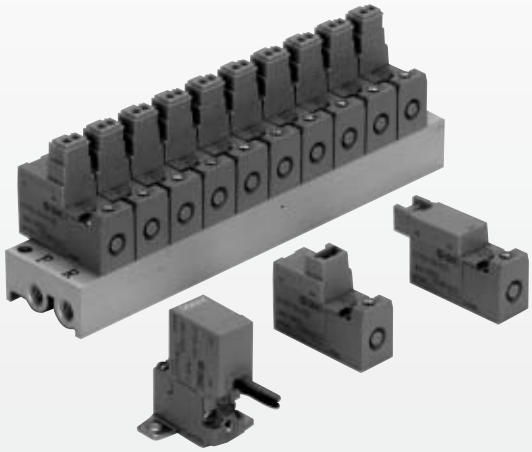
3 Port Solenoid Valve
Rubber Seal
Series SY100

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.]

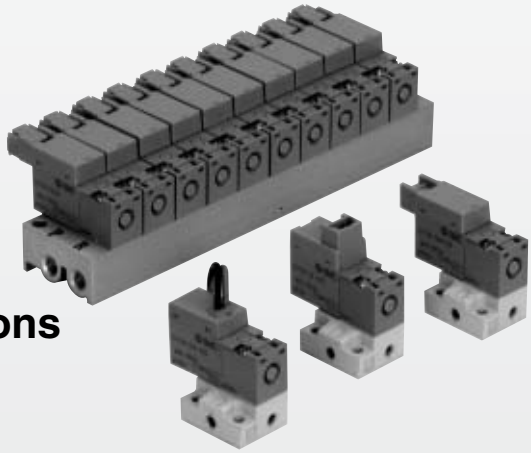
Body width: 10 mm

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

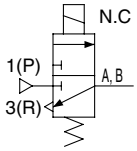
No copper used for sections in contact with fluids.

Bright color tone and neat design

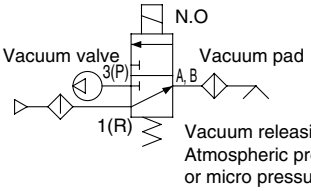
A bright gray concept has been adopted for this product to compliment the surrounding operational environment.

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

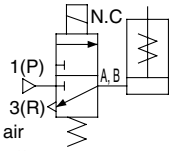
1. For blowing off



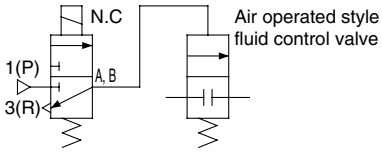
2. For vacuum control



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.

⚠Precautions

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

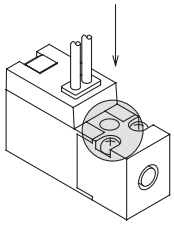
Manual Override Operation

⚠Warning

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

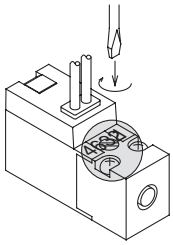
■ Non-locking push type [Standard type]

Press in the direction of the arrow

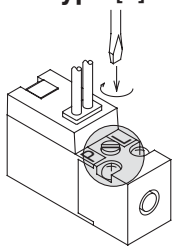


■ Locking slotted type [B]

Turn in the direction of arrow.



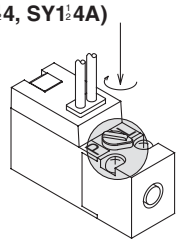
■ Push-turn locking slotted type [D]



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.

■ Push-turn locking lever type [E]

(SY1⅟₂4, SY1⅟₂4A)



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

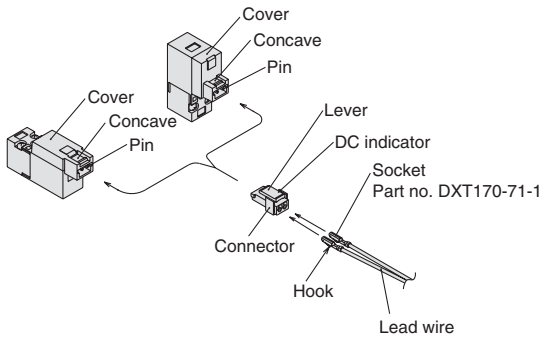
When operating the lock with the driver, use a watchmakers' screwdriver and turn lightly.
[Torque: 0.1 N·m or less]

How to Use Plug Connector

⚠Caution

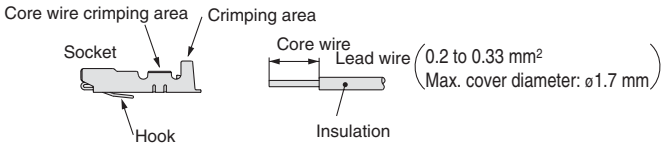
1. Attaching and detaching connectors

- 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.)



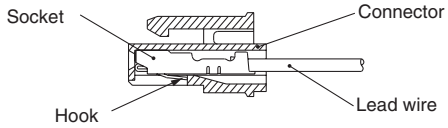
3. Attaching and detaching lead wires with sockets

- **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)	For AC
SY114-5LO	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

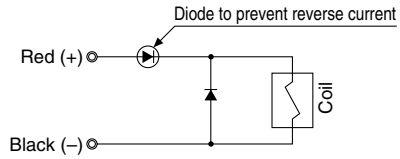
Surge Voltage Suppressor

<For DC>

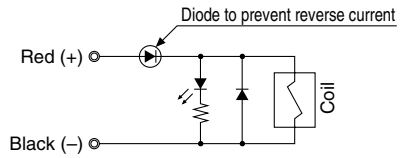
Grommet, L/M Plug Connector Type

■ Standard type (With polarity)

With surge voltage suppressor (□S)

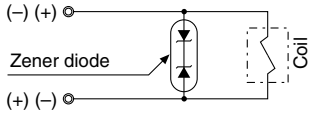


Light/Surge voltage suppressor (□Z)

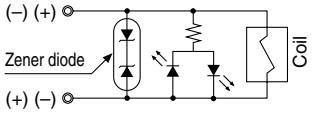


■ Non-polar type

With surge voltage suppressor (□R)



Light/Surge voltage suppressor (□U)



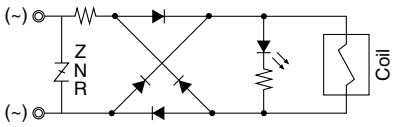
- Please connect correctly the lead wires to + (positive) and – (negative) indications on the connector.
  (For non-polar type, the lead wires can be connected to either one.)
- For DC voltages other than 12 and 24 VDC, incorrect wiring will cause damage to the surge voltage suppressor circuit. (Wrong 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 dusttight.

- 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.

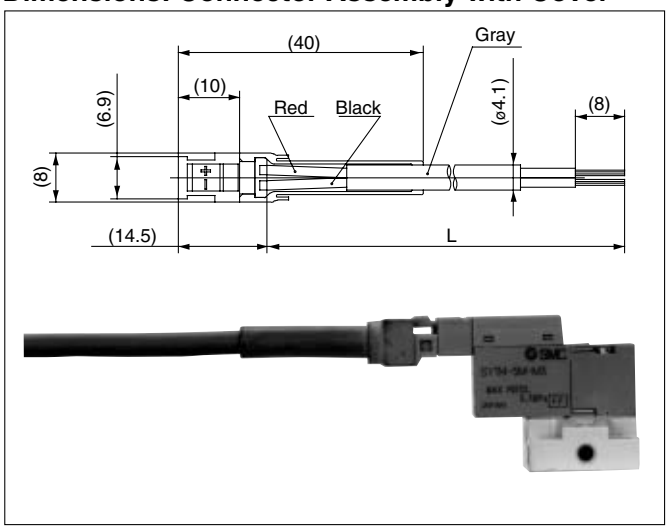
How to Order

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

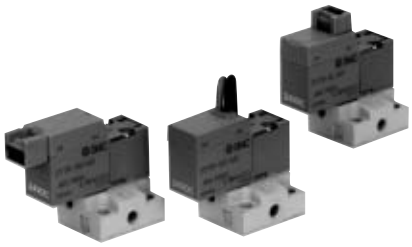
∗ No part numbers of connector assembly with cover are needed to be indicated in this case.

For details about certified products conforming to international standards, visit us at www.smcworld.com.

3 Port Direct Operated Solenoid Valve Rubber Seal

Series SY100

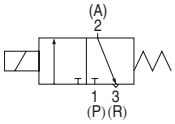
Body ported



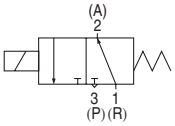
Base mounted

JIS Symbol

SY11$^{3}_{4}$ (A)



SY12$^{3}_{4}$ (A)



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

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$^{1}_{2}$4, SY1$^{1}_{2}$4A only}
Lubrication	Not required
Mounting position	Unrestricted
Impact/Vibration resistance (m/s^2) (2)	150/30
Enclosure	Dustproof

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$^{13}_{24}$	SY1$^{13}_{24}$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 [115 V]	1.0 (With indicator light: 1.1) [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.]

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$^{3}_{4}$**	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$^{3}_{4}$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$^{3}_{4}$** (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$^{3}_{4}$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$^{3}_{4}$ and SY123/SY124$^{3}_{4}$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)

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

Nil: For manifold
P: For body ported type to P, R, A port

Bracket

Nil: Without bracket
F: With bracket

"P" piping specifications only.

3 port

For manifold type 30, 31

Type of actuation

1	Normally closed
2	Normally open

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 □ □ – □

3 port

Sub-plate style
For manifold type S41

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

Nil: Without sub-plate
M3: With sub-plate

(With gasket and screws)

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.

Manual override

Nil: Non-locking push type
D: Push-turn locking slotted type
B: Locking slotted type
E: Push-turn locking lever type

SY1½4, SY1½4A only

How to Order

Large flow type (Cv: 0.012)

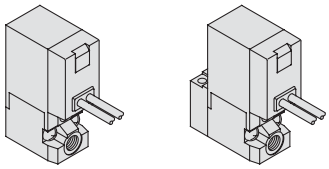
Light/Surge voltage suppressor

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

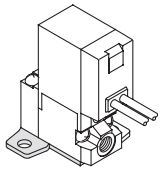
Nil: For manifold

P: For body ported type to P, R, A port



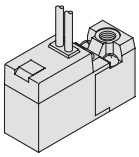
Bracket

Nil: Without bracket
F: With bracket



"P" piping specifications only.

3 port



For manifold type 30, 31

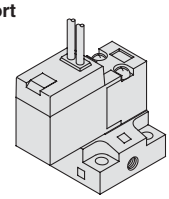
Type of actuation

1	Normally closed
2	Normally open

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] [ ] [ ] – [ ]

3 port



Sub-plate type
For manifold type S41

Rated voltage

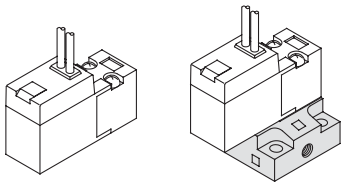
5	24 VDC
6	12 VDC
V	6 VDC
S	5 VDC
R	3 VDC

Large flow type

Port size

Nil: Without sub-plate

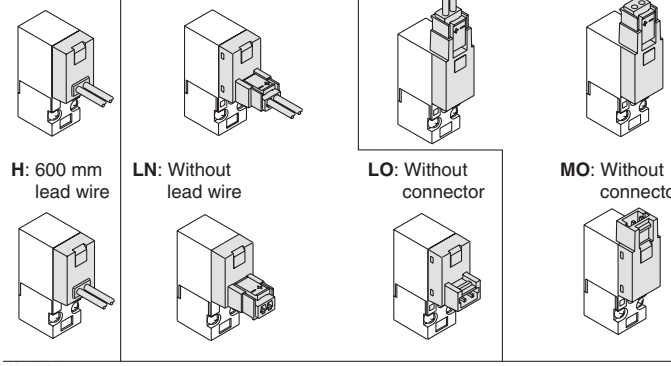
M3: With sub-plate



(With gasket and screws)

Electrical entry

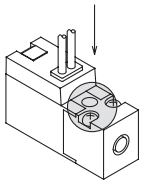
24 V, 12 V, 6 V, 5 V, 3 VDC			
Grommet	L plug connector	M plug connector	
G: 300 mm lead wire	**L**: With lead wire (Length 300 mm)	**M**: With lead wire (Length 300 mm)	**MN**: Without lead wire
H: 600 mm lead wire	**LN**: Without lead wire	**LO**: Without connector	**MO**: Without connector



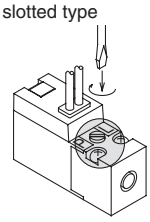
* "LN" and "MN" types are with 2 sockets.

Manual override

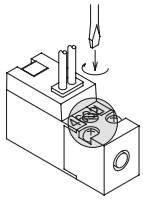
Nil: Non-locking push type



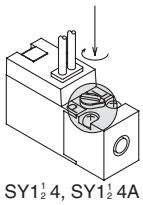
D: Push-turn locking slotted type



B: Locking slotted type



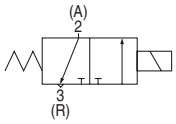
E: Push-turn locking lever type

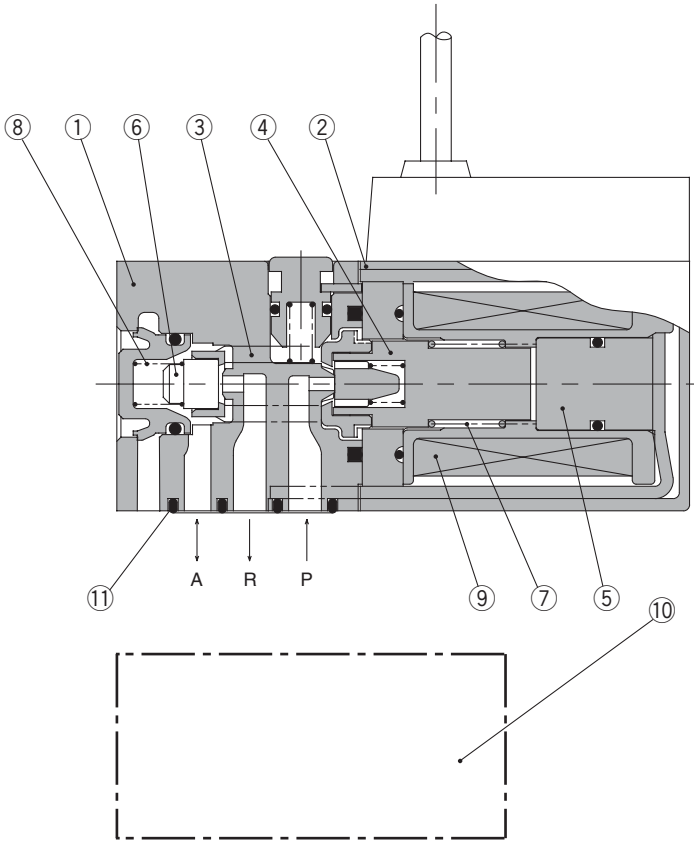


SY1$\frac{1}{2}$4, SY1$\frac{1}{2}$4A only

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 –** □

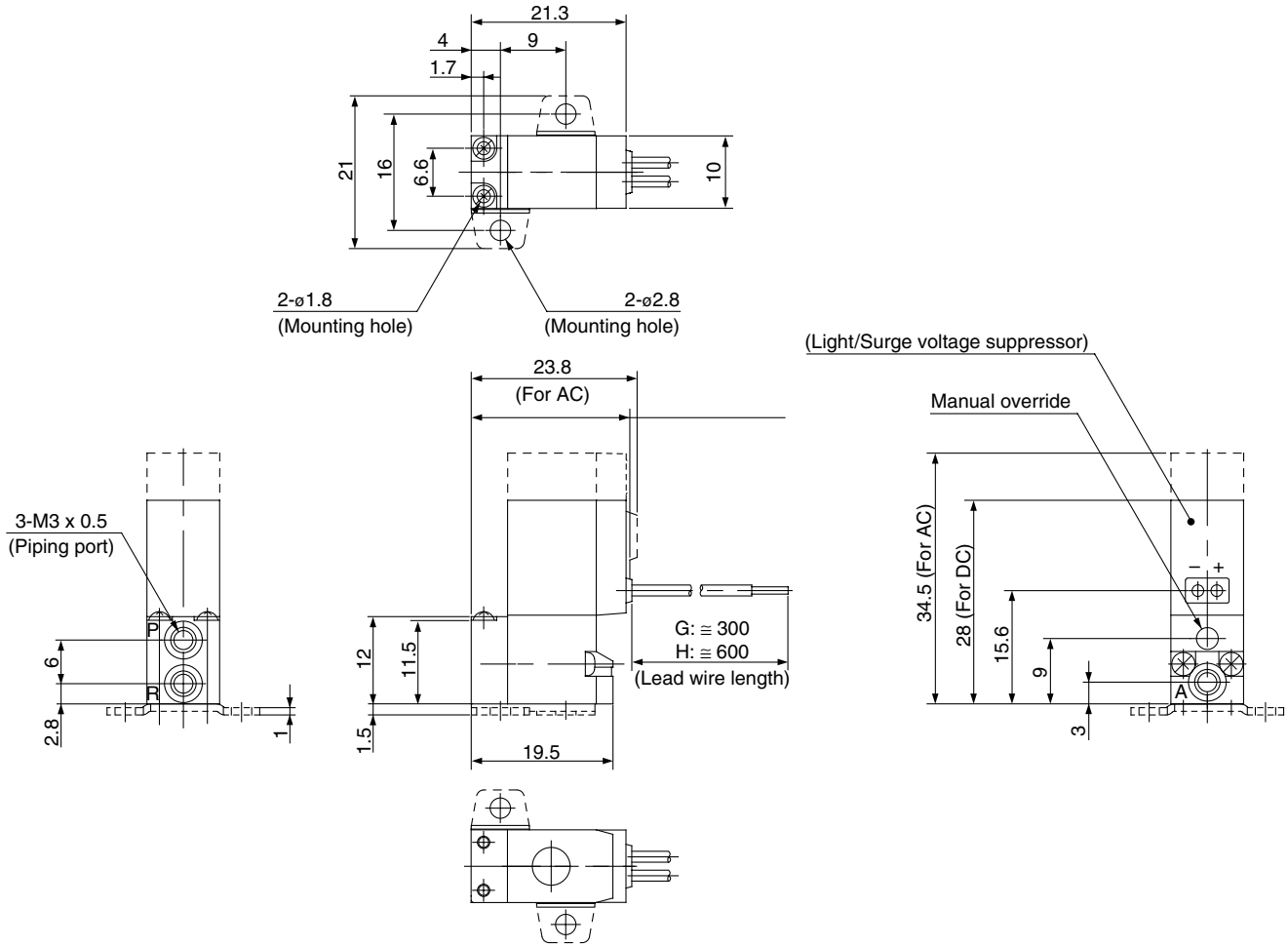
Without lead wire: **SY100 – 30 – A**
(With connector and 2 pcs. of socket)

Lead wire length

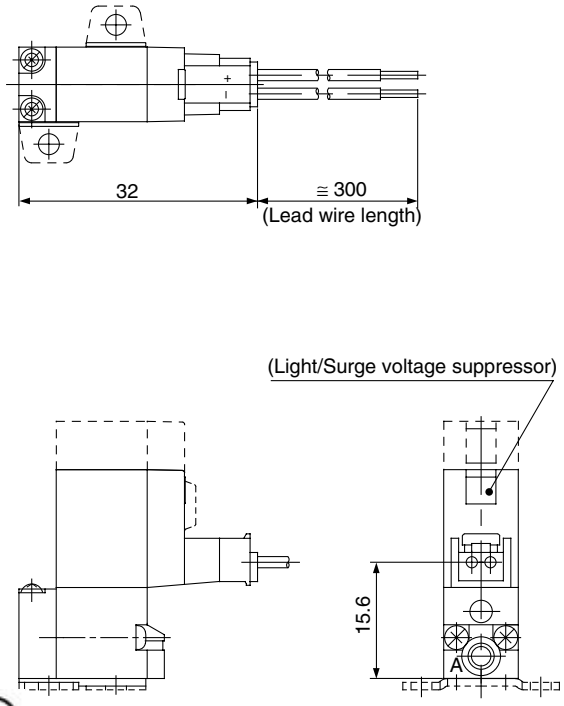
Nil	300 mm
6	600 mm
10	1000 mm
15	1500 mm
20	2000 mm
25	2500 mm
30	3000 mm
50	5000 mm

Body Ported

Grommet (G), (H): SY1$\frac{1}{2}$3 (A)-□$\frac{G}{H}$□□-PM3(-F)

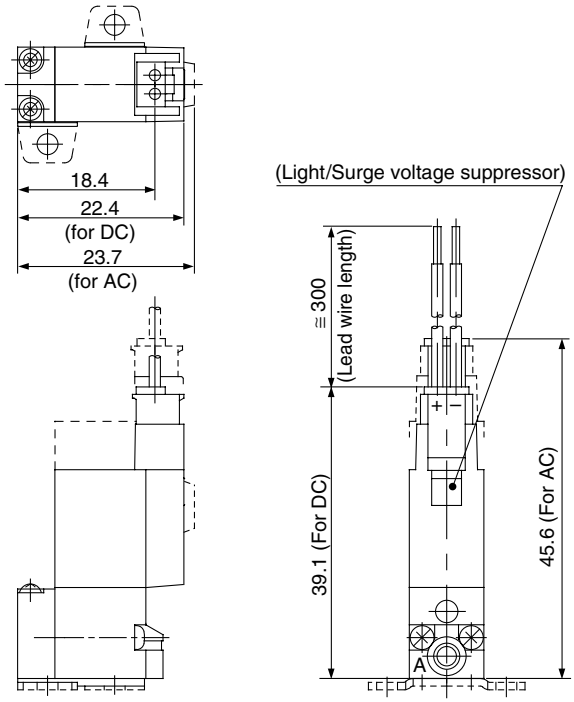


L plug connector (L): SY1$\frac{1}{2}$3(A)-□L□□-PM3(F)



∗ Other dimensions are same as grommet type.

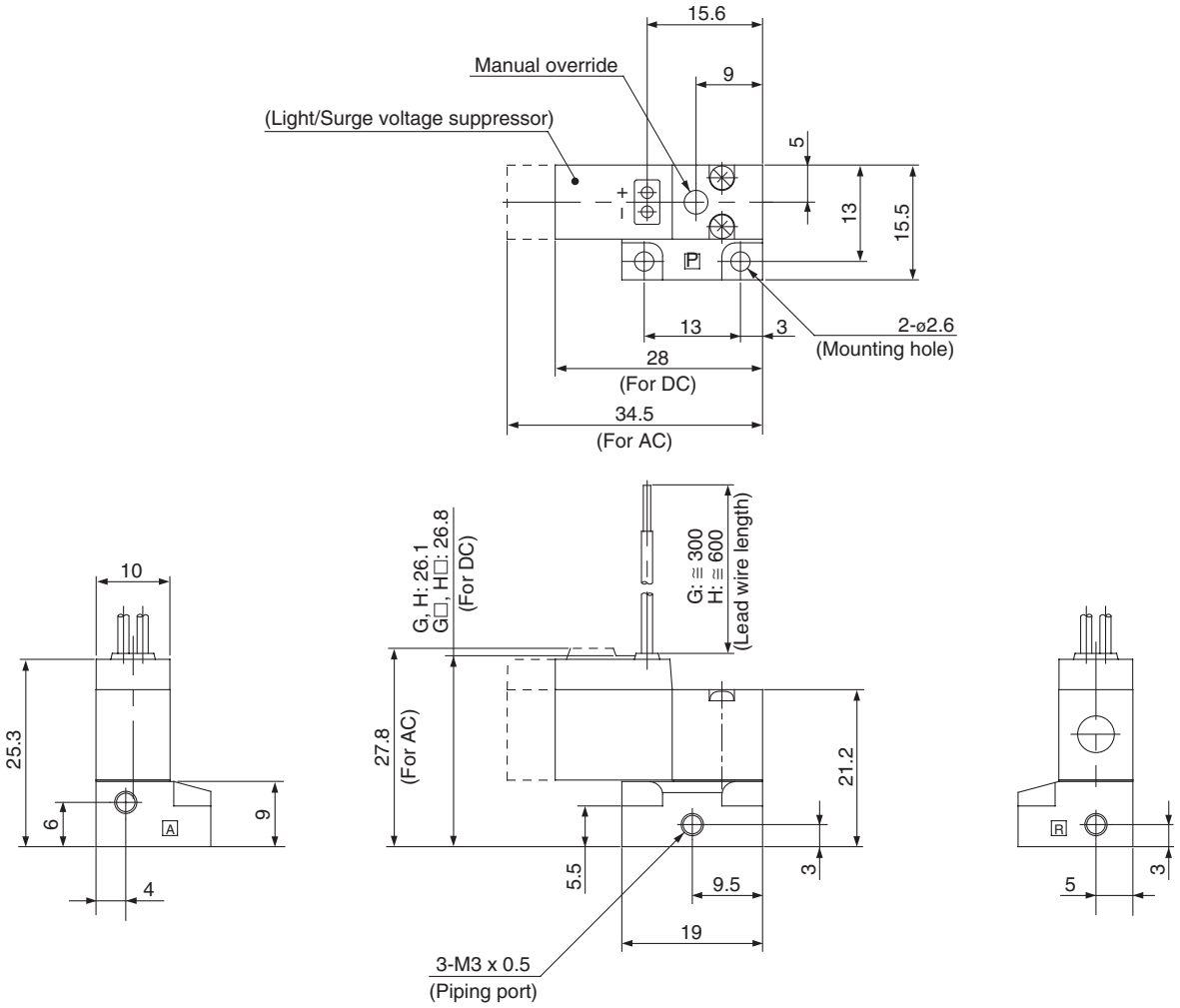
M plug connector (M): SY1$\frac{1}{2}$3(A)-□M□□-PM3(-F)



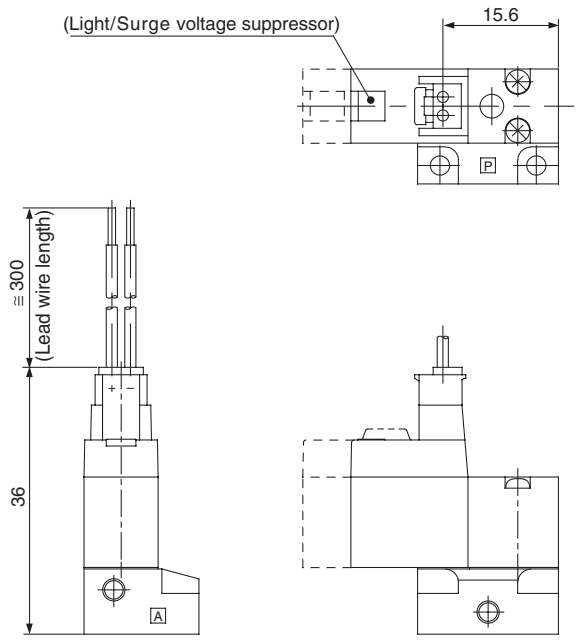
∗ Other dimensions are same as grommet type.

Base Mounted (With sub-plate)

Grommet (G), (H): SY1$^{1}_{2}$4(A)-□$^{G}_{H}$□□-M3

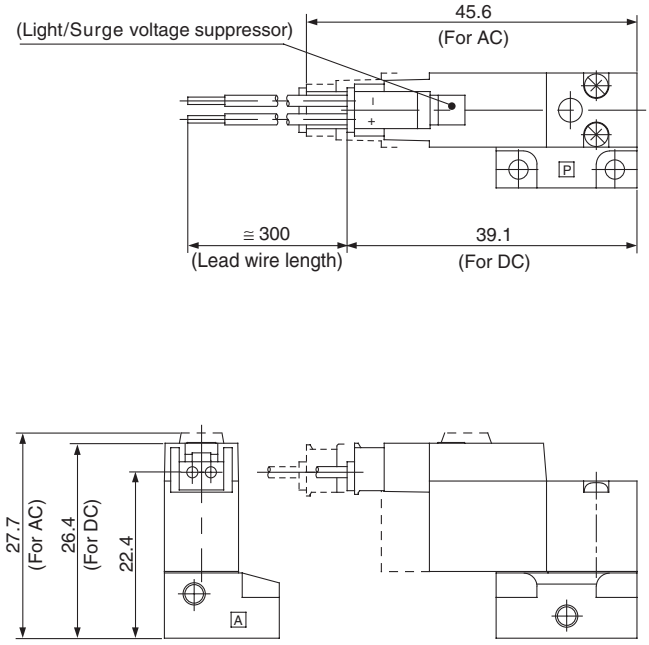


L plug connector (L): SY1$^{1}_{2}$4(A)-□L□□-M3



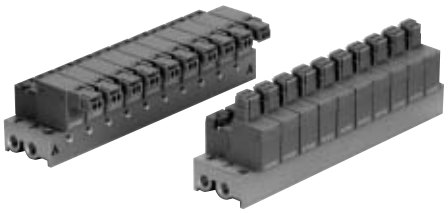
∗ Other dimensions are same as grommet type.

M plug connector (M): SY1$^{1}_{2}$4(A)-□M□□-M3



∗ Other dimensions are same as grommet type.

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.

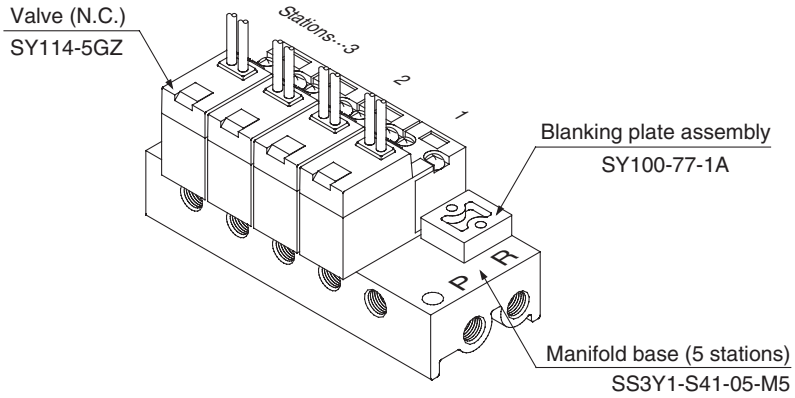
Flow Characteristics

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

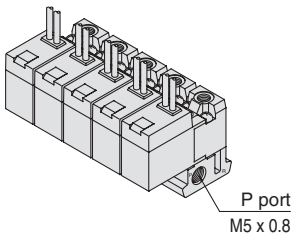


SS3Y1-S41-05-M5····· 1 set (Type S41, 5 station manifold part number)
∗ SY100-77-1A····· 1 set (Blanking plate assembly part number)
∗ SY114-5GZ····· 4 sets (Valve)
→The asterisk denotes the symbol for assembly. Prefix it to the part nos. of the solenoid valve, etc.

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

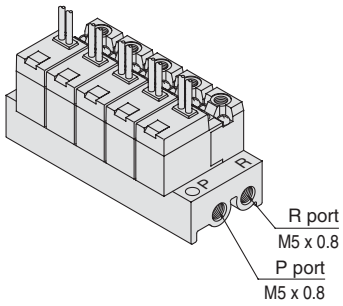
Stations

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

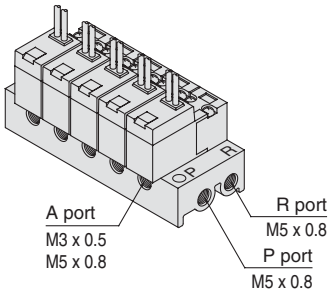
Stations

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

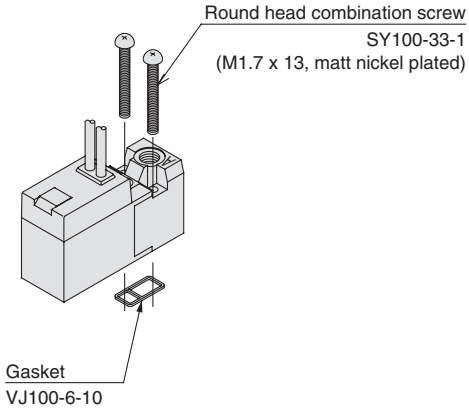
M3	M3 x 0.5
M5	M5 x 0.8

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.

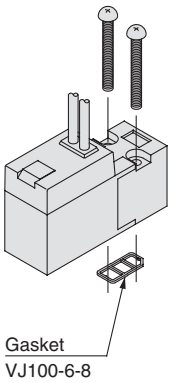
Combination with Solenoid Valve and Gasket Manifold Base

Body ported



Applicable base
- **Sub-plate (For body ported type)**
- **SS3Y1-30 type** } **Manifold base**
- **SS3Y1-31 type** } **Manifold base**

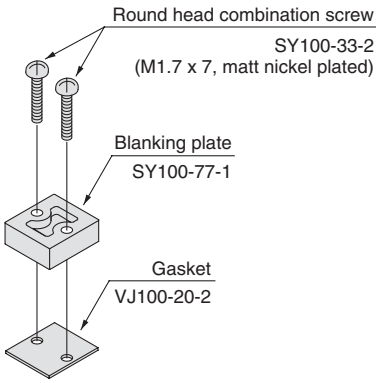
Base mounted



Applicable base
Sub-plate
Type SS3Y1- S41
Manifold base

Blanking Plate Assembly

Part no.: SY100-77-1A



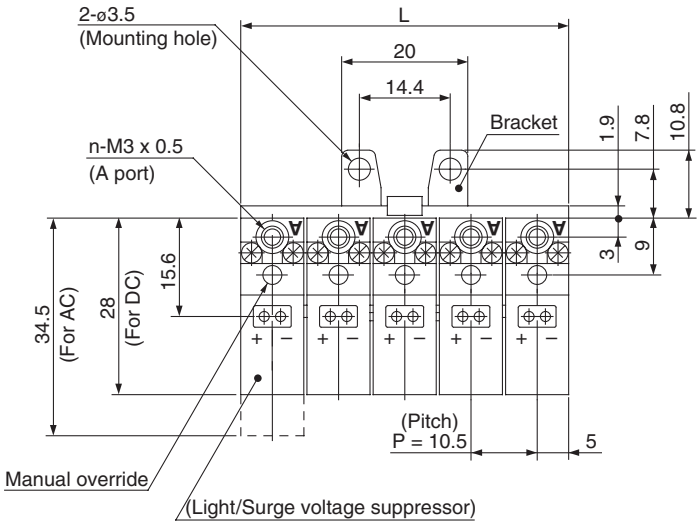
Applicable base
Sub-plate
Type SS3Y1-30
Type SS3Y1-31
Type SS3Y1-S41
} **Manifold base**

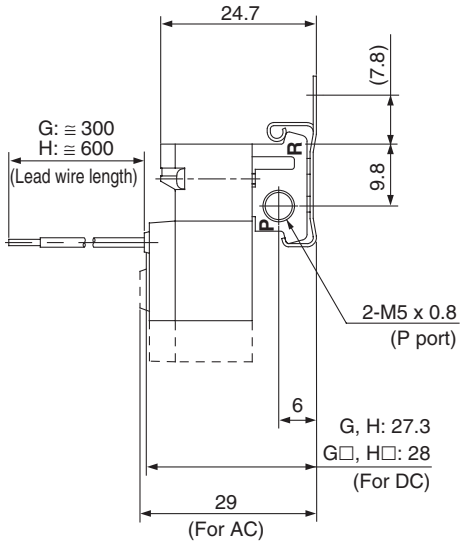
⚠Caution

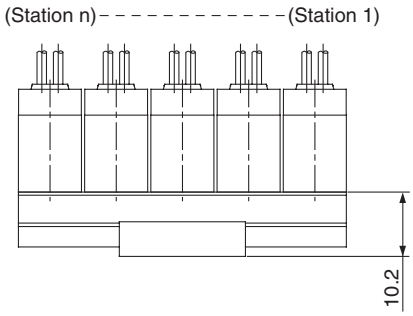
Mounting Screw Tightening Torques **M1.7: 0.12 N·m**

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

Grommet (G), (H)

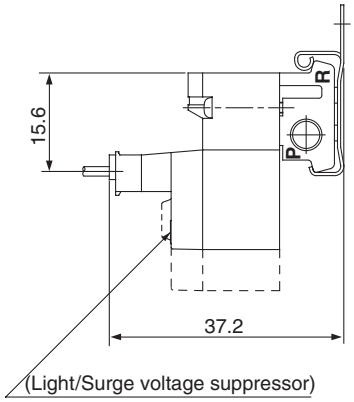






* No bracket is assembled prior to delivery. Mount one to the appropriate position.
(Attach two brackets if more than five stations.)

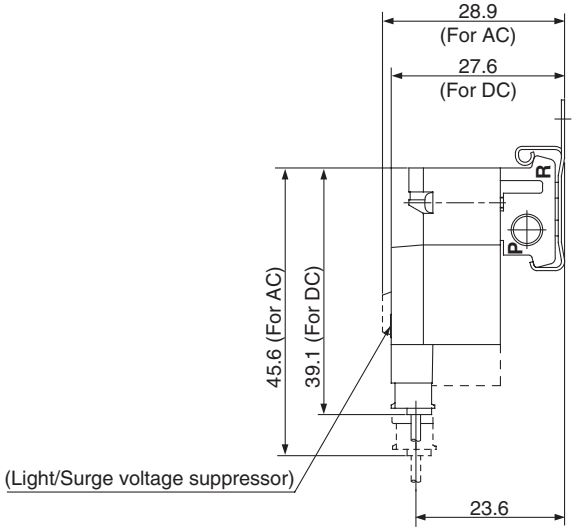
L plug connector (L)



* 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

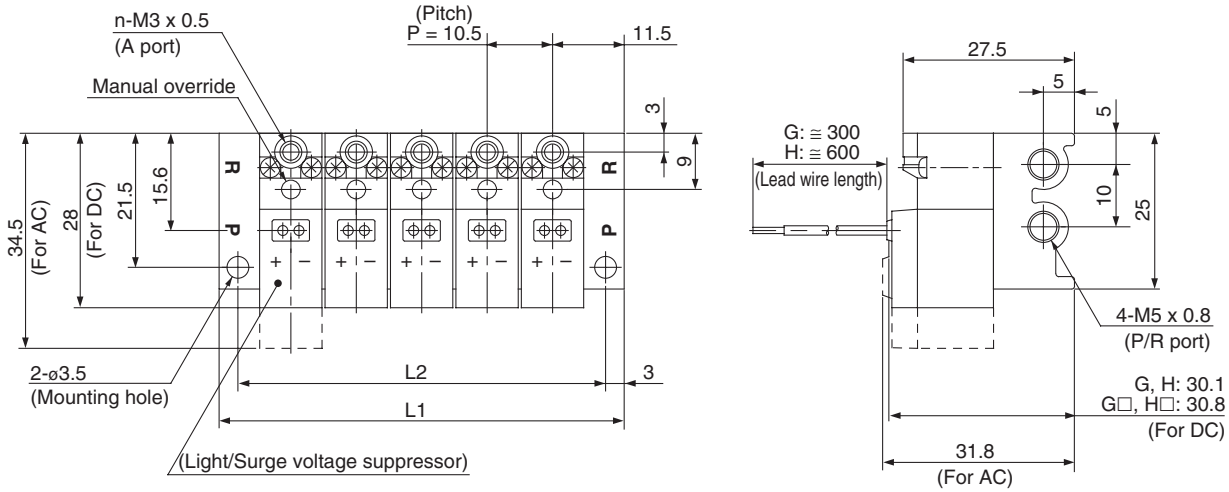
M plug connector (M)

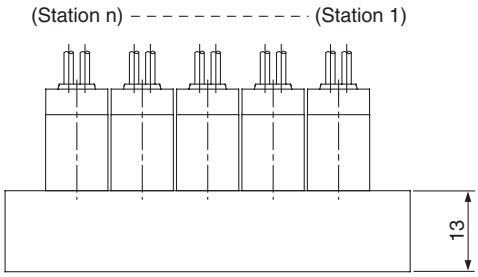


* Other dimensions are same as grommet type.

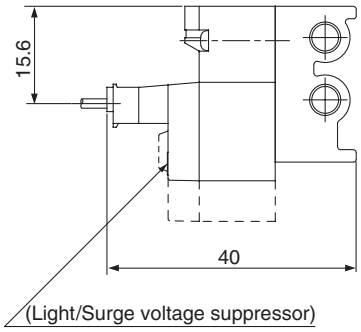
Type 31 Manifold: Top Ported/SS3Y1-31-Stations

Grommet (G), (H)



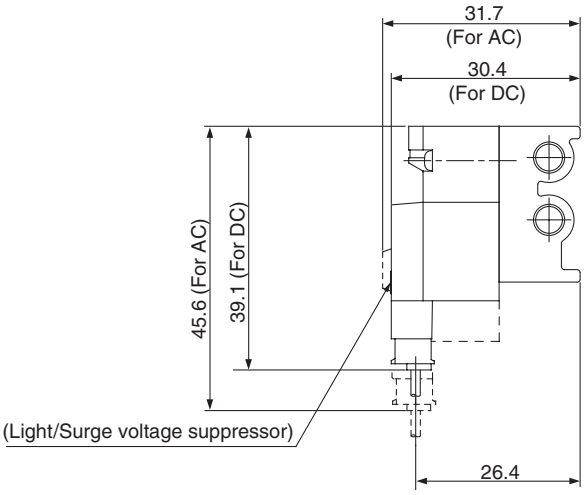


L plug connector (L)



∗ Other dimensions are same as grommet type.

M plug connector (M)

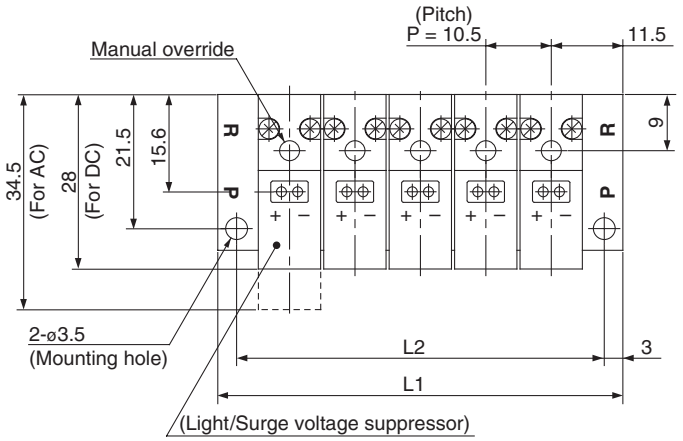


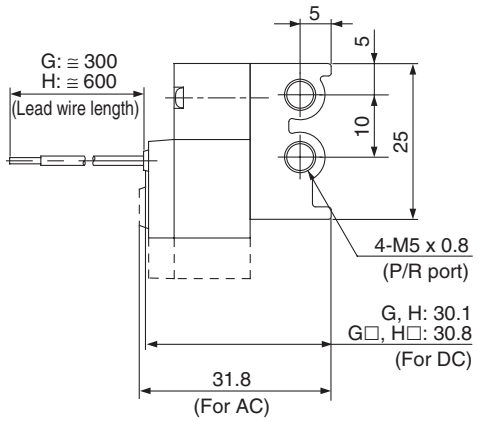
∗ Other dimensions are same as grommet type.

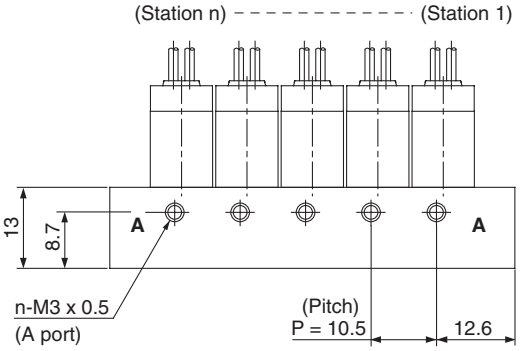
Station	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L_1	33.5	44	54.5	65	75.5	86	96.5	107	117.5	128	138.5	149	159.5	170	180.5	191	201.5	212	222.5
L_2	27.5	38	48.5	59	69.5	80	90.5	101	111.5	122	132.5	143	153.5	164	174.5	185	195.5	206	216.5

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

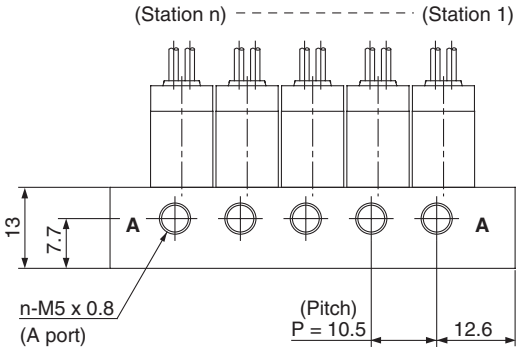
Grommet (G), (H)





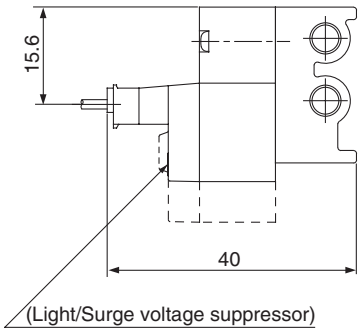


M3



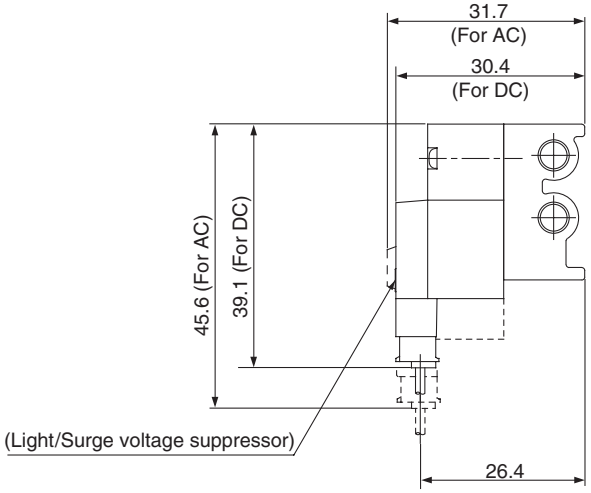
M5

L plug connector (L)



∗ Other dimensions are same as grommet type.

M plug connector (M)



∗ 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
L_1	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
L_2	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

Made to Order Specifications:

Please contact SMC for detailed specifications, delivery and pricing.

Energy-saving Type

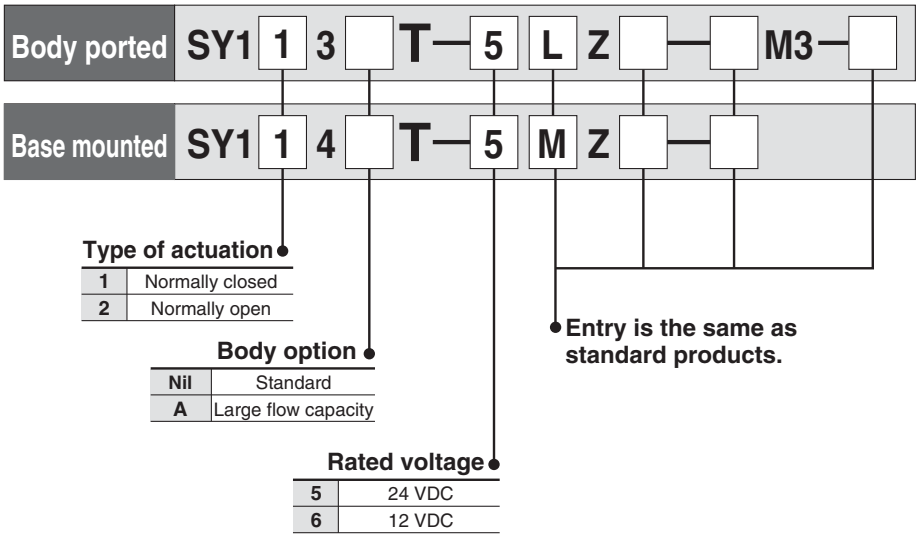
Power consumption is decreased by 1/3 by reducing the wattage required to hold the valve in an energized state. (Effective energizing time is over 62 ms at 24 VDC.)

Specifications

Series		SY1$^{1\,3}_{2\,4}$T	SY1$^{1\,3}_{2\,4}$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.

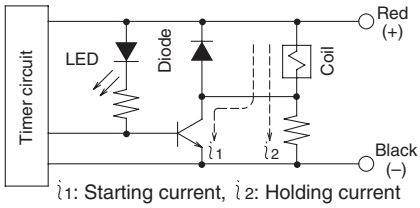
How to Order



Working Principle

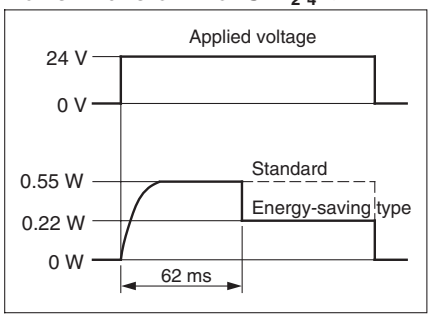
The circuit shown below reduces current consumption at holding which reduces the overall power consumption.
Refer to electrical power waveform as shown below.

Electrical circuit (With energy-saving circuit)

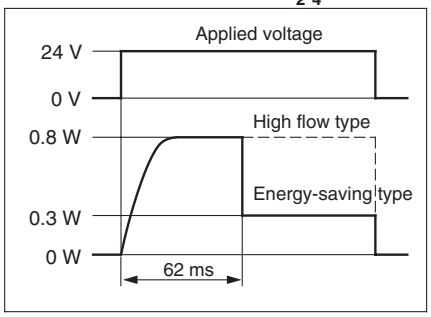


i1: Starting current, i2: Holding current

<Energy-saving Type, Electrical Power Waveform for SY1$^{1\,3}_{2\,4}$T>



<Energy-saving Type, Electrical Power Waveform for SY1$^{1\,3}_{2\,4}$AT>



Low Wattage Specifications (0.45 W)

How to Order