

Direct Operated 3-Port Solenoid Valve

V100 Series



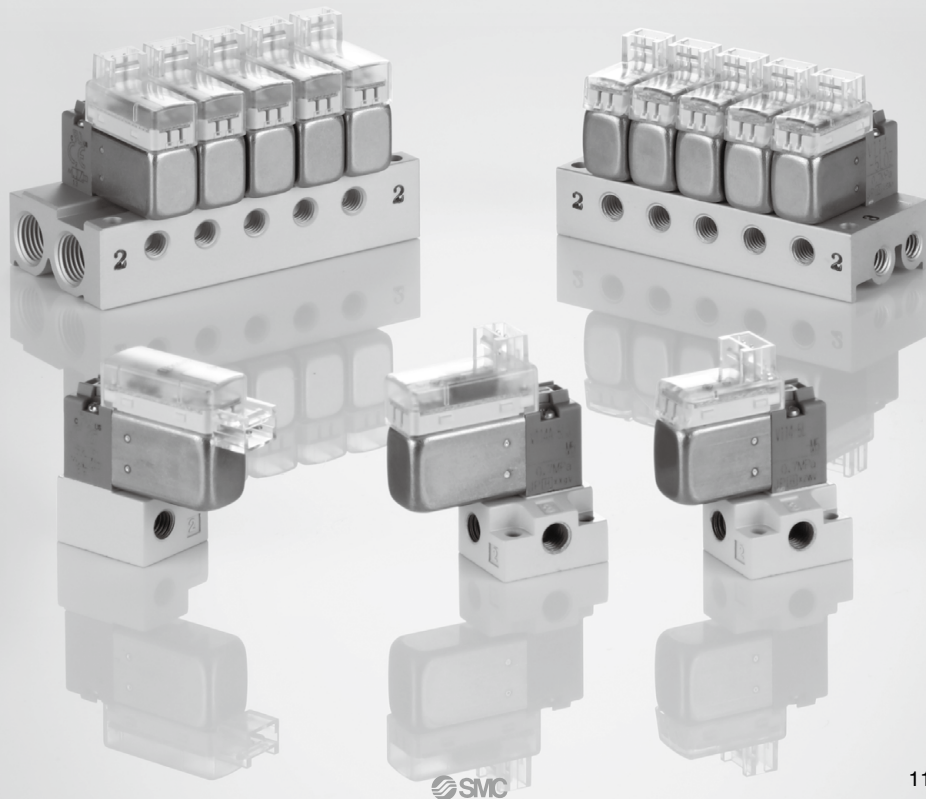
*1 DC type only

Power consumption: 0.1 w*2
(Standard type, With power-saving circuit)

Coil temperature rise: 1°C
(Standard type, With power-saving circuit)

		Large flow type (Type U)	Large flow type (Type A)	Standard type
Sonic conductance C[dm ³ /(s·bar)]		0.16	0.076	0.037
Power consumption [W]	Standard	—	1	0.35
	With power- saving circuit	0.35	—	0.1 ^{*2}

*2 Refer to page 1166 for details.



Direct Operated 3-Port Solenoid Valve

V100 Series

Rubber Seal



*1 DC type only



Specifications

Fluid	Air
Ambient and fluid temperatures [°C]	-10 to 50 (No freezing)
Response time (DC) [ms] ^{*1}	ON: 5 or less OFF: 4 or less
Max. operating frequency [Hz]	20 ^{*3}
Manual override	Non-locking push, Locking slotted
Lubrication	Not required
Mounting position	Unrestricted
Impact/Vibration resistance [m/s ²] ^{*2}	150/30
Enclosure	Dustproof

*1 Based on the JIS B 8419: 2010 dynamic performance test (Standard type: Coil temperature 20°C, at rated voltage, without surge voltage suppressor)

*2 Impact resistance: No malfunction occurred when tested with a drop tester in the axial direction and at a right angle to the armature in both an energized and a de-energized state, once in each condition. (Value in the initial state)

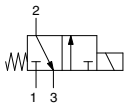
Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz in the axial direction and at a right angle to the armature in both an energized and a de-energized state, once in each condition. (Value in the initial state)

*3 Please contact SMC for the large flow type (Type U).

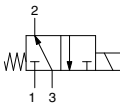
Solenoid Specifications

Symbol

V114(A,UT)



V124(A)



Series		V114/V124	V114A/V124A	V114UT
Electrical entry		Grommet (G)/(H), L plug connector (L), M plug connector (M)		L plug connector (L), M plug connector (M)
Coil rated voltage [V]		DC	24, 12, 6, 5, 3	24
Coil rated voltage [V]		AC 50/60 Hz	100, 110, 200, 220	—
Allowable voltage fluctuation		-10 to 10% ^{*1}		
Power consumption [W]	DC	Standard: 0.35 (With light: 0.4) With power-saving circuit: 0.1 ^{*2} [Inrush: 0.4, Holding: 0.1]	1 W (With light: 1.1)	With power-saving circuit: 0.35 ^{*2} [Inrush: 3.2, Holding: 0.35]
	AC	100 V: 0.78 (With light: 0.81) 110 V: 0.86 (With light: 0.89) [115 V]: 0.94 (With light: 0.97) 200 V: 1.18 (With light: 1.22) 220 V: 1.30 (With light: 1.34) [230 V]: 1.42 (With light: 1.46)	—	—
Surge voltage suppressor		Refer to page 1177.		
Indicator light		LED		

* The 110 VAC and the 115 VAC are interchangeable. The 220 VAC and the 230 VAC are interchangeable as well.

*1 The allowable voltage fluctuation is -15% to +5% of the rated voltage for the 115 VAC or the 230 VAC.

*1 For the allowable voltage fluctuation for types S, Z, and T (with power-saving circuit), please observe the following ranges because they experience voltage drops due to the internal circuit.

Types S and Z 24 VDC: -7% to +10%

12 VDC: -4% to +10%

Type T 24 VDC: -8% to +10%

12 VDC: -6% to +10%

* Select the DC standard model or the model with power-saving circuit when the valve is to be continuously energized for long periods of time.

*2 Refer to page 1177 for details.

Specifications

Valve model	Type of actuation	Type	Operating pressure range*4 [MPa]	Vacuum specification [MPa]**4		Port size		Weight [g]**2	
				Port 1	Port 3	Port 1, 3	Port 2	Grommet	L plug connector M plug connector
V114	N.C.	Standard type	0 to 0.7	-100 kPa to 0.6	-100 kPa to 0	M5 x 0.8	M5 x 0.8	V1□4: 13 (27) V1□4A: 16 (30)	V1□4: 12 (26) V1□4A: 15 (29) V114UT: 15 (29)
V114A	N.C.	Large flow type (Type A)	0 to 0.7	-100 kPa to 0.6	-100 kPa to 0	M5 x 0.8	M5 x 0.8		
V114UT	N.C.	Large flow type (Type U)	0 to 0.6	-100 kPa to 0.5	-100 kPa to 0	M5 x 0.8	M5 x 0.8		
V124*1	N.O.	Standard type	0 to 0.7	-100 kPa to 0	-100 kPa to 0.6	M5 x 0.8	M5 x 0.8		
V124A*1	N.O.	Large flow type (Type A)	0 to 0.7	-100 kPa to 0	-100 kPa to 0.6	M5 x 0.8	M5 x 0.8		

Valve model	Flow rate characteristics					
	1 → 2 [3 → 2*3]			2 → 3 [2 → 1*3]		
	C [dm ³ /(s·bar)]	b	Cv	C [dm ³ /(s·bar)]	b	Cv
V114	0.037	0.11	0.008	0.054	0.35	0.015
V114A	0.076	0.07	0.016	0.099	0.23	0.024
V114UT	0.16	0.18	0.038	0.15	0.34	0.041
V124*1	0.054	0.35	0.015	0.037	0.11	0.008
V124A*1	0.099	0.23	0.024	0.076	0.07	0.016

*1 For both the V124 and the V124A, pressure from port 3 and exhaust from port 1.

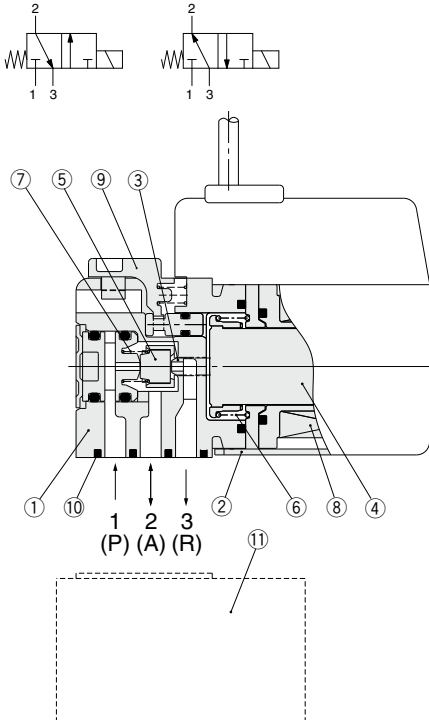
*2 The values shown in () are for values with sub-plate.

*3 For the V124(A)

*4 Please note that, if the difference between the inlet side and the outlet side is extremely low (0.001 MPa or less as a guide), air may not be output or the flow rate may deteriorate excessively due to the quality of the lubricant and air in the solenoid valve (mixing in of the drain, etc.).

Construction

V114(A, UT) V124(A)



Component Parts

No.	Description	Material
1	Body	Resin
2	Cover	Stainless steel
3	Push rod	Resin
4	Armature assembly	Stainless steel, Resin
5	Poppet	FKM, HNBR
6	Return spring	Stainless steel
7	Poppet spring	Stainless steel
8	Coil assembly	—
9	Manual override	Resin

Replacement Parts

No.	Description	Part no.	Material	Note
10	Gasket assembly	V100-31-1A	FKM, Steel	Gasket, 2 screws
11	Sub-plate	V100-74-1	Aluminum die-cast	—

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 sockets)

• 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

How to Order

Standard type

Base mounted

Sub-plate type,
For manifold type S41



V1 **1** **4** **5** **M**

Type of actuation

1	Normally closed
2	Normally open

Coil type

Nil	0.35 W
T	0.1 W (with power-saving circuit) (24 VDC, 12 VDC only)

* All the types with power-saving circuit are with light and surge voltage suppressor "Z."

Rated voltage

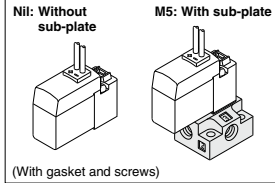
For DC	CE/UKCA-compliant
5	24 VDC ●
6	12 VDC ●
V	6 VDC ●
S	5 VDC ●
R	3 VDC ●

For AC (50/60 Hz)	CE/UKCA-compliant
1	100 VAC —
2	200 VAC —
3	110 VAC [115 VAC] —
4	220 VAC [230 VAC] —

Electrical entry

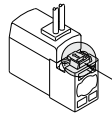
24 V, 12 V, 6 V, 5 V, 3 VDC/100 V, 110 V, 200 V, 220 VAC			
Grommet	L plug connector	M plug connector	
G: 300 mm lead wire	L: With 300 mm lead wire	M: With 300 mm lead wire	MN: Without lead wire
H: 600 mm lead wire	LN: Without lead wire	LO: Without connector	MO: Without connector

Port size

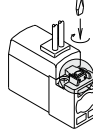


Manual override

Nil: Non-locking push



B: Locking slotted



Light/surge voltage suppressor

Nil	Without light/surge voltage suppressor	For DC, AC
S	With surge voltage suppressor	For DC
Z	With light/surge voltage suppressor	For DC, AC
R	With surge voltage suppressor (Non-polar)	For DC
U	With light/surge voltage suppressor (Non-polar)	For DC

* Only "Z" is available for the models with power-saving circuit.

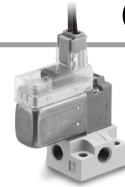
* LN and MN types are with 2 sockets.

* Refer to page 1176 for the different lead wire lengths of L and M plug connectors.

* Refer to page 1178 for the connector assembly with a dustproof cover for L and M plug connectors.



How to Order



Large flow type (Type A)

Base mounted

Sub-plate type,
For manifold type S41

V1 **1** 4 A— **5** M

Type of actuation

1	Normally closed
2	Normally open

Large flow type (Type A)

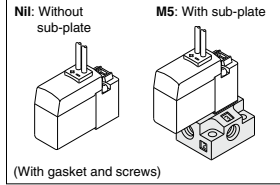
Rated voltage

For DC		CE/UKCA-compliant
5	24 VDC	●
6	12 VDC	●
V	6 VDC	●
S	5 VDC	●
R	3 VDC	●

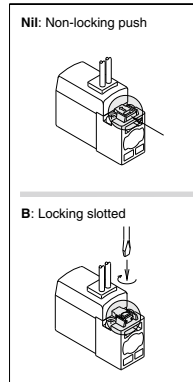
Electrical entry

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

Port size



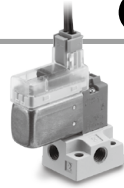
Manual override



Light/surge voltage suppressor

Nil	Without light/surge voltage suppressor	For DC
R	With surge voltage suppressor	
U	With light/surge voltage suppressor	

* LN and MN types are with 2 sockets.
 * Refer to page 1176 for the different lead wire lengths of L and M plug connectors.
 * Refer to page 1178 for the connector assembly with a dustproof cover for L and M plug connectors.



Large flow type (Type U)

Base mounted

Sub-plate type,
For manifold type S41

V1 1 4 U T - 5 M Z - -

Type of actuation

1 Normally closed

Large flow type (Type U)

Coil type

T 0,35 W (With power-saving circuit)

Rated voltage

For DC	CE/UKCA-compliant
5 24 VDC	●

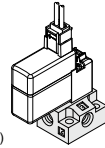
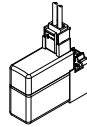
Electrical entry

24 VDC		
L plug connector	M plug connector	
L: With 300 mm lead wire	M: With 300 mm lead wire	MN: Without lead wire
LN: Without lead wire	LO: Without connector	MO: Without connector

- * LN and MN types are with 2 sockets.
- * Refer to page 1176 for the different lead wire lengths of L and M plug connectors.
- * Refer to page 1178 for the connector assembly with a dustproof cover for L and M plug connectors.

Port size

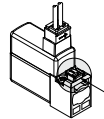
Nil: Without sub-plate M5: With sub-plate



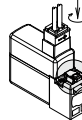
(With gasket and screws)

Manual override

Nil: Non-locking push



B: Locking slotted



Light/surge voltage suppressor

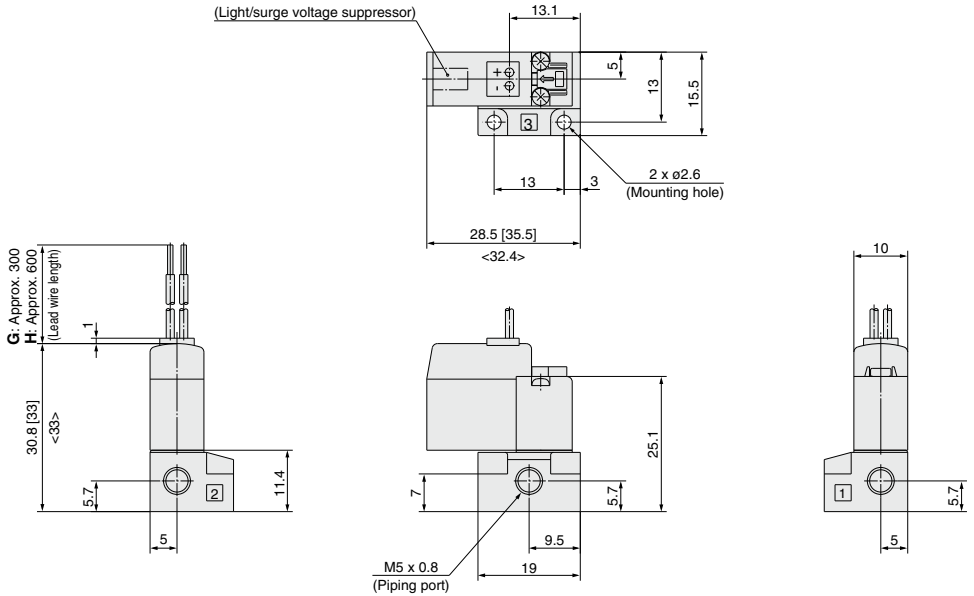
Z With light/surge voltage suppressor

Base Mounted (With sub-plate)

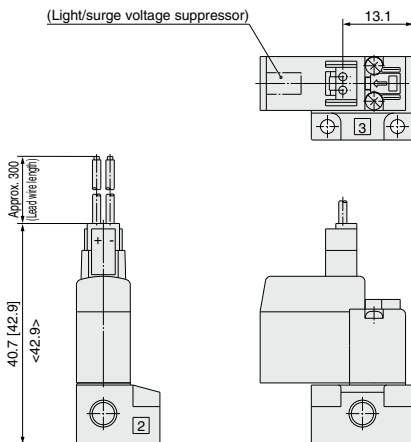
Grommet (G), (H): V1 $\frac{1}{2}$ 4(A)-□ $\frac{G}{H}$ □□-M5

* []: AC

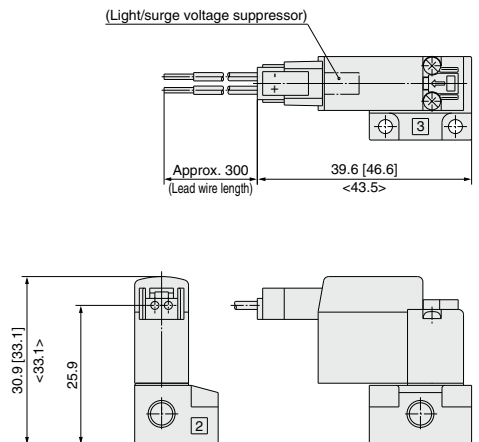
< >: Values for the large flow type (Type A, UT)



L plug connector (L): V1 $\frac{1}{2}$ 4(A, UT)-□L□□-M5



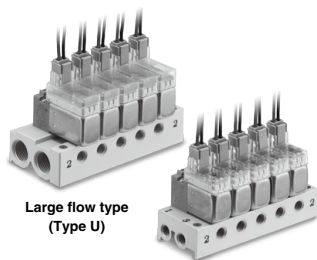
M plug connector (M): V1 $\frac{1}{2}$ 4(A, UT)-□M□□-M5



* Other dimensions are the same as those of the grommet type.

* Other dimensions are the same as those of the grommet type.

3-Port Solenoid Valve/V100 Series Manifold Specifications



Large flow type
(Type U)

Standard type /
Large flow type
(Type A)

Manifold Specifications

Model		Type S41	
Manifold		Single base type/B mount	
P (SUP)/R (EXH) type		Common SUP/Common EXH	
Valve stations		2 to 20 stations	
Output port porting specifications	Location	Base	
	Direction	Side	
Port size	Type VV100-S41	Port 1, 2, 3	M5 x 0.8
	Type VV100U-S41	Port 1, 3	1/8
		Port 2	M5 x 0.8

- * The V114(A) and the V124(A) cannot be mounted to the same manifold.
- * For the V124(A), pressure from port 3 and exhaust from port 1.

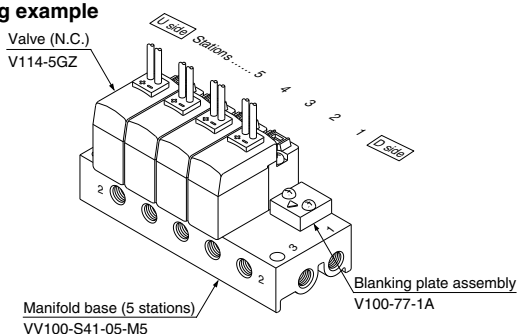
Flow Rate Characteristics*1

Manifold		Port size	Flow rate characteristics					
			1 → 2 [3 → 2*1]			2 → 3 [2 → 1*1]		
			C [dm ³ /(s·bar)]	b	Cv	C [dm ³ /(s·bar)]	b	Cv
Type VV100-S41	V114	M5 x 0.8	0.032	0.13	0.007	0.050	0.26	0.012
	V114A		0.070	0.10	0.016	0.085	0.16	0.020
	V124		0.050	0.26	0.012	0.032	0.13	0.007
	V124A		0.085	0.16	0.020	0.070	0.10	0.016
Type VV100U-S41	V114UT	1, 3: 1/8 2: M5 x 0.8	0.14	0.12	0.034	0.15	0.26	0.036

- * Values when mounted on the manifold base (5 stations)
- *1 For the V124(A)

How to Order Valve Manifold Assembly (Example)

Ordering example



VV100-S41-05-M5 1 set (Type S41, 5 station manifold base part no.)
 *V100-77-1A 1 set (Blanking plate assembly part no.)
 *V114-5GZ 4 sets (Valve)

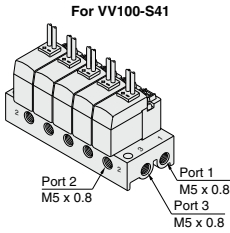
*The asterisk denotes the symbol for the assembly.
 Prefix it to the part nos. of the solenoid valve, etc.

Beneath the manifold base part number, enter the valve and option part numbers to be mounted.



Common SUP/Common EXH

Type S41



How to Order

Standard type / Large flow type (Type A)

VV100 - S41 - 05 - M5

Stations

02	2 stations
⋮	⋮
20	20 stations

Port 2 size

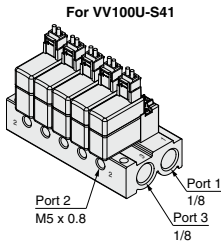
M5	M5 x 0.8
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Applicable solenoid valve*1

- V114-□□□□
- V114A-□□□□
- V124-□□□□
- V124A-□□□□

Applicable blanking plate assembly
V100-77-1A

*1 The V114(A) and the V124(A) cannot be mounted to the same manifold.
* For 2 to 9 stations, the port 1 [for the V114(A)] or port 3 [for the V124(A)] entry is only available on the U side (a plug is mounted on the D side). For 10 to 20 stations, it is available on both sides (with no plug mounted).



Large flow type (Type U)

VV100U - S41 - 05 D - 01

Stations

02	2 stations
⋮	⋮
20	20 stations

Port 1/3 size

NII	Rc1/8
F	G1/8
N	NPT1/8

Applicable solenoid valve

- V114UT-5□□
- Applicable blanking plate assembly
V100-77-1A

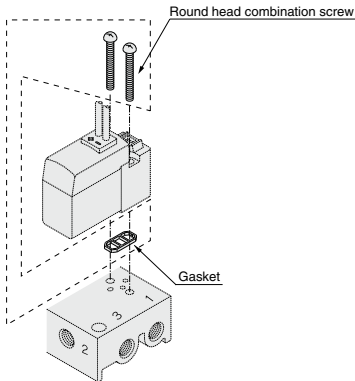
Port 1 entry

U	U side*2
D	D side*2
B	Both sides

*2 Plugs are mounted on the opposite side of the selected ports.

Gasket Assembly

Part No.: V100-31-1A

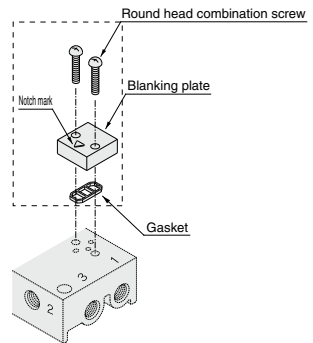


- Applicable base
- Sub-plate
 - Type VV100(U)-S41 manifold base

Blanking Plate Assembly

Part No.: V100-77-1A

Have the notch mark on the blanking plate face the port 2 side when assembling.



- Applicable base
- Sub-plate
 - Type VV100(U)-S41 manifold base

Caution

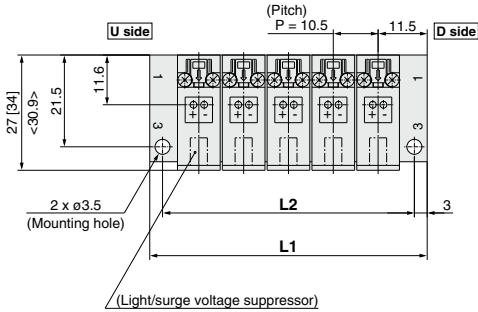
Mounting screw tightening torque M2: 0.12 N·m

V100 Series

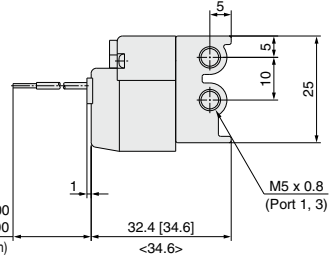
Type S41 Manifold: Side Ported/VV100-S41- Stations -M5

* []: AC
< >: Values for the large flow type (Type A)

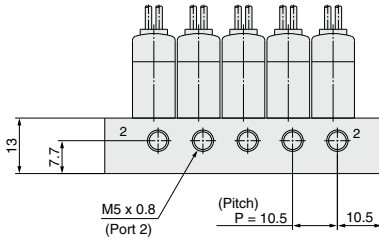
Grommet (G), (H)



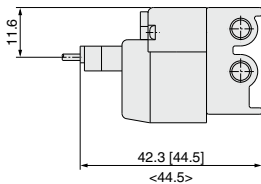
G: Approx. 300
H: Approx. 600
(Lead wire length)



(n station) ----- (1 station)

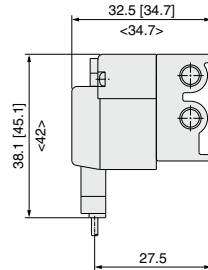


L plug connector (L)



* Other dimensions are the same as those of the grommet type.

M plug connector (M)

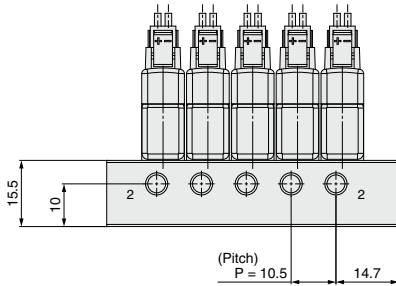
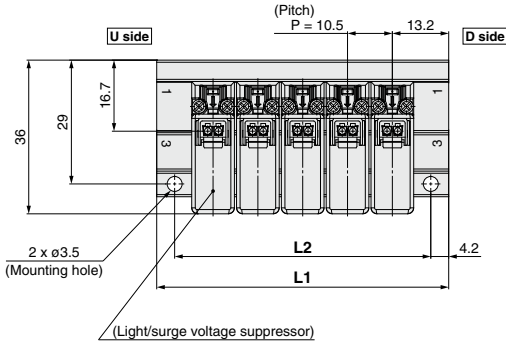
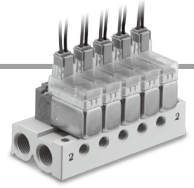


* Other dimensions are the same as those of the grommet type.

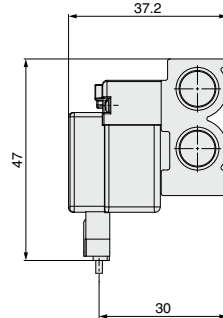
Station	2 stations	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20 stations
L1	33.5	44	54.5	65	75.5	86	96.5	107	117.5	128	138.5	149	159.5	170	180.5	191	201.5	212	222.5
L2	27.5	38	48.5	59	69.5	80	90.5	101	111.5	122	132.5	143	153.5	164	174.5	185	195.5	206	216.5

Type S41 Manifold: Side Ported/VV100U-S41- Stations -01

L plug connector (L)



M plug connector (M)



* Other dimensions are the same as those of the L plug connector type.

Station	2 stations	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20 stations
L1	36.9	47.4	57.9	68.4	78.9	89.4	99.9	110.4	120.9	131.4	141.9	152.4	162.9	173.4	183.9	194.4	204.9	215.4	225.9
L2	28.5	39	49.5	60	70.5	81	91.5	102	112.5	123	133.5	144	154.5	165	175.5	186	196.5	207	217.5



V100 Series

Specific Product Precautions 1

Be sure to read this before handling the products. Refer to page 8 for safety instructions and pages 9 to 15 for 3/4/5 port solenoid valve precautions.

Manual Override Operation

Warning

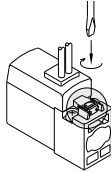
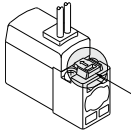
Since connected equipment will be actuated when the manual override is operated, first confirm that conditions are safe.

■ Non-locking push type [Standard]

Press in the direction of the arrow.

■ Locking slotted type [Type B]

Turn in the direction of the arrow.



Caution

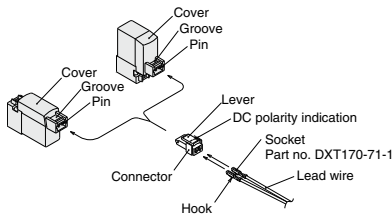
When operating with a screwdriver, turn it gently using a watchmakers' screwdriver. [Torque: Less than 0.1 N·m]

How to Use Plug Connector

Caution

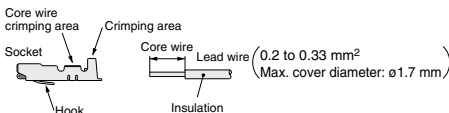
1. Connector attachment/detachment

- 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 the 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 the lead wire does not enter into the crimping part. Use special tool when crimping. (Please contact SMC for the dedicated crimping tools.)



How to Use Plug Connector

Caution

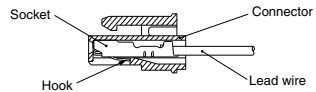
3. Lead wires with sockets attachment/detachment

• Attachment

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

• Detachment

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 is used again, spread the hook outward.



Plug Connector Lead Wire Length

Plug connector lead wires have a standard length of 300 mm, however, the following lengths are also available.

Connector Assembly Part Nos.

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 sockets)

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
V114-SLO
SY100-30-4A-20

For AC
V114A-1LO
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

SMC's Lead Wire Specifications

Cover diameter: 1.55 mm
Conductor area: 0.3 mm² (AWG22 equivalent)



V100 Series

Specific Product Precautions 2

Be sure to read this before handling the products. Refer to page 8 for safety instructions and pages 9 to 15 for 3/4/5 port solenoid valve precautions.

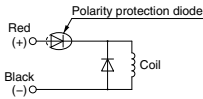
Surge Voltage Suppressor

<For DC>

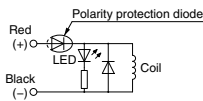
Grommet, L and M Plug Connector

■ Standard type (with polarity)

With surge voltage suppressor (□S)

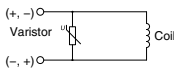


With light/surge voltage suppressor (□Z)

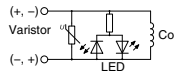


■ Non-polar type

With surge voltage suppressor (□R)



With light/surge voltage suppressor (□U)

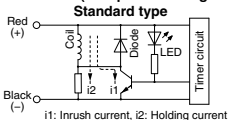


- Please connect correctly the lead wires to + (positive) and - (negative) indications on the connector.
- For DC voltages other than 12, 24 VDC, incorrect wiring will cause damage to the surge voltage suppressor circuit since a diode to prevent reverse current is not provided. (Wrong polarity will cause trouble.)
- When wiring is done at the factory, positive (+) is red and negative (-) is black.

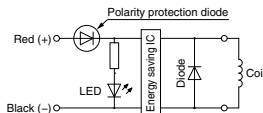
■ With power-saving circuit

Power consumption has been reduced to approx. 1/4 (approx. 1/9 for the large flow type (Type U)) of that of the standard model by eliminating the need for electrical current for holding. (Effective after more than 62 ms (23 ms for the large flow type (Type U)) energized and 24 VDC rated voltage applied.)

Electric circuit (with power-saving circuit)



Large flow type (Type U)



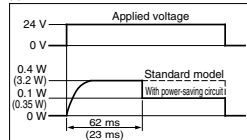
Operating Principle

The electrical circuit as shown in the left figure, allows reduced holding current consumption and measures power saving. Refer to electrical power waveform as shown below.

- Please be careful not to reverse the polarity, since a diode to prevent the reversed current is not provided for the model with power-saving circuit (Standard type).

<Electric waveform in power-saving, for the V1 $\frac{1}{2}$ 4T>

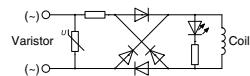
(): Values of the V114UT



<For AC>

Grommet, L and M Plug Connector

With light (□Z)



⚠ Caution

For the varistor surge voltage suppressor for DC, please note that the surge voltage will be suppressed on the controller side as there will be residual voltage according to the protective element and rated voltage. Moreover, the residual voltage of the diode is approx. 1 V.



V100 Series

Specific Product Precautions 3

Be sure to read this before handling the products. Refer to page 8 for safety instructions and pages 9 to 15 for 3/4/5 port solenoid valve precautions.

Connector Assembly with Cover

Connector assembly with protective cover enhances dust protection

- Effective in preventing possible short circuit problems due to contaminants in contact with connector section.
- Chloroprene rubber for electrical use, which provides outstanding weather resistance and electrical insulation, is used for the cover material. However, be careful not to allow contact with cutting oil, etc.
- Round cord provides neat appearance.

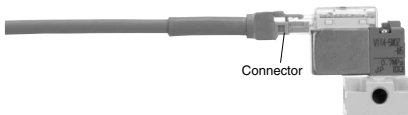
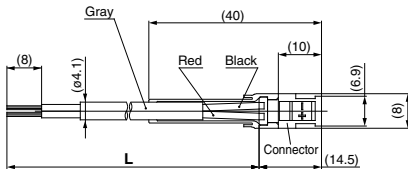
How to Order

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

Connector Assembly with Cover / Dimensions



• How to Order

Indicate part number of connector assembly with cover in addition to the solenoid valve part number without connector of the plug connector.

<Example 1> Lead wire length: 2000 mm

V114-5LOZ-M5

SY100-68-A-20

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

V114-5LPZ-M5

Symbol for a connector assembly with cover

* No need to indicate the part number for a connector assembly with cover in this case.