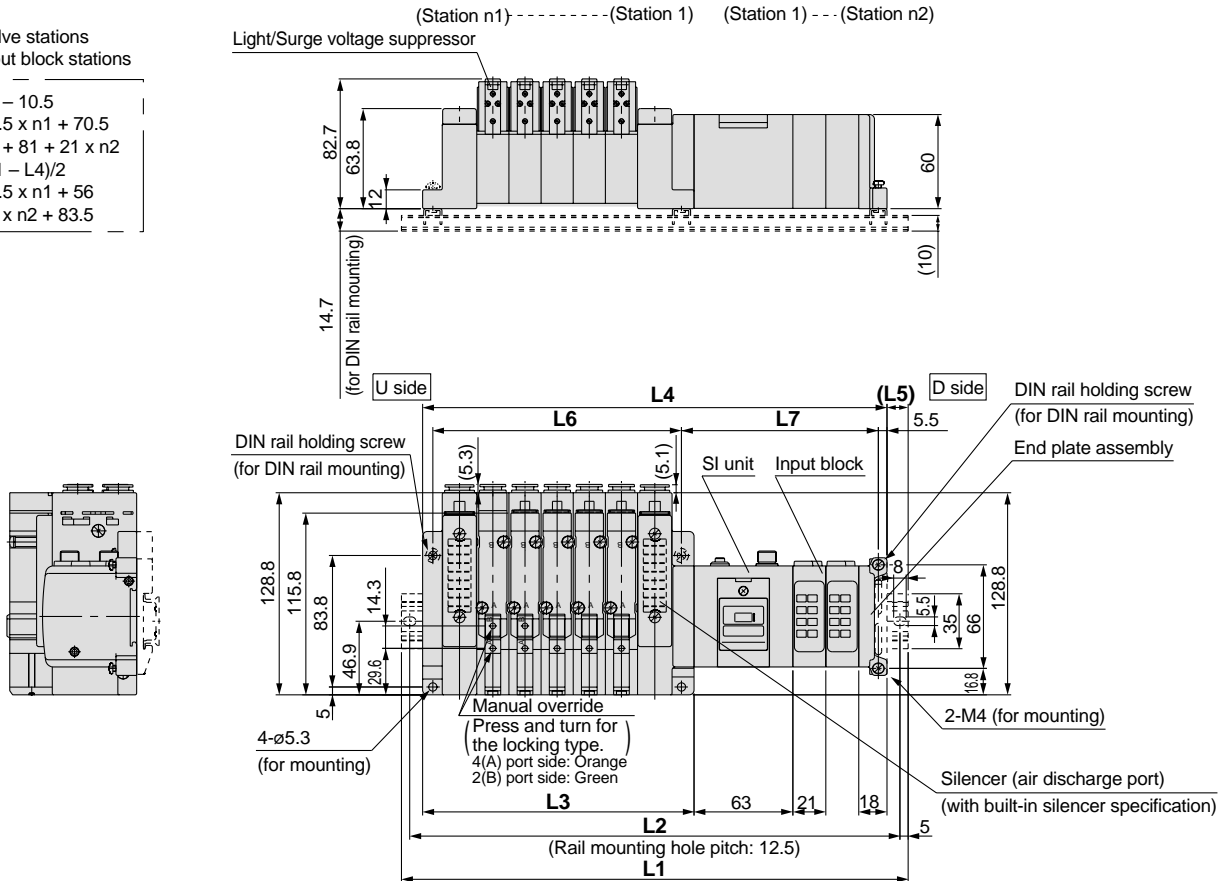
• Tie-rod base manifold: **SS5V3-W10S1** □ □ □ □ □ **D - Stations**  $\begin{matrix} U \\ D \end{matrix}$  (S, R, RS)  $\begin{matrix} C6, N7 \\ C8, N9 \\ C10, N11 \end{matrix}$  (-D)

(With 2 input blocks)

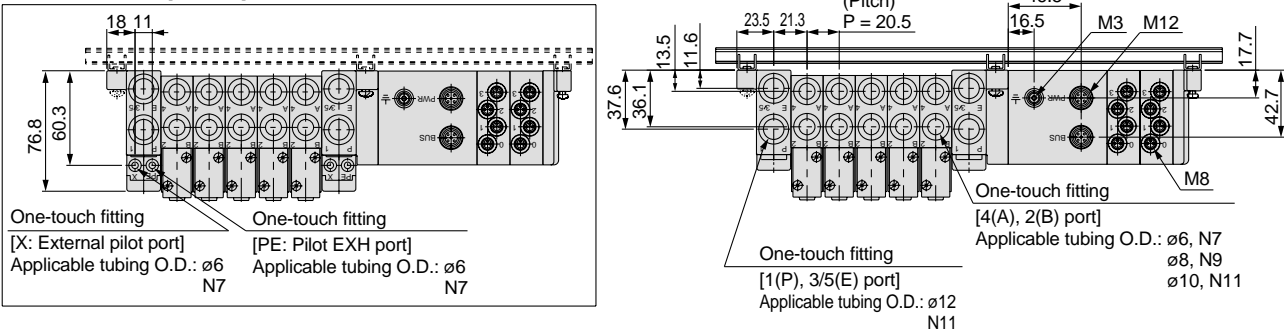
- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.

n1 = Valve stations  
n2 = Input block stations

- L2 = L1 - 10.5
- L3 = 20.5 x n1 + 70.5
- L4 = L3 + 81 + 21 x n2
- L5 = (L1 - L4)/2
- L6 = 20.5 x n1 + 56
- L7 = 21 x n2 + 83.5



**With external pilot specification**



**L1: DIN rail overall length**

Valve stations (n1) / Input block stations (n2)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<b>0</b>	223	248	260.5	285.5	298	323	348	360.5	385.5	410.5	423	448	473	485.5	510.5	535.5	548	573	585.5
<b>1</b>	248	260.5	285.5	310.5	323	348	360.5	385.5	410.5	423	448	473	485.5	510.5	535.5	548	573	585.5	610.5
<b>2</b>	260.5	285.5	310.5	323	348	360.5	385.5	410.5	423	448	473	485.5	510.5	535.5	548	573	598	610.5	635.5
<b>3</b>	285.5	310.5	323	348	373	385.5	410.5	423	448	473	485.5	510.5	535.5	548	573	598	610.5	635.5	648
<b>4</b>	310.5	323	348	373	385.5	410.5	423	448	473	485.5	510.5	535.5	548	573	598	610.5	635.5	660.5	673
<b>5</b>	323	348	373	385.5	410.5	435.5	448	473	485.5	510.5	535.5	548	573	598	610.5	635.5	660.5	673	698
<b>6</b>	348	373	385.5	410.5	435.5	448	473	485.5	510.5	535.5	548	573	598	610.5	635.5	660.5	673	698	723
<b>7</b>	373	385.5	410.5	435.5	448	473	498	510.5	535.5	548	573	598	610.5	635.5	660.5	673	698	723	735.5
<b>8</b>	385.5	410.5	435.5	448	473	498	510.5	535.5	548	573	598	610.5	635.5	660.5	673	698	723	735.5	760.5

**SV**

**SY**

**SYJ**

**SX**

**VK**

**VZ**

**VF**

**VFR**

**VP7**

**VQC**

**SQ**

**VQ**

**VQ4**

**VQ5**

**VQZ**

**VQD**

**VFS**

**VS**

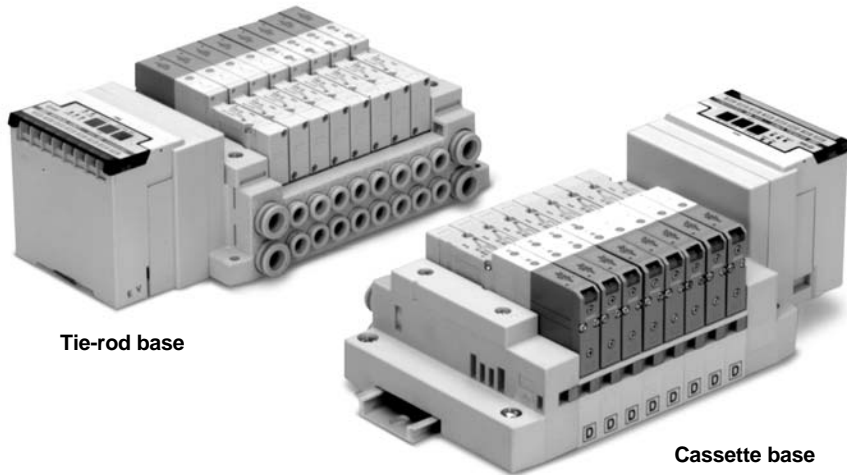
**VS7**

**VQ7**



# Dedicated Output Serial Wiring

## Series EX120



Applicable series	Cassette base manifold SV1000/SV2000
	Tie-rod base manifold SV1000/SV2000/SV3000/SV4000
• Number of outputs: 16	

**SV**

**SY**

**SYJ**

**SX**

**VK**

**VZ**

**VF**

**VFR**

**VP7**

**VQC**

**SQ**

**VQ**

**VQ4**

**VQ5**

**VQZ**

**VQD**

**VFS**

**VS**

**VS7**

**VQ7**

# EX120 Serial transmission unit with output unit Series SV

## How to order

**Series**

1	SV1000
2	SV2000
3	SV3000
4	SV4000

**SI unit**

1	SV1000
2	SV2000

**Valve stations**

Symbol	Stations	Comments
02	2 Stations	Double wiring <small>Note 1)</small>
⋮	⋮	
08	8 Stations	
02	2 Stations	Specified layout (up to 16 solenoids possible) <small>Note 2)</small>
⋮	⋮	
16	16 Stations	

**P, E port position**

U	U side (2 to 10 stations)
D	D side (2 to 10 stations)
B	Both sides (2 to 16 stations)

**Supply/Exhaust block assembly**

-	Internal pilot specification
S	Internal pilot / built in silencer
R	External pilot specification
RS	External pilot / built-in silencer

**Mounting**

-	Direct mount	
D	DIN rail mount (with DIN rail)	
D0 <small>Note)</small>	DIN rail mount (without DIN rail)	
D3	for 3 stations	When a DIN rail longer than the specified stations is required (specify a rail longer than the standard DIN rail)
⋮	⋮	
D16	for 16 stations	

Note) In case of D0, only rail fittings are attached.

**DIN rail length**

-	Standard length	
3	for 3 stations	Specify a rail longer than the standard DIN rail.
⋮	⋮	
16	for 16 stations	

**• Tie-rod type**  
SS5V 1 — 10S3 N D — 05 U

**• Cassette type**  
SS5V 1 — 16S3 N D — 05 U

Symbol	Specification
0	Without SI unit
B	Mitsubishi Electric Corporation: MELSECNET/MINI-S3 Data Link System
C	OMRON Corporation: SYSBUS Wire System
N	PROFIBUS-DP, 16 outputs
P	Interbus S, 16 outputs
T2	AS-i, 8 outputs with external valve power supply
T4	AS-i, 4 outputs with external valve power supply
T5	AS-i, 4 outputs without external valve power supply
Y	CAN open, 16 outputs
V	Mitsubishi electric corporation: CC-Link
Q	Device Net, 16 outputs

The SI units T4 and T5 have 4 outputs available, therefore a maximum of 4 solenoids can be used.  
The SI unit T2 has 8 outputs available, therefore a maximum of 8 solenoids can be used.  
Other systems available on demand.

### SI Unit part number

Symbol	Specification	for SS5V□-□□S3
B	Mitsubishi Electric Corporation: MELSECNET/MINI-S3 Data Link System	EX120-SMB1
C	OMRON Corporation: SYSBUS Wire System	EX120-STA1
N	PROFIBUS-DP	EX120-SPR1
P	Interbus S	EX120-SIB1
T2	AS-i, 8 outputs with external valve power supply	EX120-SAS2
T4	AS-i, 4 outputs with external valve power supply	EX120-SAS4
T5	AS-i, 4 outputs without external power supply	EX120-SAS5
Y	CAN open	EX120-SCA1
V	Mitsubishi electric corporation: CC-Link	EX120-SMJ1
Q	Device Net	EX120-SDN1

\* Refer to pages 1.1-42 to 1.1-44 for LED descriptions and cable wiring etc. for each SI unit

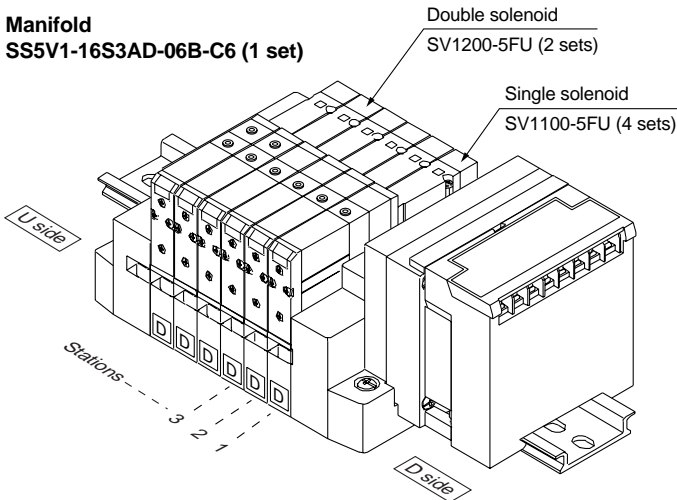


## How to Order Manifold Assemblies (Order Example)

### Example (SV1000)

#### Manifold

SS5V1-16S3AD-06B-C6 (1 set)



SS5V1-16S3AD-06B-C6 ..... 1 set ( manifold part no.)  
 \* SV1100-5FU ..... 4 sets (single solenoid part no.)  
 \* SV1200-5FU ..... 2 sets (double solenoid part no.)

## How to Order Solenoid Valves

SV 1 1 0 0 [ ] [ ] - 5 F [ ] [ ] [ ]

#### Series

1	SV1000
2	SV2000
3	SV3000
4	SV4000

#### Type of actuation

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

\* 4 position dual 3 port valves are applicable to series SV1000 and SV2000 only.

#### Pilot specification

Nil	Internal pilot
R	External pilot

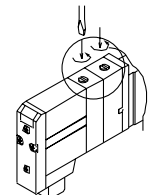
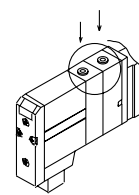
\* External pilot specification is not available for 4 position dual 3 port valves.

Note) Available with manifold block for station additions. Refer to pages 1.1-85 and 1.1-89.

#### Manual override

Nil: Non-locking push type

D: Slotted locking type



#### Rated voltage

5	24VDC
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#### Light/Surge voltage suppressor

U	With light and surge voltage suppressor
R	With surge voltage suppressor

#### Back pressure check valve

Nil	None
K	Built-in

\* Built-in back pressure check valve type is applicable to series SV1000 only.

\* Back pressure check valve is not available for 3 position closed center and 3 position pressure center.

\* Flow rate with the built-in back pressure check valve is reduced approximately 20%.

#### A, B port size (metric)

Symbol	A, B port	P, E port	Applicable series
C3	ø3.2 One-touch fitting	ø8 One-touch fitting	SV1000
C4	ø4 One-touch fitting		
C6	ø6 One-touch fitting		
C4	ø4 One-touch fitting	ø10 One-touch fitting	SV2000
C6	ø6 One-touch fitting		
C8	ø8 One-touch fitting		
C6	ø6 One-touch fitting	ø12 One-touch fitting	SV3000
C8	ø8 One-touch fitting		
C10	ø10 One-touch fitting		
C8	ø8 One-touch fitting	ø12 One-touch fitting	SV4000
C10	ø10 One-touch fitting		
C12	ø12 One-touch fitting		
02	Rc 1/4	Rc 3/8	
03	Rc 3/8		
02F	G 1/4		
03F	G 3/8	G 3/8	
M	A, B ports mixed		

#### A, B port size (inch)

Symbol	A, B port	P, E port	Applicable series
N1	ø1/8" One-touch fitting	ø5/16" One-touch fitting	SV1000
N3	ø5/32" One-touch fitting		
N7	ø1/4" One-touch fitting		
N3	ø5/32" One-touch fitting	ø3/8" One-touch fitting	SV2000
N7	ø1/4" One-touch fitting		
N9	ø5/16" One-touch fitting		
N7	ø1/4" One-touch fitting	ø3/8" One-touch fitting	SV3000
N9	ø5/16" One-touch fitting		
N11	ø3/8" One-touch fitting		
N9	ø5/16" One-touch fitting	ø3/8" One-touch fitting	SV4000
N11	ø3/8" One-touch fitting		
02N	NPT 1/4		
03N	NPT 3/8	NPT 3/8	
02T	NPTF 1/4		
03T	NPTF 3/8		
M	A, B ports mixed		

\* In case of mixed specification (M), indicate separately on a manifold specification sheet.

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

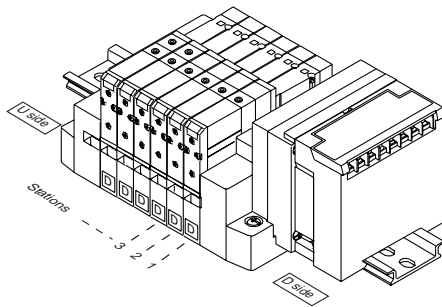
VS

VS7

VQ7

# Series SV

- The serial data transmission system reduces connection work, while also minimizing wiring cost and save space.
- 16 stations or less (As desired, introduce the specific layout in a valve manifold specification form.)



- The stations are counted starting out from the D side.
- A maximum of 16 solenoids are permitted (16 stations with single solenoid valves).

	Type N, Profibus-DP	Type P, Interbus-S																																																																																																										
Description of LED display	<table border="1"> <thead> <tr> <th>LED</th> <th>Status (after configuration)</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>RUN</td> <td>Green</td> <td>Power supply (+24VDC) for the SI unit is present, and valves drivers protection fuses are intact.</td> </tr> <tr> <td></td> <td>OFF</td> <td>Power supply absent or fuses blown.</td> </tr> <tr> <td>DIA</td> <td>Red</td> <td>SI unit circuit failure.</td> </tr> <tr> <td></td> <td>OFF</td> <td>No error.</td> </tr> <tr> <td>BF</td> <td>Red</td> <td>Bus error. A bus communication cycle was not realised in the time set by control parameters.</td> </tr> <tr> <td></td> <td>OFF</td> <td>No error.</td> </tr> </tbody> </table>	LED	Status (after configuration)	Description	RUN	Green	Power supply (+24VDC) for the SI unit is present, and valves drivers protection fuses are intact.		OFF	Power supply absent or fuses blown.	DIA	Red	SI unit circuit failure.		OFF	No error.	BF	Red	Bus error. A bus communication cycle was not realised in the time set by control parameters.		OFF	No error.	<table border="1"> <thead> <tr> <th>LED status</th> <th>Colour</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>UL (Voltage load)</td> <td>Green</td> <td>Indicates whether both power supplies for electronics and the valves (each +24VDC) are connected. LED illuminates: - Both 24V power supplies are correct. LED OFF: - At least one of these power supplies is not correct.</td> </tr> <tr> <td>RD (Remote bus Disabled)</td> <td>Red</td> <td>Indicates whether the output interface to the fielbus (starting from the master) is active. LED illuminates: - The output interface to the fielbus is not active. LED OFF: - The output interface is active.</td> </tr> <tr> <td>BA (Bus active)</td> <td>Green</td> <td>Indicates whether data transmission via Interbus-S is in progress or has been interrupted. LED illuminates: - Data transmission in progress. LED OFF: - Data transmission interrupted.</td> </tr> <tr> <td>RC (Remote bus Check)</td> <td>Green</td> <td>Indicates whether the remote bus's cable connection to the previous SI unit is correct (count direction from the master): LED illuminates: - Cable connection is correct. LED OFF: - The cable connection is interrupted.</td> </tr> </tbody> </table>	LED status	Colour	Description	UL (Voltage load)	Green	Indicates whether both power supplies for electronics and the valves (each +24VDC) are connected. LED illuminates: - Both 24V power supplies are correct. LED OFF: - At least one of these power supplies is not correct.	RD (Remote bus Disabled)	Red	Indicates whether the output interface to the fielbus (starting from the master) is active. LED illuminates: - The output interface to the fielbus is not active. LED OFF: - The output interface is active.	BA (Bus active)	Green	Indicates whether data transmission via Interbus-S is in progress or has been interrupted. LED illuminates: - Data transmission in progress. LED OFF: - Data transmission interrupted.	RC (Remote bus Check)	Green	Indicates whether the remote bus's cable connection to the previous SI unit is correct (count direction from the master): LED illuminates: - Cable connection is correct. LED OFF: - The cable connection is interrupted.																																																																						
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For detailed information please refer to our instructions manual

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SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

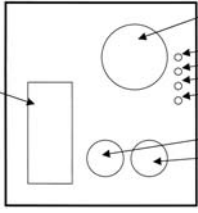
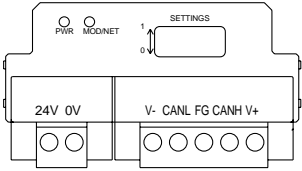
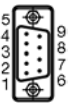

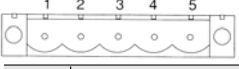
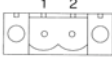
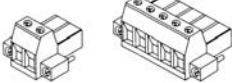
VFS

VS

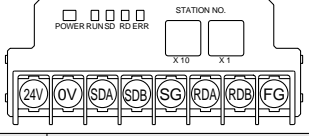
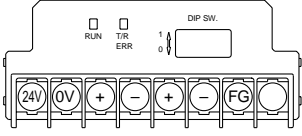
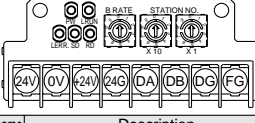
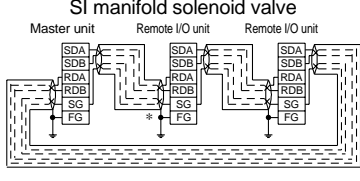
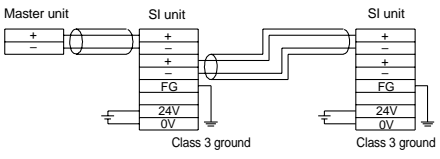
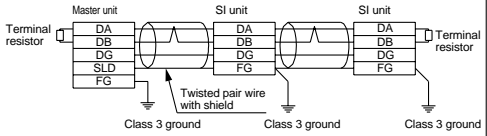
VS7

VQ7

# Series SV

	Type Y, CAN open	Type Q, DeviceNet																																																															
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9	(CAN_V+)	optional power supply (e.g. for transceiver and optocoupler during the electrical isolation of bus nodes — not supported by the SI unit)																																																															
Pin 1	+24V +/-10%	Valves power supply																																																															
Pin 2	0V	0V SI unit																																																															
Pin 3	PE	Ground connection (Protective earth)																																																															
Pin 4	+24V +/-10%	SI unit power supply																																																															
Pin 5	0V	Solenoid valves																																																															
Pin no.	Description																																																																
1	V- (black)																																																																
2	CAN_L (blue)																																																																
3	Shield																																																																
4	CAN_H (white)																																																																
5	V+ (red)																																																																
Pin no.	Description																																																																
1	+24VDC ±10%																																																																
2	0VDC																																																																

For detailed information, please refer to our instructions manual

	Type B Mitsubishi Electric Corporation MELSECNET/MINI-S3 Data Link System	Type C OMRON Corporation SYSBUS Wire System	Type V Mitsubishi Electric Corporation CC-Link																																
Terminal block LED description	 <table border="1" data-bbox="162 1630 545 1765"> <thead> <tr> <th>LED name</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>POWER</td><td>ON for power supply Input</td></tr> <tr><td>RUN</td><td>ON for normal data traffic with master unit</td></tr> <tr><td>RD</td><td>ON during data reception</td></tr> <tr><td>SD</td><td>ON during data transmission</td></tr> <tr><td>ERR</td><td>ON for data reception error, OFF when normal</td></tr> </tbody> </table>	LED name	Description	POWER	ON for power supply Input	RUN	ON for normal data traffic with master unit	RD	ON during data reception	SD	ON during data transmission	ERR	ON for data reception error, OFF when normal	 <table border="1" data-bbox="577 1639 976 1765"> <thead> <tr> <th>LED name</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>RUN</td><td>ON when transmission is normal and PLC is in operation mode</td></tr> <tr><td>T/R</td><td>Blinks when transmission is normal</td></tr> <tr><td>ERR</td><td>ON when transmission is abnormal</td></tr> </tbody> </table>	LED name	Description	RUN	ON when transmission is normal and PLC is in operation mode	T/R	Blinks when transmission is normal	ERR	ON when transmission is abnormal	 <table border="1" data-bbox="1072 1617 1391 1774"> <thead> <tr> <th>LED name</th> <th>Description</th> </tr> </thead> <tbody> <tr><td>PW</td><td>ON when communication power is supplied, OFF when power is OFF</td></tr> <tr><td>L RUN</td><td>ON when normal data is being received</td></tr> <tr><td>SD</td><td>ON when data is transmitted</td></tr> <tr><td>RD</td><td>ON when data is received</td></tr> <tr><td>L ERR.</td><td>ON for transmission error/wrong setting. Blinks when station or transmission speed setting changes during operation</td></tr> </tbody> </table>	LED name	Description	PW	ON when communication power is supplied, OFF when power is OFF	L RUN	ON when normal data is being received	SD	ON when data is transmitted	RD	ON when data is received	L ERR.	ON for transmission error/wrong setting. Blinks when station or transmission speed setting changes during operation
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Note	<ul style="list-style-type: none"> <li>MELSECNET/MINI-S3 Data Link System</li> <li>Master unit: AJ71PT32-S3, AJ71T32-S3, A1SJ71PT32-S3</li> <li>16 outputs, occupying two stations</li> </ul>	<ul style="list-style-type: none"> <li>SYSBUS Wire System</li> <li>Master unit: Type C500-RM201, Type C200H-RM201</li> <li>16 outputs</li> </ul>	<ul style="list-style-type: none"> <li>CC-Link System</li> <li>Master unit: AJ61BT11, A1SJ61BT11, AJ61QBT11, A1SJ61QBT11</li> <li>16 outputs</li> </ul>																																
Cable wiring	 <p>* Ground either the reception side or the transmission side of the shielding wire shield.</p>	 <p>Class 3 ground</p>	 <p>Class 3 ground</p>																																

**Dimensions: Series SV1000 for EX120 Dedicated Output Serial Transmission Unit**

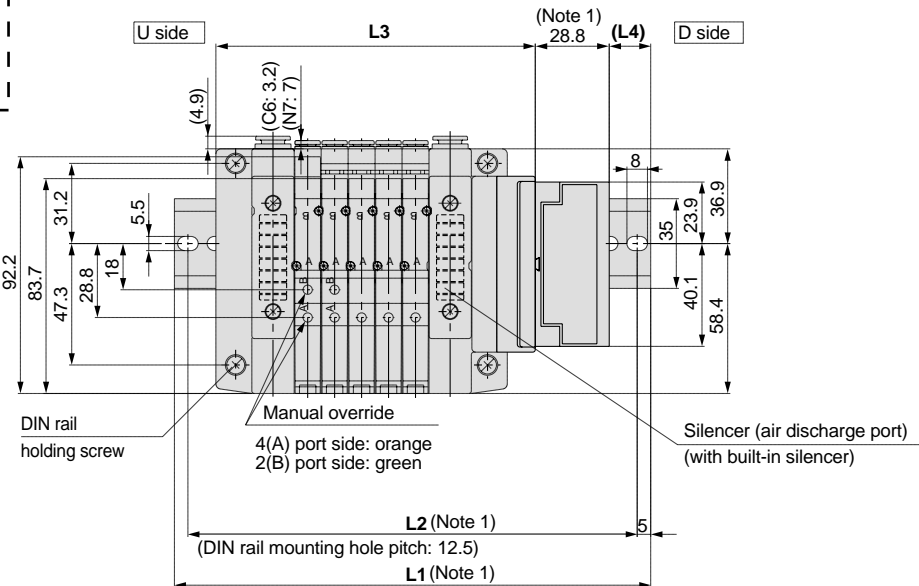
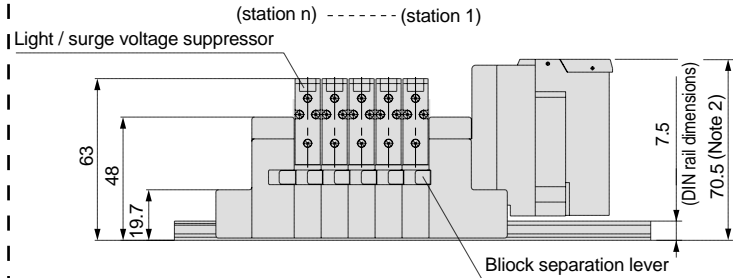
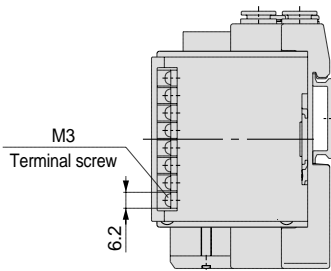
• Cassette base manifold: **SS5V1-16S3** □ **D** - stations  $\frac{U}{D}{B}$  (S, R, RS) - C3, N1  
C4, N3  
C6, N7

- When P, E ports are specified on the U or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions correspond to the P, E port outlet positions.

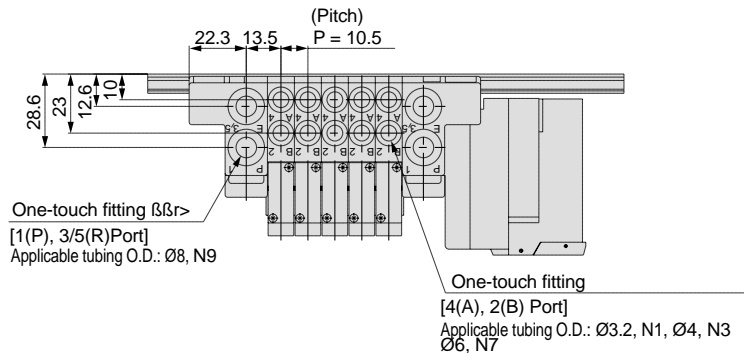
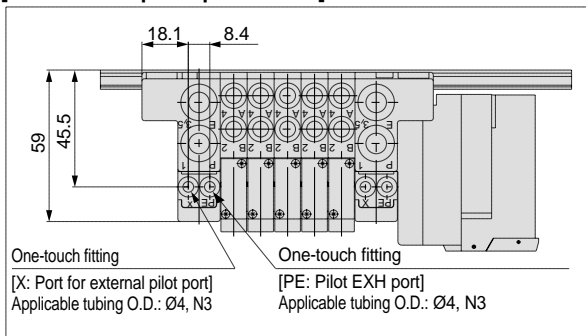
**Note 1):**  
The dimensions layouts correspond to version B, C and Q.  
In all other bus systems the SI unit is 24.3 mm longer.

**Note 2):**  
For the below listed SI units the overall SI unit height is higher due to the connector sockets used.

Specification	Version	Height
Profibus	<b>N</b>	14 mm longer
Interbus	<b>P</b>	
CANopen	<b>Y</b>	
AS-i	<b>T2, T4, T5</b>	22.5 mm longer



[with external pilot specification]



**L-Dimensions**

		n: stations														
L \ n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
(Note 1) <b>L1</b>	148	160.5	173	185.5	198	198	210.5	223	235.5	248	260.5	260.5	273	285.5	298	
(Note 1) <b>L2</b>	137.5	150	162.5	175	187.5	187.5	200	212.5	225	237.5	250	250	262.5	275	287.5	
<b>L3</b>	92.9	103.4	113.9	124.4	134.9	145.4	155.9	166.4	176.9	187.4	197.9	208.4	218.9	229.4	239.9	
<b>L4</b>	13	14	15	16	17	12	13	14	15	16	17	11.5	12.5	13.5	14.5	

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

VS7

VQ7

# Series SV

## Dimensions: Series SV2000 for EX120 Dedicated Output Serial Wiring

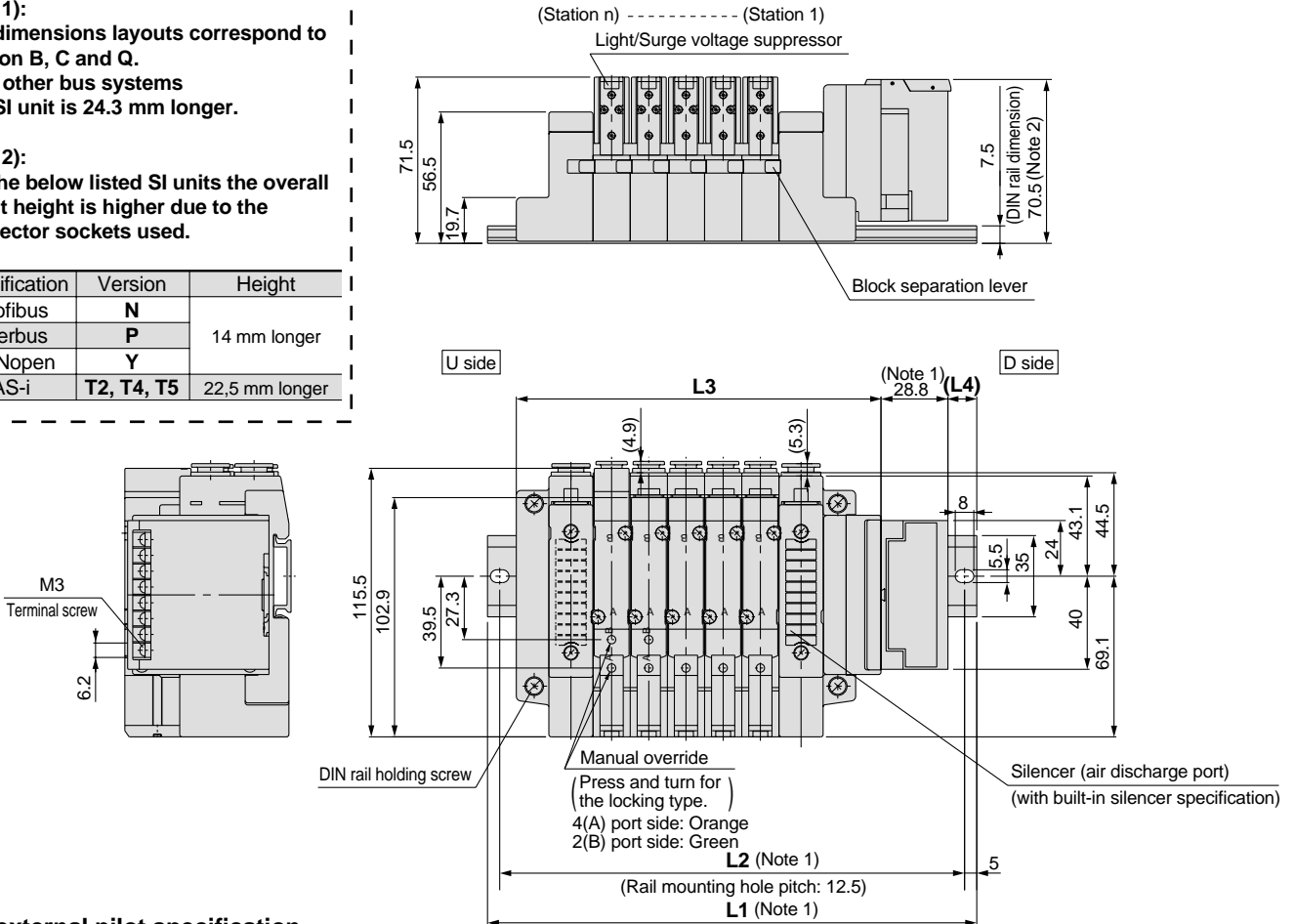
• Cassette base manifold: **SS5V2-16S3** □ **D** - Stations  $\begin{matrix} \text{U} \\ \text{D} \\ \text{B} \end{matrix}$  (**S, R, RS**) -  $\begin{matrix} \text{C4, N3} \\ \text{C6, N7} \\ \text{C8, N9} \end{matrix}$

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.

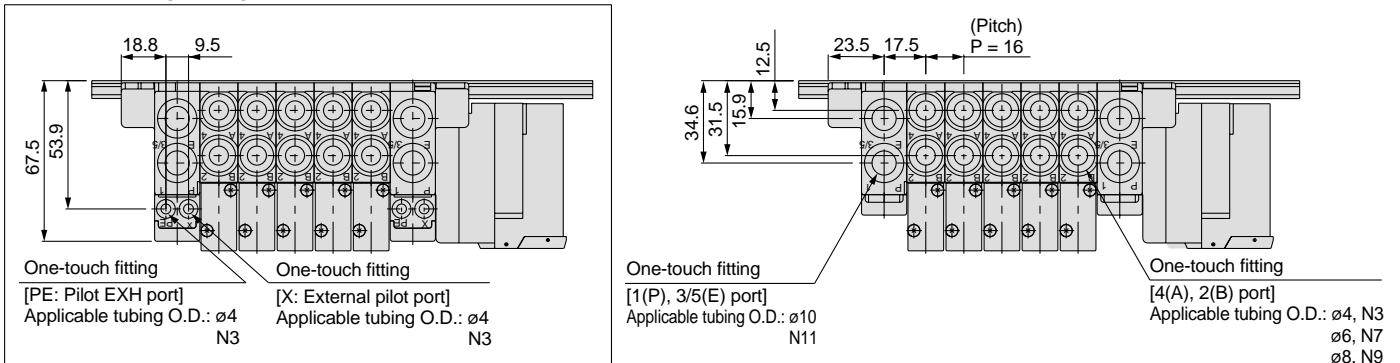
**Note 1):**  
The dimensions layouts correspond to version B, C and Q.  
In all other bus systems the SI unit is 24.3 mm longer.

**Note 2):**  
For the below listed SI units the overall SI unit height is higher due to the connector sockets used.

Specification	Version	Height
Profibus	<b>N</b>	14 mm longer
Interbus	<b>P</b>	
CANopen	<b>Y</b>	22,5 mm longer
AS-i	<b>T2, T4, T5</b>	



### With external pilot specification



### L dimensions

		n: Stations														
		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
(Note 1)	<b>L1</b>	173	185.5	198	210.5	235.5	248	260.5	273	298	310.5	323	348	360.5	373	385.5
(Note 1)	<b>L2</b>	162.5	175	187.5	200	225	237.5	250	262.5	287.5	300	312.5	337.5	350	362.5	375
	<b>L3</b>	108.9	124.9	140.9	156.9	172.9	188.9	204.9	220.9	236.9	252.9	268.9	284.9	300.9	316.9	332.9
	<b>L4</b>	17.5	16	14	12.5	17	15	13.5	11.5	16	14.5	12.5	17	15.5	13.5	12

**Dimensions: Series SV1000 for EX120 Dedicated Output Serial Wiring**

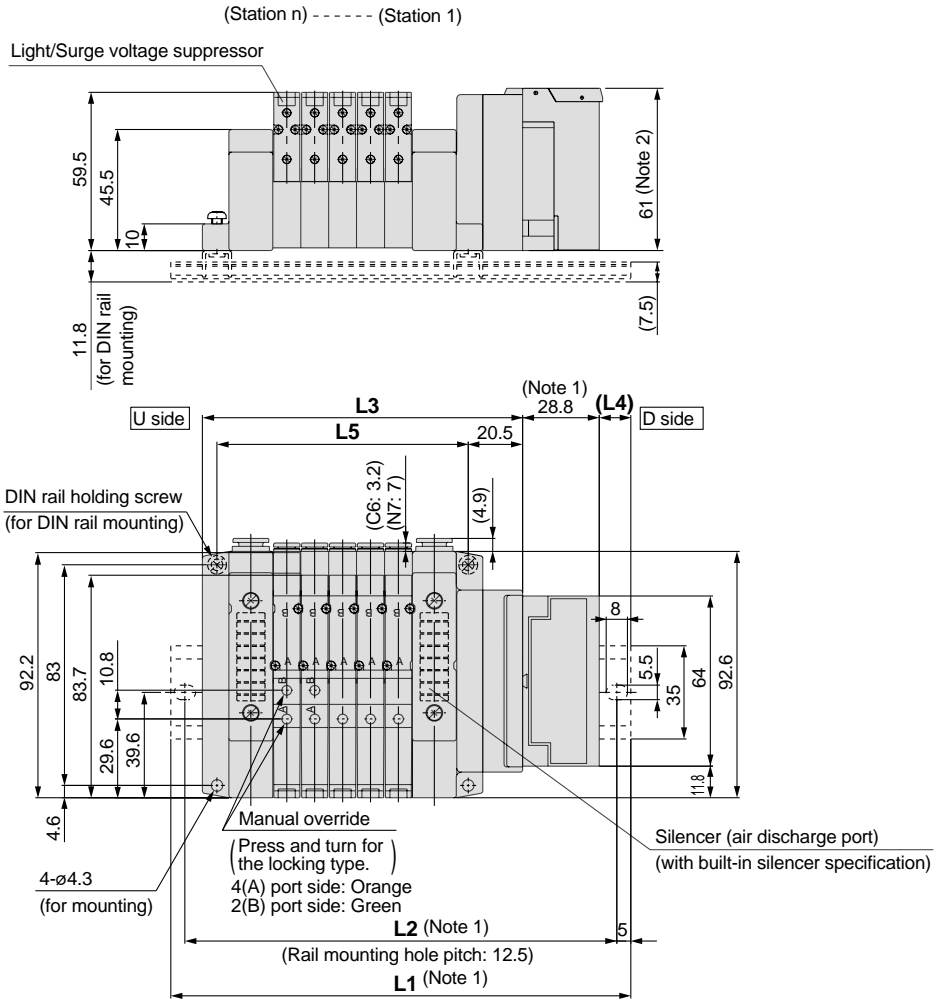
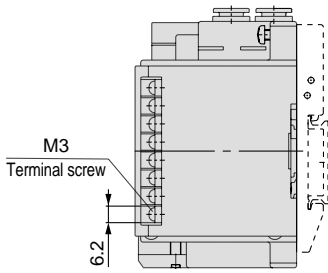
• Tie-rod base manifold: **SS5V1-10S3** □ **D** - Stations  $\begin{matrix} U \\ D \\ B \end{matrix}$  (**S, R, RS**) -  $\begin{matrix} C3, N1 \\ C4, N3 \\ C6, N7 \end{matrix}$  (**-D**)

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.

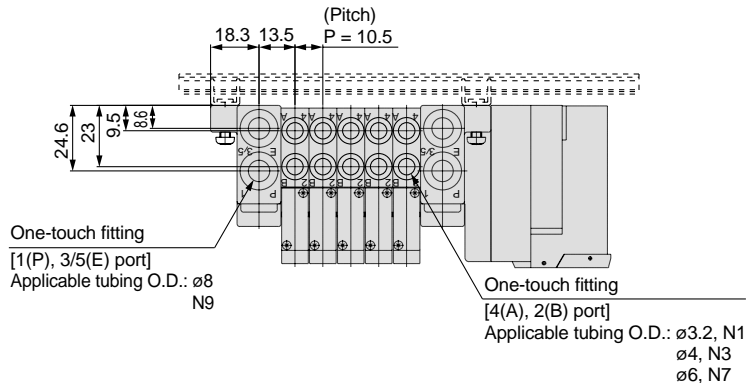
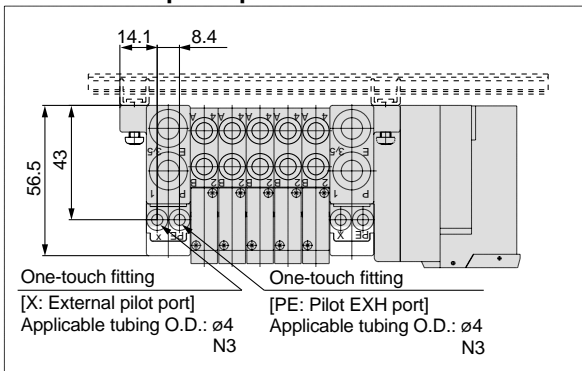
**Note 1):**  
The dimensions layouts correspond to version B, C and Q.  
In all other bus systems the SI unit is 24.3 mm longer.

**Note 2):**  
For the below listed SI units the overall SI unit height is higher due to the connector sockets used.

Specification	Version	Height
Profibus	<b>N</b>	14 mm longer
Interbus	<b>P</b>	
CANopen	<b>Y</b>	22.5 mm longer
AS-i	<b>T2, T4, T5</b>	



**With external pilot specification**



**L dimensions**

		n: Stations														
(Note 1)	L n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
(Note 1)	L1	148	160.5	173	173	185.5	198	210.5	223	235.5	235.5	248	260.5	273	285.5	298
(Note 1)	L2	137.5	150	162.5	162.5	175	187.5	200	212.5	225	225	237.5	250	262.5	275	287.5
	L3	89	99.5	110	120.5	131	141.5	152	162.5	173	183.5	194	204.5	215	225.5	236
	L4	15	16	17	12	13	14	15	16	17	11.5	12.5	13.5	14.5	15.5	16.5
	L5	63	73.5	84	94.5	105	115.5	126	136.5	147	157.5	168	178.5	189	199.5	210

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

# Series SV

## Dimensions: Series SV2000 for EX120 Dedicated Output Serial Wiring

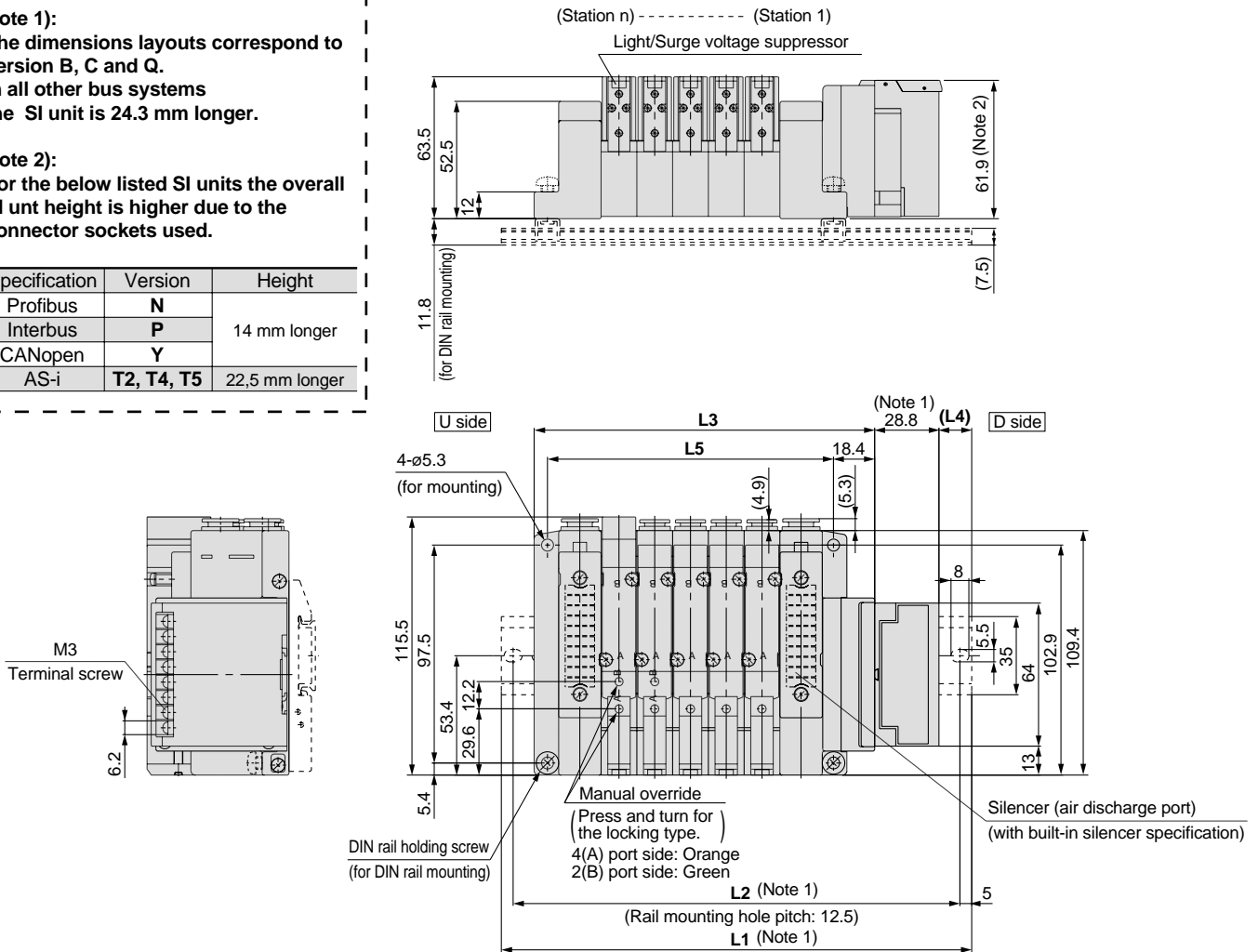
• Tie-rod base manifold: **SS5V2-10S3□D** - Stations  $\frac{U}{D}$  (S, R, RS) -  $\frac{C4, N3}{C6, N7}$  /  $\frac{C8, N9}{C8, N9}$  (-D)

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.

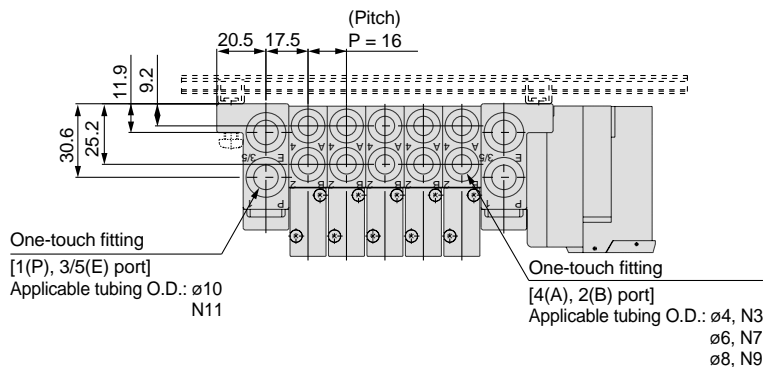
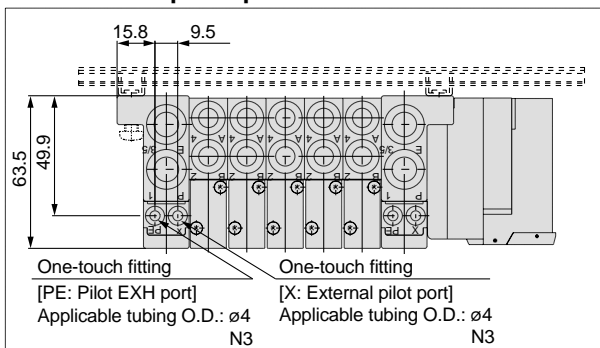
**Note 1):**  
 The dimensions layouts correspond to version B, C and Q.  
 In all other bus systems the SI unit is 24.3 mm longer.

**Note 2):**  
 For the below listed SI units the overall SI unit height is higher due to the connector sockets used.

Specification	Version	Height
Profibus	N	14 mm longer
Interbus	P	
CANopen	Y	22,5 mm longer
AS-i	T2, T4, T5	



### With external pilot specification



### L dimensions

		n: Stations														
L	n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
(Note 1)	L1	160.5	173	198	210.5	223	248	260.5	273	285.5	310.5	323	335.5	360.5	373	385.5
(Note 1)	L2	150	162.5	187.5	200	212.5	237.5	250	262.5	275	300	312.5	325	350	362.5	375
	L3	104.4	120.4	136.4	152.4	168.4	184.4	200.4	216.4	232.4	248.4	264.4	280.4	296.4	312.4	328.4
	L4	13.5	12	16.5	14.5	13	17.5	15.5	14	12	16.5	15	13	17.5	16	14
	L5	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304



**Dimensions: Series SV3000 for EX120 Dedicated Output Serial Wiring**

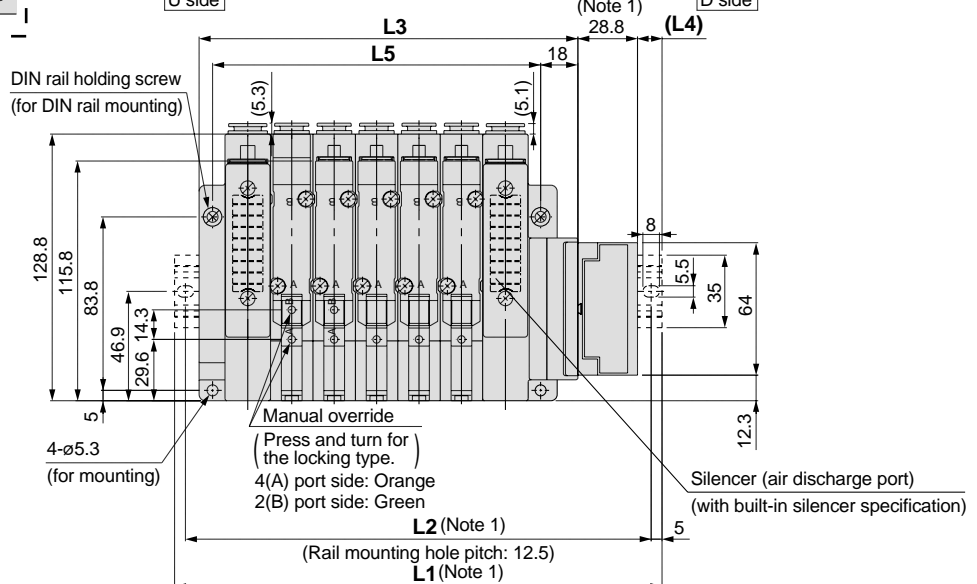
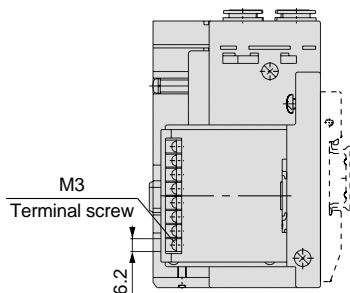
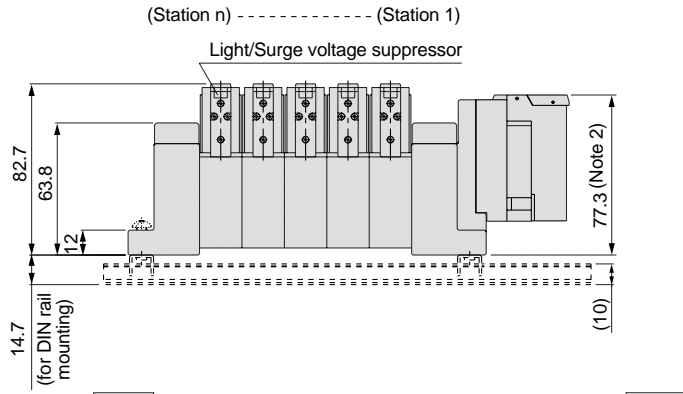
• Tie-rod base manifold: **SS5V3-10S3** □ **D** - Stations  $\frac{U}{D}$  (**S, R, RS**) -  $\frac{C6, N7}{C8, N9}$  (**-D**)  
 $\frac{C10, N11}$

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.

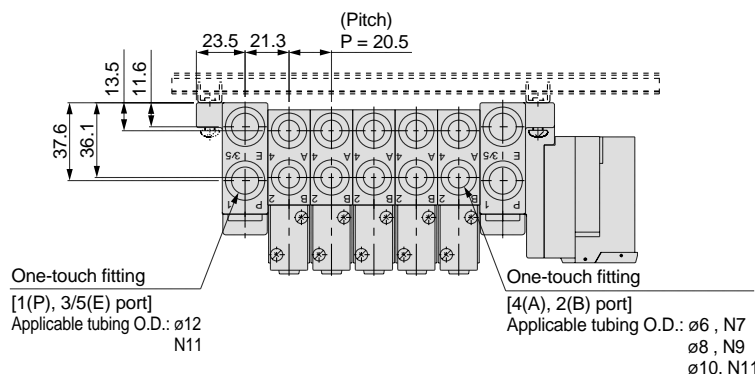
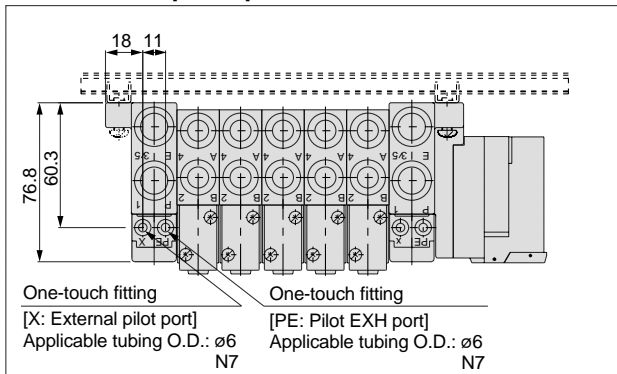
**Note 1):**  
 The dimensions layouts correspond to version B, C and Q.  
 In all other bus systems the SI unit is 24.3 mm longer.

**Note 2):**  
 For the below listed SI units the overall SI unit height is higher due to the connector sockets used.

Specification	Version	Height
Profibus	<b>N</b>	14 mm longer
Interbus	<b>P</b>	
CANopen	<b>Y</b>	
AS-i	<b>T2, T4, T5</b>	22,5 mm longer



**With external pilot specification**



**L dimensions**

L		n: Stations														
(Note 1)	n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
(Note 1)	L1	185.5	198	223	235.5	260.5	285.5	298	323	348	360.5	385.5	410.5	423	448	460.5
(Note 1)	L2	175	187.5	212.5	225	250	275	287.5	312.5	337.5	350	375	400	412.5	437.5	450
	L3	121.5	142	162.5	183	203.5	224	244.5	265	285.5	306	326.5	347	367.5	388	408.5
	L4	17.5	13.5	16	12	14	16.5	12.5	14.5	17	13	15	17.5	13.5	15.5	11.5
	L5	97	117.5	138	158.5	179	199.5	220	240.5	261	281.5	302	322.5	343	363.5	384

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

# Series SV

## Dimensions: Series SV4000 for EX120 Dedicated Output Serial Wiring

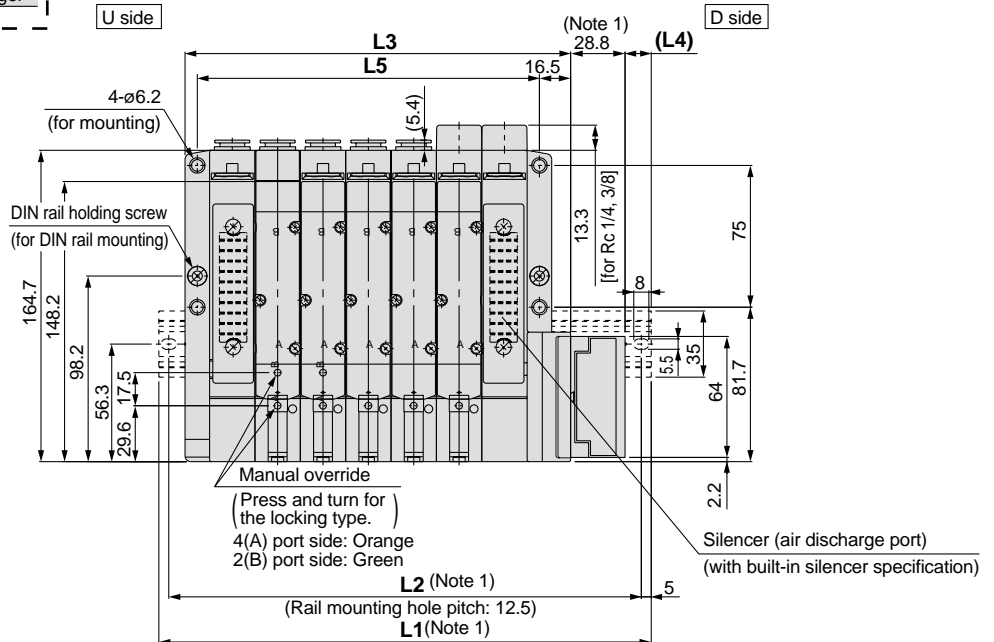
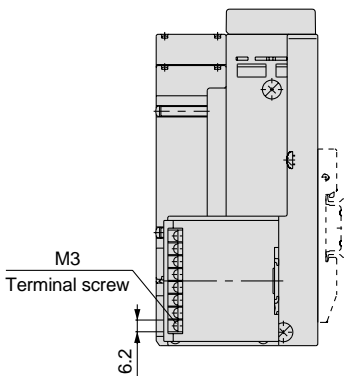
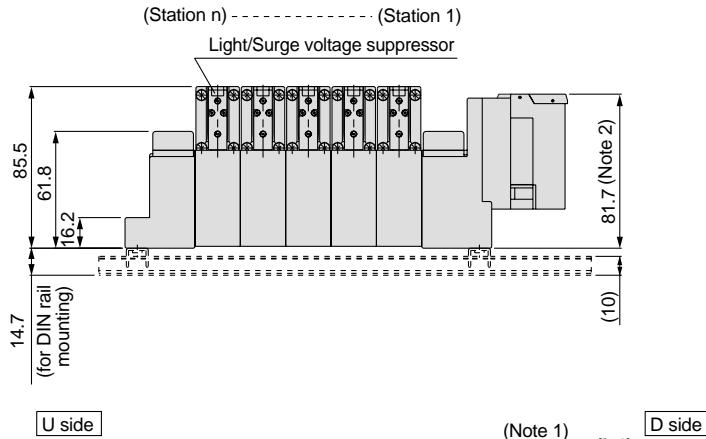
• Tie-rod base manifold: **SS5V4-10S3** □ **D** - Stations  $\begin{matrix} U \\ D \\ B \end{matrix}$  (**S, R, RS**) -  $\begin{matrix} 02, C8, N9, \\ 03, C10, N11 \\ C12, \end{matrix}$  (**-D**)

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.

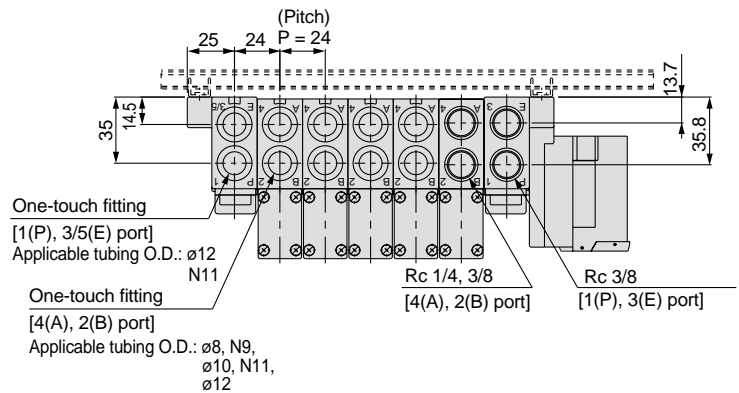
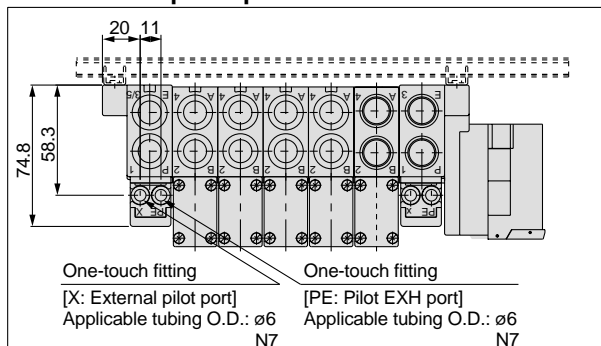
**Note 1):**  
The dimensions layouts correspond to version B, C and Q.  
In all other bus systems the SI unit is 24.3 mm longer.

**Note 2):**  
For the below listed SI units the overall SI unit height is higher due to the connector sockets used.

Specification	Version	Height
Profibus	<b>N</b>	14 mm longer
Interbus	<b>P</b>	
CANopen	<b>Y</b>	22.5 mm longer
AS-i	<b>T2, T4, T5</b>	



### With external pilot specification

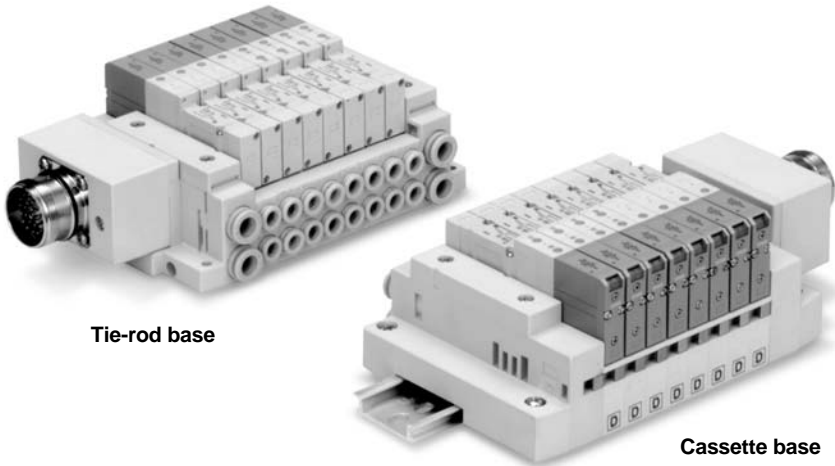


### L dimensions

	n: Stations															
$\begin{matrix} L \\ n \end{matrix}$	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
(Note 1) <b>L1</b>	185.5	210.5	235.5	260.5	285.5	310.5	335.5	360.5	385.5	410.5	435.5	448	473	498	523	
(Note 1) <b>L2</b>	175	200	225	250	275	300	325	350	375	400	425	437.5	462.5	487.5	512.5	
<b>L3</b>	132	156	180	204	228	252	276	300	324	348	372	396	420	444	468	
<b>L4</b>	12.5	13	13.5	14	14.5	15	15.5	16	16.5	17	17.5	11.5	12	12.5	13	
<b>L5</b>	109	133	157	181	205	229	253	277	301	325	349	373	397	421	445	

# Circular Connector

IP67 protection



Applicable series	Cassette base manifold SV1000/SV2000
	Tie-rod base manifold SV1000/SV2000/SV3000/SV4000
• Number of connectors: 26 pins	

- SV**
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7

- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

# Circular Connector Series SV

## How to Order

**Series**

1	SV1000
2	SV2000
3	SV3000
4	SV4000

**Valve stations**

Symbol	Stations	Note
02	2 stations	Double wiring specification <small>Note 1)</small>
∴	∴	
12	12 stations	Specified layout <small>Note 2)</small> (Up to 24 solenoids possible.)
∴	∴	
20	20 stations	

**Tie-rod base**  
SS5V 1 — W 10CD — 05 U

**Cassette base**  
SS5V 1 — W 16CD — 05 U

**Series**

1	SV1000
2	SV2000

**Enclosure IP67 specification**

**Mounting**

Nil	Direct mount
D	DIN rail mount (with DIN rail)
D0 <sup>Note)</sup>	DIN rail mount (without DIN rail)
D3	For 3 stations <small>When a DIN rail longer than the specified stations is required. (Specify a rail longer than the standard length.)</small>
∴	∴
D20	For 20 stations

Note 1) Double wiring specification: Single, double and 3 position solenoid valves can be used on all manifold stations. Use of a single solenoid will result in an unused control signal. If this is not desired, order with a specified layout.

Note 2) Specified layout: Indicate wiring specifications on a manifold specification sheet. (Note that double and 3 position valves cannot be used where single solenoid wiring has been specified.)

Note) In case of D0, only DIN rail fittings are attached.

**DIN rail length**

Nil	Standard length
3	For 3 stations <small>Specify a rail longer than the standard length.</small>
∴	∴
20	For 20 stations

**Valve stations**

**Series SV1000**

Symbol	Stations	Note
02	2 stations	Double wiring specification <small>Note 1)</small>
∴	∴	
09	9 stations	Specified layout <small>Note 2)</small> (Up to 18 solenoids possible.)
∴	∴	
18	18 stations	

**Series SV2000**

Symbol	Stations	Note
02	2 stations	Double wiring specification <small>Note 1)</small>
∴	∴	
12	12 stations	Specified layout <small>Note 2)</small> (Up to 24 solenoids possible.)
∴	∴	
20	20 stations	

Note 1) Double wiring specification: Single, double and 3 position solenoid valves can be used on all manifold stations. Use of a single solenoid will result in an unused control signal. If this is not desired, order with a specified layout.

Note 2) Specified layout: Indicate wiring specifications on a manifold specification sheet. (Note that double and 3 position valves cannot be used where single solenoid wiring has been specified.)

**P, E port position**

U	U side (2 to 10 stations)
D	D side (2 to 10 stations)
B	Both sides (2 to 20 stations)

**Supply/Exhaust block assembly specification**

Nil	Internal pilot specification
S*	Internal pilot/Built-in silencer
R	External pilot specification
RS*	External pilot/Built-in silencer

\* When the built-in silencer type is used, keep the exhaust port from coming in direct contact with water or other liquids.

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

Symbol	A, B port	P, E port	Applicable series
C3	ø3.2 One-touch fitting	ø8 One-touch fitting	SV1000
C4	ø4 One-touch fitting		
C6	ø6 One-touch fitting	ø10 One-touch fitting	SV2000
C4	ø4 One-touch fitting		
C6	ø6 One-touch fitting	ø12 One-touch fitting	SV3000
C8	ø8 One-touch fitting		
C6	ø6 One-touch fitting	ø12 One-touch fitting	SV4000
C8	ø8 One-touch fitting		
C10	ø10 One-touch fitting	ø12 One-touch fitting	SV4000
C8	ø8 One-touch fitting		
C10	ø10 One-touch fitting	Rc 3/8	SV4000
C12	ø12 One-touch fitting		
02	Rc 1/4	G 3/8	SV4000
03	Rc 3/8		
02F	G 1/4	G 3/8	SV4000
03F	G 3/8		
M	A, B ports mixed		

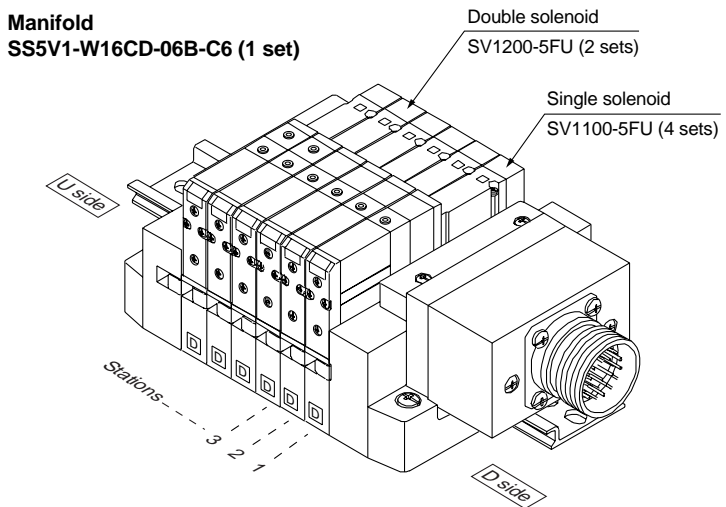
**A, B port size (inch)**

Symbol	A, B port	P, E port	Applicable series
N1	ø1/8" One-touch fitting	ø5/16" One-touch fitting	SV1000
N3	ø5/32" One-touch fitting		
N7	ø1/4" One-touch fitting	ø3/8" One-touch fitting	SV2000
N3	ø5/32" One-touch fitting		
N7	ø1/4" One-touch fitting	ø3/8" One-touch fitting	SV3000
N9	ø5/16" One-touch fitting		
N7	ø1/4" One-touch fitting	ø3/8" One-touch fitting	SV4000
N9	ø5/16" One-touch fitting		
N11	ø3/8" One-touch fitting	NPT 3/8	SV4000
N9	ø5/16" One-touch fitting		
N11	ø3/8" One-touch fitting	NPTF 3/8	SV4000
02N	NPT 1/4		
03N	NPT 3/8		
02T	NPTF 1/4		
03T	NPTF 3/8		
M	A, B ports mixed		

\* In case of mixed specification (M), indicate separately on a manifold specification sheet.

### How to Order Manifold Assemblies (Order Example)

**Example (SV1000)**



SS5V1-W16CD-06B-C6 ..... 1 set (manifold part no.)  
 \* SV1100-5FU ..... 4 sets (single solenoid part no.)  
 \* SV1200-5FU ..... 2 sets (double solenoid part no.)

- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7

### How to Order Solenoid Valves



Note) Available with manifold block for station additions. Refer to pages 1.1-85 and 1.1-89.

**Series**

1	SV1000
2	SV2000
3	SV3000
4	SV4000

**Type of actuation**

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

\* 4 position dual 3 port valves are applicable to series SV1000 and SV2000 only.

**Pilot specification**

Nil	Internal pilot
R	External pilot

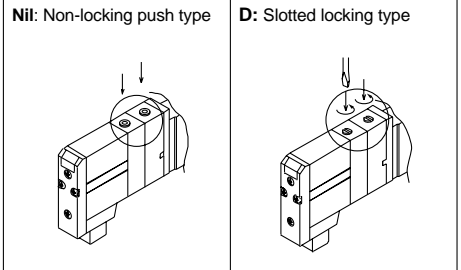
\* External pilot specification is not available for 4 position dual 3 port valves.

**Back pressure check valve**

Nil	None
K	Built-in

\* Built-in back pressure check valve type is applicable to series SV1000 only.  
 \* Back pressure check valve is not available for 3 position closed center and 3 position pressure center.  
 \* Flow rate with the built-in back pressure check valve is reduced approximately 20%.

**Manual override**



**Light/Surge voltage suppressor**

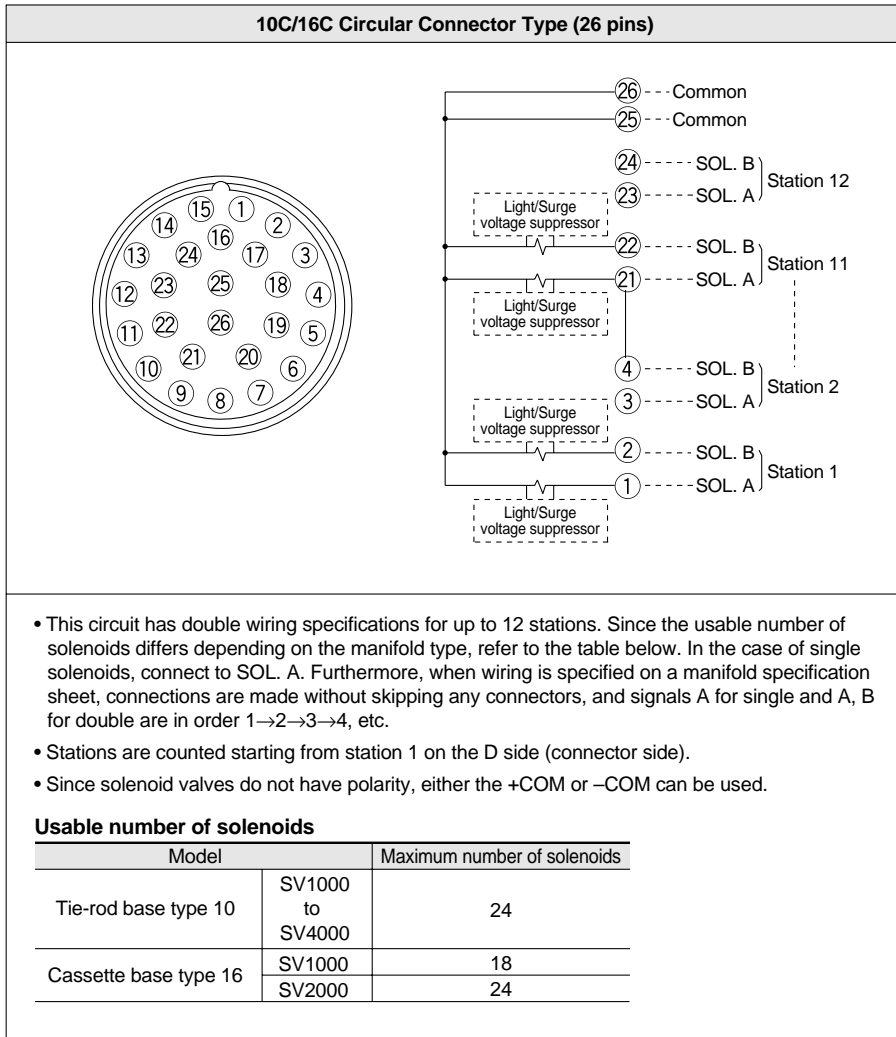
U	With light and surge voltage suppressor
R	With surge voltage suppressor

**Rated voltage**

5	24VDC
6	12VDC

- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

## Manifold Electrical Wiring

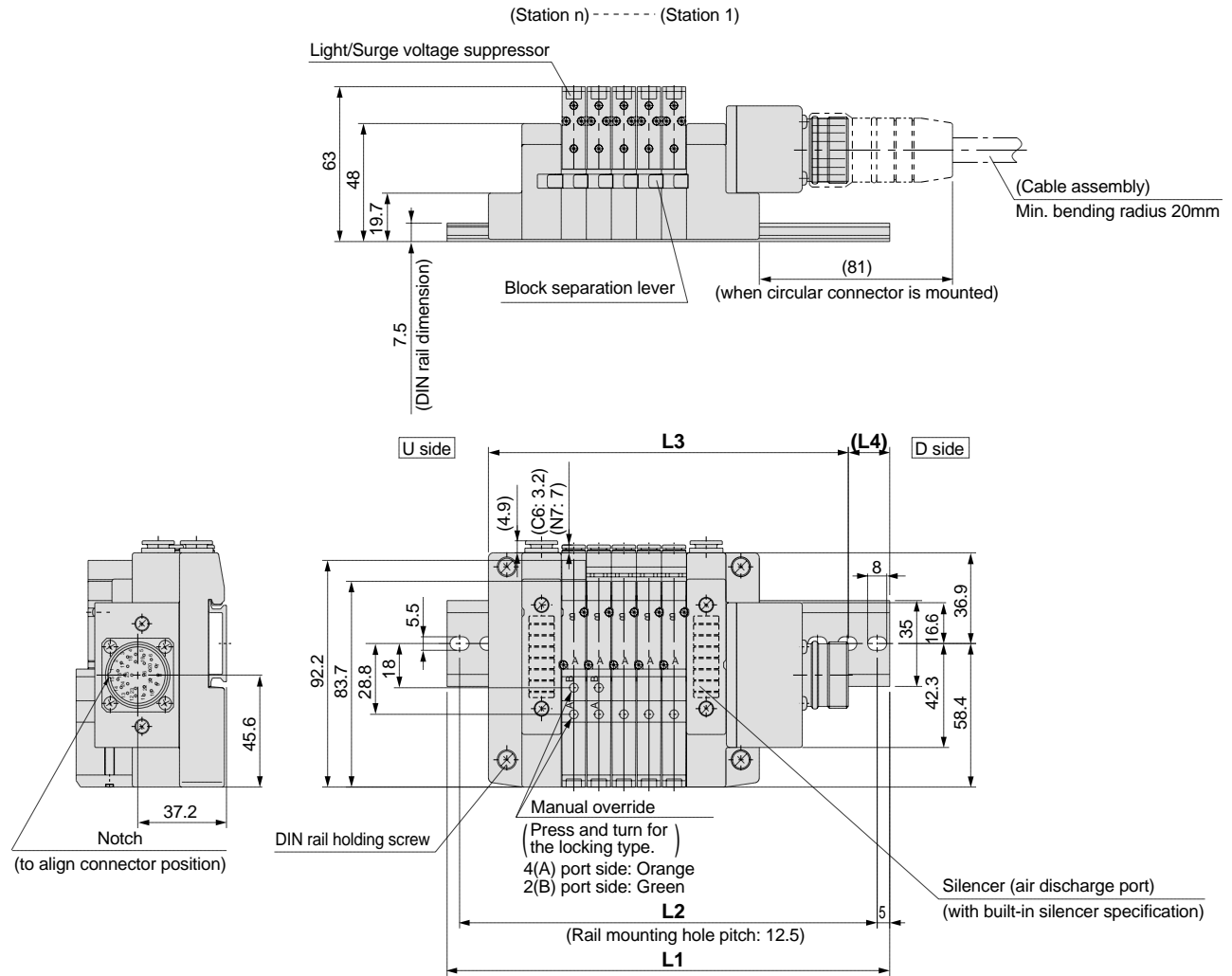


- This circuit has double wiring specifications for up to 12 stations. Since the usable number of solenoids differs depending on the manifold type, refer to the table below. In the case of single solenoids, connect to SOL. A. Furthermore, when wiring is specified on a manifold specification sheet, connections are made without skipping any connectors, and signals A for single and A, B for double are in order 1→2→3→4, etc.
- Stations are counted starting from station 1 on the D side (connector side).
- Since solenoid valves do not have polarity, either the +COM or -COM can be used.

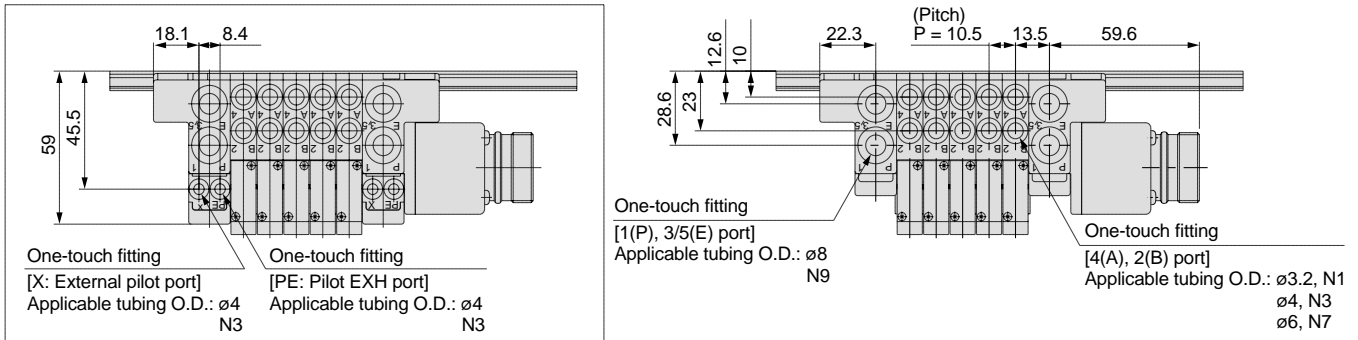
**Dimensions: Series SV1000 for Circular Connector**

• Cassette base manifold: **SS5V1-W16CD** - Stations  $\begin{matrix} U \\ D \\ B \end{matrix}$  (**S, R, RS**) -  $\begin{matrix} C3, N1 \\ C4, N3 \\ C6, N7 \end{matrix}$

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



**With external pilot specification**



**L dimensions**

L	n: Stations																
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
L1	148	160.5	173	185.5	185.5	198	210.5	223	235.5	248	248	260.5	273	285.5	298	310.5	310.5
L2	137.5	150	162.5	175	175	187.5	200	212.5	225	237.5	237.5	250	262.5	275	287.5	300	300
L3	119.3	129.8	140.3	150.8	161.3	171.8	182.3	192.8	203.3	213.8	224.3	234.8	245.3	255.8	266.3	276.8	287.3
L4	14.5	15.5	16.5	17.5	12	13	14	15	16	17	12	13	14	15	16	17	11.5

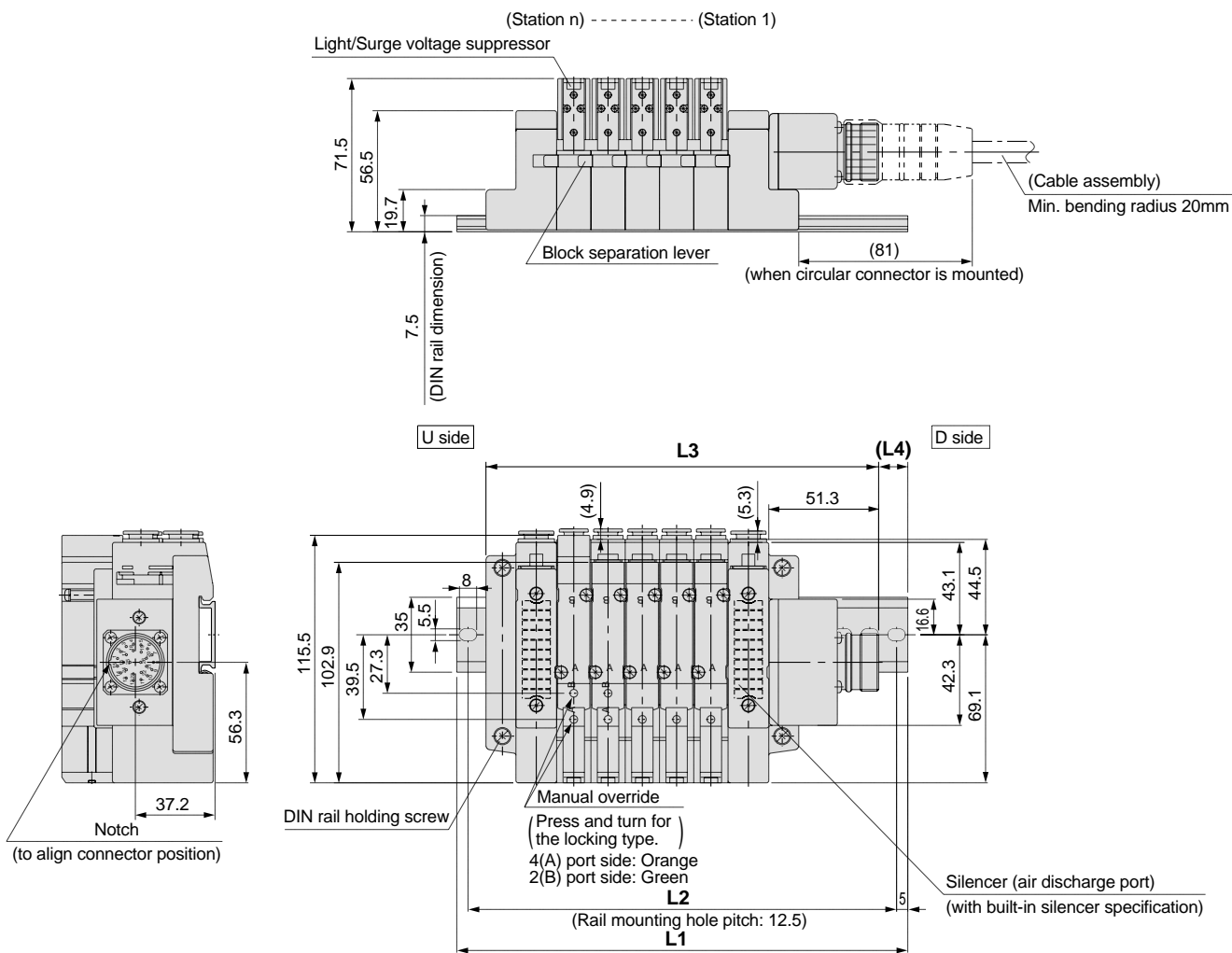
- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7
- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

# Series SV

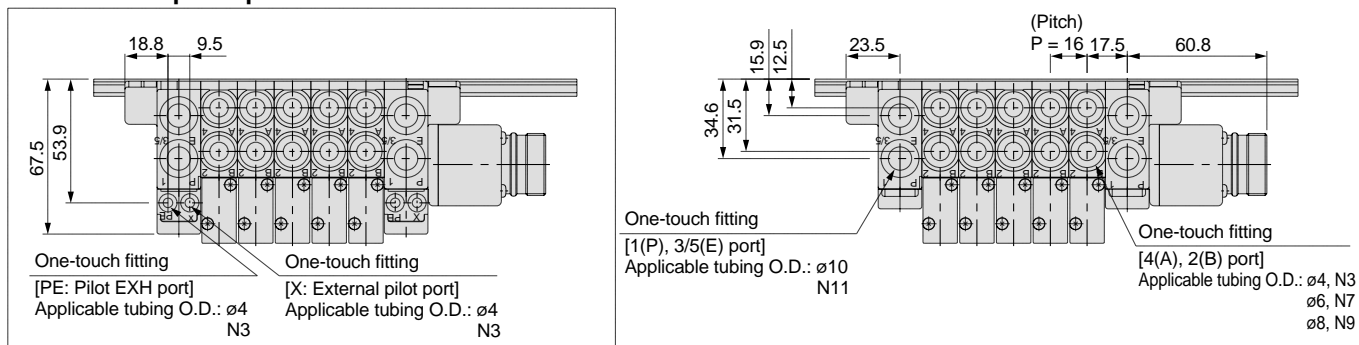
## Dimensions: Series SV2000 for Circular Connector

• Cassette base manifold: **SS5V2-W16CD-** Stations  $\begin{matrix} \text{U} \\ \text{D} \\ \text{B} \end{matrix}$  (S, R, RS) -  $\begin{matrix} \text{C4, N3} \\ \text{C6, N7} \\ \text{C8, N9} \end{matrix}$

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



### With external pilot specification



### L dimensions

L \ n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	160.5	185.5	198	210.5	223	248	260.5	273	298	310.5	323	335.5	360.5	373	385.5	410.5	423	435.5	448
L2	150	175	187.5	200	212.5	237.5	250	262.5	287.5	300	312.5	325	350	362.5	375	400	412.5	425	437.5
L3	135.3	151.3	167.3	183.3	199.3	215.3	231.3	247.3	263.3	279.3	295.3	311.3	327.3	343.3	359.3	375.3	391.3	407.3	423.3
L4	12.5	17	15.5	13.5	12	16.5	14.5	13	17.5	15.5	14	12	16.5	15	13	17.5	16	14	12.5

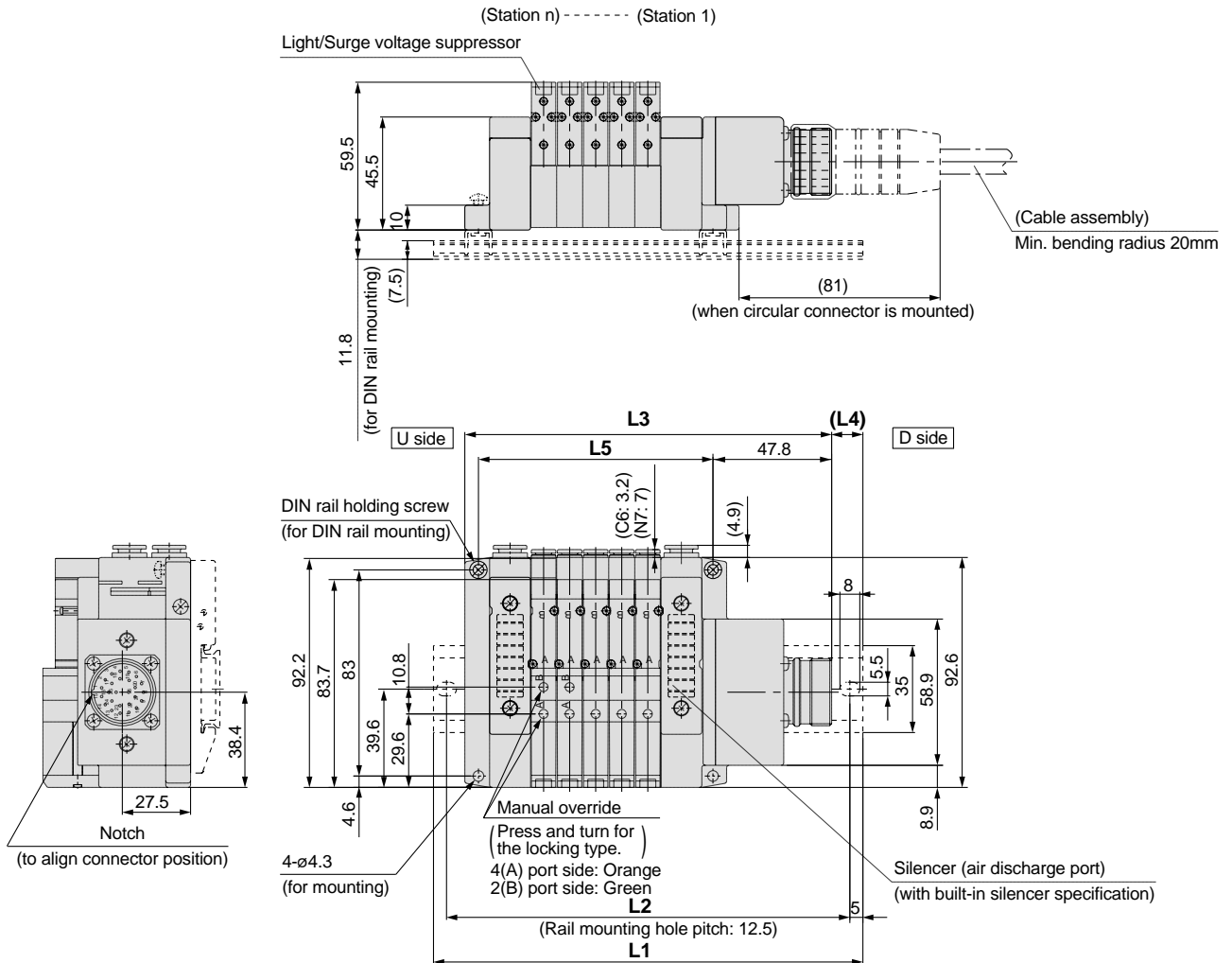
n: Stations



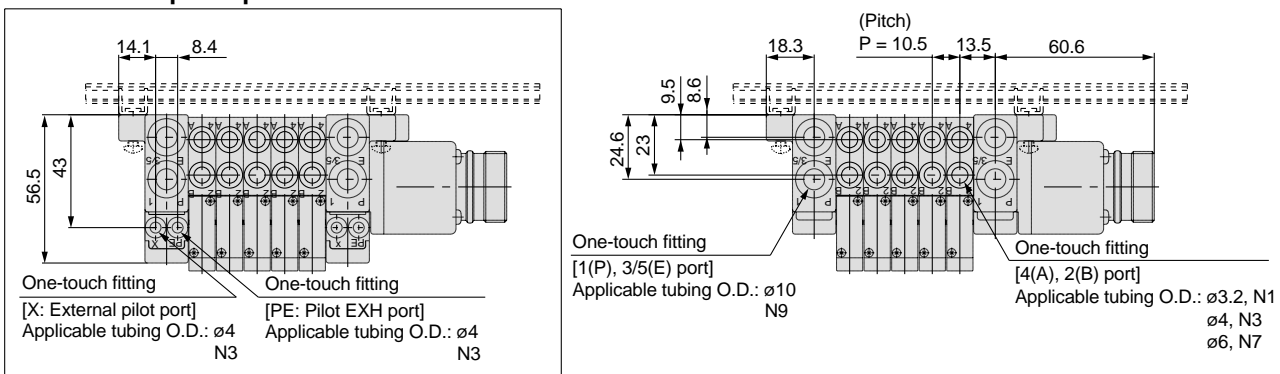
**Dimensions: Series SV1000 for Circular Connector**

• Tie-rod base manifold: **SS5V1-W10CD** - Stations  $\frac{U}{D}$  **(S, R, RS)** -  $\frac{C3, N1}{C4, N3}$  **(-D)**

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



**With external pilot specification**



**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	148	160.5	160.5	173	185.5	198	210.5	223	235.5	235.5	248	260.5	273	285.5	298	298	310.5	323	335.5
L2	137.5	150	150	162.5	175	187.5	200	212.5	225	225	237.5	250	262.5	275	287.5	287.5	300	312.5	325
L3	116.3	126.8	137.3	147.8	158.3	168.8	179.3	189.8	200.3	210.8	221.3	231.8	242.3	252.8	263.3	273.8	284.3	294.8	305.3
L4	16	17	11.5	12.5	13.5	14.5	15.5	16.5	17.5	12.5	13.5	14.5	15.5	16.5	17.5	12	13	14	15
L5	63	73.5	84	94.5	105	115.5	126	136.5	147	157.5	168	178.5	189	199.5	210	220.5	231	241.5	252

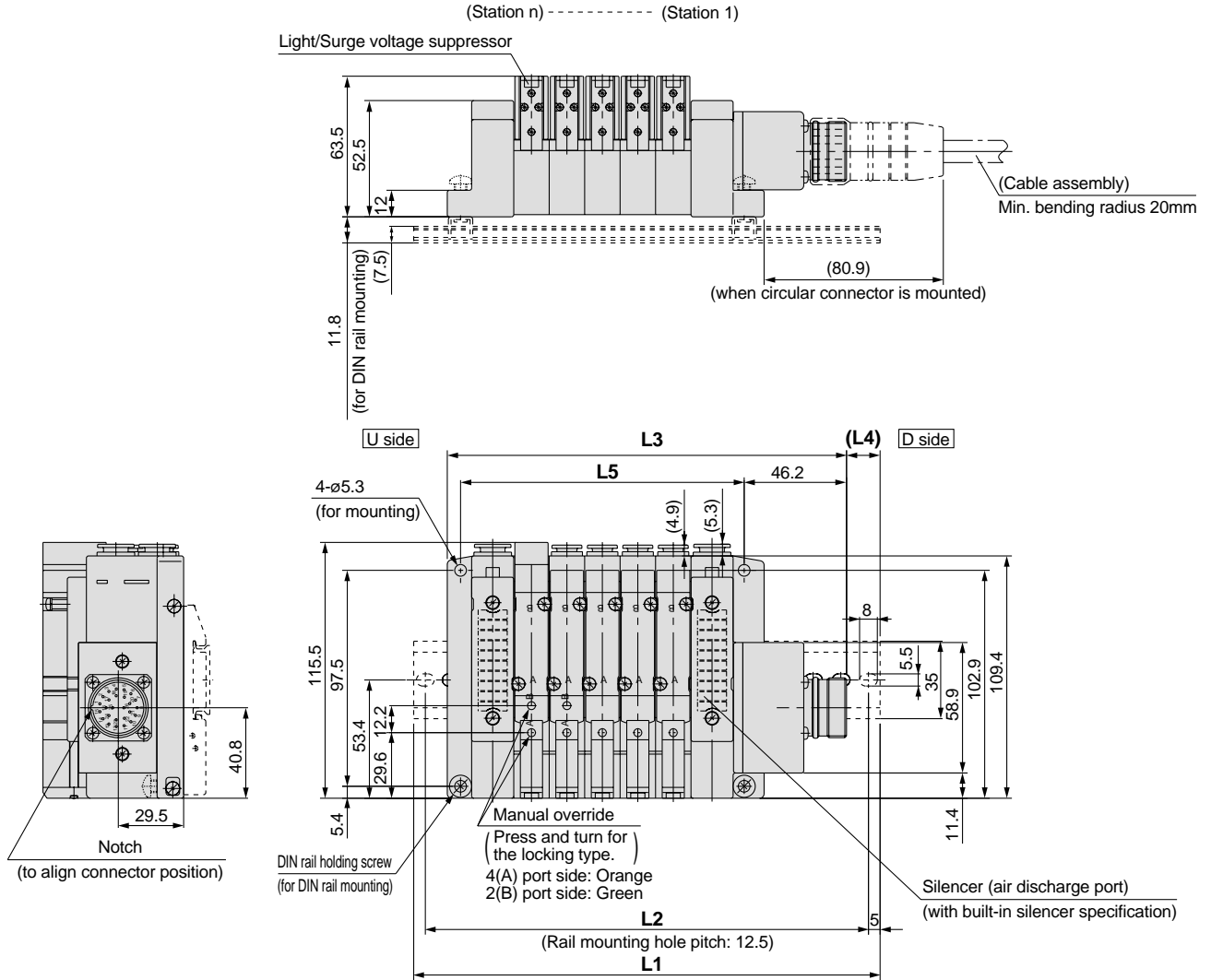
- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7
- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

# Series SV

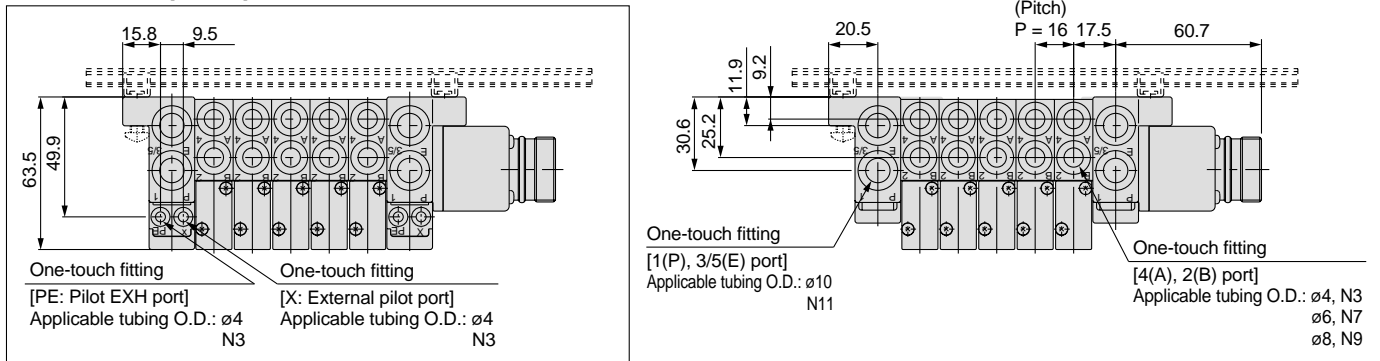
## Dimensions: Series SV2000 for Circular Connector

• Tie-rod base manifold: **SS5V2-W10CD** - Stations  $\begin{matrix} U \\ D \end{matrix}$  (**S, R, RS**) -  $\begin{matrix} C4, N3 \\ C6, N7 \\ C8, N9 \end{matrix}$  (**-D**)

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



### With external pilot specification



### L dimensions

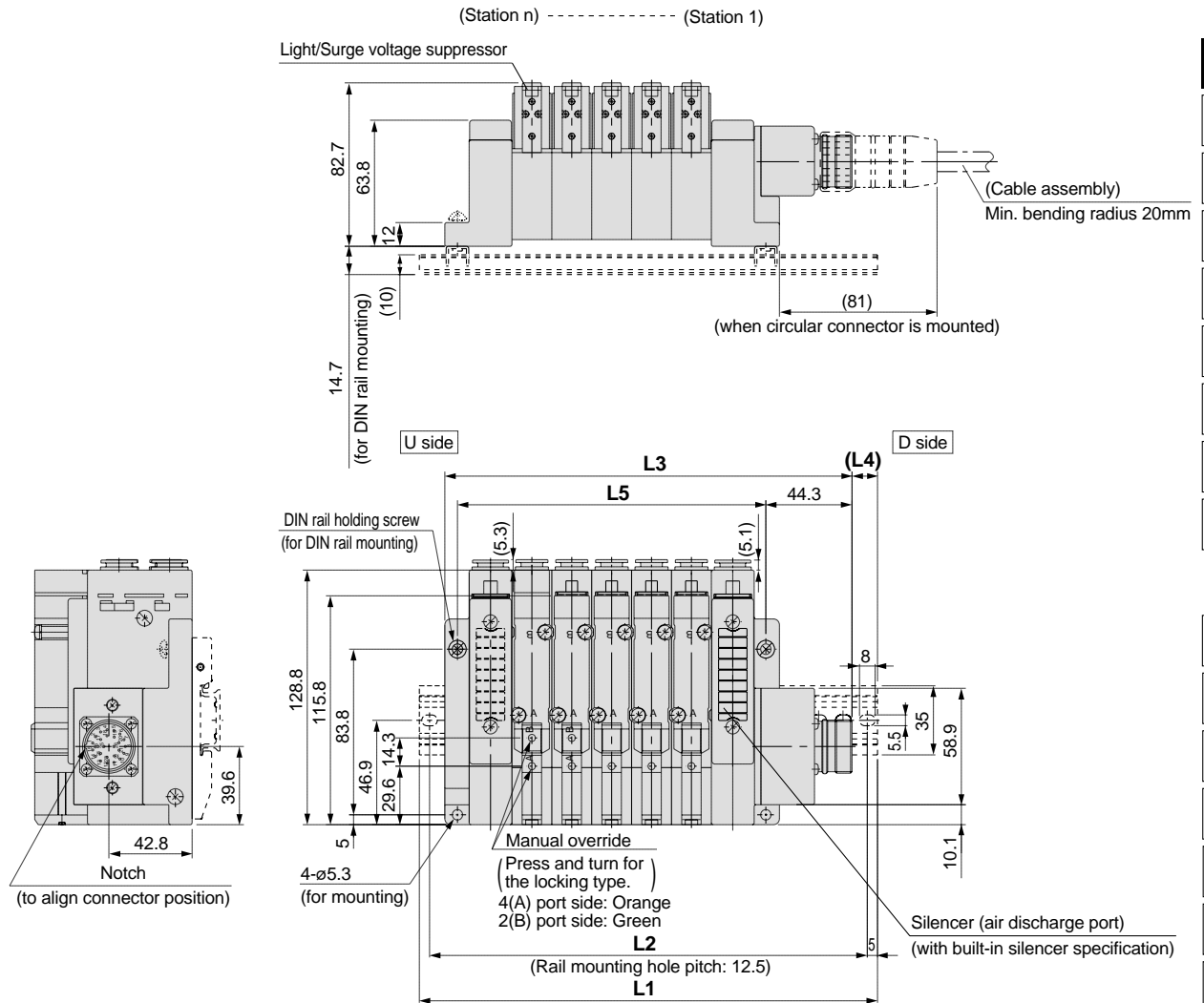
$\frac{L}{n}$	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	160.5	173	198	210.5	223	235.5	260.5	273	285.5	310.5	323	335.5	348	373	385.5	398	423	435.5	448
L2	150	162.5	187.5	200	212.5	225	250	262.5	275	300	312.5	325	337.5	362.5	375	387.5	412.5	425	437.5
L3	132.2	148.2	164.2	180.2	196.2	212.2	228.2	244.2	260.2	276.2	292.2	308.2	324.2	340.2	356.2	372.2	388.2	404.2	420.2
L4	14	12.5	17	15	13.5	11.5	16	14.5	12.5	17	15.5	13.5	12	16.5	14.5	13	17.5	15.5	14
L5	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304	320	336	352	368

n: Stations

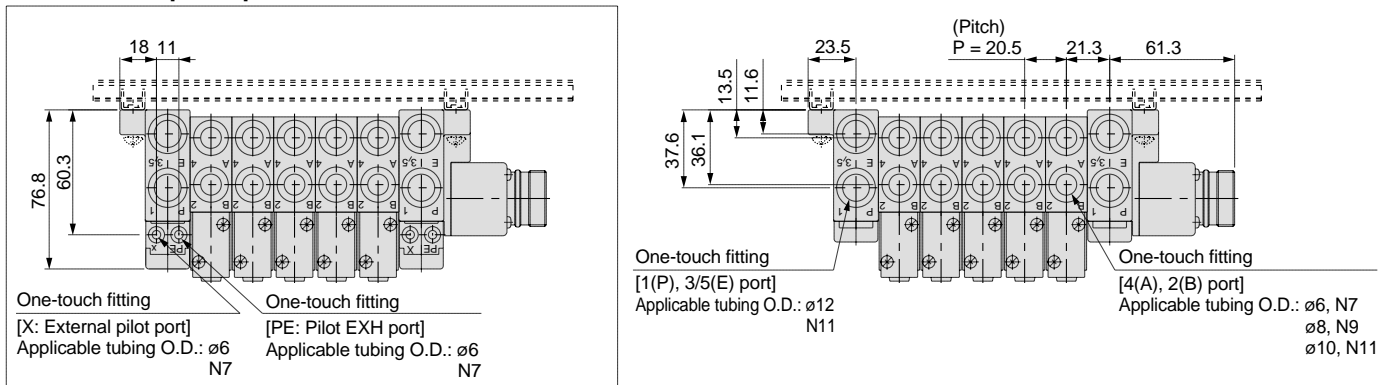
**Dimensions: Series SV3000 for Circular Connector**

• Tie-rod base manifold: **SS5V3-W10CD** - Stations  $\begin{matrix} U \\ D \\ B \end{matrix}$  (**S, R, RS**) -  $\begin{matrix} C6, N7 \\ C8, N9 \\ C10, N11 \end{matrix}$  (**-D**)

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



**With external pilot specification**



**L dimensions**

L \ n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	173	198	223	235.5	260.5	285.5	298	323	335.5	360.5	385.5	398	423	448	460.5	485.5	510.5	523	548
L2	162.5	187.5	212.5	225	250	275	287.5	312.5	325	350	375	387.5	412.5	437.5	450	475	500	512.5	537.5
L3	147.8	168.3	188.8	209.3	229.8	250.3	270.8	291.3	311.8	332.3	352.8	373.3	393.8	414.3	434.8	455.3	475.8	496.3	516.8
L4	12.5	15	17	13	15.5	17.5	13.5	16	12	14	16.5	12.5	14.5	17	13	15	17.5	13.5	15.5
L5	97	117.5	138	158.5	179	199.5	220	240.5	261	281.5	302	322.5	343	363.5	384	404.5	425	445.5	466

n : Stations

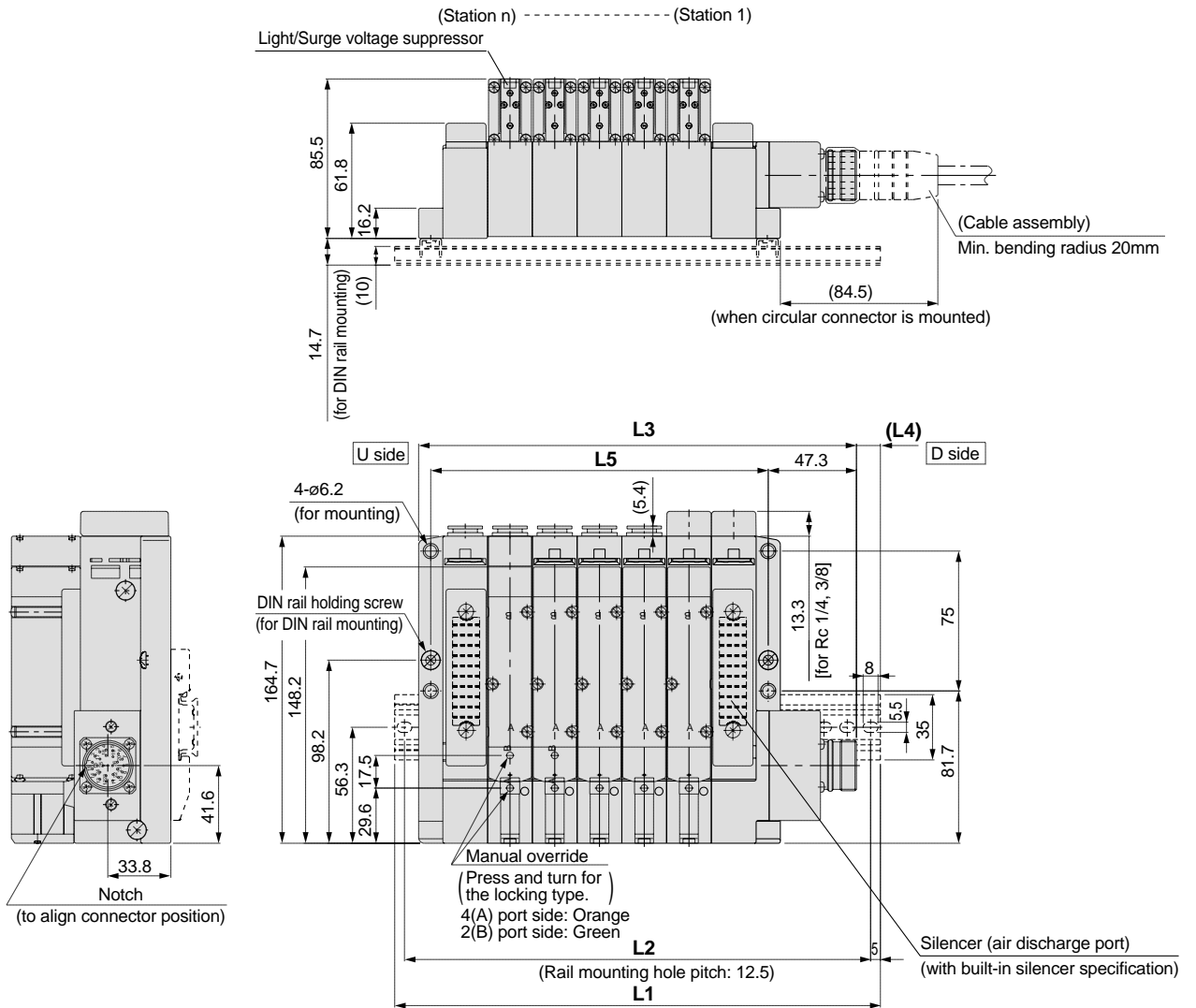
- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7
- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

# Series SV

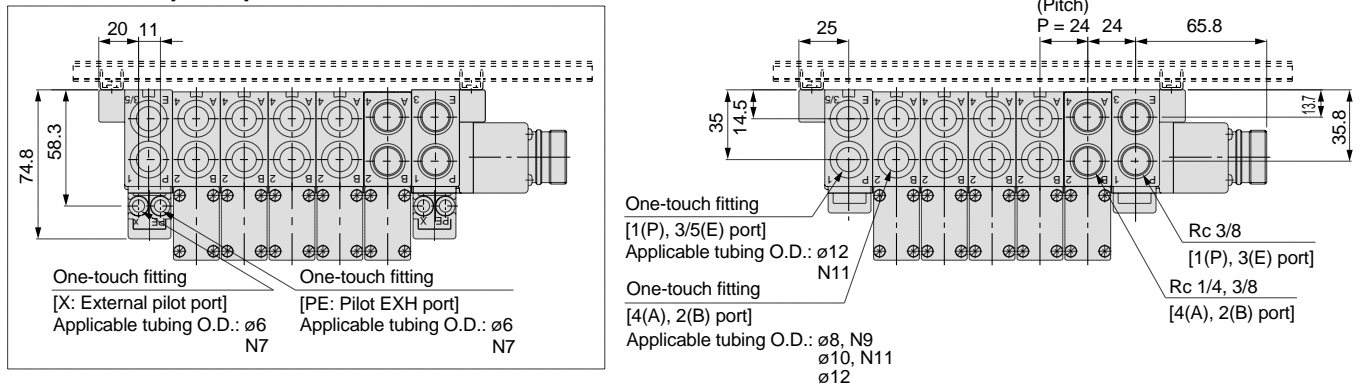
## Dimensions: Series SV4000 for Circular Connector

• Tie-rod base manifold: **SS5V4-W10CD** - Stations  $\begin{matrix} U \\ D \end{matrix}$  **(S, R, RS)** -  $\begin{matrix} 02, C8, N9, \\ 03, C10, N11, \\ C12, \end{matrix}$  **(-D)**

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



### With external pilot specification



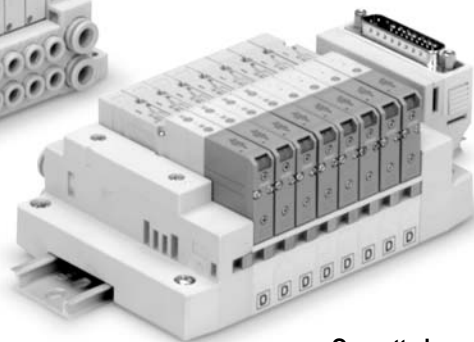
### L dimensions

L	n: Stations																			
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
L1	198	210.5	235.5	260.5	285.5	310.5	335.5	360.5	385.5	410.5	435.5	460.5	485.5	498	523	548	573	598	623	
L2	187.5	200	225	250	275	300	325	350	375	400	425	450	475	487.5	512.5	537.5	562.5	587.5	612.5	
L3	162.8	186.8	210.8	234.8	258.8	282.8	306.8	330.8	354.8	378.8	402.8	426.8	450.8	474.8	498.8	522.8	546.8	570.8	594.8	
L4	17.5	12	12.5	13	13.5	14	14.5	15	15.5	16	16.5	17	17.5	11.5	12	12.5	13	13.5	14	
L5	109	133	157	181	205	229	253	277	301	325	349	373	397	421	445	469	493	517	541	

# D-sub Connector



Tie-rod base



Cassette base

Applicable series	Cassette base manifold SV1000/SV2000
	Tie-rod base manifold SV1000/SV2000/SV3000/SV4000
	<ul style="list-style-type: none"> <li>• Number of connectors: 25 pins</li> <li>• MIL-C-24308</li> <li>• Conforms to JIS-X-5101</li> </ul>

**SV**

**SY**

**SYJ**

**SX**

**VK**

**VZ**

**VF**

**VFR**

**VP7**

**VQC**

**SQ**

**VQ**

**VQ4**

**VQ5**

**VQZ**

**VQD**

**VFS**

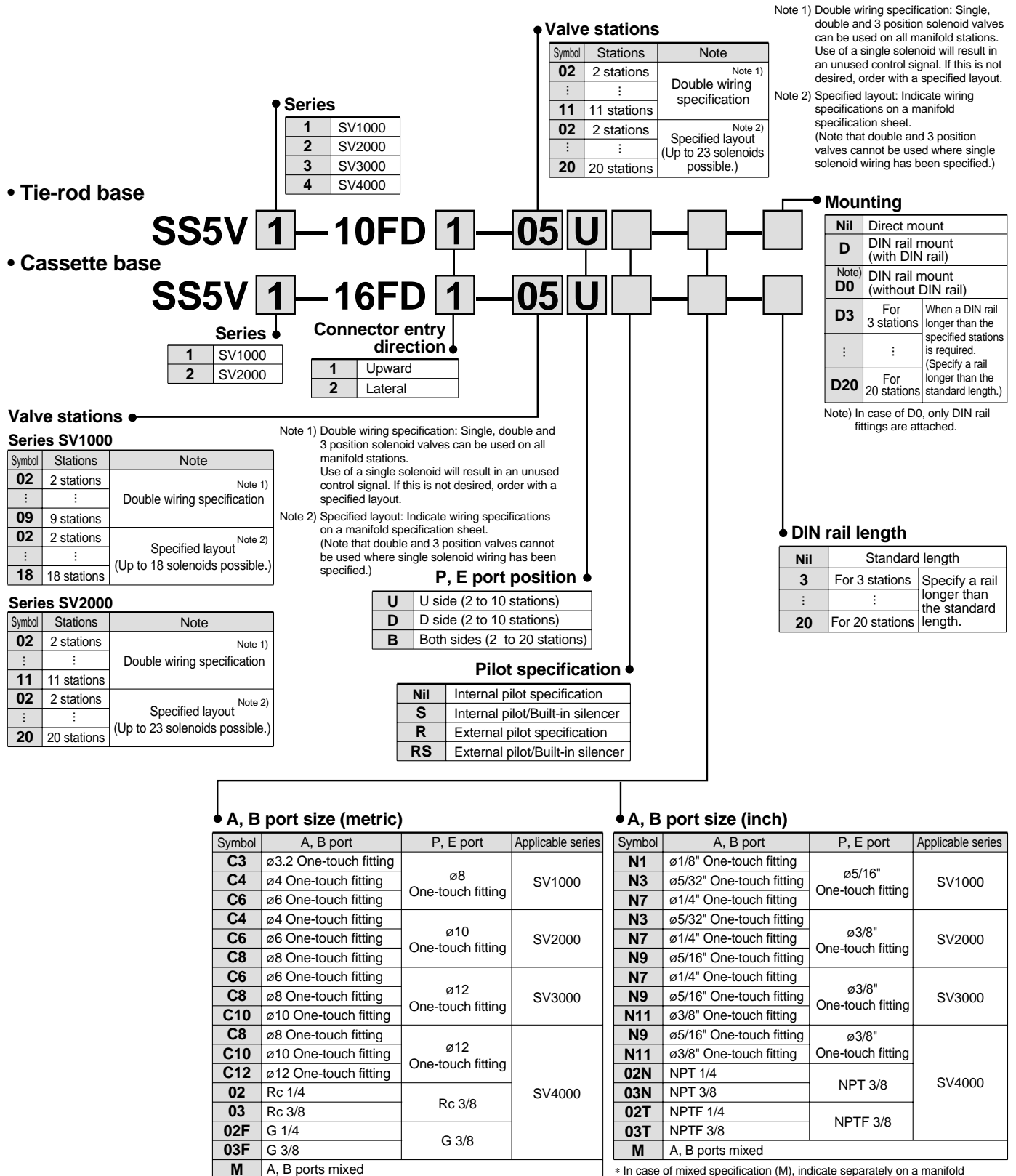
**VS**

**VS7**

**VQ7**

# D-sub Connector Series SV

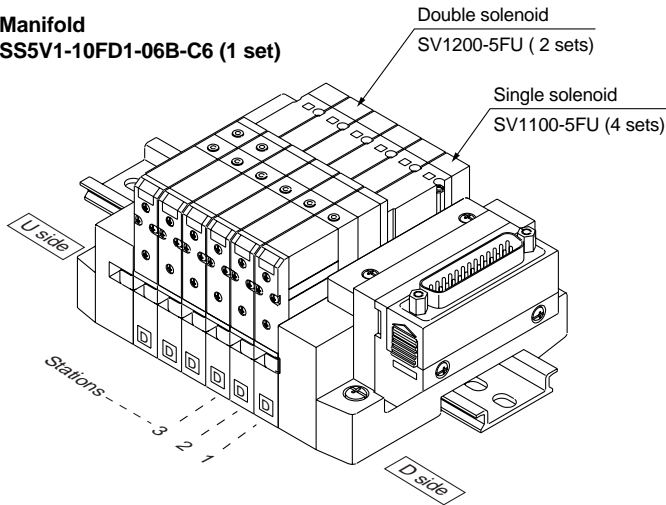
## How to Order



## How to Order Manifold Assemblies (Order Example)

### Example (SV1000)

Manifold  
SS5V1-10FD1-06B-C6 (1 set)



SS5V1-10FD1-06B-C6 ..... 1 set ( manifold part no.)  
 \* SV1100-5FU ..... 4 sets (single solenoid part no.)  
 \* SV1200-5FU ..... 2 sets (double solenoid part no.)

## How to Order Solenoid Valves

SV 1 1 0 0 — 5 F

Series

1	SV1000
2	SV2000
3	SV3000
4	SV4000

Type of actuation

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

\* 4 position dual 3 port valves are applicable to series SV1000 and SV2000 only.

Pilot specification

Nil	Internal pilot
R	External pilot

\* External pilot specification is not available for 4 position dual 3 port valves.

Rated voltage

5	24VDC
6	12VDC

Back pressure check valve

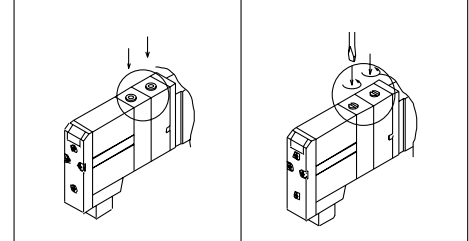
Nil	None
K	Built-in

\* Built-in back pressure check valve type is applicable to series SV1000 only.  
 \* Back pressure check valve is not available for 3 position closed center and 3 position pressure center.  
 \* Flow rate with the built-in back pressure check valve is reduced approximately 20%.

Note) Available with manifold block for station additions. Refer to pages 1.1-85 and 1.1-89

Manual override

Nil: Non-locking push type    D: Slotted locking type



Light/Surge voltage suppressor

U	With light and surge voltage suppressor
R	With surge voltage suppressor

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

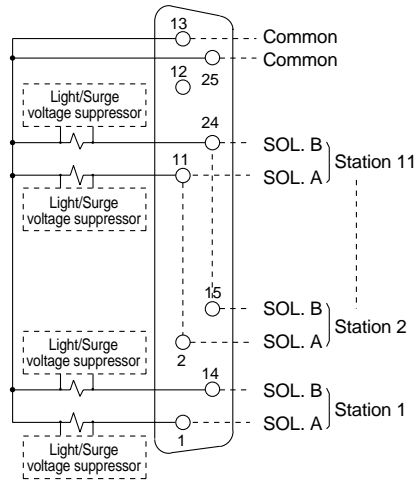
VS

VS7

VQ7

## Manifold Electrical Wiring

10F/16F D-sub Connector Type (25 pins)



- This circuit has double wiring specifications for up to 11 stations. Since the usable number of solenoids differs depending on the manifold type, refer to the table below. In the case of single solenoids, connect to SOL. A. Furthermore, when wiring is specified on a manifold specification sheet, connections are made without skipping any connectors, and signals A for single and A, B for double are in order 1→14→2→15, etc.
- Stations are counted starting from station 1 on the D side (connector side).
- Since solenoid valves do not have polarity, either the +COM or –COM can be used.

**Usable number of solenoids**

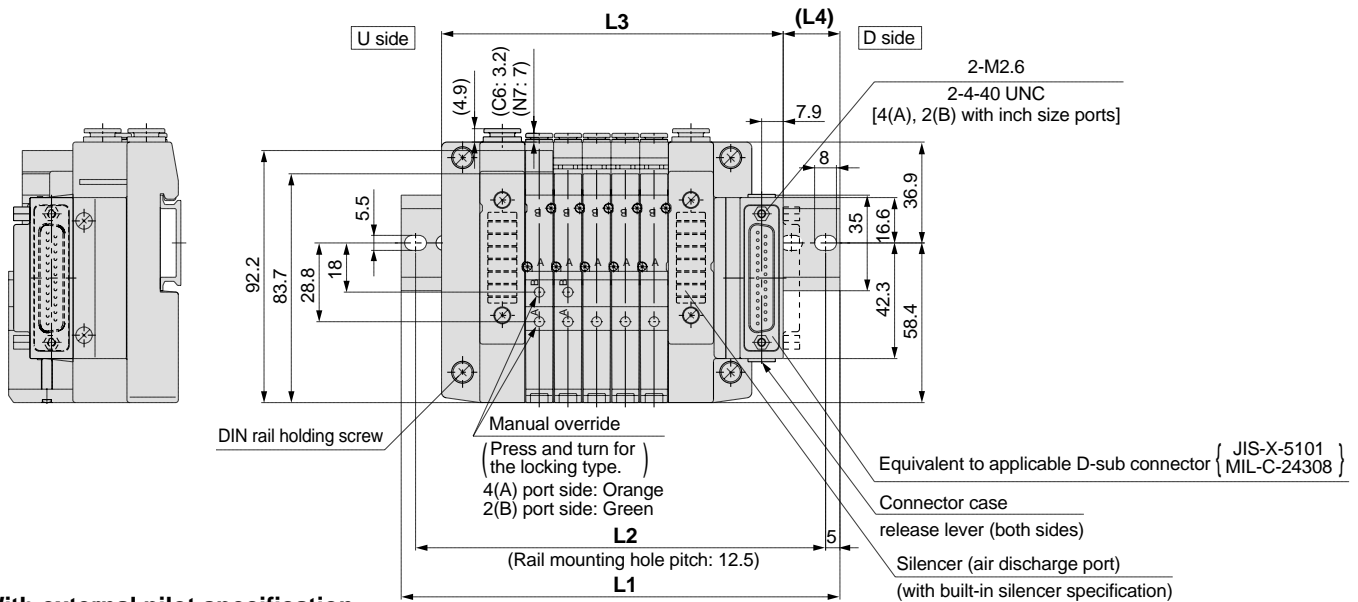
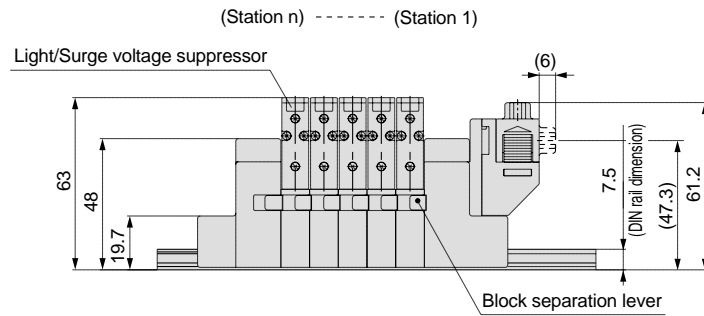
Model		Maximum number of solenoids
Tie-rod base type 10	SV1000 to SV4000	23
	SV1000	18
Cassette base type 16	SV1000	18
	SV2000	23



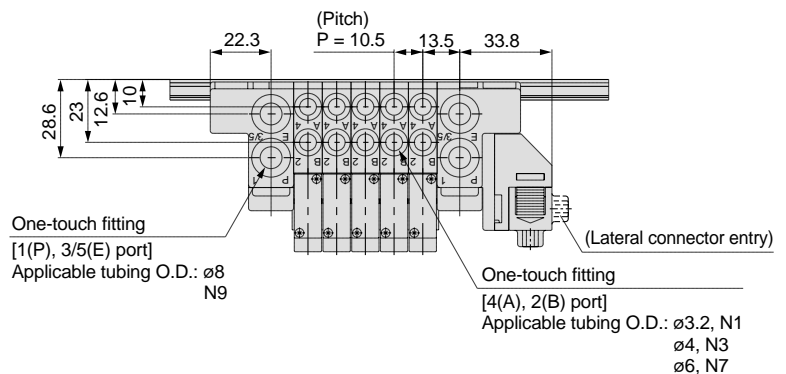
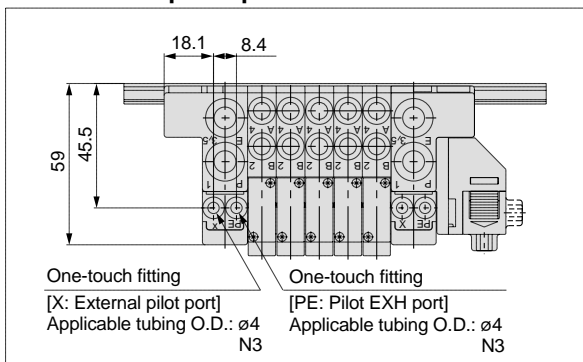
**Dimensions: Series SV1000 for D-sub Connector**

• Cassette base manifold: **SS5V1-16FD**  $\frac{1}{2}$  - Stations  $\begin{matrix} U \\ D \end{matrix}$  (**S, R, RS**) -  $\begin{matrix} C3, N1 \\ C4, N3 \\ C6, N7 \end{matrix}$

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



**With external pilot specification**



**L dimensions**

n: Stations

L n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
L1	123	135.5	148	160.5	173	185.5	198	198	210.5	223	235.5	248	260.5	260.5	273	285.5	298
L2	112.5	125	137.5	150	162.5	175	187.5	187.5	200	212.5	225	237.5	250	250	262.5	275	287.5
L3	99.5	110	120.5	131	141.5	152	162.5	173	183.5	194	204.5	215	225.5	236	246.5	257	267.5
L4	12	13	14	15	16	17	18	12.5	13.5	14.5	15.5	16.5	17.5	12.5	13.5	14.5	15.5

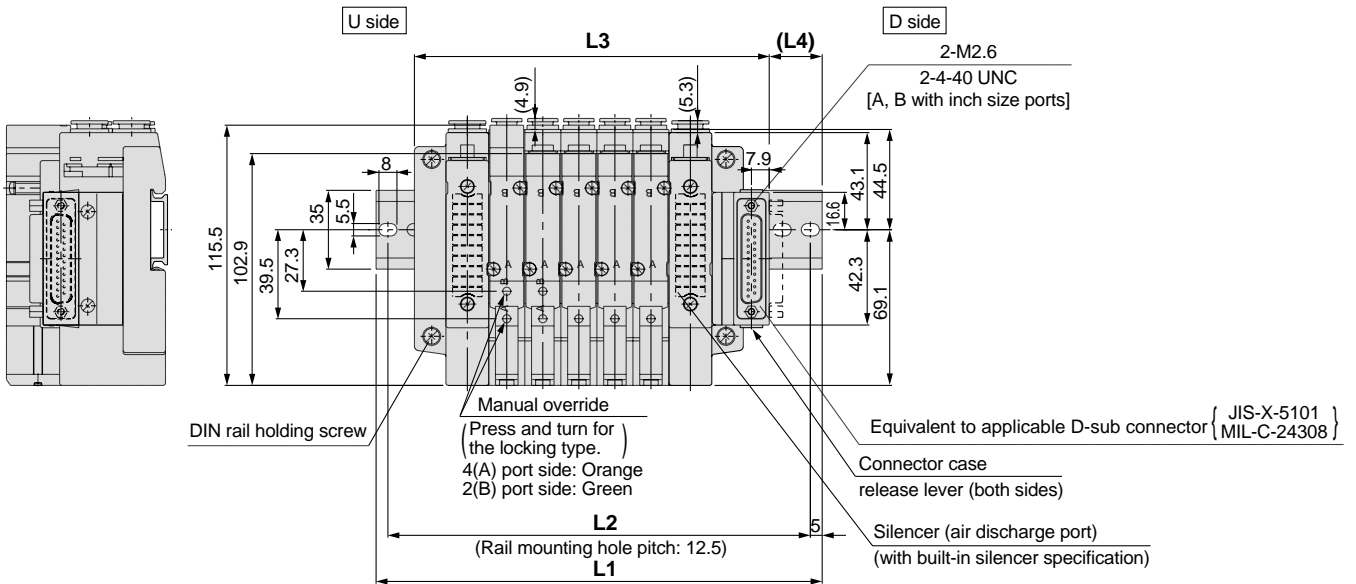
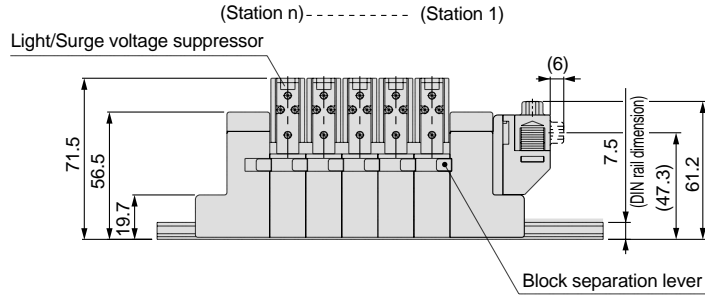
- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7
- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

# Series SV

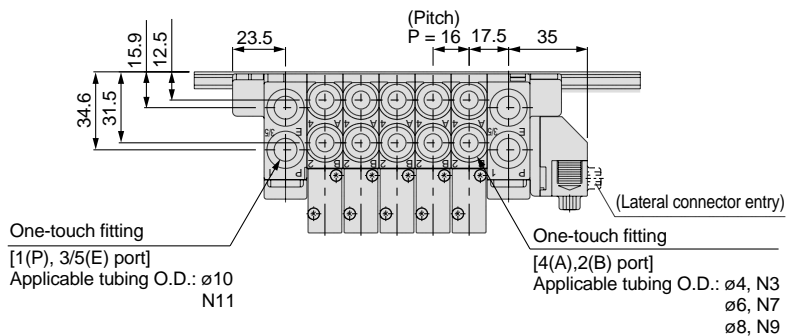
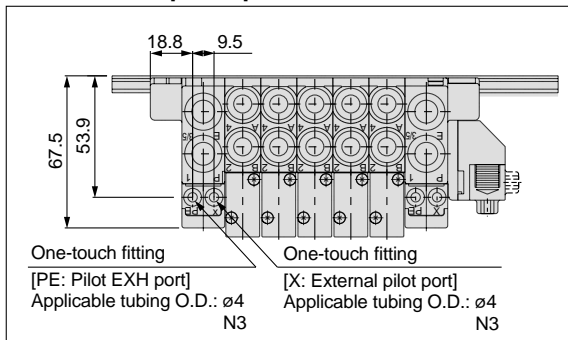
## Dimensions: Series SV2000 for D-sub Connector

• Cassette base manifold: **SS5V2-16FD**  $\frac{1}{2}$  - Stations  $\begin{matrix} U \\ D \\ B \end{matrix}$  (**S, R, RS**) -  $\begin{matrix} C4, N3 \\ C6, N7 \\ C8, N9 \end{matrix}$

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



### With external pilot specification



### L dimensions

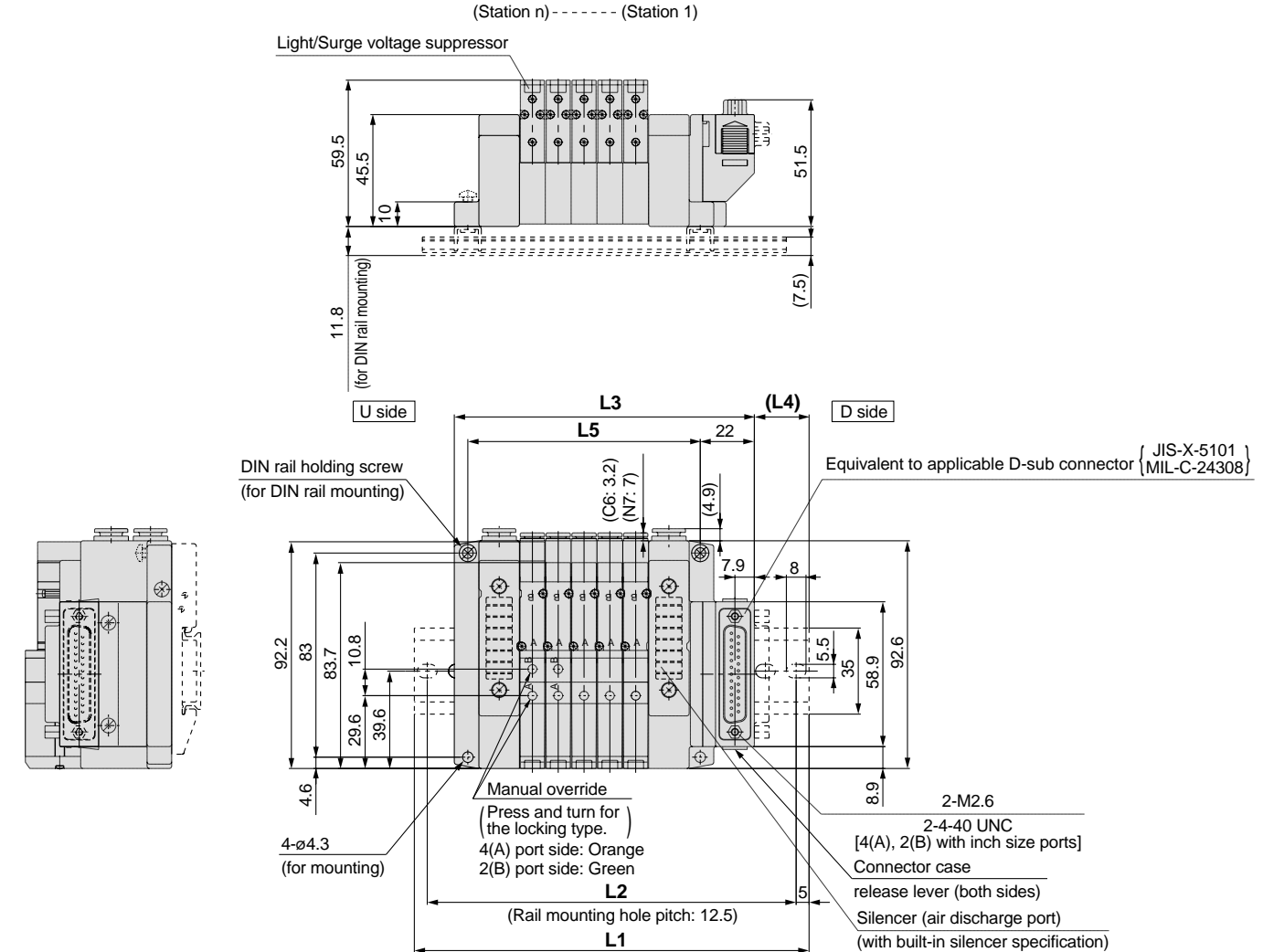
$\frac{L}{n}$	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<b>L1</b>	148	160.5	173	198	210.5	223	235.5	260.5	273	285.5	310.5	323	335.5	348	373	385.5	398	423	435.5
<b>L2</b>	137.5	150	162.5	187.5	200	212.5	225	250	262.5	275	300	312.5	325	337.5	362.5	375	387.5	412.5	425
<b>L3</b>	109.5	125.5	141.5	157.5	173.5	189.5	205.5	221.5	237.5	253.5	269.5	285.5	301.5	317.5	333.5	349.5	365.5	381.5	397.5
<b>L4</b>	22.5	20.5	19	23.5	21.5	20	18	22.5	21	19	23.5	22	20	18.5	23	21	19.5	24	22

n: Stations

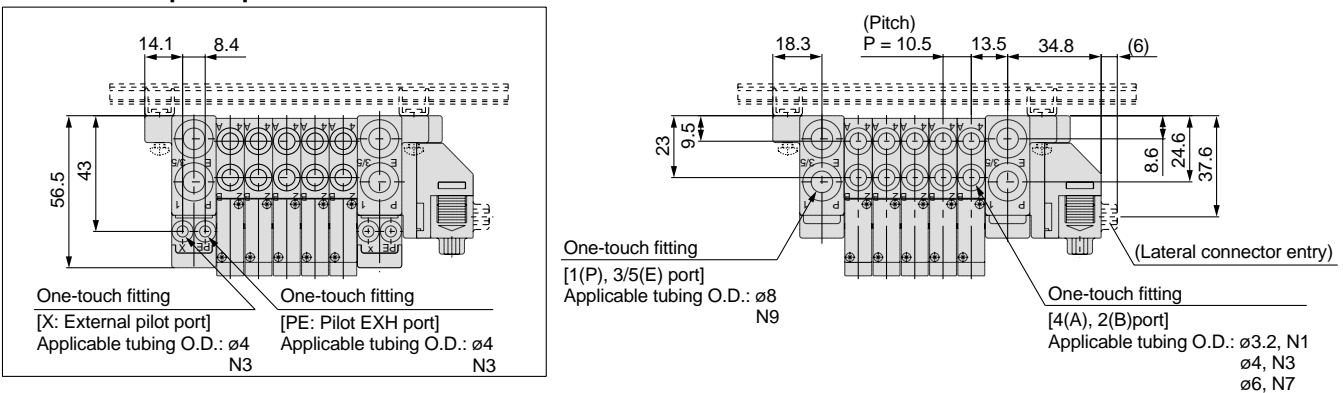
## Dimensions: Series SV1000 for D-sub Connector

• Tie-rod base manifold: **SS5V1-10FD**  $\frac{1}{2}$  - Stations  $\begin{matrix} U \\ D \\ B \end{matrix}$  (S, R, RS) -  $\begin{matrix} C3, N1 \\ C4, N3 \\ C6, N7 \end{matrix}$  (-D)

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



### With external pilot specification



### L dimensions

L \ n	n: Stations																			
	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	90.5	101	111.5	122	132.5	143	153.5	164	174.5	185	195.5	206	216.5	227	237.5	248	258.5	269	279.5	
L4	19.5	20.5	21.5	22.5	23.5	18	19	20	21	22	23	18	19	20	21	22	23	24	18.5	
L5	63	73.5	84	94.5	105	115.5	126	136.5	147	157.5	168	178.9	189	199.5	210	220.5	231	241.5	252	

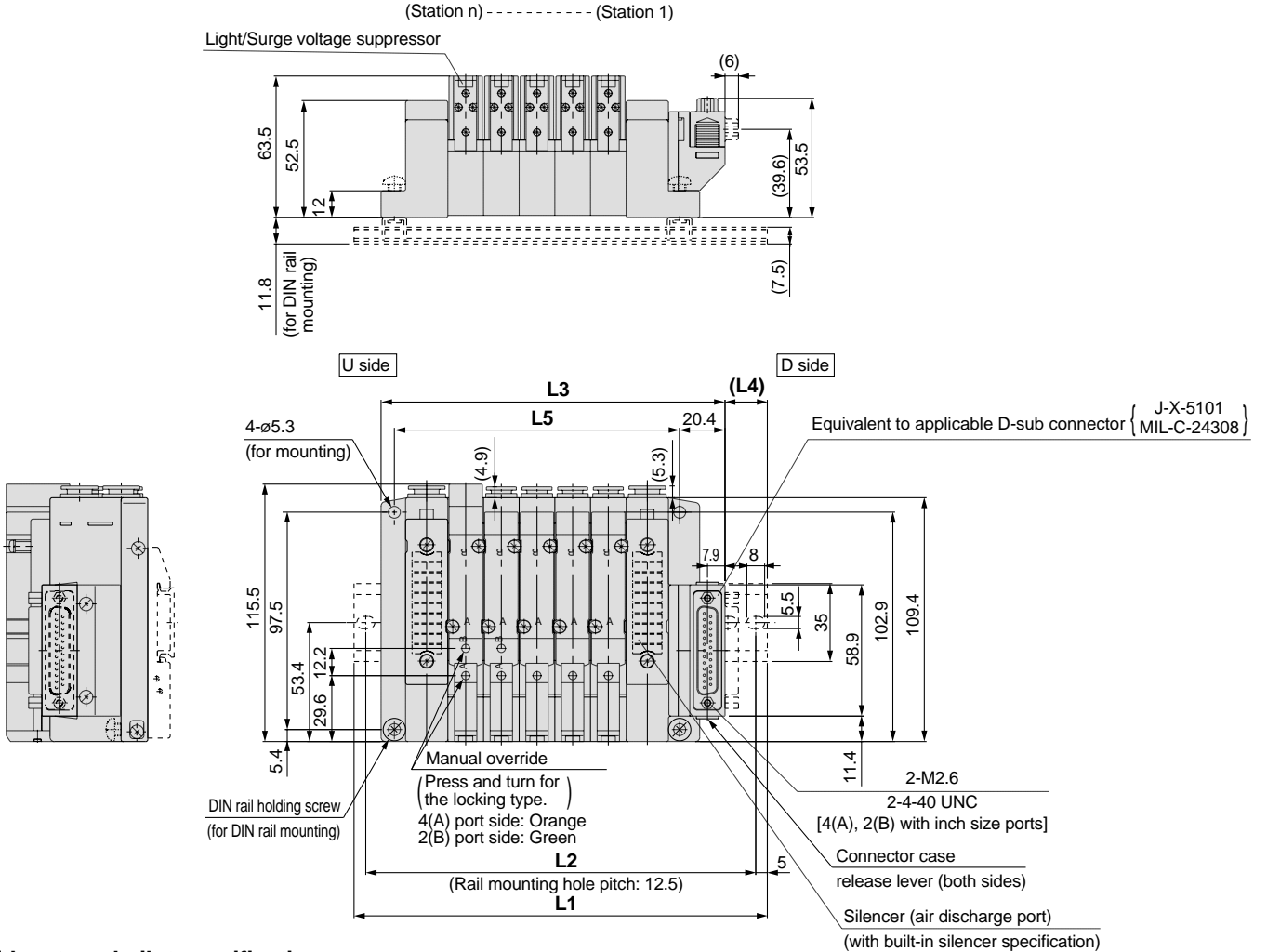
- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7
- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

# Series SV

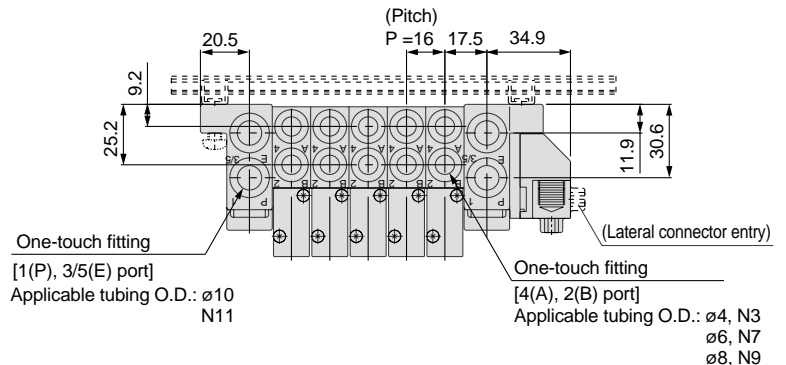
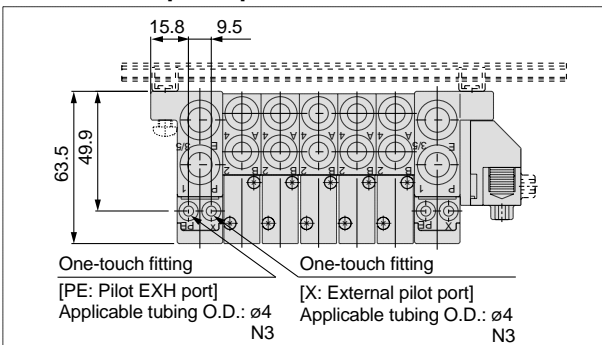
## Dimensions: Series SV2000 for D-sub Connector

• Tie-rod base manifold: **SS5V2-10FD**  $\frac{1}{2}$  - Stations  $\frac{U}{D}$  (S, R, RS) -  $\frac{C4, N3}{C6, N7}$   $\frac{C8, N9}{(-D)}$

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



### With external pilot specification



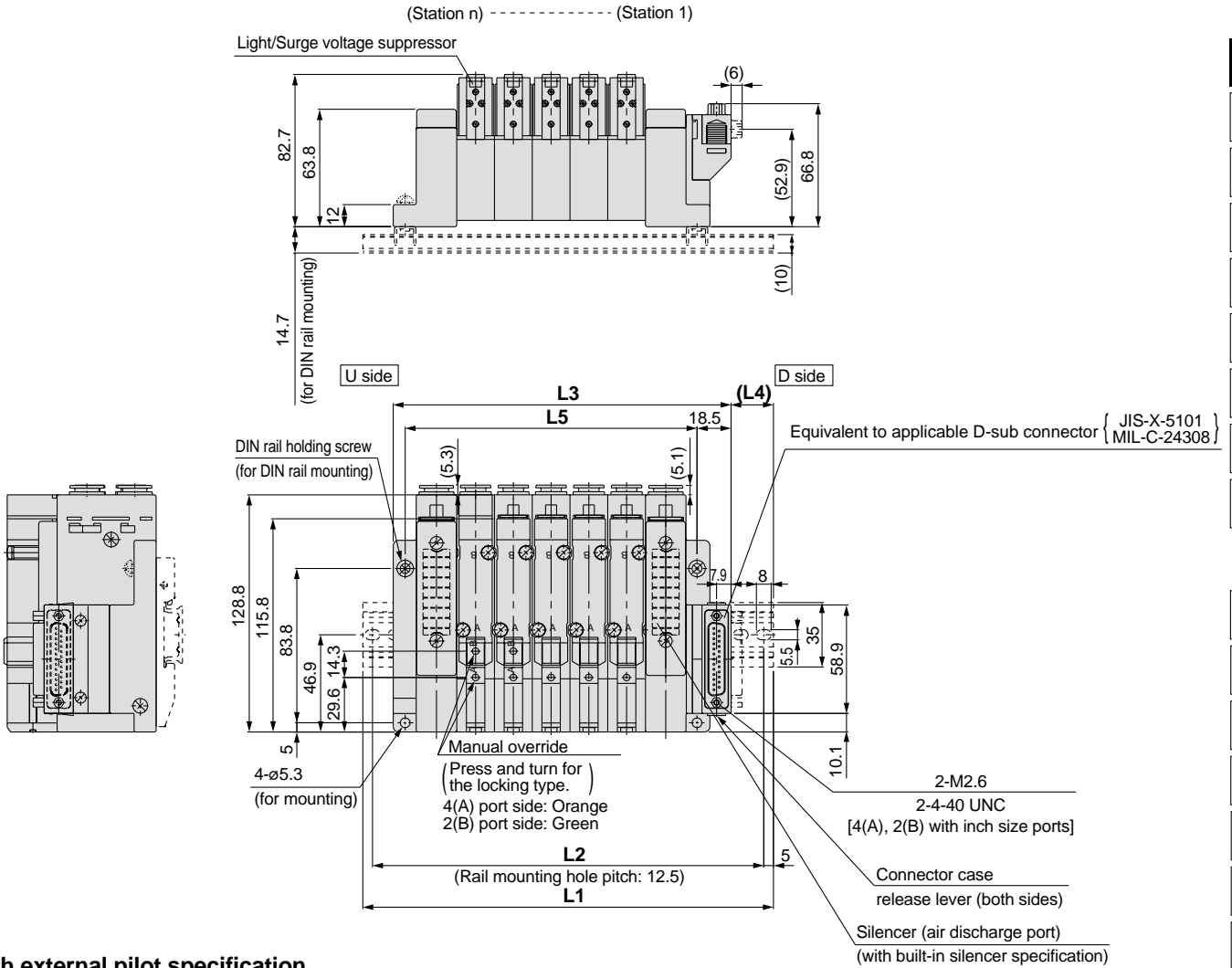
### L dimensions

$\frac{L}{n}$	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	135.5	160.5	173	185.5	210.5	223	235.5	248	273	285.5	298	323	335.5	348	360.5	385.5	398	410.5	435.5
L2	125	150	162.5	175	200	212.5	225	237.5	262.5	275	287.5	312.5	325	337.5	350	375	387.5	400	425
L3	106.4	122.4	138.4	154.4	170.4	186.4	202.4	218.4	234.4	250.4	266.4	282.4	298.4	314.4	330.4	346.4	362.4	378.4	394.4
L4	18	22	20.5	19	23	21.5	20	18	22.5	21	19	23.5	22	20	18	22.5	21	19	23.5
L5	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304	320	336	352	368

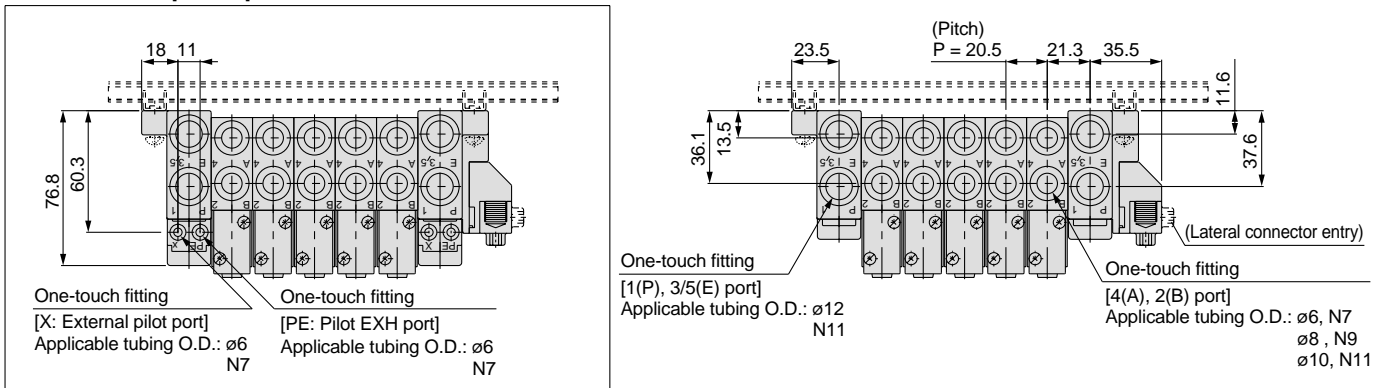
**Dimensions/Series SV3000 for D-sub Connector**

• Tie-rod base manifold: **SS5V3-10FD<sub>2</sub>** - Stations  $\frac{U}{D}$   $\frac{B}{B}$  (**S, R, RS**) -  $\frac{C6, N7}{C8, N9}$   $\frac{C10, N11}{C10, N11}$  (**-D**)

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



**With external pilot specification**



**L dimensions**

L	n: Stations																			
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
L1	160.5	173	198	223	235.5	260.5	285.5	298	323	348	360.5	385.5	398	423	448	460.5	485.5	510.5	523	
L2	150	162.5	187.5	212.5	225	250	275	287.5	312.5	337.5	350	375	387.5	412.5	437.5	450	475	500	512.5	
L3	122	142.5	163	183.5	204	224.5	245	265.5	286	306.5	327	347.5	368	388.5	409	429.5	450	470.5	491	
L4	22.5	18.5	20.5	23	19	21	23.5	19.5	21.5	24	20	22	18	20.5	22.5	18.5	21	23	19	
L5	97	117.5	138	158.5	179	199.5	220	240.5	261	281.5	302	322.5	343	363.5	384	404.5	425	445.5	466	

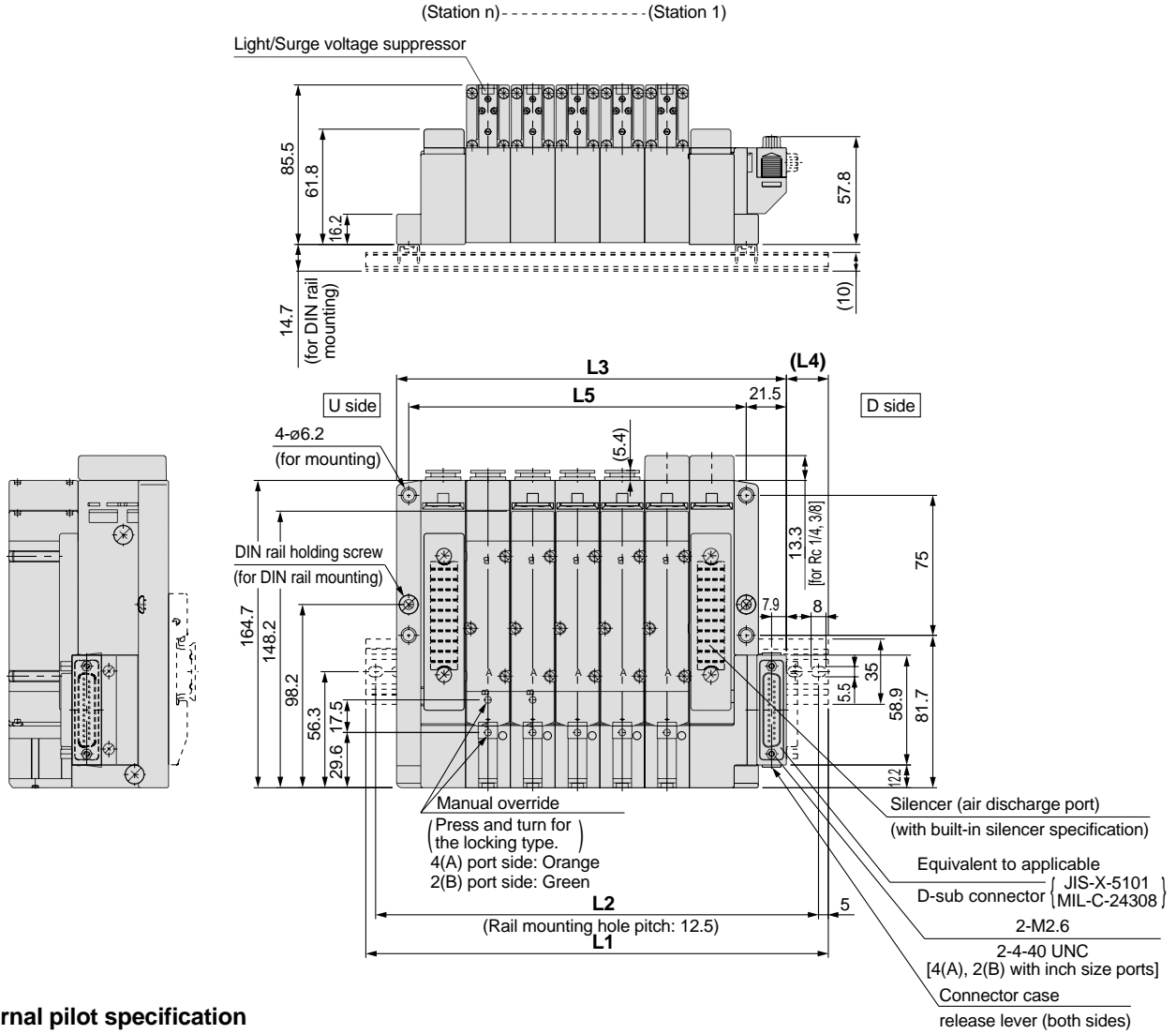
- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7
- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

# Series SV

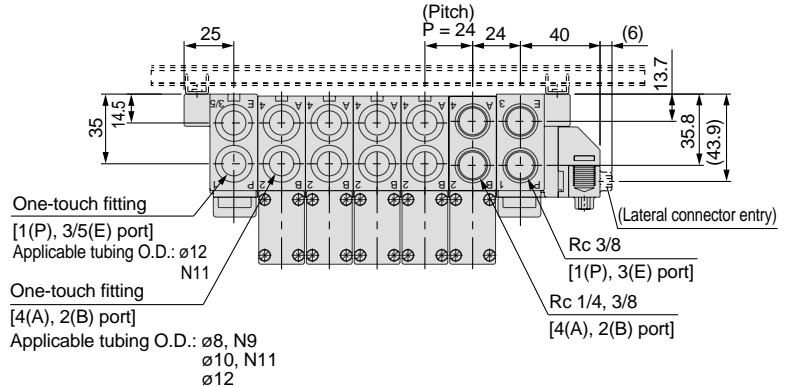
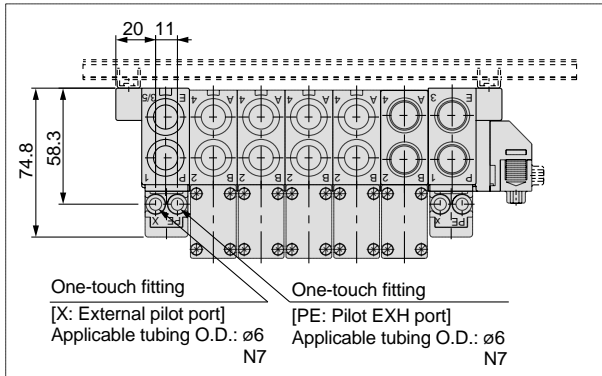
## Dimensions: Series SV4000 for D-sub Connector

• Tie-rod base manifold: **SS5V4-10FD<sub>2</sub>** - Stations  $\frac{U}{D}$  **(S, R, RS)** -  $\frac{C8, N9}{C03, C10, C12}$  **(-D)**

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



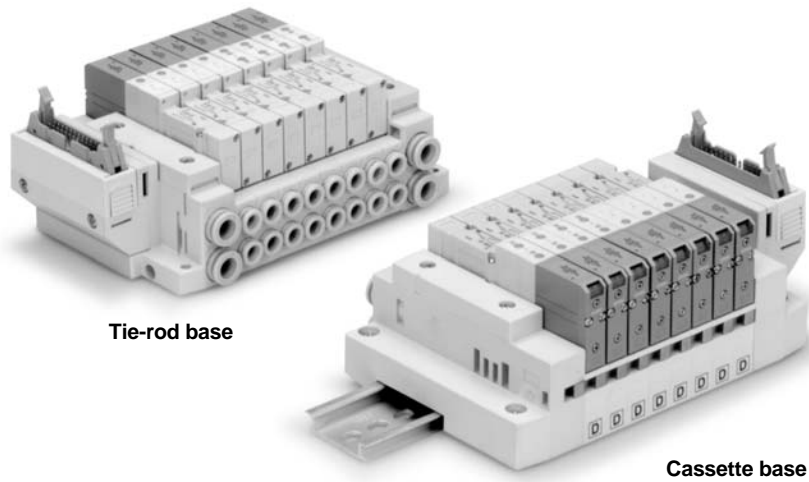
### With external pilot specification



### L dimensions

L	n: Stations																			
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
L1	173	198	223	248	273	298	310.5	335.5	360.5	385.5	410.5	435.5	460.5	485.5	510.5	535.5	560.5	585.5	610.5	
L2	162.5	187.5	212.5	237.5	262.5	287.5	300	325	350	375	400	425	450	475	500	525	550	575	600	
L3	137	161	185	209	233	257	281	305	329	353	377	401	425	449	473	497	521	545	569	
L4	21	21.5	22	22.5	23	23.5	18	18.5	19	19.5	20	20.5	21	21.5	22	22.5	23	23.5	24	
L5	109	133	157	181	205	229	253	277	301	325	349	373	397	421	445	469	493	517	541	

# Flat Ribbon Cable



Applicable series	Cassette base manifold SV1000/SV2000
	Tie-rod base manifold SV1000/SV2000/SV3000/SV4000
	<ul style="list-style-type: none"> <li>• Number of connectors: 26, 20, 10 pins</li> <li>• With strain relief</li> <li>• Conforms to MIL-C-83503</li> </ul>

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

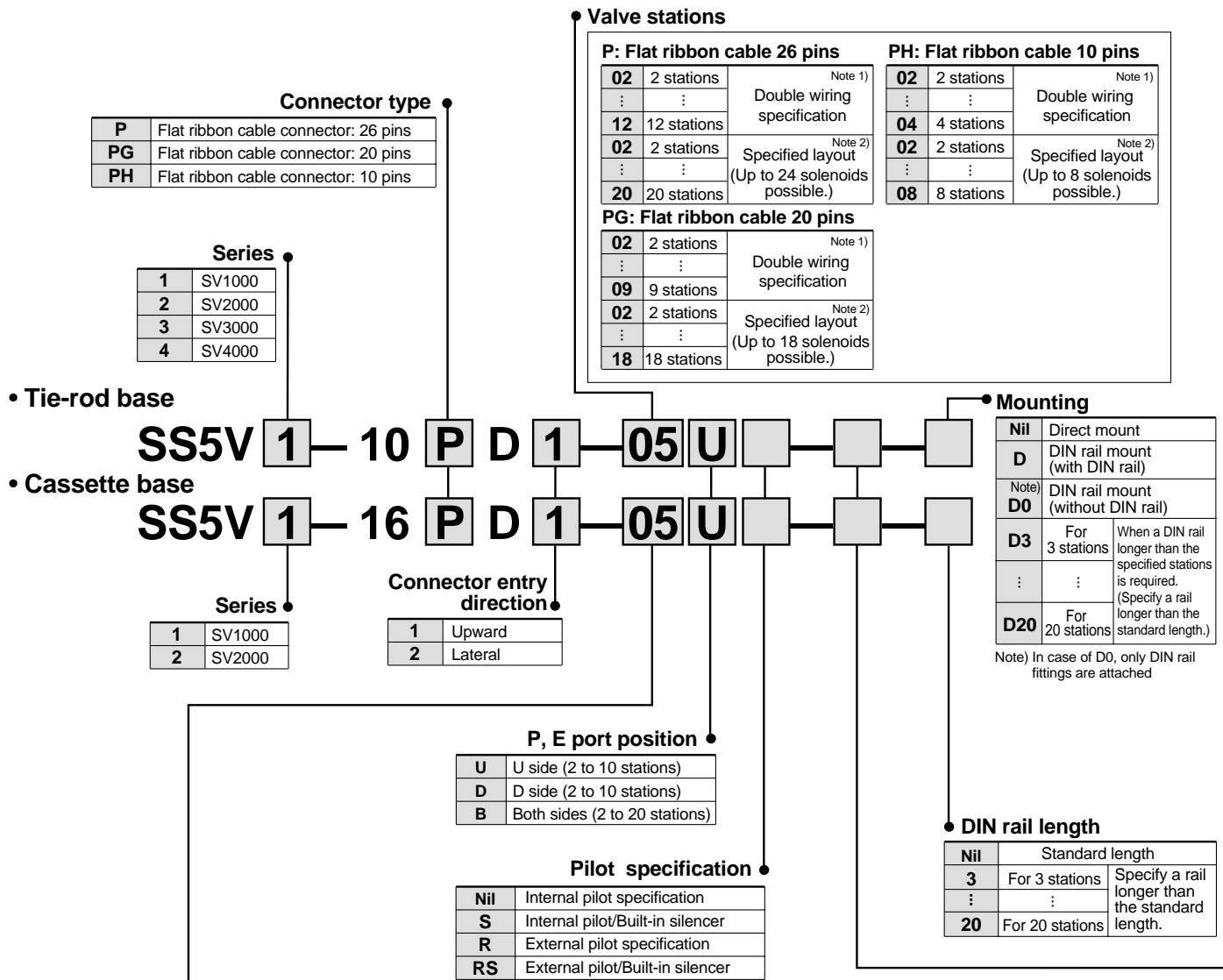
VS

VS7

VQ7

# Flat Ribbon Cable Connector Series SV

## How to Order



### Valve stations

#### Series SV1000

<b>P: Flat ribbon cable 26 pins</b>			<b>PH: Flat ribbon cable 10 pins</b>		
02	2 stations	Double wiring specification	02	2 stations	Double wiring specification
09	9 stations		04	4 stations	
02	2 stations	Specified layout (Up to 18 solenoids possible.)	02	2 stations	Specified layout (Up to 8 solenoids possible.)
18	18 stations		08	8 stations	
<b>PG: Flat ribbon cable 20 pins</b>					
02	2 stations	Double wiring specification			
09	9 stations				
02	2 stations	Specified layout (Up to 18 solenoids possible.)			
18	18 stations				

#### Series SV2000

<b>P: Flat ribbon cable 26 pins</b>			<b>PH: Flat ribbon cable 10 pins</b>		
02	2 stations	Double wiring specification	02	2 stations	Double wiring specification
12	12 stations		04	4 stations	
02	2 stations	Specified layout (Up to 24 solenoids possible.)	02	2 stations	Specified layout (Up to 8 solenoids possible.)
20	20 stations		08	8 stations	
<b>PG: Flat ribbon cable 20 pins</b>					
02	2 stations	Double wiring specification			
09	9 stations				
02	2 stations	Specified layout (Up to 18 solenoids possible.)			
18	18 stations				

Note 1) Double wiring specification: Single, double and 3 position solenoid valves can be used on all manifold stations. Use of a single solenoid will result in an unused control signal. If this is not desired, order with a specified layout.

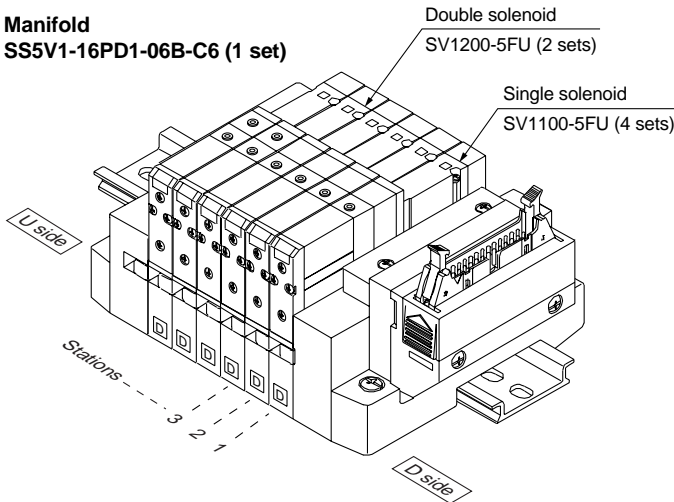
Note 2) Specified layout: Indicate wiring specifications on a manifold specification sheet. (Note that double and 3 position valves cannot be used where single solenoid wiring has been specified.)



## How to Order Manifold Assemblies (Order Example)

### Example (SV1000)

Manifold  
SS5V1-16PD1-06B-C6 (1 set)



SS5V1-16PD1-06B-C6 ..... 1 set (manifold part no.)  
\* SV1100-5FU ..... 4 sets (single solenoid part no.)  
\* SV1200-5FU ..... 2 sets (double solenoid part no.)

## How to Order Solenoid Valves

SV 1 1 0 0 — 5 F

### Series

1	SV1000
2	SV2000
3	SV3000
4	SV4000

### Type of actuation

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

\* 4 position dual 3 port valves are applicable to series SV1000 and SV2000 only.

### Pilot specification

Nil	Internal pilot
R	External pilot

\* External pilot specification is not available for 4 position dual 3 port valves.

### Rated voltage

5	24VDC
6	12VDC

### Back pressure check valve

Nil	None
K	Built-in

\* Built-in back pressure check valve type is applicable to series SV1000 only.

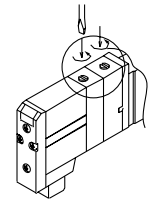
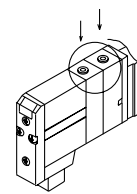
\* Back pressure check valve is not available for 3 position closed center and 3 position pressure center.

\* Flow rate with the built-in back pressure check valve is reduced approximately 20%.

Note) Available with manifold block for station additions. Refer to pages 1.1-85 and 1.1-89.

### Manual override

Nil: Non-locking push type    D: Slotted locking type



### Light/Surge voltage suppressor

U	With light and surge voltage suppressor
R	With surge voltage suppressor

### A, B port size (metric)

Symbol	A, B port	P, E port	Applicable series
C3	ø3.2 One-touch fitting	ø8 One-touch fitting	SV1000
C4	ø4 One-touch fitting		
C6	ø6 One-touch fitting		
C4	ø4 One-touch fitting	ø10 One-touch fitting	SV2000
C6	ø6 One-touch fitting		
C8	ø8 One-touch fitting		
C6	ø6 One-touch fitting	ø12 One-touch fitting	SV3000
C8	ø8 One-touch fitting		
C10	ø10 One-touch fitting		
C8	ø8 One-touch fitting	ø12 One-touch fitting	SV4000
C10	ø10 One-touch fitting		
C12	ø12 One-touch fitting		
02	Rc 1/4	Rc 3/8	SV4000
03	Rc 3/8		
02F	G 1/4		
03F	G 3/8	G 3/8	SV4000
M	A, B ports mixed		

### A, B port size (inch)

Symbol	A, B port	P, E port	Applicable series
N1	ø1/8" One-touch fitting	ø5/16" One-touch fitting	SV1000
N3	ø5/32" One-touch fitting		
N7	ø1/4" One-touch fitting		
N3	ø5/32" One-touch fitting	ø3/8" One-touch fitting	SV2000
N7	ø1/4" One-touch fitting		
N9	ø5/16" One-touch fitting		
N7	ø1/4" One-touch fitting	ø3/8" One-touch fitting	SV3000
N9	ø5/16" One-touch fitting		
N11	ø3/8" One-touch fitting		
N9	ø5/16" One-touch fitting	ø3/8" One-touch fitting	SV4000
N11	ø3/8" One-touch fitting		
02N	NPT 1/4		
03N	NPT 3/8	NPT 3/8	SV4000
02T	NPTF 1/4		
03T	NPTF 3/8		
M	A, B ports mixed		

\* In case of mixed specification (M), indicate separately on a manifold specification sheet.

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

VS7

VQ7

## Manifold Electrical Wiring

**10P/16P Flat Ribbon Cable Type (26 pins)**

- This circuit has double wiring specifications for up to 12 stations. Since the usable number of solenoids differs depending on the manifold type, refer to the table below. In the case of single solenoids, connect to SOL. A. Furthermore, when wiring is specified on a manifold specification sheet, connections are made without skipping any connectors, and signals A for single and A, B for double are in order 1→2→3→4, etc.
- Stations are counted starting from station 1 on the D side (connector side).
- Since terminal numbers are not indicated on flat ribbon cables, use the triangle mark as a reference.
- Since solenoid valves do not have polarity, either the +COM or -COM can be used.

**Usable number of solenoids**

Model	Maximum number of solenoids
Tie-rod base type 10	24
Cassette base type 16	18
	24

**10PG/16PG Flat Ribbon Cable Type (20 pins)**

- This circuit has double wiring specifications for up to 9 stations. Since the usable number of solenoids differs depending on the manifold type, refer to the table below. In the case of single solenoids, connect to SOL. A. Furthermore, when wiring is specified on a manifold specification sheet, connections are made without skipping any connectors, and signals A for single and A, B for double are in order 1→2→3→4, etc.
- Stations are counted starting from station 1 on the D side (connector side).
- Since terminal numbers are not indicated on flat ribbon cables, use the triangle mark as a reference.
- Since solenoid valves do not have polarity, either the +COM or -COM can be used.

**Usable number of solenoids**

Model	Maximum number of solenoids
Tie-rod base type 10	18
Cassette base type 16	18

**10PH/16PH Flat Ribbon Cable Type (10 pins)**

- This circuit has double wiring specifications for up to 4 stations. Since the usable number of solenoids differs depending on the manifold type, refer to the table below. In the case of single solenoids, connect to SOL. A. Furthermore, when wiring is specified on a manifold specification sheet, connections are made without skipping any connectors, and signals A for single and A, B for double are in order 1→2→3→4, etc.
- Stations are counted starting from station 1 on the D side (connector side).
- Since terminal numbers are not indicated on flat ribbon cables, use the triangle mark as a reference.
- Since solenoid valves do not have polarity, either the +COM or -COM can be used.

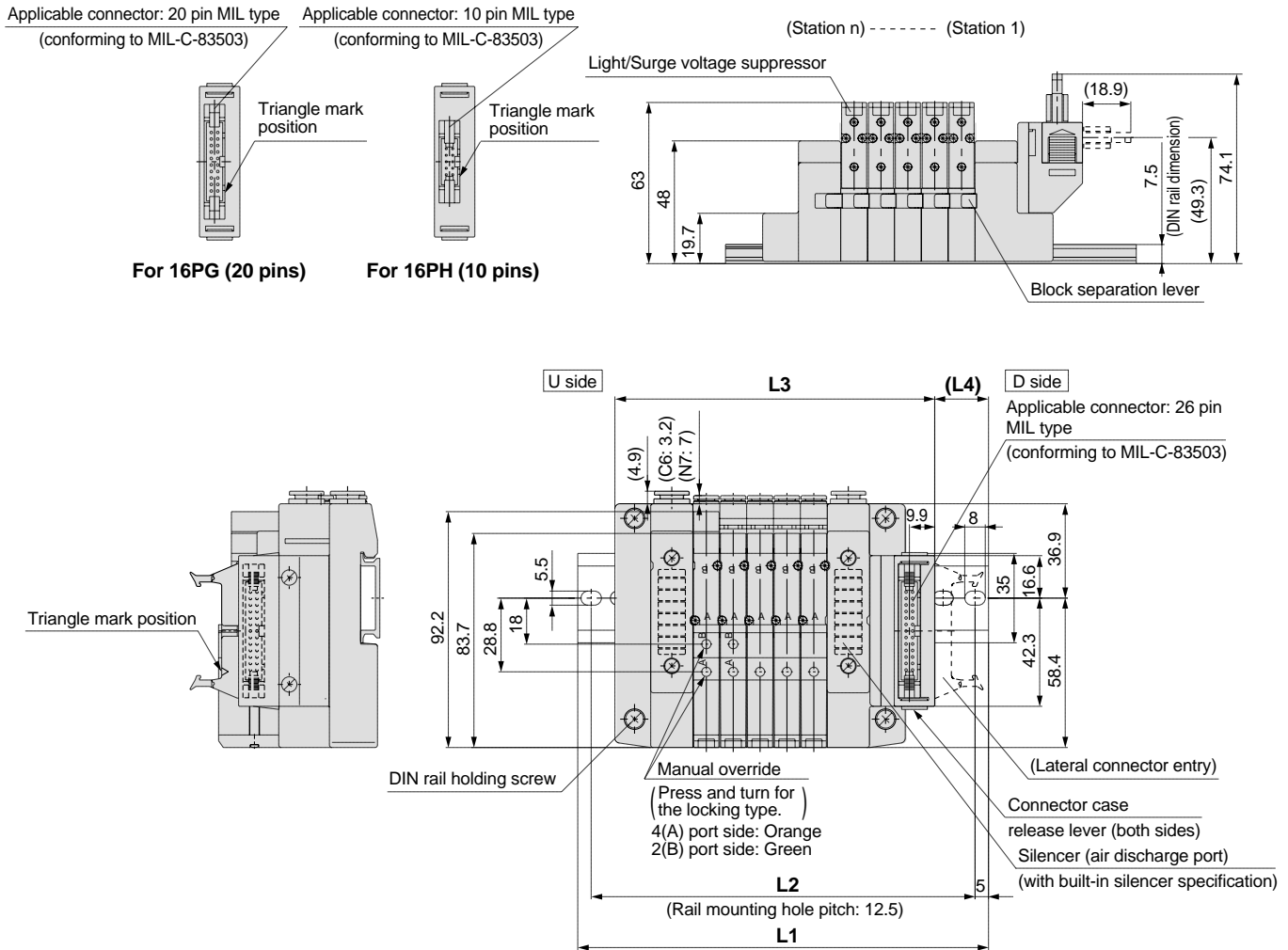
**Usable number of solenoids**

Model	Maximum number of solenoids
Tie-rod base type 10	8
Cassette base type 16	8

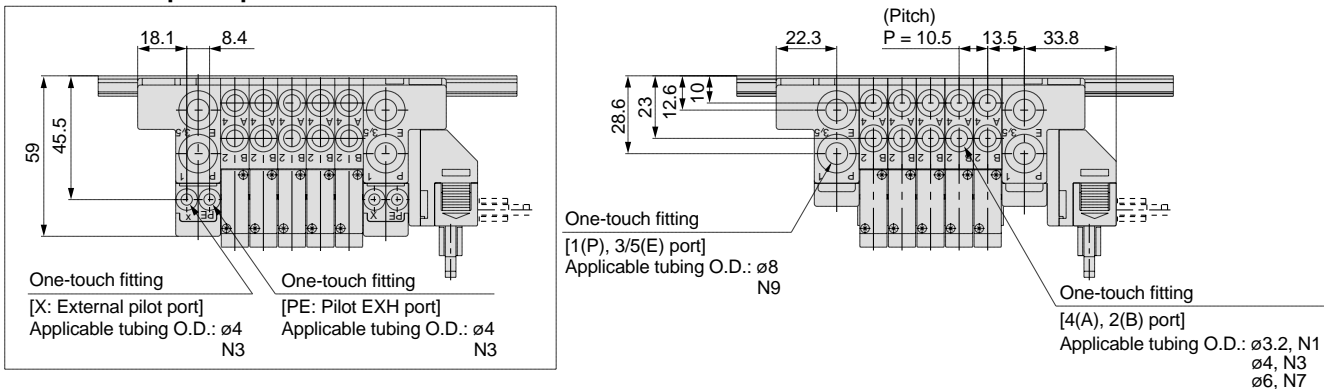
## Dimensions: Series SV1000 for Flat Ribbon Cable

• Cassette base manifold: **SS5V1-16**  $\frac{P}{PH} D \frac{1}{2}$  - Stations  $\frac{U}{B}$  (S, R, RS) -  $\frac{C3, N1}{C4, N3}$   $\frac{C6, N7}{C6, N7}$

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



### With external pilot specification



### L dimensions

L \ n	n: Stations																	
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
L1	135.5	135.5	148	160.5	173	185.5	198	198	210.5	223	235.5	248	260.5	260.5	273	285.5	298	
L2	125	125	137.5	150	162.5	175	187.5	187.5	200	212.5	225	237.5	250	250	262.5	275	287.5	
L3	93.5	104	114.5	125	135.5	146	156.5	167	177.5	188	198.5	209	219.5	230	240.5	251	261.5	
L4	24.5	19	20	21	22	23	24	19	20	21	22	23	24	18.5	19.5	20.5	21.5	

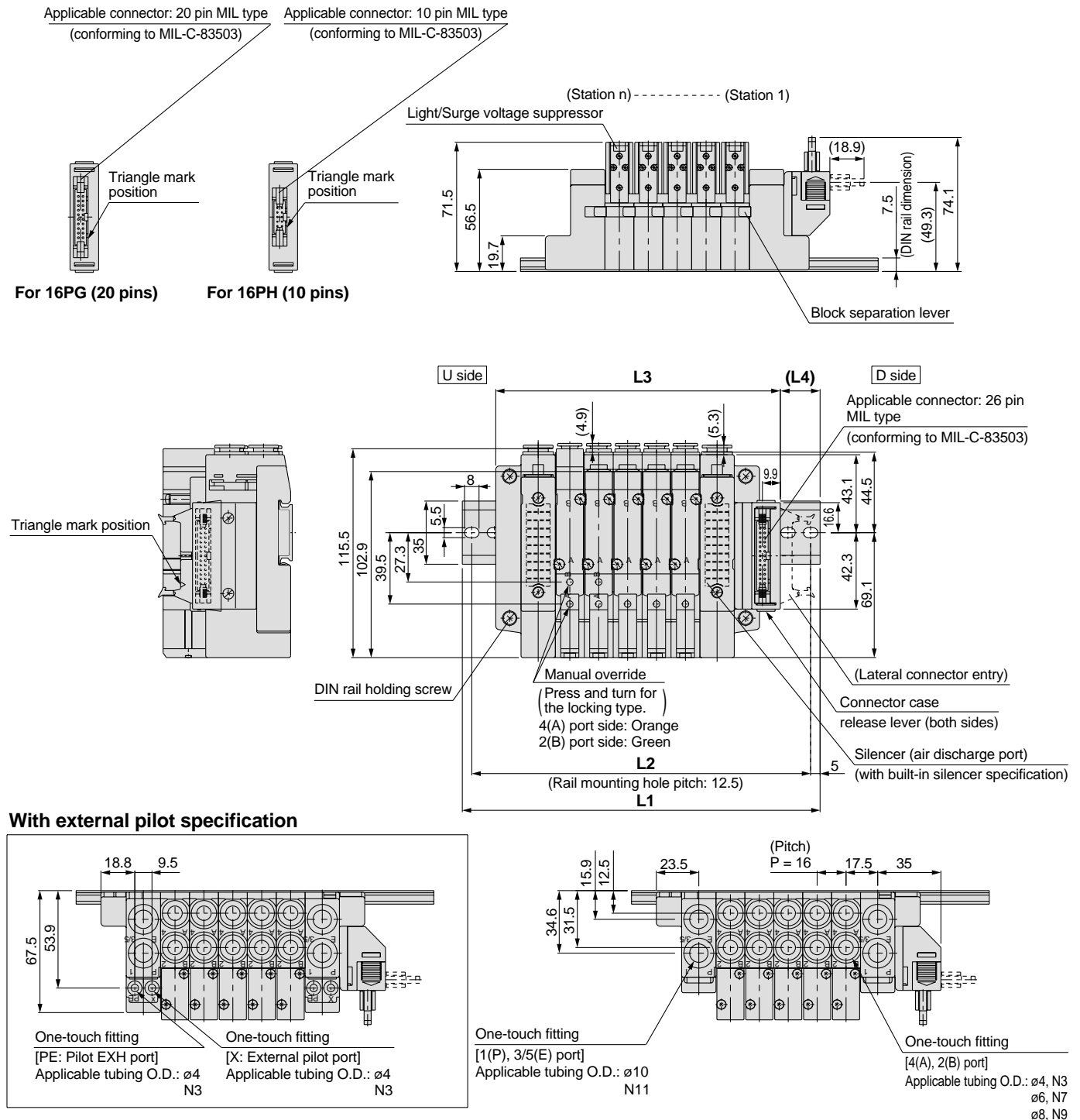
- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7
- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

# Series SV

## Dimensions: Series SV2000 for Flat Ribbon Cable

• Cassette base manifold: **SS5V2-16**  $\frac{P}{PH} D_2$  - Stations -  $\frac{U}{B}$  (S, R, RS) -  $\frac{C4, N3}{C6, N7}$   $\frac{C8, N9}{C8, N9}$

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



### L dimensions

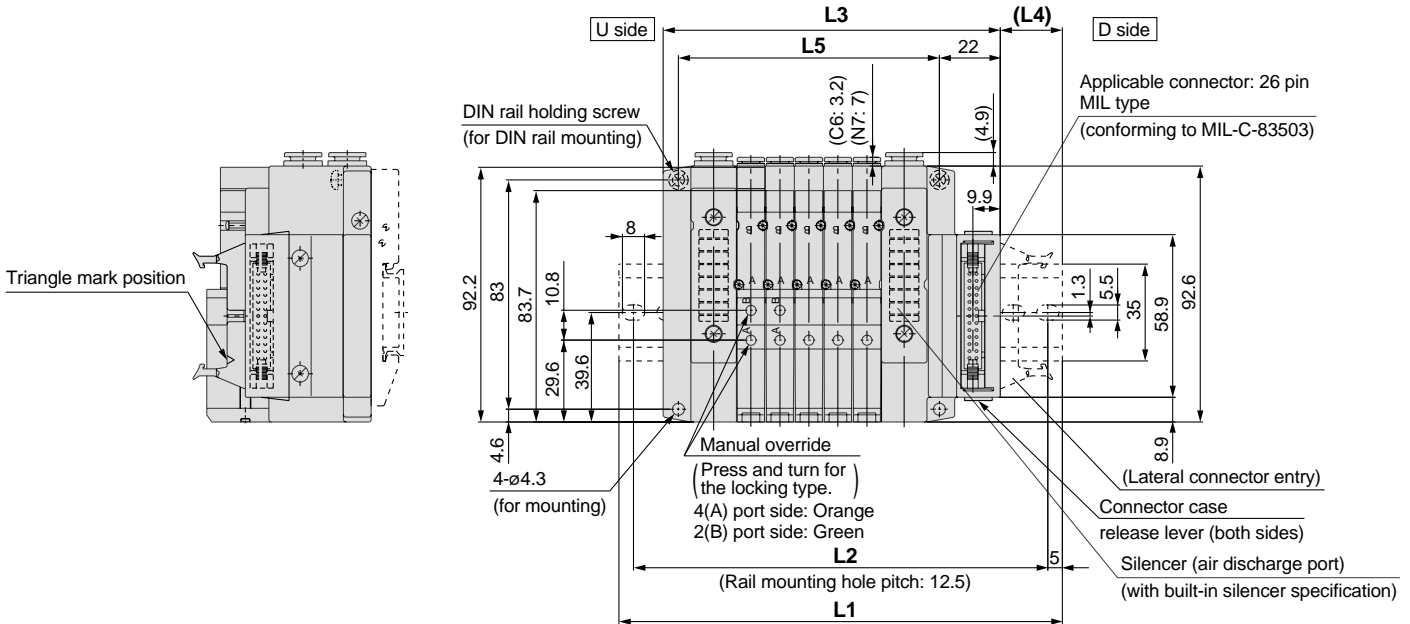
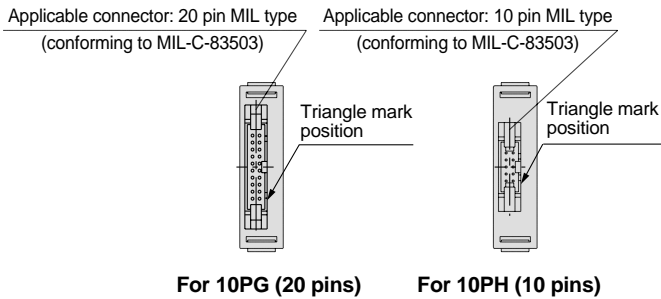
$L_n$	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	148	160.5	173	198	210.5	223	235.5	260.5	273	285.5	310.5	323	335.5	348	373	385.5	398	423	435.5
L2	137.5	150	162.5	187.5	200	212.5	225	250	262.5	275	300	312.5	325	337.5	362.5	375	387.5	412.5	425
L3	109.5	125.5	141.5	157.5	173.5	189.5	205.5	221.5	237.5	253.5	269.5	285.5	301.5	317.5	333.5	349.5	365.5	381.5	397.5
L4	22.5	21	19	23.5	22	20	18.5	23	21	19.5	24	22	20.5	18.5	23	21.5	19.5	24	22.5

n: Stations

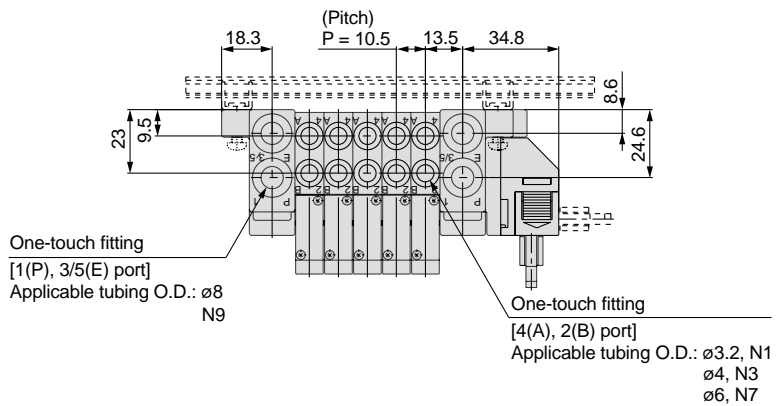
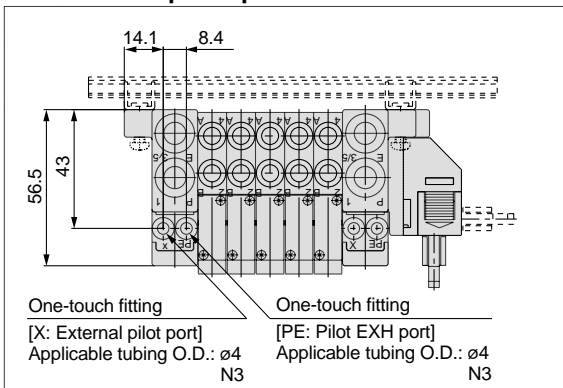
## Dimensions: Series SV1000 for Flat Ribbon Cable

• Tie-rod base manifold: **SS5V1-10** <sup>P</sup>PG <sup>D</sup>D <sub>PH</sub> <sup>1</sup>2 - Stations <sup>U</sup> (S, R, RS) - <sup>D</sup> C3, N1 C4, N3 C6, N7 (-D)

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



### With external pilot specification



### L dimensions

L	n: Stations																			
	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	90.5	101	111.5	122	132.5	143	153.5	164	174.5	185	195.5	206	216.5	227	237.5	248	258.5	269	279.5	
L4	19.5	20.5	21.5	22.5	23.5	18.5	19.5	20.5	21.5	22.5	23.5	24.5	19	20	21	22	23	24	19	
L5	63	73.5	84	94.5	105	115.5	126	136.5	147	157.5	168	178.5	189	199.5	210	220.5	231	241.5	252	

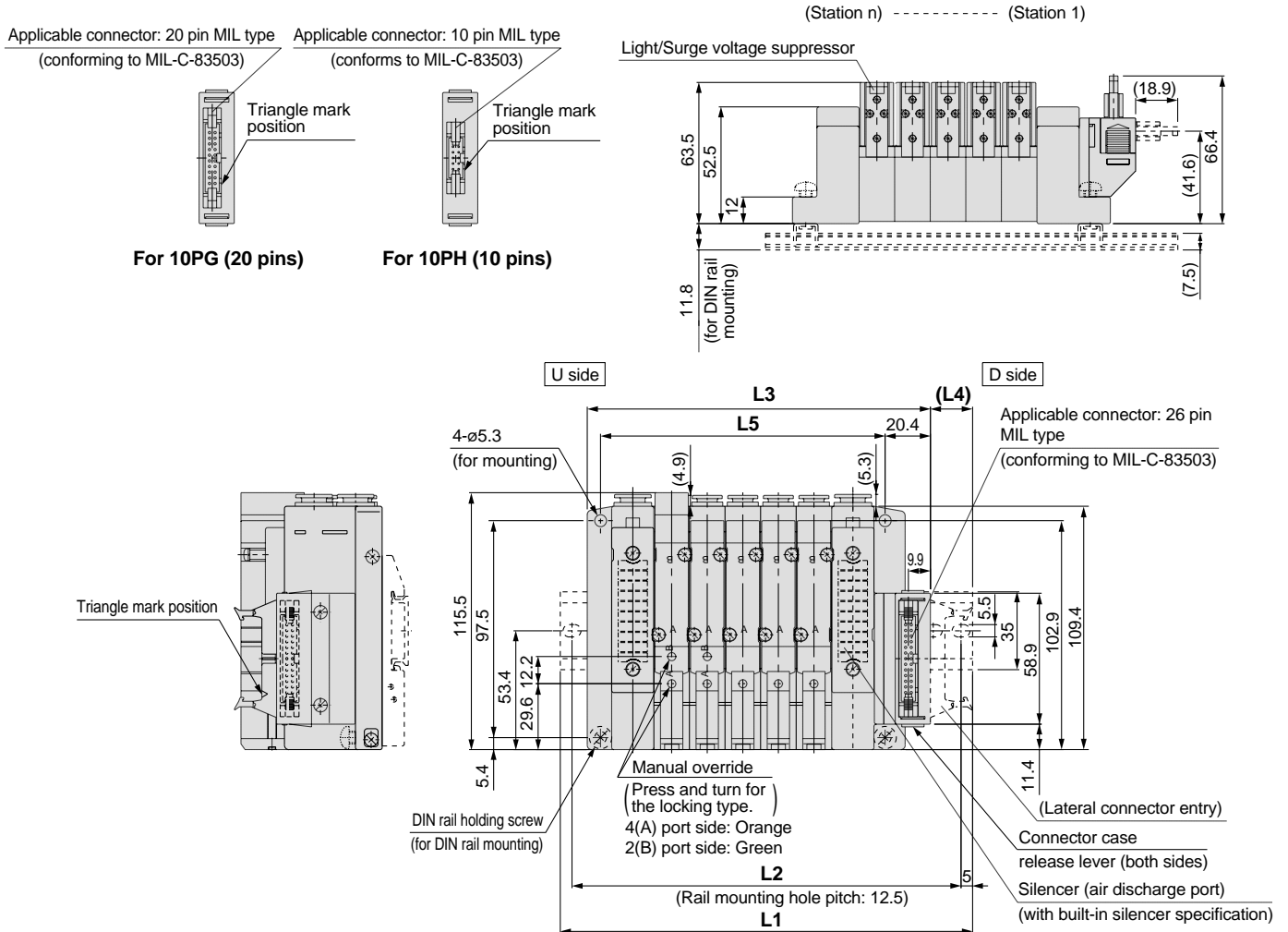
- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7
- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

# Series SV

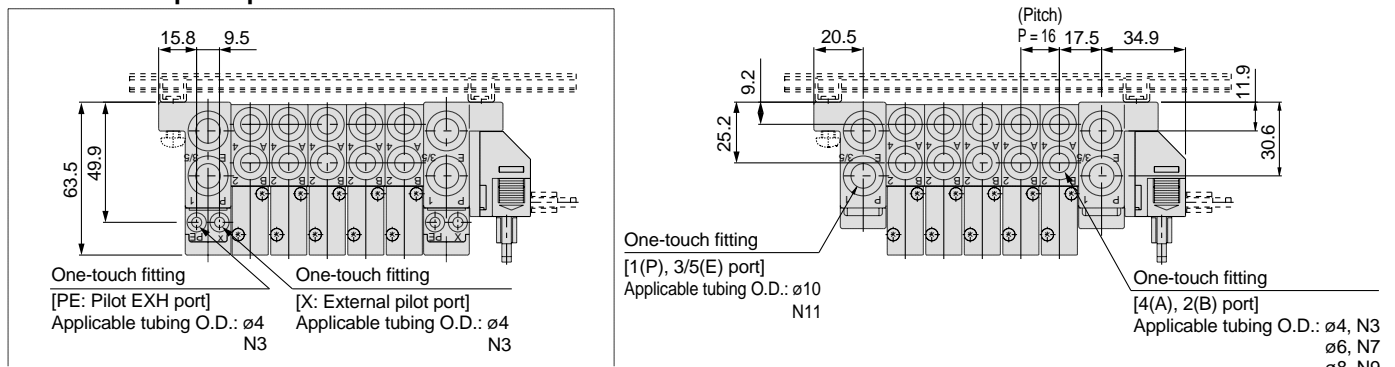
## Dimensions: Series SV2000 for Flat Ribbon Cable

• Tie-rod base manifold: **SS5V2-10**  $\frac{P}{PH} D_2$  - Stations  $\frac{U}{D}$  **(S, R, RS)** -  $\frac{C4, N3}{C6, N7}$   $\frac{C8, N9}{C8, N9}$  **(-D)**

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



### With external pilot specification



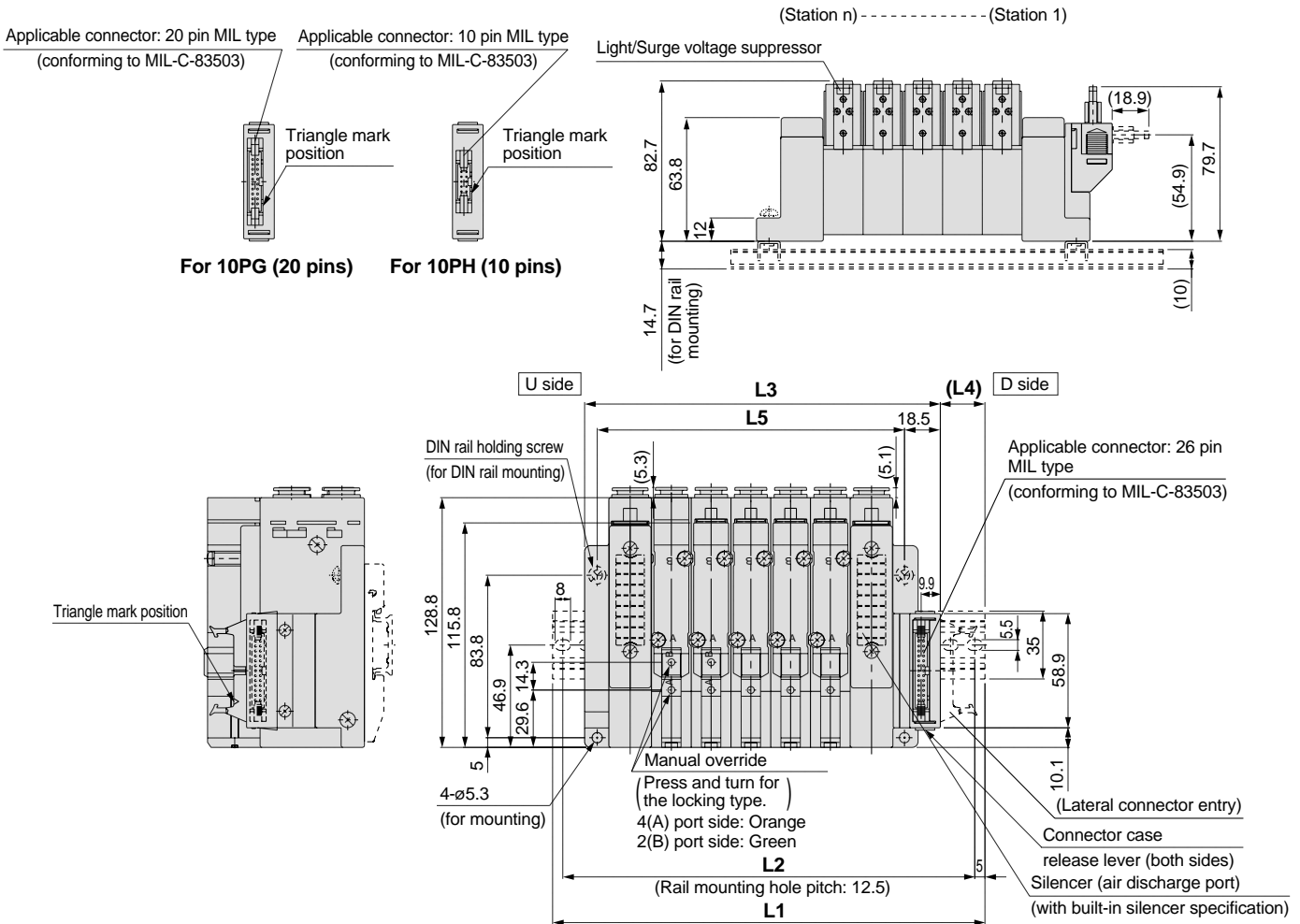
### L dimensions

$\frac{L}{n}$	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	148	160.5	173	185.5	210.5	223	235.5	248	273	285.5	298	323	335.5	348	360.5	385.5	398	410.5	435.5
L2	137.5	150	162.5	175	200	212.5	225	237.5	262.5	275	287.5	312.5	325	337.5	350	375	387.5	400	425
L3	106.4	122.4	138.4	154.4	170.4	186.4	202.4	218.4	234.4	250.4	266.4	282.4	298.4	314.4	330.4	346.4	362.4	378.4	394.4
L4	24.5	22.5	20.5	19	23.5	21.5	20	18.5	22.5	21	19.5	23.5	22	20.5	18.5	23	21	19.5	24
L5	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304	320	336	352	368

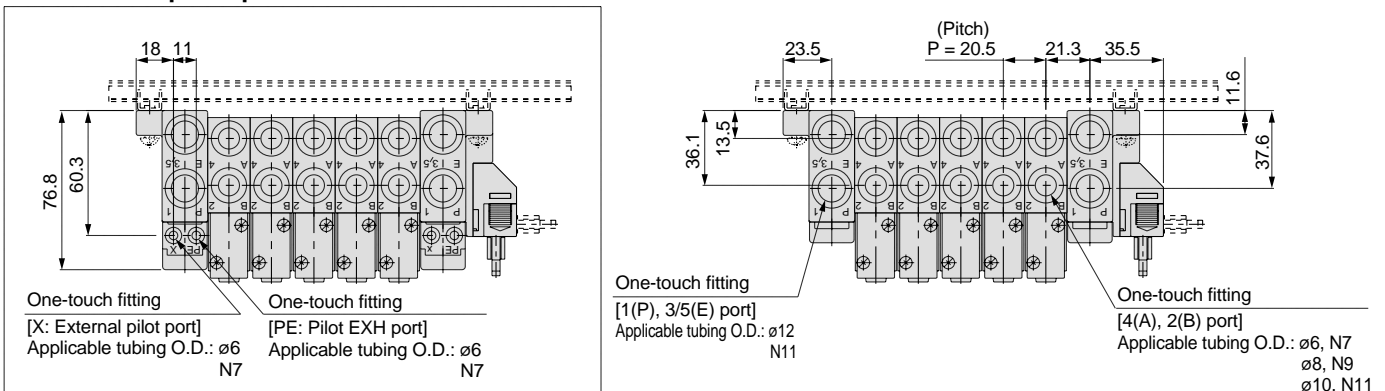
## Dimensions: Series SV3000 for Flat Ribbon Cable

• Tie-rod base manifold: **SS5V3-10** <sup>P</sup>PG <sup>D</sup>D<sub>2</sub> - Stations <sup>U</sup>U <sup>D</sup>D (S, R, RS) - <sup>C6, N7</sup>C6, N7 <sup>C8, N9</sup>C8, N9 <sup>C10, N11</sup>C10, N11 (-D)

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



### With external pilot specification



### L dimensions

L	n : Stations																			
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
L1	160.5	173	198	223	235.5	260.5	285.5	298	323	348	360.5	385.5	398	423	448	460.5	485.5	510.5	523	
L2	150	162.5	187.5	212.5	225	250	275	287.5	312.5	337.5	350	375	387.5	412.5	437.5	450	475	500	512.5	
L3	122	142.5	163	183.5	204	224.5	245	265.5	286	306.5	327	347.5	368	388.5	409	429.5	450	470.5	491	
L4	22.5	18.5	21	23	19	21.5	23.5	19.5	22	24	20	22.5	18.5	20.5	23	19	21	23.5	19.5	
L5	97	117.5	138	158.5	179	199.5	220	240.5	261	281.5	302	322.5	343	363.5	384	404.5	425	445.5	466	

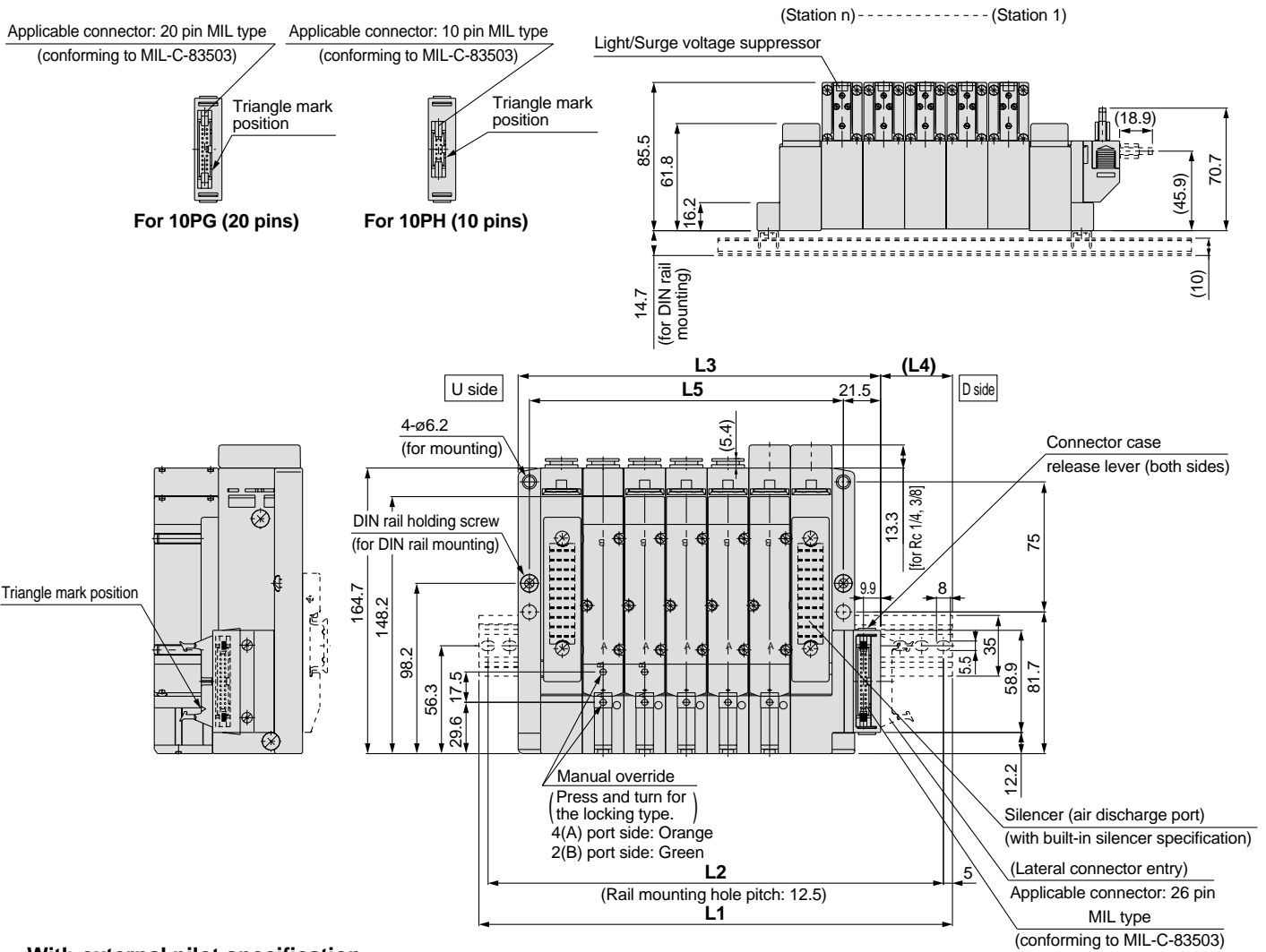
- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7
- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

# Series SV

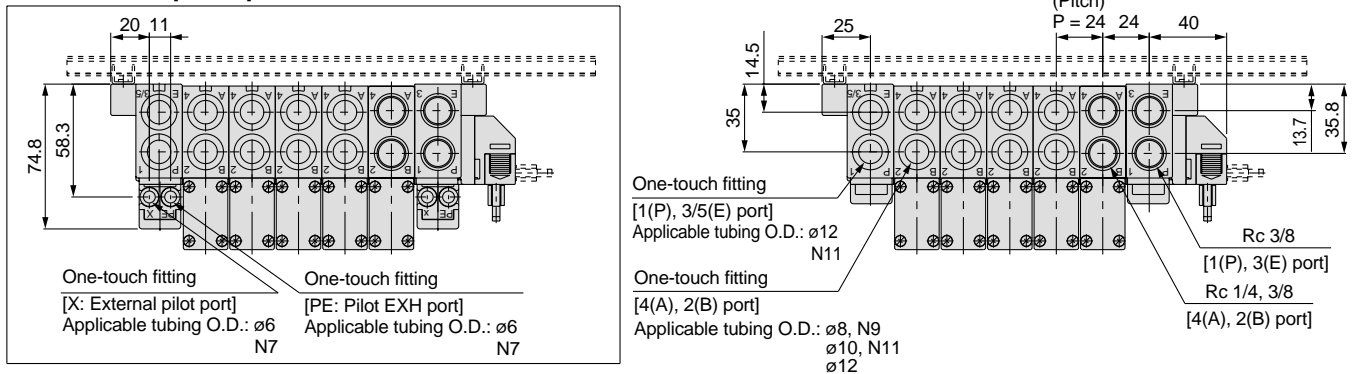
## Dimensions: Series SV4000 for Flat Ribbon Cable

• Tie-rod base manifold: **SS5V4-10**  $\frac{P}{PG}$   $\frac{D}{PH}$   $2^1$  - Stations  $\frac{U}{D}$   $B$  (S, R, RS) -  $\frac{02, C8, N9}{03, C10, C12, N11}$  (-D)

- When P, E port outlets are indicated on the U side or D side, the P, E ports on the opposite side are plugged.
- External pilot port positions and silencer discharge port positions are the same as P, E port outlet positions.



### With external pilot specification



### L dimensions

$\frac{L}{n}$	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	185.5	210.5	235.5	260.5	285.5	310.5	335.5	348	373	398	423	448	473	498	523	548	573	598	623
L2	175	200	225	250	275	300	325	337.5	362.5	387.5	412.5	437.5	462.5	487.5	512.5	537.5	562.5	587.5	612.5
L3	137	161	185	209	233	257	281	305	329	353	377	401	425	449	473	497	521	545	569
L4	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5
L5	109	133	157	181	205	229	253	277	301	325	349	373	397	421	445	469	493	517	541



**SV**

**SY**

**SYJ**

**SX**

**VK**

**VZ**

**VF**

**VFR**

**VP7**

**VQC**

**SQ**

**VQ**

**VQ4**

**VQ5**

**VQZ**

**VQD**

**VFS**

**VS**

**VS7**

**VQ7**

## Type 16: Cassette Base Manifold Exploded View

### Type 16C (circular connector type) manifold

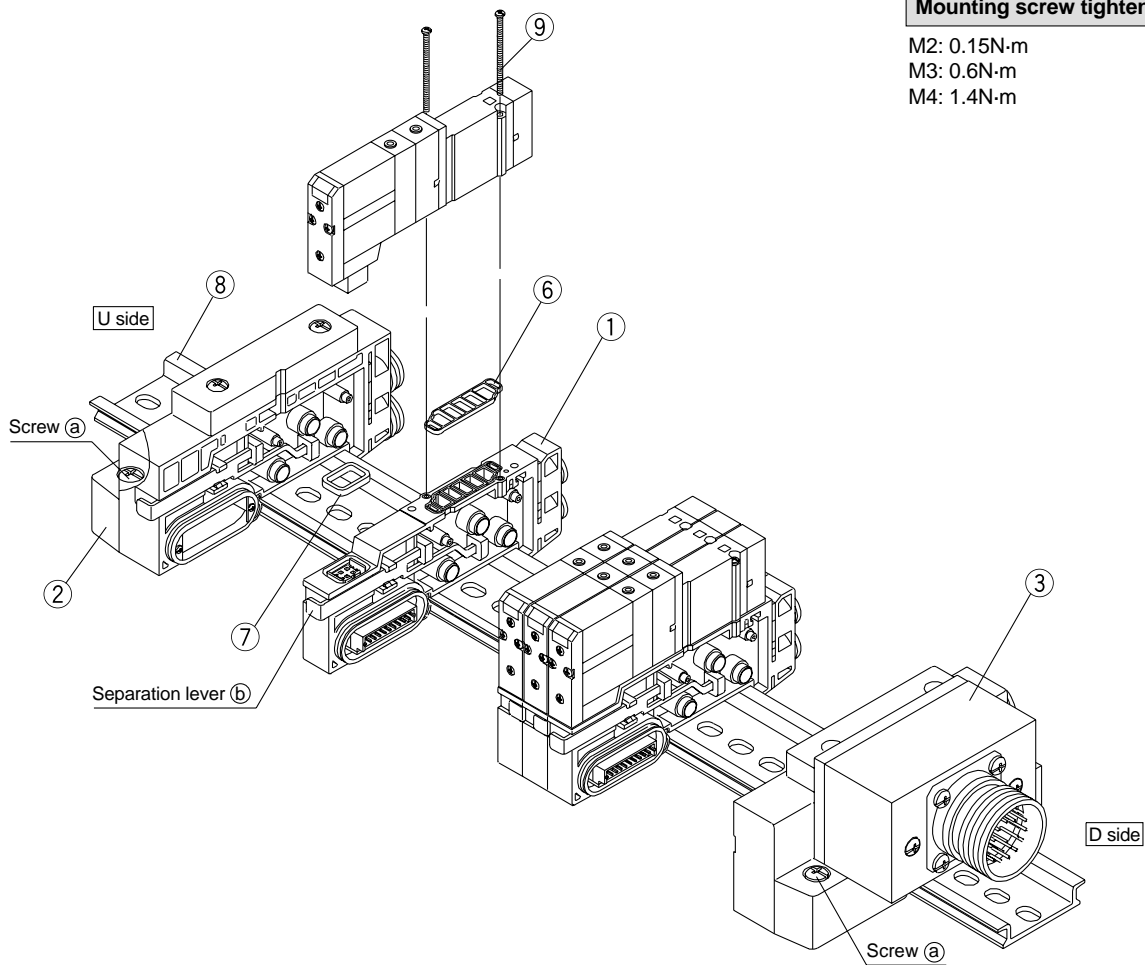
### ⚠ Caution

#### Mounting screw tightening torques

M2: 0.15N·m

M3: 0.6N·m

M4: 1.4N·m



③ Supply/Exhaust block assembly		
<p>EX500 (type 16SA□W)</p>	<p>EX120 (type 16S3□)</p>	
<p>Circular connector (type 16C)</p>	<p>D-sub connector (type 16F□)</p>	<p>Flat ribbon cable connector (type 16P□)</p>

① Manifold block assembly part numbers

Series	Wiring specification	Manifold block assembly part no.	Note
SV1000	For single	SV1000-50-3A-□□	C3: With ø3.2 One-touch fitting N1: ø1/8" One-touch fitting C4: With ø4 One-touch fitting N3: ø5/32" One-touch fitting C6: With ø6 One-touch fitting N7: ø1/4" One-touch fitting (Gaskets ⑥ and ⑦ are included.)
	For double	SV1000-50-4A-□□	
SV2000	For single	SV2000-50-3A-□□	C4: With ø4 One-touch fitting N3: ø5/32" One-touch fitting C6: With ø6 One-touch fitting N7: ø1/4" One-touch fitting C8: With ø8 One-touch fitting N9: ø5/16" One-touch fitting (Gaskets ⑥ and ⑦ are included.)
	For double	SV2000-50-4A-□□	

② Supply/Exhaust end block assembly SV □ 000 - 52U - 2 A □ □

③ Supply/Exhaust block assembly SV □ 000 - 51D □ □ A □ □

Series ●

1	SV1000
2	SV2000

Connector entry direction ●  
(D-sub, flat types only)

1	Upward
2	Lateral

● P, E port size

C8	ø8 One-touch fitting	SV1000
N9	ø5/16" One-touch fitting	SV1000
C10	ø10 One-touch fitting	SV2000
N11	ø3/8" One-touch fitting	SV2000
00	Plug	All series

\* "00" (plug) is not available for S, R and RS types.

Supply/Exhaust block assembly specification ●

30	For EX500 (decentralized serial)
32	For circular connector
33	For D-sub connector
34	For Flat ribbon cable connector (26 pins)
35	For Flat ribbon cable connector (20 pins)
36	For Flat ribbon cable connector (10 pins)
38	For EX120 (dedicated output serial)

\* Since EX500 and EX120 type SI units are not included, order them separately.

● Pilot specification

Nil	Internal pilot specification
S	Internal pilot/Built-in silencer
R	External pilot specification
RS	External pilot/Built-in silencer

No.	Description	Part no.		Note
		SV1000	SV2000	
④	Series EX500 SI unit	Refer to page 14.		
⑤	Series EX120 SI unit	Refer to page 32.		
⑥	Gasket	SX3000-57-4	SX5000-57-6	
⑦	Connector gasket	SX3000-146-2		
⑧	DIN rail	VZ1000-11-1-□		Refer to the DIN rail dimension tables on page 1.1-93.
⑨	Round head combination screw	SX3000-22-2 (M2 x 24)	SV2000-21-1 (M3 x 30)	

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

## Type 16: Cassette Base Manifold Replacement Parts

### Adding manifold bases (type 16)

1 Loosen the screws (a) (2 pcs. on one side) that hold the manifold base onto the DIN rail.  
(When removing the manifold base from the DIN rail, loosen the holding screws at four locations.)

2 Using a flat head screw driver, etc., pull the lever (b) forward on the manifold block assembly where a station is to be added, and disconnect the manifold block assemblies.

3 Attach the manifold block assembly to be added to the DIN rail as shown in the figure.

4 Connect the block assemblies by pressing them together, and push the lever in firmly until it stops. Then secure them to the DIN rail by tightening the screws (a).

**⚠ Caution** (Tightening torque: 1.4N·m)

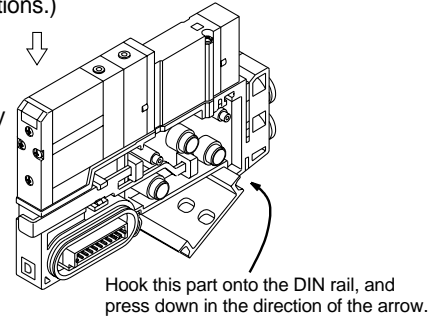


Figure. Block mounting

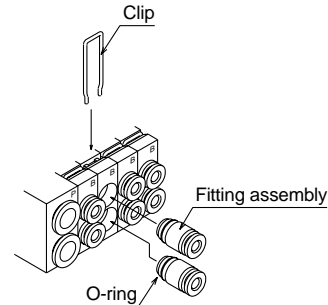
## ⚠ Caution

### Fitting assembly replacement

By replacing manifold fitting assemblies, it is possible to change the size of the A, B ports and P, E ports. To replace them, remove the clip with a flat head screw driver, etc., and pull out the fitting assembly. Mount the new fitting assembly by inserting it and then replacing the clip to its fully inserted position.

#### Fitting assembly part numbers

Port size		SV1000	SV2000
A, B port	ø3.2 One-touch fitting	VVQ1000-50A-C3	—
	ø4 One-touch fitting	VVQ1000-50A-C4	VVQ1000-51A-C4
	ø6 One-touch fitting	VVQ1000-50A-C6	VVQ1000-51A-C6
	ø8 One-touch fitting	—	VVQ1000-51A-C8
	N1 One-touch fitting	VVQ1000-50A-N1	—
	N3 One-touch fitting	VVQ1000-50A-N3	VVQ1000-51A-N3
	N7 One-touch fitting	VVQ1000-50A-N7	VVQ1000-51A-N7
	N9 One-touch fitting	—	VVQ1000-51A-N9
P, E port	ø8 One-touch fitting	VVQ1000-51A-C8	—
	ø10 One-touch fitting	—	VVQ2000-51A-C10
	N9 One-touch fitting	VVQ1000-51A-N9	—
	N11 One-touch fitting	—	VVQ2000-51A-N11



Note 1) Be careful to avoid damage or contamination of O-rings, as this can cause air leakage.

Note 2) When removing a fitting assembly from a valve, after removing the clip, attach tubing or a plug (KQP-□□) to the One-touch fitting, and pull it out while holding the tubing (or plug). If it is pulled out while holding the release button of the fitting assembly (resin part), the release button may be damaged.

Note 3) Be sure to shut off the power and air supplies before disassembly. Furthermore, since air may remain inside the actuator, piping and manifold, confirm that the air is completely exhausted before performing any work.

## How to order cassette base type 16 solenoid valves with manifold block

[Series SV1000/SV2000]

• Type with manifold block is used when adding stations, etc.

SV **1100** **5** F

**Series**

1	SV1000
2	SV2000

**Type of actuation**

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

Nil	Internal pilot
R	External pilot

\* External pilot specification is not available for 4 position dual 3 port valves.

**Back pressure check valve**

Nil	None
K	Built-in

\* Back pressure check valve is not available for 3 position closed center and 3 position pressure center.

\* Built-in back pressure check valve type is applicable to series SV1000 only.

\* Flow rate with the built-in back pressure check valve is reduced approximately 20%.

**A, B port size**

Refer to A, B ports size tables on pages 1.1-16, 1.1-41, 1.1-52, 1.1-62 and 1.1-73.

**Manifold wiring specification**

Nil	Double wiring
S	Single wiring

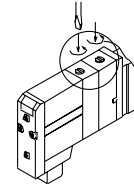
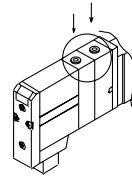
**Manifold block type**

C	Cassette base type 16 with manifold block
---	---

**Manual override**

Nil: Non-locking push type

D: Slotted locking type



**Light/Surge voltage suppressor**

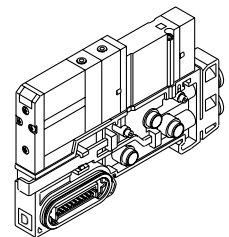
U	With light and surge voltage suppressor
R	With surge voltage suppressor

**Rated voltage**

5	24VDC
6	12VDC

\* Note that serial wiring manifolds (EX500, EX250 and EX120) are only available with 24VDC.

Example (SV1000)  
SV1200-5FU-C-C6



SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

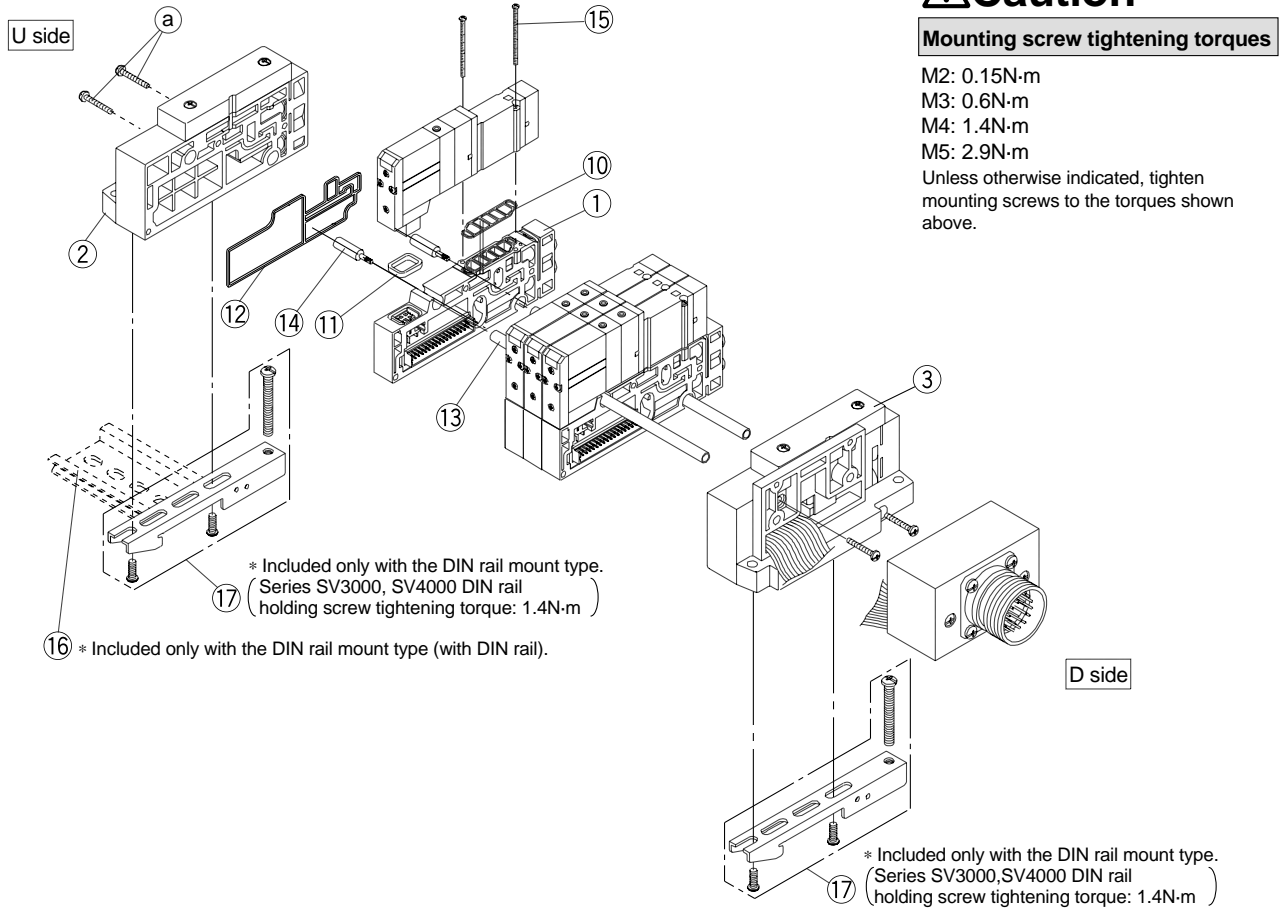
VS

VS7

VQ7

## Type 10: Tie-rod Base Manifold Exploded View

### Type 10C (circular connector type) manifold



### ⚠ Caution

#### Mounting screw tightening torques

M2: 0.15N·m

M3: 0.6N·m

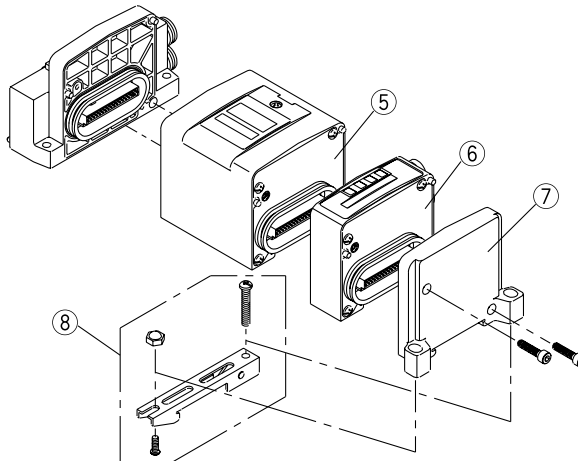
M4: 1.4N·m

M5: 2.9N·m

Unless otherwise indicated, tighten mounting screws to the torques shown above.

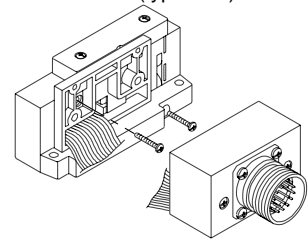
### ③ Supply/Exhaust block assembly

#### EX250 (type 10S1□W)

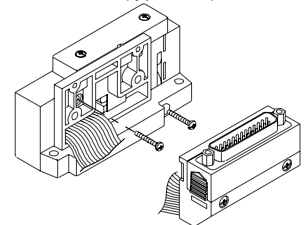


\* Included only with the DIN rail mount type.  
(DIN rail holding screw tightening torque: 0.5N·m)

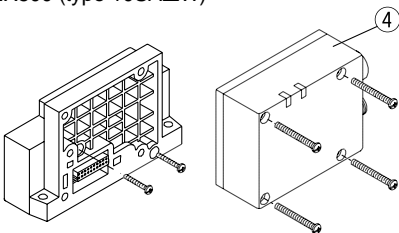
#### Circular connector (type 10C)



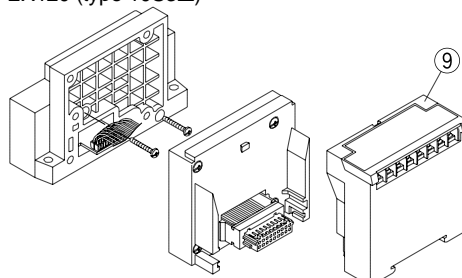
#### D-sub connector (type 10F)



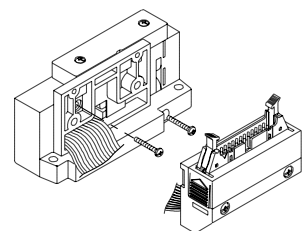
#### EX500 (type 10SA□W)



#### EX120 (type 10S3□)



#### Flat ribbon cable connector (type 10P□)



## ① Manifold block assembly part numbers

Series	Wiring specifications	Manifold block assembly part no.	Note
SV1000	For single	SV1000-50-1A-□□	C3: With ø3.2 One-touch fitting C4: With ø4 One-touch fitting C6: With ø6 One-touch fitting (Tie-rod for station additions ⑬ and gaskets ⑩, ⑪, and ⑫ are included.)
	For double	SV1000-50-2A-□□	
SV2000	For single	SV2000-50-1A-□□	C4: With ø4 One-touch fitting C6: With ø6 One-touch fitting C8: With ø8 One-touch fitting (Tie-rod for station additions ⑬ and gaskets ⑩, ⑪, and ⑫ are included.)
	For double	SV2000-50-2A-□□	
SV3000	For single	SV3000-50-1A-□□	C6: With ø6 One-touch fitting C8: With ø8 One-touch fitting C10: With ø10 One-touch fitting (Tie-rod for station additions ⑬ and gaskets ⑩, ⑪, and ⑫ are included.)
	For double	SV3000-50-2A-□□	
SV4000	For single	SV4000-50-1A-□□	C8: With ø8 One-touch fitting C10: With ø10 One-touch fitting C12: With ø12 One-touch fitting 02: Rc 1/4    02N: NPT 1/4 03: Rc 3/8    03N: NPT 3/8 02F: G 1/4    02T: NPTF 1/4 03F: G 3/8    03T: NPTF 3/8 (Tie-rod for station additions ⑬ and gaskets ⑩, ⑪, and ⑫ are included.)
	For double	SV4000-50-2A-□□	

② Supply/Exhaust end block assembly **SV** □□□□ - 52U - 1 A □□□□

③ Supply/Exhaust block assembly **SV** □□□□ - 51D □□□□ A □□□□

Series	
1	SV1000
2	SV2000
3	SV3000
4	SV4000

Connector entry direction (D-sub, flat types only)	
1	Upward
2	Lateral

### Supply/Exhaust block assembly specification

10	For EX500 (SI unit)
11	For EX250 (SI unit)
12	For circular connector
13	For D-sub connector
14	For Flat ribbon cable connector (26 pins)
15	For Flat ribbon cable connector (20 pins)
16	For Flat ribbon cable connector (10 pins)
18	For EX120 (SI unit)

\* Since EX500 and EX120 type SI units are not included, order them separately.

### Pilot specification

Nil	Internal pilot specification
S	Internal pilot/Built-in silencer
R	External pilot specification
RS	External pilot/Built-in silencer

Mounting	
Nil	Direct mount
D0	DIN rail mount

### P, E port size

C8	ø8 One-touch fitting	SV1000
N9	ø5/16" One-touch fitting	
C10	ø10 One-touch fitting	SV2000
N11	ø3/8" One-touch fitting	
C12	ø12 One-touch fitting	SV3000
N11	ø3/8" One-touch fitting	
03	Rc 3/8	SV4000
03F	G 3/8	
03N	NPT 3/8	
03T	NPTF 3/8	SV4000
00	Plug	

\* "00" (Plug) is not available for S, R and RS types.

No.	Description	Part no.				Note
		SV1000	SV2000	SV3000	SV4000	
④	Series EX500 SI unit	Refer to page 14.				
⑤	Series EX250 SI unit	EX250-SDN1				For DeviceNet
		EX250-SPR1				For PROFIBUS-DP
⑥	Series EX250 input block	EX250-IE1				M12, 2 inputs
		EX250-IE2				M12, 4 inputs
		EX250-IE3				M8, 4 inputs
		EX250-EA1				With mounting screws (M3 x 10, 2 pcs.)
⑦	Series EX250 end plate assembly	EX250-EA1				
⑧	EX250 clamp assembly	SV1000-78A				
⑨	Series EX120 SI unit	Refer to page 32.				
⑩	Gasket	SX3000-57-4	SX5000-57-6	SX7000-57-5	SY9000-11-2	
⑪	Connector gasket	SX3000-146-2	SX3000-146-2	SX3000-146-2	SX3000-146-2	
⑫	Manifold block gasket	SX3000-181-1	SX5000-138-1	SV3000-65-1	SV4000-65-1	
⑬	Tie-rod	SV1000-55-1-□□	SV2000-55-1-□□	SV3000-55-1-□□	SV4000-55-1-□□	□□: Manifold stations
⑭	Tie-rod for station addition	SV1000-55-2-1	SV2000-55-2A	SV3000-55-2A	SV4000-55-2A	
⑮	Round head combination screw (Valve mounting screw)	SX3000-22-2	SV2000-21-1	SV3000-21-1	SV2000-21-2	
		(M2 x 24)	(M3 x 30)	(M4 x 35)	(M3 x 40)	
⑯	DIN rail	VZ1000-11-1-□	VZ1000-11-1-□	VZ1000-11-4-□	VZ1000-11-4-□	Refer to DIN rail dimension tables on page 1.1-93.
⑰	Clamp assembly	SV1000-69A	SV1000-69A	SV3000-69A	SV3000-69A	

Note) Two pieces of ⑬ and ⑭ (tie-rod) are required for Series SV1000, and three pieces are required for Series SV2000, 3000 and 4000.  
Two pieces of ⑮ (valve mounting screw) are required for Series SV1000, 2000 and 3000, and three pieces are required for Series SV4000.

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

## Type 10: Tie-rod Base Manifold Replacement Parts

### Adding manifold bases (type 10)

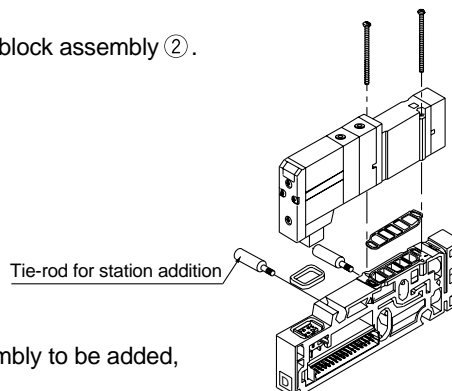
1 Loosen the U side screws (a), and remove the supply/exhaust end block assembly (2).



2 Screw in the tie-rods for station addition.  
(Screw them in until there is no gap between the tie-rods.)



3 Connect the manifold assembly and supply/exhaust end block assembly to be added, and tighten the screws (a).



**⚠ Caution** Tightening torques  
 SV1000, SV2000 0.6N·m  
 SV3000 1.4N·m  
 SV4000 2.9N·m

(Note) When eliminating manifold stations, the appropriate tie-rods (3) for the desired change should be ordered separately.  
 (When equipped with a DIN rail, be sure to tighten the DIN rail holding screws after tightening the tension bolts.)

### ⚠ Caution

#### Fitting assembly replacement

By replacing manifold fitting assemblies, it is possible to change the size of the A, B ports and P, E ports. To replace them, remove the clip with a flat head screw driver, etc., and pull out the fitting assembly. Mount the new fitting assembly by inserting it and then replacing the clip to its fully inserted position.


#### Fitting assembly part numbers

Port size		SV1000	SV2000	SV3000	SV4000
A, B port	ø3.2 One-touch fitting	VVQ1000-50A-C3	—	—	—
	ø4 One-touch fitting	VVQ1000-50A-C4	VVQ1000-51A-C4	—	—
	ø6 One-touch fitting	VVQ1000-50A-C6	VVQ1000-51A-C6	VVQ2000-51A-C6	—
	ø8 One-touch fitting	—	VVQ1000-51A-C8	VVQ2000-51A-C8	VVQ4000-50B-C8
	ø10 One-touch fitting	—	—	VVQ2000-51A-C10	VVQ4000-50B-C10
	ø12 One-touch fitting	—	—	—	VVQ4000-50B-C12
	N1 One-touch fitting	VVQ1000-50A-N1	—	—	—
	N3 One-touch fitting	VVQ1000-50A-N3	VVQ1000-51A-N3	—	—
	N7 One-touch fitting	VVQ1000-50A-N7	VVQ1000-51A-N7	VVQ2000-51A-N7	—
	N9 One-touch fitting	—	VVQ1000-51A-N9	VVQ2000-51A-N9	VVQ4000-50B-N9
	N11 One-touch fitting	—	—	VVQ2000-51A-N11	VVQ4000-50B-N11
	1/4 threaded type port block assembly	—	—	—	SY9000-58A-02□
	3/8 threaded type port block assembly	—	—	—	SY9000-58A-03□
P, E port	ø8 One-touch fitting	VVQ1000-51A-C8	—	—	—
	ø10 One-touch fitting	—	VVQ2000-51A-C10	—	—
	ø12 One-touch fitting	—	—	VVQ4000-50B-C12	VVQ4000-50B-C12
	N9 One-touch fitting	VVQ1000-51A-N9	—	—	—
	N11 One-touch fitting	—	VVQ2000-51A-N11	VVQ4000-50B-N11	VVQ4000-50B-N11
	3/8 threaded type port block assembly	—	—	—	SY9000-58B-03□



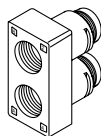
## 1/4, 3/8 threaded type port block assembly part numbers

For A, B port

**SY9000 – 58A – 02** 

For P, E port

**SY9000 – 58B – 03** 



• **Thread type**

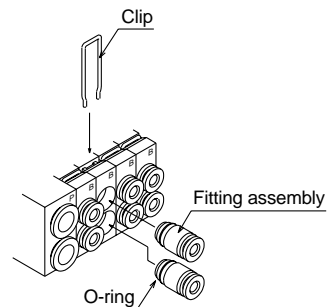
Nil	Rc
F	G
N	NPT
T	NPTF

Note 1) Be careful to avoid damage or contamination of O-rings, as this can cause air leakage.

Note 2) When removing a fitting assembly from a valve, after removing the clip, attach tubing or a plug (KQP-□□) to the One-touch fitting, and pull it out while holding the tubing (or plug). If it is pulled out while holding the release button of the fitting assembly (resin part), the release button may be damaged.

However, 02 and 03 port block assemblies should be pulled out as they are.







Note 3) Be sure to shut off the power and air supplies before disassembly. Furthermore, since air may remain inside the actuator, piping and manifold, confirm that the air is completely exhausted before performing any work.



## How to order tie-rod type 10 solenoid valves with manifold block

[Series SV1000 to SV4000]

• Type with manifold block is used when adding stations, etc.

**SV 1 1 0 0**   **– 5 F**    

• **Series**

1	SV1000
2	SV2000
3	SV3000
4	SV4000

• **Type of actuation**

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

\* 4 position dual 3 port valves are applicable to series SV1000 and SV2000 only.

• **Pilot specification**

Nil	Internal pilot
R	External pilot

\* External pilot specification is not available for 4 position dual 3 port valves.

• **Back pressure check valve**

Nil	None
K	Built-in

\* Back pressure check valve is not available for 3 position closed center and 3 position pressure center.

\* Built-in back pressure check valve type is applicable to series SV1000 only.

\* Flow rate with the built-in back pressure check valve is reduced approximately 20%.

• **A, B port size**

Refer to A, B port size table on pages 1.1-16, 1.1-41, 1.1-52, 1.1-62 and 1.1-73.

• **Manifold wiring specification**

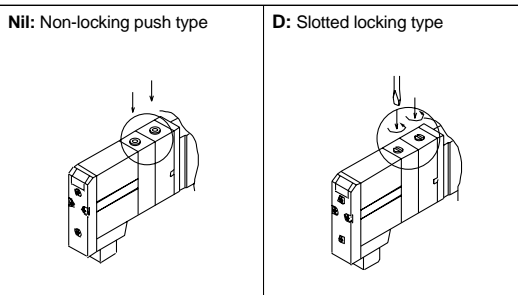
Nil	Double wiring
S	Single wiring

• **Manifold block type**

T	Tie-rod type 10 with manifold block
---	-------------------------------------

Note) Tie-rod type 10 includes tie-rods for station additions.

• **Manual override**



• **Light/Surge voltage suppressor**

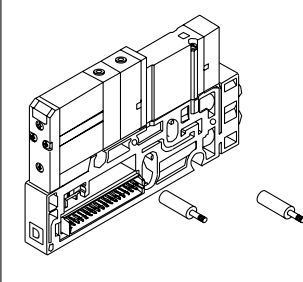
U	With light and surge voltage suppressor
R	With surge voltage suppressor

• **Rated voltage**

5	24VDC
6	12VDC

\* Note that serial wiring manifolds (EX500, EX250 and EX120) are only available with 24VDC.

Example (SV1000)  
SV1200-5FU-T-C6



- SV**
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7

- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

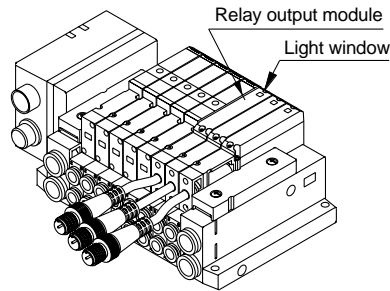
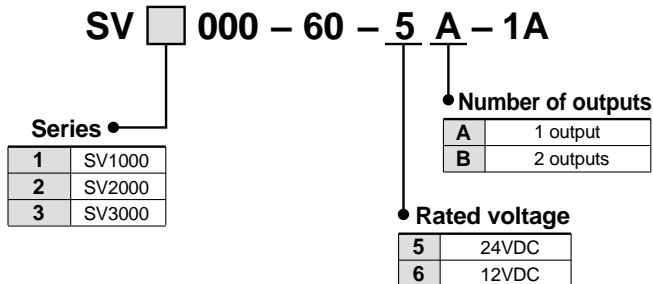
# Series SV

## Manifold Options (Common for types 16 and 10)

### Relay output module

By adding a relay output module to a series SV manifold, devices up to 110VAC, 3A (large type solenoid valves, etc.) can be controlled together with series SV valves.

#### How to Order



\* Note that serial wiring manifolds (EX500, EX250 and EX120) are available with 24VDC only.

#### Relay output module specifications

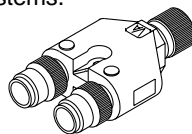
Item	Specification			
Number of outputs	1 output [connector with lead wire (M12)]		2 outputs [connector with lead wire (M12)]	
Output type	4 pin connector (M12) plug ① —                      ② ③ —                      ④ ④ Output A Contact type ("a" contact)      Relay output module side pin arrangement		4 pin connector (M12) plug ① Output B                      ②                      ① ③ Output B                      ④                      ③ ④ Output A                      ④                      ④ Contact type ("a" contact)      Relay output module side pin arrangement	
Load voltage	110VAC	30VDC	110VAC	30VDC
Load current	3A	3A	0.3A	1A
Indicator light	Orange		A side: Orange B side: Green	
Current consumption	20mA or less			
Polarity	Non-polar			
Weight g	48			

### Y type connector

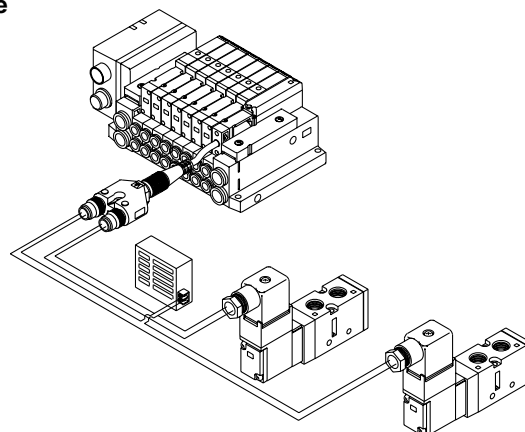
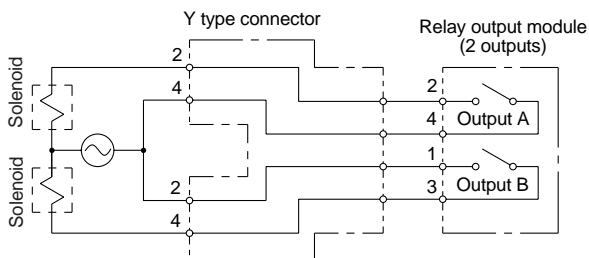
Used to branch a two output relay output module to two separate systems.

#### How to Order

EX500 – ACY00 – S



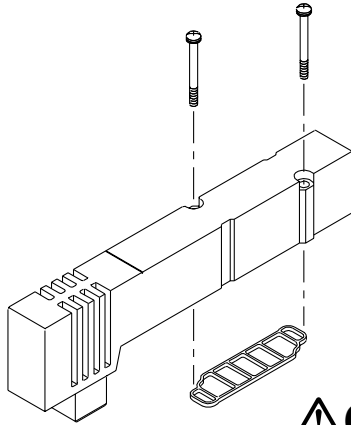
#### Relay output module and Y type connector wiring example



## Manifold Options

### ■ Blanking plate assembly

Used in situations where valves will be added in the future, and for maintenance, etc.



### ⚠ Caution

Mounting screw tightening torques

M2: 0.15N·m  
M3: 0.6N·m  
M4: 1.4N·m

Series	Blanking plate assembly part no.
SV1000	SV1000-67-1A
SV2000	SV2000-67-1A
SV3000	SV3000-67-1A
SV4000	SV4000-67-1A

### ■ SUP/EXH block disks

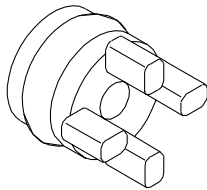
[SUP block disk]

By placing a SUP block disk in a manifold valve's pressure supply passage, two different high and low pressures can be supplied to one manifold.

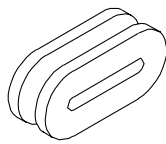
[EXH block disk]

By placing an EXH block disk in a manifold valve's exhaust passage, the valve's exhaust can be separated so that it will not affect other valves.

It can also be used on a manifold with mixed positive pressure and vacuum. (Two pieces are required to block EXH on both sides. However, series SV1000 and 2000 type 10 manifolds require only one piece.)



Cassette base type 16



Tie-rod base type 10

Series	Manifold type	SUP block disk	EXH block disk
SV1000	10	SV1000-59-1A	SV1000-59-2A
	16	SX3000-77-1A	SX3000-77-1A
SV2000	10	SV2000-59-1A	SV2000-59-2A
	16	SV2000-59-3A	SV2000-59-3A
SV3000	10	SV3000-59-1A	SV3000-59-1A
SV4000	10	SY9000-57-1A	SY9000-57-1A

### ■ Block disk labels

These labels are attached to manifolds in which SUP and EXH block disks have been installed, in order to identify the installed locations. (Three sheets each included.)

\* When manifolds are ordered with block disks installed, the labels will be attached where the block disks are installed.

### SV1000 – 74 – 1A

SUP block disk label



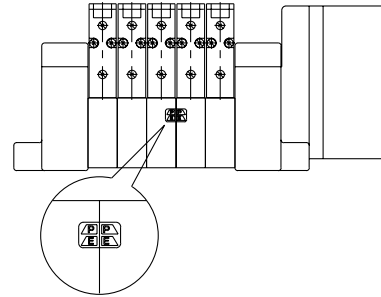
EXH block disk label



SUP, EXH block disk label

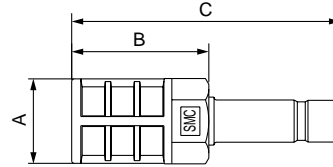


\* When ordering a manifold and block disks together using a manifold specification sheet, etc., labels will be attached where block disks are installed prior to shipment from the factory.



### ■ Silencer with One-touch fitting

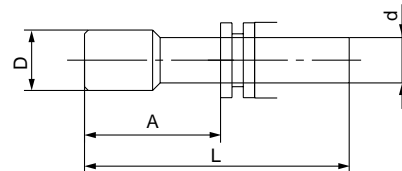
This silencer can be quickly mounted on the manifold's E (exhaust) port.



Series	Model	Effective area	A	B	C
SV1000 (for ø8)	AN203-KM8	14mm <sup>2</sup>	ø16	26	51
SV2000 (for ø10)	AN200-KM10	26mm <sup>2</sup>	ø22	53.8	80.8
	AN300-KM10	30mm <sup>2</sup>	ø25	70	97
SV3000 SV4000 (for ø12)	AN300-KM12	41mm <sup>2</sup>	ø25	70	98

### ■ Plug (white)

These are inserted in unused cylinder ports and P, E ports.



Applicable fitting size d	Model	A	L	D
ø4	KQ2P-04	16	32	ø6
ø6	KQ2P-06	18	35	ø8
ø8	KQ2P-08	20.5	39	ø10
ø10	KQ2P-10	22	43	ø12
ø12	KQ2P-12	24	44.5	ø14
ø1/8"	KQ2P-01	16	31.5	ø5
ø5/32"	KQ2P-03	16	32	ø6
ø1/4"	KQ2P-07	18	35	ø8.5
ø5/16"	KQ2P-09	20.5	39	ø10
ø3/8"	KQ2P-11	22	43	ø11.5

SV  
SY  
SYJ  
SX  
VK  
VZ  
VF  
VFR  
VP7

VQC  
SQ  
VQ  
VQ4  
VQ5  
VQZ  
VQD  
VFS  
VS  
VS7  
VQ7

# Series SV

## Manifold Options

### Additional Supply / Exhaust

For SV1000

SV1000 — 38 — 1A — C6

Supply / Exhaust

38	SUP
39	EXH

Port size

C3	Ø3,2 One-touch fitting
C4	Ø4 One-touch fitting
C6	Ø6 One-touch fitting
N1	Ø1/8" One-touch fitting
N3	Ø5/32" One-touch fitting
N7	Ø1/4" One-touch fitting

For SV2000, 3000, 4000

SV 2000 — 38 — 1 F A

Series

2	SV2000
3	SV3000
4	SV4000

Supply / Exhaust

38	SUP
39	EXH

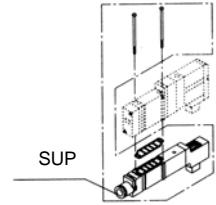
Thread type

-	Rc
F	G
N	NPT
T	NPTF

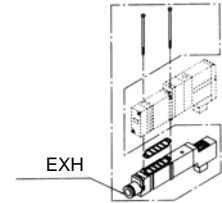
Thread port

SV2000	1/8
SV3000	1/4
SV4000	1/4

SUP

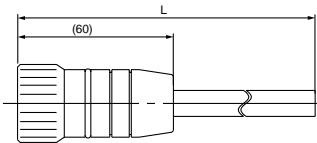


EXH



### Circular connector cable assembly (26 pin)

GAXT100-MC26-□



Port cable length

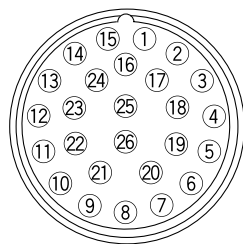
Part no.	L dimension
GAXT100-MC26-015	1.5m
GAXT100-MC26-030	3m
GAXT100-MC26-050	5m

Lead wire colours according to pin numbers

The colour code is according to DIN47100.

Pin no.	Cable colour	Identification
1	white	-
2	brown	-
3	green	-
4	yellow	-
5	grey	-
6	pink	-
7	blue	-
8	red	-
9	black	-
10	violet	-
11	grey	pink
12	red	blue
13	white	green
14	brown	green
15	white	yellow
16	yellow	brown
17	white	grey
18	grey	brown
19	white	pink
20	pink	brown
21	white	blue
22	brown	blue
23	white	red
24	brown	red
25	white	black
26 *	bridged to pin 25	

Connector pin number  
(Arrangement as seen from the cable's port side)



Electrical characteristics

Item	Characteristics
Conductor resistance Ω/km, 20°C	57 or less
Electric strength V, 5min, AC	1500
Insulation resistance MΩ/km	20

\* only for circular connectors

(See also AXT100-MC26-□  
which conforms to colour code MIL-C24308)

### D-sub connector cable assembly (25 pin)

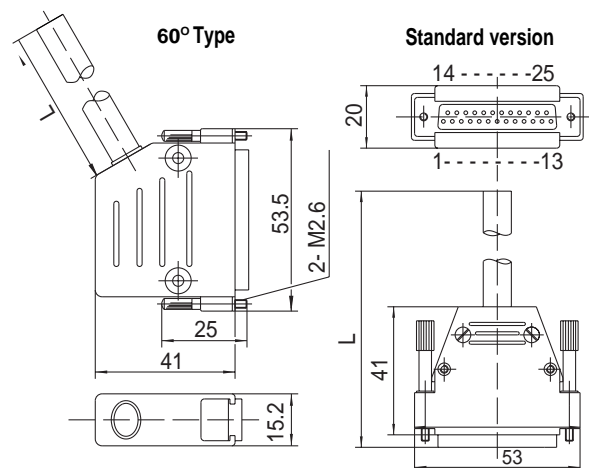
GVVZS3000-21A-□

D sub connector / cable

Cable length (L)	Part no.	Plug type
1m	GVVZS3000-21A-160	60° outlet
3m	GVVZS3000-21A-260	60° outlet
5m	GVVZS3000-21A-360	60° outlet
8m	GVVZS3000-21A-460	60° outlet
3m	GVVZS3000-21A-2	Standard
5m	GVVZS3000-21A-3	Standard
8m	GVVZS3000-21A-4	Standard

Shielded cable

Cable length (L)	Part no.	Cable type
1m	GVVZS3000-21A-1S	shielded
3m	GVVZS3000-21A-2S	shielded
5m	GVVZS3000-21A-3S	shielded
8m	GVVZS3000-21A-4S	shielded
20m	GVVZS3000-21A-5S	on demand



Standard version  
(See also VVZS3000-21A-□  
which conforms to colour code MIL-C24308)

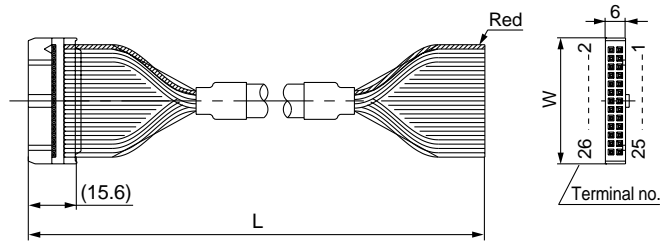
**Manifold Options**

**■ Flat ribbon cable/Cable assembly**

**AXT100 – FC □ – □**

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

\* When a commercially available connector is required, use a strain relief type conforming to MIL-C-83503.



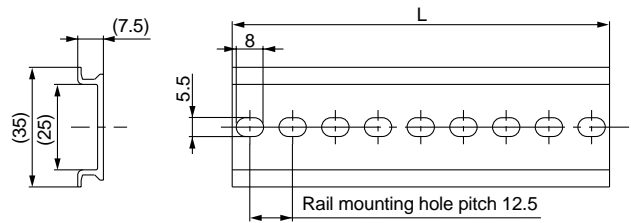
Connector manufacturers

- HIROSE ELECTRIC CO., LTD.
- Sumitomo/3-M Limited
- Japan Aviation Electronics Industry, Ltd.
- Fujitsu, Ltd.
- J.S.T. Mfg. Co., Ltd.

**■ SV1000, 2000 and series EX500 input unit  
DIN rail dimensions and weights**

**VZ1000 – 11 – 1 – □**

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



No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L dimension	98	110.5	123	135.5	148	160.5	173	185.5	198	210.5	223	235.5	248	260.5	273	285.5	298	310.5	323	335.5	348
Weight (g)	17.6	19.9	22.1	24.4	26.6	28.9	31.1	33.4	35.6	37.9	40.1	42.4	44.6	46.9	49.1	51.4	53.6	55.9	58.1	60.4	62.5

No.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
L dimension	360.5	373	385.5	398	410.5	423	435.5	448	460.5	473	485.5	498	510.5	523	535.5	548	560.5	573	585.5	598	610.5
Weight (g)	64.9	67.1	69.4	71.6	73.9	76.1	78.4	80.6	82.9	85.1	87.4	89.6	91.9	94.1	96.4	98.6	100.9	103.1	105.4	107.6	109.9

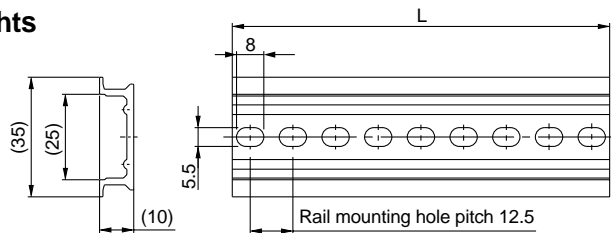
No.	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62
L dimension	623	635.5	648	660.5	673	685.5	698	710.5	723	735.5	748	760.5	773	785.5	798	810.5	823	835.5	848	860.5	873
Weight (g)	112.1	114.4	116.6	118.9	121.1	123.4	125.6	127.9	130.1	132.4	134.6	136.9	139.1	141.4	143.6	145.9	148.1	150.4	152.6	154.9	157.1

No.	63	64	65	66	67	68	69	70	71
L dimension	885.5	898	910.5	923	935.5	948	960.5	973	985.5
Weight (g)	159.4	161.6	163.9	166.1	168.4	170.6	172.9	175.1	177.4

**■ SV3000 and 4000 DIN rail dimensions and weights**

**VZ1000 – 11 – 4 – □**

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



No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L dimension	98	110.5	123	135.5	148	160.5	173	185.5	198	210.5	223	233.5	248	260.5	273	285.5	298	310.5	323	335.5	348
Weight (g)	24.8	28	31.1	34.3	37.4	40.6	43.8	46.9	50.1	53.3	56.4	59.6	62.7	65.9	69.1	72.2	75.4	78.6	81.7	84.9	88

No.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
L dimension	360.5	373	385.5	398	410.5	423	435.5	448	460.5	473	485.5	498	510.5	523	535.5	548	560.5	573	585.5	598	610.5
Weight (g)	91.2	94.4	97.5	100.7	103.9	107	110.2	113.3	116.5	119.7	122.8	126	129.2	132.3	135.5	138.6	141.8	145	148.1	151.3	154.5

No.	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62
L dimension	623	635.5	648	660.5	673	685.5	698	710.5	723	735.5	748	760.5	773	785.5	798	810.5	823	835.5	848	860.5	873
Weight (g)	157.6	160.8	163.9	167.1	170.3	173.4	176.6	179.8	182.9	186.1	189.2	192.4	195.6	198.7	201.9	205.1	208.2	211.4	214.5	217.7	220.9

No.	63	64	65	66	67	68	69	70	71
L dimension	885.5	898	910.5	923	935.5	948	960.5	973	985.5
Weight (g)	224	227.2	230.4	233.5	236.7	239.8	243	246.2	249.3

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

# SV1000/2000/3000/4000 Single Valve/Sub-plate Type [IP67 Protection]

## How to Order

SV 1 1 00    — 5 W1 U D —      

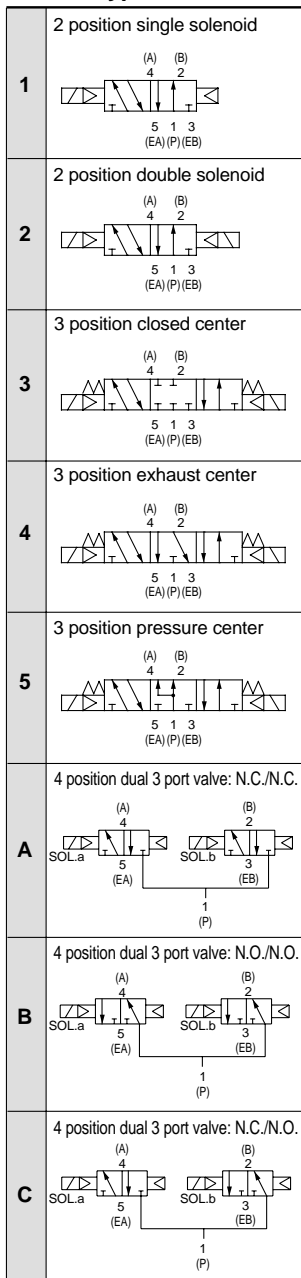
### Series

1	SV1000
2	SV2000
3	SV3000
4	SV4000

### Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

### Type of actuation



### Pilot specification

Nil	Internal pilot
R	External pilot

\* External pilot specification is not available for 4 position dual 3 port valves.

### Rated voltage

5	24VDC
6	12VDC

### M12 waterproof connector

Symbol	Cable length (mm)
W1	300
W2	500
W3	1000
W4	2000
W7	5000

### Port size

Symbol	Port size	Applicable series
Nil	Without sub-plate	
01	1/8	SV1000
02	1/4	SV2000 SV3000
03	3/8	SV3000
04	1/2	SV4000

### Manual override

Nil	Non-locking push type
D	Slotted locking type

### Light/Surge voltage suppressor

U	With light and surge voltage suppressor
R	With surge voltage suppressor

SV3000 and 4000 are not available with dual 3 port valve.

## Series SV Solenoid Valve Specifications



Fluid		Air
Internal pilot operating pressure range MPa	2 position single	0.15 to 0.7
	4 position dual 3 port valve	
	2 position double	0.1 to 0.7
3 position		0.2 to 0.7
External pilot operating pressure range MPa	Operating pressure range	-100kPa to 0.7
	2 position single, double	0.25 to 0.7
	3 position	
Ambient and fluid temperature °C		-10 to 50 (with no freezing)*
Maximum operating frequency Hz	2 position single, double	5
	4 position dual 3 port valve	
	3 position	3
Manual override		Non-locking push type Slotted locking type
Pilot exhaust method	Internal pilot	Main valve/Pilot valve common exhaust Pilot valve individual exhaust
	External pilot	
Lubrication		Not required
Mounting orientation		Unrestricted
Impact/Vibration resistance ms <sup>2</sup>		150/30 (8.3 to 2000Hz)
Enclosure		IP67 (based on IEC529)
Electrical entry		M12 waterproof connector
Rated coil voltage		24VDC, 12VDC
Allowable voltage fluctuation		±10% of rated voltage
Power consumption W		0.6 (With light: 0.65)
Surge voltage suppressor		Zener diode
Indicator light		LED

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 energized and de-energized states (at initial value).

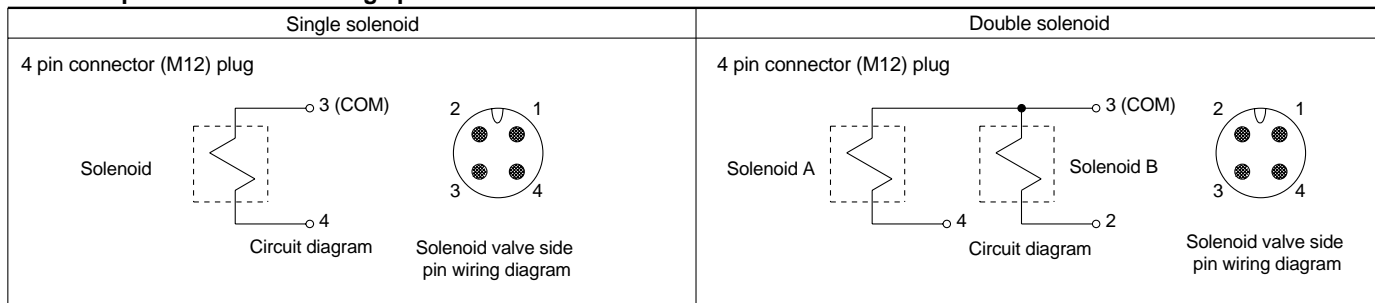
Vibration resistance: No malfunction when tested with one sweep of 8.3 to 2000Hz in the axial direction and at a right angle to the main valve and armature, in both energized and de-energized states (at initial value).

### Response time

Type of actuation	Response time ms (at 0.5MPa)			
	SV1000	SV2000	SV3000	SV4000
2 position single	11 or less	25 or less	28 or less	40 or less
2 position double	10 or less	17 or less	26 or less	40 or less
3 position	18 or less	29 or less	32 or less	82 or less
4 position dual 3 port valve	15 or less	33 or less	—	—

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

### M12 waterproof connector wiring specifications



Note) Solenoid valves do not have polarity.

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

# Series SV

## Model

### Series SV1000

Note) Values inside [ ] are applicable normal position. Values inside ( ) are applicable without sub-plate.

Valve Model	Type of Actuation		Port size	Flow characteristics		Weight (g) <sup>Note)</sup>
				1→4, 2 (P→A, B)	4, 2→5, 3 (A, B→EA, EB)	M12 waterproof connector (cable length 300mm)
				Nl/min	Nl/min	
SV1□00-□-01	2 position	Single	Rc 1/8	236	255	123 (88)
		Double				128 (93)
	3 position	Closed centre		177	187	130 (95)
		Exhaust centre		177	236 [157]	
		Pressure centre		285 [137]	236	
	4 position dual	N.C./N.C.		177	285	128 (93)
		N.O./N.O.		226	206	

### Series SV2000

Valve Model	Type of Actuation		Port size	Flow characteristics		Weight (g) <sup>Note)</sup>
				1→4, 2 (P→A, B)	4, 2→5, 3 (A, B→EA, EB)	M12 waterproof connector (cable length 300mm)
				Nl/min	Nl/min	
SV2□00-□-02	2 position	Single	Rc 1/4	628	648	159 (96)
		Double				163 (100)
	3 position	Closed centre		491	461	168 (105)
		Exhaust centre		432	707 [363]	
		Pressure centre		834 [275]	471	
	4 position dual	N.C./N.C.		540	589	163 (100)
		N.O./N.O.		560	530	

### Series SV3000

Valve Model	Type of Actuation		Port size	Flow characteristics		Weight (g) <sup>Note)</sup>
				1→4, 2 (P→A, B)	4, 2→5, 3 (A, B→EA, EB)	M12 waterproof connector (cable length 300mm)
				Nl/min	Nl/min	
SV3□00-□-02	2 position	Single	Rc 1/4	1079	981	250 (121)
		Double				253 (124)
	3 position	Closed centre		785	707	261 (132)
		Exhaust centre		697	1080 [481]	
		Pressure centre		1276 [638]	618	
SV3□00-□-03	2 position	Single	Rc 3/8	1178	1080	235
		Double				238
	3 position	Closed centre		785	717	246
		Exhaust centre		697	1080 [334]	
		Pressure centre		1276 [628]	647	

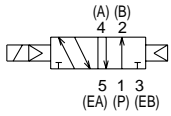
### Series SV4000

Valve Model	Type of Actuation		Port size	Flow characteristics		Weight (g) <sup>Note)</sup>
				1→4, 2 (P→A, B)	4, 2→5, 3 (A, B→EA, EB)	M12 waterproof connector (cable length 300mm)
				Nl/min	Nl/min	
SV4□00-□-03	2 position	Single	Rc 3/8	1962	2453	505 (208)
		Double				509 (212)
	3 position	Closed centre		1767	1669	530 (233)
		Exhaust centre		1669	2748 [932]	
		Pressure centre		2748 [825]	1865	
SV4□00-□-04	2 position	Single	Rc 1/2	2158	2453	484
		Double				488
	3 position	Closed centre		1767	1767	509
		Exhaust centre		1963	3533 [2356]	
		Pressure centre		3239 [923]	1865	

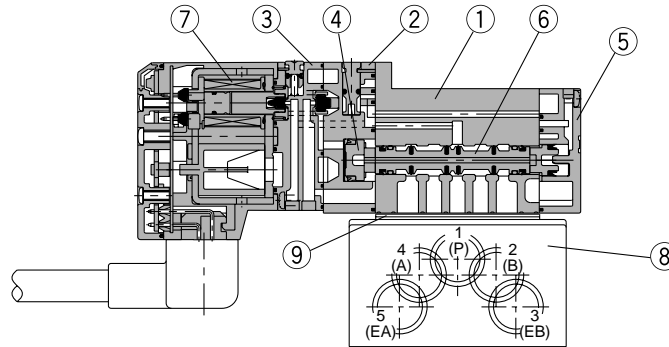


**Construction: SV1000/2000/3000/4000 Single Valve/Sub-plate Type**

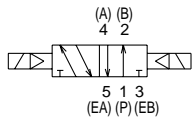
2 position single



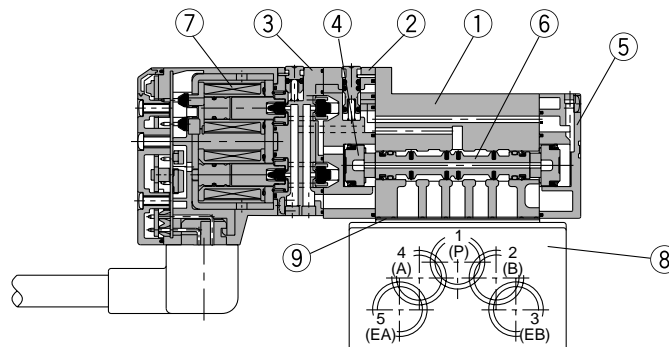
2 position single



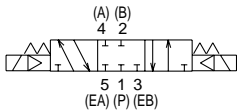
2 position double



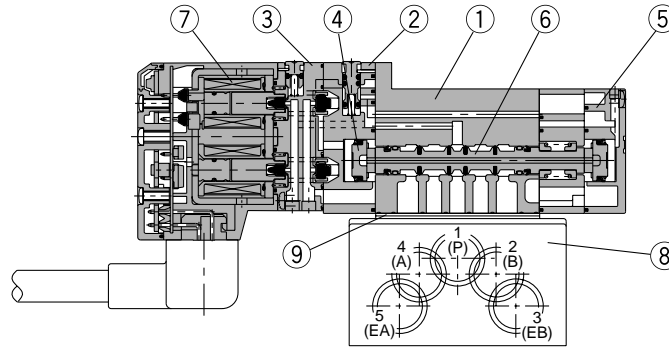
2 position double



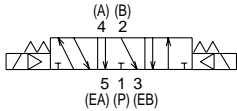
3 position closed centre



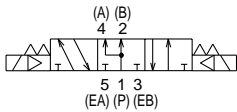
3 position closed centre/exhaust centre/pressure centre



3 position exhaust centre



3 position pressure centre



**Parts list**

No.	Description	Material	Note
1	<b>Body</b>	Die-cast aluminum (SV1000 is die-cast zinc)	White
2	<b>Adapter plate</b>	Resin	White
3	<b>Pilot body</b>	Resin	White
4	<b>Piston</b>	Resin	—
5	<b>End plate</b>	Resin	White
6	<b>Spool valve assembly</b>	Aluminum/H-NBR	—
7	<b>Molded coil</b>	Resin	Gray

**Caution**

Mounting screw tightening torques

- M2: 0.15N·m
- M3: 0.6N·m
- M4: 1.4N·m

**Replacement parts**

No.	Description	Part number				Note
		SV1□00	SV2□00	SV3□00	SV4□00	
8	<b>Sub-plate</b>	SY3000-27-1□-Q	SY5000-27-1□-Q	1/4: SY7000-27-1□-Q 3/8: SY7000-27-2□-Q	3/8: SY9000-27-1□ 1/2: SY9000-27-2□	Die-cast aluminium See thread types on page 1.1-94 for □.
9	<b>Gasket</b>	SY3000-11-25	SY5000-11-18	SY7000-11-14	SY9000-11-2	
—	<b>Round head combination screw</b>	SX3000-22-2 (M2 x 24)	SV2000-21-1 (M3 x 30)	SV3000-21-1 (M4 x 35)	SV2000-21-2 (M3 x 40)	For valve mounting (flat nickel plated)

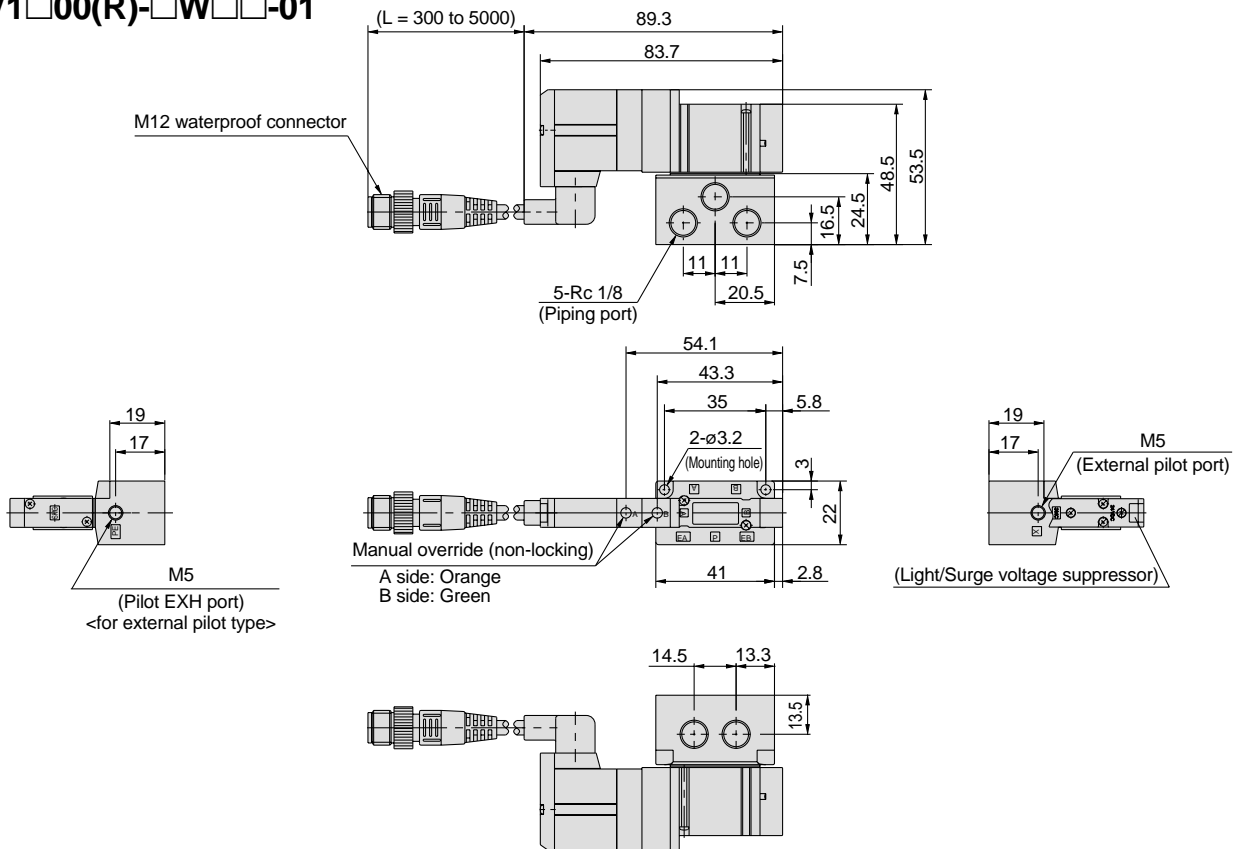
- SV
- SY
- SYJ
- SX
- VK
- VZ
- VF
- VFR
- VP7
- VQC
- SQ
- VQ
- VQ4
- VQ5
- VQZ
- VQD
- VFS
- VS
- VS7
- VQ7

# Series SV

## Dimensions: Series SV1000

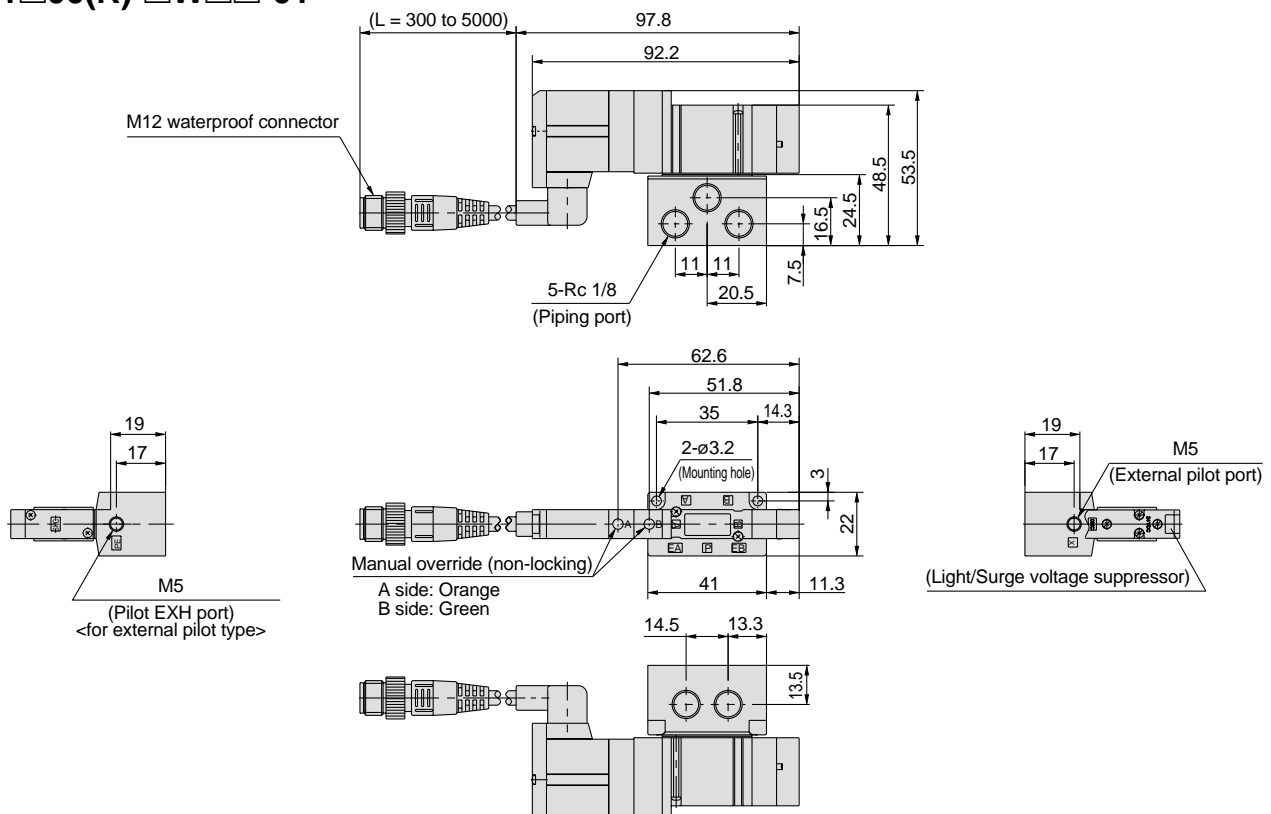
### 2 position single/double/4 position dual 3 port [M12 waterproof connector type]

#### SV1□00(R)-□W□□-01



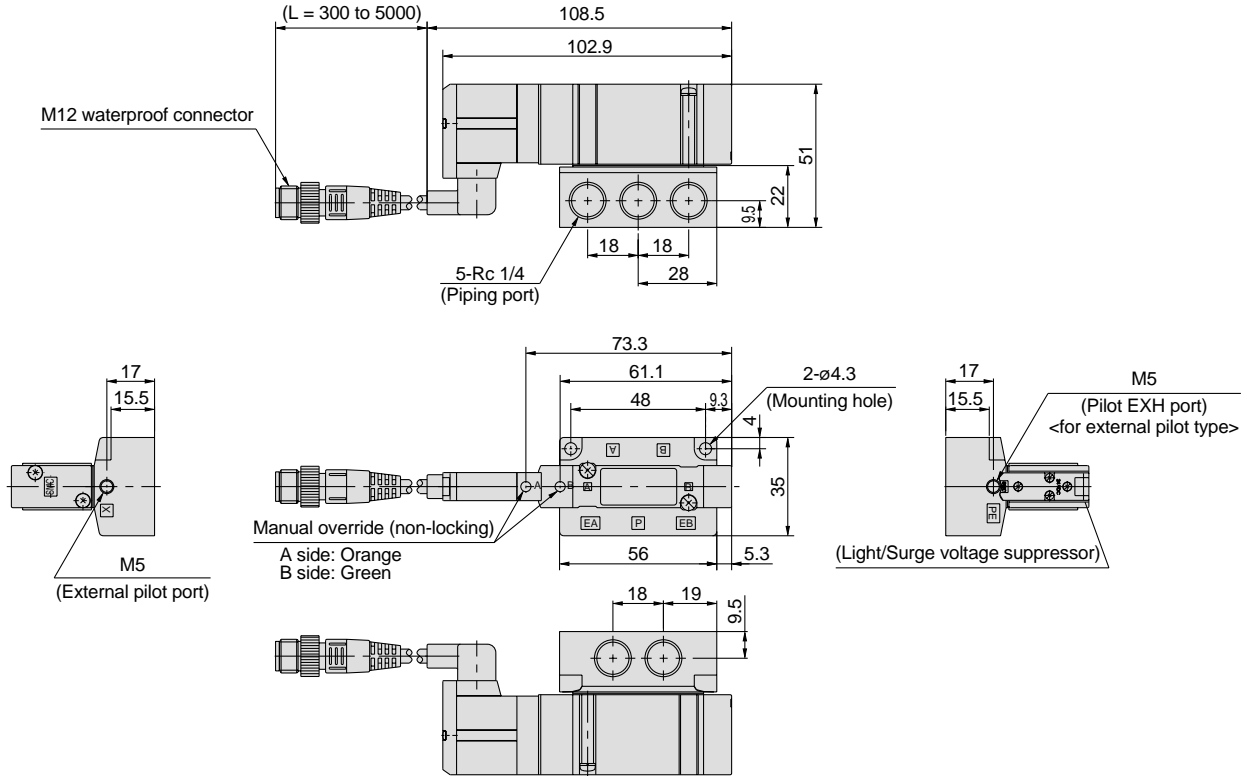
### 3 position closed centre/exhaust centre/pressure centre [M12 waterproof connector type]

#### SV1□00(R)-□W□□-01

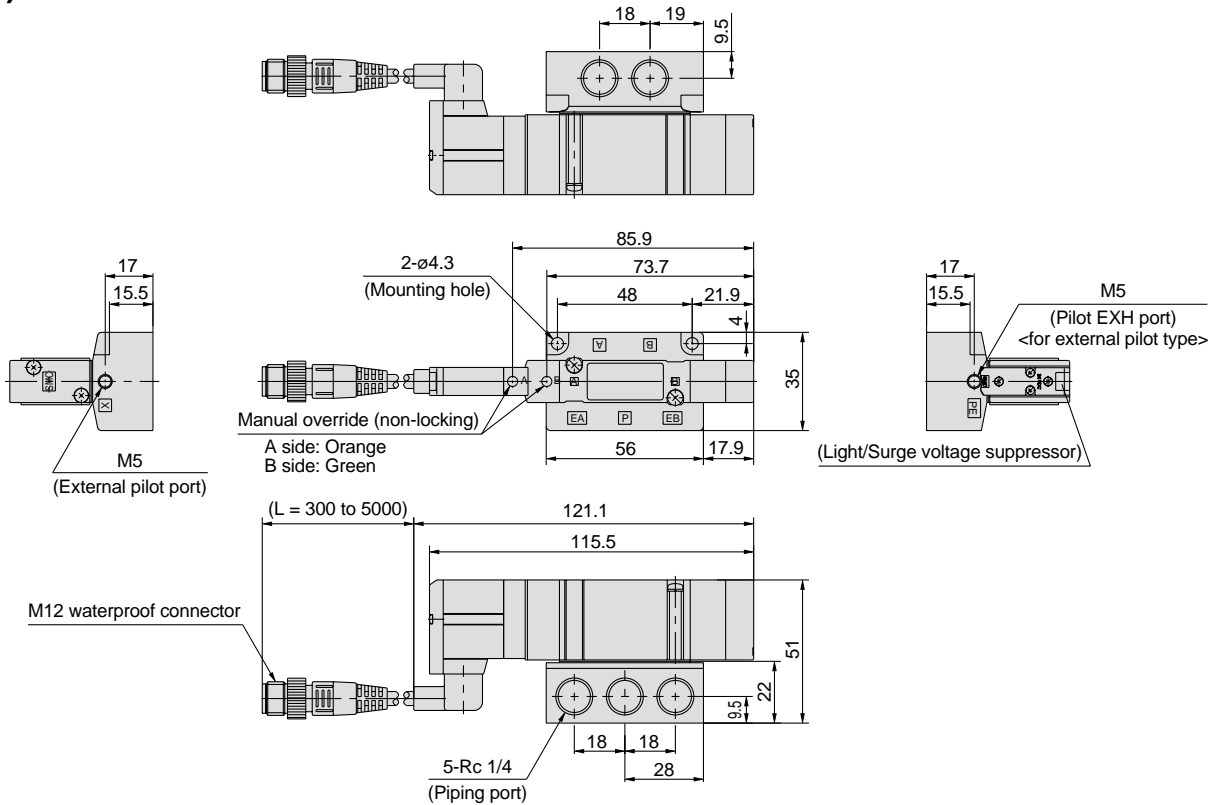


**Dimensions: Series SV2000**

**2 position single/double/4 position dual 3 port [M12 waterproof connector type]  
SV2□00(R)-□W□□-02**



**3 position closed centre/exhaust centre/pressure centre [M12 waterproof connector type]  
SV2□00(R)-□W□□-02**



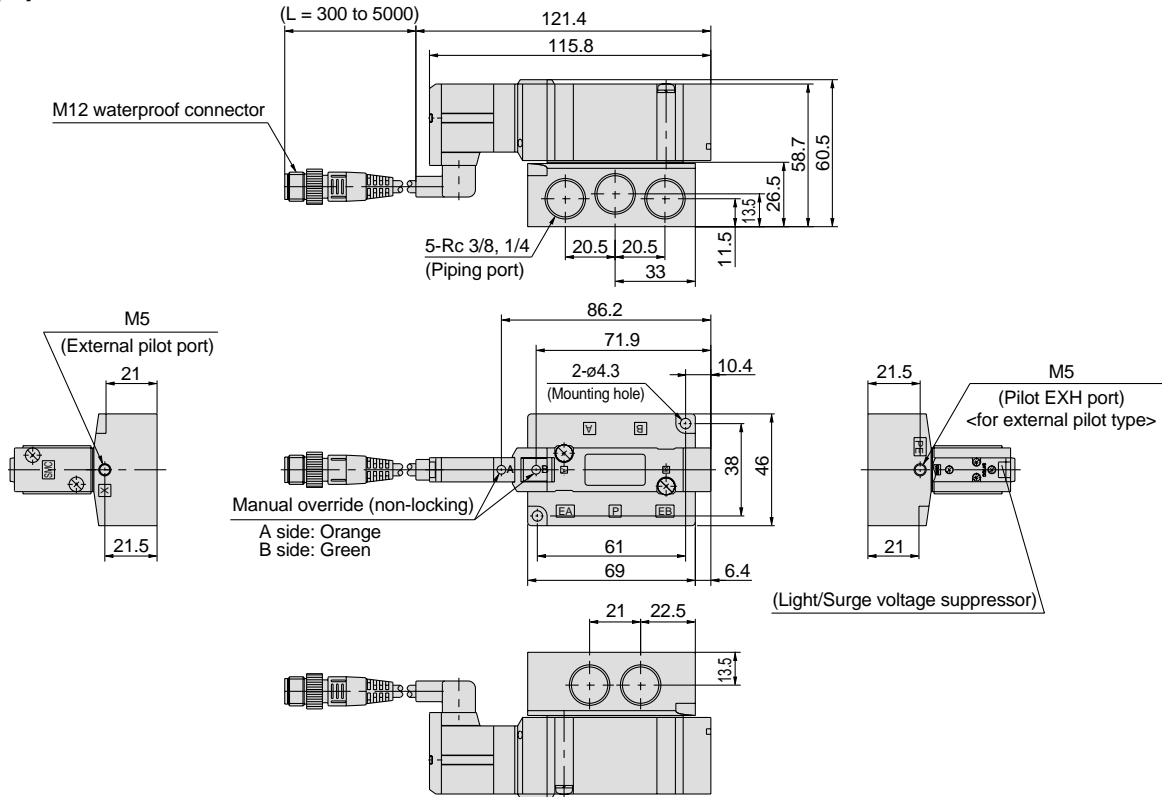
SV
SY
SYJ
SX
VK
VZ
VF
VFR
VP7
VQC
SQ
VQ
VQ4
VQ5
VQZ
VQD
VFS
VS
VS7
VQ7

# Series SV

## Dimensions: Series SV3000

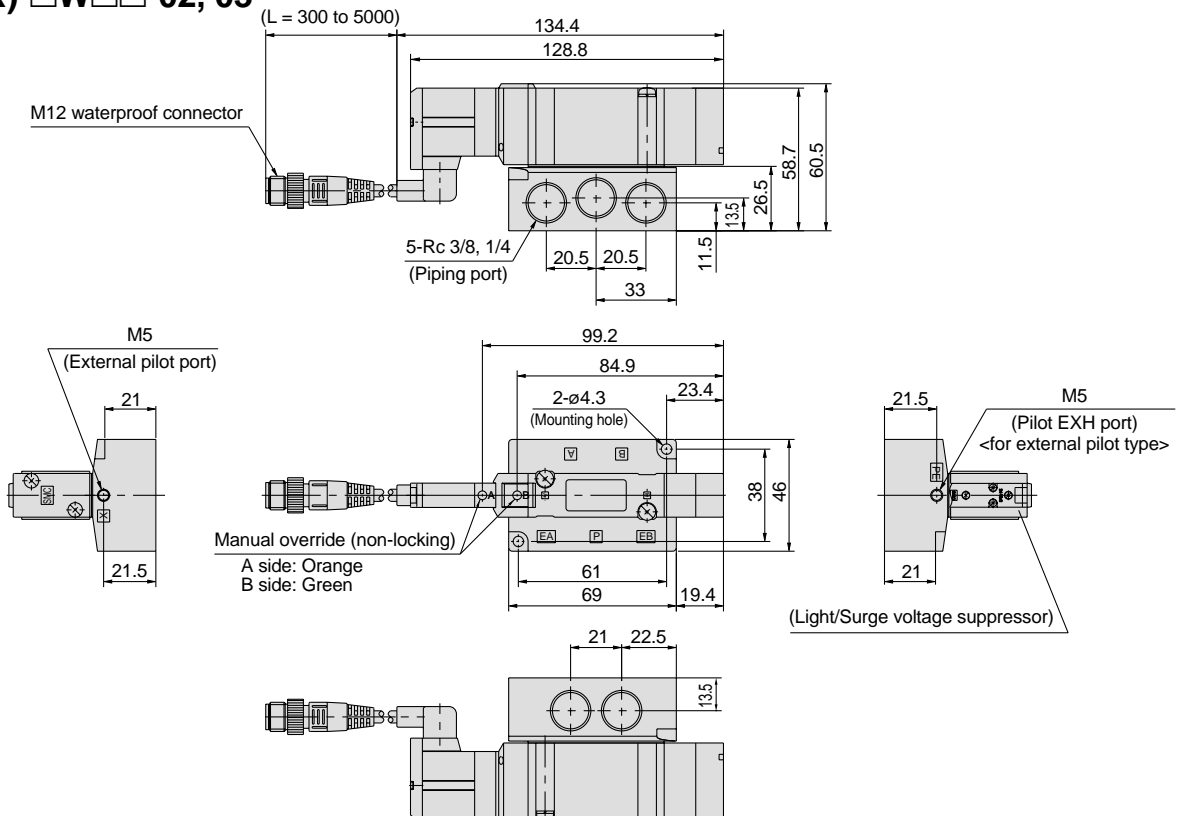
### 2 position single/double [M12 waterproof connector type]

#### SV3□00(R)-□W□□-02, 03



### 3 position closed centre/exhaust centre/pressure centre [M12 waterproof connector type]

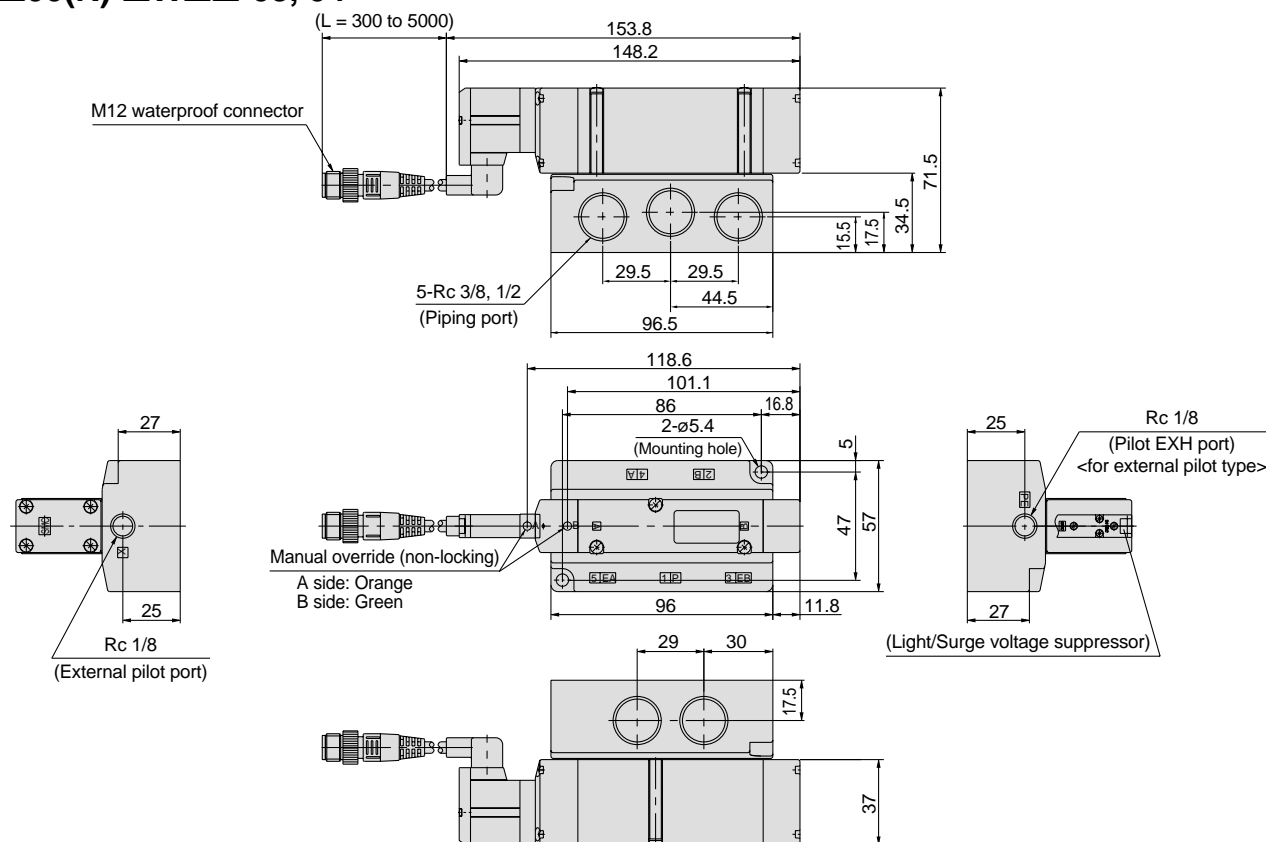
#### SV3□00(R)-□W□□-02, 03



**Dimensions: Series SV4000**

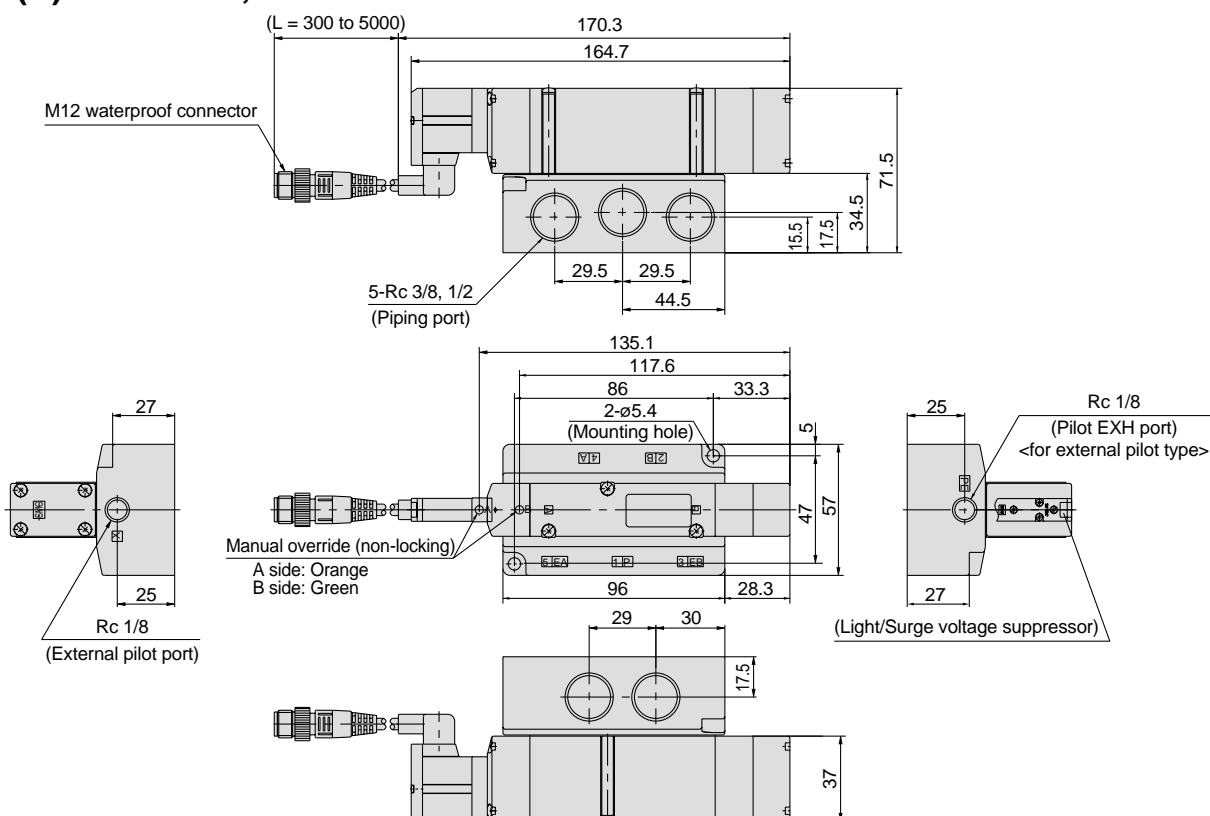
**2 position single/double [M12 waterproof connector type]**

**SV4□00(R)-□W□□-03, 04**



**3 position closed centre/exhaust centre/pressure centre [M12 waterproof connector type]**

**SV4□00(R)-□W□□-03, 04**



<b>SV</b>
<b>SY</b>
<b>SYJ</b>
<b>SX</b>
<b>VK</b>
<b>VZ</b>
<b>VF</b>
<b>VFR</b>
<b>VP7</b>

<b>VQC</b>
<b>SQ</b>
<b>VQ</b>
<b>VQ4</b>
<b>VQ5</b>
<b>VQZ</b>
<b>VQD</b>
<b>VFS</b>
<b>VS</b>
<b>VS7</b>
<b>VQ7</b>

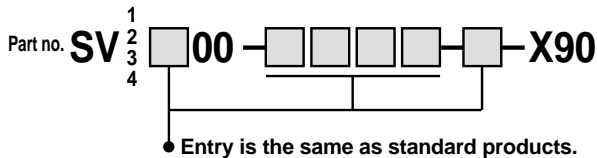


Contact SMC regarding detailed specifications, lead times and pricing.

## 1 Main Valve Fluoro Rubber Specification Symbol -X90

Fluoro rubber is used for rubber parts of the main valve to allow use in applications such as the following.

1. When using a lubricant other than the recommended turbine oil, and there is a possibility of malfunction due to swelling of the spool valve seals.
2. When ozone enters or is generated in the air supply.



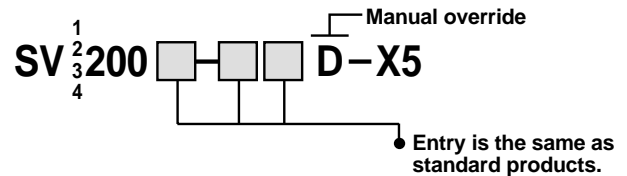
Specifications and performance are the same as standard products.

Note) Because in series-X90 fluoro rubber is used for only main valve, the rubber parts of the application/usage in conditions requiring heat resistance should be avoided.

## 2 Single, Double Common Type Symbol -X5

Single solenoid and double solenoid can be changed at the installation.

### How to order



### Specifications

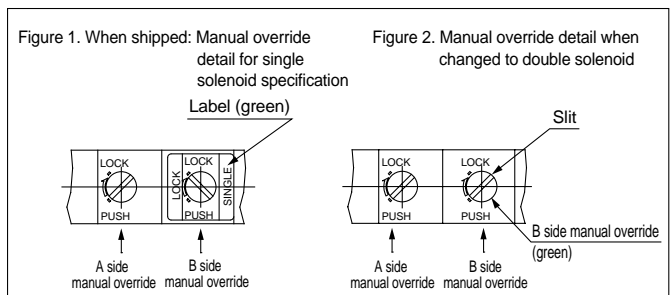
Valve configuration	Pilot type 2 position 5 port solenoid valve		
Type of actuation	Single solenoid, double solenoid common type		
Internal pilot operating pressure range MPa	2 position single	0.15 to 0.7	
	2 position double	0.15 to 0.7	
External pilot operating pressure range MPa	Operating pressure 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	-10 to 50 (with no freezing) Note)		
Power consumption W	0.6 (With light: 0.65)		

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

## ⚠ Caution

### Operating precautions

1. The single solenoid specification is applicable when shipped from the factory. (Refer to Figure 1.)
2. For use as a double solenoid, set the manual override and connector assembly as follows.
  - ①. Remove the B side manual override (green) label, and turn the slit of the B side manual override with a watchmakers screw driver so that it is positioned as shown in Figure 2.
3. When set for double solenoid, do not apply current to solenoids on both sides at the same time.
4. Refer to page 1.1-103 for details on electrical connections and electrical circuits with light and surge voltage suppressor.
5. Dimensions are the same as standard products.





# Series SV Specific Product Precautions 1

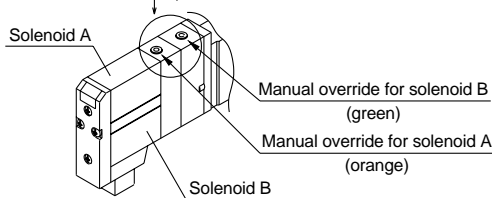
Be sure to read before handling.

## Warning

### Manual override operation

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

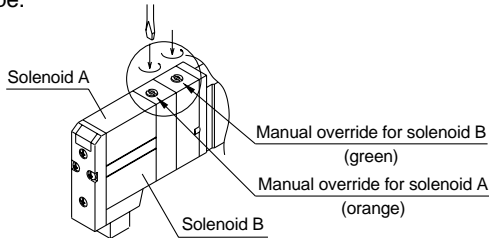
#### Non-locking push type



#### Slotted locking type (screwdriver 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 screwdriver 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 other trouble such as air leakage, etc.

## Caution

### Exhaust restriction

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

## Caution

### Series SV used as a 3 port valve

#### Using a 5 port valve as a 3 port valve

Series SV 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
Actuation	N.C.	N.O.
Number of solenoids	Single	
	Double	

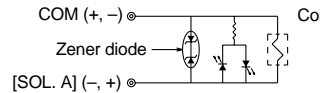
## Caution

### Light/Surge voltage suppressor

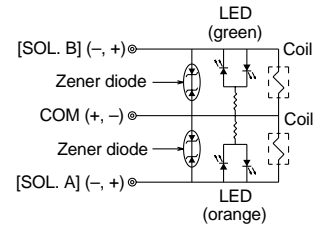
Solenoid valves have no polarity.

#### Light/surge voltage suppressor

Single solenoid type

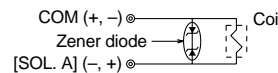


Double solenoid, 3 position type

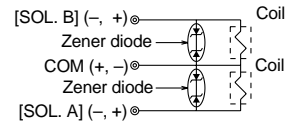


#### Surge voltage suppressor

Single solenoid type



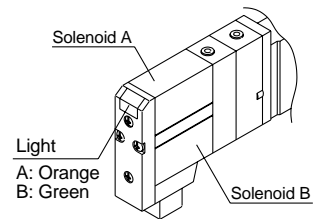
Double solenoid, 3 position type



## Caution

### Light indication

When equipped with light and surge voltage suppressor, the indicator light window turns orange when solenoid A is energized, and it turns green when solenoid B is energized.



SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

VS7

VQ7



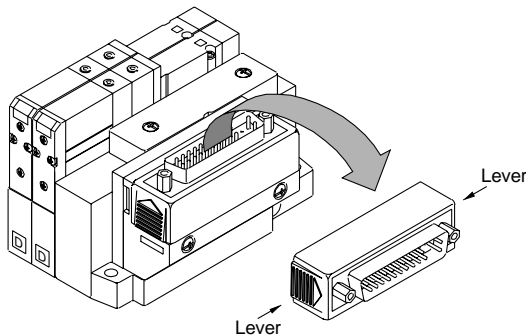
# Series SV Specific Product Precautions 2

Be sure to read before handling.

## ⚠ Caution

### Connector entry directions

Connector entry directions for D-sub connectors and flat ribbon cables can be changed. 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 wire assemblies are attached to the connector, excessive pulling or twisting can cause broken wires or other trouble. Also, take precautions so that lead wires are not caught and pinched when installing the connector.

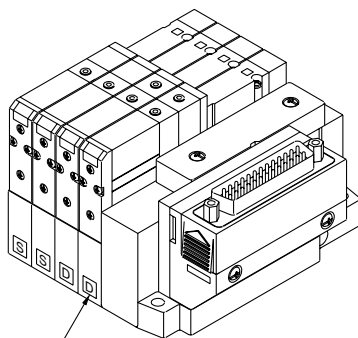


## ⚠ Caution

### How to order manifolds

The letter "S" or "D" is indicated on manifold blocks for series SV as shown below. This indication refers to the type substrate assembly (single wiring or double wiring) inside the manifold blocks.

When the manifold specification sheet does not include a wiring specification, all stations will be double wiring specification (D). In this case, single and double valves can be mounted in any position, but when a single valve is used, there will be an unused control signal. To avoid this, indicate positions of manifold blocks for single wiring specification (S) and double wiring specification (D) on a manifold specification sheet. (Note that double, 3 or 4 position valves cannot be used for manifold blocks with single wiring specification (S).)



## ⚠ Caution

### 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, there is the danger that the tube may be cut diagonally or become flattened, etc., making a secure installation impossible, and causing problems such as the tube pulling out after installation or air leakage. Also 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, and push the collar evenly at the same time.
- 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 end or portion that was connected before reusing it as it may have become worn. If the grabbing or connecting portion of the tube is used as is, this can cause trouble such as air leakage or difficulty in removing the tube.

## ⚠ Caution

### Other tube brands

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

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

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

## ⚠ Caution

### Substrate assemblies inside manifolds

Substrate assemblies inside of manifolds cannot be taken apart. Attempting to do so may damage parts.





# Series SV Specific Product Precautions 3

Be sure to read before handling.

## Serial wiring EX500/EX250/EX120 Precautions

### ⚠ Warning

1. These products are intended for use in general factory automation equipment.  
Avoid using these products in machinery/equipment which affects human safety, and in cases where malfunction or failure can result in extensive damage.
2. Do not use in explosive atmospheres, environments with inflammable gases, or corrosive environments.  
This can cause injury or fire, etc.
3. Work such as transporting, installing, piping, wiring, operation, control and maintenance should be performed by personnel with specialized knowledge.  
There is a danger of electrocution, injury or fire, etc.
4. Install an external emergency stop circuit that can promptly stop operation and shut off the power supply.
5. Do not rebuild these products, as there is a danger of injury and damage.

### ⚠ Caution

1. Read the instruction manual carefully, strictly observe the precautions and operate within the range of the specifications.
2. Do not drop these products or submit them to strong impacts. This can cause damage, failure or malfunction, etc.
3. In locations with poor electrical conditions, take steps to ensure a steady flow of the rated power supply. Use of a voltage outside of the specifications can cause malfunction, damage to the unit, electrocution or fire, etc.
4. Do not touch connector terminals or internal substrates when current is being supplied. There is a danger of malfunction, damage to the unit or electrocution if connector terminals or internal substrates are touched when current is being supplied.  
Be sure that the power supply is OFF when adding or removing manifold valves or input blocks, etc., or when connecting or disconnecting connectors.
5. Operate at an ambient temperature that is within the specifications. Even when the ambient temperature range is within the specifications, do not use in locations where there are rapid temperature changes.
6. Keep wire scraps and other extraneous material from getting inside these products. This can cause fire, failure or malfunction, etc.
7. Give consideration to the operating environment depending on the type of enclosure being used.  
To achieve IP65 protection, provide appropriate wiring between all units using electrical wiring cables, communication connectors and cables with M12 connectors. Also, provide waterproof caps when there are unused ports, and perform proper mounting of input units, input blocks, SI units and manifold valves, etc. Provide a cover or other protection for applications in which there is constant exposure to water.
8. Use the proper tightening torques.  
There is a possibility of damaging threads if tightening exceeds the tightening torque range.

### ⚠ Caution

9. Provide adequate protection when operating in locations such as the following:
  - Where noise is generated by static electricity, etc.
  - Where there is a strong electric field
  - Where there is a danger of exposure to radiation
  - When in close proximity to power supply lines
10. When these products are installed in equipment, provide adequate protection against noise by using noise filters, etc.
11. Since these products are components that are used after installation in other equipment, the customer should confirm conformity to EMC directives for the finished product.
12. Do not remove the name plate.
13. Perform periodic inspections and confirm normal operation. It may otherwise be impossible to guarantee safety due to unexpected malfunction or erroneous operation.

## Power Supply Safety Instructions

### ⚠ Caution

1. Operation is possible with a single power supply or a separate power supply. However, be sure to provide two wiring systems (one for solenoid valves, and one for input and control units).
2. Use the following UL approved products for DC power supply combinations.
  - (1) Controlled voltage current circuit conforming to UL508  
Circuit uses the secondary coil of an isolated transformer as the power supply, satisfying the following conditions.
    - Max. voltage (with no load): 30Vrms (42.4V peak) or less
    - Max. current: ① 8A or less (including shorts), and  
② When controlled by a circuit protector (fuse, etc.) with the following rating

No-load voltage (V peak)	Max. current rating
0 to 20 [V]	5.0
Over 20 [V] to 30 [V]	100
	Peak voltage value
  - (2) A circuit (class 2 circuit) with maximum 30Vrms (42.4V peak) or less, and a power supply consisting of a class 2 power supply unit conforming to UL1310, or a class 2 transformer conforming to UL1585

## Cable Safety Instructions

### ⚠ Caution

1. Be careful of mis-wiring. This can cause malfunction, damage and fire in the unit.
2. To prevent noise and surge in signal lines, keep all wiring separate from power lines and high voltage lines. Otherwise, this can cause malfunction.
3. Check wiring insulation, as defective insulation can cause damage to the unit due to excessive voltage or current.
4. Do not bend or pull cables repeatedly, and do not place heavy objects on them or allow them to be pinched. This can cause broken lines.

SV

SY

SYJ

SX

VK

VZ

VF

VFR

VP7

VQC

SQ

VQ

VQ4

VQ5

VQZ

VQD

VFS

VS

VS7

VQ7

