

5-Port Solenoid Valve

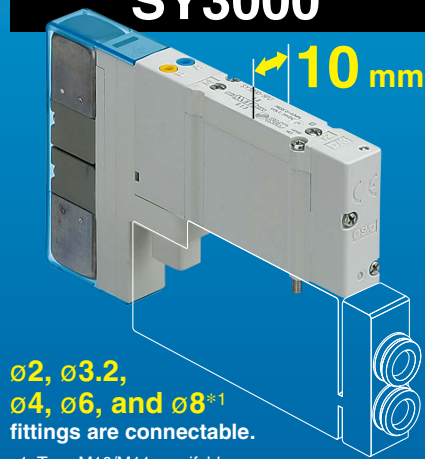
Plug-in Type



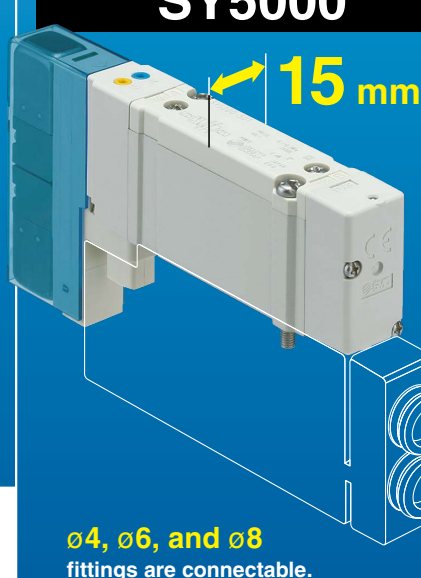
**Due to the flow increase,
the valve size can be reduced!**

Saves energy and space

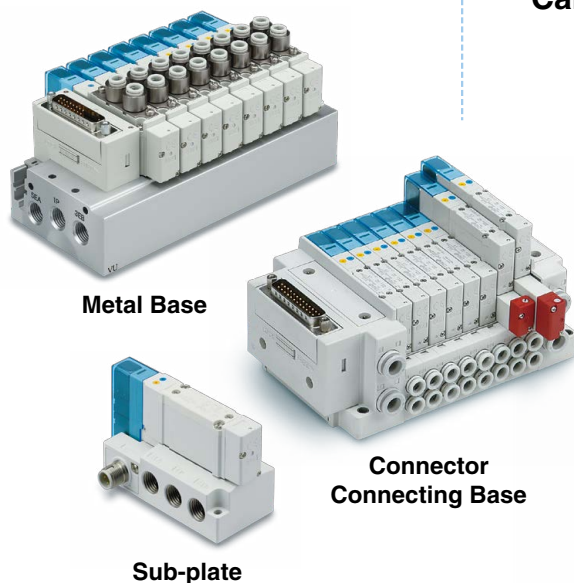
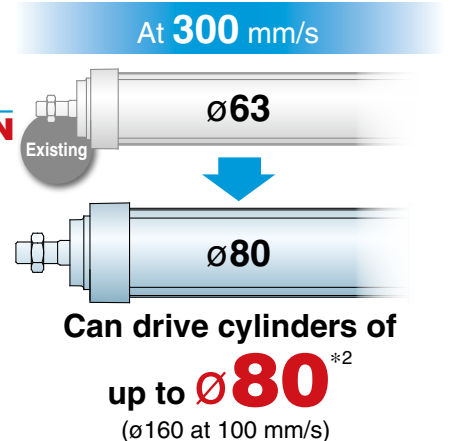
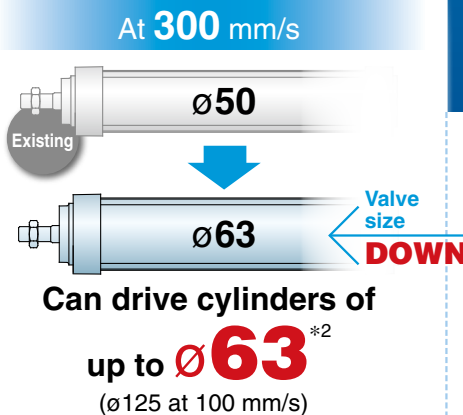
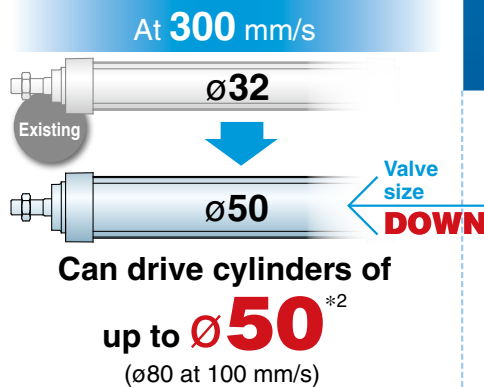
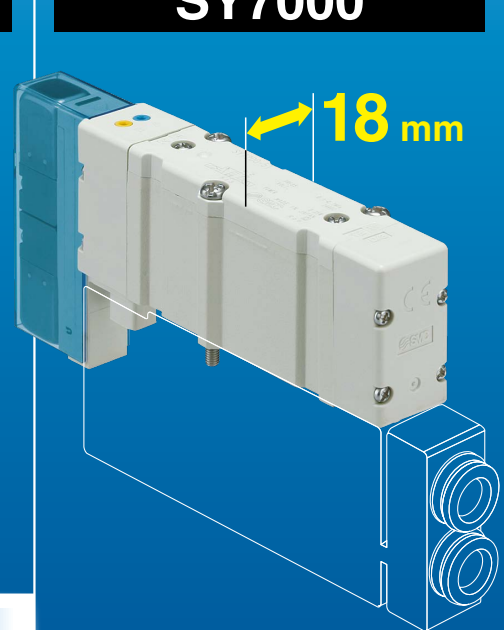
SY3000



SY5000



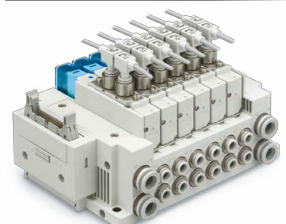
SY7000



*2 Values based on comparison with the existing SMC model
For details, refer to page 13.

Compatible with wireless systems

With pressure sensor



SY3000/5000/7000 Series



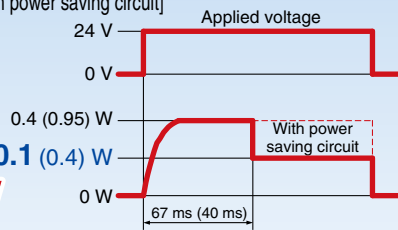
CAT.ES11-103E

Power Saving

Power Consumption

[Electrical power waveform with power saving circuit]

With power saving circuit **0.1 w**
Standard **0.35 w**



Power consumption is reduced by the power saving circuit.

Power consumption is decreased to approx. 1/3 by reducing the wattage required to hold the valve in an energized state. (Effective energizing time is over 67 ms at 24 VDC.) Refer to the electrical power waveform to the left.

- * Only products with an indicator light are equipped with the power saving circuit.
- * The value in () is for the quick response and high pressure types.

Long Service Life

Metal seal

(Service life: 200 million cycles)*1

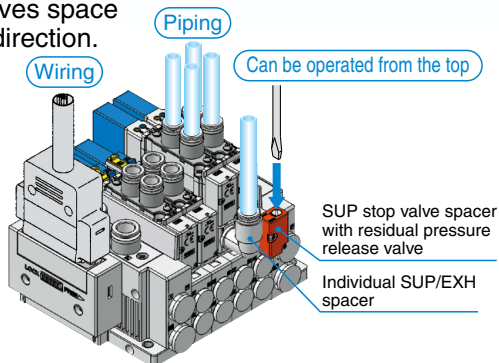
- *1 According to SMC life test conditions
- *2 Please contact SMC if life test data is required.

Space Saving / Improved Operability

Wiring, piping, and operation are integrated on one side.

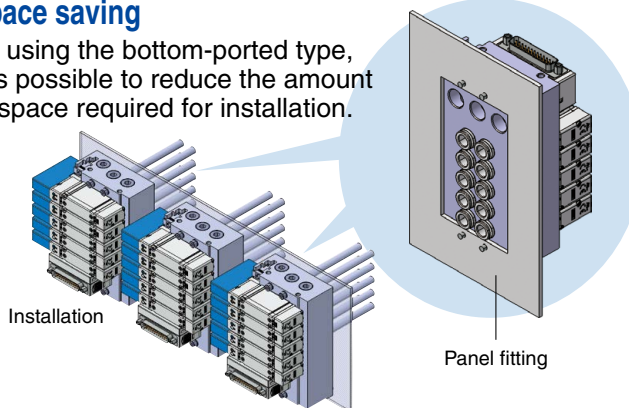
A multiple-layer type is available as an option that saves space in the lateral direction.

From p. 204



A bottom-ported type is available (A and B ports).
Space saving

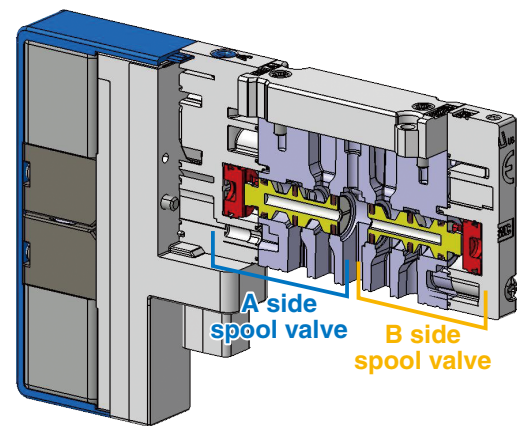
By using the bottom-ported type, it is possible to reduce the amount of space required for installation.



A 4-position dual 3-port valve is available.

(Only for the rubber seal type)

• Two 3-port valves built into one body



- 3-port valves on the A and B sides can be operated independently.
- When used as a 3-port valve, only half the number of stations is required.
- Can also be used as a 4-position, 5-port valve
- A 4-position dual 3-port valve with a back pressure check valve is also available.
- Combination examples

Series	A side	B side
SY□A ₃ 0	N.C. valve	N.C. valve
SY□B ₃ 0	N.O. valve	N.O. valve
SY□C ₃ 0	N.C. valve	N.O. valve

Different sizes (SY3000/5000 or SY5000/7000) can be mixed! From p. 165

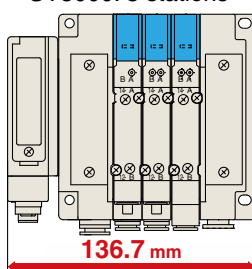
It is possible to reduce installation space, the number of serial units, and the amount of wiring.

Overall manifold length
Approx. 29% reduction

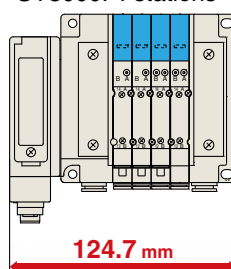
For serial transmission EX260

Installation space

SY5000 manifold
SY5000: 3 stations

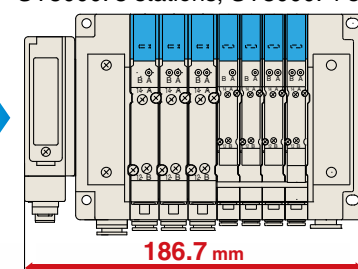


SY3000 manifold
SY3000: 4 stations



Mixed manifold

SY5000: 3 stations, SY3000: 4 stations



Number of serial units

2 sets

1 set

Applicable to EX600-W Series Wireless Systems p. 113 p. 123 p. 165 p. 169 p. 177

Noise resistance

- Uses the 2.4 GHz ISM frequency band
- Frequency hopping: Every 5 ms

High-speed connection

- From power supply ON to start of communication:
Min. 250 ms*

*1 For wireless remote

Communication response

- Wireless communication signal
Response time: **5 ms**

Communication cables not required

- Reduced wiring work, space, and cost
- Minimized disconnection risk

Number of I/O points

- Max. 1280 inputs/1280 outputs
(Max. 128 inputs/128 outputs per module)

Compatible protocol

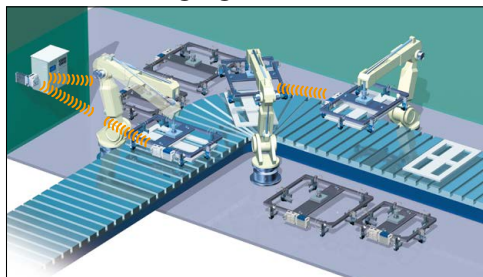
EtherNet/IP™

PROFINET®



Application Examples

For tool changing

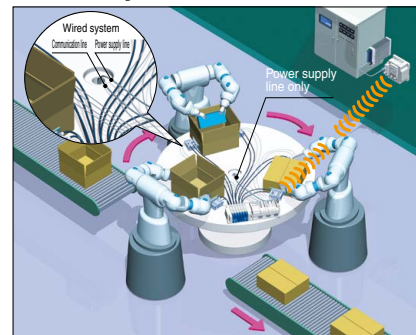


For spot welding

Welding environment



For rotary tables



The EX260 series supports safety communication (PROFIsafe). p. 135-1

■ This is a Fieldbus unit which supports safety standard ISO 13849-compliant safety circuit constructions.



PROFIsafe is established as an international standard (IEC 61784-3-3). It is a communication protocol that transmits safety-related data by PROFINET communication and can be used up until safety standards ISO 13849-1 PL e and IEC 61508/IEC 62061 SIL 3.

Using the safety communication protocol

Refer to the EX260 **Web Catalog** for details on units that support the safety communication protocol.

When using a manifold valve within an ISO 13849-compliant safety system, the device needs to be considered from both the pneumatic circuit and the electric side.

Devices (including valves) need to be selected based on whether their functions are in line with the safety level of the equipment as a whole.

The use of valves that have been validated as being compliant with ISO 13849-2 may be required.

For details on valves that have been validated, please contact SMC.

In addition, refer to "Safety Instructions" for precautions on model selection.

SY3000/5000/7000 Series

Valve Specifications

Valve Specifications

Valve type			Rubber seal	Metal seal
Fluid			Air	
Internal pilot operating pressure range [MPa]	2-position single		0.15 to 0.7	0.1 to 0.7 (High pressure type: 0.1 to 1)
	2-position double		0.1 to 0.7	
	3-position		0.2 to 0.7	
	4-position dual 3-port valve		0.15 to 0.7	—
External pilot operating pressure range [MPa]	Operating pressure range		−100 kPa to 0.7 (4-position: −100 kPa to 0.6)	−100 kPa to 0.7 (High pressure type: −100 kPa to 1)
	Pilot pressure range	2-position single	0.25 to 0.7	0.1 to 0.7 (High pressure type: 0.1 to 1)
		2-position double		
		3-position		
	4-position dual 3-port valve		Operating pressure + 0.1 or more (Min. 0.25) to 0.7	—
Ambient and fluid temperatures [°C]			−10 to 50 (No freezing)	
Max. operating frequency [Hz]	SY3000 SY5000	2-position single/double	5	20*1
		4-position dual 3-port valve		
		3-position		
	SY7000	2-position single/double	5	10*1
		4-position dual 3-port valve	3	—
		3-position	3	10*1
Manual override			Non-locking push type	
			Push-turn locking slotted type	
			Push-turn locking lever type	
			Slide locking type	
Pilot exhaust type	Internal pilot		Main/Pilot valve common exhaust	Main/Pilot valve individual exhaust
	External pilot		Pilot valve individual exhaust	
Lubrication			Not required	
Mounting orientation*2			Unrestricted	Single: Unrestricted Double/3-position: Main valve is horizontal.
Impact/Vibration resistance*2 [m/s²]			150/30	
Enclosure			IP67 (Based on IEC60529)*3	
Coil rated voltage [DC]			24, 12 V	
Allowable voltage fluctuation [V]			±10% of rated voltage*4	
Power consumption [W]	Standard		0.35 (With indicator light: 0.4)	
	High pressure type, Quick response type		0.9 (With indicator light: 0.95)	
	With power saving circuit		Standard: 0.1*5 (With indicator light only) [Inrush 0.4, Holding 0.1], High pressure type: 0.4*5 (With indicator light only) [Inrush 0.95, Holding 0.4]	
Surge voltage suppressor			Diode (Varistor for non-polar type)	
Indicator light			LED	

*1 Use below 5 Hz for with the power saving circuit.

*2 Impact resistance: No malfunction occurred when it is tested in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)
Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. The test was performed at both energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)
Refer to page 295 for the fixation of DIN rail mounting type manifold.

*3 In the case of a metal seal, there are restrictions in the operating environment. Refer to the "Specific Product Precautions" on page 290.

*4 Due to voltage drops by the internal circuit in S/Z type and T type (with power saving circuit), use within the allowable voltage fluctuation as follows.

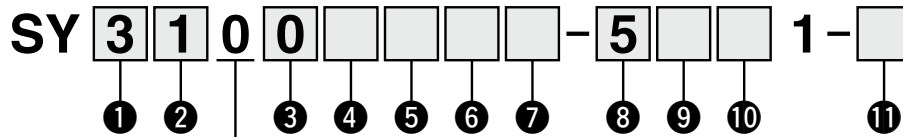
S/Z type { 24 VDC: –7% to +10%
12 VDC: –4% to +10% } T type { 24 VDC: –8% to +10%
12 VDC: –6% to +10% }

*5 For details, refer to page 292.

SY3000/5000/7000 Series

How to Order Valves (With mounting screw)

Refer to page 15 for valve specifications.



Base mounted

1 Series

3	SY3000
5	SY5000
7	SY7000

2 Type of actuation

1	2-position	Single
2		Double
3	3-position	Closed center
4		Exhaust center
5		Pressure center
A*1	4-position	N.C./N.C.
B*1	dual	N.O./N.O.
C*1	3-port	N.C./N.O.

*1 Only the rubber seal type is available for the 4-position dual 3-port valve.

3 Seal type

0	Rubber seal
1	Metal seal

4 Pilot type

Nil	Internal pilot
R	External pilot

5 Back pressure check valve (Built-in valve type)

Nil	None
H	Built-in

* Only the rubber seal type is available. A manifold installed type is available if a back pressure check valve with a metal seal is required. Refer to page 212 for ordering examples. However, it is not recommended to use the built-in valve type and the manifold installed type at the same time because it will reduce the flow.

* The built-in valve type back pressure check valve is not available for the 3-position type or the SY7000.

6 Pilot valve option

Nil	Standard (0.7 MPa)
B	Quick response type (0.7 MPa)
K*1	High pressure type (1.0 MPa)

*1 Only the metal seal type is available for the high pressure type.

7 Coil type

Nil	Standard
T	With power saving circuit (Continuous duty type)

* Be sure to select the power saving circuit type if the valve is to be continuously energized for long periods of time.

* Be careful of the energizing time when the power saving circuit is selected. Refer to page 292 for details.

8 Rated voltage

5	24 VDC
6	12 VDC

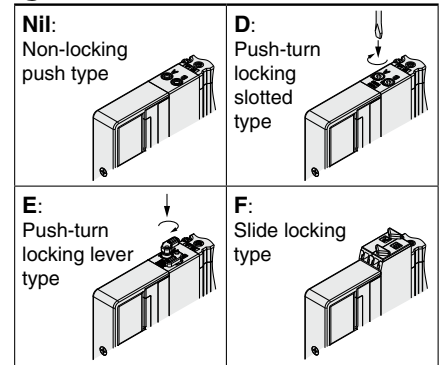
9 Light/surge voltage suppressor and common specification

Symbol	With light	Surge voltage suppressor	Common specification
Nil	—	—	Non-polar
R	—	—	
U	●	—	
S	—	●	Positive common
Z	●	—	Negative common
NS	—	—	
NZ	●	—	

* For the non-polar type, be careful of surge voltage intrusion. Refer to page 293 for details.

* Only "Z" and "NZ" types are available with a power saving circuit.

10 Manual override



* Refer to page 34 for the safety slide locking manual override.

11 Type of mounting screw

Nil	Round head combination screw
B	Hexagon socket head cap screw
K	Round head combination screw (Drop prevention type)
H	Hexagon socket head cap screw (Drop prevention type)

* For "K" and "H," the valve body cover has a drop prevention construction to stop the mounting screws from falling out when the valve is removed for maintenance, etc.

* **When ordering a valve individually, the base gasket is not included.**

Since the base gasket is attached to the manifold, please order the base gasket separately if it is needed for maintenance. Refer to page 198 for base gasket and mounting screw part numbers.

* "B" and "H" cannot be selected for the individual SUP/EXH spacer assembly, interface regulator, or double check spacer assembly with residual pressure release valve.