

### How to Order Valves

### How to Order Manifold Assembly

**VQ1 1 3 0 Y 5 C6**

**Series VQ1000**  
Type of actuation

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

Note) 3 position occupies two stations.

**Seal**

0	Metal seal
1	Rubber seal

Note 1) For negative common specifications, refer to "Option" on page 2-4-29.

**Cylinder ports**

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) For inch-size One-touch fittings, refer to "Option" on page 2-4-29.

**Manual override**

Nil:	Non-locking push type (Tool required)	B: Locking type (Tool required)	C: Locking type (Manual)
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Manual override on body side  
Manual override for pilot valve

Note) A manual override for pilot valve is provided to the standard model for double type. (Refer to page 2-4-26.)

**Light/Surge voltage suppressor**

Nil	Yes
E	None

**Function**

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

Note 1) For power consumption of AC type, refer to page 2-4-10.  
Note 2) Except double (latching).

**Coil voltage**

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

Note) 200/220 VAC models are applicable to the F and L kits.

**Example**

Single solenoid (24 VDC)  
VQ1130-5-C6 (4 sets)

Double solenoid (24 VDC)  
VQ1230-5B-C6 (4 sets)

D-sub connector cable  
F kit (D-sub connector)

Manifold base (8 stations)  
VV5Q13-08FU2

Cylinder ports  
C6: With One-touch fitting for ø6

VV5Q13-08FU2 ... 1 set (F kit 8 station manifold base no.)  
\*VQ1130-5-C6 ... 4 sets (Single solenoid part no.)  
\*VQ1230-5B-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.

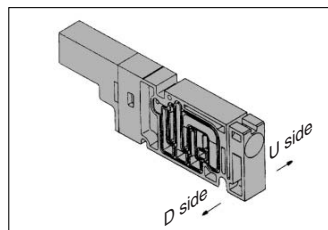
Specify the part numbers for valves and options together beneath the manifold base part number. Besides, when the arrangement will be complicated, specify them by means of the manifold specification sheet.

- VQC
- SQ
- VQ0
- VQ4
- VQ5
- VQZ
- VQD

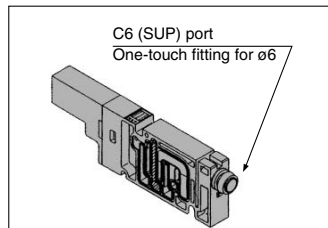
### Manifold Option

P. 2-4-23

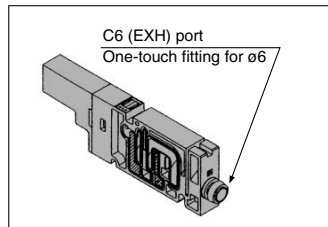
**Blanking plate assembly**  
VVQ1000-10A-3



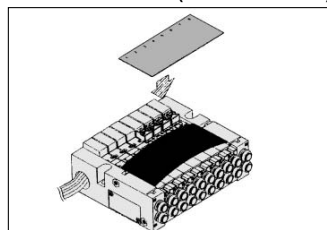
**Individual SUP spacer**  
VVQ1000-P-3-C6



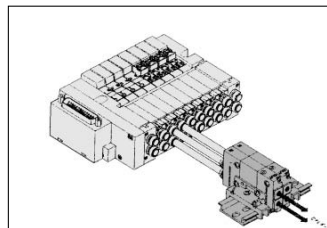
**Individual EXH spacer**  
VVQ1000-R-3-C6



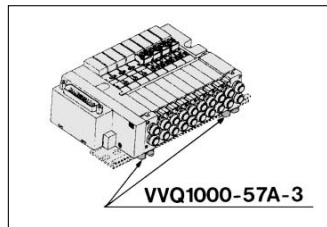
**Name plate [-N3]**  
VVQ1000-N3-Station (1 to Max. stations)



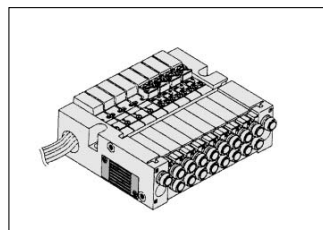
**Double Check block**  
VQ1000-FPG-□□



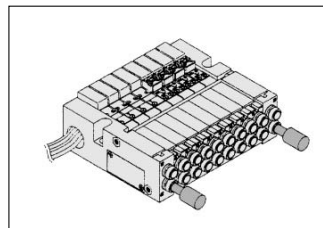
**DIN rail mounting bracket [-D]**  
VVQ1000-57A-3



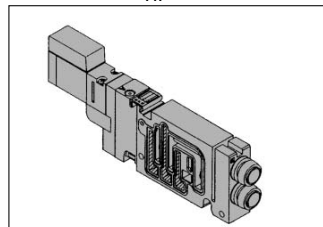
**Built-in silencer, direct exhaust [-S]**



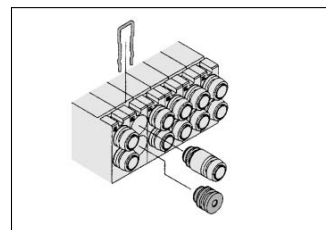
**Silencer**  
AN103-X233



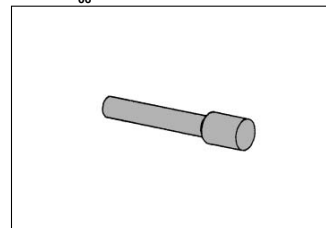
**Block valve**  
VQ□□□□□□□□□□□□□□□□



**Port plug**  
VVQ000-58A



**Blanking plug**  
KQ2P-<sup>23</sup>/<sub>06</sub>



- Refer to page 2-4-27 for cylinder port fitting.
- For replacement parts, refer to page 2-4-103.

# Series VQ1000

## Body Ported

### Plug-in Unit: Flip Type

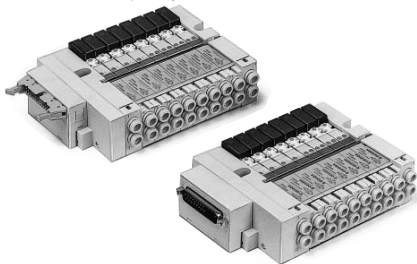
#### Model

Series	Number of solenoids	Model		Flow characteristics						Response time <sup>(2)</sup> (ms)			Weight (g)	
				1 → 4/2 (P → A/B)			4/2 → 5/3 (A/B → R1/R2)			Standard: 1 W H: 1.5 W	Low wattage: 0.5 W	AC		
				C [dm <sup>3</sup> /(s·bar)]	b	Cv	C [dm <sup>3</sup> /(s·bar)]	b	Cv					
VQ1000	2 position	Single	Metal seal	VQ1130	0.77	0.14	0.18	0.84	0.14	0.19	12 or less	15 or less	29 or less	57
			Rubber seal	VQ1131	0.91	0.19	0.21	1.0	0.21	0.25	15 or less	20 or less	34 or less	
		Double (Latching)	Metal seal	VQ1230	0.77	0.14	0.18	0.84	0.14	0.19	12 or less	15 or less	29 or less	
			Rubber seal	VQ1231	0.91	0.19	0.21	1.0	0.21	0.25	15 or less	20 or less	34 or less	
	3 position	Closed center	Metal seal	VQ1330	0.67	0.13	0.16	0.73	0.13	0.17	20 or less	26 or less	40 or less	105
			Rubber seal	VQ1331	0.78	0.22	0.18	0.84	0.21	0.20	25 or less	33 or less	47 or less	
		Exhaust center	Metal seal	VQ1430	0.74	0.14	0.17	0.84	0.16	0.20	20 or less	26 or less	40 or less	
			Rubber seal	VQ1431	0.78	0.28	0.19	1.0	0.21	0.24	25 or less	33 or less	47 or less	
		Pressure center	Metal seal	VQ1530	0.74	0.14	0.17	0.82	0.16	0.20	20 or less	26 or less	40 or less	
			Rubber seal	VQ1531	0.78	0.28	0.19	0.84	0.21	0.22	25 or less	33 or less	47 or less	



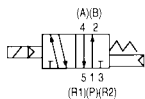
Note 1) Cylinder port size C6

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.

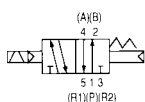


#### JIS Symbol

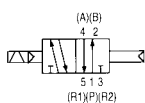
2 position single



2 position double (Latching)

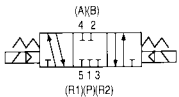


Metal seal

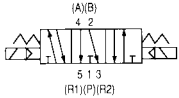


Rubber seal

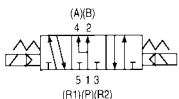
3 position closed center



3 position exhaust center



3 position pressure center



#### Standard Specifications

Valve specifications	Valve construction	Metal seal	Rubber seal	
	Fluid	Air/Inert gas	Air/Inert gas	
	Maximum operating pressure <sup>(3)</sup>	0.7 MPa (High pressure type: 0.8 MPa) <sup>(3)</sup>		
	Minimum operating pressure	Single	0.1 MPa	0.15 MPa
		Double (Latching)	0.1 MPa	0.15 MPa
		3 position	0.1 MPa	0.2 MPa
	Ambient and fluid temperature	-10 to 50°C <sup>(1)</sup>		
	Lubrication	Not required		
	Manual override	Push type/Locking type (Tool required, Manual) Option		
	Impact/Vibration resistance <sup>(2)</sup>	150/30 m/s <sup>2</sup>		
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) <sup>(3)</sup> , 0.5 W DC (21 mA) <sup>(4)</sup>	
		12 VDC	1 W DC (83 mA), 1.5 W DC (125 mA) <sup>(3)</sup> , 0.5 W DC (42 mA) <sup>(4)</sup>	
		100 VAC	Inrush 0.75 VA (7.5 mA), Holding 0.75 VA (7.5 mA)	
		110 VAC	Inrush 0.83 VA (7.5 mA), Holding 0.83 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.

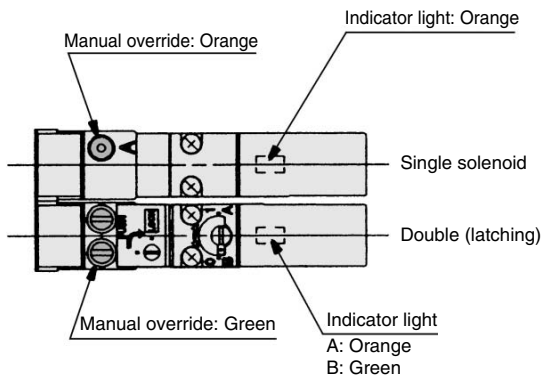
## ⚠ Precautions

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

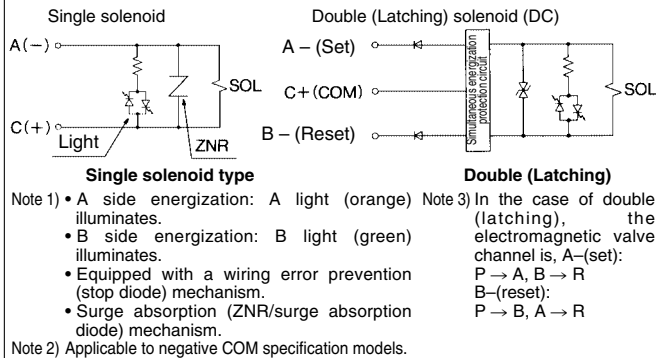
### Light/Surge Voltage Suppressor

#### ⚠ Caution

The lighting positions are concentrated on one side for both single solenoid 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 type circuit diagram



### Double (Latching solenoid) Type

#### ⚠ Caution

Different from the conventional double solenoid, the double 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.

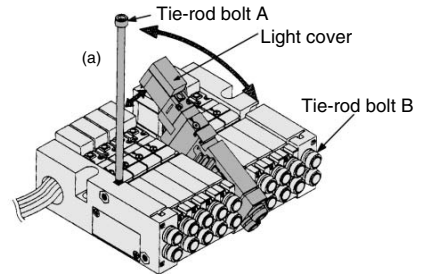
#### <Special Cautions for Latching Solenoid>

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. If the metal seal type goes down below the minimum operating pressure of supply air (0.1 MPa or less), the main valve will get back the home position (B side ON position). Therefore, in the event of shutting the supply air or applying the air with being A side ON position remained, cylinder may be pulsated. In the event of manipulating the supply air, the valve's switching position has to be set in the home position side (B side ON position side).

### How to Mount/Remove Solenoid Valve

#### ⚠ Caution

#### <Procedure>



#### How to remove

1. Loosen tie-rod bolt B. (Two to four turns)
2. After fully loosening the tie-rod bolt, take off bolt A upward as shown above.
3. Slide the valves aside to make a 1 mm clearance between the valve to be taken off and the others. As shown above, remove the whole valve while holding up the (a) side.

#### Mounting

Reverse the sequence of steps above to remount. Torque applied to tie-rod bolt should be 1.0 to 1.4 N·m. Tighten evenly.

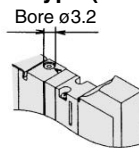
Note) Be careful not to push on the light cover while mounting/removing the valve.

### Manual Override

#### ⚠ Warning

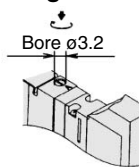
Without an electric signal for the solenoid valve the manual override is used for switching the main valve.

#### ■ Push type (Tool required)



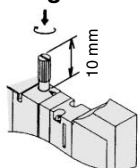
Push down on the manual override button with a small screwdriver until it stops. Release the screwdriver and the manual override will return.

#### ■ Locking slotted type



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

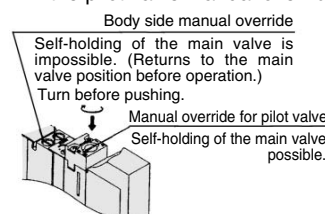
#### ■ Locking lever type (Option)



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



- 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)

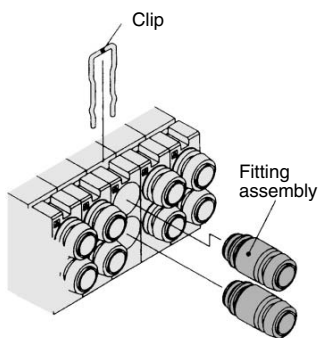
## Plug-in Unit: Flip Type Series VQ1000

### 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 top of the valve.

Remove the clip with a screwdriver to remove fittings. For replacement, insert the fitting assembly until it strikes against the inside wall and then re-insert the clip to the specified position.



Applicable tubing O.D.	Fitting assembly part no.
	<b>VQ1000</b>
Applicable tubing $\phi 3.2$	VVQ1000-50A-C3
Applicable tubing $\phi 4$	VVQ1000-50A-C4
Applicable tubing $\phi 6$	VVQ1000-50A-C6

Purchasing order is available in units of 10 pieces.

#### Caution

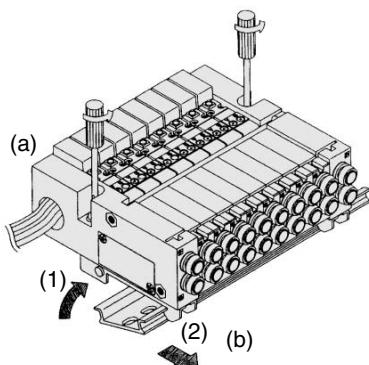
1. Use caution that O-rings must be free from scratches and dust. Otherwise, air leakage may result.
2. The tightening torque for inserting fittings to the M5 thread assembly should be 0.8 to 1.4 N·m.

### Mounting/Removing from the DIN Rail

#### ⚠ Caution

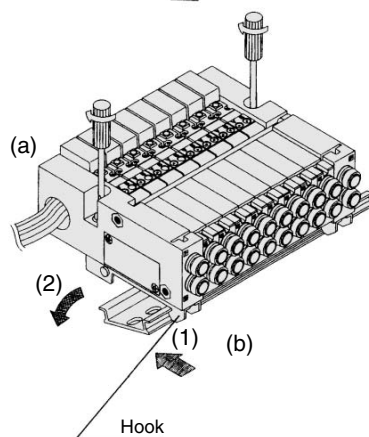
##### Removing

1. Loosen the clamp screw of the end plate on both sides.
2. Lift side (a) of the manifold base and side the end plate in the direction of (2) shown in the figure to remove.



##### Mounting

1. Hook side (b) of the manifold base on the DIN rail.
2. Press down side (a) and mount the end plate on the DIN rail. Tighten the clamp screw on side (a) of the end plate. The proper tightening torque for screws is 0.4 to 0.6 N·m.



### Built-in Silencer Replacement Element

#### ⚠ Caution

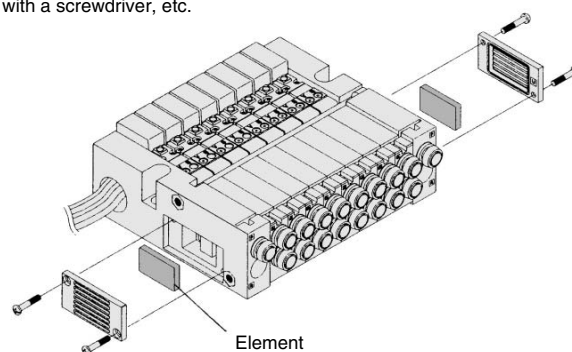
A silencer element is incorporated in the end plate on both sides of the base. A dirty and choked element may reduce cylinder speed or cause malfunction. Clean or replace the dirty element.

#### Element Part No.

Type	Element part no.
	<b>VQ1000</b>
Built-in silencer, direct exhaust (-S)	VVQ1000-82A-3

\* The minimum order quantity is 10 pcs.

Remove the cover from the side of the end plate and remove the old element with a screwdriver, etc.



VQC

SQ

VQ0

VQ4

VQ5

VQZ

VQD

### How to Calculate the Flow Rate

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

Option

Special Wiring Specifications

In the internal wiring of F kit, P kit, and JS 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.

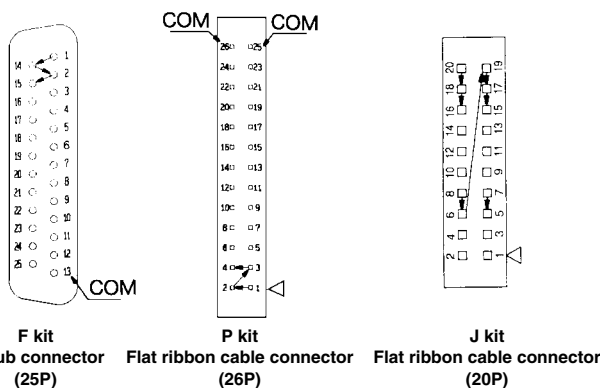
Example)

VV5Q13-09FS0-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.



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)				J kit (Flat ribbon cable connector)	S kit (Serial)
Type	F <sub>S</sub> □ 25P	F <sub>S</sub> A 15P	P <sub>S</sub> □ 26P	P <sub>S</sub> C 20P	P <sub>S</sub> B 16P	P <sub>S</sub> A 10P	J <sub>S</sub> □ 20P	S □
Max. points	24 (16 stations)	14	24 (16 stations)	18 (16 stations)	14	8	16	16

Negative Common Specifications

Specify the valve model no. as shown below for negative COM specification. The manifold no. shown below is for the L kits. For other kits the standard manifold can be used. Please contact for negative COM S kit.

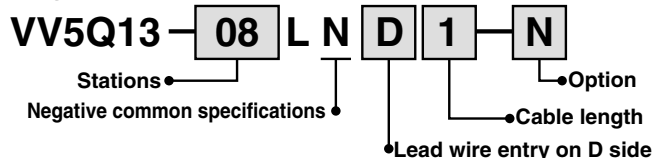
How to order negative COM valves

VQ1130 N-5-C6

Negative common specifications

How to order negative COM manifold

L kit:



Inch-size One-touch Fittings

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

How to order manifold

VV5Q13-08FSO-DN-00T

1(P), 3(R) port size: ø1/4"

How to order valves

VQ1130-5-N7

Cylinder ports

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

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 DIN rail is unnecessary (Except S kit)

(DIN rail mounting brackets only are attached.)

Indicate the option symbol, -DO, for the manifold no.

Example)

VV5Q13-08LD1-DOS

Others, option symbols: to be indicated alphabetically.

● 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)

VV5Q13-08FS1-D09S

DIN rail for 9 stations

Others, option symbols: to be indicated alphabetically.

● When changing the manifold style into a DIN rail mount

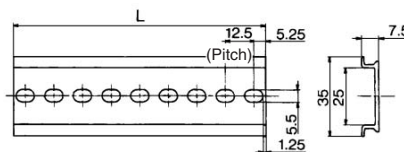
Order brackets for mounting a DIN rail. (Refer to "Option" on page 2-4-24.)

No. VVQ1000-57A-3 2 pcs. per one

● When ordering DIN rail only

DIN rail no.: AXT100-DR-n

\* Refer to the DIN rail dimension table for determining the length.



L Dimension

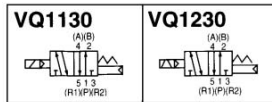
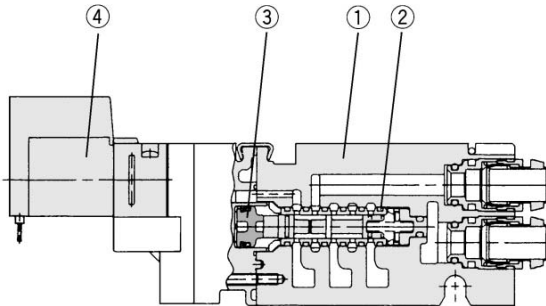
L = 12.5 x n + 10.5

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

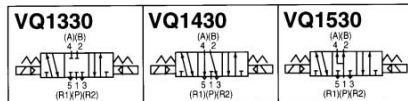
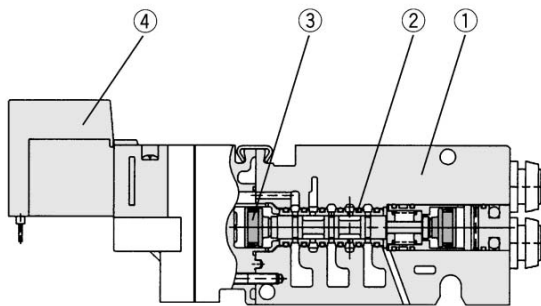
# Series VQ Construction Main Parts, Replacement Parts

## Construction: VQ1000/Plug-in Unit, Flip Type

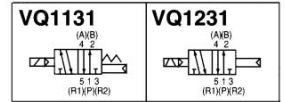
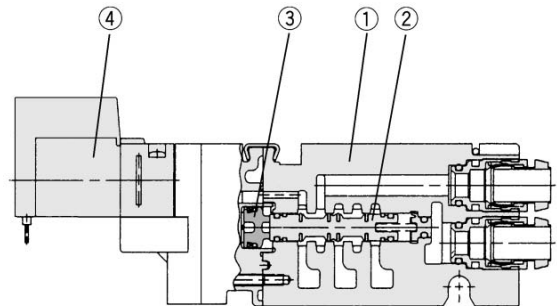
### Metal seal Single/Double (Latching)



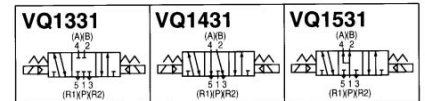
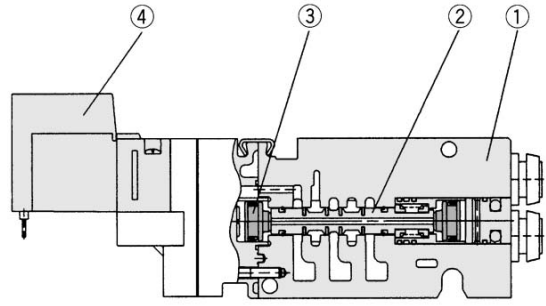
### 3 position



### Rubber seal Single/Double (Latching)



### 3 position



### Component Parts

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

#### ④ Pilot valve assembly

Single/3 position	VQ111 <sup>(H)</sup> / <sub>(Y)</sub> -□F Voltage ↓ 1 to 6	
Double (Latching)	VQ110L-□F Voltage ↓ 1 to 6	

Note (H): 1.5 W, (Y): 0.5 W

### Component Parts

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

#### ④ Pilot valve assembly

Single/3 position	VQ111 <sup>(H)</sup> / <sub>(Y)</sub> -□F Voltage ↓ 1 to 6	
Double (Latching)	VQ110L-□F Voltage ↓ 1 to 6	

Note (H): 1.5 W, (Y): 0.5 W