

# Series VQ2000

## Body Ported

# Plug Lead Unit: Flip Type

### How to Order Manifold

**Series** 2 VQ2000

**Manifold** 4 Plug lead unit/Flip

**Stations** 01 1 station

**Option**

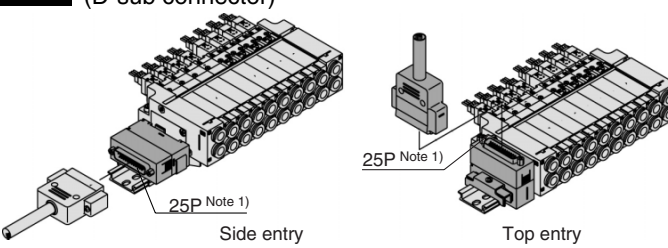
Nil	None (C kit only)
D <sup>(2)</sup>	DIN rail mounting style
K <sup>(3)</sup>	Special wiring specifications (Except double wiring)
N	With name plate
S <sup>(4)</sup>	Built-in silencer, direct exhaust

Note 1) When two or more symbols are specified, indicate them alphabetically. Example) -DNS  
 Note 2) F, P, T, and S kits are of DIN rail include suffix -D  
 Note 3) Specify the wiring specifications in the manifold specification sheet. (Except C kit)  
 Note 4) F, P, T and S kits are provided with an exhaust on one side, while C kits are with an exhaust on both sides.

The number of max. stations differs from kit to kit. (Refer to the table below.)

### Kit/Electrical entry/Cable length

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

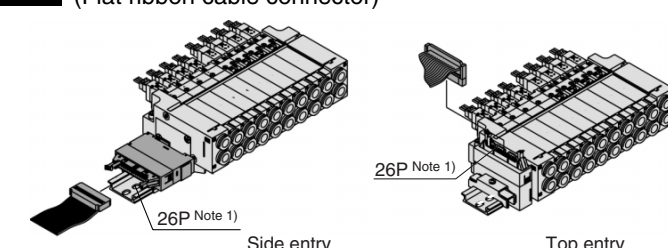


25P Note 1

Connector entry direction	
Top entry	Side entry
U0	S0
U1	S1
U2	S2
U3	S3

P. 2-4-38

**P** kit (Flat ribbon cable connector)

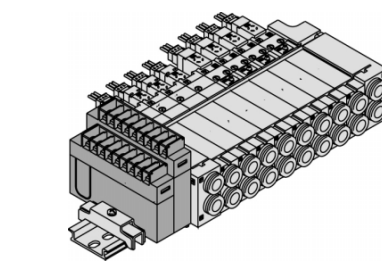


26P Note 1

Connector entry direction	
Top entry	Side entry
U0	S0
U1	S1
U2	S2
U3	S3

P. 2-4-42

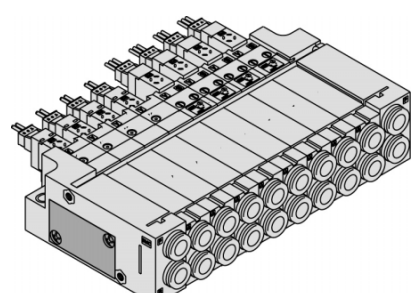
**T** kit (Terminal block)



P. 2-4-46

Kit T 1	No. of terminals: 8, 1 row	Applicable stations 1 to 8
Kit T 2	No. of terminals: 16, 2 rows	Applicable stations 5 to 16

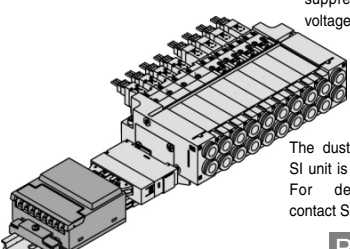
**C** kit (Connector)



P. 2-4-50

Kit C	Connector kit	Max. 16
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**S** kit (Serial transmission unit)



P. 2-4-54

Without SI unit	
Kit S <sup>(3)</sup> A	With general type SI unit (Series EX300)
Kit S <sup>(3)</sup> B	Mitsubishi Electric Corp.: MELSECNET/mini-S3 Data Link System
Kit S <sup>(3)</sup> C	OMRON Corp.: SYSBUS Wire System
Kit S <sup>(3)</sup> D	SHARP Corp.: Satellite I/O Link System
Kit S <sup>(3)</sup> F1	NKE Corp.: Uni-wire System (16 output points)
Kit S <sup>(3)</sup> H	NKE Corp.: Uni-wire H System

Max. 16 stations<sup>(2)</sup>

Note 1) Besides the above, F and P kits with different number of pins are available. For details, refer to page 2-4-68.  
 Note 2) See page 2-4-69 for details.  
 Note 3) Please consult with SMC for the following serial transmission kits: Matsushita Electric Works, Ltd.; Rockwell Automation, Inc.; SUNX Corporation; Fuji Electric Co., Ltd.; OMRON Corporation.

### How to Order Valves

**VQ 2 1 4 0 Y 5 L C6**

**Series**  
2 VQ2000

**Type of actuation**  
1 2 position single  
2 2 position double (latching)

**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

**Electrical entry**  
G: Grommet C kit single only. (Except AC)  
L: L plug connector With lead wire  
LO: L plug connector Without connector  
M: M plug connector With lead wire  
MO: M plug connector Without connector

**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) ○	—

Note) The C kits is applicable to 200/220 VAC.  
Note 1) For power consumption of AC type, refer to page 2-4-36.  
Note 2) Except double (latching).

**Seal**  
0 Metal seal  
1 Rubber seal

**Cylinder port**  
Symbol Port size  
C4 With One-touch fitting for ø4  
C6 With One-touch fitting for ø6  
C8 With One-touch fitting for ø8

Note) For inch-size One-touch fittings, refer to "Option" on page 2-4-69.

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

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

Note) LO and MO valves are used for F, P, T, and S kits. The plug connector and lead wire are attached to the manifold.

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

### Manifold Option

P. 2-4-59

**Blanking plate assembly VVQ2000-10A-4**

**Name plate [-N4] VVQ2000-N4-Station (1 to Max. stations)**

**Silencer (For EXH port) AN200-KM8**

**Blanking plug KQ2P-06**

**Individual SUP spacer VVQ2000-P-4-C8**

**DIN rail mounting bracket VVQ2000-57A-4**

**Block valve VQ2 1/4 1 - □ - □ - □ - PR**

**Blocking indication label**

**Individual EXH spacer VVQ2000-R-4-C8**

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

**Port plug VVQ1000-58A**

**Double check block VVQ2000-FPG-□□**

### How to Order Manifold Assembly

**Example**

Single solenoid (24 VDC)  
VQ2140-5LO-C8 (4 sets)

Double solenoid (24 VDC)  
VQ2240-5LOB-C8 (4 sets)

U side Stations

D side 1 2 3

3 m

D-sub connector cable  
AXT100 -DS25-030

Individual EXH spacer port size C8: One-touch fitting for ø8

F kit (D-sub connector)  
Manifold base (8 stations)  
VV5Q24-08FU2-D

VV5Q24-08FU2-D ... 1 set (F kit 8 station manifold base no.)  
\*VQ2140-5LO-C6 ... 4 sets (Single solenoid part no.)  
\*VQ2240-5LOB-C6 ... 4 sets (Double solenoid part no.)

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

Please indicate manifold base type, corresponding valve, and option parts. When entry of part numbers becomes complicated, indicate on the manifold specification sheet.

For replacement parts, refer to page 2-4-109.

## Plug Lead Unit: Flip Type Series VQ0000/1000/2000

### Manifold Specifications

Series	Base model	Type of connection	Porting specifications		Applicable stations <sup>(2)</sup>	Applicable solenoid valve	5 station weight (g)	
			Port location	Port size <sup>(1)</sup>				
				1(P), 3(R)				4(A), 2(B)
VQ0000	VV5Q04-□□□	<ul style="list-style-type: none"> <li>■ F kit-D-sub connector</li> <li>■ P kit-Flat cable connector</li> <li>■ T kit-Terminal block</li> <li>■ C kit-Individual connector</li> <li>■ S kit-Serial transmission unit</li> </ul>	Side	C6 (ø6) Option Built-in silencer, direct exhaust	C3 (ø3.2) C4 (ø4) M5 (M5 thread)	1 to 16 stations	VQ0□40 VQ0□41	225
VQ1000	VV5Q14-□□□	<ul style="list-style-type: none"> <li>■ F kit-D-sub connector</li> <li>■ P kit-Flat cable connector</li> <li>■ T kit-Terminal block</li> <li>■ C kit-Individual connector</li> <li>■ S kit-Serial transmission unit</li> </ul>	Side	C6 (ø6) Option Built-in silencer, direct exhaust	C3 (ø3.2) C4 (ø4) C6 (ø6) M5 (M5 thread)		VQ1□40 VQ1□41	380
VQ2000	VV5Q24-□□□	<ul style="list-style-type: none"> <li>■ F kit-D-sub connector</li> <li>■ P kit-Flat cable connector</li> <li>■ T kit-Terminal block</li> <li>■ C kit-Individual connector</li> <li>■ S kit-Serial transmission unit</li> </ul>	Side	C8 (ø8) Option Built-in silencer, direct exhaust	C4 (ø4) C6 (ø6) C8 (ø8)		VQ2□40 VQ2□41	671



Note 1) Inch-size One-touch fittings are also available. For details, refer to page 2-4-69.

Note 2) See page 2-4-69 for details.

VQC

SQ

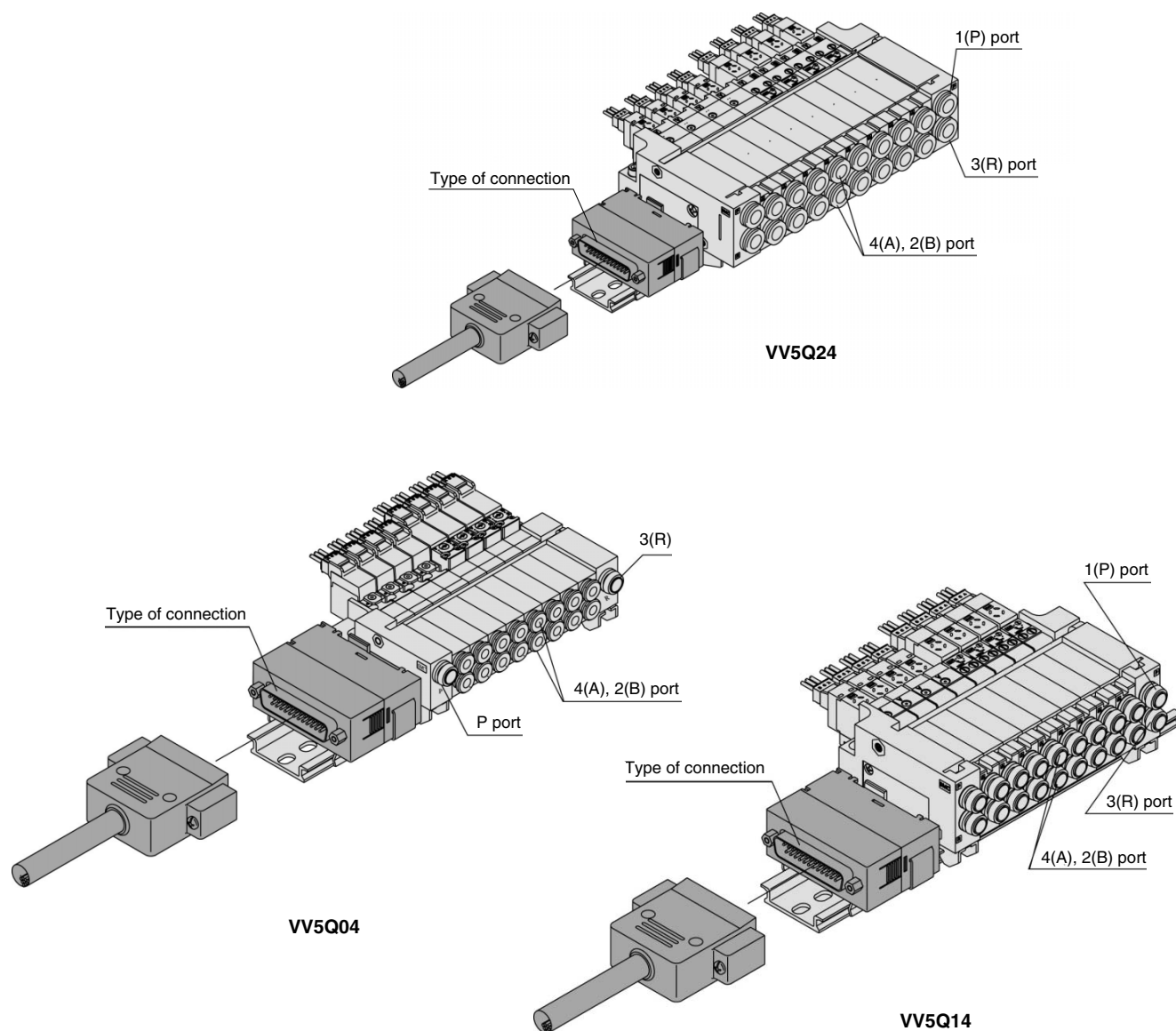
VQ0

VQ4

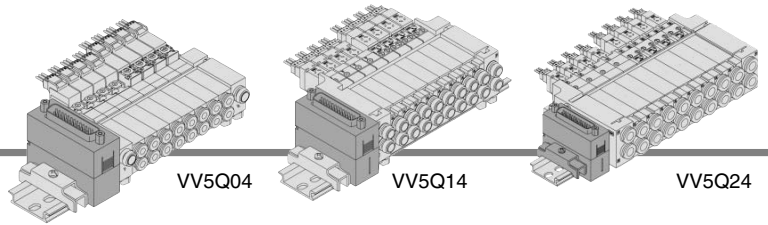
VQ5

VQZ

VQD



# F VQ000/1000/2000 Kit (D-sub connector)



- The D-sub connector reduces installation labor for electrical connections.
- Using the D-sub connector (25P), (15P as an option) conforming to MIL standard permits the use of connectors put on the market and gives a wide interchangeability.
- Top or side receptacle position can be selected in accordance with the available mounting space.
- Maximum stations are 16.

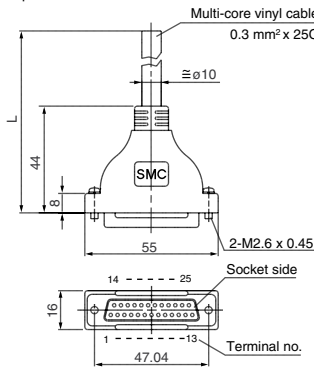
## Manifold Specifications VV5Q14

Series	Porting specifications		Applicable stations
	Port location	Port size	
VQ0000	Side	C6, C3, C4, M5	Max. 16 stations
VQ1000	Side	C6, C3, C4, C6, M5	Max. 16 stations
VQ2000	Side	C8, C4, C6, C8	Max. 16 stations

## D-sub Connector (25 pins)

**AXT100-DS25-015**  
**030**  
**050**

(The D-sub connector cable assembly can be ordered individually or included in a specific manifold model no. Refer to How to Order Manifold.)



### D-sub Connector Cable Assembly (Option)

Cable length (L)	Assembly part no.	Note
1.5 m	AXT100-DS25-015	Cable 25 core x 24AWG
3 m	AXT100-DS25-030	
5 m	AXT100-DS25-050	

\* For other commercial connectors, use a 25 pins type with female connector conforming to MIL-C-24308.

### Connector manufacturers' example

- Fujitsu Limited
- Japan Aviation Electronics Industry, Ltd.
- J.S.T. Mfg. Co., Ltd.

### Electric Characteristics

Item	Characteristics
Conductor resistance Ω/km, 20°C	65 or less
Insulation resistance V, 1 min, AC	1000
Insulation resistance MΩ/km, 20°C	5 or more

Note) The minimum bending radius of D-sub cable assembly is 20 mm.

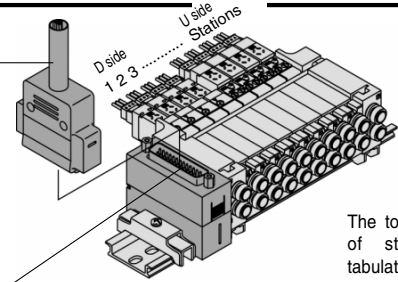


Note) Types with 15 pin are also available. For details, refer to page 2-4-68.

### Wire Color by Terminal No. of D-sub Connector Cable Assembly

Terminal no.	Lead wire color	Dot marking
1	Black	None
2	Brown	None
3	Red	None
4	Orange	None
5	Yellow	None
6	Pink	None
7	Blue	None
8	Purple	White
9	Gray	Black
10	White	Black
11	White	Red
12	Yellow	Red
13	Orange	Red
14	Yellow	Black
15	Pink	Black
16	Blue	White
17	Purple	None
18	Gray	None
19	Orange	Black
20	Red	White
21	Brown	White
22	Pink	Red
23	Gray	Red
24	Black	White
25	White	None

### Cable assembly



The total number of stations is tabulated starting from station one

### Electrical wiring specifications on the D side.

D-sub assembly 015  
 AXT100-DS25-030  
 050  
 Wire color

D-sub connector	Terminal no.	Polarity	Lead wire color	Dot marking	
1 station	SOLA_1	(-)	Black	None	
	SOLB_14	(-)	(+)	Yellow	Black
2 stations	SOLA_2	(-)	(+)	Brown	None
	SOLB_15	(-)	(+)	Pink	Black
3 stations	SOLA_3	(-)	(+)	Red	None
	SOLB_16	(-)	(+)	Blue	White
4 stations	SOLA_4	(-)	(+)	Orange	None
	SOLB_17	(-)	(+)	Purple	None
5 stations	SOLA_5	(-)	(+)	Yellow	None
	SOLB_18	(-)	(+)	Gray	None
6 stations	SOLA_6	(-)	(+)	Pink	None
	SOLB_19	(-)	(+)	Orange	Black
7 stations	SOLA_7	(-)	(+)	Blue	None
	SOLB_20	(-)	(+)	Red	White
8 stations	SOLA_5	(-)	(+)	Purple	White
	SOLB_21	(-)	(+)	Brown	White
	COM_13	(+)	(-)	Orange	Red

Positive common Negative common (NSD) specifications specifications

Connector terminal no.

As the standard electrical wiring specifications, double wiring (connected to SOL. A and SOL. B) is adopted for the internal wiring of each station for 8 stations or less, regardless of valve and option types. Mixed single and double wiring is available as an option. For details, refer to page 2-4-69. Note) When using the negative common specifications, use valves for negative common. (Refer to page 2-4-69.)

## How to Order Manifold

**VV5Q 1 4 - 08 F S 1 - D**

Series	Manifold	Stations	Cable (Length)	Connector entry direction	Option
0 VQ0000	4 Plug lead unit/Flip	01 1 station : : 16 16 stations	0 Without cable 1 With cable (1.5 m) 2 With cable (3 m) 3 With cable (5 m)	U Top entry S Side entry	D (2) DIN rail mounting style K (3) Special wiring specifications (Except double wiring) N With name plate S Built-in silencer, direct exhaust (U side only)

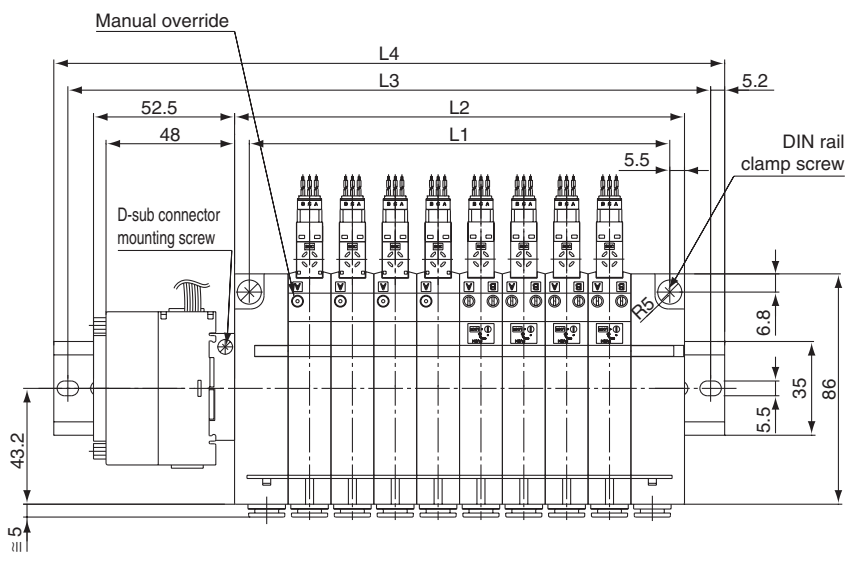
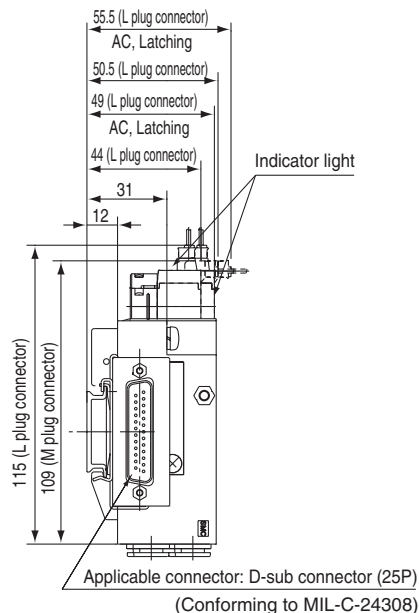
Note) For details, refer to page 2-4-69.

Note 1) When two or more symbols are specified, indicate them alphabetically. Example) -DNS  
 Note 2) F kits are DIN rail mounting styles, include suffix -D.  
 Note 3) Specify the wiring specifications on the manifold specification sheet.

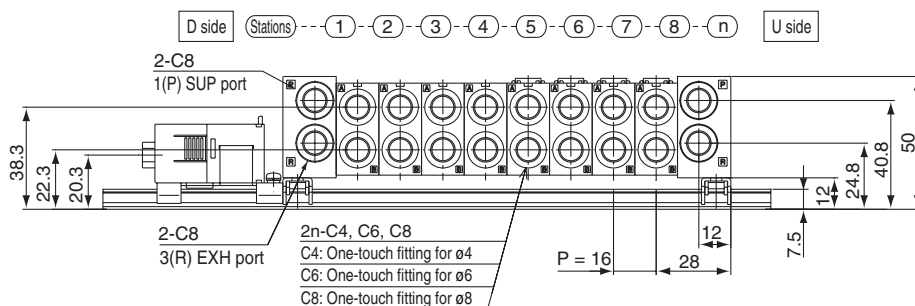
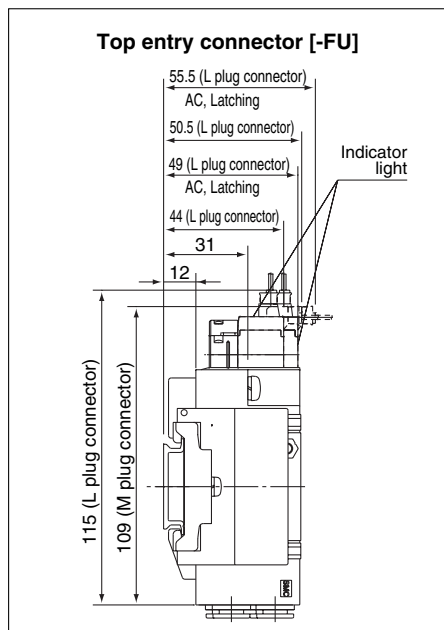


# Plug Lead Unit: Flip Type Series VQ0000/1000/2000

## VQ2000



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



### Dimensions: Side Entry Connector [-FS]

Formula  $L1 = 16n + 29$ ,  $L2 = 16n + 40$  n: Stations (Maximum 16 stations)

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	45	61	77	93	109	125	141	157	173	189	205	221	237	253	269	285
L2	56	72	88	104	120	136	152	168	184	200	216	232	248	264	280	296
L3	137.5	150	162.5	187.5	200	212.5	225	250	262.5	275	300	312.5	325	337.5	362.5	375
L4	148	160.5	173	198	210.5	223	235.5	260.5	273	285.5	310.5	323	335.5	348	373	385.5

### Dimensions: Top Entry Connector [-FU]

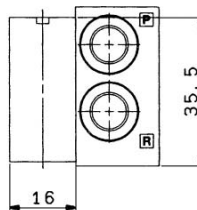
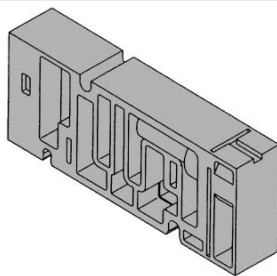
n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L3	112.5	137.5	150	162.5	175	200	212.5	225	237.5	262.5	275	287.5	312.5	325	337.5	350
L4	123	148	160.5	173	185.5	210.5	223	235.5	248	273	285.5	298	323	335.5	348	360.5

# Plug Lead Unit: Flip Type Series VQ0000/1000/2000

## Manifold Option Parts for VQ2000

### Blanking plate assembly VVQ2000-10A-4

It is used when a blanking plate is mounted to a manifold in advance for possible valve mounting, etc.

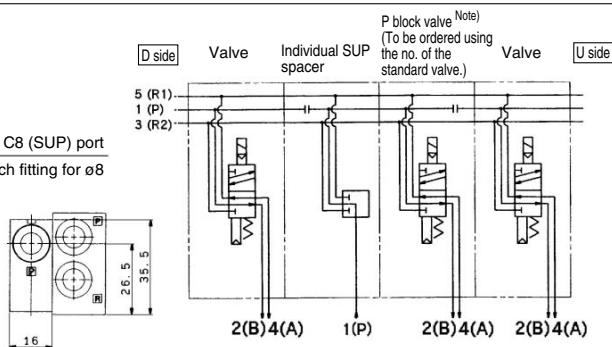
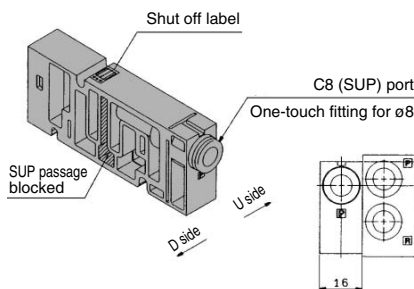


### Individual SUP spacer VVQ2000-P-4-C8

When the same manifold is to be used for different pressures, individual SUP spacers are used as SUP ports for different pressures. (One station space is occupied.)

Since the SUP passage on the spacer's D side is blocked in advance, it is mounted on the D side of the valves U side. (Refer to the application example.)

\* Specify the spacer mounting position and SUP block plate mounting position on the manifold specification sheet.



Note) P block valve is mounted in the blocking position when ordering an individual SUP spacer incorporated with a manifold. When separately ordering an individual SUP spacer, separately order a P block valve.

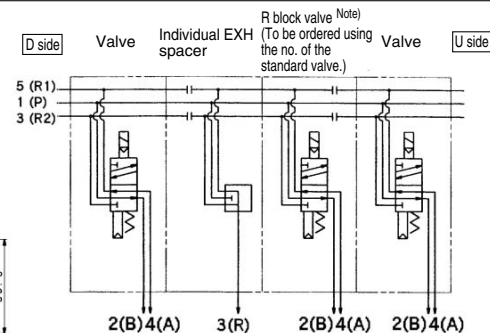
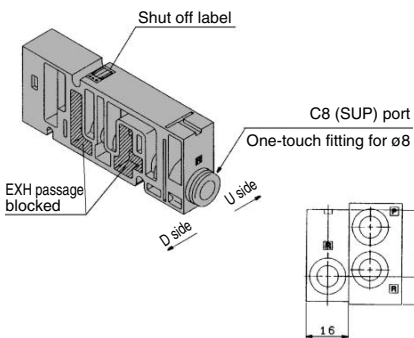
### Individual EXH spacer VVQ2000-R-4-C8

When valve exhaust affects other stations due to the circuit configuration, this spacer is used for individual valve exhaust. (1 station space is occupied.)

Since the EXH passage on the spacer's D side is blocked in advance, it is mounted on the D side of the valve for individual supply while blocking the valves U side. (Refer to the application example.)

\* Specify the spacer mounting position and EXH block plate mounting position on the manifold specification sheet.

\* When the electrical entry is F, P, T, S kit, and if you choose the option with built-in silencer, no exhaust port will be supplied on the D side end plate. In this case, mount a spacer for individual EXH on the 1st station.



Note) R block valve is mounted in the blocking position when ordering an individual EXH spacer incorporated with a manifold. When separately ordering an individual EXH spacer, separately order a R block valve.

### P Block valve VQ2 1/4" - □ - □ - □ - P

For a flip plug-in unit, block plate is built in the valve for blocking SUP and EXH passages. Since the valve is classified by the passage to be blocked, specify it by attaching the option no. to the valve no. The block valve is constructed so that U sides of SUP and EXH passages are blocked.

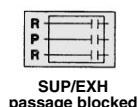
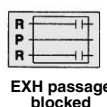
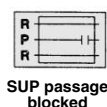
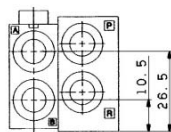
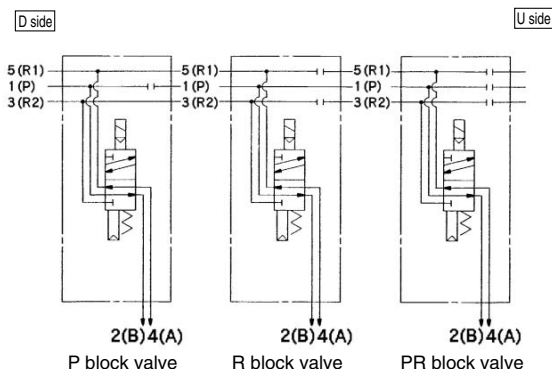
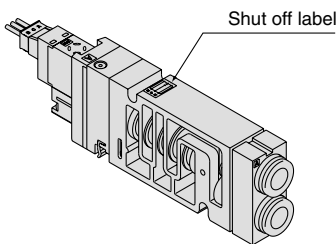
\* Specify the number of stations on the manifold specification sheet.

#### <Shut off label>

When using block plates for SUP, EXH passage, indication label for confirmation of the blocking position from outside is attached. (One label for each)

\* When ordering a block plate incorporated with the manifold no., a block indication label is attached to the manifold.

\* Caution on handling P/RP block valve  
When the electrical entry is F, P, T, S kit, and if you choose the option with built-in silencer, no exhaust port will be supplied on the D side end plate. In this case, mount a spacer for individual EXH on the 1st station.



For SUP passage block	VQ2 1/4" - □ - □ - □ - P
For EXH passage block	VQ2 1/4" - □ - □ - □ - R
For SUP/EXH passage block	VQ2 1/4" - □ - □ - □ - PR

VQC

SQ

VQ0

VQ4

VQ5

VQZ

VQD

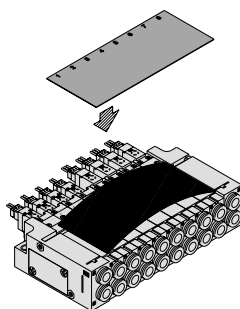
# Series VQ0000/1000/2000

## Manifold Option Parts for VQ2000

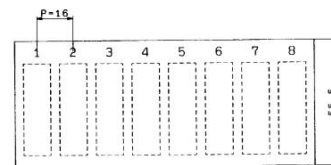
### Name plate [-N4]

#### VVQ2000-N4-Station (1 to Max. stations)

It is a transparent resin plate for placing a label that indicates solenoid valve function, etc. Insert it into the groove on the side of the end plate and bend it as shown in the figure.



\* When ordering assemblies incorporated with a manifold, add suffix N to the manifold no.

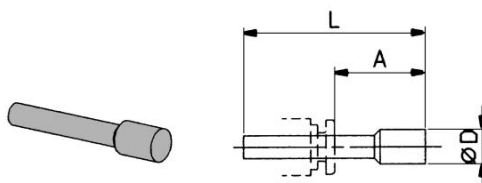


### Blanking plug

#### KQ2P-<sup>04</sup><sub>06</sub><sub>08</sub>

It is inserted into an unused cylinder port and SUP/EXH ports.

Purchasing order is available in units of 10 pieces.



#### Dimensions

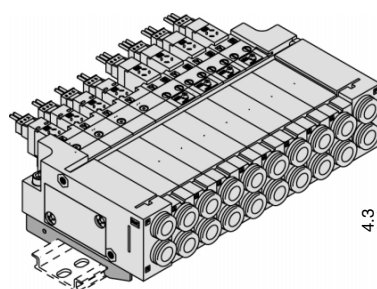
Applicable fittings size $\phi$ d	Model	A	L	D
4	KQ2P-04	16	32	6
6	KQ2P-06	18	35	8
8	KQ2P-08	20.5	39	10

### DIN rail mounting bracket

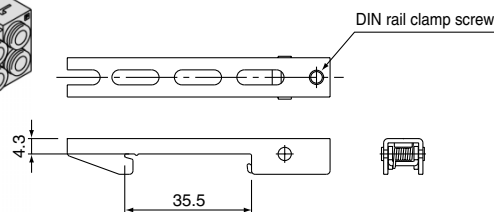
#### VVQ2000-57A-4

It is used for mounting a manifold on a DIN rail. The DIN rail mounting bracket is fixed to the manifold end plate. (The specification is the same as that for the option -D.)

1 set of DIN rail mounting bracket is used for 1 manifold (2 DIN rail mounting brackets).



\* When ordering assemblies incorporated with a manifold, add suffix -D to the manifold no.



### Built-in silencer, Direct exhaust [-S]

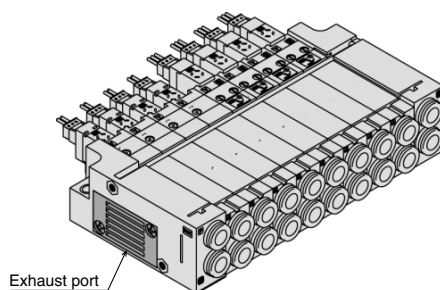
This is type with an exhaust port atop the manifold endplate. The built-in silencer exhibits an excellent noise suppression effect.

F, P, T and S kits are provided with exhaust on one side.

Note) A large quantity of drainage generated in the air source results in exhaust of air together with drainage.



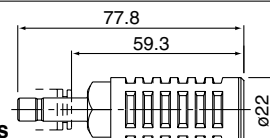
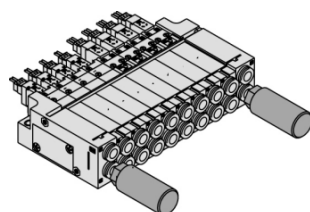
• For maintenance, refer to page 2-4-67.



\* When ordering assemblies incorporated with a manifold, add suffix -S to the manifold no.

### Silencer (For EXH port)

This silencer is to be inserted into the EXH port (One-touch fittings) of the common exhaust.



#### Dimensions

Series	Applicable fittings size $\phi$ d	Model	A	L	D	Effective area (mm <sup>2</sup> )	Noise reduction (dB)
VQ2000	8	AN200-KM8	59.3	77.8	22	20	30

### Port plug

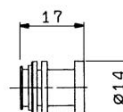
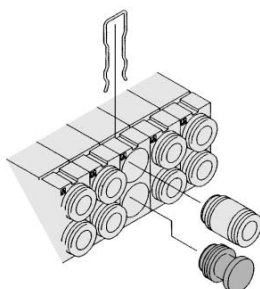
#### VVQ1000-58A

The plug is used to block the cylinder port when using a 4 port valve as a 3 port valve.

When ordering it incorporated with a manifold, suffix A or B, the symbol of the plug port, to the valve no.

Example) VQ2140-5L-C8-A

→A port, Plug



# Plug Lead Unit: Flip Type Series VQ0000/1000/2000

## Manifold Option

### Double check block (Separated type)

VQ2000-FPG-□□-□

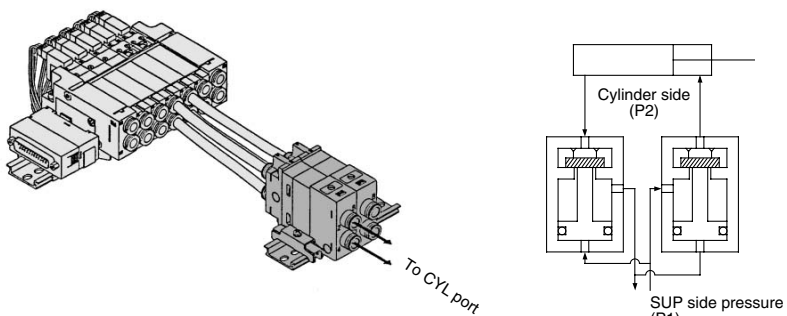
It is used on the outlet side piping. Combining the double check block with built-in pilot double check valve and a two-position single/double solenoid valve will prevent the dropping at the cylinder stroke end when the SUP residual pressure is released.

### Specifications

Maximum operating pressure	0.8 MPa
Ambient and fluid temperature	0.15 MPa
Ambient and fluid temp.	-5 to 50° C
Flow characteristics: C	3.0 dm <sup>3</sup> /(s·bar)
Max. operating frequency	180 c.p.m

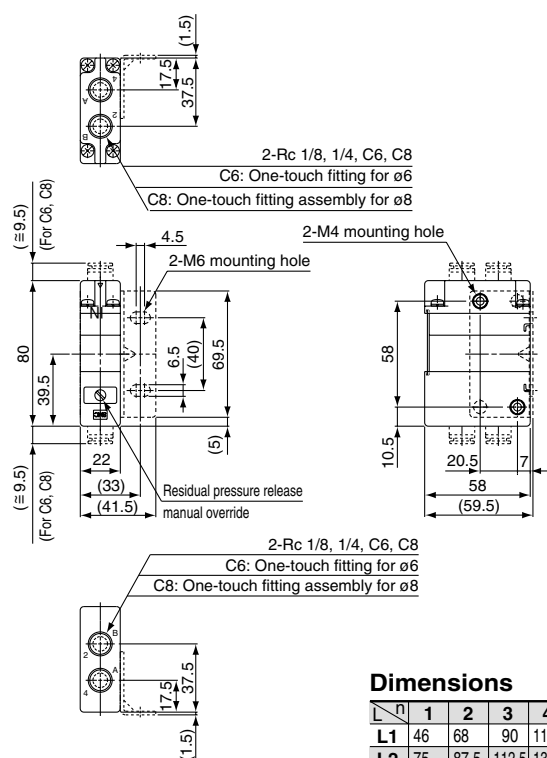
Note) Based on JIS B 8375-1981 (Supply pressure: 0.5 MPa)

### <Check valve operation principle>

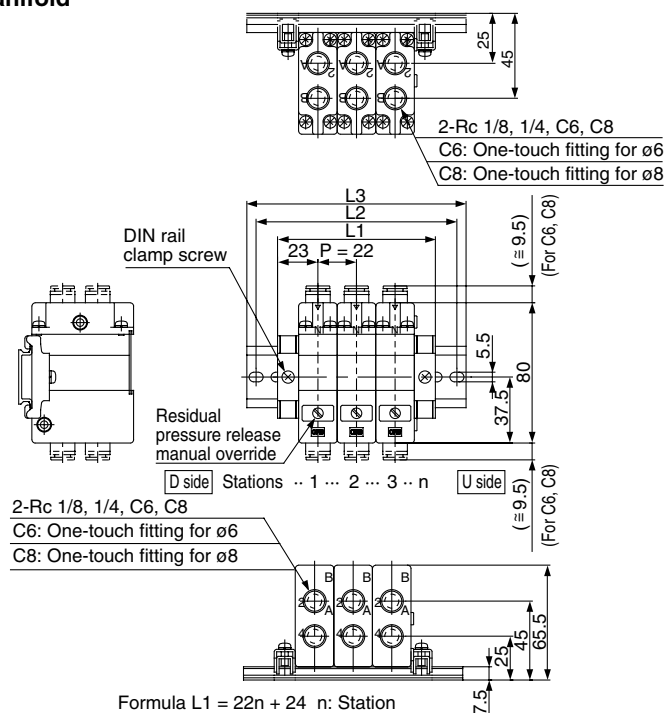


## Dimensions

### Single unit



### Manifold



### Dimensions

L	n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1		46	68	90	112	134	156	178	200	222	244	266	288	310	332	354	376
L2		75	87.5	112.5	137.5	162.5	175	200	225	250	262.5	287.5	312.5	337.5	362.5	375	400
L3		85.5	98	123	148	173	185.5	210.5	235.5	260.5	273	298	323	348	373	385.5	410.5

## How to Order

### Double check block

VQ2000-FPG-01 01 F

#### IN side port size

01	Rc 1/8
02	Rc 1/4
C6	One-touch fitting for ø6
C8	One-touch fitting for ø6

#### OUT side port size

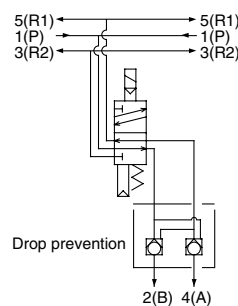
01	Rc 1/8
02	Rc 1/4
C6	One-touch fitting for ø6
C8	One-touch fitting for ø6

### Option

Nil	None
D	DIN rail mounting style (For manifold)
F	With bracket
N	Name plate

Note) When two or more symbols are specified, indicate them alphabetically. Example) -DN

### <Example>



## Manifold

VVQ2000-FPG-06

### Stations

01	1 station
⋮	⋮
16	16 stations

### <Ordering Example>

VVQ2000-FPG-06...6 stations manifold  
\*VQ2000-FPG-C6C6-D: 3 sets } Double check block  
\*VQ2000-FPG-C8C8-D: 3 sets }

## Caution

- Air leakage from the pipe between the valve and cylinder or from the fittings will prevent the cylinder from stopping for a long time. Check the leakage using neutral household detergent, such as dish washing soap. Also check the cylinder's tube gasket, piston packing and rod packing for air leakage.
- Since One-touch fittings allow slight air leakage, screw piping (with M5 thread) is recommended when stopping the cylinder in the middle for a long time.
- When screwing the fittings in the double check block, proper tightening torque is as shown below:
- If the exhaust of the double check block is throttled too much, the cylinder may not operate properly and may not stop intermediately.
- Set the cylinder load so that the cylinder pressure will be within two times that of the supply pressure.

Connection threads	Proper tightening torque (N·m)
Rc 1/8	7 to 9
Rc 1/4	12 to 14



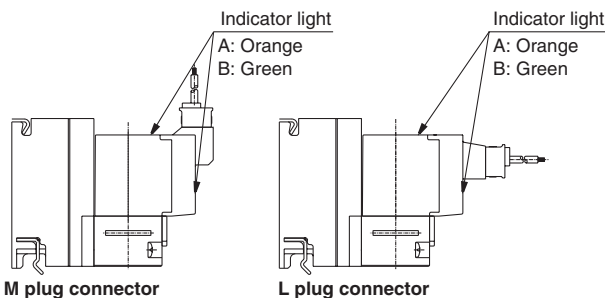
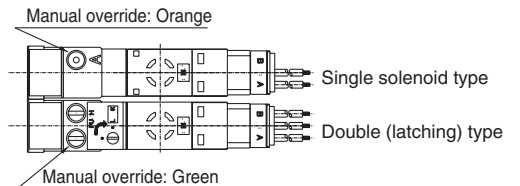
## ⚠ Precautions

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

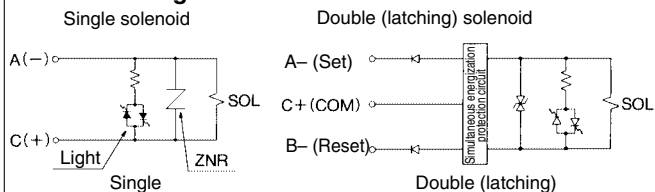
### Light/Surge Voltage Suppressor

#### ⚠ 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 circuit diagram



Note 1) • A-side energization: A light (orange) illuminates. Note 3) In the case of double  
• B-side energization: B light (green) illuminates. (latching), the electromagnetic  
• Equipped with a wiring error prevention (stop valve channel is, A-(set):  
diode) mechanism and a surge absorption (ZNR/surge absorption diode) mechanism. P → A, B → R,  
B-(reset):  
P → B, A → R.

Note 2) Applicable to negative COM specification models.

### 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.

#### <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.
5. After manual operation, the main valve will return to its original position. 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).

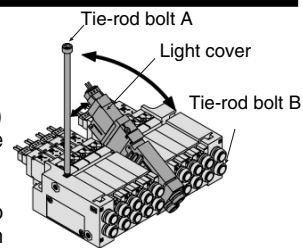
### How to Mount/Remove Solenoid Valve

#### ⚠ 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. (Avoid rough handling of the connector.)



##### Mounting

Reverse the sequence of steps above to remount.

Tighten the tie-rod bolts with the tightening torque at the right table while using caution not to tighten the only one side unevenly.

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

#### Torque Applied to Tie-rod Bolt

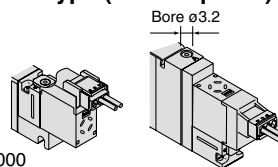
Model	Torque
VQ0000	0.5 to 0.7 N·m
VQ1000	1.0 to 1.4 N·m
VQ2000	1.0 to 1.4 N·m

### Double (Latching solenoid) Type

#### ⚠ Warning

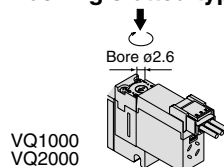
Without an electric signal for the solenoid valve the manual override is used for switching the main valve.

##### ■ Push type (Tool required)

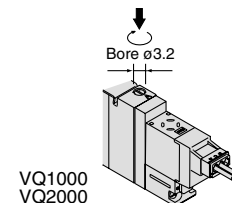


Push down on the manual override button with a small screwdriver until it stops. Release the screwdriver and the manual override will return.

##### ■ Locking slotted type

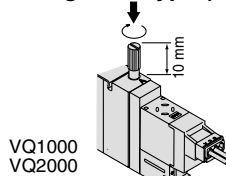


If the manual override is turned by 180° clockwise and the ► mark is adjusted to 1, then pushed in the direction of an arrow (↓), it will be locked in the ON state. If the manual override is turned by 180° counterclockwise and ► mark is adjusted to 0, locking will be released and the manual override will return.



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.

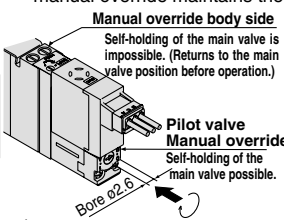
##### ■ Locking lever type (Option)



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. (VQ0000: Pilot valve only). 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)

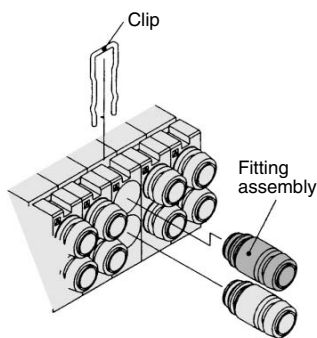
# Plug Lead Unit: Flip Type Series VQ0000/1000/2000

## Replacement of Cylinder Port Fittings

### ⚠ Caution

The cylinder port fittings are a cassette for easy replacement. (Except VQ1000)

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.	
	VQ1000	VQ2000
Applicable tubing ø3.2	VVQ1000-50A-C3	—
Applicable tubing ø4	VVQ1000-50A-C4	VVQ1000-51A-C4
Applicable tubing ø6	VVQ1000-50A-C6	VVQ1000-51A-C6
Applicable tubing ø8	—	VVQ1000-51A-C8

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 assembly should be 0.8 to 1.4 N·m

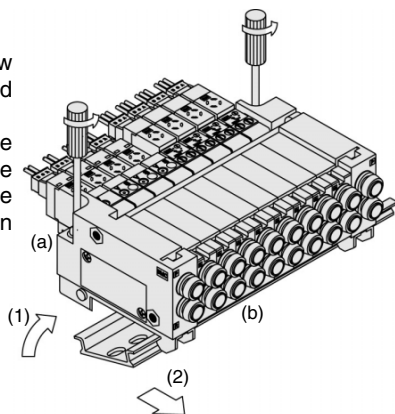
## Mounting/Removing from the DIN Rail

### ⚠ Caution

<Procedure>

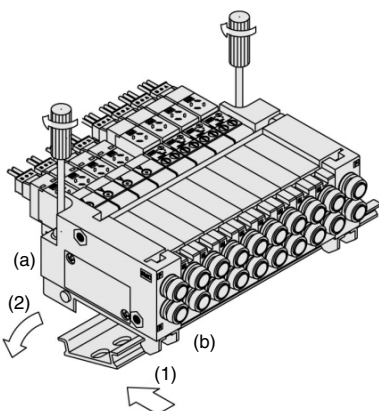
#### How to Remove

1. Loosen the clamp screw on side (a) of the end plate on both sides.
2. Lift side (a) of the manifold base and slide 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.



## How to Calculate the Flow Rate

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

## Built-in Silencer Replacement Element

### ⚠ Caution

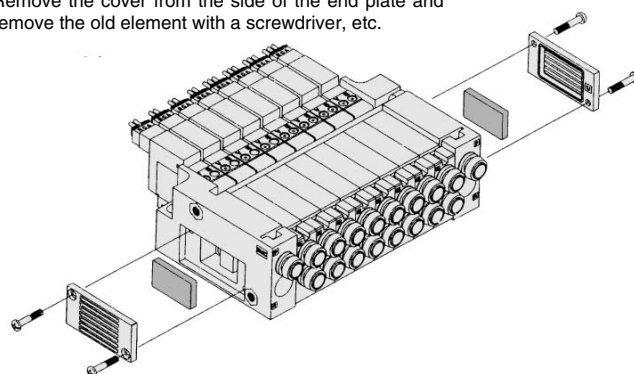
A silencer element is incorporated in the end plate on both sides of the manifold base. A dirty and choked element may reduce cylinder speed or cause malfunction. Clean or replace the dirty element.

#### Element Part No.

Type	Element part no.		
	VQ0000	VQ1000	VQ2000
Built-in silencer, direct exhaust (-S)	VVQ0000-82A-4	VVQ1000-82A-4	VVQ2000-82A-4

\* 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.

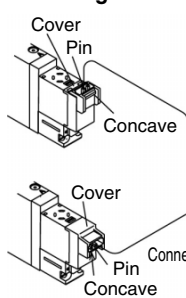


## How to Use Plug Connector

### ⚠ Caution

#### 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.

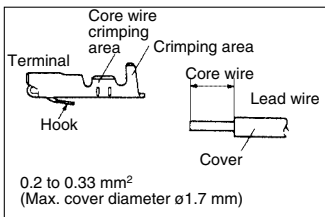


Lever  
DC indicator Socket  
Part no. DXT170-71-1  
Lead wire 0.2 to 0.33 mm<sup>2</sup>  
(Max. cover diameter ø1.7 mm)

To detach a connector, remove the pawl from the groove by pushing the lever downward with your thumb, and pull the connector straight out.

#### Crimping the lead wire and socket

Peel 3.2 to 3.7 mm of the tip of lead wire, enter the core wires and press contact it by a press tool. Be careful so that the cover of lead wire does not enter into the core contacting part.



0.2 to 0.33 mm<sup>2</sup>  
(Max. cover diameter ø1.7 mm)

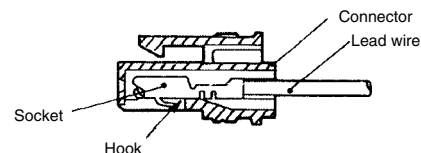
#### Attaching and detaching lead wires with sockets

##### Attaching

Insert a socket in the square hole (Indicated as +, -) of connector, push in the lead wire and lock by hanging the hook of socket to the seat of connector. (Pushing-in can open the hook and lock it automatically.) Then confirm the lock by lightly pulling on the lead wire.

##### 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.

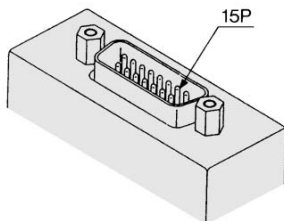


Option

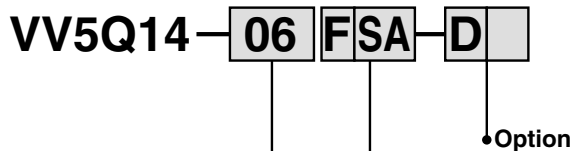
Different Number of Connector Pins

F and P kits with the following number of pins are available. Besides the standard number (F = 25; P = 26) select the desired number of pins and cable length from the cable assembly list. Place an order for the cable assembly separately.

**F** kit (D-sub connector) 15 pins



How to order manifold



**How to Order**  
D-sub connector, 15 pins  
Connector location-Side (horizontal)  
Without cable

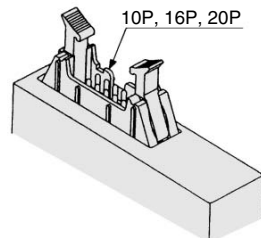
Kit/Electrical entry

Pins	Location		Top entry		Side entry	
	Kit	UA	Kit	SA		
15P (Max. 7 stations)	Kit F	UA	Kit F	SA		

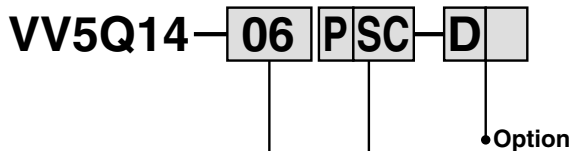
Wiring specifications

\* In the same way as the 25-pin models (standard) the terminal no. 1 is for SOL.A at the 1st station, the terminal no. 9 for SOL.B at the 1st station, and the terminal no. 8 for COM.

**P** kit (Flat ribbon cable connector) 10 pins, 16 pins, 20 pins



How to order manifold



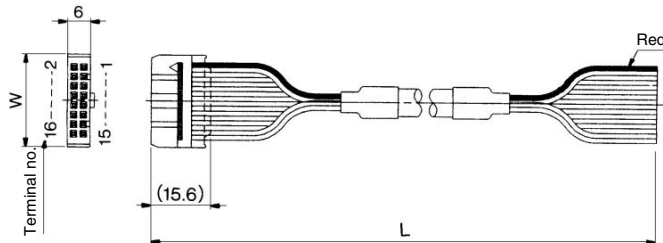
**How to Order**  
Flat ribbon cable, 20 pins  
Connector location-Side (Horizontal)  
Without cable

Kit/Electrical entry

Pins	Location		Top entry		Side entry	
	Kit	P	UA	UB	UC	SA
10P (Max. 4 stations)	Kit P	P	UA	UB	UC	SA
16P (Max. 7 stations)			UB	UC	SB	
20P (Max. 8 stations)			UC	SC		

Wiring Specifications

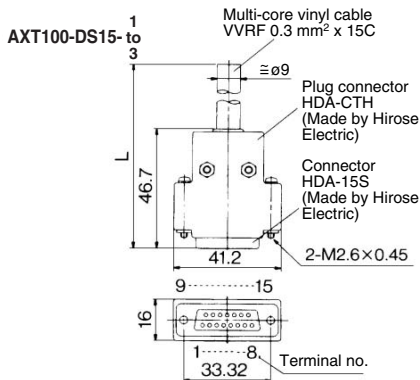
\* In the same way as the 26-pin models (standard) the terminal no. 1 is for SOL.A at the 1st station, the terminal no. 2 for SOL.B at the 1st station, and two pins from the max. terminal numbers are for COM.



Flat Ribbon Cable Assembly

Cable length (L)	Pins	10P	16P	20P
1.5 m		AXT100-FC10-1	AXT100-FC16-1	AXT100-FC20-1
3 m		AXT100-FC10-2	AXT100-FC16-2	AXT100-FC20-2
5 m		AXT100-FC10-3	AXT100-FC16-3	AXT100-FC20-3
Connector width (W)		17.2	24.8	30

\* For other commercial connectors, use a type with strain relief conforming to MIL-C-83503.



Wire Color by Terminal No. of D-sub Connector Cable Assembly

Terminal no.	Lead wire color	Dot marking
1	Black	None
2	Brown	None
3	Red	None
4	Orange	None
5	Yellow	None
6	Pink	None
7	Blue	None
8	Purple	White
9	Gray	Black
10	White	Black
11	White	Red
12	Yellow	Red
13	Orange	Red
14	Yellow	Black
15	Pink	Black

D-sub Connector Cable Assembly

Cable length (L)	Pins	15P
1.5 m		AXT100-DS15-1
3 m		AXT100-DS15-2
5 m		AXT100-DS15-3

\* For other commercial connectors, use a type conforming to MIL-C-24308.

### Special Wiring Specifications

In the internal wiring of F kit, P 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)

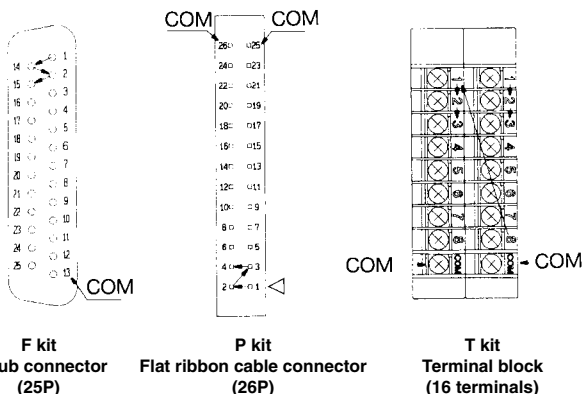
**VV5Q14-09FS0-D K S**



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 skipping 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)				T kit (Terminal block)		S kit (Serial)
Type	F □ 25P	F A 15P	P □ 26P	P C 20P	P B 16P	P A 10P	T1	T2	S □
Max. points	Note) 16	14	Note) 16	Note) 16	14	8	8	16	16

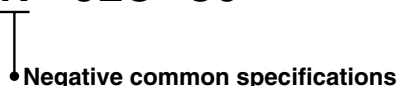
Note) Due to the limitation of internal wiring.

### 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

**VQ1140 N-5LO-C6**



### Inch-size One-touch Fittings

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

#### How to order manifold

**VV5Q14-08FS0-DN-00T**

P, R port size

VQ0000	ø1/4"
VQ1000	ø1/4"
VQ2000	ø5/16"

#### How to order valves

**VQ1140-5M-N7**

Cylinder port

Symbol	N1	N3	N7	N9
Applicable tubing O.D. (Inch)	ø1/8"	ø5/32"	ø1/4"	ø5/16"
A, B port	VQ0000	○	○	—
	VQ1000	—	○	○
	VQ2000	—	○	○

### Plug Connector Assembly Model

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

Specify the type of 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

Note) The parts numbers above are applicable to VQ0000/1000 (2 to 16 stations) and VQ2000 (2 to 10 stations). VQ2000 (11 to 16 stations) uses AXT661-13A(N)-F425.

VQC

SQ

VQ0

VQ4

VQ5

VQZ

VQD



# Series VQ0000/1000/2000

## Option

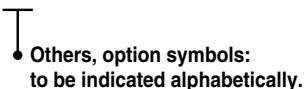
### DIN Rail Mounting

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 (C kit only.)**  
 (DIN rail mounting brackets only are attached.)  
 Indicate the option symbol, -DO, for the manifold no.

Example)

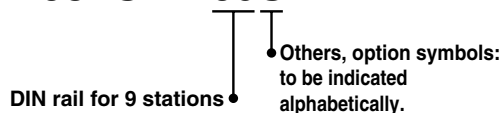
**VV5Q14-08C-DOS**



- **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)

**VV5Q14-08FS1-D09S**

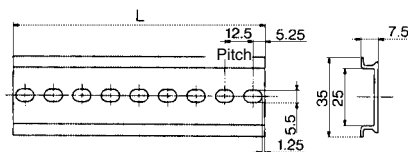


- **When changing the manifold style into a DIN rail mount**  
 Order brackets for mounting a DIN rail. (Refer to "Option" on pages 2-4-60, 61 and 64.)

No. VQ0000-57A4 (For VQ0000)  
 VQ1000-57A-4 (For VQ1000)  
 VQ2000-57A-4 (For VQ2000)  
 2 pcs. per one set

- **When ordering DIN rail only**  
**DIN rail no.: AXT100-DR-n**

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



### L Dimension

$$L = 12.5 \times n + 10.5$$

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

## VQ2000 (VV5Q24)/Plug Lead Unit, Flip Type

(F, P, T, S kit)

\* For how to increase the stations, refer to the instruction manual.

	Housing assembly and SI unit <sup>(3)</sup>	U side end plate assembly	Valve	D side end plate assembly	Station increase parts
<b>S kit</b>					
<b>P kit</b>					
<b>F kit</b>					
<b>T kit</b>					

Note 1) S kit is composed of a flat ribbon cable housing assembly (AXT100-2-PU20) of ① SI unit and ② P kit (20 pins).

Note 2) Since no connector assembly is included, order it separately. (Refer to page 2-4-69.)

Note 3) A housing assembly is not used for a C kit.

Note 4) A DIN rail clamping bracket is attached to each.



## <Housing Assembly and SI Unit>

### Housing assembly and SI unit no.

No.	Manifold	Part no.	Description
① <sup>(1)</sup>	(SA kit)	EX330-S001	General type SI unit (Series EX300)
	(SB kit)	EX130-SMB1	SI unit for MELSECNET/MINI-S3 Data Link System (Mitsubishi Electric Corporation)
	(SC kit)	EX130-STA1	SI unit for SYSBUS Wire System (OMRON Corporation)
	(SD kit)	EX130-SSH1	SI unit for Satellite I/O Link System (SHARP Corporation)
	SF1 kit	EX130-SUW1	SI unit for 16 point Uni-wire System (NKE Corporation)
	SH kit	EX130-SUH1	SI unit for 16 point Uni-wire H System (NKE Corporation)
②	P <sub>S</sub> <sup>U</sup> kit	AXT100-2-P <sub>S</sub> <sup>U</sup> □ <sup>(2)</sup>	Flat ribbon cable housing assembly □ = Number of pins: 26, 20, 16, 10
③	F <sub>S</sub> <sup>U</sup> kit	AXT100-2-F <sub>S</sub> <sup>U</sup> □ <sup>(2)</sup>	D-sub connector housing assembly □ = Number of pins: 25, 15
④ <sup>(3)</sup>	T kit	AXT100-2-TB1	Terminal block assembly (8 terminals)
⑤ <sup>(3)</sup>	T kit	AXT100-2-TB2	Terminal block assembly (8 terminals)



Note 1) S kit is composed of a flat ribbon cable housing assembly (AXT100-2-PS20) of ① SI unit and ② P kit (20 pins). Place an order for AXT100-2-PS20 separately.

Note 2) Top/vertical entry connector for FU and PU while side (horizontal) entry connector for FS and PS.

Note 3) Since no connector assembly is included, order it separately. (Refer to page 2-4-93.)



Note 4) In the case of standard specifications and double wiring, ④ is for 1 to 4 stations and ⑤ is for 5 to 8 stations.

VQC

SQ

VQ0

VQ4

VQ5

VQZ

VQD

## <D Side End Plate Assembly>

### ⑥ D side end plate assembly no.

VVQ2000-3A-4-□

#### Option

Nil: Common exhaust

S: Built-in silencer, direct exhaust  
(Applicable for C kit only)



Note) The ⑩'s fitting assembly is included.

## <U Side End Plate Assembly No.>

### ⑦ U side end plate assembly no.

VVQ2000-2A-4-□

#### Option

Nil: Common exhaust

S: Built-in silencer, direct exhaust



Note) The ⑩'s fitting assembly is included.

## <Replacement Parts>

No.	Part no.	Description	Material	Number
⑧	VVQ2000-80A-3-2	Seal	HNBR	12
⑨	VVQ2000-80A-3-4	Clip	Stainless steel	12



Note) A set of parts containing 12 pcs. each is enclosed.

## <Fittings Assembly>

### ⑩ Fittings assembly part no.

VVQ1000-51A-□

#### Port size

C4: Applicable tubing ø4

C6: Applicable tubing ø6

C8: Applicable tubing ø8<sup>(1)</sup>



Note 1) Standard SUP/EXH port is C8.

Note 2) Purchasing order is available in units of 10 pieces.

## <Station Increase Parts>

No. <sup>(3)</sup>	Part no.	Description	Material	Number <sup>(1)</sup>
⑪	VVQ2000-105A-4-□ <sup>(2)</sup>	Tie-rod bolt	Carbon steel	2
⑫		Guide rod	Stainless steel	1



Note 1) Each number of replacement parts are included in one set.

Note 2) □: Number of stations (01 to 16)

Note 3) ⑪ and ⑫ are in one set.