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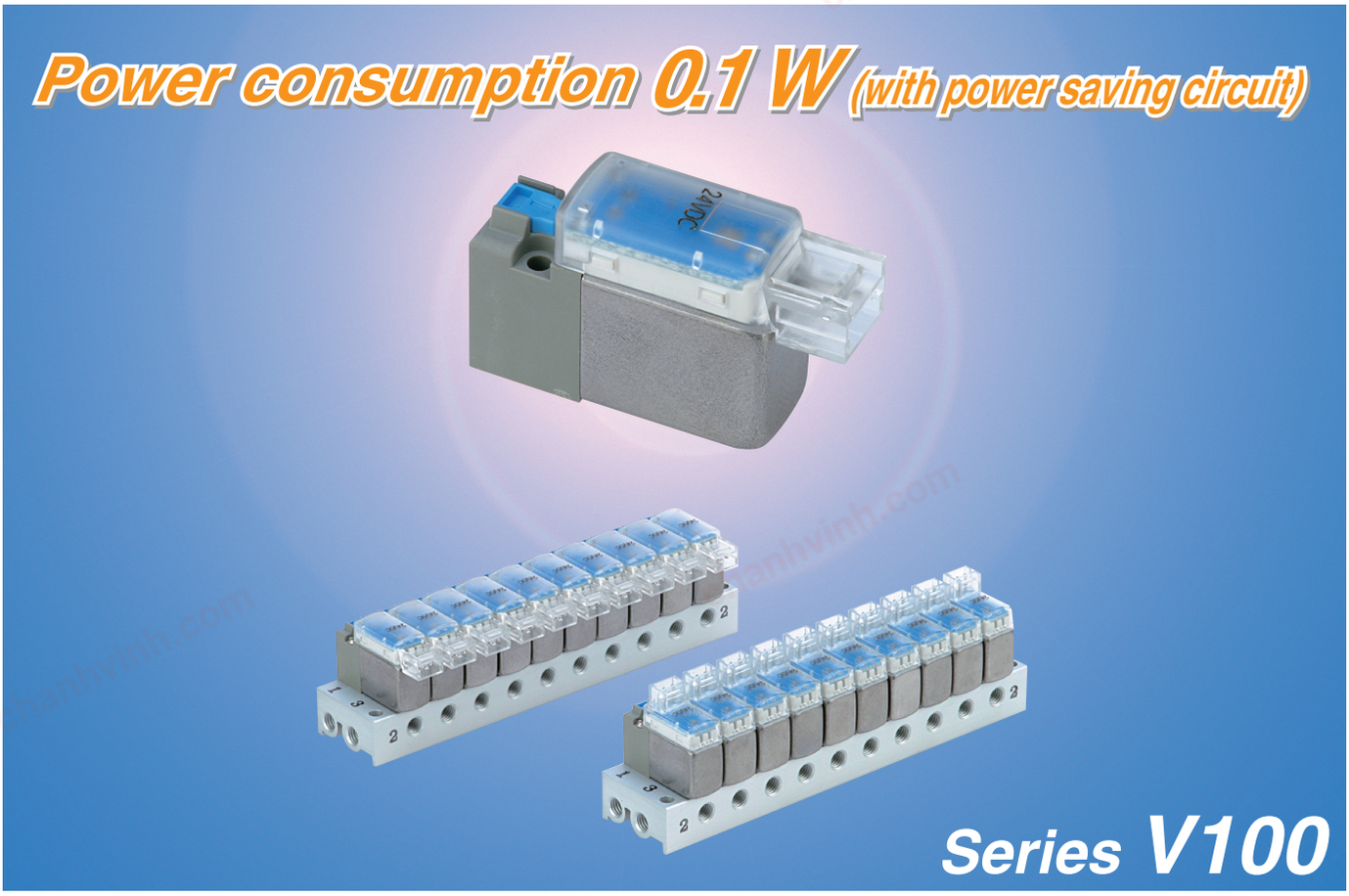
3 Port Solenoid Valve



Coil temperature rises: 1°C (with power saving circuit)

Sonic conductance C: 0.037 (Standard)/C: 0.076 (Large flow capacity)

Series		Flow characteristics		
		C[dm³/(s·bar)]	b	Cv
Standard	V1□4	0.037	0.11	0.008
Large flow capacity	V1□4A	0.076	0.070	0.016

Variations

Series		Type of actuation	Operating pressure range (MPa)	Power consumption (W)	
				Standard	With power saving circuit
Standard	V114	N.C.	0 to 0.7	0.35	0.1
	V124	N.O.	0 to 0.7	0.35	0.1
Large flow capacity	V114A	N.C.	0 to 0.7	1	—
	V124A	N.O.	0 to 0.7	1	—

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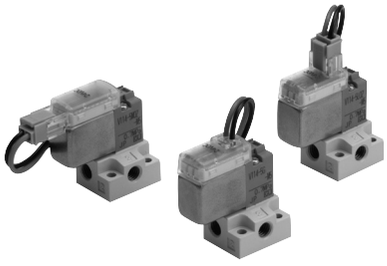
Rubber Seal
3 Port Solenoid Valve/Direct Operated
Series V100



Specifications

Fluid	Air
Ambient and fluid temperature (°C)	–10 to 50 (No freezing. Refer to back page 2.)
Response time (DC) (ms) Note 1)	ON: 5 or less OFF: 4 or less
Max. operating frequency (Hz)	20
Manual override	Non-locking push, Locking slotted
Lubrication	Not required
Mounting position	Unrestricted
Impact/Vibration resistance (m/s^2) Note 2)	150/30
Enclosure	Dust proof

Note 1) Based on dynamic performance test JIS B8374-1981 (standard type: at coil temperature of 20°C, with rated voltage, without surge voltage suppressor)

Note 2) Impact resistance: No malfunction resulted in an impact test using a drop impact tester. The test was performed one time each in the axial and right angle directions of the main valve and armature, for both energized and de-energized states. (Value in the initial stage)

Vibration resistance: No malfunction resulted in 45 to 2000 Hz, a one-sweep test performed in the axial and right angle directions of the main valve and armature for both energized and de-energized states. (Value in the initial stage)

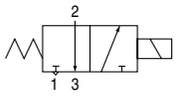
Solenoid Specifications

Series			V114/V124	V114A/V124A
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		Standard: 0.35 (with light: 0.4) With power saving circuit 0.1	1 W (with light: 1.1)
Apparent power (VA)	AC	100 V	0.78 (with light: 0.81)	—
		110 V [115 V]	0.86 (with light: 0.89) [0.94 (with light: 0.97)]	—
		200 V	1.18 (with light: 1.22)	—
		220 V [230 V]	1.30 (with light: 1.34) [1.42 (with light: 1.46)]	—
Surge voltage suppressor			Refer to back page 6.	
Indicator light			LED	

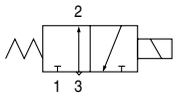
* Can be used for 110 VAC and 115 VAC, 220 VAC and 230 VAC in common.
* For 115 VAC and 230 VAC, the allowable voltage fluctuation will be –15% to 5% of the coil rated voltage.

JIS symbol

V114(A)



V124(A)



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Specifications

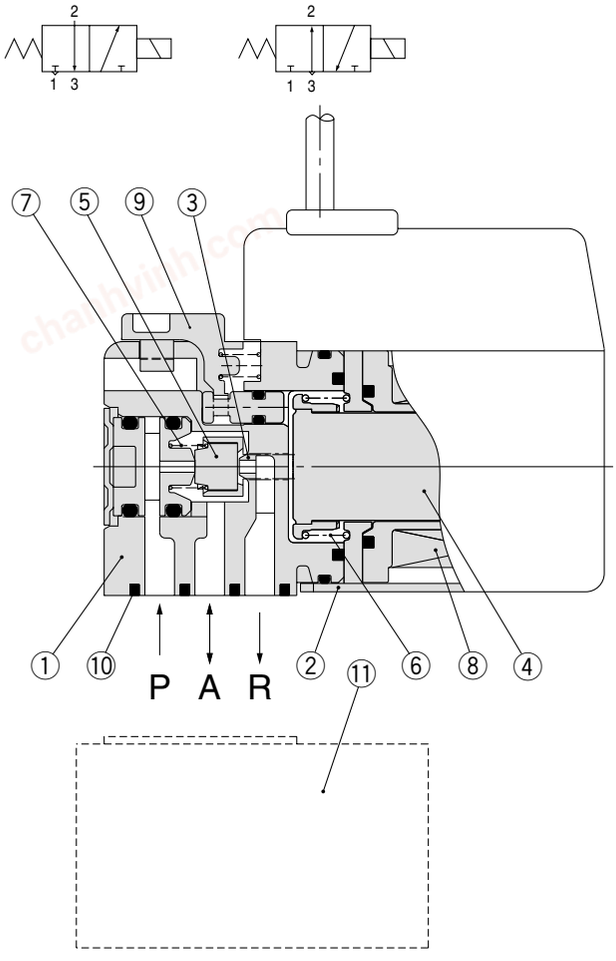
Valve model	Type of actuation	Model	Operating pressure range (MPa)	Vacuum specification (MPa)		Port size		Weight (g) Note 2)	
				Port 1	Port 3	Port 1, 3	Port 2	Grommet	L plug connector M plug connector
V114	N.C.	Standard	0 to 0.7	–100 kPa to 0.6	–100 kPa to 0	M5 x 0.8	M5 x 0.8	V1□4:13(27) V1□4A:16(30)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

Valve model	Flow characteristics					
	1→2			2→3		
	C[dm³/(s·bar)]	b	Cv	C[dm³/(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
V124 Note 1)	0.054	0.35	0.015	0.037	0.11	0.008
V124A Note 1)	0.099	0.23	0.024	0.076	0.07	0.016

Note 1) For both V124 and V124A, pressure from port 3 and exhaust from port 1.
Note 2) The values shown in ( ) are for values with sub-plate.

Construction

V114(A) **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
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

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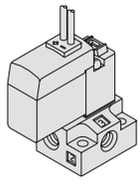
Series V100

How to Order

Standard type

Base mounted V1 [1] 4 [ ] — 5 [M] [ ] [ ] — [ ]

3 port



Sub-plate style, For manifold type S41

Type of actuation

1	Normally closed
2	Normally open

Coil specification

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.

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]

Electrical entry

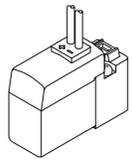
24 V, 12 V, 6 V, 5 V, 3 VDC/100 V, 110 V, 200 V, 220 VAC

Grommet	L plug connector	M plug connector	
G: 300 mm lead wire 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

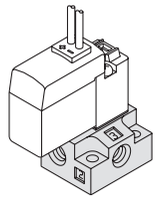
∗ LN and MN types are with 2 sockets.

Port size

Nil: Without sub-plate



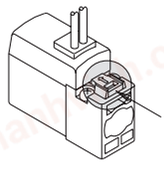
M5: With sub-plate



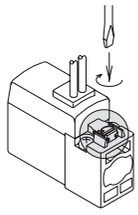
(With gasket and screws)

Manual override

Nil: Non-locking push



B: Locking slotted



Indicator light and surge voltage suppressor

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

∗ Only "Z" is available for the types with power saving circuit.

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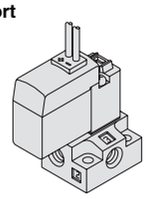
How to Order

Large flow type

Base mounted V1 [1] 4 [A] — [5] [M] [ ] [ ] — [ ]

3 port



Sub-plate style, For manifold type S41

Type of actuation

1	Normally closed
2	Normally open

Large flow capacity

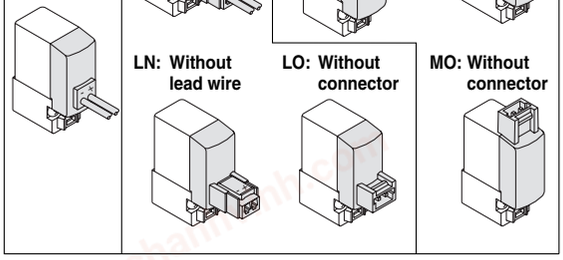
Rated voltage

For DC

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

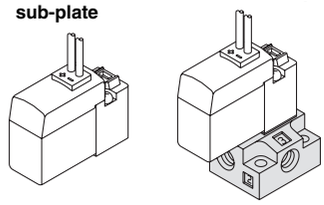


* LN and MN types are with 2 sockets.

Port size

Nil: Without sub-plate

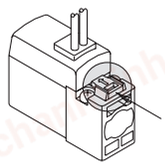
M5: With sub-plate



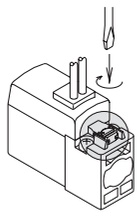
(With gasket and screws)

Manual override

Nil: Non-locking push



B: Locking slotted



Indicator light and surge voltage suppressor

Nil	Without indicator light or surge voltage suppressor	For DC
R	With surge voltage suppressor	
U	With indicator light and surge voltage suppressor	

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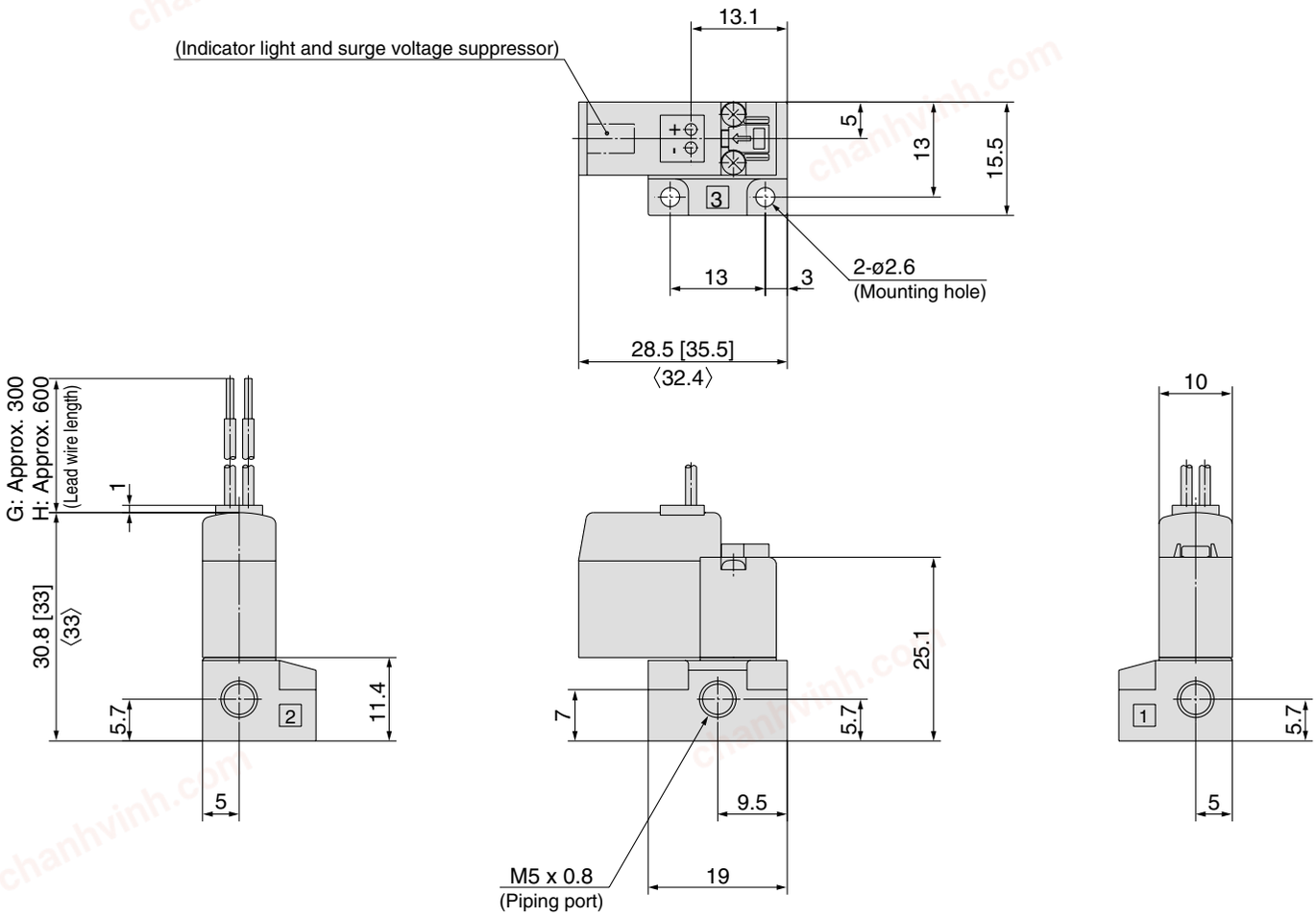
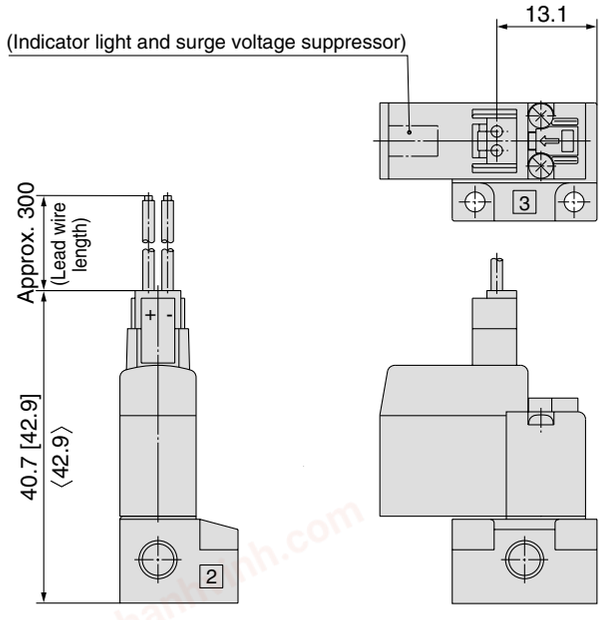
Base Mounted (With sub-plate)

Note) [ ]: AC
〈 〉: values for the large flow type (A)

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

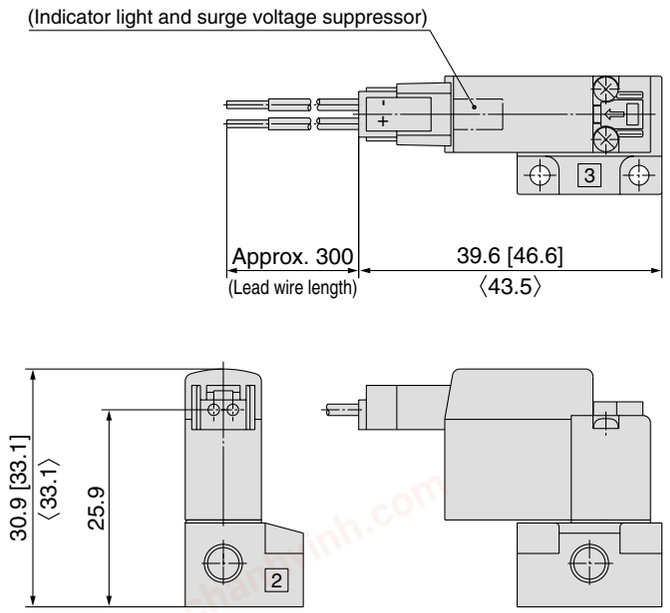


L plug connector (L): V1$^{1}_{2}$4(A)-□L□□-M5



∗ Other dimensions are same as the grommet type.

M plug connector (M): V1$^{1}_{2}$4(A)-□M□□-M5



∗ Other dimensions are same as the grommet type.

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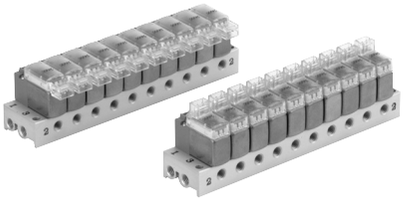
3 Port Solenoid Valve
Series V100
Manifold Specifications



Manifold Specifications

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

Note 1) V114(A) and V124(A) cannot be mounted to the same manifold.
Note 2) For V124(A), pressure from port 3 and exhaust from port 1.

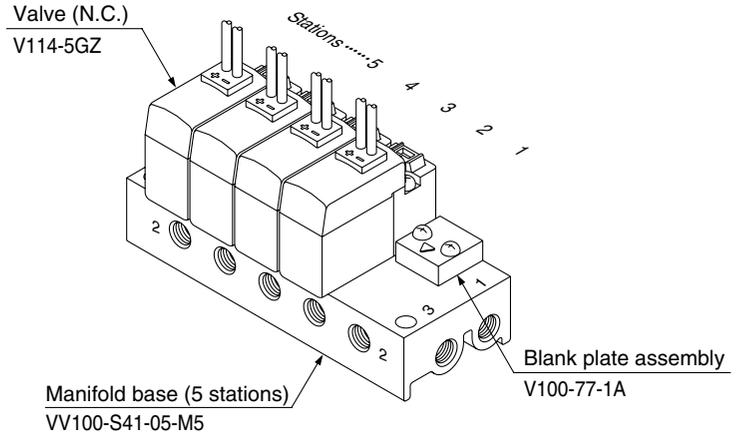
Flow Characteristics

Manifold		Port size	Flow characteristics					
		Port 1, 2, 3	1→2			2→3		
			C[dm³/(s·bar)]	b	Cv	C[dm³/(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

Note) Values when mounted on the manifold base (5 stations).

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 (Blank plate assembly part no.)
∗**V114-5GZ** ····· 4 sets (Valve)
∗The asterisk (∗) is used when referring to assembly.
Enter the asterisk at the beginning of individual cmponent part numbers.

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

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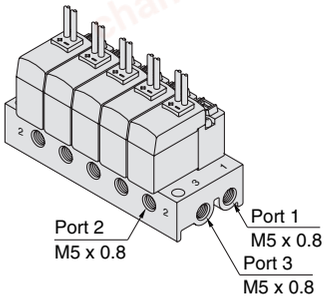
Series V100

Common SUP/Common EXH

Type S41



How to Order

VV100 – S41 – 05 – M5

Stations

02	2 stations
⋮	⋮
20	20 stations

2 port size

M5	M5 x 0.8

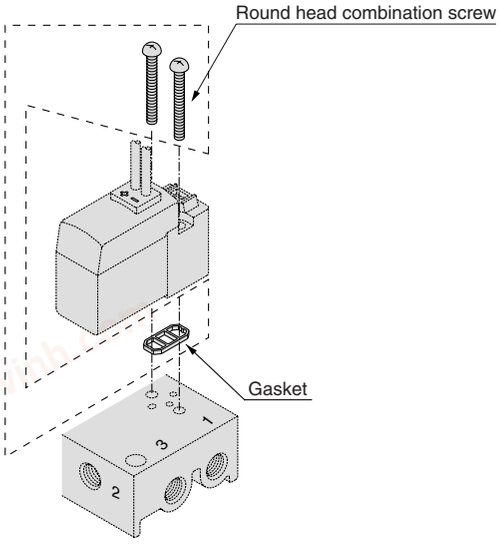
Applicable solenoid valve Note)
V114-□□□□
V114A-□□□□
V124-□□□□
V124A-□□□□

Applicable blank plate assembly
V100-77-1A

Note) V114(A) and V124(A) cannot be mounted to the same manifold.

Gasket Assembly

Part No. V100-31-1A

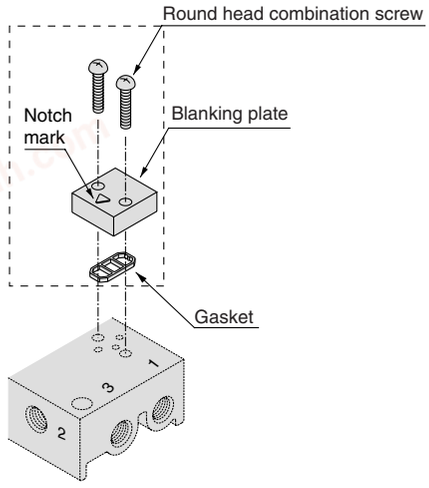


Applicable base
- Sub-plate
- Type VV100-S41 manifold base

Blank Plate Assembly

Part No. V100-77-1A

Place the notch mark on a blank plate to the port 2 side when assembling.



Applicable base
- Sub-plate
- Type VV100-S41 manifold base

⚠ Caution

Mounting screw tightening torques **M2: 0.12 N·m**

SMC

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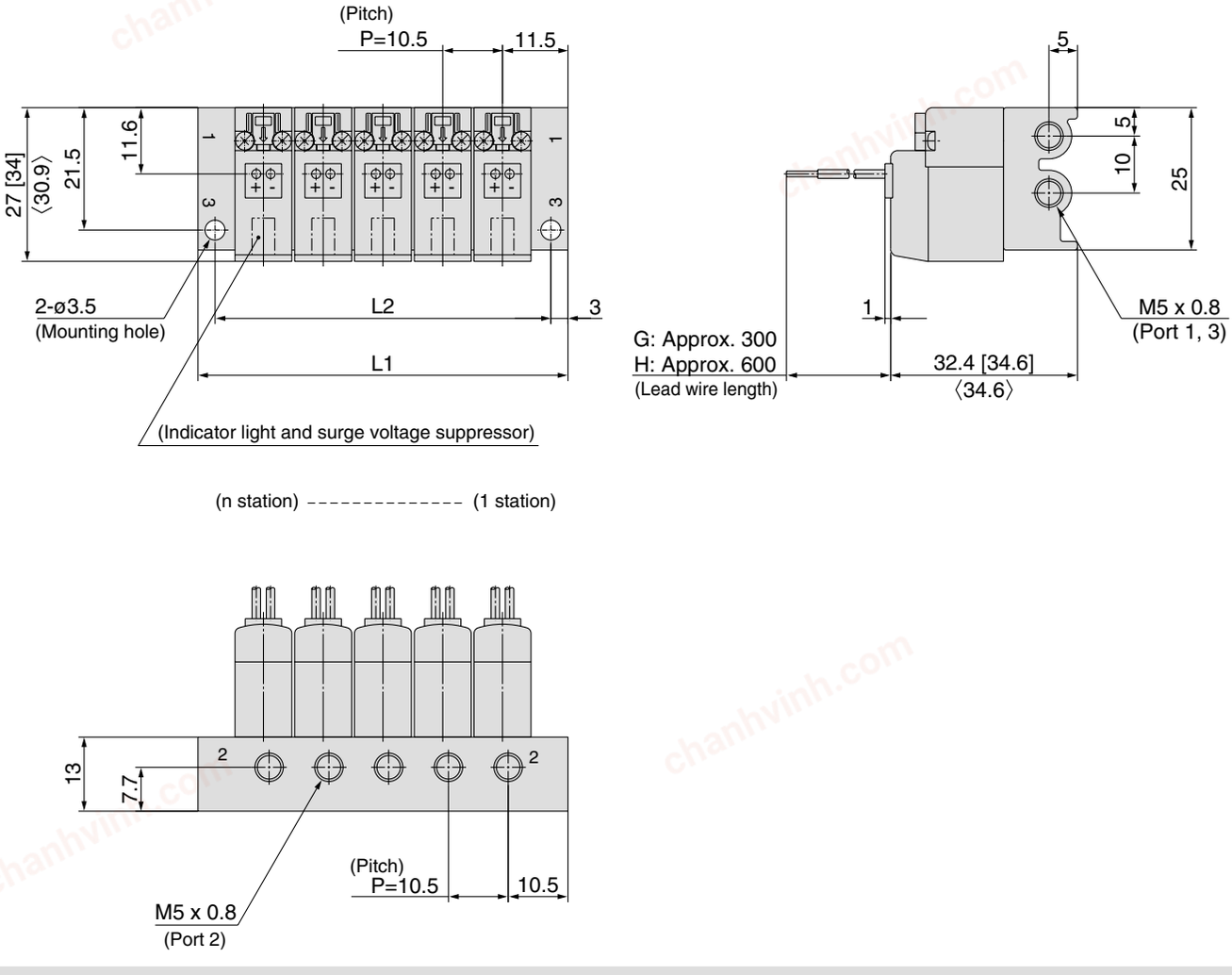
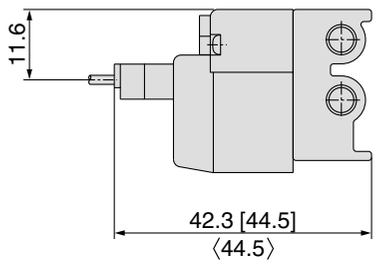
Type S41 Manifold: Side Ported/VV100-S41-Stations-M5

Note) [ ]: AC
〈 〉: values for the large flow type (A)

Grommet (G), (H)

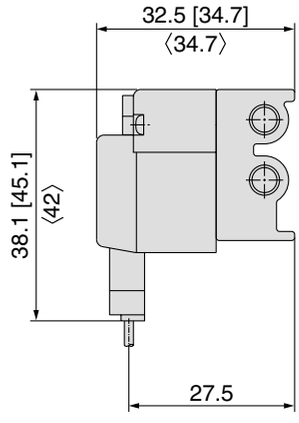


L plug connector (L)



∗ Other dimensions are same as the grommet type.

M plug connector (M)



∗ Other dimensions are same as 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

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Series V100
Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by a label of **"Caution", "Warning"** or **"Danger"**. To ensure safety, be sure to observe ISO 4414 Note 1), JIS B 8370 Note 2) and other safety practices.

⚠ **Caution :** Operator error could result in injury or equipment damage.

⚠ **Warning :** Operator error could result in serious injury or loss of life.

⚠ **Danger :** In extreme conditions, there is a possible result of serious injury or loss of life.

Note 1) ISO 4414: Pneumatic fluid power – General rules relating to systems
Note 2) JIS B 8370: Pneumatic system axiom

⚠ Warning

1. The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.

Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements. The expected performance and safety assurance will be the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified, referring to the latest catalog information with a view to giving due consideration to any possibility of equipment failure when configuring a system.

2. Only trained personnel should operate pneumatically operated machinery and equipment.

Compressed air can be dangerous if handled incorrectly. Assembly, handling or maintenance of pneumatic systems should be performed by trained and experienced operators.

3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.

1. Inspection and maintenance of machinery/equipment should only be performed once measures to prevent falling or runaway of the driven object have been confirmed.
2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc.

4. Contact SMC if the product is to be used in any of the following conditions:

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuits in press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, or animals, and therefore requires special safety analysis.

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3 Port Solenoid Valves/Common Precautions 1

Be sure to read before handling.

Design

⚠ Warning

1. Actuator drive

When an actuator, such as a cylinder, is to be driven using a valve, take appropriate measures to prevent potential danger caused by actuator operation.

2. Effect of back pressure when using a manifold

Use caution when the valves are used on a manifold, as actuator malfunction due to back pressure may occur. Special caution is also necessary when driving a single acting cylinder. Take additional care in cases where there is a danger of malfunction due to this potential back-pressure.

3. Holding pressure (including vacuum)

Since valves are subject to air leakage, they cannot be used for applications such as holding pressure (including vacuum) in a pressure vessel.

4. The valve cannot be used as an emergency shutoff valve, etc.

The valves presented in this catalog are not designed for safety applications such as an emergency shutoff valve. If the valves are used in this type of system, other reliable safety assurance measures should also be adopted.

5. Maintenance space

The installation should allow sufficient space for maintenance activities (removal of valve, etc.).

6. Release of residual pressure

Provide a residual pressure release function for maintenance purposes.

7. Vacuum applications

When a valve is used for vacuum switching, take appropriate measures against the suction of external dust or other contaminants through vacuum pads and exhaust ports.

8. Ventilation

When a valve is used inside a sealed control panel, etc., provide ventilation to prevent a pressure increase caused by exhausted air inside the control panel or temperature rise caused by the heat generated by the valve.

Selection

⚠ Warning

1. Confirm the specification.

The products presented in this catalog are designed only for use in compressed air systems (including vacuum). Do not operate at pressures or temperatures, etc., beyond the range of specifications, as this can cause damage or malfunction. (Refer to specifications.)

Contact SMC when using a fluid other than compressed air (including vacuum).

2. Extended periods of continuous energization

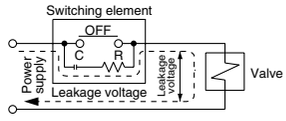
- If a valve is continuously energized for long periods, heat generation of the coil may result in reduced performance and shorter service life. This may also have an adverse effect on the peripheral equipment in proximity. Should a valve be continuously energized for long periods, or its daily energized state exceeds its non energized state, please use an energy saving type valve with DC specifications. Under someoperating conditions, alternative valves from those detailed above can be used (for example, valves with DC specifications). For more information, consult with SMC. It is also possible to avoid potential problems by shortening the energization time and using the valve as a N.O. (normally open) type.
- When solenoid valves are mounted in a control panel, employ measures to radiate excess heat, so that temperatures remain within the valve specification range. Use special caution when three or more stations sequentially aligned on the manifold are continuously energized since this will cause a drastic temperature rise.

Selection

⚠ Warning

⚠ Caution

1. Leakage voltage



When using a resistor in parallel with the switching element or using a C-R element (surge voltage suppressor) for protection of the switching element, note that leakage voltage will increase due to leakage current flowing through the resistor or C-R element. Limit the amount of residual leakage voltage to the following value:

DC coil : 3% or less of the rated voltage

AC coil : 8% or less of the rated voltage

2. Solenoid valve drive for AC with solid state output (SSR, TRIAC output, etc.)

1) Voltage leakage
When using a snubber circuit (C-R element) for surge protection of the output element, a very small electric current will still continue to flow in spite of the OFF state. This results in the valve not returning. In the cases when exceeding the tolerance as shown above, take measures to install a bleeder resistor.

2) Minimum allowable load (Minimum load current)
When the current consumption of the valve is less than, or close to, the minimum allowable load of the output element, this may cause the output element not to switch normally. Please consult SMC for details.

3. Surge voltage suppressor

If a surge protection circuit contains non-ordinary diodes such as Zener diodes or ZNRs, a residual voltage that is in proportion to the protective elements and the rated voltage will remain. Therefore, give consideration to surge voltage protection of the controller. In the case of diodes, the residual voltage is approximately 1 V.

4. Low temperature operation

Take appropriate measures to avoid freezing of drainage, moisture, etc. Valve use is still possible to temperature extremes of –10°C, unless there are specific instructions on the valve.

5. Mounting orientation

The mounting orientation is unrestricted.

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3 Port Solenoid Valves/Common Precautions 2

Be sure to read before handling.

Mounting

⚠ Warning

1. If air leakage increases or equipment does not operate properly, stop operation.

Check moutning conditions when air and power supplies are connected. Initial function and leakage tests should be performed after installation.

2. Instruction manual

Mount and operate the product after reading the manual carefully and understanding its contents.
Also keep the manual where it can be referred to as necessary.

3. Painting and coating cases

Warnings or specifications printed or pasted on the product should not be erased, removed or covered up.
Consult with SMC if paint is to be applied to resinous parts, as this may have an adverse effect due to the paint solvent.

Piping

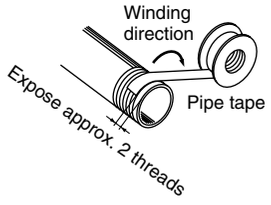
⚠ Caution

1. Preparation before piping

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

2. Wrapping of sealant tape

When connecting pipes and fittings, etc., be sure chips from the pipe threads and sealing material do not get inside the valve. Furthermore, when sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.



3. Screwing in fitting

When screwing fittings into valves, tighten as follows.

1) For M5

(1) When installing SMC fittings, etc., follow the procedures below.
After tightening by hand, tighten an additional 1/6 rotation for M5 with a tool. However, when using a miniature fitting, tighten an additional 1/4 rotation with a tool after tightening by hand. Also, when there are 2 gaskets such as in case of a universal elbow or universal tee, tighten an additional 1/2 rotation.

Note) If overtightened, threaded part may be broken or gasket deformed. If tightened insufficiently, thread part may be loosened. In either case, air leakage could occur.

(2) When using a fitting brand other than SMC, follow the instruction by the manufacturer of the fittings.

4. Connection of piping to products

When connecting piping to a product, refer to its instruction manual to avoid mistakes regarding the supply port, etc.

Wiring

⚠ Caution

1. Polarity

When connecting power to a DC specification solenoid valve with (light/) surge voltage suppressor, confirm whether or not there is polarity.
Please use caution for the following cases involving polarity.
In the case where a diode is not provided to protect the valve's polarity (including any power saving circuit):
If the polarity reversed, the diode inside the valve or the switching element in the controlling equipment side and or the power supply equipment will likely burn.
In the case where a diode is provided to protect the valve's polarity:
If the polarity is reversed, it will not be possible to switch the valve.

2. Applied voltage

When electric power is connected to a solenoid valve, be careful to apply the proper voltage. Improper voltage may cause malfunction or coil damage.

3. Confirm the connections.

After completing the wiring, confirm that the connections are correct.

4. External stress to the lead wire

Excessive stress to the lead wire will likely cause the wire to break. Take measures to prevent a force of 30 N or greater from being applied to the lead wire.

Lubrication

⚠ Caution

1. Lubrication

1) The valve has been lubricated for life at the manufacturer, and does not require any further lubrication.

2) If a lubrication is applied in the system, use turbine oil Class 1 (no additive), ISO VG32.
However, once lubrication is applied it must be continued, as loss of the original lubricant may lead to malfunction.

Class 1 Turbine Oil (with no additive), ISO VG32

Classification of viscosity cst (40°C) / Viscosity according to ISO Grade	32
Idemitsu Kosan Co., Ltd.	Turbine oil P-32
Nippon Oil Corp.	Turbine oil 32/ Mitsubishi turbine 32
Cosmo Oil Co., Ltd.	Cosmo turbine 32
Japan Energy Corp.	Kyodo turbine 32
Kygnus Oil Co.	Turbine oil 32

Classification of viscosity cst (40°C) / Viscosity according to ISO Grade	32
Kyushu Oil Co.	Stork Turbine 32
Showa Shell Sekiyu K.K.	Turbine 32
Tonen General Sekiyu K.K.	General R turbine 32
Fuji Kosan Co., Ltd.	Fucoal turbine 32

Contact SMC regarding Class 2 turbine oil (with additives), ISO VG32.

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3 Port Solenoid Valves/Common Precautions 3

Be sure to read before handling.

Air Supply

⚠ Warning

1. Use clean air.

Do not use compressed air which contains chemicals, synthetic oils containing organic solvents, salts or corrosive gases, etc., as this can cause damage or malfunction.

⚠ Caution

1. Install air filters.

Install air filters close to valves at their upstream side. A filtration degree of 5 μm or less should be selected.

2. Install an air dryer, after cooler or Drain Catch, etc.

Air that includes excessive drainage may cause malfunction of valves and other pneumatic equipment. To prevent this, install an air dryer, after-cooler or water separator, etc.

3. If excessive carbon powder is seen, install a mist separator on the upstream side of the valve.

If excessive carbon dust is generated by the compressor, it may adhere to the inside of valves and cause malfunction.

Refer to “SMC Best Pneumatic” catalog Vol. 14 for compressed air quality.

Operating Environment

⚠ Warning

1. Do not use in atmospheres where the valve is in direct contact with corrosive gases, chemicals, salt water, water or steam.

2. Do not use in an explosive atmosphere.

3. Do not use in locations subject to vibration or impact. Confirm the specifications in the main section of the catalog.

4. Use a protective cover, etc., to shield valves from direct sunlight.

5. Shield valves from radiated heat generated by nearby heat sources.

6. Employ suitable protective measures in locations where there is contact with oil or welding spatter, etc.

7. When solenoid valves are mounted in a control panel or are energized for extended periods of time, employ measures to radiate excess heat, so that temperatures remain within the valve specification range.

Maintenance

⚠ Warning

1. Perform maintenance procedures as shown in the instruction manual.

If handled improperly, malfunction or damage of machinery or equipment may occur.

2. Removal of equipment and supply/exhaust of compressed air

When equipment is serviced, first confirm that measures are in place to prevent dropping of work pieces and run-away of equipment, etc. Then cut the supply pressure and power, and exhaust all compressed air from the system using its residual pressure release function.

When the equipment is to be started again after remounting or replacement, first confirm that measures are in place to prevent lurching of actuators, etc., and then confirm that the equipment is operating normally.

3. Low frequency operation

Valves should be switched at least once every 30 days to prevent malfunction. (Use caution regarding the air supply.)

4. Manual override operation

When the manual override is operated, connection equipment will be actuated. Start the operation after confirming its safety.

⚠ Caution

1. Drain flushing

Remove drainage from air filters regularly.

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Series V100
Specific Product Precautions 1

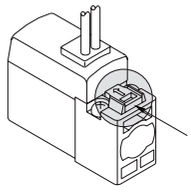
Be sure to read before handling.
Refer to back page 1 through to 4 for Safety Instructions, Precautions.

⚠ Warning

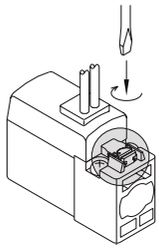
Manual Override Operation

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 type]
Turn in the direction of arrow.



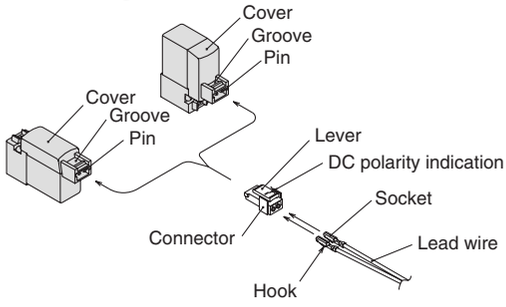
⚠ Caution
When operating with a screw driver, turn it gently using a watchmakers' screw driver. [Torque: less than 0.1Nm]

⚠ Caution

How to Use of Plug Connector

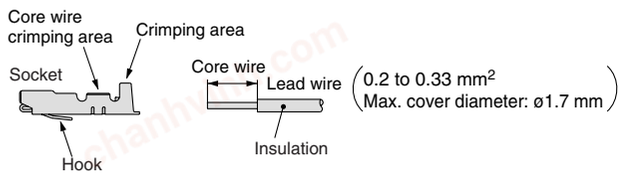
1. Attaching and detaching connectors

- 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

Strip 3.2 to 3.7 mm at the end of the lead wires, insert the ends of the core wires evenly into the sockets, and then crimp with a crimping tool. When this is done, take care that the coverings of the lead wires do not enter the core wire crimping area.
Use special tool when crimping. (Consult with SMC for the crimping tool.)



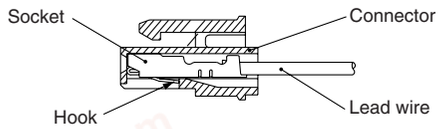
⚠ Caution

How to Use a Plug Connector

3. Attaching and detaching lead wires with sockets

● **Attaching**
Insert the sockets into the square holes of the connector (⊕, ⊖ 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.) 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 (about 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 (with connector and 2 sockets): **SY100 – 30 – A**

How to Order
To order a valve with lead wire length of other than 300 mm, indicate part numbers of the valve without connector and the required connector assembly separately.
<Example> Lead wire length 2000 mm

For DC	For AC
V114-5LO	V114A-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

Back page 5

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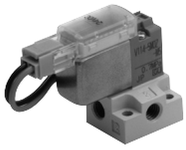
Series V100
Specific Product Precautions 2

Be sure to read before handling.
Refer to back page 1 through to 4 for Safety Instructions, Precautions.

Surge Voltage Suppressor

<For DC>
Grommet, L and M Plug Connector

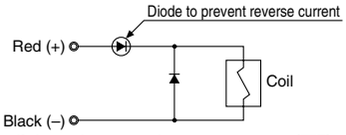




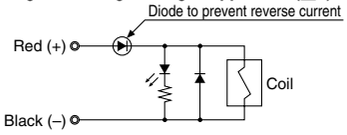


■ **Standard type (with polarity)**

With surge voltage suppressor (□S)

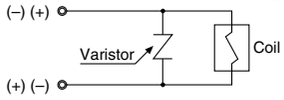


Indicator light and surge voltage suppressor (□Z)

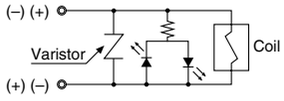


■ **Non-polar type**

With surge voltage suppressor (□R)



Indicator light and surge voltage suppressor (□U)

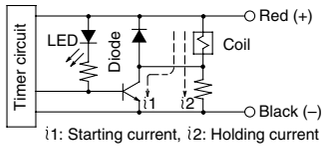


- Please connect correctly the lead wires to + (positive) and – (negative) indications on the connector.
- For DC voltages other than 12, 24 VDC, incorrect wiring will cause damage to the surge voltage suppressor circuit since a diode to prevent reverse current is not provided. (Wrong polarity will cause trouble.)
- Solenoids, whose lead wires have been pre-wired: positive side red and negative side black.

■ **With power saving circuit**

Power consumption is reduced by approximately 75% compared with the standard product by eliminating the need for electrical current for holding. (Effective after more than 62 ms energized and 24 VDC rated voltage applied.)

Electric circuit (with power saving circuit)



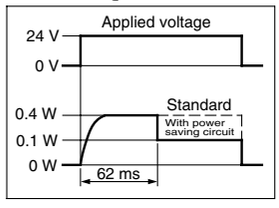
i1: Starting current, i2: Holding current

Operating Principle

The electrical circuit as shown above, allows reduced holding current consumption and measures power saving. Refer to the electric waveform on the right.

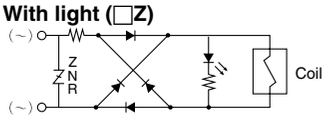
- Please be careful not to reverse the polarity, since a diode to prevent the reversed current is not provided for the power saving circuit.

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



<For AC>
Grommet, L and M Plug Connector

With light (□Z)



⚠Caution

In the case of ZNR surge voltage suppressor, note the surge voltage to be suppressed at controller side as there will be a residual voltage according to the protective element and rated voltage.
Moreover, the residual voltage of the diode is approximately 1 V.

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.
- Cover material is chloroprene rubber which has excellent weatherability and electric insulation properties. However, be careful not to allow contact with cutting oil, etc.
- Round cord provides neat appearance.

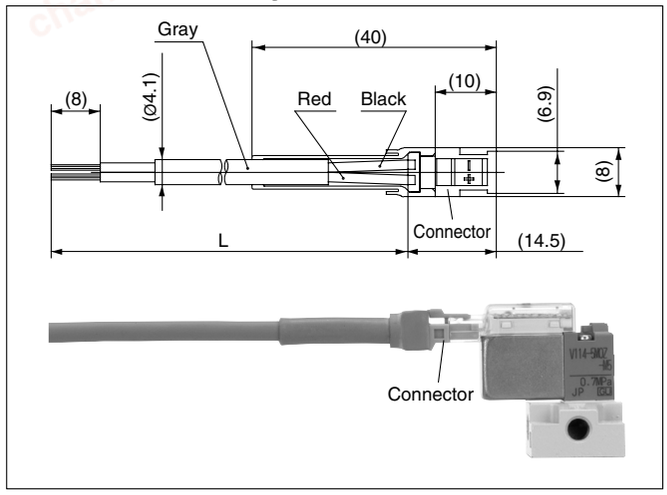
How to Order

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.

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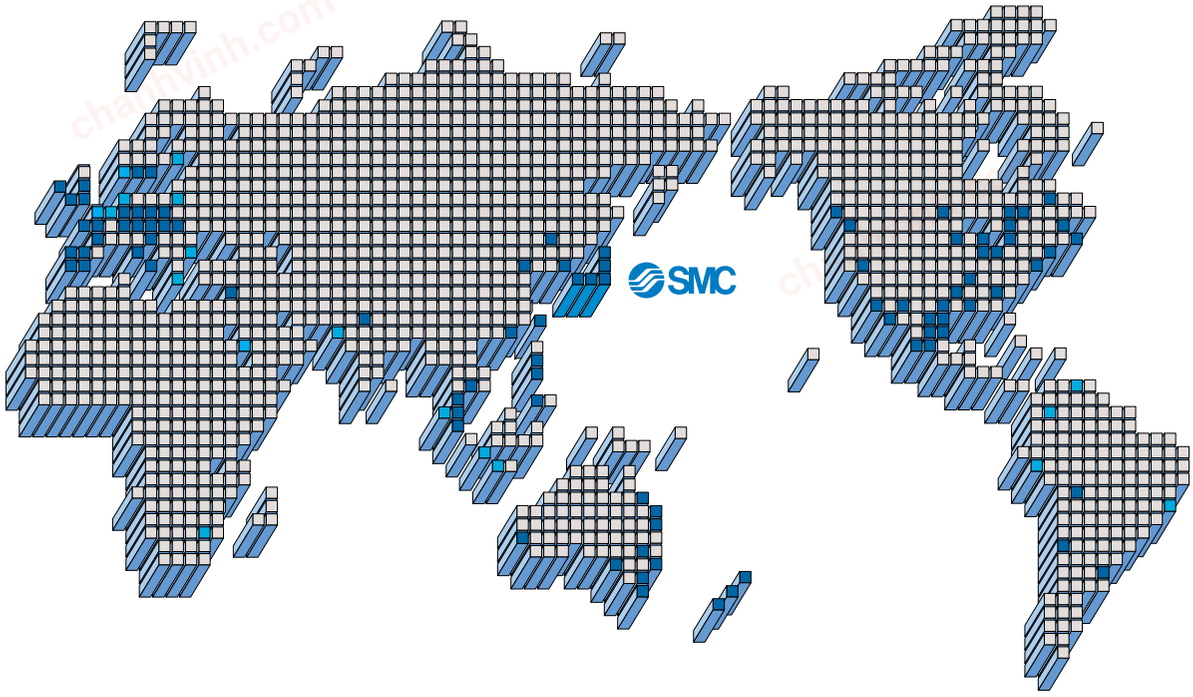

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D-DN 1st printing HU printing JO 120DN Printed in Japan.

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Series 10-V100 Rubber seal 3 port direct operated solenoid valve



Specifications

Fluid	Air
Ambient and fluid temperature (°C)	–10 to 50 (With no freezing. Refer to page 714.)
Response time (DC) ms Note 1)	ON: 5 or less, OFF: 4 or less
Max. operating frequency (Hz)	20
Manual override	Non-locking push type, push-turn locking slotted type
Lubrication	Not required
Mounting position	Unrestricted
Impact / vibration resistance (m/s²) Note 2)	150/30
Enclosure	Dust tight

Note 1) Based on dynamic performance test, JIS B 8374-1981 (Standard type :Coil temperature 20°C, at rated voltage, without surge voltage 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. (Initial value)

Vibration resistance: No malfunction occurred in one sweep between 45 and 2000Hz. Test was performed in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states. (Initial value)

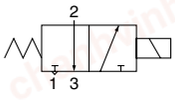
Solenoid specifications

Series			10-V114/V124	10-V114A/V124A
Electrical entry			Grommet (G)/(H), L plug connector (L) M plug connector (M)	
Coil rated voltage V	DC		24, 12, 6, 5, 3	
	AC 50/60Hz		100, 110, 200, 220	—
Allowable voltage fluctuation			–10 to 10%	
Power consumption (W)	DC		Standard: 0.35 (With indicator light: 0.4) With power saving circuit: 0.1	1 W (With indicator light: 1.1)
Apparent power (VA)	AC	100V	0.78 (With indicator light: 0.81)	—
		110V [115V]	0.86 (With indicator light: 0.89) 0.94 (With indicator light: 0.97)	— —
		200V	1.18 (With indicator light: 1.22)	—
		220V [230V]	1.30 (With indicator light: 1.34) [1.42 (With indicator light: 1.46)]	— —
Surge voltage suppressor			Refer to page 647.	
Indicator light			LED	

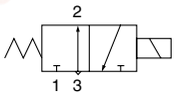
∗ In common between 110VAC and 115VAC, and between 220VAC and 230VAC.
∗ For 115VAC and 230VAC, the allowable voltage fluctuation will be –15% to 5% of rated voltage.

JIS Symbol

10-V114 (A)



10-V124 (A)



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Model

Valve model	Type of actuation	Type	Operating pressure range (MPa)	Vacuum specification (MPa)		Port size		Weight (g) Note 2)	
				Port 1	Port 3	Ports 1, 3	Port 2	Grommet type	L/M plug connector
10-V114	N.C.	Standard	0 to 0.7	–100kPa to 0.6	–100kPa to 0	M5 x 0.8	M5 x 0.8	10-V1□4: 13(27) 10-V1□4A: 16(30)	10-V1□4: 12(26) 10-V1□4A: 15(29)
10-V114A	N.C.	Large flow capacity	0 to 0.7	–100kPa to 0.6	–100kPa to 0	M5 x 0.8	M5 x 0.8		
10-V124 Note 1)	N.O.	Standard	0 to 0.7	–100kPa to 0	–100kPa to 0.6	M5 x 0.8	M5 x 0.8		
10-V124A Note 1)	N.O.	Large flow capacity	0 to 0.7	–100kPa to 0	–100kPa to 0.6	M5 x 0.8	M5 x 0.8		

Valve model	Flow characteristics					
	1→2			2→3		
	C[dm³/(s·bar)]	b	Cv	C[dm³/(s·bar)]	b	Cv
10-V114	0.037	0.11	0.008	0.054	0.35	0.015
10-V114A	0.076	0.07	0.016	0.099	0.23	0.024
10-V124 Note 1)	0.054	0.35	0.015	0.037	0.11	0.008
10-V124A Note 1)	0.099	0.23	0.024	0.076	0.07	0.016

Note 1) 10-V124 and 10-V124A: Supply pressure to port 3 and exhaust from port 1.
Note 2) ( ): With sub-plate

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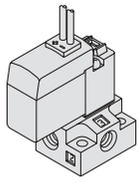
How to Order

Standard type

Base mounted 10 — V1 [1] 4 [ ] — [5] [M] [ ] [ ] — [ ]

3 port



For sub-plate type,
For manifold type S41

Clean series

Type of actuation

1	Normally closed
2	Normally open

Coil specifications

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

∗ All types with power saving circuit are with light/surge voltage suppressor.

Rated voltage

For DC

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

For AC (50/60Hz)

1	100 VAC
2	200 VAC
3	110 VAC [115 VAC]
4	220 VAC [230 VAC]

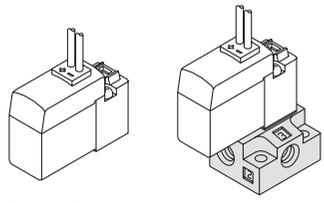
Electrical entry

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

∗ "LN", "MN" type: with 2 sockets.

Port size

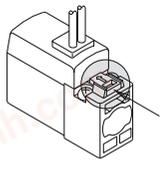
Nil: Without sub-plate M5: With sub-plate



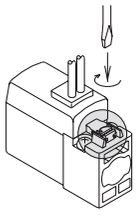
(With gasket and screws)

Manual operation

Nil: Non-locking push type



B: Locking slotted type



Light/Surge voltage suppressor

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

∗ Power saving circuit is only available in the "Z" type.

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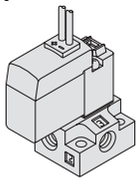
How to Order

Large flow type

Base mounted 10 — V1 [1] 4 [A] — [5] [M] [ ] [ ] — [ ]

3 port



For sub-plate type,
For manifold type S41

Clean series

Type of actuation

1	Normally closed
2	Normally open

Large flow type

Rated voltage

For DC

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

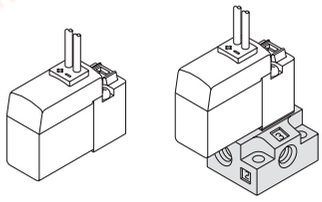
Electrical entry

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

* "LN", "MN" types: with 2 sockets.

Port size

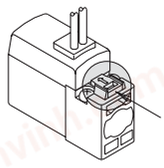
Nil: Without sub-plate M5: With sub-plate



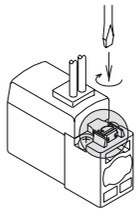
(With gasket and screws)

Manual override

Nil: Non-locking push type



B: Locking slotted type



Light/surge voltage suppressor

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

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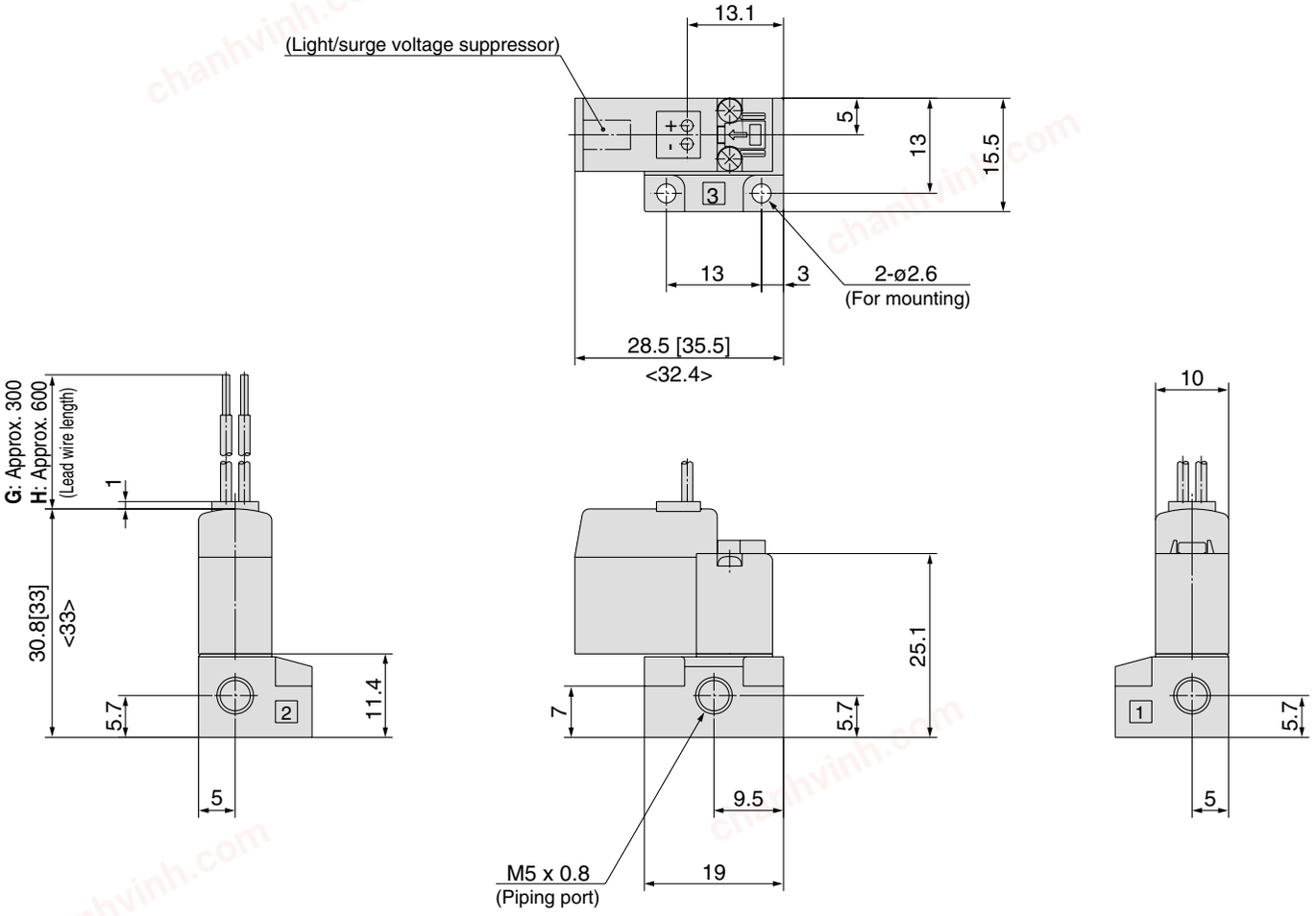
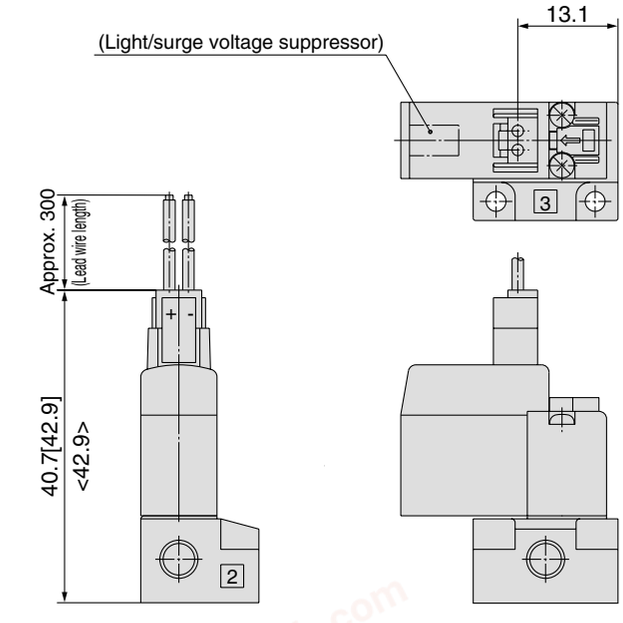
Base mounted (with sub-plate)

Note) [ ]: AC
< >: Large flow type (A)

Grommet (G)/(H): 10-V1$^{1}_{2}$4(A)-□$^{G}_{H}$□□-M5

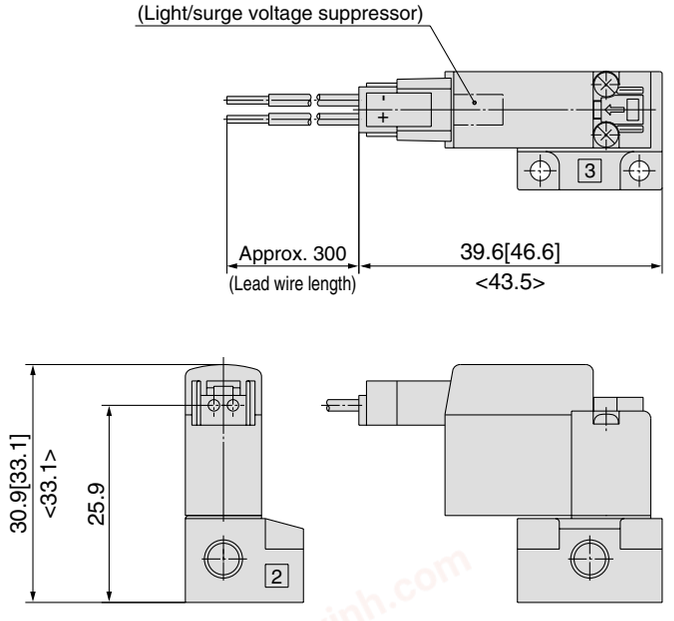


L plug connector (L): 10-V1$^{1}_{2}$4(A)-□L□□-M5



＊ Other dimensions are same as grommet style.

M plug connector (M): 10-V1$^{1}_{2}$4(A)-□M□□-M5



＊ Other dimensions are same as grommet style.

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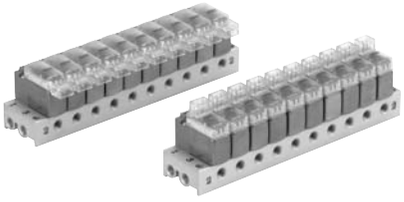
Series 10-V100 3 port solenoid valve Manifold specifications



Manifold specifications

Model		S41 type
Manifold		Single base / B mount
P (SUP), R (EXH)		Common SUP / Common EXH
Stations		2 to 20 stations
Output port Porting specifications	Location	Base
	Direction	Side
Port size	1, 2, 3 port	M5 x 0.8

Note 1) 10-V114(A) and 10-V124(A) cannot be mounted on the same manifold.
Note 2) For 10-V124(A), supply pressure to port 3 and exhaust from port 1.

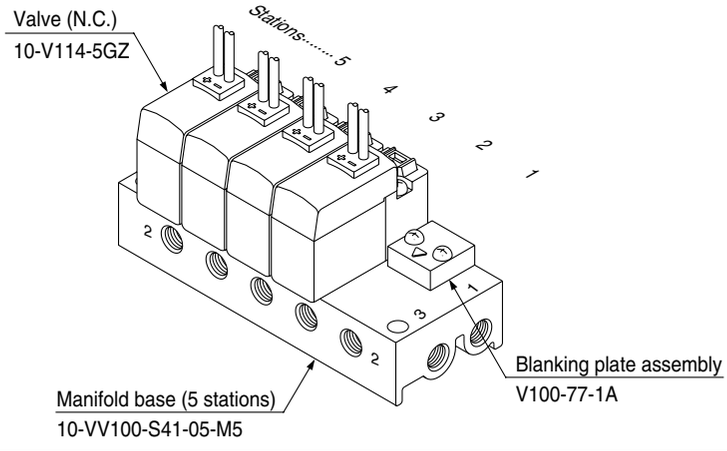
Flow characteristics

Manifold		Port size	Flow characteristics					
		1, 2, 3 port	1→2			2→3		
			C[dm³/(s·bar)]	b	Cv	C[dm³/(s·bar)]	b	Cv
10-VV100-S41 type	10-V114	M5 x 0.8	0.032	0.13	0.007	0.050	0.26	0.012
	10-V114A		0.070	0.10	0.016	0.085	0.16	0.020
	10-V124		0.050	0.26	0.012	0.032	0.13	0.007
	10-V124A		0.085	0.16	0.020	0.070	0.10	0.016

Note) Values when manifold base (5 stations) is mounted.

How to Order Valve Manifold Assembly

Ordering example



10-VV100-S41-05-M5·····1 set (S41 type 5 station manifold part no.)
∗ **V100-77-1A**·····1 set (blanking plate assembly part no.)
∗ **10-V114-5GZ**·····4 sets (valve)
∗ The asterisk denotes the symbol for assembly. Prefix it to the part nos. of the solenoid valve, etc.

Indicate part numbers of valve and option beneath the manifold part no.

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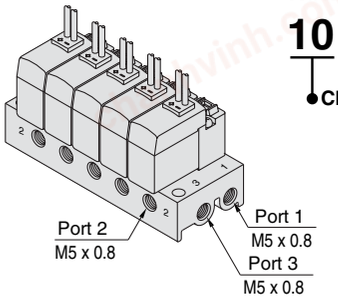
Manifold specifications 10-*V100*

Common SUP / Common EXH

S41 type



How to Order

10 – VV100 – S41 – 05 – M5

Clean series

Stations

02	2 stations
⋮	⋮
20	20 stations

2 port size

M5	M5 x 0.8

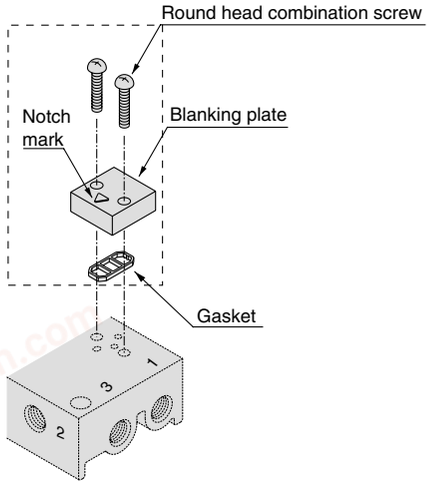
Applicable solenoid valve Note)
10-V114-□□□□
10-V114A-□□□□
10-V124-□□□□
10-V124A-□□□□
Applicable blanking plate assembly
V100-77-1A

Note) 10-V114(A) and 10-V124(A) cannot be mounted on the same manifold.

(Manifold option)
Blanking plate assembly

Part no: V100-77-1A

Place notch mark on the blanking plate to 2 port side when assembling.



Base
· Sub-plate
· 10- VV100-S41 type manifold base

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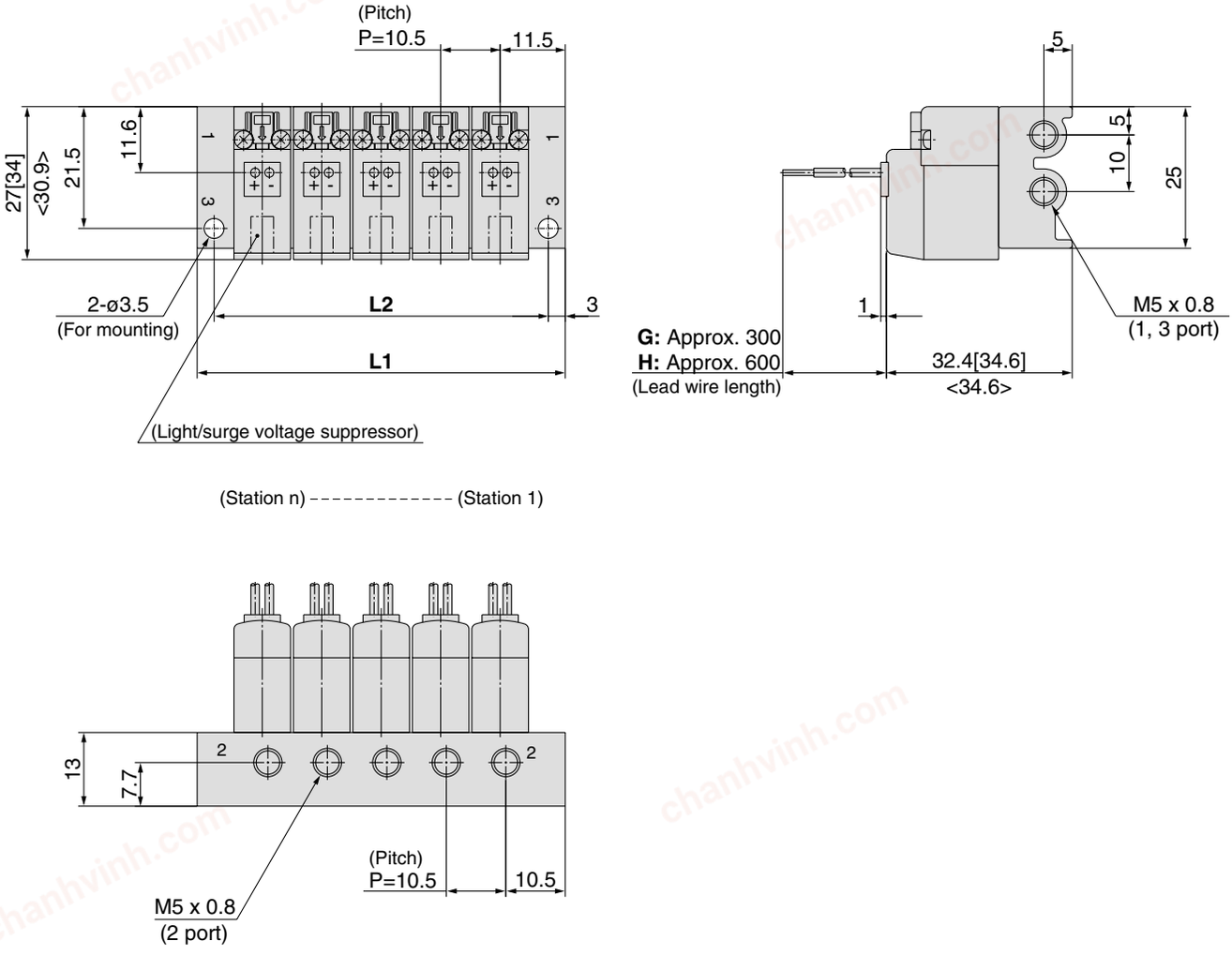
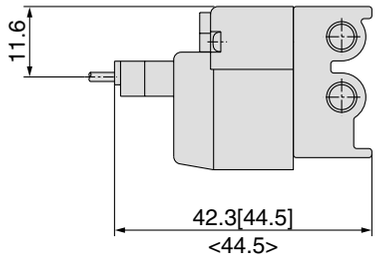
Type S41 manifold: Side ported / 10-VV100-S41-Stations-M5

Note) [ ]: AC
< >: For large flow type (A)

Grommet (G), (H)

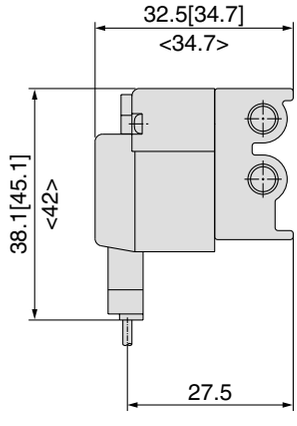


L plug connector (L)



∗ Other dimensions are same as grommet style.

M plug connector (M)



∗ Other dimensions are same as grommet style.

Stations	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

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Series 10-*V100*
Specific Product Precautions 1

Be sure to read before handling.

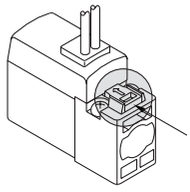
⚠ Warning

Manual override operation

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

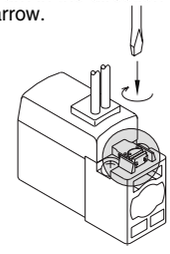
■ **Non-locking push type [Standard]**

Press in the direction of the arrow.



■ **Locking slotted type [B]**

Turn in the direction of the arrow.



⚠ Caution

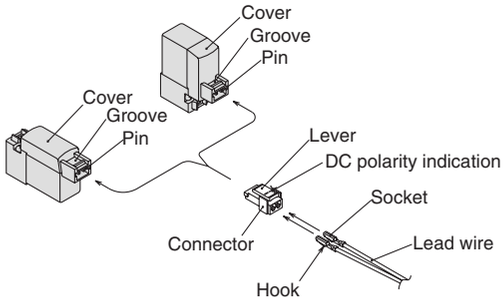
When operating with a screwdriver, turn it gently using a watchmaker's screwdriver.
[Torque: Less than 0.1 N·m]

⚠ Caution

How to use plug connector

1. Attaching and detaching connectors

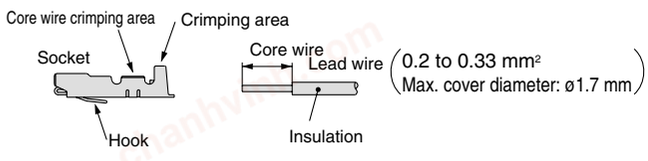
- To attach a connector, hold the lever and connector unit between your fingers and insert straight onto the pins of the solenoid valve so that the lever's pawl is pushed into the groove and locks.
- To detach a connector, remove the pawl from the groove by pushing the lever downward with your thumb,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



2. Crimping of lead wires and sockets

Strip 3.2 to 3.7 mm at the end of the lead wires, insert the ends of the core wires evenly into the sockets, and then crimp with a crimping tool. When this is done, take care that the coverings of the lead wires do not enter the core wire crimping area.

Use special tool when crimping. (For the crimping tool, please consult with SMC.)



⚠ Caution

How to use plug connector

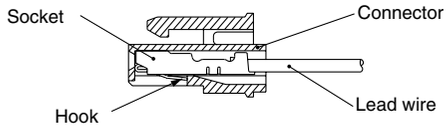
3. Attaching and detaching sockets with lead wires

- **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 they 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, however, the following lengths are 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 sockets only)

How to Order

Indicate part numbers of the valve without connector and the required connector assembly separately.
<Example> Lead wire length 2000 mm

For DC	For AC
10-V114-5LO	10-V114A-1LO
SY100-30-4A-20	SY100-30-1A-20

● Lead wire length

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

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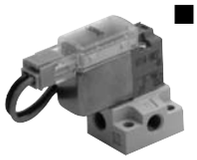
Series 10-V100
Specific Product Precautions 2

Be sure to read before handling.

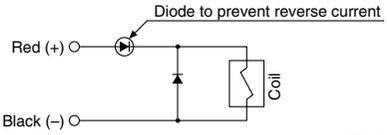
Surge voltage suppressor

(For DC)
Grommet, L/M plug connector



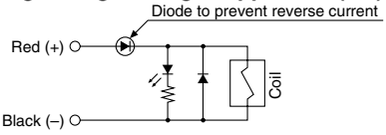
■ **Standard type (with polarity)**

With surge voltage suppresser (□S)





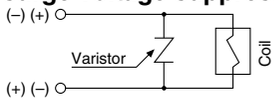
With light/surge voltage suppresser (□Z)



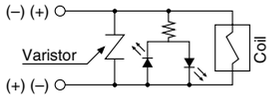
■ **Non-polar type**



With surge voltage suppresser (□R)



With light/surge voltage suppresser (□U)

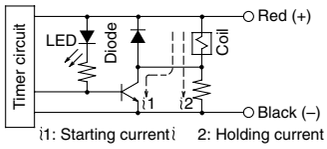


- Please connect correctly the lead wires to + (positive) and – (negative) indications on the connector.
- For DC voltages other than 12 and 24 VDC, use caution not to connect in reverse due to the absence of a diode to prevent reverse current. (Wrong polarity will cause trouble.)
- Solenoids, whose lead wires have been pre-wired: positive side red and negative side black.

■ **With power saving circuit**

Power consumption is reduced by approximately 75% compared with the standard product by eliminating the need for electrical current for holding. (Effective after more than 62ms energized and 24 VDC rated voltage applied.)

Electrical Circuit (with power saving circuit)



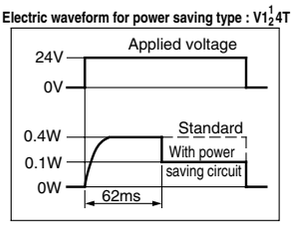
i1: Starting current i 2: Holding current

Working principle

The electrical circuit as shown above, allows reduced holding current consumption and measures power saving. Refer to electric waveform on the right.

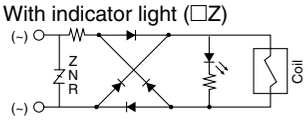
- When a power saving circuit is installed, a diode to prevent reverse current is not provided. Therefore, use caution not to connect in reverse.

Electric waveform for power saving type : V$^{1}_{2}$4T



<For AC>
Grommet, L / M plug connectors

With indicator light (□Z)



⚠Caution

In the case of ZNR surge voltage suppressor, take note the surge voltage to be suppressed at controller side as there will be a residual voltage according to the protective element and rated voltage.
Moreover, the residual voltage of the diode is approximately 1V.

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
- Cover material is chloroprene rubber which has excellent weatherability and electric insulation properties. However, be careful not to allow contact with cutting oil, etc.
- Round cord provides neat appearance.

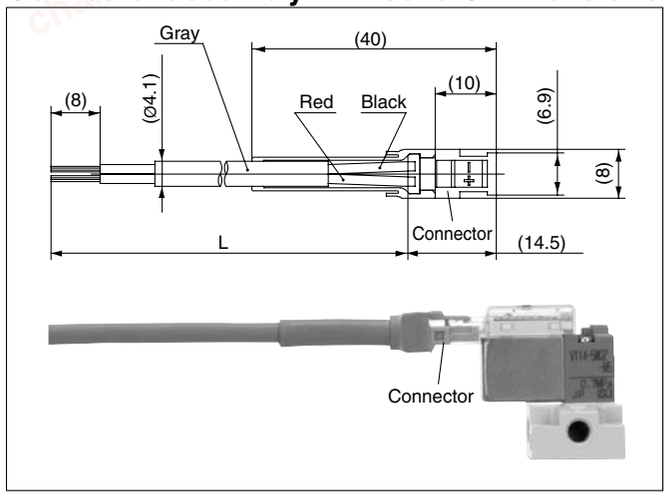
How to Order

SY100 - 68 - A - □

Lead wire length (L)

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

Connector assembly with cover / Dimensions



• How to Order

Specify the part numbers of the solenoid valve without connector together with the part number of the connector assembly with protective cover.

<Example> Lead wire length 2000 mm

10-V114-5LOZ-M5

SY100-68-A-20

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

10-V114-5LPZ-M5

Symbol of connector assembly with protective cover

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