How to Order Valves

VQ 1 1 7 0 Y 5 M [ ] C6

Series VQ1000

Type of actuation

1	2 position single
2	2 position double (Latching) — Metal seal / Rubber seal
3	3 position closed center
4	3 position exhaust center
5	3 position pressure center

L type plug connector is used for 3 position AC.

Coil voltage

1	100 VAC (50/60 Hz)
2 Note)	200 VAC (50/60 Hz)
3	110 VAC (50/60 Hz)
4 Note)	220 VAC (50/60 Hz)
5	24 VDC
6	12 VDC

Note) 200/220 VAC models are applicable to the C kit.

Function

Symbol	Specifications	DC	AC
Nil	Standard type	(1.0 W) ○	○ (1)
H (2)	High pressure type	(1.5 W) ○	—
Y (2)	Low wattage type	(0.5 W) ○	—

Note1) For power consumption of AC type, refer to page 2-4-74.
Note2) Except double (latching).

Seal

0	Metal seal
1	Rubber seal

Note 1) For negative common specifications, refer to "Option" on page 2-4-93.
Note 2) Connector assembly will be required when the F, P, T, S kits add a valve. For model no., refer to "Option" on page 2-4-93.

Manual override

Nil: Non-locking push type (Tool required)	B: Locking type (Tool required)	C: Locking type (Manual)

Manual override body side
Bore ø3.2
Pilot valve manual override

Note) A manual override for pilot valve is provided to the standard model for double type.

Electrical entry

G: Grommet (C kit only. Except double (latching) and AC.)	L: L plug connector With lead wire	LO: L plug connector Without lead wire	M: M plug connector With lead wire	MO: M plug connector Without lead wire
	With light/surge voltage suppressor	With light/surge voltage suppressor	With light/surge voltage suppressor	With light/surge voltage suppressor

Note) LO and MO valves are used for F, P, T, and S kits. Plug connector and Lead wire layers are attached to the manifold.

Cylinder port

C3	With One-touch fitting for ø3.2
C4	With One-touch fitting for ø4
C6	With One-touch fitting for ø6
M5	M5 thread

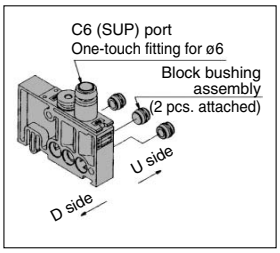
Note 1) The code is L for elbow piping for all manifold stations.
Example) L6: Elbow with One-touch fittings for ø6
Note 2) For inch-size One-touch fittings, refer to "Option" on page 2-4-93.

VQC
SQ
VQ0
VQ4
VQ5
VQZ
VQD

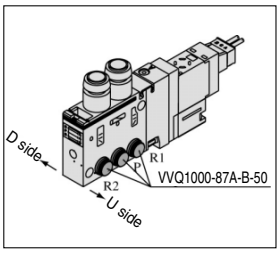
Manifold Option

P. 2-4-87

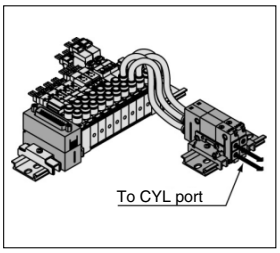
Individual SUP spacer
VVQ1000-P-7-C6



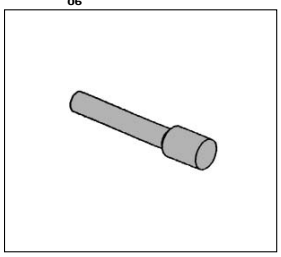
SUP/EXH block bush assembly
VVQ1000-87A-B-50



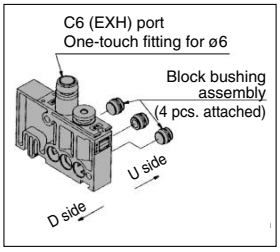
Double Check block
VQ1000-FPG-□□



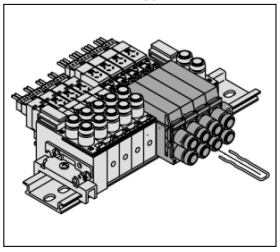
Blanking plug
KQ2P- 23 04 06



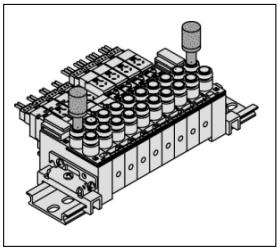
Individual EXH spacer
VVQ1000-R-7-C6



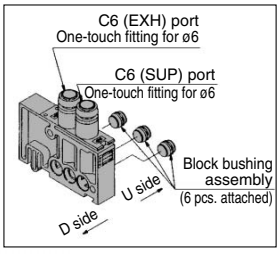
Elbow fitting assembly
VVQ1000-F7-L C3 C4 C6



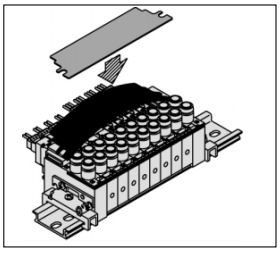
Silencer
AN103-X233



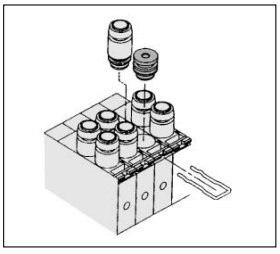
Individual SUP/EXH spacer
VVQ1000-PR-7-C6



Name plate [-N7]
VVQ1000-N7-station (1 to Max. stations)

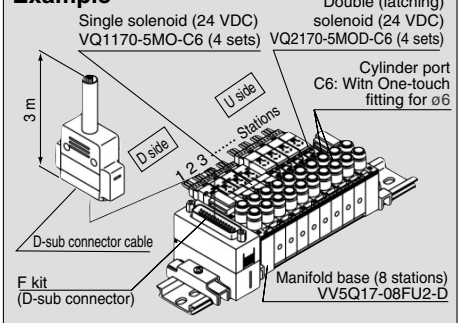


Port plug
VVQ0000-58A



How to Order Manifold Assembly

Example

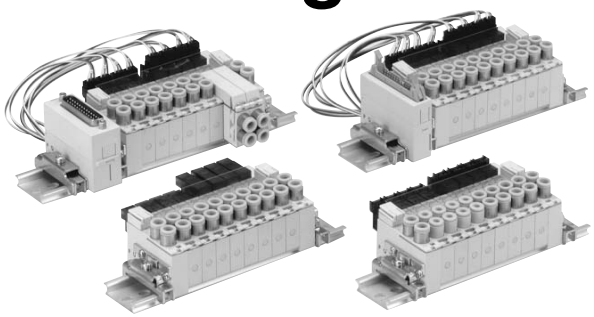


VV5Q17-08FU2-D ····· 1 set (F kit 8 station manifold base no.)
∗VQ1170-5MO-C6 ····· 4 sets (Single solenoid part no.)
∗VQ1270-5MOB-C6 ··· 4 sets (Double latching solenoid part no.)
The asterisk denotes the symbol for assembly. Prefix it to the part nos. of the solenoid valve, etc.

Add the valve and option part number under the manifold base part number. In the case of complex arrangement, specify them on the manifold specification sheet.

• See page 2-4-91 for cylinder port fittings.
• For replacement parts, refer to page 2-4-111.

Series VQ1000
Body Ported
Plug Lead Unit: Cassette Type



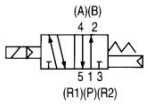
Model

Series	Number of solenoids		Model		Flow characteristics: 1 → 4/2 (P → A/B) C [dm³/(s·bar)]	b	Cv	Flow characteristics: 4/2 → 5/3 (A/B → R1/R2) C [dm³/(s·bar)]	b	Cv	Response time (2) (ms): Standard: 1 W H: 1.5 W	Response time (2) (ms): Low wattage: 0.5 W	AC	Weight (g)
VQ1000	2 position	Single	Metal seal	VQ1170	0.56	0.15	0.13	0.60	0.12	0.14	12 or less	15 or less	29 or less	67
			Rubber seal	VQ1171	0.71	0.20	0.17	0.80	0.16	0.19	15 or less	20 or less	34 or less	
		Double (Latching)	Metal seal	VQ1270	0.56	0.15	0.13	0.60	0.12	0.14	12 or less	15 or less	29 or less	
			Rubber seal	VQ1271	0.71	0.20	0.17	0.80	0.16	0.19	15 or less	20 or less	34 or less	
	3 position	Closed center	Metal seal	VQ1370	0.53	0.16	0.12	0.58	0.12	0.14	20 or less	26 or less	40 or less	82
			Rubber seal	VQ1371	0.65	0.23	0.16	0.70	0.20	0.17	25 or less	33 or less	47 or less	
		Exhaust center	Metal seal	VQ1470	0.54	0.16	0.12	0.60	0.12	0.14	20 or less	26 or less	40 or less	
			Rubber seal	VQ1471	0.65	0.23	0.16	0.80	0.16	0.19	25 or less	33 or less	47 or less	
		Pressure center	Metal seal	VQ1570	0.54	0.16	0.12	0.58	0.12	0.14	20 or less	26 or less	40 or less	
			Rubber seal	VQ1571	0.70	0.20	0.17	0.72	0.20	0.17	25 or less	33 or less	47 or less	

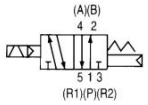
Note 1) Cylinder port size C6
Note 2) As per JIS B 8375-1981 (Supply pressure: 0.5 MPa; with indicator light/surge voltage suppressor; clean air. Subject to the pressure and air quality.)

JIS Symbol

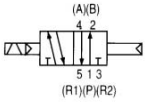
2 position single



2 position double (latching)

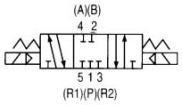


Metal seal

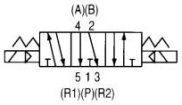


Rubber seal

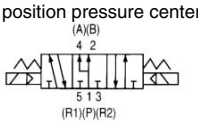
3 position closed center



3 position exhaust center



3 position pressure center



Standard Specifications

			Metal seal	Rubber seal
Valve specifications	Valve construction		Metal seal	Rubber seal
	Fluid		Air/Inert gas	Air/Inert gas
	Maximum operating pressure		0.7 MPa (High pressure type: 0.8 MPa) (3)	
	Minimum operating pressure	Single	0.1 MPa	0.15 MPa
		Double (Latching)	0.1 MPa	0.15 MPa
		3 position	0.15 MPa	0.2 MPa
	Ambient and fluid temperature		10 to 50°C (1)	
	Lubrication		Not required	
	Manual override		Push type/Locking type (Tool required, Manual) Option	
	Impact/Vibration resistance (2)		150/30 m/s²	
	Enclosure		Dust-protected	
Solenoid	Coil rated voltage		12, 24 VDC, 100, 110, 200, 220 VAC (50/60 Hz)	
	Allowable voltage fluctuation		±10% of rated voltage	
	Coil insulation type		Class B or equivalent	
	Power consumption (Current)	24 VDC	1 W DC (42 mA), 1.5 W DC (63 mA) (3), 0.5 W DC (21 mA) (4)	
		12 VDC	1 W DC (83 mA), 1.5 W DC (125 mA) (3), 0.5 W DC (42 mA) (4)	
		100 VAC	Inrush 0.5 VA (5 mA), Holding 0.5 VA (5 mA)	
		110 VAC	Start-up 0.55 VA (5 mA), Holding 0.55 VA (7.5 mA)	
		200 VAC	Inrush 1.0 VA(5 mA), Holding 1.0 VA (5 mA)	
		220 VAC	Inrush 1.1 VA (5 mA), Holding 1.1 VA (5 mA)	

Note 1) Use dry air to prevent condensation when operating at low temperatures.
Note 2) Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)
Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. Test was performed at both energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)
Note 3) Values in the case of high pressure type (1.5 W).
Note 4) Values in the case of low wattage (0.5 W) specifications.

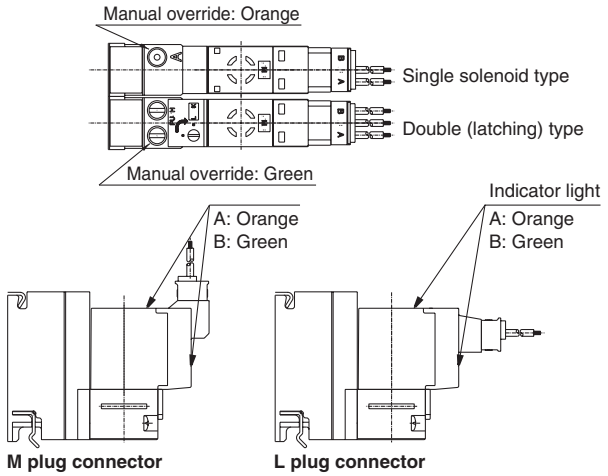
⚠ Precautions

Be sure to read before handling. For Safety Instructions and Solenoid Valve Precautions, refer to page 2-9-2.

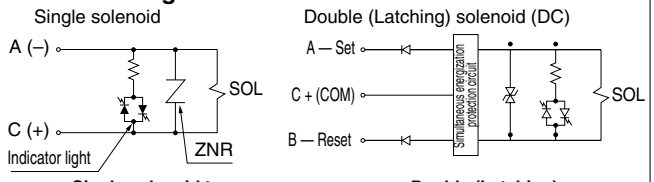
Light/Surge Voltage Suppressor

⚠ Caution

The standard model is equipped with an indicator light and surge voltage suppressor. The lighting positions are concentrated on one side for both single solenoid type and double (latching) type. In the double (latching) type, A side and B side energization are indicated by two colors which match the colors of the manual overrides.



DC circuit diagram



Single solenoid type | **Double (Latching)**

Note 1) • A-side energization: A light (orange) illuminates.
• B-side energization: B light (green) illuminates.
• Equipped with a wiring error prevention (stop diode) mechanism.
• Surge absorption (ZNR/surge absorption diode) mechanism.

Note 2) Applicable to negative COM specification models.

Note 3) In the case of double (latching), the electromagnetic valve channel is, A–(set):
P → A, B → R
B–(reset): P → B, A → R

Double (Latching solenoid) Type

⚠ Caution

Different from the conventional double solenoid, the double type uses a latching (self-holding system) solenoid. Although the appearance is the same as the single solenoid, it is constructed so that the movable iron core in the solenoid is held in the ON position on A and B sides by instantaneous energization (20 ms or more). The usage and function is the same as the double solenoid type.

<Special Cautions for Latching Solenoid>

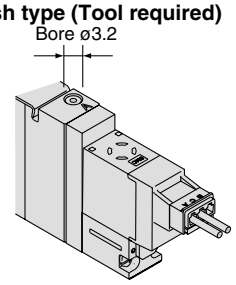
1. Select the circuit in which ON and OFF signals are not energized simultaneously.
2. 20 ms energization time is necessary for self-holding.
3. Avoid using the latching solenoid valves in environments where impact or collisions with the valve might occur.
   Also, do not use in places where strong magnetic fields are present.
4. Even though the armature in the solenoid of this valve is held on to B side, ON position (Reset), verify either A side, ON position or B side, ON position by energizing prior to use.
   After manual operation, the main valve will return to its original position.
5. Manual override on the pilot valve side can retain its switching position after manipulation.
6. Please contact SMC for long-term energization applications.
7. In the case of metal seal type, if the supply air goes down below the minimum operating pressure (0.1 MPa or less), the main valve will be back to the home position (B side ON position). Therefore, when the supply air is shut off or applied while leaving A side ON position, cylinder may be pulsated. The valve's switching position when the supply air is operated should be installed on the home position side (B side ON position).

Manual Override

⚠ Warning

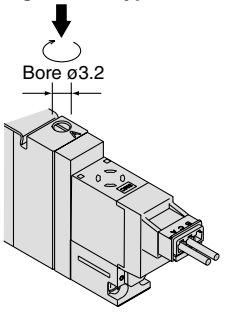
Without an electric signal for the solenoid valve the manual override is used for switching the main valve.

■ Push type (Tool required)



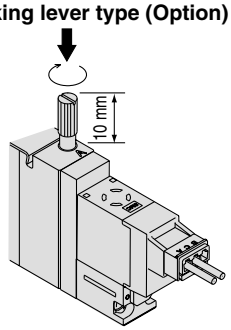
Push down on the manual override button with a small screwdriver until it stops. Release the screwdriver and the manual override will return.

■ Locking slotted type



Push down on the manual override button with a small screwdriver until it stops. While down, turn clockwise by 90° to lock it. Turn it counterclockwise to release it.

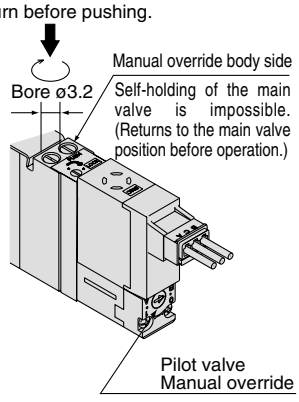
■ Locking lever type (Option)



Push down completely on the manual override button with a small screwdriver. While down, turn clockwise 90° to lock it. Turn it counterclockwise to release it.

■ Manual override for double (latching) type

In case of a double (latching) type, a manual override is provided not only on the body side but to the pilot as a standard specification.
After manual operation, the main valve of the manual override on the body side returns to the position before the manual operation, however, the pilot valve manual override maintains the change-over position.



Self-holding of the main valve possible.

- If the manual override is turned by 180° clockwise and the ▶ mark is adjusted to A, then pushed in the direction of an arrow (⇳), it will be back to the reset condition. (passage P → A)
- If the manual override is turned by 180° counterclockwise and the ▶ mark is adjusted to B, then pushed in the direction of an arrow (⇳), it will be back to the reset condition. (passage P → B) (It is in the reset state at the time of shipment.)

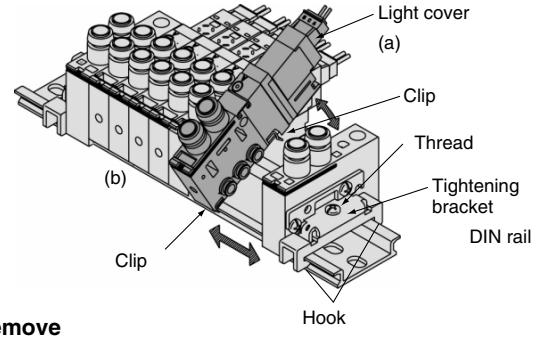
⚠ Caution

Do not apply excessive torque when turning the locking type manual override. (0.1 N·m or less)

How to Mount/Remove Solenoid Valve

⚠ Caution

<Procedure>



How to Remove

1. Loosen the clamp screw on one side.
2. Slightly slide a part the valve stations on both sides of the station to be removed.
3. Pull up side (a) of the valve station and remove it from the DIN rail.

How to mount

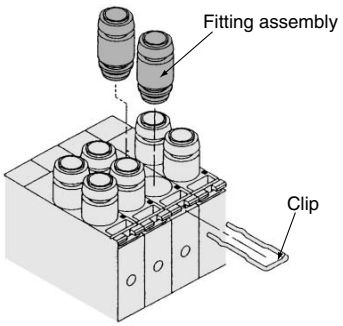
1. Take procedures 1 and 2 above to make an open space in the position for mounting a new valve station.
2. Diagonally insert the clip on the side (b) of the valve station to the DIN rail.
3. Press down on the valve station and insert the clip on the side (a) of the valve station to the DIN rail.
4. Slide the valve stations together so that there is no clearance between them. Position the clamp screw and tighten. (Proper tightening torque: 0.7 to 1.0 N·m)

Note) **Be careful to keep O-ring or gallery dust free since dirt may cause air leakage.**
Be sure both hooks of the bracket are fixed to the DIN rail.
Use caution not to apply force on the light cover when mounting or dismounting the valve.

Replacement of Cylinder Port Fittings

⚠ Caution

The cylinder port fittings are a cassette for easy replacement. The fittings are blocked by a clip inserted from the side of the valve. Remove the clip with a screwdriver and remove fittings. For replacement, insert the fitting assembly until it strikes against the inside wall and then reinsert the clip to the specified position.



Applicable tubing O.D	Fitting assembly part no.
Applicable tubing ø3.2	VVQ1000-50A-C3
Applicable tubing ø4	VVQ1000-50A-C4
Applicable tubing ø6	VVQ1000-50A-C6

∗ Purchasing order is available in units of 10 pieces.

⚠ Caution

1. Protect O-rings from scratches and dust to prevent air leakage.
2. The tightening torque for inserting fittings to the M5 thread ass'y should be 0.8 to 1.4 N·m.

How to Use Plug Connector

⚠ Caution

For details, refer to page 2-4-67.

How to Calculate the Flow Rate

⚠ Caution

For obtaining the flow rate, refer to pages 2-1-8 to 2-1-11.

Special Wiring Specifications

In the internal wiring of F kit, P kit, J kit, G kit, T kit and S kit, double wiring (connected to SOL. A and SOL. B) is adopted for each station regardless of the valve and option types.
Mixed single and double wiring is available as an option.

1. How to order valves

Indicate an option symbol, -K, for the manifold no. and be sure to specify the mounting position and number of stations of the single and double wiring by means of the manifold specification sheet.

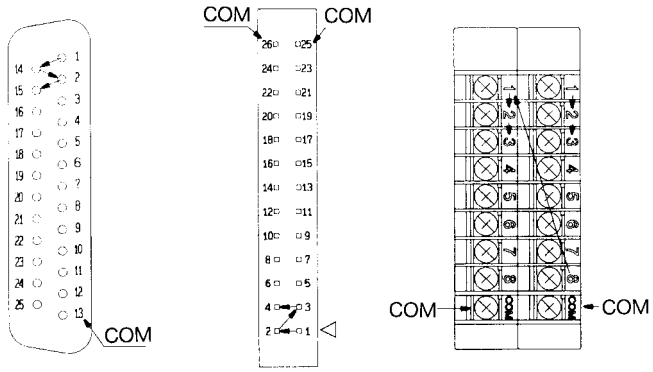
Example)

VV5Q17-09FU0-D K S

Others, option symbols: to be indicated alphabetically.

2. Wiring specifications

Connector terminal numbers are connected from solenoid station 1 on the A side in the order indicated by the arrows without shipping any terminal numbers.



F kit
D-sub connector (25P)

P kit
Flat ribbon cable connector (26P)

T kit
Terminal block (16 terminals)

3. Max. number of stations

The maximum number of stations depends upon the number of solenoids. Assuming one for a single and two for a double, determine the number of stations so that the total number is not more than the maximum number given in the following table.

kit	F kit (D-sub connector)		P kit (Flat ribbon cable connector)				T kit (Terminal block)		S kit (Serial)
Type	F S U □ 25P	F S U A 15P	P S U □ 26P	P S U C 20P	P S U B 16P	P S U A 10P	T1	T2	S□
Max. points	16 Note)	14	16 Note)	16 Note)	14	8	8	16	16

Note) Due to the limitation of internal wiring.

Negative Common Specifications

Specify the valve model no. as shown below for negative COM specification. The standard manifold no. can be used. Please contact SMC for negative COM S kit.

How to order negative COM valves

VQ1170 N − 5MO − C6

Negative common specifications

Inch-size One-touch Fittings

Refer to following model no. for inch-size One-touch fittings.

How to order manifold

VV5Q17 − 08FSO − DN − 00T

1(P), 3(R) port size ø1/4"

How to order valves

VQ1170 − 5M − N7

Cylinder port

Symbol	N1	N3	N7
Applicable tube O.D. (Inch)	ø1/8"	ø5/32"	ø1/4"

Plug Connector Assembly Model

Connector assembly will be required when the F, P, T, S kits add a valve.
Specify the valve and connector assembly.

Connector Assembly Part No.

Specifications		Part no.
Single (2-wire)	Positive common	AXT661-14A-F
	Negative common	AXT661-14AN-F
Double (latching) (3-wire)	Positive common	AXT661-13A-F
	Negative common	AXT661-13AN-F

Note) Lead wire length: 300 mm

DIN Rail Mounting

Each manifold can be mounted on a DIN rail.
Order it by indicating an option symbol for DIN rail mounting style, -D. In this case, a DIN rail which is approx. 30 mm longer than the manifold with the specified number of stations is attached. Besides, it is also available in the following cases.

● **When using DIN rail longer than the manifold with specified number of stations**
Clearly indicate the necessary number of stations next to the option symbol, -D, for the manifold no.

Example)

VV5Q17-08FU1-D09S

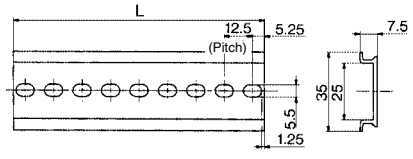
DIN rail for 9 stations

Others, option symbols: to be indicated alphabetically.

● **When ordering DIN rail only**

DIN rail no.: AXT100-DR-n

∗ Refer to the DIN rail dimension table for determining the length.

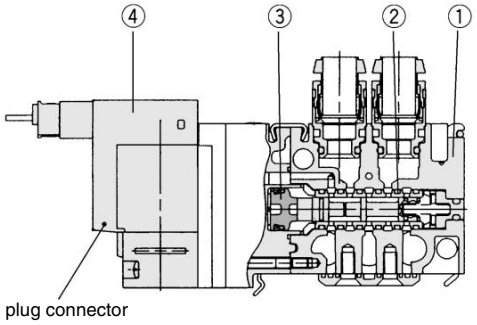


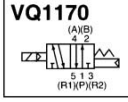
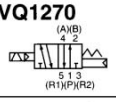
L Dimension L = 12.5 x n + 10.5

No.	1	2	3	4	5	6	7	8	9	10
L dimension	23	35.5	48	60.5	73	85.5	98	110.5	123	135.5
No.	11	12	13	14	15	16	17	18	19	20
L dimension	148	160.5	173	185.5	198	210.5	223	235.5	248	260.5
No.	21	22	23	24	25	26	27	28	29	30
L dimension	273	285.5	298	310.5	323	335.5	348	360.5	373	385.5
No.	31	32	33	34	35	36	37	38	39	40
L dimension	398	410.5	423	435.5	448	460.5	473	485.5	498	510.5

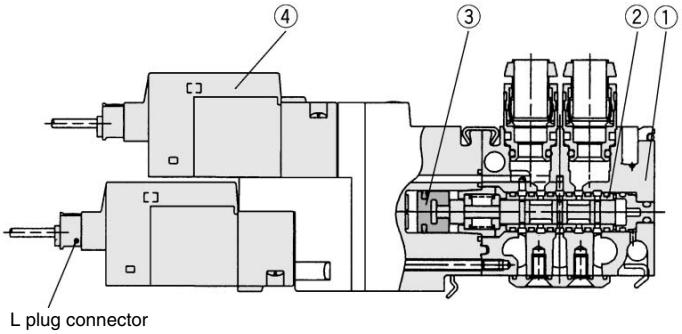
Construction: VQ1000/Plug Lead Unit, Cassette Type

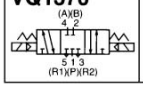
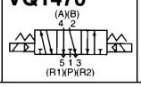
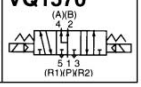
Metal seal
Single/Double (Latching)



VQ1170	VQ1270
	

3 position



VQ1370	VQ1470	VQ1570
		

Component Parts

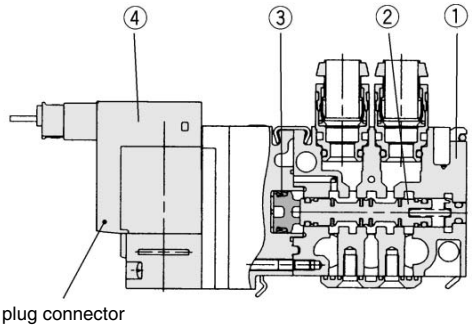
No.	Description	Material	Note
①	Body	Zinc die-casted	
②	Spool/Sleeve	Stainless steel	
③	Piston	Resin	

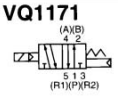
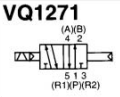
④ Pilot valve assembly

Single	Note) VQ111(H)(Y)-□L/M/G-2 (Voltage: 1 to 6)	
Double (Latching)	VQ110L-□L/M-2 (Voltage: 1 to 6)	
3 position	Note) VQ111(H)(Y)-□L/M/G-X18 {A side (Bottom side)} Nil {B side (Top side)} (Voltage: 1 to 6)	The direction of the L and Mconnectors of a pilot valve is opposite to that of the single and double type.

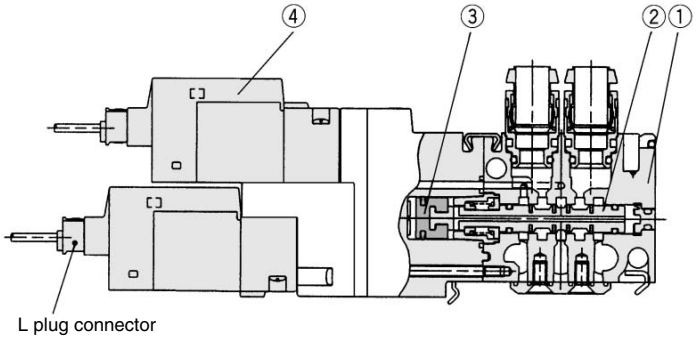
Note 1) (H): 1.5 W, (Y): 0.5 W, G type: DC only

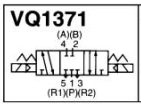
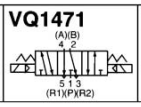
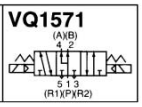
Rubber seal
Single/Double (Latching)



VQ1171	VQ1271
	

3 position



VQ1371	VQ1471	VQ1571
		

Component Parts

No.	Description	Material	Note
①	Body	Zinc die-casted	
②	Spool valve	Aluminum/HNBR	
③	Piston	Resin	

④ Pilot valve assembly

Single	Note) VQ111(H)(Y)-□L/M/G-2 (Voltage: 1 to 6)	
Double (Latching)	VQ110L-□L/M-2 (Voltage: 1 to 6)	
3 position	Note) VQ111(H)(Y)-□L/M/G-X18 {A side (Bottom side)} Nil {B side (Top side)} (Voltage: 1 to 6)	The direction of the L and Mconnectors of a pilot valve is opposite to that of the single and double type.

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