

3 Port Solenoid Valve Rubber Seal Series SY100

**Low power consumption: 0.5 W (Standard, Without indicator light)
(Current draw: 21 mA at 24 VDC)**

* Large flow type: 0.75 W (Current draw: 31 mA at 24 VDC)

[Energy saving type [0.22 W] is available, too. For details, refer to catalog on page 4-3-15.]

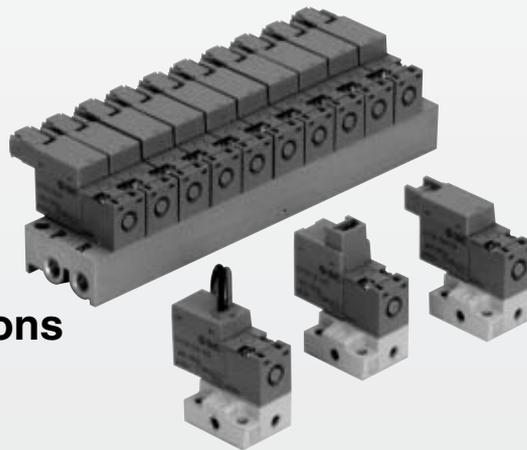
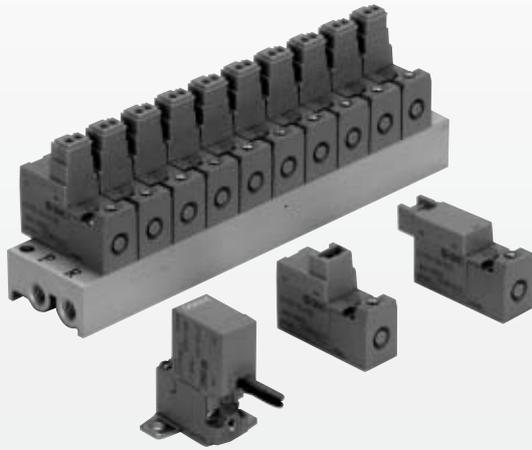
[Low wattage [0.45 W] is available, too. For details, refer to catalog on page 4-3-15.]

Body width: 10 mm

Effective area 0.14 mm² (Standard type)
Effective area 0.22 mm² (Large flow type)

High reliability

100 million cycles or more (By SMC life test data)



Available in vacuum applications

(Up to -100 kPa)

Copper-free

No copper used for sections in contact with fluids.

Bright color tone and neat design

A bright gray concept has been adopted for this product to compliment the surrounding operational environment.

V100

SY

SYJ

VK

VZ

VT

VP

VG

VP

S070

VQ

VKF

VQZ

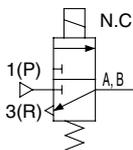
VZ

VS

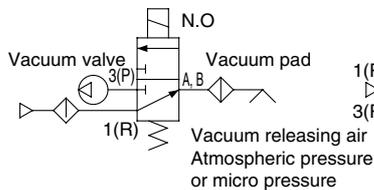
VFN

SY100/Application Example (Pneumatic JIS symbols shown are typical examples.)

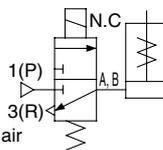
1. For blowing off



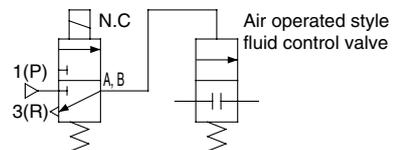
2. For vacuum control



3. For driving single acting cylinders



4. For driving air operated valves for fluid control



The characteristic values shown in the catalog are representative values, not warranting the performance.

Series SY100

⚠ Precautions

Be sure to read before handling. For Safety Instructions and Solenoid Valve Precautions, refer to page 4-18-2.

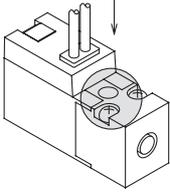
Manual Override Operation

⚠ Warning

Since connected equipment will be actuated when the manual override is operated, first confirm that conditions are safe.

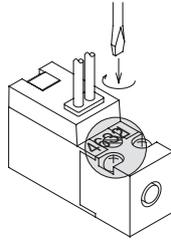
■ Non-locking push type [Standard type]

Press in the direction of the arrow

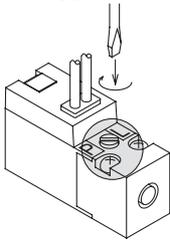


■ Locking slotted type [B]

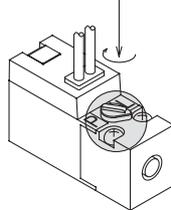
Turn in the direction of arrow.



■ Push-turn locking slotted type [D]



■ Push-turn locking lever type [E] (SY1½4, SY1¾4A)



(Pressing makes the valve operate. The valve can be locked in the manual override position by turning it to the direction that the arrow shows while keeping it pressed. If it is not turned, it can be used as a non-locking push type.)

(Pressing makes the valve operate. The valve can be locked in the manual override position by turning it to the direction that the arrow shows while keeping it pressed. If it is not turned, it can be used as a non-locking push type.)

⚠ Caution

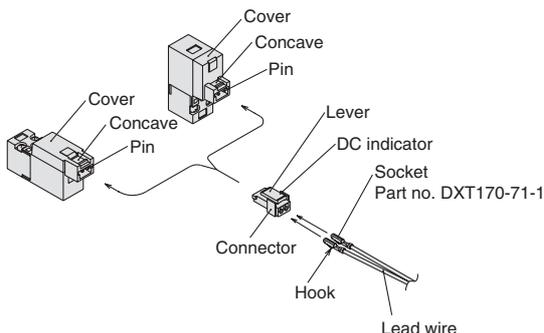
When operating the lock with the driver, use a watchmakers' screwdriver and turn lightly. [Torque: 0.1 N·m or less]

How to Use Plug Connector

⚠ Caution

1. Attaching and detaching connectors

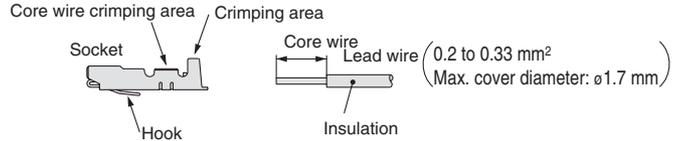
- To attach a connector, hold the lever and connector unit between your fingers and insert straight onto the pins of the solenoid valve so that the lever's pawl is pushed into the groove and locks.
- To detach a connector, remove the pawl from the groove by pushing the lever downward with your thumb,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



2. Crimping of lead wires and sockets

Peel 3.2 to 3.7 mm of the tip of lead wire, enter the core wires neatly into a socket and crimp it with a special crimp tool. Be careful so that the cover of lead wire does not enter into the crimping part.

(For special crimping tool, please contact SMC.)



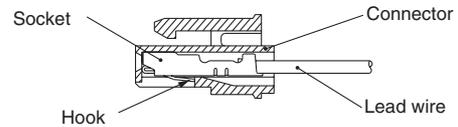
3. Attaching and detaching lead wires with sockets

● Attaching

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

● Detaching

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



Plug Connector Lead Wire Length

Standard length is 300 mm, but the following length is also available.

How to Order Connector Assembly

For DC: **SY100-30-4A**

For 100 VAC: **SY100-30-1A**

For 200 VAC: **SY100-30-2A**

For other voltages of AC: **SY100-30-3A**

Without lead wire: **SY100-30-A**
(With connector and 2 pcs. of socket)

How to Order

Include the connector assembly part number together with the part number for the plug connector's solenoid valve without connector.
<Example> Lead wire length 2000 mm

For DC (+COM) **SY114-5LO** For AC **SY114-1LO**
SY100-30-4A-20 **SY100-30-1A-20**

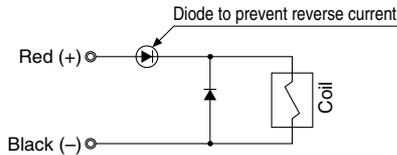
● Lead wire length

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

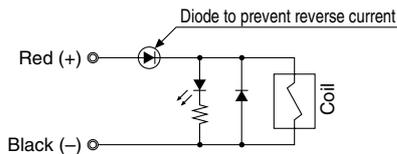
Surge Voltage Suppressor

<For DC>
Grommet, L/M Plug Connector Type

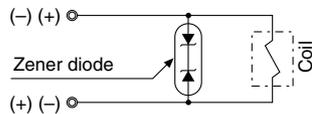
Standard type (With polarity) With surge voltage suppressor (□S)



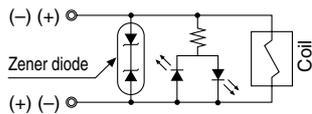
Light/Surge voltage suppressor (□Z)



Non-polar type With surge voltage suppressor (□R)



Light/Surge voltage suppressor (□U)



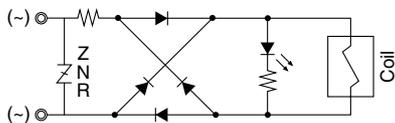
- Please connect correctly the lead wires to + (positive) and - (negative) indications on the connector.
(For non-polar type, the lead wires can be connected to either one.)
- For DC voltages other than 12 and 24 VDC, incorrect wiring will cause damage to the surge voltage suppressor circuit. (Wrong polarity will cause trouble.)
- Solenoids, whose lead wires have been pre-wired: positive side red and negative side black.

<For AC>

("S" option is not available since voltage surge is suppressed by the converter.)

Grommet, L/M Plug Connector Type

With indicator light (□Z)



Caution

In the case of zener diode and protection circuit for surge voltage of ZNR, use caution to the surge voltage protection in the controller side, since there remains the residual voltage according to the protecting element and the rated voltage. Moreover, the residual voltage of the diode is approximately 1 V.

Connector Assembly with Protective Cover

Connector assembly with a protective cover which's taken countermeasures against dustlight.

- Effective to prevent short circuit accidents caused by invasion of foreign matters into the connector section, etc.
- Cover material adopts the chloroprene rubber which is excellent in weatherability and electric insulation properties. However, use caution not to allow contact with cutting oil, etc.
- Simple and unencumbered appearance by adopting round-shaped cord.

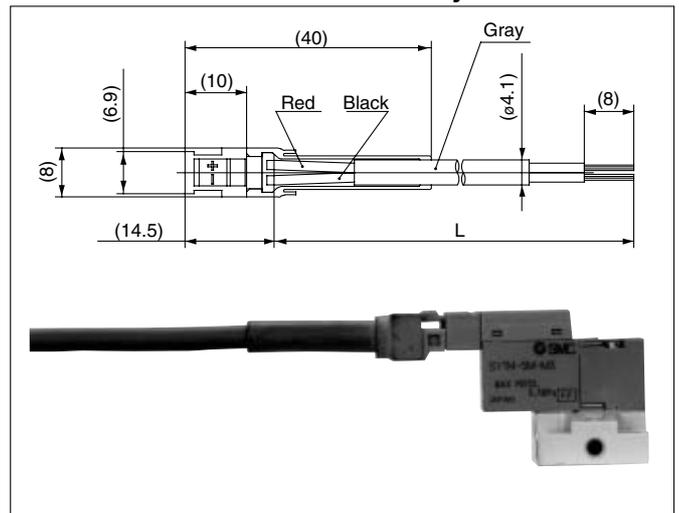
How to Order

SY100-68-A-□

• Lead wire length (L)

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

Dimensions: Connector Assembly with Cover



How to Order

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

<Example 1> For lead wire length: 2000 mm

SY114-5LOZ-M3

SY100-68-A-20

<Example 2> For lead wire length: 300 mm (Standard)

SY114-5LPZ-M3

Symbol of connector assembly with protective cover

* No part numbers of connector assembly with cover are needed to be indicated in this case.

V100

SY

SYJ

VK

VZ

VT

VP

VG

VP

S070

VQ

VKF

VQZ

VZ

VS

VFN

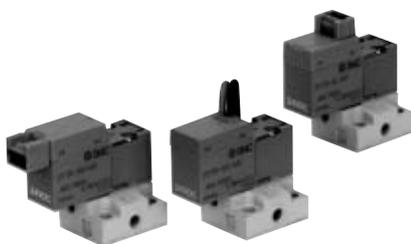
3 Port Direct Operated Solenoid Valve Rubber Seal Series SY100

Specifications

Fluid	Air
Ambient and fluid temperature (°C)	-10 to 50°C (No freezing. Refer to page 4-18-4.)
Response time (ms) ⁽¹⁾	10 or less
Max. operating frequency (Hz)	20
Manual override	Non-locking push type, Locking slotted type Push-turn locking slotted type Push-turn locking lever type (SY1 $\frac{3}{4}$, SY1 $\frac{3}{4}$ A only)
Lubrication	Not required
Mounting position	Unrestricted
Impact/Vibration resistance (m/s ²) ⁽²⁾	150/30
Enclosure	Dustproof



Body ported



Base mounted

Note 1) Based on dynamic performance test, JIS B 8374-1981. (Coil temperature: 20°C, at rated voltage, without surge suppressor.)
 Note 2) Impact resistance: No malfunction occurred when it is tested with a drop tester 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. 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)

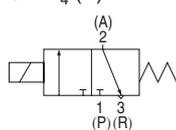
Solenoid Specifications

Series		SY1 $\frac{3}{4}$ ₂₄	SY1 $\frac{3}{4}$ ₂₄ A
Electrical entry		Grommet (G)/(H), L plug connector (L) M plug connector (M)	
Coil rated voltage (V)	DC	24, 12, 6, 5, 3	
	AC ^{50/60} Hz	100, 110, 200, 220	—
Allowable voltage fluctuation		-10 to +10%	
Power consumption (W)	DC	0.5 (With indicator light: 0.55)	0.75 W (With indicator light: 0.8 W)
Apparent power (VA)	AC	100 V	0.9 (With indicator light: 1.0)
		110 V	1.0 (With indicator light: 1.1)
		[115 V]	[1.1 (With indicator light: 1.2)]
		200 V	1.8 (With indicator light: 1.9)
		220 V [230 V]	1.9 (With indicator light: 2.0) [2.2 (With indicator light: 2.3)]
Surge voltage suppressor		Diode	
Indicator light		LED	

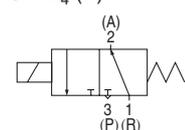
* It is in common between 110 VAC and 115 VAC, and between 220 VAC and 230 VAC.
 [Low wattage [0.45 W] is available, too. For details, refer to catalog on page 4-18-4.]

JIS Symbol

SY11 $\frac{3}{4}$ (A)



SY12 $\frac{3}{4}$ (A)



Made to Order Specifications
 (For details, refer to page 4-3-17.)

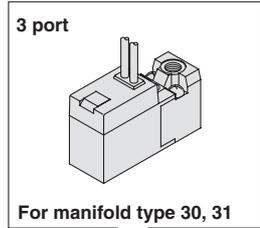
Model

Function	Valve model	Type	Operating pressure range (MPa)	Vacuum specifications (MPa)		Port size		Effective area (mm ²)	Weight (g) ⁽²⁾	
				1(P) port	3(R) port	1(P), 3(R) port	2(A) port		Grommet	L plug connector, M plug connector
N.C.	SY11 $\frac{3}{4}$	Standard	0 to 0.7	-100 kPa to 0.6	-100 kPa to 0	M3 x 0.5	M3 x 0.5	0.14	SY1□3(A): 13 SY1□4(A): 24 (12)	SY1□3(A): 15 SY1□4(A): 26 (14)
N.C.	SY11 $\frac{3}{4}$ A	Large flow	0 to 0.7	-100 kPa to 0.6	-100 kPa to 0	M3 x 0.5	M3 x 0.5	0.22		
N.O.	SY12 $\frac{3}{4}$ ⁽¹⁾	Standard	0 to 0.7	-100 kPa to 0	-100 kPa to 0.6	M3 x 0.5	M3 x 0.5	0.14		
N.O.	SY12 $\frac{3}{4}$ A ⁽¹⁾	Large flow	0 to 0.7	-100 kPa to 0	-100 kPa to 0.6	M3 x 0.5	M3 x 0.5	0.22		

Note 1) SY123/SY124 $\frac{3}{4}$ and SY123/SY124 $\frac{3}{4}$ A: Supply pressure to 1(R) port and exhaust air from 3(P) port.
 Note 2) Value for DC. Add 1 g for AC. (): Without sub-plate.

How to Order

Standard type (Cv0.008)

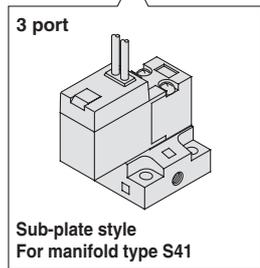


Standard type (Cv: 0.008): Body ported

SY1 1 3 5 L [] [] [] M3 []

Standard type (Cv: 0.008): Base mounted

SY1 1 4 5 M [] [] []



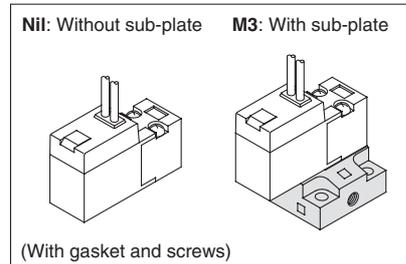
Type of actuation

1	Normally closed
2	Normally open

Rated voltage

For DC	
5	24 VDC
6	12 VDC
V	6 VDC
S	5 VDC
R	3 VDC
For AC (50/60 Hz)	
1	100 VAC
2	200 VAC
3	110 VAC [115 VAC]
4	220 VAC [230 VAC]

Port size



Electrical entry

24 V, 12 V, 6 V, 5 V, 3 VDC/100 V, 110 V, 200 V, 220 VAC			
Grommet	L plug connector	M plug connector	
G: 300 mm lead wire	L: With lead wire (Length 300 mm)	M: With lead wire (Length 300 mm)	MN: Without lead wire
H: 600 mm lead wire	LN: Without lead wire	LO: Without connector	MO: Without connector

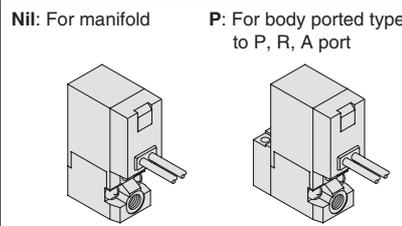
* "LN" and "MN" types are with 2 sockets.

Light/Surge voltage suppressor

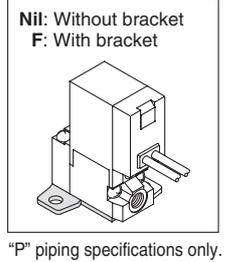
Nil	Without light/surge voltage suppressor
S	With surge voltage suppressor
Z	With light/surge voltage suppressor
R	With surge voltage suppressor (Non-polar type)
U	With light/surge voltage suppressor (Non-polar type)

* For AC voltage valves there is no "S" option. It is already built into the rectifier circuit.
* For "R" and "U", DC voltage is only available.

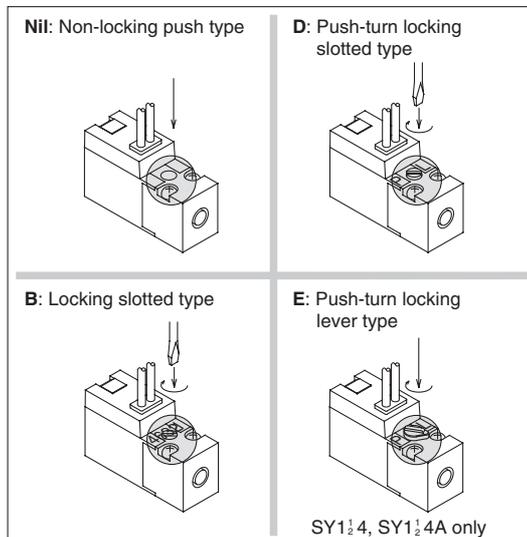
Porting specifications



Bracket



Manual override

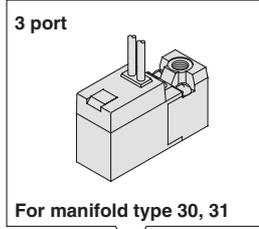


- V100
- SY**
- SYJ
- VK
- VZ
- VT
- VP
- VG
- VP
- S070
- VQ
- VKF
- VQZ
- VZ
- VS
- VFN

Series SY100

How to Order

Large flow type (Cv: 0.012)

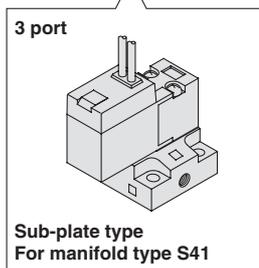


Large flow type
(Cv: 0.012) : Body ported

SY1 1 3 A — 5 L [] [] [] M3 []

Large flow type
(Cv: 0.012) : Base mounted

SY1 1 4 A — 5 M [] [] []



Rated voltage

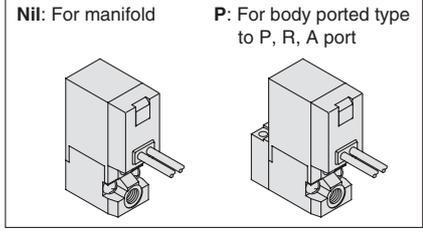
5	24 VDC
6	12 VDC
V	6 VDC
S	5 VDC
R	3 VDC

Large flow type

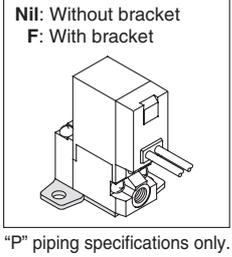
Light/Surge voltage suppressor

Nil	Without light/surge voltage suppressor
S	With surge voltage suppressor
Z	With light/surge voltage suppressor
R	With surge voltage suppressor (Non-polar type)
U	With light/surge voltage suppressor (Non-polar type)

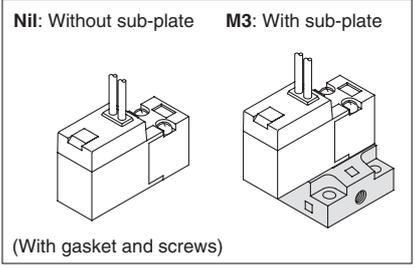
Porting specifications



Bracket



Port size

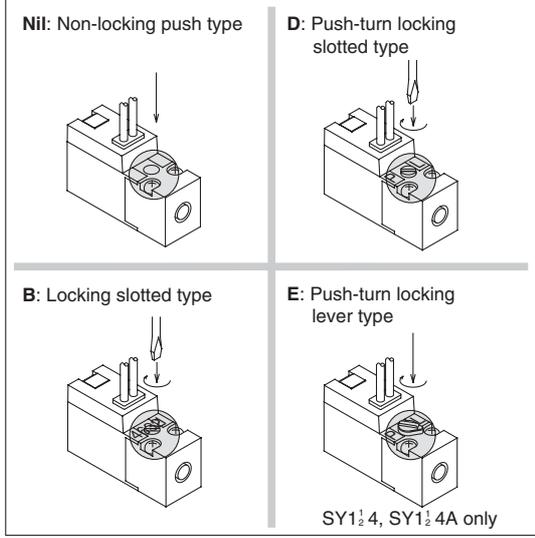


Electrical entry

24 V, 12 V, 6 V, 5 V, 3 VDC			
Grommet	L plug connector	M plug connector	
G: 300 mm lead wire	L: With lead wire (Length 300 mm)	M: With lead wire (Length 300 mm)	MN: Without lead wire
H: 600 mm lead wire	LN: Without lead wire	LO: Without connector	MO: Without connector

* "LN" and "MN" types are with 2 sockets.

Manual override

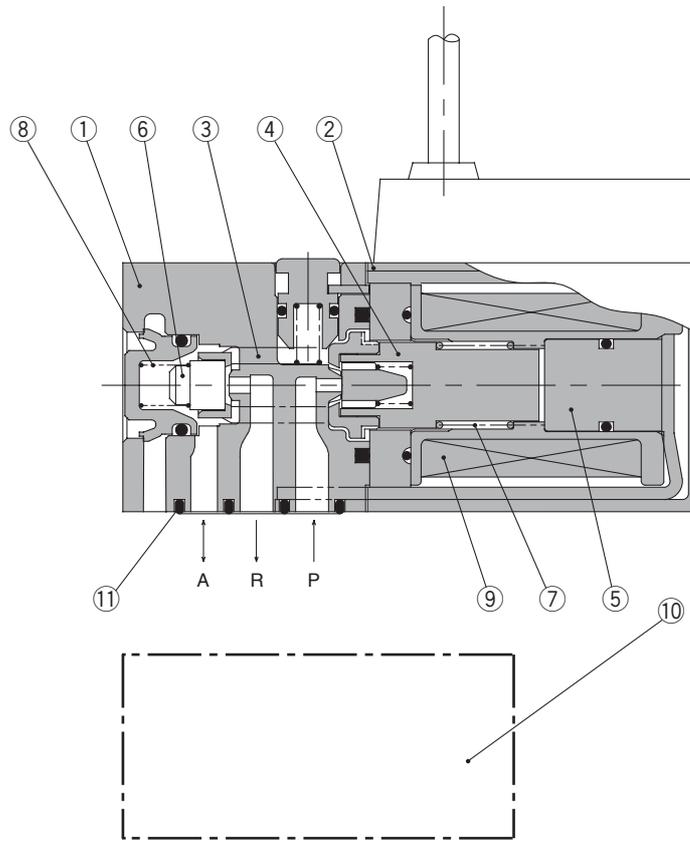
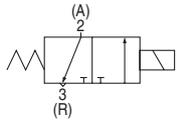


Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com



Construction

SY114, SY114A



Component Parts

No.	Description	Material	Note
①	Body	Resin	Gray
②	Cover	Resin	Gray
③	Push rod	Resin	—
④	Movable iron core assembly	HNBR/Stainless steel	—
⑤	Fixed iron core	Stainless steel	—
⑥	Exhaust poppet	HNBR	—
⑦	Return spring	Stainless steel	—
⑧	Poppet spring	Stainless steel	—
⑨	Coil assembly	—	—

Replacement Parts

No.	Description	Part no.	Material
⑩	Sub-plate	SY100-74-1	Zinc die-casted
⑪	Gasket	VJ100-6-8	HNBR

How to Order Connector Assembly

For DC: **SY100-30-4A**

For 100 VAC: **SY100-30-1A**

For 200 VAC: **SY100-30-2A**

For other voltages of AC: **SY100-30-3A**

Without lead wire: **SY100-30-A**
(With connector and
2 pcs. of socket)

●Lead wire length

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

V100

SY

SYJ

VK

VZ

VT

VP

VG

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S070

VQ

VKF

VQZ

VZ

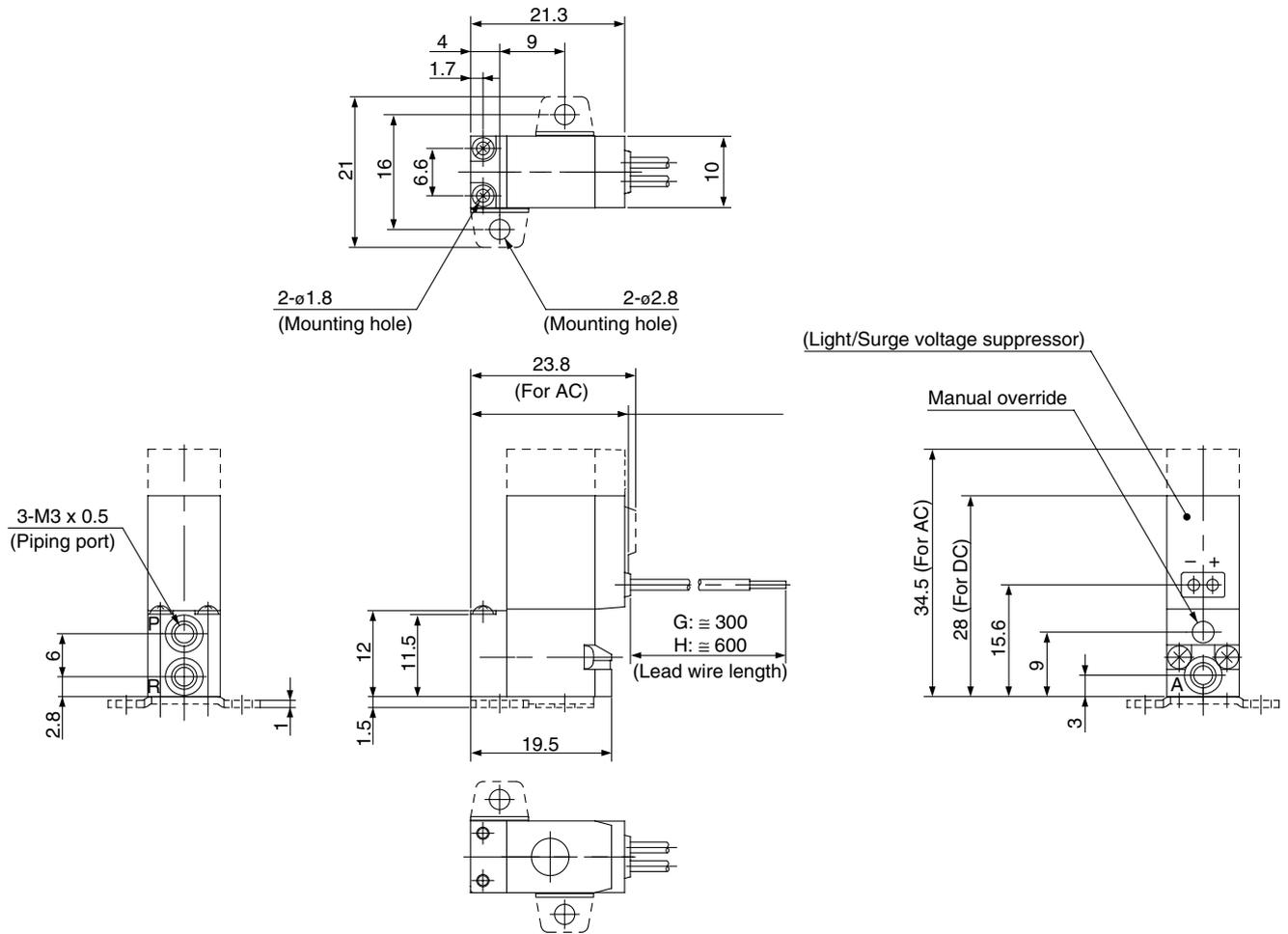
VS

VFN

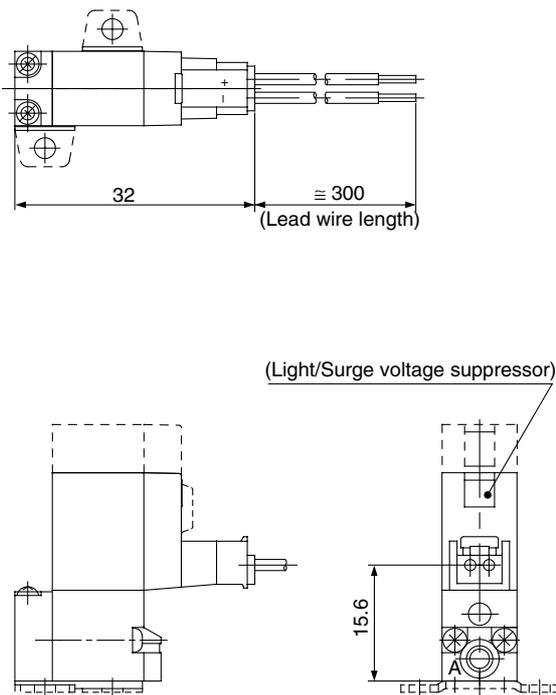
Series SY100

Body Ported

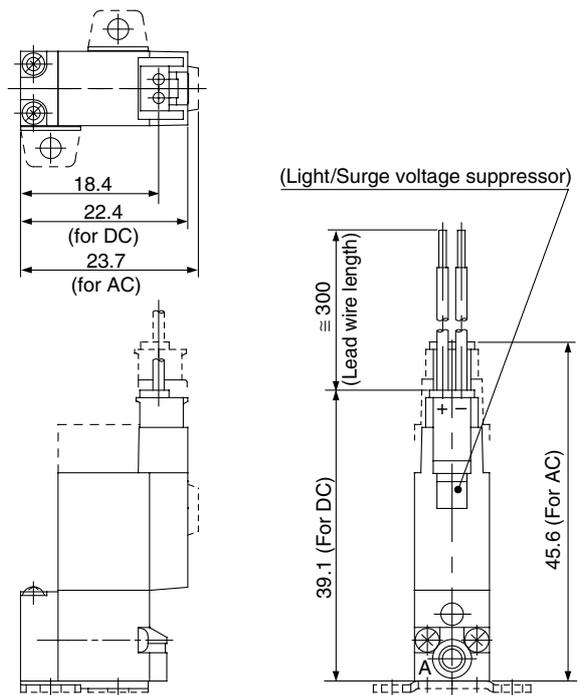
Grommet (G), (H): SY1₂3(A)-□^G□□-PM3(-F)



L plug connector (L): SY1₂3(A)-□L□□-PM3(F)



M plug connector (M): SY1₂3(A)-□M□□-PM3(-F)

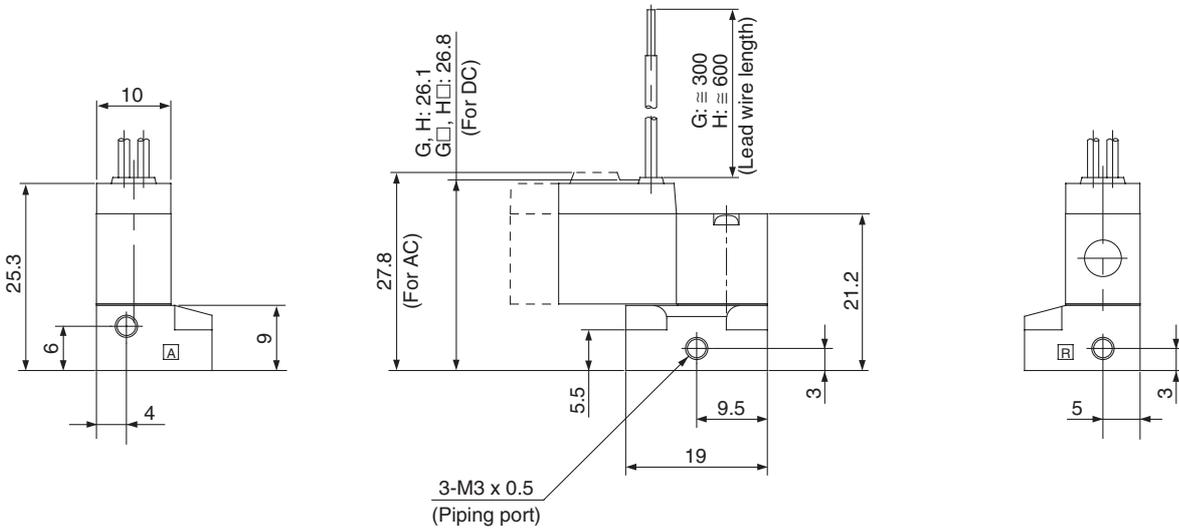
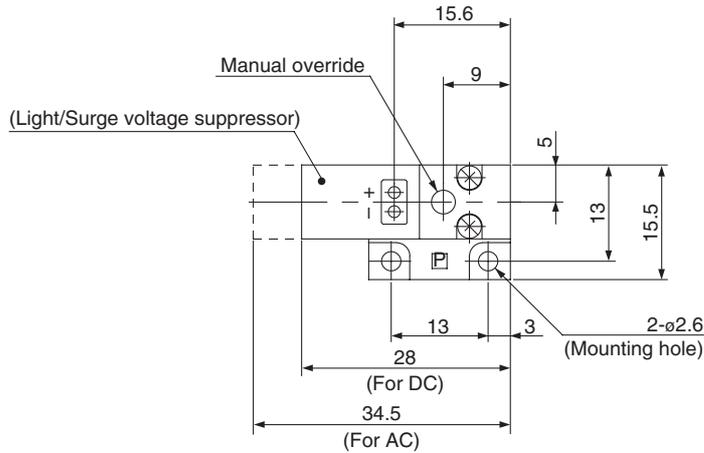


* Other dimensions are same as grommet type.

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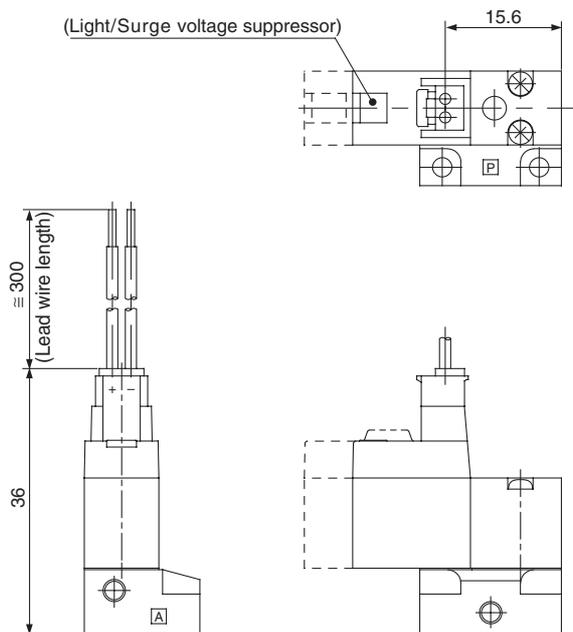
Base Mounted (With sub-plate)

Grommet (G), (H): SY1₂4(A)-□^G_H□□-M3



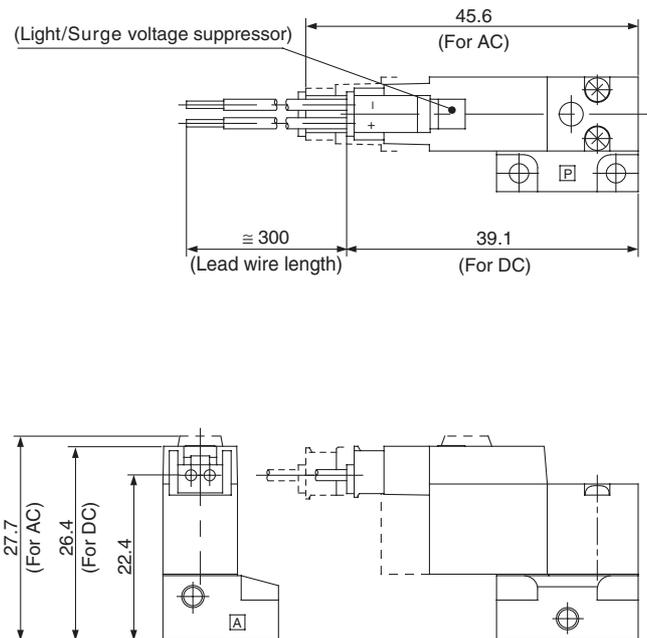
V100
SY
SYJ
VK
VZ
VT
VP
VG
VP
S070
VQ
VKF
VQZ
VZ
VS
VFN

L plug connector (L): SY1₂4(A)-□L□□-M3



* Other dimensions are same as grommet type.

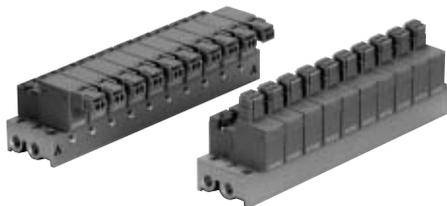
M plug connector (M): SY1₂4(A)-□M□□-M3



* Other dimensions are same as grommet type.

Series SY100

Manifold Specifications



Manifold Specifications

Model		Type 30 ⁽³⁾	Type 31	Type S41
Manifold		Single base/B mount		
P(SUP)/R(EXH)		Common SUP/Common EXH		
Valve stations		2 to 10 stations	2 to 20 stations	
A port porting specifications	Position	Valve		Base
	Direction	Top		Side
Port size	P, R ports	M5 x 0.8		
	A port	M3 x 0.5	M3 x 0.5, M5 x 0.8	



Note 1) SY114(A) and SY124(A) can not be mounted on the same manifold.

Note 2) Supply to R port and exhaust from P port for SY124(A).

Note 3) 30 Type is applicable only for SY113 and SY113A. Piping to exhaust port is not possible.

Flow Characteristics

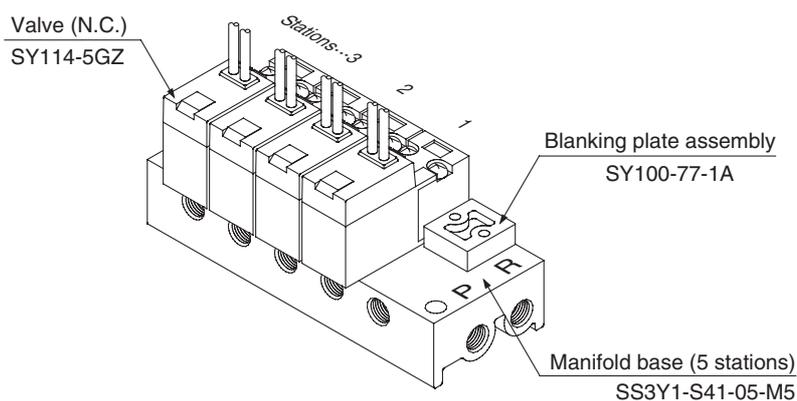
Manifold		Port size		Effective area (mm ²)
		1(P), 3(R) port	2(A) port	
SS3Y1-30	SY1□3	M5 x 0.8	M3 x 0.5	0.14
	SY1□3(A)			0.21
SS3Y1-31	SY1□3	M5 x 0.8	M3 x 0.5	0.14
	SY1□3(A)			0.21
SS3Y1-S41	SY1□4	M5 x 0.8	M3 x 0.5	0.14
	SY1□4(A)			0.21
	SY1□4	M5 x 0.8	M5 x 0.8	0.14
	SY1□4(A)			0.21



Note) Value at manifold base mounted

How to Order Valve Manifold Assembly

Example



SS3Y1-S41-05-M5..... 1 set (Type S41, 5 station manifold part number)

* SY100-77-1A..... 1 set (Blanking plate assembly part number)

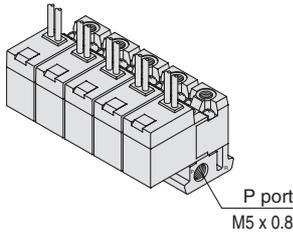
* SY114-5GZ..... 4 sets (Valve)

→ The asterisk denotes the symbol for assembly. Prefix it to the part nos. of the solenoid valve, etc.

List part numbers of the installed valve and option in required station location separately under manifold part no.

Common SUP/Common EXH

Type 30



How to Order

SS3Y1 - 30 - 05 - F

● Stations

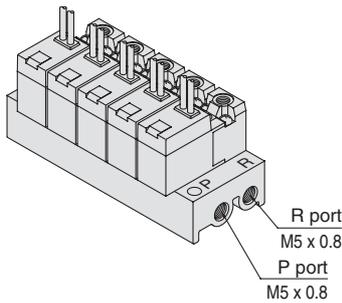
02	2 stations
⋮	⋮
10	10 stations

Applicable solenoid valve
 SY113-□□□□-M3
 SY113A-□□□□-M3
Applicable blanking plate assembly
 SY100-77-1A



Note) Piping to exhaust port not possible.

Type 31



How to Order

SS3Y1 - 31 - 05

● Stations

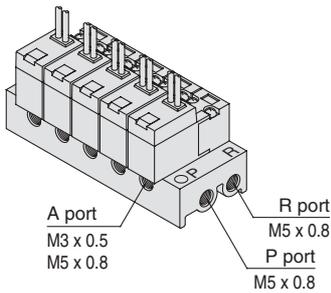
02	2 stations
⋮	⋮
20	20 stations

Applicable solenoid valve Note)
 SY113-□□□□-M3
 SY113A-□□□□-M3
 SY123-□□□□-M3
 SY123A-□□□□-M3
Applicable blanking plate assembly
 SY100-77-1A



Note) SY113(A) and SY123(A) cannot be mounted on the same manifold.

Type S41



How to Order

SS3Y1 - S41 - 05 - M3

● Stations

02	2 stations
⋮	⋮
20	20 stations

● A port side

M3	M3 x 0.5
M5	M5 x 0.8

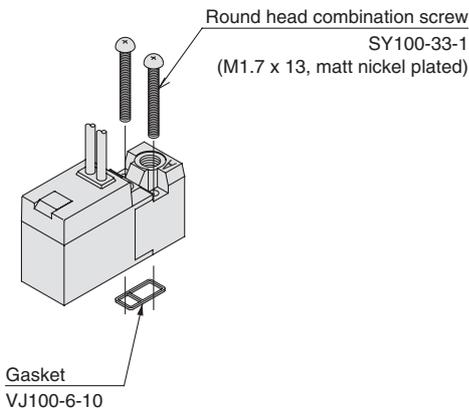
Applicable solenoid valve Note)
 SY114-□□□□
 SY114A-□□□□
 SY124-□□□□
 SY124A-□□□□
Applicable blanking plate assembly
 SY100-77-1A



Note) SY114(A) and SY124(A) cannot be mounted on the same manifold.

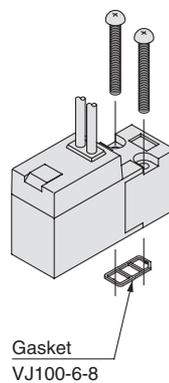
Combination with Solenoid Valve and Gasket Manifold Base

Body ported



Applicable base
 • Sub-plate (For body ported type)
 • SS3Y1-30 type | Manifold
 • SS3Y1-31 type | base

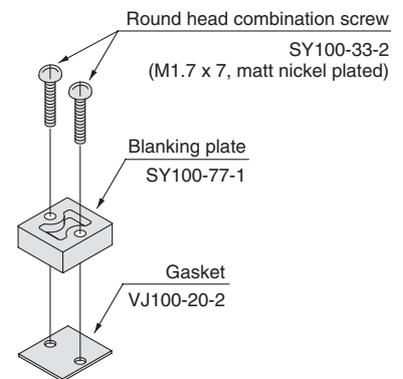
Base mounted



Applicable base
 Sub-plate
 Type SS3Y1- S41
 Manifold base

Blanking Plate Assembly

Part no.: SY100-77-1A



Applicable base
 Sub-plate
 Type SS3Y1-30
 Type SS3Y1-31
 Type SS3Y1-S41 } Manifold base

Caution

Mounting Screw Tightening Torques M1.7: 0.12 N·m

V100

SY

SYJ

VK

VZ

VT

VP

VG

VP

S070

VQ

VKF

VQZ

VZ

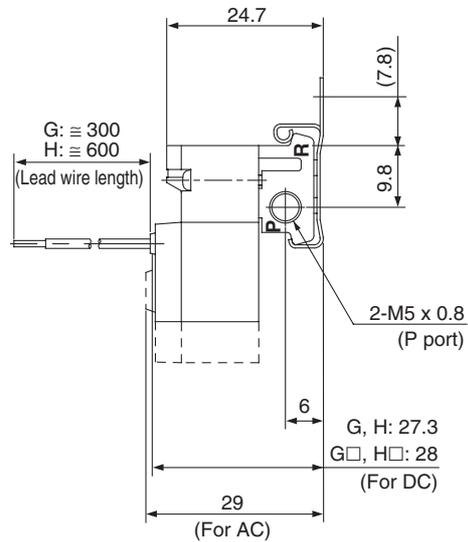
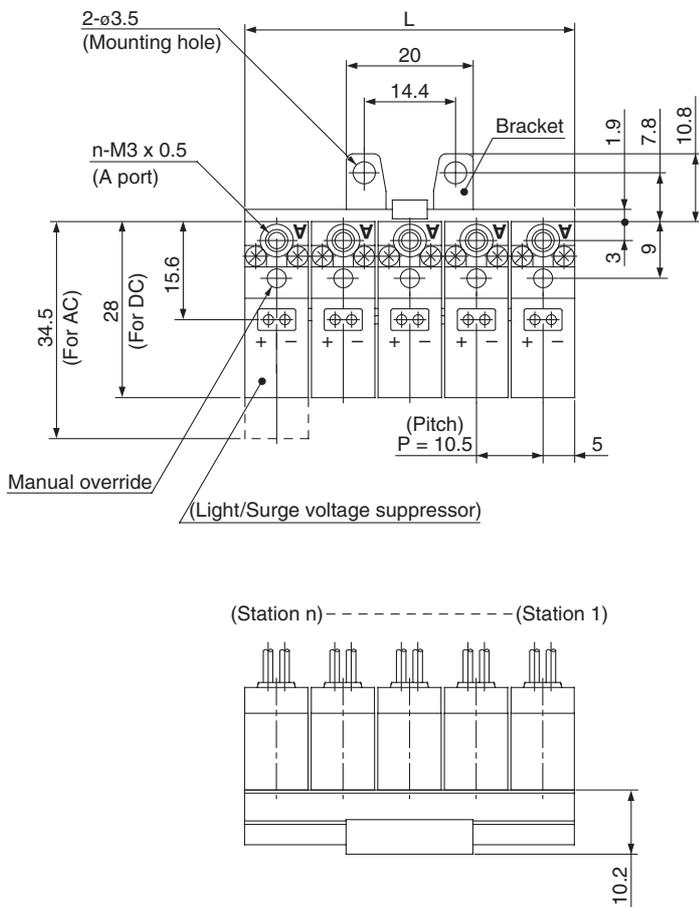
VS

VFN

Series SY100

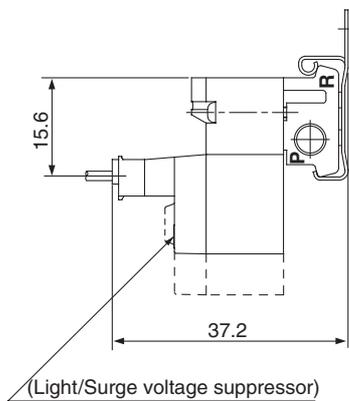
Type 30 Manifold: Top Ported/SS3Y1-30-Stations-F

Grommet (G), (H)

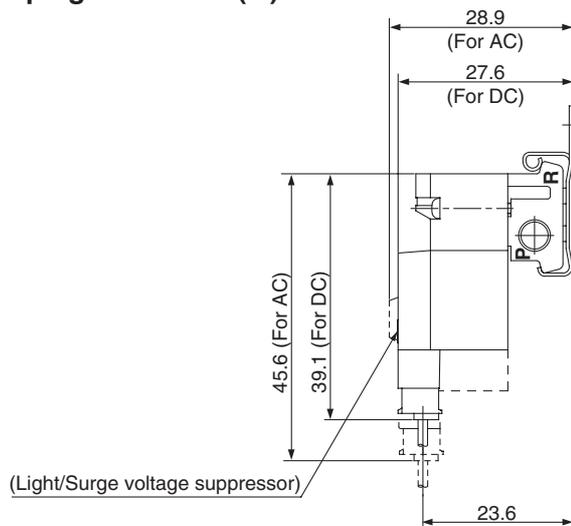


* No bracket is assembled prior to delivery. Mount one to the appropriate position. (Attach two brackets if more than five stations.)

L plug connector (L)



M plug connector (M)



* Other dimensions are same as grommet type.

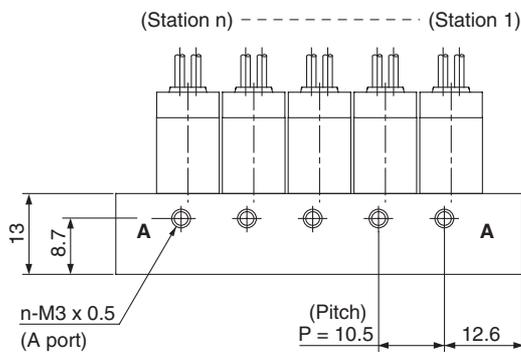
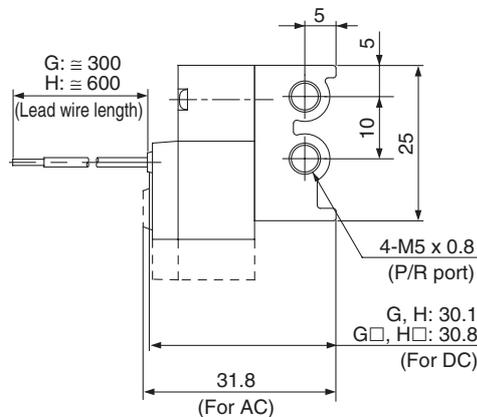
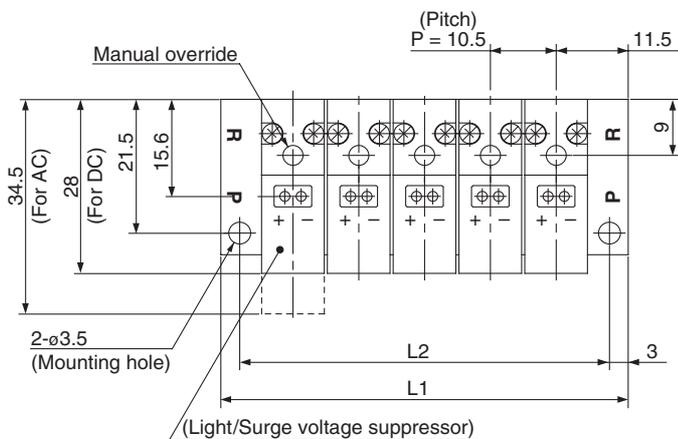
* Other dimensions are same as grommet type.

Station	2	3	4	5	6	7	8	9	10
L	20.5	31	41.5	52	62.5	73	83.5	94	104.5

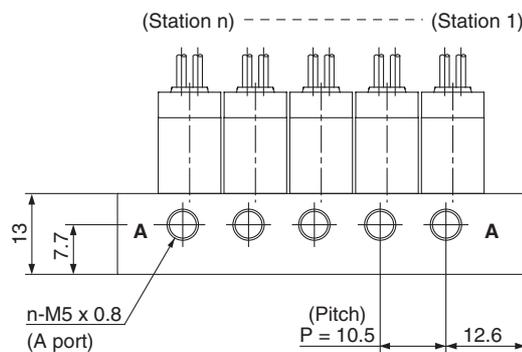
Series SY100

Type S41 Manifold: Side Ported/SS3Y1-S41- Stations -M3/M5

Grommet (G), (H)

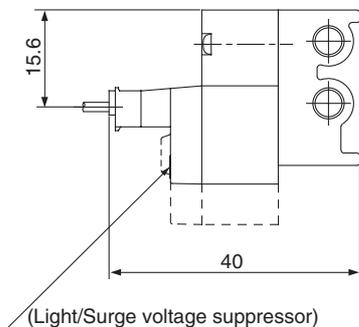


M3

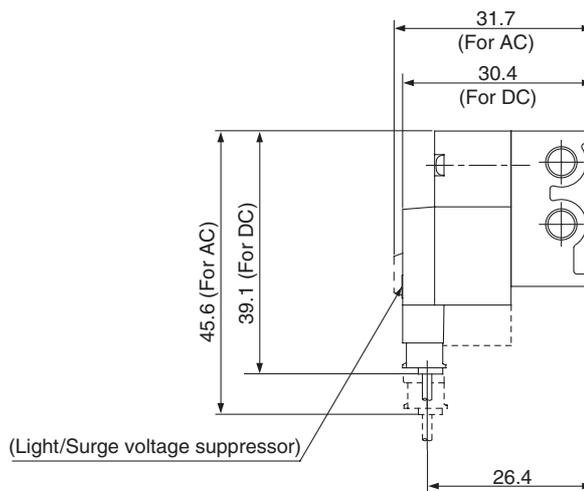


M5

L plug connector (L)



M plug connector (M)



* Other dimensions are same as grommet type.

* Other dimensions are same as grommet type.

Station	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	33.5	44	54.5	65	75.5	86	96.5	107	117.5	128	138.5	149	159.5	170	180.5	191	201.5	212	222.5
L2	27.5	38	48.5	59	69.5	80	90.5	101	111.5	122	132.5	143	153.5	164	174.5	185	195.5	206	216.5

Series SY

Made to Order Specifications:

Please contact SMC for detailed specifications, delivery and pricing.

Energy-saving Type

Power consumption is decreased by 1/3 by reducing the wattage required to hold the valve in an energized state. (Effective energizing time is over 62 ms at 24 VDC.)

Specifications

Series		SY1 ¹ ₂ ³ ₄ T	SY1 ¹ ₂ ³ ₄ AT
Coil rated voltage (V)		24 DC, 12 DC	
Power consumption (W)	Inrush	0.55	0.8
	Holding	0.22	0.3

Specifications other than above are the same as standard models.

How to Order

Body ported SY1 1 3 T-5 L Z M3-

Base mounted SY1 1 4 T-5 M Z

Type of actuation
 1 Normally closed
 2 Normally open

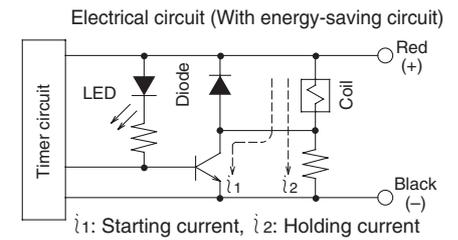
Body option
 Nil Standard
 A Large flow capacity

Rated voltage
 5 24 VDC
 6 12 VDC

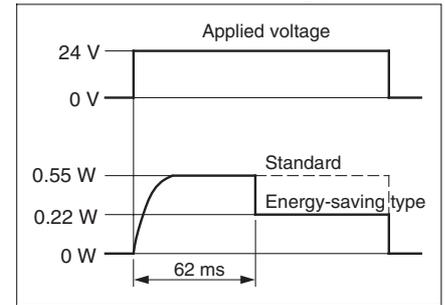
• Entry is the same as standard products.

Working Principle

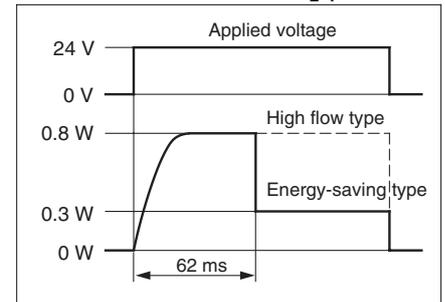
The circuit shown below reduces current consumption at holding which reduces the overall power consumption. Refer to electrical power waveform as shown below.



<Energy-saving Type, Electrical Power Waveform for SY1¹₂³₄T>



<Energy-saving Type, Electrical Power Waveform for SY1¹₂³₄AT>



Low Wattage Specifications (0.45 W)

How to Order

SY1 - - X200

• Entry is the same as standard products.

- V100
- SY
- SYJ
- VK
- VZ
- VT
- VP
- VG
- VP
- S070
- VQ
- VKF
- VQZ
- VZ
- VS
- VFN